Scientific Refereed Quarterly

Sosyoekonomi

Vol. 29(50) October 2021 ISSN 1305-5577

Effects of the US Trade Policy Uncertainty on the Turkish Financial Markets and Bank Loans
Ecenur UĞURLU-YILDIRIM

Turkish Economic Growth: (Non) Labour Creating? (2000-2018)
Leyla BAŞTAV

An Analysis of The Validity of Absolute Purchasing Power Parity: The Case of Turkish Lira and British Pounds
Mehmet ERDOĞMUŞ

Social Networks, Female Unemployment, and the Urban-Rural Divide in Turkey: Evidence from Tree-Based Machine Learning Algorithms
Mehmet Güney CELBİŞ

Investigation of the Effect of R&D, Education and Health Expenditures on Economic Growth by Panel Data Analysis Method
Durmuş GÖKKAYA - Osman ŞENOL - Ümit ÇIRAKLI

Legacy of the Truman Doctrine on Turkish-American Relations: A Political Economy Perspective
Emrullah Can KILIÇ - Itır ÖZER-İMER

Tax Awareness and Morality in the Effectiveness of Tax Revenues: Secondary School Teachers' Tax Perception Analysis in Manavgat, Antalya
Emine UZUNALI - Yasin OĞUZ - Volkan OLCA - Mehmet DAĞ - Kazım KUMAŞ - Afşin GÜNGÖR

Validity of J-Curve for Turkey and Its Main External Trade Partners: An Application of a Panel Data Approach
Mehmet Çağrı GÖZEN - Fikriye Ceren BOSTANCI

Another Perspective of The Effects of Migration as A Determinant of Foreign Direct Investment: Evidence-Based on Panel Gravity Model from Turkey and OECD Countries
Hande AKSOZ-YILMAZ

Online Tertiary Education During The COVID-19 Pandemic in Turkey: A Country Profile Based on Survey With 13 Thousand Students
Furkan TUZUN - Nilay YORUK-TORAMAN

The Effect of Anthropomorphic Mascot on The Purchasing Intention of Consumers: An Experimental Study
Kadir DELİGÖZ - Sevtap ÜNAL

COVID-19 Pandemisinin İnsan Kaynakları Yönetimi Üzerine Etkilerinin Belirlenmesine Yönelik Bir Araştırma
Selma KILIÇ-KIRILMAZ

COVID-19'un İktisadi Yaşama, Siyasi Alana ve Topluma Etkileri: Kapsamlı Bir Değerlendirme
Yıldırım YILDIRIM

Cari Açık - Bütçe Açığı ve Faiz Oranı İlişkisi Bağlamında İkiz Açık ve Üçüz Açık Hipotezinin Geçerliliği: 1990-2019 Dönemi Türkiye Örneği
Selim İNANÇLI - Mustafa TORUSDAĞ

Türkiye'de Tarım, Sanayi ve Hizmet Sektörleri Arasındaki Nedensellik İlişkisinin Analizi
Nilcan MERT - Zehra ABDİOĞLU

Finansal Kuznets Eğrisi Hipotezi: Yapısal Kırılmalı Eş-bütünleşme Testleri ile Türk Ekonomisine İlişkin Ampirik Bir Analiz
Cüneyt DUMRUL - Salih Çağrı İLKAY - Yasemin DUMRUL

Piyasa Güven Endeksi ile Finansal Yatırım Araçları Arasındaki İlişki: BRICS ve MIST Ülkeleri Üzerine Bir Araştırma
Ferhat Şirin SÖKMEN - Serdar YAMAN - Mert Baran TUNÇEL

Yatırımcı Duyarlılığının BIST Pay Piyasasına Etkisi
Duygu ALTUNTAŞ - Ersan ERSOY

Makina Öğrenmesi Yöntemleri ile Türk Mevduat Bankalarının Müşteri Tahminine Yönelik Bir Uygulama
Filiz YETİZ - Mustafa TERZİOĞLU - Mehmet KAYAKUŞ

Âdem-i Merkeziyetçilik-Merkeziyetçilik Tartışmaları Bağlamında Osmanlı Devleti ve Fransa'da Savaşlar, Mali Baskılar, Kurumsal Değişim
Perihan Hazel KAYA

Kurumsal Kalite Faktörlerinin Finansal Gelişmişlik Üzerindeki Etkisi: İslam İşbirliği Teşkilatı Ülkeleri Örneği
Muhammed KASIM - Gökhan ÖZKUL - Dilek ÇETİN

Will Workers be Unemployed Because of Robots? A Meta-Analysis on Technology and Employment
İbrahim DAĞLI

Türkiye'de Para İkamesine Karşı Politika Faizi Etkin Olarak Kullanılıyor Mu? Fourier Alandan Kanıtlar
Tayfur BAYAT - Şebnem TAŞ

Kitlesel Fonlama Projelerinin Başarılarını Etkileyen Faktörler Üzerine Bir İnceleme
Birten AKYILDIZ - Selin METİN-CAMGÖZ - Kazım Barış ATICI

Yenilenebilir Enerji Yatırımları ve İstihdam İlişkisi: E-7 Ülkeleri Üzerine Bir Analiz
Muharrem AFŞAR - Başak OZARSLAN-DOĞAN

Editor-in-Chief

Ahmet Burçin YERELİ

Co-Editors-in-Chief

Emre ATSAN

Mehmet Fatih ÇAPANOĞLU

Ali Gökhan GÖLÇEK

Editorial Board

Hale AKBULUT

Barış ALPASLAN

Hakan AY

Başak DALGIÇ

Burcu FAZLIOĞLU

Sevilay GÜMÜŞ-ÖZUYAR

Anna KIZILTAN

Mustafa KIZILTAN

Altuğ Murat KÖKTAŞ

Aslı Ceren SARAL

Işıl Şirin SELÇUK

Ayşen SİVRİKAYA

Furkan TÜZÜN

INDEXED IN EMERGING SOURCES CITATION INDEX THOMSON REUTERS

TÜBİTAK ULAKBİM

SOSYOEKONOMİ

Peer-Reviewed, Scientific, Quarterly Hakemli, Bilimsel, Süreli

Sosyoekonomi Society Sosyoekonomi Derneği

October 2021, Vol. 29(50) ISSN 1305-5577

www.sosyoekonomijournal.org

Publisher / Derginin Sahibi **Editor-in-Chief / Yayın Kurulu Başkanı** **(Sorumlu Yazı İşleri Müdürü)**	:	On Behalf of Sosyoekonomi Society / Sosyoekonomi Derneği Adına **Ahmet Burçin YERELİ** editor@sosyoekonomijournal.org
Co-Editors-in-Chief / **Yayın Kurulu Bşk. Yrd.** **(Sorumlu Yazı İşleri Müdür Yrd.)**	:	**Emre ATSAN** **Mehmet Fatih ÇAPANOĞLU** **Ali Gökhan GÖLÇEK** info@sosyoekonomijournal.org
Title of Journal / **Yayının Adı**	:	Sosyoekonomi Journal Sosyoekonomi Dergisi
Type of Journal / **Yayının Türü**	:	Periodical Yaygın, Süreli Yayın
Frequency and Language / **Yayının Şekli ve Dili**	:	Quarterly, English & Turkish 3 Aylık, İngilizce & Türkçe
Directorial Address / **Yayının İdare Adresi**	:	Sosyoekonomi Derneği, Cihan Sokak, 27/7 06430 Sıhhiye / ANKARA Tel: +90 312 229 49 11 Fax: +90 312 230 76 23
Printing House / **Basım Yeri**	:	Sonçağ Yayıncılık Matbaacılık Reklam San. Tic. Ltd. Şti. İstanbul Caddesi, İstanbul Çarşısı, 48/48, İskitler / ANKARA Tel: +90 312 341 36 67
Place and Date of Print / **Basım Yeri ve Tarihi**	:	Ankara, 31.10.2021
Abstracting-Ranking-Indexing / **Dizin**	:	*Emerging Sources Citation Index (ESCI), Tübitak - ULAKBİM TR Dizin, EconLit, EBSCO, SOBIAD, ProQuest, Global Impact Factor (GIF), RePEc (Research Papers in Economics), IDEAS, EconPapers.*

Bu derginin her türlü yayım ve telif hakkı Sosyoekonomi Dergisi'ne aittir. 5846 sayılı Fikir ve Sanat Eserleri Kanunu hükümlerine göre, fotokopi, dijital ve benzeri yöntemlerle herhangi bir bölümü veya tamamı Dergi Sahibinin veya Yayın Kurulu Başkanının izni olmadan basılamaz ve çoğaltılamaz. Bilimsel etik kurallarına uygun olmayan alıntı yapılamaz. Dergide yayımlanan makalelerin fikri sorumluluğu yazarlara aittir.

©2021

Editorial Board / Yayın Kurulu

Ahmet Burçin	YERELİ	Hacettepe University, Turkey
Emre	ATSAN	Niğde Ömer Halisdemir University, Turkey
Mehmet Fatih	ÇAPANOĞLU	Hakkari University, Turkey
Ali Gökhan	GÖLÇEK	Niğde Ömer Halisdemir University, Turkey
Hale	AKBULUT	Hacettepe University, Turkey
Barış	ALPASLAN	Social Sciences University of Ankara, Turkey
Hakan	AY	Dokuz Eylül University, Turkey
Basak	DALGIÇ	Hacettepe University, Turkey
Burcu	FAZLIOĞLU	TOBB University of Economics and Technology, Turkey
Sevilay Ece	GÜMÜŞ-ÖZUYAR	Necmettin Erbakan University, Turkey
Egemen	İPEK	Tarsus University, Turkey
Tuncay	KARA	Hakkari University, Turkey
Anna	KIZILTAN	Onbeş Kasım Kıbrıs, Turkey
Mustafa	KIZILTAN	Hacettepe University, Turkey
Altuğ Murat	KÖKTAŞ	Necmettin Erbakan University, Turkey
Zuhal	KURUL	Hacettepe University, Turkey
Aslı Ceren	SARAL	Ankara University, Turkey
Işıl Şirin	SELÇUK	Bolu Abant İzzet Baysal University, Turkey
Ayşen	SİVRİKAYA	Hacettepe University, Turkey
Furkan	TÜZÜN	Social Sciences University of Ankara, Turkey

Editorial Advisory Board / Uluslararası Danışma Kurulu

Tekin	AKDEMİR	Ankara Yıldırım Beyazıt University, Turkey
Abdilahi	ALI	University of Salford, United Kingdom
Nunzio	ANGIOLA	University of Foggia, Italy
Shafiul	AZAM	Aberystwyth University, United Kingdom
Necmiddin	BAĞDADİOĞLU	Hacettepe University, Turkey
Elshan	BAGIRZADEH	Azerbaijan State University of Economics, Azerbaijan
Serdal	BAHÇE	Ankara University, Turkey
Alparslan Abdurrahman	BAŞARAN	Hacettepe University, Turkey
Caterina	DE LUCIA	University of Foggia, Italy
Matthias	FINGER	Ecole Polytechnique Fédérale de Lausanne, Switzerland
Ömer	GÖKÇEKUŞ	Seton Hall University, U.S.A.
Aleksandra	GÓRECKA	Warsaw University of Life Sciences, Poland
Jafar	HAGHIGHAT	University of Tabriz, Iran
Mubariz	HASANOV	Okan University, Turkey
Katsushi	IMAI	University of Manchester, United Kingdom
Kamalbek	KARYMSHAKOV	Kyrgyz-Turkish MANAS University, Kyrgyzstan
Ayşegül	KAYAOĞLU-YILMAZ	İstanbul Technical University, Turkey
King Yoong	LIM	Nottingham Trent University, United Kingdom
Adalet	MURADOV	Azerbaijan State University of Economics, Azerbaijan
Mehmed	MURIĆ	University for Peace, Serbia
Joaquín	NAVAL	University of Girona, Spain
Maria Paola	RANA	University of Salford, United Kingdom
Uğur	SADİOĞLU	Hacettepe University, Turkey
M. Mahruf C.	SHOHEL	Aberystwyth University, United Kingdom
Biagio	SIMONETTI	Università degli Studi del Sannio, Italy
Joseph	SZYLIOWICZ	University of Denver, U.S.A.
Bican	ŞAHİN	Hacettepe University, Turkey
Nevzat	ŞİMŞEK	Dokuz Eylül University, Turkey
Mustafa Erdinç	TELATAR	Okan University, Turkey
Ayşe Yasemin	YALTA	Hacettepe University, Turkey
Kasırga	YILDIRAK	Hacettepe University, Turkey

Referees of This Issue / Bu Sayının Hakemleri

Nilgün	ACAR-BALAYLAR	Dokuz Eylül University
Hale	AKBULUT	Hacettepe University
Remzi	ALTUNIŞIK	Sakarya University
Şükrü	APAYDIN	Nevşehir Hacı Bektaş Veli University
Shihomi	ARA-AKSOY	Hacettepe University
Ahmet Yılmaz	ATA	Kahramanmaraş Sütçü İmam University
Hakan	AY	Dokuz Eylül University
Fatih	AYHAN	Bandırma Onyedi Eylül University
Tarana	AZİMOVA	İstanbul Aydın University
Harun	BAL	Çukurova University
Ayberk Nuri	BERKMAN	Niğde Ömer Halisdemir University
Yasemin	BİLGEL	Bahçeşehir University
Gürkan	BOZMA	Iğdır University
Çiydem	ÇATAK	Turkish-German University
Mehmet Yunus	ÇELİK	Kastamonu University
Aysun	ÇETİN	Ondokuz Mayıs University
Başak	DALGIÇ	Hacettepe University
Yıldırım	DEMİR	Van Yüzüncü Yıl University
Burcu	DİNÇERGÖK	Atılım University
Aysel	ERCİŞ	Atatürk University
Sena	ERDEN-AYHÜN	Çanakkale Onsekiz Mart University
Ersan	ERSOY	Nevşehir Hacı Bektaş Veli University
Sinem	EYÜBOĞLU	Tarsus University
Burcu	FAZLIOĞLU	TOBB University of Economics and Technology
Eda	FENDOĞLU	Malatya Turgut Özal University
Atilla	GÖKÇE	Ankara Hacı Bayram Veli University
Ekrem	GÜL	Sakarya University
Derya	GÜLER-AYDIN	Hacettepe University
Elif	GÜNEREN-GENÇ	İstanbul Commerce University
Miraç Fatih	İLGÜN	Erciyes University
Egemen	İPEK	Tarsus University
Havvanur Feyza	KAYA	Samsun University
Anna	KIZILTAN	Onbeş Kasım Kıbrıs University
Asuman	KOÇ-YURTKUR	Zonguldak Bülent Ecevit University
Turhan	KORKMAZ	Mersin University
Ayben	KOY	İstanbul Commerce University
Handan	KUMAŞ	Pamukkale University
Zühal	KURUL	Hacettepe University
Sema	MERCANOĞLU-ERİN	İstanbul Gelişim University
Lucky	NUGROHO	Universitas Mercu Buana
Işıl Fulya	ORKUNOĞLU-ŞAHİN	Ankara Hacı Bayram Veli University
Gülserim	ÖZCAN	Atılım University
Elif Özlem	ÖZÇATAL	Tokat Gaziosmanpaşa University
Cem	ÖZGÜZEL	OECD Organisation for Economic Co-operation and Development
Özlem	ÖZKIVRAK	Trakya University
Doğuş	ÖZUYAR	Ankara University
Habibur	RAHMAN	Universiti Sultan Zainal Abidin
İbrahim Erdem	SEÇİLMİŞ	Hacettepe University
Sevgi	SEZER	Balıkesir University
Ayşen	SİVRİKAYA	Hacettepe University
Alptekin	SÖKMEN	Ankara Hacı Bayram Veli University
Nurhan	TALEBİ	İstanbul Aydın University
Celal	TAŞDOĞAN	Ankara Hacı Bayram Veli University
Emre Esat	TOPALOĞLU	Şırnak University
Metin	TOPRAK	İstanbul Sabahattin Zaim University
Nadide Sevil	TÜLÜCE	Kayseri University
Umut	TÜRK	Abdullah Gül University
Hilmi	ÜNSAL	Ankara Hacı Bayram Veli University
Haluk	YERGİN	Van Yüzüncü Yıl University
Mesut	YÜCESAN	Çanakkale Onsekiz Mart University

Content

	Author(s)	Title	pp.
		Executive Summary	6
		Editörün Notu	8
Research Article	Ecenur UĞURLU-YILDIRIM	**Effects of the US Trade Policy Uncertainty on the Turkish Financial Markets and Bank Loans** ABD Ticaret Politikası Belirsizliğinin Türk Finansal Piyasalarına ve Banka Kredilerine Etkileri	11
Research Article	Leyla BAŞTAV	**Turkish Economic Growth: (Non) Labour Creating? (2000-2018)** Ekonomik Büyüme: Türkiye'de İstihdam Yaratmıyor Mu? (2000-2018)	35
Research Article	Mehmet ERDOĞMUŞ	**An Analysis of The Validity of Absolute Purchasing Power Parity: The Case of Turkish Lira and British Pound** Mutlak Satın Alma Gücü Paritesinin Geçerliliğine İlişkin Bir Analiz: Türk Lirası ve İngiliz Sterlini Örneği	51
Research Article	Mehmet Güney CELBİŞ	**Social Networks, Female Unemployment, and the Urban-Rural Divide in Turkey: Evidence from Tree-Based Machine Learning Algorithms** Sosyal Ağlar, Kadın İşsizliği ve Türkiye'de Kentsel-Kırsal Farklılaşmaları: Ağaç Bazlı Makine Öğrenmesi Algoritmalarından Bulgular	73
Research Article	Durmuş GÖKKAYA Osman ŞENOL Ümit ÇIRAKLI	**Investigation of the Effect of R&D, Education and Health Expenditures on Economic Growth by Panel Data Analysis Method** Ar-Ge, Eğitim ve Sağlık Harcamalarının Ekonomik Büyüme Üzerindeki Etkisinin Panel Veri Analizi Yöntemiyle Değerlendirilmesi	95
Research Article	Emrullah Can KILIÇ Itır ÖZER-İMER	**Legacy of the Truman Doctrine on Turkish-American Relations: A Political Economy Perspective** Türk-Amerikan İlişkilerinde Truman Doktrini'nin Mirası: Bir Ekonomi Politik Perspektifi	109
Research Article	Emine UZUNALİ Yasin OĞUZ Volkan OLCA Mehmet DAĞ Kazım KUMAŞ Afşin GÜNGÖR	**Tax Awareness and Morality in the Effectiveness of Tax Revenues: Secondary School Teachers' Tax Perception Analysis in Manavgat, Antalya** Vergi Gelirlerinin Etkinliğinde Vergi Bilinci ve Vergi Ahlakının Önemi: Antalya İli Manavgat İlçesi Ortaokul Öğretmenleri Üzerinde Bir Algı Analizi Çalışması	131
Research Article	Mehmet Çağrı GÖZEN Fikriye Ceren BOSTANCI	**Validity of J-Curve for Turkey and Its Main External Trade Partners: An Application of a Panel Data Approach** Türkiye ve Ana Ticaret Partnerleri için J Eğrisinin Geçerliliğinin Analizi: Panel Veri Yaklaşımı Uygulaması	149
Research Article	Hande AKSÖZ-YILMAZ	**Another Perspective of The Effects of Migration as A Determinant of Foreign Direct Investment: Evidence-Based on Panel Gravity Model from Turkey and OECD Countries** Doğrudan Yabancı Yatırımın Belirleyicisi Olarak Göçün Etkilerine Farklı Bir Bakış: Türkiye ve OECD Ülkeleri Üzerine Panel Çekim Modelinden Bulgular	169
Research Article	Furkan TÜZÜN Nilay YÖRÜK-TORAMAN	**Online Tertiary Education During The COVID-19 Pandemic in Turkey: A Country Profile Based on Survey With 13 Thousand Students** COVID-19 Pandemisi Döneminde Türkiye'de Yükseköğretim: 13bin Öğrenci ile Yapılan Anket Sonuçları Bazında bir Ülke Profili	197
Research Article	Kadir DELİGÖZ Sevtap ÜNAL	**The Effect of Anthropomorphic Mascot on The Purchasing Intention of Consumers: An Experimental Study** Tüketicilerin Satın Alma Niyetlerinde Antropomorfik Maskotun Etkisi: Deneysel Bir Çalışma	229
Research Article	Selma KILIÇ-KIRILMAZ	**COVID-19 Pandemisinin İnsan Kaynakları Yönetimi Üzerine Etkilerinin Belirlenmesine Yönelik Bir Araştırma** A Research to Determine the Effects of COVID-19 Pandemic on Human Resources Management	255
Research Article	Yıldırım YILDIRIM	**COVID-19'un İktisadi Yaşama, Siyasi Alana ve Topluma Etkileri: Kapsamlı Bir Değerlendirme** The Effects of COVID-19 On Economic Life, Political Field, and Society: A Comprehensive Evaluation	277
Research Article	Selim İNANÇLI Mustafa TORUSDAĞ	**Cari Açık - Bütçe Açığı ve Faiz Oranı İlişkisi Bağlamında İkiz Açık ve Üçüz Açık Hipotezinin Geçerliliği: 1990-2019 Dönemi Türkiye Örneği** Validity of Twin Deficit and Triplet Deficit Hypothesis in The Relation of Current Account Deficit - Budget Deficit and Interest Rate: 1990-2019 Case of Turkey	299

Research Article	Nilcan MERT Zehra ABDİOĞLU	**Türkiye'de Tarım, Sanayi ve Hizmet Sektörleri Arasındaki Nedensellik İlişkisinin Analizi** Analysis of the Causality Relationship between Agriculture, Industry and Service Sectors in Turkey	317
Research Article	Cüneyt DUMRUL Salih Çağrı İLKAY Yasemin DUMRUL	**Finansal Kuznets Eğrisi Hipotezi: Yapısal Kırılmalı Eş-bütünleşme Testleri ile Türk Ekonomisine İlişkin Ampirik Bir Analiz** The Financial Kuznets Curve Hypothesis: An Empirical Analysis of the Turkish Economy with Structural Breaks Co-integration Tests	337
Research Article	Ferhat Şirin SÖKMEN Serdar YAMAN Mert Baran TUNÇEL	**Piyasa Güven Endeksi ile Finansal Yatırım Araçları Arasındaki İlişki: BRICS ve MIST Ülkeleri Üzerine Bir Araştırma** The Relation Between Business Confidence Index and Financial Investment Instruments: An Investigation on BRICS and MIST Countries	361
Research Article	Duygu ALTUNTAŞ Ersan ERSOY	**Yatırımcı Duyarlılığının BIST Pay Piyasasına Etkisi** The Effect of Investor Sentiment on the BIST Stock Index	387
Research Article	Filiz YETİZ Mustafa TERZİOĞLU Mehmet KAYAKUŞ	**Makina Öğrenmesi Yöntemleri ile Türk Mevduat Bankalarının Müşteri Tahminine Yönelik Bir Uygulama** An Analysis of Turkish Deposit Banks' Customer Forecasting with Machine Learning Methods	413
Research Article	Perihan Hazel KAYA	**Âdem-i Merkeziyetçilik-Merkeziyetçilik Tartışmaları Bağlamında Osmanlı Devleti ve Fransa'da Savaşlar, Mali Baskılar, Kurumsal Değişim** Wars, Fiscal Pressures, Institutional Change in the Ottoman Empire and France in the Context of Decentralization and Centralization Debates	433
Research Article	Muhammed KASIM Gökhan ÖZKUL Dilek ÇETİN	**Kurumsal Kalite Faktörlerinin Finansal Gelişmişlik Üzerindeki Etkisi: İslam İşbirliği Teşkilatı Ülkeleri Örneği** Effect of Institutional Quality Factors on Financial Development: The Case of Islamic Cooperation Organization Countries	465
Research Article	İbrahim DAĞLI	**Will Workers be Unemployed Because of Robots? A Meta-Analysis on Technology and Employment** Çalışanlar Robotlar Yüzünden İşsiz mi Kalacak? Teknoloji ve İstihdam Üzerine Bir Meta-Analiz Çalışması	485
Research Article	Tayfur BAYAT Şebnem TAŞ	**Türkiye'de Para İkamesine Karşı Politika Faizi Etkin Olarak Kullanılıyor Mu? Fourier Alandan Kanıtlar** Is Policy Interest Effectively Used in Turkey for Against Currency Substitution: Evidence from Fourier Area	503
Research Article	Birten AKYILDIZ Selin METİN-CAMGÖZ Kazım Barış ATICI	**Kitlesel Fonlama Projelerinin Başarılarını Etkileyen Faktörler Üzerine Bir İnceleme** An Investigation on Factors Affecting Crowdfunding Project Success	521
Research Article	Muharrem AFŞAR Başak ÖZARSLAN-DOĞAN	**Yenilenebilir Enerji Yatırımları ve İstihdam İlişkisi: E-7 Ülkeleri Üzerine Bir Analiz** Relation of Renewable Energy Investments and Employment: An Analysis on E-7 Countries	547
Notes for Contributors			566
Yazarlara Duyuru			567

Executive Summary

In the last issue of 2021 in *Sosyoekonomi Journal*, there are twenty-five articles, twelve of which were written in English and thirteen in Turkish. Our journal undertakes a humble responsibility to bring the original contributions of these high-quality studies, all of which are designed as research articles, to the literature. We are pleased to bring you original works from a wide variety of fields in Social Sciences in this issue, including 51 researchers who worked jointly or individually.

In the opening article of this issue, the effect of US trade policy uncertainty on financial markets in Turkey is evaluated by **Uğurlu-Yıldırım**. In the second study, which belongs to Baştav, the relationship between the employment creation capacity of Turkey and GDP was analysed. In the third article, **Erdoğmuş** revealed the effect of the exchange rate, which is extremely important for economies, on absolute purchasing power parity. The study, which covered the analysis of the period between 2001 and 2020, concluded that the absolute purchasing power parity is not valid for the Turkish lira and the US dollar. The fourth article prepared by Celbiş is on machine learning, which has recently found a great place in the literature. The causes of individual unemployment, social networks, women's unemployment, and urban-rural distinction were tried to be estimated in the study. In the fifth article by **Gökkaya, Şenol, and Çıraklı**, the effects of R&D, education, and health expenditures on economic growth on the middle-upper-income and high-income country groups were investigated over 45 countries.

Kilic and Ozer-Imer brought the Turkish-American relations to the agenda through the Truman Doctrine, with an economic-political perspective. In the seventh study prepared by **Uzunali, Oguz, Olca, Dağ, Kumaş, and Güngör**, the tax perception of 124 secondary school teachers working in the Manavgat district of Antalya province was measured using a questionnaire. The study revealed that the tax awareness and moral understanding of the surveyed teachers were not at a sufficient level. The validity of the J Curve and its main trading partners, Russia, USA, Germany, UK, Italy, and China, were analyzed by the authors of the eighth article, **Gözen, and Bostancı**, for Turkey.

Moreover, **Aksöz-Yılmaz** analyzed the effect of migration on foreign direct investment between Turkey and the OECD. The article concludes that immigrants coming to OECD countries from Turkey positively affect foreign direct investments coming from OECD countries to Turkey. In the tenth article written by **Tüzün and Yörükk-Toraman**, the transformation created by the Covid-19 Pandemic, which has affected the whole world for the last one and a half years, in higher education has been revealed with the implementation of a survey on university students in Turkey.

Deligöz and Ünal conducted an experimental study on consumers' purchasing intentions using the survey data conducted with 60 people in the central districts of Erzurum. The results of the survey conducted by **Kılıç-Kırılmaz** with 240 online participants aimed to reveal the effects of the Covid-19 Pandemic on human resources management. In the thirteenth article, **Yıldırım** examined the effects of the Covid-19 Pandemic on economic life, political sphere, diplomacy, and society. **İnançlı and Torusdağ** analyzed the validity of the twin deficit and triple deficit hypothesis through the relationship between current account deficit, budget deficit, and interest rates in Turkey. In the fifteenth study in the issue, **Mert and Abdioğlu** investigated the causality relationship between Turkey's agriculture, industry, and service sectors. In the study, panel data covering the period of 2004-2017 of 81 provinces were used. It was tried to determine the key sectors that shape the economic growth according to the regions.

In the sixteenth article **Dumrul, Ilkay, and Dumrul**analyzed the effects of financial sector developments in the Turkish economy on income inequality. The findings obtained in the study showed that the inverted u-shaped relationship predicted in the Financial Kuznets Curve is not valid for the Turkish economy. In another study, **Sökmen, Yaman, and Tunçel** examined the relationship between market confidence index and financial investment instruments within the scope of BRICS and MIST countries. According to the findings obtained in the study, it has been determined that the effects of investor confidence and expectations on financial investment instruments differ according to country.

In the eighteenth study conducted by **Altuntaş and Ersoy**, the effect of investor sentiment on the BIST Equity Market was analysed to cover the period of 2007-2020. **Yetiz, Terzioğlu, and Kayakuş**aimed to determine the number of bank branches, employees, deposits, and loans with machine learning methods and factors affecting customer forecasting in the Turkish banking sector. In the twentieth article, **Kaya** compared the Ottoman Empire and France between the 16th and 19th centuries in decentralization and discussed administrative and social events in the mentioned periods.

Kasım, Özkul, and Çetin examined the effect of institutional quality factors on financial development through the Organization of Islamic Cooperation countries. According to the results obtained in the study, it was found that the decrease in corruption and the rule of law, the efficiency of the legislation, the openness of the markets affects the financial development positively and the size of the state negatively. **Dağlı** tried to find an answer to the question "Will workers be unemployed because of robots?" by using the meta-analysis method in the field of economics. In the twenty-third article, **Bayat and Taş** analyzed with Fourier Causality Tests whether the policy rate is used effectively against currency substitution in Turkey. According to the results obtained in the said study, it has been observed that interest rates are not effective in the currency substitution process in Turkey.

Akyıldız, Metin-Camgöz, and Atıcı examined crowdfunding projects in Turkey and the USA, and the factors affecting the success of these projects were tried to be determined. In the last article of 2021, **Afşar and Özarslan-Doğan** tried to analyse the relationship between renewable energy investments and employment in the context of E-7 countries.

The primary motivation of our journal, which focuses on research regarding Social Science, is to contribute to the field by including qualified publications. Our journal, which is set out for this purpose, is completing the year 2021 with 94 articles written by 195 researchers individually or jointly. In this issue of our journal, we hope that our authors' articles and their contributions to the literature will shed light on the work of our esteemed readers. We would like to thank all our reviewers and editorial board members who contributed to this gruelling and meticulous work process, as well as you, our esteemed readers, for your continued interest.

Ali Gökhan GÖLÇEK

Editorial Board Member

Editörün Notu

Sosyoekonomi Dergisinin 2021 yılının son sayısında on iki İngilizce ve on üçü Türkçe kaleme alınmış toplam yirmi beş makale bulunmaktadır. Tamamı araştırma makalesi olarak tasarlanmış olan bu yüksek kaliteli çalışmaların her birinin literatüre yapacağı özgün katkıların kazandırılmasında dergimiz naçizane bir sorumluluk üstlenmektedir. Bu sayımızda 51 araştırmacının ortak veya bireysel olarak hazırladığı Sosyal Bilimlerin çok çeşitli alanlarından özgün çalışmaları sizlerle buluşturmanın memnuniyeti içerisindeyiz.

Uğurlu-Yıldırım tarafından kaleme alınan bu sayının açılış makalesinde, ABD'nin ticaret politikası belirsizliğinin Türkiye'de finansal piyasalara etkisini değerlendirilmiştir. **Baştav**'a ait olan ikinci çalışmada, Türkiye'nin istihdam yaratma kapasitesi ve GSYİH arasındaki ilişki analiz edilmiştir. Üçüncü makalede **Erdoğmuş**, ekonomiler için son derece önemli olan döviz kurunun, mutlak satın alma gücü paritesine etkisini ortaya koymuştur. 2001-2020 döneminin analiz edildiği çalışmasında, Türk lirası ve ABD doları açısından mutlak satın alma gücü paritesinin geçerli olmadığı sonucuna ulaşılmıştır. **Celbiş** tarafından hazırlanan dördüncü makale, son dönemde literatürde bir hayli yer bulan makine öğrenmesi üzerinedir. Söz konusu çalışmada bireysel işsizlik durumlarının sebepleri; sosyal ağlar, kadın işsizliği ve kent-kır ayrımı üzerinden tahmin edilmeye çalışılmıştır. **Gökkaya, Şenol ve Çıraklı**'ya ait olan beşinci makalede Ar-Ge, eğitim ve sağlık harcamalarının ekonomik büyüme üzerindeki etkileri, orta-üst gelir ve yüksek gelirli ülke gruplarında yer alan 45 ülke üzerinden araştırılmıştır.

Kılıç ve Özer-İmer, Türk-Amerikan ilişkilerini Truman Doktrini üzerinden, ekonomi-politik bir bakış açısıyla gündeme getirmişlerdir. **Uzunali, Oğuz, Olca, Dağ, Kumaş ve Güngör** tarafından hazırlanan yedinci çalışmada, Antalya ili Manavgat ilçesinde görev yapan 124 ortaokul öğretmeninin vergi algısı, anket yoluyla ölçülmüştür. Söz konusu çalışmada anket uygulanan öğretmenlerin, vergi bilinç ve ahlak anlayışlarının yeterli düzeyde olmadığı ortaya konulmuştur. Sekizinci makalenin yazarları **Gözen ve Bostancı** tarafından, Türkiye ve ana ticaret partnerleri olan Rusya, ABD, Almanya, Birleşik Krallık, İtalya ve Çin için J Eğrisinin geçerliliği analiz edilmiştir.

Aksöz-Yılmaz, göçün Türkiye ile OECD arasındaki doğrudan yabancı yatırımlara etkisini analiz etmiştir. Makalede OECD ülkelerine Türkiye'den gelen göçmenlerin, OECD ülkelerinden Türkiye'ye gelen doğrudan yabancı yatırımlar üzerinde olumlu etkisi olduğu sonucuna ulaşılmıştır. **Tüzün ve Yörük-Toraman** tarafından kaleme alınan onuncu makalede, son bir buçuk yıldır bütün dünyayı etkisi altına alan Covid-19 Pandemisinin yükseköğretimde yarattığı dönüşüm, Türkiye özelinde üniversite öğrencileri üzerinden anket uygulaması ile ortaya konulmuştur.

Deligöz ve Ünal, Erzurum ili merkez ilçelerde 60 kişiyle yapılan anket verilerini kullanarak tüketicilerin satın alma niyetleri üzerine deneysel bir çalışma yürütmüşlerdir. **Kılıç-Kırılmaz** tarafından 240 online katılımcı ile gerçekleştirilen anket sonuçları, Covid-19 Pandemisinin insan kaynakları yönetimi üzerine etkilerini ortaya koymayı amaçlamıştır. On üçüncü makalede **Yıldırım**, Covid-19 Pandemisinin ekonomik yaşama, siyasal alana, diplomasiye ve topluma etkilerini incelemiştir. **İnançlı ve Torusdağ**, ikiz açık ve üçüz açık hipotezinin geçerliliğini Türkiye özelinde cari açık, bütçe açığı ve faiz oranları ilişkisi üzerinden analiz etmiştir. Sayıda yer alan on beşinci çalışmada **Mert ve Abdioğlu**, Türkiye için tarım, sanayi ve hizmet sektörleri arasındaki nedensellik ilişkisi araştırılmıştır. Çalışmada 81 ilin 2004-2017 dönemini kapsayan panel veriler kullanılmış ve bölgelere göre ekonomik büyümeye yön veren kilit sektörler belirlenmeye çalışılmıştır.

On altıncı makalede **Dumrul, İlkay ve Dumrul**, Türkiye ekonomisinde gerçekleşen finansal sektör gelişmelerinin gelir adaletsizliği üzerindeki etkisini analiz etmişlerdir. Çalışmada elde edilen bulgular, Türkiye ekonomisi için Finansal Kuznets Eğrisinde öngörülen ters u şeklindeki ilişkinin geçerli olmadığını göstermiştir. Bir diğer çalışmada **Sökmen, Yaman ve Tunçel**, BRICS ve MIST ülkeleri kapsamında piyasa güven endeksi ile finansal yatırım araçları arasındaki ilişkiyi incelemişlerdir. Çalışmada elde edilen bulgulara göre, yatırımcı güven ve beklentilerinin finansal yatırım araçlarına olan etkilerinin ülkelere göre farklılık gösterdiği tespit edilmiştir.

Altuntaş ve Ersoy tarafından kaleme alınan on sekizinci çalışmada ise, yatırımcı duyarlılığının BIST Pay Piyasasına etkisi 2007-2020 dönemini kapsayacak şekilde analiz edilmiştir. **Yetiz, Terzioğlu ve Kayakuş**, Türk Bankacılık sektöründe müşteri tahminini etkileyen etmenleri; banka şube sayısı, çalışan sayısı, mevduat ve krediler üzerinden makine öğrenmesi yöntemleri ile tespit etmeye çalışmışlardır. Yirminci makalede **Kaya**, 16. ve 19. yüzyıllar arasındaki Osmanlı Devleti ve Fransa'yı âdem-i merkeziyetçilik bağlamında karşılaştırmış ve bahsedilen dönemlerde idari ve toplumsal olaylar üzerinden tartışmıştır.

Kasım, Özkul ve Çetin, kurumsal kalite faktörlerinin finansal gelişmişlik üzerindeki etkisini İslam İşbirliği Teşkilatı ülkeleri üzerinden incelemişlerdir. Çalışmada elde edilen sonuçlara göre; yolsuzluğun azalmasının ve hukukun üstünlüğü, mevzuat etkinliği, piyasaların açıklığının finansal gelişmişliği pozitif, devlet

büyüklüğünün ise negatif etkilediği bulunmuştur. **Dağlı**, "*çalışanlar, robotlar yüzünden işsiz mi kalacak?*" sorusuna, meta-analiz yöntemini ekonomi alanında kullanarak yanıt aramaya çalışmıştır. Yirmi üçüncü makalede **Bayat ve Taş**, Türkiye'de politika faizinin para ikamesine karşı etkin olarak kullanılıp kullanılmadığını Fourier Nedensellik Testleri ile analiz etmişlerdir. Söz konusu çalışmada elde edilen sonuçlara göre Türkiye'de faizlerin para ikamesi sürecinde etkili olmadığı görülmüştür.

Akyıldız, Metin-Camgöz ve Atıcı tarafından kaleme alınan çalışmada, Türkiye ve ABD'deki kitlesel fonlama projeleri incelenmiş ve söz konusu projelerin başarılarını etkileyen faktörler tespit edilmeye çalışılmıştır. 2021 yılının son makalesinde ise **Afşar ve Özarslan-Doğan**, yenilebilir enerji yatırımları ve istihdam ilişkisini E-7 Ülkeleri bağlamında analiz etmeye çalışmışlardır.

Sosyal Bilim araştırmalarına odaklanan dergimizin temel motivasyonu, nitelikli yayınlara yer vererek alana katkıda bulunmaktır. Bu amaçla yola çıkan dergimiz, 2021 yılını 195 araştırmacının bireysel veya ortaklaşa yazdığı toplam 94 makale ile tamamlamaktadır. Dergimizin bu sayısında, yazarlarımızın makaleleri ile literatüre yaptıkları katkılarının, siz değerli okuyucularımızın çalışmalarına ışık tutmasını temenni ediyoruz. Bu meşakkatli ve titiz çalışma sürecine katkı sunan tüm hakemlerimize ve yayın kurulu üyelerimize, ayrıca süregelen ilginizden ötürü siz değerli okuyucularımıza teşekkürü bir borç biliriz.

Ali Gökhan GÖLÇEK
Yayın Kurulu Üyesi

Sosyoekonomi

2021, Vol. 29(50), 11-33

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.01
Date Submitted: 13.04.2020
Date Revised: 28.06.2021
Date Accepted: 02.08.2021

Effects of the US Trade Policy Uncertainty on the Turkish Financial Markets and Bank Loans

Ecenur UĞURLU-YILDIRIM *(https://orcid.org/0000-0001-6465-4781), Social Sciences University of Ankara, Turkey; ecenur.yildirim@asbu.edu.tr*

ABD Ticaret Politikası Belirsizliğinin Türk Finansal Piyasalarına ve Banka Kredilerine Etkileri

Abstract

For many decades, the transmission of uncertainty among countries has been one of the hottest topics in the literature. This study aims to contribute to this literature by studying the impact of the U.S.'s trade policy uncertainty (TPU) on the Turkish stock market, bank loans, and investor sentiment. We employ a non-linear autoregressive distributed lag (NARDL) approach. An existing cointegration between variables is demonstrated. Our findings also show that while the U.S.'s TPU significantly influences both share prices and bank loans, it does not seem to substantially impact Turkey's investor sentiment in the long run or the short run. This paper demonstrates that the effects of U.S. policies on financial market players and investors in Turkey are not negligible.

Keywords : Trade Policy Uncertainty, NARDL, Stock Market, Bank Loans, Investor Sentiment.

JEL Classification Codes : F13, G10, G20.

Öz

Uzun yıllar boyunca, belirsizliğin ülkeler arasında aktarılması, literatürdeki en sıcak konulardan biri olmuştur. Bu çalışma, ABD'nin ticaret politikası belirsizliğinin Türkiye'deki hisse-senedi piyasasının, bankalarca verilen kredilerin ve yatırımcı duyarlılığının üzerindeki etkisini inceleyerek bu literatüre katkıda bulunmayı amaçlamaktadır. Doğrusal olmayan otoregresif dağıtılmış gecikme (NARDL) yaklaşımı kullanılarak değişkenler arasında eşbütünleşmenin varlığı gösterilmiştir. Bulgularımız, ABD'nin ticaret politikası belirsizliğinin Türkiye için hem hisse fiyatları hem de banka kredileri üzerinde önemli bir etkiye sahip olduğunu gösterirken ne uzun ne de kısa vadede yatırımcı duyarlılığı üzerinde önemli bir etkisinin olmadığını ortaya koymaktadır. Bu çalışma, ABD politikalarının Türkiye'deki finansal piyasa oyuncuları ve yatırımcıları üzerindeki etkilerinin göz ardı edilemeyeceğini göstermektedir.

Anahtar Sözcükler : Ticaret Politikası Belirsizliği, NARDL, Hisse Senedi Piyasası, Banka Kredileri, Yatırımcı Duyarlılığı.

1. Introduction

The cross-border spillovers of uncertainty shocks become the central point of hot debate in the literature. Ample studies demonstrate that economies can be suffered from external uncertainties, even when the level of domestic uncertainty remains the same (see Biljanovska et al., 2017; Bonaime et al., 2018: 531-558). As emerging markets are affected by the interrelationship of uncertainties across borders, these markets get considerable attention from economic and finance researchers. Turkey deserves special devotion among these markets as it is one of the most critical and comparatively large emerging markets to analyse (Bown, 2013: 193-218). Foreign trade has an essential influence on Turkish domestic and foreign policies, as the portion of international trade in the Gross Domestic Product (GDP) is almost 50 percent of the GDP of Turkey (Kirişçi & Kaptanoğlu, 2011: 705-724). By having nearly $20 billion total trade amount in 2019, the United States (U.S.) is the second-largest trade partner of Turkey. This fact suggests the existence of the possible effects of the uncertainty in the U.S. trade policy on the Turkish real economy and capital markets.

Additionally, due to the high interaction between these two countries, it is worth examining the impact of changes in trade policy uncertainty in the U.S. on investor sentiment in Turkey. In this regard, the primary purpose of this study is to examine the transmission of the U.S.'s trade policy uncertainty to the Turkish financial markets and bank loans by empirically analysing the non-linear cointegration relationships among trade policy uncertainty in the U.S., Turkey's share price index, bank loans, and investor sentiment. No prior studies to our knowledge have examined the impact of the U.S.'s TPU on the financial markets and bank loans in Turkey.

Our contribution to the literature is mainly four-fold. First of all, although the high trade volume between U.S. and Turkey suggests the possible impact of trade policy uncertainty in Turkish capital markets, we verify the direct evidence of this effect both in the long-run and short-run by employing non-linear autoregressive distributed lag (NARDL) methodology presented by Shin et al. (2014: 281-314). This methodology has several advantages over the previous methods employed in the literature. First, unlike its counterparts like Vector Error Correction Model (VECM), NARDL models allow variables to be integrated of different orders. Second, the asymmetric effects of negative and positive shocks in both the long- and short-run can be obtained with this model. The linearity and symmetry assumptions of ARDL are overly restrictive and unrealistic, particularly for variables related to economics. Because with the increase in the interconnection of economies, these variables become more unpredictable (Hamzah & Masih, 2018). Finally, this methodology is free from the convergence and endogeneity problems that other models like non-linear threshold VECM can suffer from (see Mensi et al., 2017: 258-279; Kocaarslan & Soytas., 2019).

Moreover, instead of examining one aspect of the uncertainty in trade policy, the aggregate index constructed by Caldara et al. (2019) is employed in this study. Therefore,

the interpretations of our results are more comprehensive than the existing studies. The findings of this paper suggest changes in the uncertainty have a significant impact on the share prices both in the long- and short-run. Moreover, negative and positive changes influence share prices asymmetrically in the short run.

Second, we contribute to the literature by offering direct evidence of the link between TPU in the U.S. and investor sentiment in Turkey. With the increase in economic integration and financial globalization, changes in uncertainty in one country are expected to affect investor sentiment. By considering asymmetric impacts among variables, the NARDL findings show no significant effect of uncertainty in the U.S.'s trade policy on the sentiment of investors in Turkey, neither in the long- nor short-run. These findings can be considered as less than perfect economic and financial harmonization between the U.S. and Turkey.

The third contribution of our study to the literature is that we propose direct evidence of the relationship between investor sentiment and bank loans. To the best of our knowledge, this study is the first one that investigates the asymmetric relations between these two variables for Turkey. Our results demonstrate that only negative changes in investor sentiment directly impact private loans in the long run. Additionally, while the negative changes in investor sentiment still have a significant positive impact on bank loans, the positive changes in investor sentiment affect loans given by banks significantly (and asymmetrically) negatively. These findings are consistent with Caglayan and Xu (2016), who demonstrate the increase in bank loans as investors become pessimistic for G7 countries. On the other hand, bank loans affect investor sentiment only in the short run, which is negative.

Finally, as financial institutions are considered the primary transmission of uncertainty, we examine whether the policy uncertainty spread to the Turkish market via banks and the loan accessibility to households and firms. Baum et al. (2009) demonstrate the negative impact of macroeconomic uncertainties on bank loans. They state that bank managers behave more conservatively and diminish the number of credits in case of macroeconomic uncertainty as it influences the capability of bank managers to assess returns from possible lending opportunities. Empirical studies examined developed markets like Italy, Canada, and the U.S. also present similar results (Calmes & Theoret, 2014: 388-402; Quagliariello, 2009: 323-336). Our findings reveal that uncertainty in the U.S. significantly affects the Turkish banking system both in the long- and short-run. Moreover, we provide evidence that positive and negative changes in TPU affect bank loans asymmetrically. While the reduction in uncertainty influences the bank loans positively, the increase in uncertainty in the U.S. reduces the amount of credit given by Turkish banks in the short run.

This paper is related and aims to contribute many strands of literature. First, the uncertainty about government policies in the last decades emphasizes the importance of understanding its effect on the real economy and financial markets. Uncertainty in policies might occur due to unanticipated macroeconomic developments and the application of the procedure itself (Kurov & Stan, 2018: 127-142). Uncertainty in trade policy, which is the

level of flexibility that is offered by trade agreements, is one of the policy uncertainties that affect the real economy (Osnago et al., 2015). Decisions of households regarding investment and saving are influenced by trade policy uncertainty (Steinberg, 2019: 175-195). As investments are not fully reversible, uncertainties in trade policy might operate as a tax, making firms postpone their investments (Rodrik, 1991: 229-242). Handley & Limao (2017) state that the U.S.'s trade policy uncertainty reduces the welfare of the U.S.'s households by influencing imports of the U.S. firms from China. Studies also demonstrate that an increase in the TPU causes a reduction in GDP, which is in line with a massive amount of literature presenting the inverse impacts of other types of uncertainties (Caldara et al., 2019).

On the other hand, the unemployment rate is expected to increase due to the reduction in trade policy uncertainty (Pierce & Scott, 2016; Autor et al., 2013: 2121-2168). Even though the impacts of TPU for real sector variables have been examined widely by macroeconomists, the relationship between TPU and capital market prices is just starting to get attention in finance literature (see Black, 1976: 529-543; Davis et al., 2006: 107-179; Bianconni et al., 2019). Moreover, the studies on the transmission mechanism of trade policy uncertainty among countries are even more scarce. By employing the H.H. volatility spillover test, Ordu-Akkaya (2019) presents evidence that this transmission of uncertainty in the U.S. to Turkey occurs via financial institutions. She documents a significant impact of economic policy uncertainty in the U.S. on bank loan growth in Turkey. Our study contributes to Ordu-Akkaya (2019) by analysing whether the financial markets and banks are a transmission channel for trade policy uncertainty.

In another growing literature, academic researchers have devoted considerable effort to understanding investor sentiment transmission mechanisms among countries. Empirical studies document that investor sentiment is contagious among countries with highly connected economies (Baker et al., 2012). Factors that increase the possibility of a spillover of market sentiment between markets can be listed as high economic interrelations and geographic proximity (Perez-Liston et al., 2018). Sayim and Rahman (2015) state that although Turkey and the U.S. are located on a different continent, the U.S.'s investor sentiment act as a systematic risk factor for the Turkish stock market because of their high economic relation. Moreover, the magnitude of trade between countries is also a significant determinant of a level of contagion of investor sentiment (Verma & Soydemir, 2006). Apart from the extant ones, this study explores whether the uncertainty in trade policy also plays an essential role in investor sentiment contagion between countries.

The U.S. policymakers give less significance to Turkey after the Gulf War and the breakdown of the Soviet Union. This period, from 1991 to 2002, is called the Reassessment period. Starting in 2003, the relationship between the two countries rose due to Turkey's expanding economic and political influence in the Middle East (Zanotti & Thomas, 2020). Therefore, the monthly data from January 2003 to December 3019 is analysed in this study. Moreover, this period is preferred to prevent biased inferences that can arise because of the economic crisis in 2001 and 2002.

Our paper proceeds as follows: The Second section discusses the existent literature. The data and methodology are presented in section three. In the fourth section, empirical results are discussed. The fifth section concludes the paper.

2. Literature Review

Uncertainty about future conditions, which can result from economic shocks or policy shocks, has many impacts on firms regarding their demand, profitability, and expenses. Many companies are reluctant to invest if the future condition is uncertain enough to decide irreversible investments like making production or entering the new market (Handley & Limao, 2015: 189-222). Among these uncertainties, the effects of the trade policy uncertainty on the real economy have recently gathered more attention in the literature. Although the trade policy changes are not very frequent, the magnitude is enormous and continuing (Handley & Limao, 2015: 189-222). When the future circumstances of trade are not certain, firms hesitate to enter foreign markets as the uncertainty generates an option value of waiting to penetrate a new market. By acting as a fixed cost, uncertainty in trade policy affects the margin of trade negatively (Handley, 2014: 50-66). By constructing TPU measures at both the firm and aggregate levels, Caldara et al. (2019) investigate the impact of TPU on investment. For a firm level, Caldara et al. (2019) present that more significant rises in TPU lead to lower accumulated capital for companies after a year. They assert that an increase in TPU leads to lower investment and output levels for the aggregate level. By demonstrating TPU leads preventative raise in markups, Caldara et al. (2019) support Fernandez-Villaverde et al. (2015: 3352-3384), who show uncertainty reduces economic activity as companies increase their markups. From the firm level to the aggregate level, studies demonstrate TPU reduces investment (Caldara et al., 2019).

Unlike the literature on TPU and the real economic variables, the studies on the link between TPU and capital markets are scarce. As stock returns are a crucial element of the wealth of households and value and investment decisions of firms, this side of the relationship deserves more interest. Uncertainty in trade policies can influence the expectations of investors about future performances and risks of the firms, which cause the stock returns of companies to be affected (see Black, 1976: 529-543; Davis et al., 2006: 107-179; Bianconni et al., 2019). By defining the TPU as the gap between normal trade relations (NTR) and non-NTR rates, Bianconni et al. (2019) demonstrate that industries subjected to higher uncertainty generate significantly higher stock returns between 1990 and 2001. For example, stock returns of the U.S. manufacturing industries have 4.3% higher stock returns per year than industries that have lower exposure to TPU.

Additionally, Bianconni et al. (2019) claim that this disparity between stock returns can be considered a risk premium for compensation for risk related to policy uncertainty. Performing portfolio analyses demonstrates that TPU portfolios yield significantly higher returns and are considered a systematic, non-diversifiable risk factor. The volatility of firms' stock prices also varies with the level of exposure to TPU. Firms subjected to higher TPU have greater realized volatility than companies with less exposure during the uncertainty

period. Finally, on an industry level, more concentrated industries demonstrate a lower increase in stock returns during uncertainty period, as they can transfer their greater input costs to their buyers easier than less concentrated ones (see Ali et al. 2008: 3839-3871; and Bianconni et al., 2019). Although the effect of trade policy in another county on the Turkish stock market has not been analysed before, there are studies on the relationship between foreign economic policy uncertainty (EPU) and Turkey. For instance, Demir and Ersan (2018) present the significance of European EPU on the stock returns' changes in Turkey.

Another strand of literature related to our paper is the literature on investor sentiment. The greater is the diversity in possible scenarios about prospect economic development. The lesser is the knowledge about the probability distribution of future outcomes. Investors become less confident regarding their trading capability (Nowzohour & Stracca, 2017). Therefore, it is expected that trade policy uncertainty will have a significant effect on investor sentiment.

Moreover, the relationship between investor sentiment and the stock market is examined in the literature extensively. Investors affected by their sentiment while trading put additional risk on the assets, called "noise-trader risk". Both in the short- and long-run, this additional risk influences stock prices positively, as assets subjected to the same noise-trader sentiment face undiversifiable risk, which is priced in equilibrium (Delong et al., 1990: 703-738). There is also substantial literature on the relationship between stock returns and investor sentiment in Turkey. For example, by employing vector autoregressive (VAR) methodology and Granger causality test, Canbaş and Kandır (2009) demonstrate that returns of stock portfolios influence investor sentiment in Turkey. Moreover, the impact of investor sentiment on Turkish stock returns is robust, even after controlling for economic variables (Canbaş & Kandır, 2006: 26-39).

The relationship between TPU and private loans is another concern of this paper. Studies show that financial institutions are the primary ones influenced by uncertainty (see Kaufman, 1994: 123-150; Ordu-Akkaya, 2019). An increase in the economic policy uncertainty reduces the growth of loans across U.S. banks (Bordo et al., 2016: 90-106). Ordu-Akkaya (2019) investigates the transmission channel of uncertainty across economies and demonstrates that economic policy uncertainty in the U.S. affects bank loans in Turkey, indicating economic uncertainty spreads across countries via loan accessibility. Studies including Bloom et al. (2007) and Bradley et al. (2016) show that the future cash-flows of firms become more uncertain as to the TPU increases. This leads bank managers to adopt more strict credit policies to prevent risk. As Turkey and the U.S. have a close business relationship, an increase in the risk of the U.S. firms might transmit to the firms in Turkey, which will affect the credit policies of the bank managers in Turkey. By investigating the impact of TPU in the U.S. on private loans in Turkey, we aim to demonstrate if the TPU in one country can also influence the loan growth in another country.

Finally, the relationship between investor sentiment and bank loans is examined in this study. Studies show that the amount of bank loans decreases in financial crisis times

because of the reduction in the demand side as firms postpone their expansion plans (Ivashina & Scharfstein, 2010; Puri et al., 2011). By investigating G7 countries, Caglayan and Xu (2016) present that investor sentiment and volatility negatively influence bank loans. They conclude that the expectations of agents influence the lending decisions of banks. However, no study investigates this relationship in Turkey, and this paper aims to fill this gap.

3. Data and Methodology

3.1. Data

Our sample period is between January 2003 and December 2019. Only the data for consumer opinion is started from January 2005, due to data availability. The aggregate trade policy uncertainty (TPU) index, developed by Caldara et al. (2019), is employed. This index is constructed based on newspaper coverage of the regularity of the joint existence of trade policy and uncertainty terms. They examine seven newspapers' electronic records by operating the automatic text searches for the trade policy terms and uncertainty terms (Caldara et al., 2019).

Bank lending is proxied by log levels of private loans, hereafter LNPRIVATE, given to individuals and companies, and the data is achieved from the Central bank of Turkey database. Investor sentiment, hereafter OPINION, is proxied by the "Consumer Opinion Surveys: Confidence Indicators" data, which is obtained from the OECD "main economic indicators" complete database. This data is constructed by applying a monthly survey for 2000 households who are asked their tendencies and expectations for the economy, employment, and finance. Share price index, hereafter SHARE, is employed as an indicator of the Turkish stock market, obtained from the OECD databank. We also include the discount rate of Turkey, D.R., in our analysis as a control variable to uncover a reliable relationship between TPU, bank loans, investor sentiment, and stock markets.

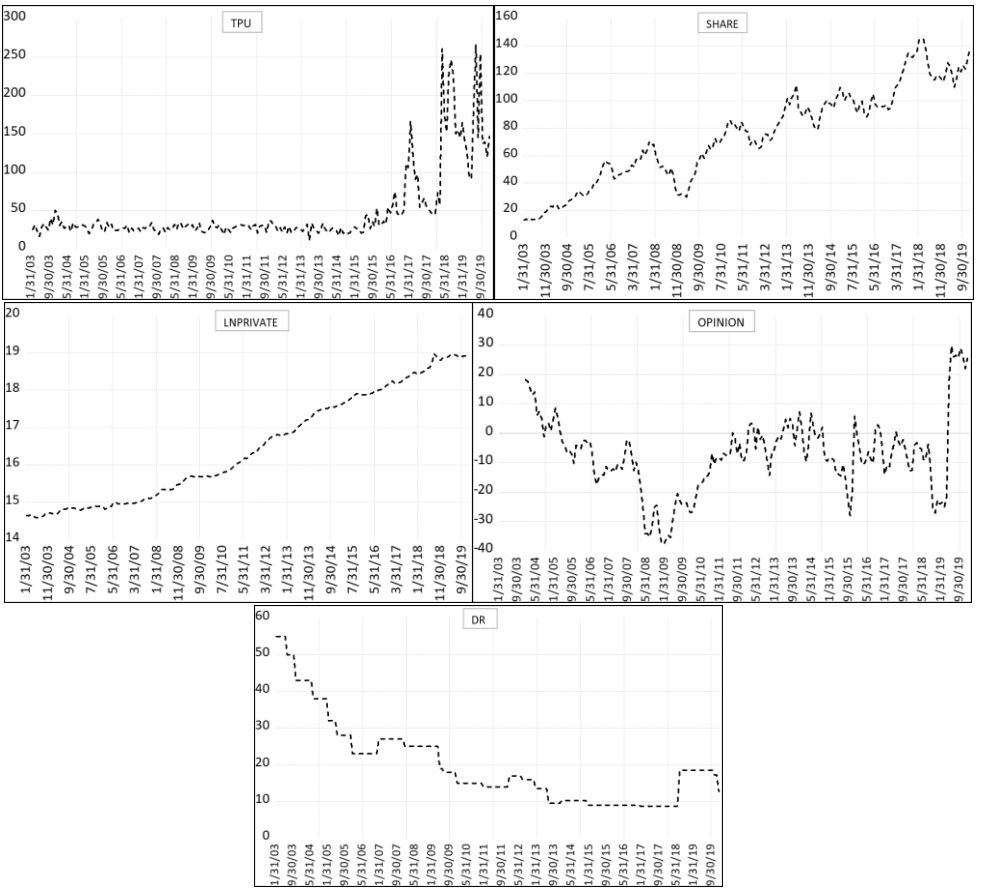
Table: 1
Descriptive Statistics

	TPU	SHARE	LNPRIVATE	OPINION	DR
Mean	48.2537	74.3658	16.49115	-7.434352	19.9939
Median	29.647	75.5069	16.20628	-6.92	17
Maximum	266.005	144.686	18.98161	29.9	55
Minimum	11.2991	12.515	14.59203	-37.81	8.75
Std. Dev.	49.2612	34.5065	1.448183	13.1599	11.4459
Skewness	2.68127	-0.0012	0.267137	0.231958	1.30251
Kurtosis	9.85356	2.03854	1.612617	3.717735	4.25084
Jarque-Bera	643.69	7.85756	18.78739	5.873315	70.9807
Probability	0	0.01967	0.000083	0.053043	0
Observations	204	204	204	193	204

TPU, SHARE, LNPRIVATE, OPINION, and D.R. refer to the trade policy uncertainty index in the U.S., the share price index for Turkey, logarithmic values of private credit in Turkey, investor sentiment in Turkey, and discount rate in Turkey, respectively.

Descriptive statistics of each variable are provided in Table 1. The graphical demonstration of each variable is represented in Figure 1. We get the logarithmic transformation for the private loans to reduce the nonnormality and heteroscedasticity. As shown in Figure 1, there is no requirement for the seasonal adjustment as there are no seasonal fluctuations in data. However, except OPINION, all variables have a trend, which is considered in the unit-root tests.

Figure: 1
Historical TPU, SHARE, LNPRIVATE, OPINION, and D.R.



TPU, SHARE, LNPRIVATE, OPINION, and D.R. refer to the trade policy uncertainty index in the U.S., the share price index for Turkey, logarithmic values of private credit in Turkey, investor sentiment in Turkey, and discount rate in Turkey, respectively.

While applying the linear and non-linear ARDL models, the variables should not be integrated of order 2 (see Peseran & Shin, 1998: 371-413; Shin et al., 2014). Therefore, to

avoid spurious regression and invalid results, the stationarity characteristics of the variables are examined by unit root tests. Rejecting the null hypothesis of these tests indicates variables are integrated of order 0. The order of integration presents the number that a series has to be differenced to become stationary.

In this paper, augmented Dickey-Fuller (ADF) (Dickey & Fuller, 1979: 427-431), generalized least squares (GLS) detrended Dickey-Fuller (DF-GLS), and Phillips-Perron (P.P.) (Phillips & Perron, 1988: 335-346) are employed to test stationarity characteristics of series. The lag lengths are determined by the Akaike Information Criterion (AIC). The results of unit root tests are shown in Table 2 and Table 3 for levels and first differences, respectively. As all of the results suggest the variables are integrated of either order 0 or 1, ARDL and NARDL models can be employed in the analysis without hesitation (Peseran & Shin, 1998: 371-413; Shin et al., 2014).

Table: 2
Unit Root Test Results (Levels)

		ADF		DF-GLS		PP
		Statistics	**Lag**	**Statistics**	**Lag**	
TPU	*Intercept*	-2.414	1	-2.174	1	-3.160**
SHARE		-1.018	1	0.692	1	-0.95
LNPRIVATE		1.559	0	4.504	1	1.412
OPINION		-2.633*	2	-1.413	2	-2.904**
DR		-3.575***	0	0.618	0	-3.634***
TPU	*Intercept and Trend*	-3.441*	1	-3.247*	1	-4.769***
SHARE		-3.756***	1	-3.706***	1	-3.269*
LNPRIVATE		-2.702	0	-0.71	0	-2.676
OPINION		-2.857	2	-1.639	2	-2.954
DR		-2.597	0	-0.567	0	-2.59

*Superscripts ***, **, and * represent significance at 1%, 5%, and 10%, respectively. ADF, DF-GLS, and P.P. refer to Dickey-Fuller, Dickey- Fuller GLS detrended, and Phillips-Perron, respectively. Lag lengths are determined by automatically Schwarz Information Criterion (SIC). TPU, SHARE, LNPRIVATE, OPINION, and D.R. refer to the trade policy uncertainty index in the U.S., the share price index for Turkey, logarithmic values of private credit in Turkey, investor sentiment in Turkey, and discount rate in Turkey, respectively.*

Table: 3
Unit Root Test Results (First Differences)

		ADF		DF-GLS		PP
		Statistics	**Lag**	**Statistics**	**Lag**	
TPU	*Intercept*	-20.930***	0	-19.820***	0	-27.839***
SHARE		-11.342***	0	-11.293***	0	-11.122***
LNPRIVATE		-12.257***	0	-3.708***	3	-12.23***
OPINION		-11.028***	1	-10.92***	1	-11.416***
DR		-14.099***	0	-14.119***	0	-14.127***
TPU	*Intercept and Trend*	-20.896***	0	-20.363***	0	-28.327***
SHARE		-11.312***	0	-11.108***	0	-11.189***
LNPRIVATE		-12.425***	0	-11.764***	0	-12.402***
OPINION		-11.144***	1	-11.173***	1	-11.889***
DR		-14.543	0	-12.519***	0	-14.544***

*Superscripts ***, **, and * represent significance at 1%, 5%, and 10%, respectively. ADF, DF-GLS, and P.P. refer to Dickey-Fuller, Dickey- Fuller GLS detrended, and Phillips-Perron, respectively. Lag lengths are determined by automatically Schwarz Information Criterion (SIC). TPU, SHARE, LNPRIVATE, OPINION, and D.R. refer to the trade policy uncertainty index in the U.S., the share price index for Turkey, logarithmic values of private credit in Turkey, investor sentiment in Turkey, and discount rate in Turkey, respectively.*

3.2. Methodology

To investigate the asymmetric effects and cointegrating links between variables, the non-linear autoregressive distributed lag (NARDL) approach is employed in this paper. Autoregressive distributed lag (ARDL) models that perform well even for small sample sizes have some shortcomings. This methodology has two assumptions, which are symmetric adjustment and linearity. While the symmetric adjustment refers to the stable modification speed from the equilibrium, the linearity assumption indicates that every 1% change in the independent variable always causes a proportional change in the dependent one. However, these assumptions are not realistic and limiting to hold. Specifically, an increase in globalization and the interrelation between economies make economic variables very inconsistent with keeping the assumptions of ARDL (Hamzah & Masih, 2018). NARDL model, which is the comprehensive edition of the linear ARDL model, relaxes these assumptions and enables us to catch both the positive and negative shocks in the long- and short-run, no matter the variables are integrated of order 0, 1, or mixed (Peseran et al., 2001; Shin et al., 2014; Mensi et al., 2017; Ahmad et al., 2020).

In addition to the aforementioned econometrical advantages of the NARDL model, this study's subject also requires employing this methodology. Bachman and Bayer (2013) state that while an increase in the uncertainty triggers firms and consumers to delay large consumptions, which decreases share prices, a decrease in the uncertainty during the end of the recession causes an overstated increase in the short-run purchases that cause immediate rebound. Liang et al. (2020) support them by presenting that variations in the U.S. uncertainty influence Asian capital markets by affecting the consumption of Asian products that influence the capital markets of Asian countries by various channels, which causes an asymmetric capital market response. Therefore, Liang et al. (2020) state that linear models cannot be employed to analyse the asymmetric impacts of uncertainty. Another disadvantage of the linear models is that these models overlook the possibility that the data used might have other fundamental nonlinearities. Given the facts above, linear models might be overly restrictive and unrealistic, resulting in biased conclusions (Katrakilidis & Trachanas, 2012: 1064-1069). For these reasons, employing linear models does not suit the aim of this study.

Given the disadvantages of the linear models, other non-linear models like Markov-switching models and quantile regression methodology have become popular lately in uncertainty literature. Unlike these models, the NARDL model adjusts asymmetry and cointegration subtleties between variables together (Apergis & Cooray, 2015: 155-172). Thanks to the NARDL methodology, the reaction of the dependent variable to the negative and positive variations in each of the independent variables can be tested (Lahiani et al., 2016: 443-456). Moreover, this methodology is free from convergence problems that other non-linear models suffer. Finally, this approach is free from endogeneity bias (Shin et al., 2014; Kocaarslan & Soytas, 2019: 117-125). Because of these advantages of NARDL, and as the order of integrations of our variable set is mixed, this paper adopts NARDL model to examine the cointegrating relationship. This methodology is used to seize anticipated

asymmetry in Turkey's share price index, investor sentiment, and bank loan responses to changing trade policy uncertainty in the U.S.

First of all, the bounds-test procedure is employed to figure out long-run cointegration. The linear ARDL models' error correction demonstrations are as follows.

$$\begin{aligned}\Delta SHARE_t = \mu + \propto_1 SHARE_{t-1} + \propto_2 TPU_{t-1} + \propto_3 OPINION_{t-1} + \propto_4 LNPRIVATE_{t-1} + \propto_5 DR_{t-1} \\ + \sum_{i=1}^{p-1} \lambda_1 \Delta SHARE_{t-i} + \sum_{i=0}^{q-1} \lambda_2 \Delta TPU_{t-i} + \sum_{i=0}^{q-1} \lambda_3 \Delta OPINION_{t-i} \\ + \sum_{i=0}^{q-1} \lambda_4 \Delta LNPRIVATE_{t-i} + \sum_{i=0}^{q-1} \lambda_5 \Delta DR_{t-i} + \varepsilon_t\end{aligned} \tag{1}$$

$$\begin{aligned}\Delta OPINION_t = \mu + \propto_1 OPINION_{t-1} + \propto_2 TPU_{t-1} + \propto_3 SHARE_{t-1} + \propto_4 LNPRIVATE_{t-1} + \propto_5 DR_{t-1} \\ + \sum_{i=1}^{p-1} \lambda_1 \Delta OPINION_{t-i} + \sum_{i=0}^{q-1} \lambda_2 \Delta TPU_{t-i} + \sum_{i=0}^{q-1} \lambda_3 \Delta SHARE_{t-i} \\ + \sum_{i=0}^{q-1} \lambda_4 \Delta LNPRIVATE_{t-i} + \sum_{i=0}^{q-1} \lambda_5 \Delta DR_{t-i} + \varepsilon_t\end{aligned} \tag{2}$$

$$\begin{aligned}\Delta LNPRIVATE_t = \mu + \propto_1 LNPRIVATE_{t-1} + \propto_2 TPU_{t-1} + \propto_3 OPINION_{t-1} + \propto_4 SHARE_{t-1} + \propto_5 DR_{t-1} \\ + \sum_{i=1}^{p-1} \lambda_1 \Delta LNPRIVATE_{t-i} + \sum_{i=0}^{q-1} \lambda_2 \Delta TPU_{t-i} + \sum_{i=0}^{q-1} \lambda_3 \Delta OPINION_{t-i} \\ + \sum_{i=0}^{q-1} \lambda_4 \Delta SHARE_{t-i} + \sum_{i=0}^{q-1} \lambda_5 \Delta DR_{t-i} + \varepsilon_t\end{aligned} \tag{3}$$

Where SHARE, OPINION, TPU, LNPRIVATE, and D.R. refer to share price index for Turkey, consumer sentiment in Turkey, Trade policy uncertainty in the USA, bank loans given by Turkish banks to the private sector, and discount rate in Turkey, respectively. The "Δ" demonstrates the first differences of variables. Optimum lag lengths, shown by p and q, are selected based on the Akaike information criterion (AIC). Long-run coefficients are represented by $\propto$, and short-run coefficients are symbolized with λ.

The ARDL model assumes linearity, a restrictive and unrealistic assumption for economic variables (Hamzah and Masih, 2018). Therefore, the nonsymmetric ARDL (NARDL) model is applied in our analysis to depict probable long- and short-run asymmetries. In this study, the following non-linear long-run cointegrating regression is employed following Shin et al. (2014).

$$y_t = \beta^+ x_t^+ + \beta^- x_t^- + u_t \tag{4}$$

Where x_t refers to TPUt, SHAREt, and OPINIONt, y_t refers to SHAREt, OPINIONt, and LNPRIVATEt. Related long-run parameters are demonstrated by β^+ and β^-. x_t

demonstrates a k*1 vector of regressors, which can be written as $x_t = x_0 + x_t^+ + x_t^-$, where x_0, x_t^- and x_t^+ refer to initial value, positive partial sums, and negative partial sums, respectively.

$$x_t^+ = \sum_{i=1}^{t} \Delta x_i^+ = \sum_{i=1}^{t} \max(\Delta x_i, 0) \tag{5}$$

$$x_t^- = \sum_{i=1}^{t} \Delta x_i^- = \sum_{i=1}^{t} \min(\Delta x_i, 0) \tag{6}$$

Considering the control variable to represent macroeconomic situations, the following error correction demonstration of the NARDL models is employed in our empirical analyses.

$$\begin{aligned}\Delta SHARE_t = \mu + \chi SHARE_{t-1} + \omega_1^+ TPU_{t-1}^+ + \omega_1^- TPU_{t-1}^- + \omega_2^+ OPINION_{t-1}^+ + \omega_2^- OPINION_{t-1}^- \\ + \omega_3 LNPRIVATE_{t-1} + \omega_4 DR_{t-1} + \sum_{i=!}^{P-1} \tau \Delta SHARE_{t-i} + \sum_{i=0}^{q-1} \phi_1^+ \Delta TPU_{t-i}^+ \\ + \sum_{i=0}^{q-1} \phi_1^- \Delta TPU_{t-i}^- + \sum_{i=0}^{q-1} \phi_2^+ \Delta OPINION_{t-i}^+ + \sum_{i=0}^{q-1} \phi_2^- \Delta OPINION_{t-i}^- \\ + \sum_{i=0}^{q-1} \phi_3 \Delta LNPRIVATE_{t-i} + \sum_{i=0}^{q-1} \phi_4 \Delta DR_{t-i} + \varepsilon_t\end{aligned} \tag{7}$$

$$\begin{aligned}\Delta OPINION_t = \mu + \chi OPINION_{t-1} + \omega_1^+ TPU_{t-1}^+ + \omega_1^- TPU_{t-1}^- + \omega_2^+ SHARE_{t-1}^+ + \omega_2^- SHARE_{t-1}^- \\ + \omega_3 LNPRIVATE_{t-1} + \omega_4 DR_{t-1} + \sum_{i=!}^{P-1} \tau \Delta OPINION_{t-i} + \sum_{i=0}^{q-1} \phi_1^+ \Delta TPU_{t-i}^+ \\ + \sum_{i=0}^{q-1} \phi_1^- \Delta TPU_{t-i}^- + \sum_{i=0}^{q-1} \phi_2^+ \Delta SHARE_{t-i}^+ + \sum_{i=0}^{q-1} \phi_2^- \Delta SHARE_{t-i}^- \\ + \sum_{i=0}^{q-1} \phi_3 \Delta LNPRIVATE_{t-i} + \sum_{i=0}^{q-1} \phi_4 \Delta DR_{t-i} + \varepsilon_t\end{aligned} \tag{8}$$

$$\begin{aligned}\Delta LNPRIVATE_t = \mu + \chi LNPRIVATE_{t-1} + \omega_1^+ TPU_{t-1}^+ + \omega_1^- TPU_{t-1}^- + \omega_2^+ OPINION_{t-1}^+ + \omega_2^- OPINION_{t-1}^- \\ + \omega_3^+ SHARE_{t-1}^+ + \omega_3^- SHARE_{t-1}^- + \omega_4 DR_{t-1} + \sum_{i=!}^{P-1} \tau \Delta LNPRIVATE_{t-i} \\ + \sum_{i=0}^{q-1} \phi_1^+ \Delta TPU_{t-i}^+ + \sum_{i=0}^{q-1} \phi_1^- \Delta TPU_{t-i}^- + \sum_{i=0}^{q-1} \phi_2^+ \Delta OPINION_{t-i}^+ + \sum_{i=0}^{q-1} \phi_2^- \Delta OPINION_{t-i}^- \\ + \sum_{i=0}^{q-1} \phi_3^+ \Delta SHARE_{t-i}^+ + \sum_{i=0}^{q-1} \phi_3^- \Delta SHARE_{t-i}^- + \sum_{i=0}^{q-1} \phi_4 \Delta DR_{t-i} + \varepsilon_t\end{aligned} \tag{9}$$

Long-run coefficients are represented by χ, and ω_n, and short-run coefficients are symbolized with τ, and ϕ_{ji}. F-statistics is used to test the null hypothesis, which is no asymmetric cointegration.

Finally, long and short-run asymmetries are tested using a standard Wald test (Shin et al., 2014). The symmetry indicates $\beta^{+} = \beta^{-}$. By using $\beta^{+} = -\omega_{n}^{+}/\chi$ and $\beta^{-} = -\omega_{n}^{-}/\chi$ equations, the long-run coefficients about positive and negative changes of the related explanatory variables are found. The null hypothesis of $\sum_{i=0}^{q-1}\phi_k^{+} = \sum_{i=0}^{q-1}\phi_k^{-}$ is tested to examine the presence of short-run symmetry, where k=1,2, and 3. The results of these empirical analyses are discussed in the next section.

4. Empirical Findings

First, a bounds test is employed to investigate the cointegrating relationships between variables in the long run. In this test, fail to reject the null hypothesis suggests there is no cointegrating relationship. Table 4 presents the existence of long-run cointegration between variables at least at a five percent level. Therefore, the presence of the asymmetric relations between trade policy uncertainty in the U.S., stock market prices, investor sentiment, and bank loans in Turkey in the short- and long-run can be examined with the NARDL model, which is the second step of our analysis.

Table: 4
Bounds Testing Procedure Results

Cointegration Hypotheses	F Stat.
$F(SHARE_t/TPU_t^{+},TPU_t^{-},OPINION_t^{+},OPINION_t^{-},LNPRIVATE_t, DR_t)$	8.316***
$F(OPINION_t/SHARE_t^{+},SHARE_t^{-},TPU_t^{+},TPU_t^{-},LNPRIVATE_t, DR_t)$	2.622**
$F(LNPRIVATE_t/SHARE_t^{+},SHARE_t^{-},TPU_t^{+},TPU_t^{-},OPINIONt+,OPINIONt, DRt)$	7.382***

*For the dependent variable (SHARE), the critical values are 2.27-3.28and 2.88-3.99 for 5% and 1% significance levels, respectively. For the dependent variable (OPINION), the critical values are 2.27-3.28and 2.88-3.99 for 5%, and 1 % significance levels, respectively. For the dependent variable (LNPRIVATE), the critical values are 2.17-3.21 and 2.73-3.9 for 5% and 1% significance levels, respectively. Superscripts ***, **, and * represent significance at 1%, 5%, and 10%, respectively.*

In Tables 5, 6, and 7, the results of the estimated NARDL models in equations 7, 8, and 9 are demonstrated. Results of the Wald tests that provide the short- and long-run asymmetries are shown in Table 8. As shown in Table 8, the null hypothesis of short- and long-run symmetry can be rejected in most of the analyses, if not all. Having variables with an order of integration less than two and demonstrating the asymmetry indicates that the NARDL model suits our data well. The asymmetry can arise because of the complicated and dynamic financial markets with different market participants (Shahzad et al., 2017: 211-230).

The effects of explanatory variables on share prices are shown in Table 5. According to the table, while share prices are positively affected by the positive changes in TPU, the negative changes in TPU do not significantly impact the share prices in the long run. This result resonates well with Bianconni et al. (2019), who find a similar relationship between TPU and share prices for industry and firm level, and state this is the risk premium for compensation for policy uncertainty associated risk. On the other hand, while the positive changes in TPU have a significant negative impact on share prices, the negative changes in TPU have a significant positive effect on share prices in the short run. Moreover, the Wald

tests, shown in Table 8, demonstrate this significant asymmetric effect in the short run. These findings indicate that increase in the U.S. trade policy uncertainty seems to affect the global uncertainty, which decreases the risk appetite of individuals and causes the stock market prices in emerging markets like Turkey to diminish in the short run. First, the causality between the US TPU and global economic policy uncertainty (EPU) is examined to test this hypothesis. Table A.1 of the appendix shows that the TPU is the Granger cause of global economic policy uncertainty. Then, the correlation between risk aversion and TPU is examined. The findings presented in Table A.2 of the appendix reveal a significant positive correlation between risk aversion and trade policy uncertainty.

Moreover, these findings indicate that a more certain trade environment in the U.S. makes investors decrease their savings and increase their investments in emerging markets like Turkey. A significant negative correlation between foreign stock investment in Turkey and TPU in the U.S. supports this argument. Table A.3 of the appendix presents these results.

Table: 5
NARDL Estimation Results (Dependent Variable: $\triangle$ SHARE$_t$)

Panel A: Estimated coefficients (Adj. R^2= 0.3204)				
E.V.	Coefficient	Robust Std. Error	t-statistic	Prob.
C	35.582	33.364	1.066	0.288
$SHARE_{t-1}$	-0.122	0.028	-4.299	0.000
TPU_{t-1}^{+}	0.029	0.014	2.095	0.038
TPU_{t-1}^{-}	0.024	0.017	1.399	0.164
$OPINION_{t-1}^{+}$	0.117	0.046	2.532	0.012
$OPINION_{t-1}^{-}$	0.077	0.026	2.950	0.004
$LNPRIVATE_{t-1}$	-1.434	2.393	-0.599	0.550
DR_{t-1}	-0.204	0.090	-2.260	0.025
$DSHARE_{t-1}$	0.118	0.074	1.594	0.113
$DTPU_t^{+}$	0.000	0.012	-0.024	0.981
$DTPU_{t-1}^{+}$	-0.067	0.018	-3.644	0.000
$DTPU_{t-2}^{+}$	-0.041	0.021	-1.972	0.050
$DTPU_t^{-}$	-0.028	0.035	-0.800	0.425
$DTPU_{t-1}^{-}$	0.083	0.023	3.645	0.000
$DTPU_{t-2}^{-}$	0.070	0.030	2.337	0.021
$DOPINION_t^{+}$	-0.013	0.063	-0.209	0.834
$DOPINION_{t-1}^{+}$	-0.259	0.076	-3.393	0.001
$OPINION_t^{-}$	0.384	0.117	3.275	0.001
$DLNPRIVATE_t$	-31.085	7.417	-4.191	0.000
$DLNPRIVATE_{t-1}$	-16.442	10.368	-1.586	0.115
DDR_t	-0.220	0.271	-0.812	0.418
DDR_{t-1}	-0.100	0.169	-0.591	0.555
DDR_{t-2}	0.527	0.188	2.806	0.006
Panel B: Long-Run Coefficients for the asymmetric parameters				
TPU^{+}	0.2400**		TPU^{-}	0.1950
$OPINION^{+}$	0.9566**		$OPINION^{-}$	0.6309***

*Panel A contains the results from the error correction representation of the NARDL model for the case of the dependent variable $\triangle SHARE_t$. E.V. refers to the explanatory variables. The Newey-West (1987) autocorrelation and heteroskedasticity robust standard errors and t-statistics are reported. The superscripts "+" and "−" represent positive and negative partial sums, respectively. The estimated long-run coefficients associated with positive and negative changes of the corresponding variables are demonstrated in panel B. Superscripts ***, **, and * represent significance at 1%, 5%, and 10%, respectively.*

Results in the same table also show the effect of investor sentiment on the share prices. While both decreases and increases in investor sentiment significantly positively impact the share prices in the long-run symmetrically, the asymmetry arises in the short-run.

Share prices are negatively affected by positive changes in investor sentiment, while negative changes in sentiment are positive. So, the more pessimistic investors become, the higher share prices there are in the short run. The pessimism of investors could prompt speculative attacks in the financial markets in the short run. These results resonate well with Baker et al. (2012: 272-287), who document the predictive power of investor sentiment on stock returns.

In the short and long run, the bank loans given to the private sector do not significantly affect the share prices for Turkey. The discount rate has a significant negative impact on the share prices in the long and short run. This finding supports the literature that states an increase in the discount rate causes the reduction of investments in the stock market, which results in a decline in the stock prices.

Table: 6
NARDL Estimation Results (Dependent Variable: $\triangle$ OPINION$_t$)

Panel A: Estimated coefficients (Adj. R^2= 0.1662)				
E.V.	Coefficient	Robust Std. Error	t-statistic	Prob.
C	-16.0842	54.9003	-0.2930	0.7699
$OPINION_{t-1}$	-0.1370	0.0569	-2.4053	0.0172
$SHARE_{t-1}^{+}$	0.0131	0.0380	0.3443	0.7310
$SHARE_{t-1}^{-}$	0.0239	0.0554	0.4316	0.6666
TPU_{t-1}^{+}	-0.0592	0.0352	-1.6825	0.0943
TPU_{t-1}^{-}	-0.0714	0.0455	-1.5678	0.1188
$LNPRIVATE_{t-1}$	0.6020	3.6966	0.1629	0.8708
DR_{t-1}	0.1347	0.1187	1.1346	0.2581
$DOPINION_{t-1}$	0.2397	0.0758	3.1629	0.0018
$DOPINION_{t-2}$	-0.1751	0.0587	-2.9822	0.0033
$DSHARE_t^{+}$	0.2039	0.1411	1.4446	0.1504
$DSHARE_t^{-}$	0.1146	0.1864	0.6146	0.5396
$DTPU_t^{+}$	0.0075	0.0164	0.4593	0.6466
$DTPU_{t-1}^{+}$	0.0416	0.0334	1.2465	0.2143
$DTPUt^{-}$	-0.0601	0.0369	-1.6283	0.1053
$DLNPRIVATE_t$	4.8504	9.9939	0.4853	0.6281
$DLNPRIVATE_{t-1}$	-23.3744	10.5080	-2.2244	0.0274
DDR_t	0.0263	0.2908	0.0905	0.9280
Panel B: Long-Run Coefficients for the asymmetric parameters				
TPU^{+}	-0.4325		TPU^{-}	-0.5213
$SHARE^{+}$	0.0954		$SHARE^{-}$	0.1745

*Panel A contains the results from the error correction representation of the NARDL model for the case of dependent variable $\triangle OPINION_t$. E.V. refers to the explanatory variables. The Newey-West (1987) autocorrelation and heteroskedasticity robust standard errors and t-statistics are reported. The superscripts "+" and "−" represent positive and negative partial sums, respectively. The estimated long-run coefficients associated with positive and negative changes of the corresponding variables are demonstrated in panel B. Superscripts ***, **, and * represent significance at 1%, 5%, and 10%, respectively.*

Table 6 shows the influences of chosen variables on investor sentiment. None of the explanatory variables have a significant impact on investor sentiment in the long run. However, in the short run, the positive changes in share prices significantly affect investor sentiment. There is an inverse relationship between bank loans and investor sentiment. As shown in Table 8, the Wald test demonstrates no asymmetry in explanatory variables when investor sentiment is the dependent variable, neither in the long nor short run. These findings might suggest that an increase in the share prices, which can be interpreted as the increase in the investors' risk appetite, leads to a reduction in investors' sensitivity to macroeconomic

shocks, and they become more optimistic, in other words. Moreover, instead of being influenced by the U.S.'s TPU, investor sentiment in Turkey is affected by changes in domestic variables.

Last but not least, the findings of analysis when the bank loan is employed as a dependent variable are presented in Table 7. Results suggest that adverse changes in the share prices negatively affect the credit given by banks, while the positive changes positively influence bank loans in the long run. Moreover, these effects are asymmetric, as can be seen from Table 8. On the other hand, both the negative and positive changes in TPU in the U.S. positively impact bank loans in the long run. These results align with Ordu-Akkaya (2019), who shows the spillover from economic policy uncertainty to credit growth. She provides evidence that the transmission mechanism from policy uncertainty occurs primarily via financial institutions.

Moreover, Ordu-Akkaya (2019) provides evidence that the only economic policy uncertainty category that significantly impacts Turkish loan growth is the uncertainty about financial regulation and taxes. Credit availability in the Turkish financial industry is affected by the restrictive laws or tightening tax decisions, which is in line with our findings of the negative short-run impact of positive changes in TPU on bank loans. Finally, even though there is a direct relationship between negative changes in investor sentiment and private credit, the positive changes in investor sentiment have no significant effect in the long run. This result resonates well with Caglayan and Xu (2016), who demonstrate the inverse relationship between sentiment and banks' loan growth.

The picture has changed slightly in the short run, as seen from Tables 7 and 8. There is an asymmetry in the impact of TPU on private credits. While the negative changes in uncertainty positively affect the loans given by banks, positive changes in TPU influence them inversely in the short run. These findings are in line with Baum et al. (2009: 87-89), demonstrating that uncertainty affects bank managers' ability to forecast available lending opportunities' returns, which causes a reduction in the loans as they act more conservatively. Being a second trade partner of Turkey, the uncertain trade environment in the U.S. affects firms in Turkey directly or indirectly, making bank managers in Turkey cautious about giving loans to the firms in Turkey. This finding supports Bradley et al. (2016) that state banks apply more strict credit policies to prevent risk as their anticipation and trust for potential income flows diminish due to an increase in TPU. An increase in the U.S.'s TPU deepens the uncertainty of the future cash-flows of the firm in Turkey that have a business relationship with the U.S. firms. Table A.4 of the appendix shows a negative correlation between TPU and the Tukey-US foreign trade volume change indicating the cash-flow of the exporting and importing firms in Turkey are affected by the TPU in the U.S. Likewise, a similar pattern can be observed in the relationship between investor sentiment and private credits. While becoming more pessimistic increases the loans provided by banks, the amount of credits given by banks decreases as investors become more optimistic in the short-run. This finding supports Caglayan and Xu (2016), who show a similar relationship between

investor sentiment and bank lending decisions for G7 countries. Moreover, this effect is asymmetric, as can be seen from the results of Wald tests demonstrated in Table 7.

Table: 7
NARDL Estimation Results (Dependent Variable: $\triangle$ LNPRIVATE$_t$)

Panel A: Estimated coefficients (Adj. R^2= 0.4031)				
E.V.	Coefficient	Robust Std. Error	t-statistic	Prob.
C	0.9618	0.3071	3.132	0.002
LNPRIVATE$_{t-1}$	-0.0661	0.0216	-3.066	0.003
SHARE$_{t-1}^-$	-0.0012	0.0004	-2.823	0.005
SHARE$_{t-1}^+$	0.0008	0.0003	2.280	0.024
TPU$_{t-1}^-$	0.0004	0.0002	2.052	0.042
TPU$_{t-1}^+$	0.0003	0.0002	1.669	0.097
OPINION$_{t-1}^-$	0.0011	0.0003	3.456	0.001
OPINION$_{t-1}^+$	0.0004	0.0005	0.909	0.365
DR$_{t-1}$	0.0016	0.0008	1.891	0.061
DSHARE$_t^-$	-0.0042	0.0012	-3.484	0.001
DSHARE$_{t-1}^-$	0.0005	0.0012	0.457	0.648
DSHARE$_{t-2}^-$	-0.0009	0.0012	-0.793	0.429
DSHARE$_{t-3}^-$	-0.0024	0.0009	-2.537	0.012
DTPU$_t^-$	0.0009	0.0002	3.573	0.001
DTPU$_{t-1}^-$	0.0004	0.0003	1.447	0.150
DTPU$_t^+$	0.0000	0.0001	0.221	0.826
DTPU$_{t-1}^+$	-0.0002	0.0002	-0.895	0.372
DTPU$_{t-2}^+$	0.0002	0.0002	0.864	0.389
DTPU$_{t-3}^+$	-0.0004	0.0001	-3.262	0.001
OPINION$_t^-$	-0.0004	0.0012	-0.348	0.728
OPINION$_{t-1}^-$	0.0013	0.0010	1.343	0.181
OPINION$_{t-2}^-$	0.0028	0.0014	2.063	0.041
DOPINION$_t^+$	0.0001	0.0005	0.198	0.843
DOPINION$_{t-1}^+$	-0.0022	0.0006	-3.594	0.000
DOPINION$_{t-2}^+$	-0.0010	0.0006	-1.604	0.111
DOPINION$_{t-3}^+$	-0.0009	0.0006	-1.561	0.120
DDR$_t$	0.0024	0.0021	1.162	0.247
DDR$_{t-1}$	0.0012	0.0021	0.542	0.588
DDR$_{t-2}$	0.0054	0.0031	1.725	0.087
DDR$_{t-3}$	-0.0030	0.0016	-1.860	0.065
Panel B: Long-Run Coefficients for the asymmetric parameters				
TPU$^+$	0.0039*		TPU$^-$	0.0056**
SHARE$^+$	0.0117**		SHARE$^-$	-0.0181***
OPINION$^+$	0.0062		OPINION$^-$	0.016***

*Panel A contains the results from the error correction representation of the NARDL model for the case of the dependent variable $\triangle$LNPRIVATE$_t$. E.V. refers to the explanatory variables. The Newey-West (1987) autocorrelation and heteroskedasticity robust standard errors and t-statistics are reported. The superscripts "+" and "−" represent positive and negative partial sums, respectively. The estimated long-run coefficients associated with positive and negative changes of the corresponding variables are demonstrated in panel B. Superscripts ***, **, and * represent significance at 1%, 5%, and 10%, respectively.*

Table: 8
Wald Test Results for Long and Short Run Asymmetry

Panel A. Long-run asymmetry			
Dependent variables	W_{LR}(SHARE)	W_{LR}(TPU)	W_{LR}(OPINION)
DSHARE		0.6415	0.7475
DOPINION	0.8692	0.2996	
DLNPRIVATE	-3.8183***	2.0294**	1.3144
Panel B. Short-run asymmetry			
Dependent variables	W_{SR}(SHARE)	W_{SR}(TPU)	W_{SR}(OPINION)
DSHARE		15.4939***	11.0171***
DOPINION	0.7472	0.1395	
DLNPRIVATE	3.0879**	7.8428***	2.5252**

*W_{LR}(SHARE), W_{LR}(TPU), and W_{LR}(OPINION) refer to the Wald test for the null of long-run symmetry for the corresponding variable. W_{SR}(SHARE), W_{SR}(TPU), and W_{SR}(OPINION) refer to the Wald test for the null of the additive short-run symmetry condition for the corresponding variable. Superscripts ***, **, and * represent significance at 1%, 5%, and 10%, respectively.*

5. Conclusion

In this paper, we aim to examine whether the changes in uncertainty in one country transmit to another via financial markets and bank loans or not. Studies show that policy uncertainty in the U.S. leads to a more significant decline in the investment levels of emerging markets than developed ones. Therefore, emerging markets are affected by spillover more severely (see Carriere-Swallow & Cespedes, 2013: 316-325; Ordu-Akkaya, 2019). However, studies investigating the impacts of policy uncertainties in the U.S. on Turkish financial markets are scarce. Moreover, although there is a large body of theoretical and empirical work on the transmission of investor sentiment among countries (see Baker et al., 2012: 272-287; Bai, 2014: 259-290), research on the effect of policy uncertainties in developed countries on the investor sentiment in emerging ones are limited. For that instance, this paper examines the cointegrating relationship between trade policy uncertainty in the U.S., share prices, bank loans, and investor sentiment in Turkey by employing a novel approach (NARDL approach) that considers the asymmetric effects. Our results offer a vital demonstration of the impact of one country's policy uncertainty on another.

The findings show the significant impact of trade policy uncertainty in the U.S. on the financial markets in Turkey. Changes in the U.S.'s TPU affect share prices in Turkey both in the long- and short-run, and in the latter one, the effects of positive and negative changes in TPU are asymmetric. The positive (negative) changes in TPU influence share prices negatively (positively), and the magnitude of the negative changes in uncertainty is more significant. These results can be interpreted as the increase in uncertainty in the U.S.'s TPU leads investors to prefer to hold less risky assets. The findings support that by affecting the global uncertainty, the US TPU influences the risk appetite of the investors, which has an impact on emerging stock markets such as Turkey's. A significant negative correlation between foreign stock investment in Turkey and trade policy uncertainty in the U.S. found in this study indicates that a decrease in the U.S. might reduce the investors' incentive to save and increase the U.S.'s investors to invest in emerging markets such as Turkey. The U.S.'s TPU also influences the private loans in Turkey both in the long- and short-run. In the short run, the positive and negative changes in uncertainty affect bank loans

asymmetrically. A rise (decline) in the trade policy uncertainty reduces (increases) the bank loans in Turkey, and the magnitude of the impact of the decline in TPU is greater. It can be inferred as bank managers in Turkey hesitate to give loans if there is an uncertain environment in the U.S., as the US is Turkey's second trade partner. A significant portion of the Turkish firms is affected by the U.S.'s trade policy decisions directly or indirectly. Restrictive laws or tightening taxes in the U.S.'s trade policy affect credit availability in the Turkish financial industry.

Another important finding in this study is that, instead of being affected by U.S. trade policy uncertainty, investor sentiment in Turkey seems to be affected by local changes like changes in the share prices and changes in the loans provided by banks. In the short run, an increase in bank loans reduces investor sentiment. This finding implies that indebtedness reduces the confidence of consumers in the future economic prospect. Moreover, these effects are bidirectional. While the bank loans increase with the negative changes in investor sentiment, the increased optimism of investors reduces the credits given by banks. These findings imply that people and firms tend to reduce their debt level when they have positive beliefs about future economic conditions. Finding the insignificant impact of the U.S.'s TPU on investor sentiment in Turkey and its significant impact on bank loans can be interpreted as uncertainty in trade policy influences firms more than individual investors as firms hesitate to make investments during trade-related uncertain environments. Further studies will shed more light on this issue by investigating whether employing other types of uncertainties in the U.S. reveals a significant impact on investor sentiment in Turkey or not.

Overall, this study demonstrates the financial markets and institutions importance in transmitting uncertainty between countries. Though the results imply no perfect economic and financial integration between the U.S. and Turkey, the impacts of U.S. policies on financial markets players and investors in Turkey are not negligible. First, this study suggests investors consider the domestic TPU and the U.S.'s TPU while making an investment decision in the Turkish stock market. Second, as the findings present the significance of the U.S.'s TPU on private loans, bank managers can use these results in planning their future credit lines. Finally, firms and households can also benefit from these findings when they plan their leverage.

References

Ahmad, M. & S.I. Khattak & S. Khan & Z. U. Rahman (2020), "Do Aggregate Domestic Consumption Spending and Technological Innovation Affect Industrialization in South Africa? An Application of Linear and Non-linear ARDL Models", *Journal of Applied Economics*, 23(1), 43-64.

Ali, A. & S. Klasa & E. Yeung (2008), "The Limitations of Industry Concentration Measures Constructed with Compustat Data: Implications for Finance Research", *The Review of Financial Studies*, 22(10), 3839-3871.

Apergis, N. & A. Cooray (2015), "Asymmetric Interest Rate Pass-Through in the U.S., the U.K. and Australia: New Evidence from Selected Individual Banks", *Journal of Macroeconomics*, 45, 155-172.

Autor, D.H. & D. Dorn & G.H. Hanson (2013), "The China Syndrome: Local Labor Market Effects of Import Competition in the United States", *American Economic Review*, 103(6), 2121-68.

Bachman, R. & C. Bayer (2013), "Wait-and-See Business Cycles?", *Journal of Monetary Economics*, 60, 704-719.

Bai, Y. (2014), "Cross-border Sentiment: An Empirical Analysis on EU Stock Markets", *Applied Financial Economics*, 24(4), 259-290.

Baker, M. & J. Wurgler & Y. Yuan (2012), "Global, Local and Contagious Investor Sentiment", *Journal of Financial Economics*, 104(2), 272-287.

Baker, S.R. & N. Bloom & S.J. Davis (2016), "Measuring Economic Policy Uncertainty", *The Quarterly Journal of Economics*, 131(4), 1593-1636.

Baum, C.F. & M. Caglayan & N. Ozkan (2009), "The Second Moments Matter: The Impact of Macroeconomic Uncertainty on the Allocation of Loanable Funds", *Economics Letters*, 102(2), 87-89.

Bekaert, G. & E. Engstrom & N.R. Xu (2019), "The Time Variation in Risk Appetite and Uncertainty", National Bureau of Economic Research *Working Paper*, No. w25673.

Bianconi, M. & F. Esposito & M. Sammon (2019), "Trade Policy Uncertainty and Stock Returns", *Discussion Papers Series*, Department of Economics, Tufts University 0830, Department of Economics, Tufts University.

Biljanovska, N. & F. Grigoli & M. Hengge (2017), "Fear the Neighbor: Spillovers from Economic Policy Uncertainty", in: *IMF Working Paper* WP/17/240, November 2017.

Black, F. (1986), "Noise", *The Journal of Finance*, 41, 529-543.

Bloom, N. & S. Bond & J.V. Reenen (2007), "Uncertainty and Investment Dynamics", *The Review of Economic Studies*, 74(2), 391-415.

Bonaime, A. & H. Gulen & M. Ion (2018), "Does Policy Uncertainty Affect Mergers and Acquisitions?", *Journal of Financial Economics*, 129 (3), 531-558.

Bordo, M.D. & J.V. Duca & C. Koch (2016), "Economic Policy Uncertainty and the Credit Channel: Aggregate and Bank Level U.S. Evidence over Several Decades", *Journal of Financial Stability*, 26, 90-106.

Bown, C.P. (2013), "Trade Policy Flexibilities and Turkey: Tariffs, Anti-dumping, Safeguards and WTO Dispute Settlement", *The World Economy*, 37(2), 193-218.

Bradley, D.J. & C. Pantzalis & X. Yuan (2016), "Policy Risk, Corporate Political Strategies, and the Cost of Debt", *Journal of Corporate Finance*, 40, 254-275.

Caglayan, M. & B. Xu (2016), "Sentiment Volatility and Bank Lending Behavior", *International Review of Financial Analysis*, 45, 107-120.

Caldara, D. & M. Iacoviello & P. Molligo & A. Prestipino (2019), "The Economic Effects of Trade Policy Uncertainty", *Journal of Monetary Economics*, 109, 38-59.

Calmès, C. & R. Théoret (2014), "Bank Systemic Risk and Macroeconomic Shocks: Canadian and U.S. Evidence", *Journal of Banking and Finance*, 40, 388-402.

Canbas, S. & S.Y. Kandir (2006), "Examining the Effect of Investor Psychology Over Stock Returns by Closed-End Fund Discount", *Muhasebe ve Finansman Dergisi*, 29(1), 26-39.

Canbaş, S. & S.Y. Kandır (2009), "Investor Sentiment and Stock Returns: Evidence from Turkey", *Emerging Markets Finance and Trade*, 45(4), 36-52.

Carrière-Swallow, Y. & L.F. Céspedes (2013), "The impact of uncertainty shocks in emerging economies", *Journal of International Economics*, 90(2), 316-325.

Davis, S.J. & J. Haltiwanger & R. Jarmin & J. Miranda & C. Foote & E. Nagypal (2006), "Volatility and Dispersion in Business Growth Rates: Publicly Traded versus Privately Held Firms", *NBER Macroeconomics Annual 21*, 107-179.

De Long, J.B. & A. Shleifer & L.H. Summers & R.J. Waldmann (1990), "Noise trader risk in financial markets", *Journal of Political Economy*, 98(4), 703-738.

Demir, E. & O. Ersan (2018), "The Impact of Economic Policy Uncertainty on Stock Returns of Turkish Tourism Companies", *Current Issues in Tourism*, 21(8), 847-855.

Dickey, D.A. & W.A. Fuller (1979), "Distribution of the estimators for autoregressive time series with a unit root", *Journal of the American Statistical Association*, 74, 427-431.

Fernandez-Villaverde, J. & P. Guerron-Quintana & K. Kuester & J. Rubio-RamÃrez (2015), "Fiscal Volatility Shocks and Economic Activity", *American Economic Review*, 105(11), 3352-3384.

Hamzah, N.H. & M. Masih (2018), "Revisiting Effectiveness of Interest Rate as a Tool to Control Inflation: Evidence from Malaysia Based on ARDL and NARDL", *MPRA Paper* 87576, University Library of Munich, Germany.

Handley, K. & N. Limao (2012), "Trade and Investment under Policy Uncertainty: Theory and Firm Evidence", *American Economic Journal: Economic Policy*, 7(4), 189-222.

Handley, K. (2014), "Exporting Under Trade Policy Uncertainty: Theory and Evidence", *Journal of International Economics*, 94(1), 50-66.

Ivashina, V. & D. Scharfstein (2010), "Bank lending during the financial crisis of 2008", *Journal of Financial Economics*, 97(3), 319-338.

Katrakilidis, C. & E. Trachanas (2012), "What Drives Housing Price Dynamics in Greece: New Evidence from Asymmetric ARDL Cointegration", *Economic Modelling*, 29, 1064-1069.

Kaufman, G.G. (1994), "Bank contagion: A review of the theory and evidence", *Journal of Financial Services Research*, 8(2), 123-150.

Kirişçi, K. & N. Kaptanoğlu (2011), "The Politics of Trade and Turkish Foreign Policy", *Middle Eastern Studies*, 47(5), 705-724.

Kocaarslan, B. & U. Soytas (2019), "Asymmetric Pass-Through Between Oil Prices and the Stock Prices of Clean Energy Firms: New Evidence from a Nonlinear Analysis", *Energy Reports*, 5, 117-125.

Kurov, A. & R. Stan (2018), "Monetary Policy Uncertainty and the Market Reaction to Macroeconomic News", *Journal of Banking & Finance*, 86, 127-142.

Lahiani, A. & S. Hammoudeh & R. Gupta (2016), "Linkages between Financial Sector CDS spreads and Macroeconomic Influence in a Non-linear Setting", *International Reviews of Economics and Finance*, 43, 443-456.

Liang, C.C. & C. Troy & E. Rouyer (2020), "U.S. Uncertainty and Asian Stock Prices: Evidence from the Asymmetric NARDL Model", *The North American Journal of Economics and Finance*, 51, 101046.

Mensi, W. & S. Hammoudeh & S.J.H. Shahzad & M. Shahbaz (2017), "Modelling Systemic Risk and Dependence Structure Between Oil and Stock Markets Using A Variational Mode Decomposition-Based Copula Method", *Journal of Banking and Finance*, 75, 258-279.

Nowzohour, L. & L. Stracca (2017), "More than a Feeling: Confidence, Uncertainty and Macroeconomic Fluctuations", *ECB Working Paper No. 2100*.

Ordu-Akkaya, B.M. (2019), "US Economic Policy Uncertainty and Loan Growth: Evidence from Turkey", *Üçüncü Sektör Sosyal Ekonomi Dergisi*, 54, 1049-1063.

Osnago, A. & R. Piermartini & N. Rocha (2015), "Trade Policy Uncertainty as Barrier to Trade", *WTO Staff Working Papers ERSD-2015-05*, World Trade Organization (WTO), Economic Research and Statistics Division.

Perez-Liston, D. & D. Huerta-Sanches & J. Gutierrez (2018), "Do Domestic Sentiment and The Spillover of U.S. Investor Sentiment Impact Mexican Stock Market Returns?", *Journal of Emerging Market Finance*, 17, 1-28.

Pesaran, M.H. & Y. Shin (1998), "An autoregressive distributed-lag modelling approach to cointegration analysis", *Economic Soc. Monogr*., 31, 371-413.

Phillips, P.C.B. & P. Perron (1988), "Testing for a unit root in time series regressions", *Biometrica*, 75(2), 335-346.

Pierce, J.R. & P.K. Schott (2016), "Trade Liberalization and Mortality: Evidence from U.S. Counties", *NBER Working Papers* 22849, National Bureau of Economic Research, Inc.

Puri, M. & J. Rocholl & S. Steffen (2011), "Global Retail Lending in the Aftermath of the U.S. Financial Crisis: Distinguishing between Supply and Demand Effects", *Journal of Financial Economics*, 100(3), 556-578.

Quagliariello, M. (2009), "Macroeconomic Uncertainty and Banks' Lending Decisions: The Case of Italy", *Applied Economics*, 41(3), 323-336.

Rodrik, D. (1991), "Policy Uncertainty and Private Investment in Developing Countries", *Journal of Development Economics*, 36(2), 229-242.

Sayim, M. & H. Rahman (2015), "The Relationship Between Individual Investor Sentiment, Stock Return and Volatility: Evidence from the Turkish Market", *International Journal of Emerging Markets*, 10(3), 504-520.

Shahzad, S.J.H. & S.M. Nor & R. Ferrer & S. Hammoudeh (2017), "Asymmetric determinants of CDS spreads: U.S. industry-level evidence through the NARDL approach", *Economic Modelling*, 60, 211-230.

Shin, Y. & B. Yu & M. Greenwood-Nimmo (2014), "Modelling asymmetric cointegration and dynamic multipliers in a non-linear ARDL framework", in: *Festschrift in Honor of Peter Schmidt*, Springer, New York, NY, 281-314.

Steinberg, J.B. (2019), "Brexit And the Macroeconomic Impact of Trade Policy Uncertainty", *Journal of International Economics*, 117, 175-195.

Verma, R. & G. Soydemir (2006), "The Impact of U.S. Individual and Institutional Investor Sentiment on Foreign Stock Markets", *Journal of Behavioural Finance*, 7(3), 128-144.

Zanotti, J. & C. Thomas (2020), "Turkey-US relations: Timeline and brief historical context", *Congressional Research Service*, version 5.

APPENDIX

Table: A.1
Granger Causality Test Result (EPUGLOBAL-TPU)

	H_0: TPU does not Granger cause EPUGLOBAL	H_0: EPUGLOBAL does not Granger cause TPU
Lags	2	
F-Statistics	3.2076	0.7655
Prob	0.0426	0.4665

Lag lengths are determined by using Schwarz Information Criteria. EPUGLOBAL refers to the global economic policy uncertainty index, which is constructed by Baker et al. (2016). EPUGLOBAL is obtained from <www.policyuncertainty.com.>.

Table: A.2
Correlation Table (RA-TPU)

Correlation Probability	RA	TPU
RA	1.0000	
TPU	0.6470	1.0000
	(0.0000)	

Values in the parentheses show the probabilities. R.A. refers to the time-varying risk aversion index constructed by Bekaert et al. (2019).

Table: A.3
Correlation Table (LNFI-TPU)

Correlation Probability	LNFI	TPU
LNFI	1.0000	
TPU	-0.2761	1.0000
	(0.0002)	

Values in the parentheses show the probabilities. LNFI refers to the log levels of the foreign stock investment in Turkey. The data is obtained from the Central bank of Turkey database.

Table: A.4.
Correlation Table (DLNFTV-TPU)

Correlation Probability	DLNFTV	TPU
DLNFTV	1.0000	
TPU	-0.0431	1.0000

DLNFTV refers to the log first difference of the foreign trade volume (import plus export) between Turkey and the U.S. The data is obtained from the Central Bank of Turkey database.

Sosyoekonomi

2021, Vol. 29(50), 35-50

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.02
Date Submitted: 28.08.2020
Date Revised: 09.07.2021
Date Accepted: 05.08.2021

Turkish Economic Growth: (Non) Labour Creating? (2000-2018)

Leyla BAŞTAV *(https://orcid.org/0000-0003-1533-2289), Retired Senior Specialist, Banking Regulation, Supervision Agency, Turkey; bastav06@yahoo.com.tr*

Ekonomik Büyüme: Türkiye'de İstihdam Yaratmıyor Mu? (2000-2018)

Abstract

The study aims to analyse the long-term relationship between GDP and employment during 2000Q1-2018Q4. The relation is important for Turkey who has problems with employment creation capacity of growth. However, the high growth performance of Turkey during the 2000s employment ratios have well remained below OECD averages. Employment elasticity of growth is 0.15 for the 2004Q1-2018Q4 period with the Engle-Granger test. The elasticity for the entire period is much weaker, like 0.04. Johansen tests confirm the long-run cointegration between two variables, and an error-correction model (ECM) is built for detecting causality. Granger tests also reveal causality from GDP to employment.

Keywords : Growth, Employment Intensity of Growth, Employment, Cointegration, Error Correction (ECM), Granger Causality Test.

JEL Classification Codes : O47, J23, C22.

Öz

Bu çalışmanın amacı 2000Q1-2018Q4 döneminde GYİH ile istihdam arasındaki uzun dönemli ilişkinin araştırılmasıdır. Bu ilişki büyümenin istihdam yaratma kapasitesinde sorunlar bulunan Türkiye için önem taşımaktadır. Türkiye'de 2000'li yıllardaki yüksek büyüme performansına rağmen istihdam oranları OECD ortalamalarının oldukça altında seyretmiştir. 2004Q1-2018Q4 döneminde Engle-Granger testi ile büyümenin istihdam esnekliği 0.15'tir. Dönemin tamamında elastikiyet 0.04 ile çok daha düşüktür. Değişkenler arasında uzun dönemli koentegrasyon ilişkisi Johansen testi ile doğrulanmış ve bir ECM modeli kurularak nedensellik araştırılmıştır. Granger testi de gelir ve istihdam arasında gelirden istihdama doğru nedensellik bulunduğunu tespit etmiştir.

Anahtar Sözcükler : Büyüme, Büyümenin İstihdam Esnekliği, İstihdam, Koentegrasyon, Hata Düzeltme (ECM), Granger Nedensellik Testi.

1. Introduction

The low performance of Turkish employment rates has become a matter of dispute vis a vis the relatively stronger GDP growth since the 1990s. The problem has aggravated especially from 2002 on, which has led to considerably low employment rates compared with the EU countries. While the economy has contracted between 1999-2001, the average unemployment rate has stayed at 7.02%. During the 2002-2007 period of stronger growth with an annual average of 6.7%, unemployment has not shown a parallel decline, jumping to an annual 10.35% in 2002, moving towards high chronic unemployment. Having rocketed to 16,1% by March 2009, it has declined owing to the policy measures taken by the government, nevertheless remaining above 10%. Recently following the recession in the economy, unemployment rates have exceeded 13, shooting up to 14% levels by 2018.

What Turkey has gone through has been referred to as "jobless growth" which has also been observed in other economies during the era of globalization. The employment intensity or elasticity of growth is a quantitative indicator of a country's employment record, which is measured by the elasticity of employment with respect to real GDP (Khan, 2007: 4; Basnett & Sen, 2013: 7). Although high elasticity is desirable and indicates that the economy is reaching higher employment levels, it is negatively related to productivity. Especially an employment elasticity (intensity) of above one is inconvenient, for it will mean very low labour productivity.

Although economic growth is deemed most important factor in raising employment (Gordon, 2003: 53; Khemraj et al., 2006: 4; Onaran & Aydıner-Avşar, 2006: 19) it has been observed not having led to effective rises of employment alone in many cases. This has especially been an issue in the US and developing countries in the post-liberalization period upon which economists have analysed the relevant factors determining employment growth: Ghosh (2003), Heintz and Pollin (2003), Islam (2004), Osmani (2004), Heintz (2006) etc. Other factors have been identified as: *macroeconomic policies, strategies of growth, technological processes, backward and forward linkages between industries, the sectoral composition of production, size of public employment, informal labour market*.

Previously, many empirical studies have examined the relationship between employment and GDP, observing falls in employment intensity for most countries like Kapsos (2005) and Heintz (2006). Among other empirical studies measuring the elasticity of employment are Boltho and Glyn (1995), Padalino and Vivarelli (1997), Walterskirchen (1999), Khemraj et al. (2006), Seyfried (2005), Tezcek (2007) and Akçoraoğlu (2010), Murat and Yılmaz-Eser (2013) etc. for Turkey (see Section 4.1-4.2). Although the previous studies about Turkey have elaborated on employment creation of growth having calculated the employment elasticity, the studies date back to 1990s, 2000s with the newest reaching only 2011.

In this paper we examine the empirical relationship between employment and economic growth in Turkey as per phenomena of "jobless growth" during the period 2000Q1

to 2018Q4. During the post-Fordist era of mass production, neo-liberal policies adopted have led to a new global production network with new countries like China replacing the old industrial hubs US and the UK. As discussed in the literature, section 2 examines this and the reasons leading to "job disappearance" despite high growth rates and trade volume. For Turkey, reasons have been specified as a demographic shift from agriculture to urban areas, rigid regulatory framework, rising productivity, and neo-liberal growth models adopted with liberal trade and capital accounts. Section 3 examines the theory behind growth and employment, namely Okun's Law, which has formed the basis of the supply curve of the economy together with the Phillips curve, despite all the critiques it has received. After the literature survey in Section 4, an econometric model is established in Section 5 where the long-run relation between the two variables is determined with an OLS estimation of employment overgrowth. The residual-based Engle-Granger standard ADF test proves that the estimation is non-spurious. Coefficients of the OLS equation give us employment elasticity (employment intensity) of growth of 0.04 for the entire period and 0.15 for the 2004-2018 sub-period. Long-run cointegration between the two variables is further investigated by Johansen method, which confirms the relationship. Having fulfilled the cointegration prerequisite dynamic, ECM is estimated in the next step decomposing *the long-run* and *short-run causality* between the two variables. ECM reveals long and short-run causality from employment to rate of growth. Finally, the simple Granger test is conducted to control the direction of causality between growth and employment, which confirms causality from growth to employment.

2. Jobless Growth: Global Phenomenon

Low employment vis a vis relatively higher growth rates have been of concern in economics since the 1980s. When Fordist Golden Age of mass manufacturing (1960-1973) has almost reached an end with *deregulated trade* and *capital account regimes* adopted (Telli et al., 2006: 2; Ghosh, 2003: 20-24). The new global economic structures have brought changes in the factor productivity and production processes (thereby dynamics of growth) during the demise of Bretton Woods corporate production era. This is when the production economies like UK and US have gradually lost sectors to China (so called the new atelier of the world), Asian economies, and emerging markets. The new economic network also comes with finance capital dominated, speculation driven structures, as noted in Ghosh (2003: 19, 24), Telli et al., (2006: 2), Chang (2011: 291-292, 300-303). Within the framework, economists have examined the relationship between *growth* and *factors of production* for different countries during different periods examining the effect of real shocks on unemployment and the factors that determine unemployment. Others have estimated output-employment elasticities as well as their determinants, as noted below.

In the work examining neo-liberal economies the phenomenon of low employment rates vis a vis production and export growth have been labelled as *"job disappearance"* (also Khemraj et al., 2006: 3, 5) and the reasons leading to this have been analysed in Ghosh (2003: 20-24) (for the developing countries) as the following: 1) Although manufactured exports from developing to the developed world have increased, imports in reverse direction

into the developing countries have caused some local sectors close down and lose the employed workforce; as a result of trade liberalization; 2) The developing world could not achieve the diversified manufacturing industrial structure instead ending up with mostly primary goods manufacturing[1]; 3) Higher capital productivity from technological progress has come up as one dominant labour saving factor; 4) Large capital has crowded out more labour intensive small capital and has provoked labour cost-cutting by entrepreneurs; 5) The capital inflows, and the economic network therein have formed economic and/or political pressure over governments to refrain from intervening in the markets.

Several possible arguments have been brought into attention as possible causes of non-job creation for the specific case of Turkey, which has resulted in low rates of employment vis a vis the EU (Table 1). **The first** explanation is that the demographic shift from agriculture to urban areas might have caused insufficient job creation. Until 1950 agriculture has employed nearly 80% of the total labour force, which as per the import substitution policies of 1960 and 1970s had started to be gradually recruited in the industrial sector. The export-led growth model from 1980 on agricultural labour force has declined swiftly from 60 to 40 and 30% through the 1980s, 1990s, and post 2000s (Tezcek, 2007: 2; World Bank, 2006: 8). Lack of absorption of the unqualified labour force by the existing industry and services sectors mostly ended up with recruitment by the informal market (Ercan & Tansel, 2006; Murat & Yılmaz-Eser, 2013: 117-118).

Table: 1
Employment Rates in Turkey vs European Union 2000-2018 (%)

	Average Employment Rates		
	Turkey	**European Union**	**Eurozone 19**
2000-2004 (jobless growth)	43.94	NA	NA
2005-2010 (Turkey low plateau)	41.32	64.48	64.57
2010-2018	45.22	65.56	64.80

Source: TÜİK, Eurostat Database.

The second explanation follows the *rigid regulations'* framework and excessive *non-wage labour costs* imposed upon entrepreneurs (Tunalı, 2003: 93-94). Social security premiums form a 22% of the labour cost over net wages, reaching 35% with the payroll taxes paid. New Labour Act of 2003 has been blamed for bringing high labour costs and being overprotective, thereby raising unemployment (Ercan & Tansel, 2006). The Act has rather invoked searching ways of refraining from regulations, instead of bringing flexible-time, flexible work conditions as aimed (Agenor et al., 2006: 12-13). During the time, trade unions have lost power, creating another factor contributing to the downward flexibility of wages (Onaran, 2002: 2).

The third explanation has noted the structural change during the 2000s curbing the job-creating capacity of the economy significantly. Apparently, the labour shedding has led to productivity increases of the existing labour force following the 2001 financial crises

[1] *Many primary goods are with price volatility and low price and income elasticities.*

(Tezcek, 2007: 4; Murat & Yılmaz-Eser, 2013: 108-109) when, unlike the pre-1980s, economic policy has emphasized raising productivity au lieu de raising employment and producers have reclined on higher technology with less labour force (TÜSİAD, 2008: 127-128)[2]. From 1997 to 2005, productivity has increased by 53% vis a vis declines of 17% in employment (Tezcek, 2007: 4). Low investment rates have also contributed to the process; as a result, suspended high rates of unemployment have emerged versus high growth rates (Table 2) (Murat & Yılmaz-Eser, 2013: 112, 116).

Table: 2
Turkish Jobless Growth Pattern 2000-2004

	GDP Growth (%)	Investment (% of GDP)	Labour Productivity	Labour Elasticity
2000	4.9	22.8	8.0	-0.31
2002	5.0	17.3	6.7	-0.13
2003	6.7	16.1	6.1	-0.18
2004	4.2	18.4	17.5	-0.77
2005	**7.0**	**20.1**	**5.0**	**0.26**

Source: TÜİK, Murat & Yılmaz-Eser (2013).

The fourth explanation has blamed the neo-liberal economic model and the *liberal trade and capital account* with finance capital domination. In the post-Washington Consensus environment of the 1990s, economies became increasingly dependent on speculative capital inflows with the financial funds dominating the real economy: the so-called *casino capitalism* (Strange, 2015). During the time Turkey has offered high real rates of interest to financial investors motivating inflows leading to appreciate TL, cheaper imports, and widening current account deficit. This has led to import substitution of domestic and traditional labour-intensive sectors such as textiles, clothing, food industry, and light manufactures etc. (Telli et al., 2006: 3; Onaran & Aydıner-Avşar, 2006: 20).

3. Theory on Growth and Employment

There is not much theoretical work on the relationship between employment and output in the economic literature. Notwithstanding Okun has examined the fluctuations of the *unemployment rate* and *output growth* in his seminal paper (1962), establishing a reverse statistical relationship between *output gap* and *unemployment (unemployment fluctuations around long-run (natural rate) levels)*. The later labelled "Okun's Law" has stated that there is less than one to one relationship between the two variables and that 1% growth rise above long-run trend would bring 0.3% unemployment decline. Accordingly, the economy has to grow at a potential rate to keep the unemployment rate constant. However, research and computations have proved Okun's coefficient to be unstably changing over different periods as well as with different data sets and methods (Khemraj et al., 2006: 5). Still, Okun's Law has established the link between unemployment and output, forming the basis of the supply curve of modern macroeconomics and the Phillips curve (Prachowny, 2003: 331).

[2] *By 2002 average yearly unemployment rate has reached 10,35%.*

Many writers have criticized the approach referring to its theoretical flaws' vis a vis its empirical power. Economists have been critical about the asymmetry between output and unemployment due to the output increase or decrease (the change in unemployment would be different during expansions and contractions) (Courtney, 1991: 283-290; Palley, 1993). Possible reasons for the asymmetry are factor substitution, multifactor productivity, labour participation rates, differences in sectoral growth rates, etc. Other analysts have been critical about the neglect of prices, institutional factors, as well as exchange rate volatility (Slimane, 2015: 682).

Employment rates are important, and countries are concerned about raising employment along with GDP growth. The "jobless growth" has emerged as a problem during the post-1990s when many economies have adopted neo-liberal regimes. Various research has examined the relation between *employment* and *economic growth* with different periods and techniques (see Section: 4), estimating *growth's employment elasticity (employment intensity)* and analysing its determinants. Elasticity describes the percentage change in employment resulting from one percentage change in the real GDP growth, implying a causal direction between the variables[3]. Changes in GDP may stem from supply-side, productivity/technology issues, as well as from demand-side fluctuations due to the policy decisions. Notwithstanding this, some studies view the relation between employment and growth as correlating how the two variables vary together rather than a causal relationship (Kapsos, 2005: 5; Slimane, 2015: 682).

4. Employment Intensity Record: Empirical Studies

A comprehensive study by Kapsos (2005: 11) for 139 countries has shown that there are declines in employment intensity in the US and North America (0.23)[4], whereas there is a slight rise in Western Europe (to 0.42) during the period 1999-2003 compared with 1991-1999. The study has also revealed that employment elasticities are positively related to the share of services and negatively to inflation and labour taxes.

Similarly, Heintz (2006) has observed declining employment elasticities in two-thirds of 51 developed and developing countries' manufacturing sectors during 1980-2000 except Europe. Considering the two structural subperiods 1960-1973 and 1980-1994, Padalino and Vivarelli (1997: 191) infer that high technology has weakened, even eliminated employment, creating growth capacity in the post-Fordist Age production.

---

[3] Arc elasticity *of employment gives different values depending on the selected beginning and end points and proves unstable, which is why most empirical studies adopt the log-linear regression and calculate the* point *elasticity like in our study.*

[4] *The elasticity of 0.67 during 1991-1995 has declined to 0.44 during 1995-1999 and further to 0.23 during 1999-2003.*

Table: 3
Empirical Research on Employment Elasticity

AUTHORS	MODEL	PERIOD	COUNTRIES	FINDINGS
Padalino & Vivarelli (1997)	Regressions, Elasticity Formula Computations	1960-1973 1980-1994	US, Canada Japan, France, Germany, Italy, UK	0.50 Jobless growth
Walterskirchen (1999)	Regression	1988-1998	EU US	0.65 (Range between 0.24 for Austria-0.76 for Spain) 0.53
Kapsos (2005)	Log Linear Regression with dummies etc.	1991-1999 1999-2003	(139 countries) US, N. America W. Europe	Fall in many 0.23(fall) 0.42(slight rise)
Heintz (2006)	OLS Regression	1960-1970 1980-2000	(51 countries) US, Ireland, Developing Countries W. Europe	Fall (in 34 countries) Rises
Khemraj et al. (2006)	OLS Regression	1961-20 00	US UK Germany France	0.37 (fall from 90s on) 0.31(rise) 0.22(rise) 0.17(rise)
Seyfried & College (2008)	OLS Regression	1990-2006	US UK Germany France	0.16 0.33 0.08 0.23

Khemraj et al. (2006: 6-8) have found the US Okun coefficient declining since the 1990s, implying jobless growth due to: 1) Productivity increases; and 2) Structural change, whereas the coefficient has risen for the UK, France, and Germany[5]. The post-dot-com bubble burst period of 2001 had had some industries losing, others gaining jobs where the losing sectors were gone, and gaining sectors stayed in the industry permanently. Possible reasons for the disappearance of some sectors and the following structural change have been discussed as 1) Highly importing the US and rising current account deficit; 2) Falling FDI inflows into the US; 3) Hiring of temporary, part-time workers as well as overtime use of the existing labour. Writers have reckoned that Okun's coefficient may not have been very stable over periods, changing by the methods of measurement and data used.

It is observed from Table 4 that US employment elasticity has fallen from 1990 onwards from 0.50s to 0.20s. For many countries, including the developing world, elasticity shows a falling trend during the post-1980s. The situation is reversed in Western Europe, for there is a rising trend during 1980-2000 (Kapsos, 2005: 11; Heintz, 2006: 8, 9; Khemraj et al., 2006: 5).

Table: 4
Empirical Research on Turkey: Employment Elasticity

AUTHORS	MODEL	PERIOD	FINDINGS
Heintz (2006)	OLS Regression	1968-1979 1980-1997	0.93 0.26
Onaran & Avşar (2006)	SUR Model	1973-2002	0.10 to 0.34 for 22 sectors
Akçoraoğlu (2010)	Engle-Granger, Cointegration, ECM, Granger causality	1995-2007	0.20
Murat & Yılmaz-Eser (2013)	(Yearly) Computations by Employment Elasticity Formula	1971-2011	Volatile annual elasticities
Slimane (2015)	OLS Regression	1991-2011	0.28
Baştav (2019) (current study)	OLS, Engle-Granger, Cointegration, ECM, Granger causality	2000-2018 2004-2018 2006-2018	0.04 0.15 0.26

[5] *Falling after unification with the East, only rising from mid 1990s on in Germany.*

In Turkey, the high elasticity of 0.93 of the Fordist Production eras of the 1960-1970s has fallen to 0.26 during post-1980 as Heintz (2005: 8-9). After 1990 it seems to have fallen further to 0.20 by Akçoraoğlu (2010: 108). This study also reveals 0.15 and 0.26 figures by subperiods, far from the higher levels during the import substitution period of 1960-1970s. The contribution of our study is not only having updated the labour elasticity measurements but also having used cointegration, ECM, and Granger causality tests in addition to the OLS estimation to specify long-run, short-run dynamics and causality.

Murat and Yılmaz-Eser (2013: 116) have labelled 2000, 2002, 2003, and 2004 as jobless growth years, for the economy has grown high, vis a vis the negative elasticities of employment, with no employment creation. They reckon that the main reason for jobless growth has been the high rise in total productivity despite declining employment. The low investment rates during the years in question reveal another source of the problem. Very unstable annual elasticities fall during the 2000s but jump to a higher platform from 2005 on (Table 2)[6].

5. Data and the Model

5.1. 2000Q1-2018Q4 Entire Period

Real GDP and employment rate are obtained from the Turkish Institute of Statistics (TÜİK) database. Real GDP (LGDP) is measured in constant 1998 prices; the employment rate (LNRAT) contains the 15+year population. Series are quarterly covering 2000Q1-2018Q4 period and are seasonally adjusted by the Tramo-Seats method.

Three different unit root tests examine the stationarity of the series, namely Augmented Dickey-Fuller (ADF), Phillips Perron (PP), and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) using Eviews 9. Results in Table 5 show instability revealed by nonstationary in the form of a unit root in both series; however, the first differences are integrated of order one I(1).

Table: 5
Unit Root Tests

	Test Statistic Values					
	ADF-GLS		PP		KPSS	
	cst	cst&trnd	cst	cst&trnd	cst	cst&trnd
	First Order Integrated Variables I(1) (1)					
LGDP	1.25	-2.84	-0.70	-2.28	1.15	0.12
LNRAT	-1.02	-1.17	-1.12	-2.04	0.46	0.26
D(LGDP)	-4.66	-5.89	-6.65	-6.60	0.07	0.06
D(LNRAT)	-2.81	-2.75 (2)	-6.96	-6.98	0.39	0.13

(1) Variables are stationary of first order I(1) at 5% level of significance,
(2) Nonstationary variable.

[6] *Five-year averages follow like, 0.37, 0.37, 0.26, 0.39, 0.76, 0.18, 0.20, 0.30 for 1971-75, 1976-80, 1981-85, 1986-90, 1991-95, 1996-00, 2001-05, 2006-10 (disregarding outliers) respectively. Along the higher plateau of 2000s from 2005 on elasticities are 0.26, 0,26, 0.33, 3.34, 0.68, 0.79 in 2005, 2006, 2007, 2008, 2010 and 2011 respectively.*

The long-run relationship between LGDP and employment LNRAT is observed by cointegration. Following the methodology in Akçoraoğlu (2010: 108), we run an OLS of employment over the growth rate although the two-time series are not stationary at levels. The Engle-Granger residual-based cointegration test (using standard ADF test) proves that estimated OLS is not spurious. The estimation has yielded an employment elasticity of 0.04, revealing that employment is positively and significantly related to income growth in the long-run but that the elasticity is low as 0.04 during the entire 2000Q1-2018Q4 period examined. Time dummy D1 for 2004Q1 to 2009Q4 has been adopted to cover when employment rates have reached record low levels[7]. The dummy has raised the R bar squared of the equation considerably[8]. Effects of employment policy measures have begun to be felt from 2010 on, leading to higher employment rates.

Table: 6
Long-Run Relation Between Employment and Real Income Growth (LNRAT dependent variable) (2000-2018)

	Coefficient	Stand Error	P-Value
LGDP	0.04	0.02	0.047
D1=1: 04Q1 to 09Q4 Time dummy	-0.003	3.0E-4	0.00
Constant	3.37	0.22	0.00
R squared = 0.75	Adjusted R^2 = 0.74	F-statistic = 110.22	Prob (F-stat) = 0.00
The ADF test statistic on residuals = -2.65 Critical values: -3.53 (1%) -2.90 (5%) -2.59 (10%)			

Long-run cointegration relationship is further examined by Johansen test. The null hypothesis of no cointegration between real GDP and employment is rejected at 5% level of significance. The results for the number of cointegrating vectors by the Johansen method are reported in Table 7 presenting the trace and max-eigen statistics and the corresponding 5% critical values. Johansen cointegration is a prerequisite for developing dynamic error-correction model (ECM) which will provide information on both the short-*run and long-run dynamics* of the series. Since Johansen test has confirmed existence of a long run cointegrating vector, we estimate the ECM of which the results are provided in Table 8. Lag length is picked as 4 by the fact that income affects employment only after 4 lags in Turkey[9]. The same lag length is adopted in Johansen cointegration as well as the ECM in the paper. The coefficient of the error correction term in the ECM is negative as expected, which is statistically significant at 5%. This provides evidence for the long-run relationship and that each quarter the system corrects 18% of the shocks that move it away from equilibrium.

---

[7] *This is a period when employment rates in the country have descended to record low levels like 38.8% (2006Q1), 38.5% (2009Q1). After 2009, measures taken in labour markets got to pull the employment levels back to above 40s close to 50%.*

[8] *R bar squared of estimation without and with the dummy are 0.11 and 0.74 respectively.*

[9] *The optimal lag length criterion with EViews is 1 or 2 by minimum Akaike, Schwartz etc criterion, however it makes no sense macroeconomically.*

Table: 7
Johansen Tests for Cointegration [1]

Hypothesized No of CE(s)	Eigenvalue	Trace Statistics	Critical Value (5%)	P-Values [3]
None [2]	0.27	24.08	15.49	0.002
At most 1	0.02	1.78	3.84	0.18
Hypothesized No of CE(s)	Eigenvalue	Max-Eigen Statistic	Critical Value (5%)	P-Values
None [2]	0.27	22.30	14.26	0.002
At most 1	0.02	1.78	3.84	0.19

[1] The optimal lag interval is selected by macroeconomic trends as (1,4); D1 04Q1-09Q4 exogenous series.
[2] Rejection of no cointegration hypothesis.
[3] MacKinnon-Haug-Michelis p-values.

The joint significance Wald test for one to four lagged LGDP variables cannot reject the null hypothesis that the coefficients equal zero. However, individually one period lagged GDP affects the employment rate positively by a significant coefficient. *LGDP is causally related to LNRAT both in short and in the long run. The employment intensity of growth is 0.04% in the long run during the entire period 2000Q1 to 2018Q4*.

Table: 8
Error Correction Model Results (LNRAT is the Dependent Variable)

	Coefficients	t-statistics	Probability
Error Correction Term	-0.18	-4.48	0.00
$DLGDP_{t-1}$	0.11	1.88	0.06
$DLGDP_{t-2}$	-0.05	-0.75	0.46
$DLGDP_{t-3}$	0.05	0.61	0.54
$DLGDP_{t-4}$	-0.08	-1.50	0.14
$DLNRAT_{t-1}$	0.02	0.23	0.82
$DLNRAT_{t-2}$	0.12	1.11	0.27
$DLNRAT_{t-3}$	-0.25	-2.46	0.02
$DLNRAT_{t-4}$	-0.34	-2.37	0.02
D1=1: 04Q1 to 09Q4 Time dummy	-0.01	-3.70	5.0E-4
R-squared = 0.49 AIC = -6.38	SC = -6.03	DW stat. = 2.01	
Adjusted R^2 = 0.41 F-stat = 5.84	Prob(F)=0.00	Log Lik=237.66	

Short-run causality between variables is further investigated by Granger test. Since LNRAT and LGDP are integrated, of first-order Granger test is carried out on the first differences of the series. At the specified lag length, column four provides the Wald-F statistics, and column five reports the related probabilities. Results point at presence of one-way *causality from real GDP to employment* in Table 9.

Table: 9
Granger Causality Tests

Null Hypothesis	Obs	Lag length	F-Statistic	Probability
D(LGDP) does not Granger cause D(LNRAT)	72	4	3.75	0.01
D(LNRAT) does not Granger cause D(LGDP)	72	4	1.63	0.18

5.2. 2004Q1-2018Q4 Subperiod

The long-run relationship between LGDP and employment LNRAT is further investigated by examining the 2004Q1-2018Q4 period of low and stable inflation. Engle-Granger residual-based cointegration test by ADF method provides that residuals of the

equation are stationary, proving that OLS equation estimated is not spurious and there is long-run equilibrium relationship between the variables. Results of OLS estimation of GDP over employment rate have revealed higher employment elasticity of 0.15. The employment intensity of growth is higher, almost four-fold of the entire period since 1% of GDP growth would bring a 0.15% increase in employment, meaning higher job-creating capacity during the subperiod.

Table: 10
Long-Run Relationship Between Employment and Real Income Growth (LNRAT dependent variable) (2004-2018)

	Coefficient	Stand Error	P-Value
LGDP	0.15	0.06	0.02
D1=1 04Q1 to 09Q4 Time dummy	-0.002	0.001	0.001
Constant	2.30	0.61	0.00
R squared = 0.87	Adjusted R^2 = 0.87	F-statistic = 195.27	Prob (F-stat) = 0.00
The ADF test statistic on residuals = -6.08 Critical values: -3.55 (1%) -2.91 (5%) -2.59 (10%)			

Johansen tests also confirm the long-run cointegrating relationship between the two-time series over the subperiod. The null hypothesis of no cointegration between real GDP and employment is rejected at the 5% significance level. Results of the Johansen test for the existence of cointegration are reported in Table 11 which presents the relevant statistics and the corresponding 5% critical values.

Table: 11
Johansen Tests for Cointegration (1)

Hypothesized No of CE(s)	Eigenvalue	Trace Statistics	Critical Value (5%)	P-Values (3)
None (2)	0.22	24.71	15.49	0.002
At most 1	0.15	9.91	3.84	0.002
Hypothesized No of CE(s)	Eigenvalue	Max-Eigen Statistic	Critical Value (5%)	P-Values
None (2)	0.22	14.81	14.26	0.04
At most 1	0.15	9.91	3.84	2.0E-3

(1) The optimal lag interval selected by macroeconomic facts as (1,4); D1 04Q1-09Q4 exogenous series.
(2) Rejection of no cointegration hypothesis.
(3) MacKinnon-Haug-Michelis p-values.

The joint significance Wald test for one to four lagged LGDP variables rejects the null hypothesis that coefficients equal zero, meaning that one to four lagged LGDP have joint effects on LNRAT. Individually one period lagged GDP affects the employment rate positively by a (significant) coefficient. The ECM results are provided in Table 12 below. The negative and significant coefficient of the error correction term in the ECM reveals the long-run relationship: each quarter, the system corrects 15% of the shocks, which move it out of equilibrium. Also, in the short-run one period lagged GDP affects the employment rate positively. *LGDP is causally related to LNRAT both in short and in the long run. The employment intensity of growth is 0.15% in the long run* during the subperiod 2004Q1 to 2018Q4.

Table: 12
Error Correction Model Results (LNRAT is the Dependent Variable)

	Coefficients	t-statistics	Probability
Error Correction Term	-0.15	-3.39	1.0E-3
$LGDP_{t-1}$	0.16	3.45	1.0E-3
$DLGDP_{t-2}$	-0.06	-0.84	0.40
$DLGDP_{t-3}$	-0.03	-0.60	0.55
$DLGDP_{t-4}$	-0.10	-1.48	0.14
$LNRAT_{t-1}$	0.03	0.25	0.81
$DLNRAT_{t-2}$	0.15	1.68	0.10
$DLNRAT_{t-3}$	-0.23	-2.15	0.04
$DLNRAT_{t-4}$	0.25	-1.88	0.07
D1=1 04Q1 to 09Q4 Time dummy	-0.02	-3.96	2.0E-4
R-squared = 0.51 AIC = -6.43 SC = -6.58 DW stat. = 1.95			
Adjusted R^2 = 0.41 F-stat = 5.03 Prob(F) = 5.0E-05 Log Lik=208.28			

Simple Granger causality test results are provided in Table 13 below. Since LNRAT and LGDP are integrated, the first order Granger causality test is carried out on the first differences. It is known from macroeconomic experience that income will affect employment with around one year lag, which is why a lag length of four is chosen. Using the specified lag length, column four provides the Wald-F statistics, and column five reports the related probabilities. The model rejects the null hypothesis of no causality from GDP to employment, whereas there is no causality from employment to GDP. Results point at the presence of *one-way causality from real GDP to employment.*

If we further constrain the subperiod to 2006Q1-2018Q4, the year of explicit inflation targeting policy, the OLS regression yields income elasticity of employment even higher as 0.26[10]. Change in the coefficient shows the importance of macroeconomic policy measures in the employment creating capacity of the economy. Although elasticity rises with the subperiods in question, it is far from the high levels of the pre-1980s revealing the structural change.

Table: 13
Granger Causality Tests

Null Hypothesis	Obs	Lag length	F-Statistic	Probability
D(LGDP) does not Granger cause D(LNRAT)	60	4	3.09	0.02
D(LNRAT) does not Granger cause D(LGDP)	60	4	0.89	0.48

6. Findings and Conclusions

Low employment growth rates have been a matter of dispute from the 1990s on in the Turkish economy. Possible reasons for fall in job creation are discussed in Section 2. As per one argument, demographic shifts from rural to urban areas are to blame when people have added up to the informal labour force rather than being absorbed by the industry. Although partly responsible for low employment rates, this new workforce could not blame the growing economy for not creating employment as one main reason. Besides, a reverse

[10] *The OLS and cointegration results can be provided for the interested reader upon demand.*

migration from urban to rural areas has occurred following the 2008 financial crisis (Akçora, 2010: 106).

The argument about the rigidity of labour markets are two sides of a coin: 1) The labour act is overprotective in social security rights, also imposing too high non-wage costs, and presence of disorganized labour matching systems add to the problem, 2) On the other side, practicalities in the market are far from being tied up by rigidities with only partial unionization, with the unions already having lost much power, high wage differences and employers recruiting heavily from the informal market (see Section: 2). With the clashing rigid and flexible factors, the system has more or less shown the same traits over the pre-and post-globalization period, and this could not have caused the structural break of the post-1980s.

The change of economic model from *(inward-looking) import substitution* to *export-led growth* seems to have brought in a *structural break*, which is well observed in the falling values of employment elasticity (see Table 4). From the 1990s on, elasticity figures have navigated around 0.20 levels. Within the *liberal trade and capital account* framework, Turkey has offered high real interest rates, leading to capital inflows appreciating the TL, making imports cheaper, widening the external deficit. Vanishing traditional labour-intensive manufacturing sectors (textiles, food, etc.) by import substitution has led to unemployment. Post-2001 crisis has marked a *new structural break* with the layoffs and low investment levels (16-19%) aggravating the problem. Despite insufficient investments, entrepreneurs have replaced fixed capital with machinery and equipment of higher technology at the expense of less labour. This has brought in higher work hours and technology together (slightly), raising the total productivity. Although rising productivity is good for the economy's total income, it may prove detrimental for higher recruitment in the short run.

The OLS estimation has yielded an employment elasticity of 0.04 for the entire period 2000Q1-2018Q4, proving that employment is positive and significantly related to income growth in the long-run, supported by the cointegration test. As stated in Section 4.2; 2000, 2002, 2003, and 2004 have been labelled jobless growth years; for which *rise in labour productivity* and *low investment rates* are the reasons to blame. Jobless growth of the period reflects in the very low elasticity figure of 0.04. Long-run employment elasticity is computed as 0.15 for the subperiod 2004Q1-2018Q4 with an almost four-fold rise in its magnitude. ECM also confirms the presence of short-term relation between variables with a significant t-test, further supported by simple Granger causality. As we change the first year with 2004 and 2006, elasticity shows considerable rise to 0.15 and 0.26[11]. Employers' premium, tax, and wage incentives have had important effects, especially with the 2008 labour market

[11] *As per yearly employment elasticity computations of Murat and Eser (2013) elasticity jumps to a higher platform from 2005 on. During 2005 there is 7% high growth rate and relatively higher investment.*

package. In fact, labour market measures have been adopted during 2008 May and July 2009 February and 2011 February and have effectively raised employment.

As followed in empirical results, although economic *growth* is the important factor to raise employment, it may not be sufficient for job creation under certain circumstances. *Macroeconomic policies, growth strategies, the sectoral composition of production, technology, backward and forward linkages between industries, public employment, labour market measures, informal market* etc. should also be considered for employment creation. Last but not least, savings and investments should be envisaged, for insufficient savings and lack of effective investment plans and strategies have recently been the severe bottleneck in the Turkish economy.

References

Agenor, P.R. et al. (2006), "Disinflation, Fiscal Sustainability, and Labor Market Adjustment in Turkey", *World Bank Policy Research Working Paper* 3804, January.

Akçoraoğlu, A. (2010), "Employment, Economic Growth and Labor Market Performance: The Case of Turkey", *Ekonomik Yaklaşım*, 21(77), 101-114.

Basnett, Y. & R. Sen (2013), *What Do Empirical Studies Say About Economic Growth and Job Creation in Developing Countries?*, Overseas Development Institute, September, 1-41.

Boltho, A. & A. Glyn (1995), "Can Macroeconomic Policies Raise Employment?", *International Labor Review*, 134(4-5), 451-470.

Chang, H.J. (2011), *23 Things They Don't Tell You About Capitalism*, Penguin Books: U.K.

Courtney, H. (1991), "The Beveridge Curve and Okun's Law: a Re-Examination of Fundamental Relationships in the US", *Dissertation*, Massachusett Institute of Technology.

Ercan, H. & A. Tansel (2006), "How to Approach the Challenge of Reconciling Labor Flexibility wity Job Security and Social Cohesion in Turkey", *Paper of the Turkish Experts' Group's Preparation for European Council's FORUM 2005* (Strasbourg).

Eurostat (2019), *Database*, <https://ec.europa.eu/eurostat/data/database>.

Ghosh, J. (2003), "Exporting Jobs or Watching Them Disappear? Relocation, Employment and Accumulation in the World Economy", in: J. Ghosh & C.P. Chandrasekar (eds.), *Work and Well Being in the Age of Finance*, Muttukadu Papers I: Tulika Press, 1-26.

Gordon, R.J. (2003), *Macroeconomics*, Boston: Addison Wesley.

Heintz, J. & R. Pollin (2003), "Informalization, Economic Growth and the Challenge of Creating Viable Labor Standards in Developing Countries", *PERI Working Paper*, No. 60, Amherst, MA: Political Economy Research Institute, 1-22.

Heintz, J. (2006), "Globalization, Economic Policy and Employment: Poverty and Gender Implications", *Employment Strategy Papers*, Employment Policy Unit, Employment Strategy Department, Geneva: ILO, 1-83.

Islam, R. (2004), *The Nexus of Growth, Employment And Poverty Reduction: An Empirical Analysis*, Recovery and Reconstruction Department, Geneva: International Labor Office, 1-33.

Kapsos, S. (2005), "The Employment Intensity of Growth. Trends and Macroeconomic Determinants", *Employment Strategy Papers*, No. 2005/12, Employment Strategy Department, Geneva: ILO, 1-55.

Khan, A.R. (2007), *Asian Experience on Growth, Employment and Powerty: An Overview with Special Reference to the Findings of Some Recent Case Studies*, UNDP Regional Center in Colombo and International Labor Office, Geneva, 1-45.

Khemraj, T. et al. (2006), "Okun's Law and Jobless Growth", *MPRA Paper*, New School for Social Research, No. 54881, March, 2006, 1-10.

Murat, S. & B.Yılmaz-Eser (2013), "Türkiye'de Ekonomik Büyüme ve İstihdam İlişkisi: İstihdam Yaratmayan Büyüme Olgusunun Geçerliliği", *HAK-İŞ Uluslararası Emek ve Toplum Dergisi*, 2(3), 92-123.

Okun, A.M. (1962), "Potential GNP: Its Measurement and Significance", Reprinted from Proceedings of the Business and Economics Statistics Section, American Statistical Association, *Cowles Foundation Paper*, 190.

Onaran, Ö. & N. Aydıner-Avşar (2006), "The Controversy Over Employment Policy: Low Labor Costs and Openness, or Demand Policy? A Sectoral Analysis for Turkey", *Department of Economics Working Paper Series*, 97. Inst. für Volkswirtschaftstheorie und -Politik, WU Vienna University of Economics and Business, Vienna, 1-24.

Onaran, Ö. (2002), "Measuring Wage Flexibility: The Case of Turkey Before and After Structural Adjustment", *Applied Economics*, 34, April, 767-781.

Osmani, S.R. (2004), "The Employment Nexus Between Growth and Powerty: An Asian Perspective", mimeo, *Report prepared for the Swedish International Development*, 1-56.

Padalino, S. & M. Vivarelli (1997), "The Employment Intensity of Economic Growth in the G-7 Countries", *International Labor Review*, 136, 191-213.

Palley, T. (1993), "Okun's Law and the Asymmetric and Changing Cyclical Behavior of the USA Economy", *International Review of Applied Economics*, 7(2), 144-162.

Patnaik, P. (2003), "Money, Finance and Contradictions of Capitalism", in: J. Ghosh & C.P. Chandrasekar (eds.), *Work and Well Being in the Age of Finance*, Muttukadu Papers I: Tulika Press.

Prachowny, M.F.J. (1993), "Okun's Law: Theoretical Foundations and Revised Estimates", *Review of Economics and Statistics*, 75(2), 331-336.

Seyfried, W, (2005), "Examining the Relationship Between Employment and Economic Growth in the Ten Largest States", *Southwestern Economic Review*, Spring, 13-24.

Seyfried, W. & R. College (2008), "A Cross Country Analysis of the Employment Intensity of Economic Growth", *Research Gate Article*, January, 51-61.

Seyfried, W. (2014), "Examining the Employment Intensity of Economic Growth of the PIIGS", *International Business and Economics Research Journal*, 13(3), 593-598.

Singh, A. (2003), "Trade, Technology, Institutions and Social Norms: A Perspective on the Determinants of Income Inequality", in: A. Cornea (ed.), *Rising Income Inequality and Poverty Reduction: Are They Compatible?*, UNCTAD Papers, Geneva.

Slimane, S.B. (2015), "The Relationship Between Growth and Employment Intensity: Evidence for Developing Countries", *Asian Economic and Financial Review*, 5(4), 680-692.

Strange, S. (2015), *Casino Capitalism*, Manchester University Press.

Telli, C. et al. (2006), "Modelling General Equilibrium for Socially Responsible Macroeconomics. Seeking for the Alternatives to Fight Jobless Growth in Turkey", *METU Studies in Development*, 33(2), 255-293.

Tezcek, Ö. (2007), "An Alternative Approach to Overcome Jobless Growth in Turkey: A New Strategy of Industrialization", Published in IDEAs (International Development Economics Associates) Webpage, Paper Presented in the IDEAs Conference on *Sustainable Employment Generation in Developing Countries: Current Constraints and Alternative Strategies*, University of Nairobi, Kenya, 25-27th January 2007.

TÜİK Turkish Statistical Institute (2019), *Database*, <http://www.tuik.gov.tr>.

Tunalı, İ. (2003), "Background Study on the Labor Market and Employment in Turkey", *Report Prepared for the European Training Foundation*, June 2003.

TÜSİAD (2008), "Türkiye Ekonomisinin Büyüme Dinamikleri: 1987-2007 Döneminde Büyümenin Kaynakları, Temel Sorunları ve Potansiyel Büyüme Oranı", *Küresel Ekonomiye Entegrasyon Sürecinde Büyüme Projesi Üçüncü Raporu*, Haziran.

UNCTAD (1999), *Trade and Development Report*, Geneva.

Uras, Ö. (2016), "Türkiye Ekonomisindeki İstihdamsız Büyümenin Ekonometrik Analizi", *İstanbul Üniversitesi İktisat Fakültesi Ekonometri ve İstatistik Dergisi*, 24, 94-108.

Walterskirchen, E. (1999), "The Relationship Between Growth, Employment and Unemployment in the EU", *European Economist for an Alternative Economic Policy Workshop*, Barcelona, Spain.

World Bank (2006), "Turkey: Labor Market Study", Poverty Reduction and Economic Management Unit, Europe and Central Asia Region, *World Bank Report* No. 33254-TR.

Sosyoekonomi

2021, Vol. 29(50), 51-71

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.03
Date Submitted: 16.12.2020
Date Revised: 17.07.2021
Date Accepted: 09.08.2021

An Analysis of The Validity of Absolute Purchasing Power Parity: The Case of Turkish Lira and British Pound

Mehmet ERDOĞMUŞ *(https://orcid.org/0000-0001-9700-630X), Sivas Cumhuriyet University, Turkey; erdogmus1mehmet@gmail.com*

Mutlak Satın Alma Gücü Paritesinin Geçerliliğine İlişkin Bir Analiz: Türk Lirası ve İngiliz Sterlini Örneği

Abstract

This study aims to determine the validity of the absolute purchasing power parity between the Turkish lira and the British pound for March 2001-November 2020. Traditional unit root tests (and stationarity test) that do not take structural breaks into account and unit root tests that take structural breaks into account were used in the study. According to the results of all tests, it was found that the absolute purchasing power parity between the Turkish lira and the British pound was not valid.

Keywords : Absolute Purchasing Power Parity, Turkish Lira, British Pound.

JEL Classification Codes : F31.

Öz

Bu çalışmanın amacı, Mart 2001-Kasım 2020 dönemi için Türk lirası ile İngiliz sterlini arasında mutlak satın alma gücü paritesinin geçerliliğini belirlemektir. Çalışmada yapısal kırılmaları dikkate almayan geleneksel birim kök testleri (ve durağanlık testi) ve yapısal kırılmaları dikkate alan birim kök testleri kullanılmıştır. Tüm testlerin sonuçlarına göre Türk lirası ile İngiliz sterlini arasında mutlak satın alma gücü paritesinin geçerli olmadığı tespit edilmiştir.

Anahtar Sözcükler : Mutlak Satın Alma Gücü Paritesi, Türk Lirası, İngiliz Sterlini.

1. Introduction

As it is known, the rates at which different currencies are converted to each other are called the exchange rates. Unlike the fixed exchange rate or managed fluctuation system, in the flexible or floating exchange rate system, the monetary authority has little or no intervention in exchange rates. Although monetary authorities try to keep exchange rates at target levels in a fixed exchange rate system, this is unsustainable, especially for economies in a foreign currency bottleneck and with high current account deficits. On the other hand, exchange rates can appreciate significantly if economies that allow their national currency to float against foreign currencies are in foreign currency bottlenecks and have high current account deficits. Severe exchange rate increases can cause various economic problems. For instance, due to an unexpectedly significant increase in the exchange rate, the external debt, expressed in national currency, will increase.

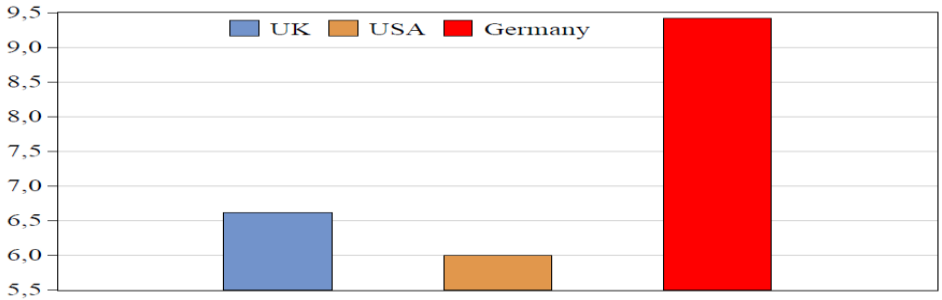
On the other hand, in economies with high import dependency, serious inflation may arise as serious increases in exchange rates will increase the costs of imported products (imported inputs, final goods, and services) in the national currency. It is extremely important to know at which level the exchange rates will stabilize to combat problems that may arise due to the increase in exchange rates. Suppose the level of exchange rates can be correctly predicted. In that case, economic actors will not face foreign currency risk, and the monetary authorities will be able to carry out a healthier monetary policy.

In this study, the absolute purchasing power parity (PPP), which is one of the theories trying to explain the development of exchange rates (Sperber & Sprink, 2012: 152), is investigated whether it is valid for the Turkish lira and the British pound. Since the United Kingdom is very substantial for Turkey's exports, the exchange rate between the Turkish lira and the British pound is significant for Turkey. Figure 1 shows the shares of exports on Turkey's total exports of the first three countries to which Turkey exports the most in 2020 [calculated according to Turkish Statistical Institute (TSI) data]. The country with the highest share is Germany. The UK is in second place, and the USA is in third place. Germany was not included in the analysis in this study because Germany uses the common currency, the euro. The exchange rate between the euro and the Turkish lira cannot be expected to depend only on the price level in Germany and Turkey. Therefore, the absolute PPP between the British pound and the Turkish lira was investigated in this study.

Most of the studies on the validity of PPP have investigated either the stationarity of the real exchange rate or/and the relationship between the nominal exchange rate and the price level of the two countries. Studies such as Taylor (1988), MacDonald (1993), Enders and Chumrusphonlert (2004), and Doğanlar et al. (2009) can be given as examples of empirical studies that try to test the validity of PPP by examining the relationship between nominal exchange rates and price levels. Studies such as Papell (1997), Baum et al. (1999), Narayan (2005), Kalyoncu and Kalyoncu (2008), Acaravci and Ozturk (2010), Chang et al. (2012), Pan et al. (2012), He and Chang (2013), Bahmani-Oskooee et al. (2014), Karagöz and Saraç (2016), Bahmani-Oskooee et al. (2018), Mike and Kızılkaya (2019), Bahramian

and Saliminezhad (2020) and Doğanlar et al. (2020) can be given as examples of empirical studies trying to reveal the validity of PPP by testing the stationarity of the real exchange rate. In this study, to test the validity of absolute PPP, it is investigated whether the real exchange rate is stationary or not.

Figure: 1
Shares of Turkey's Exports by Countries in Total Exports (in 2020)



Source: Created by the author using TSI data.

In an analysis aimed at estimating the parameters between the nominal exchange rate and price levels (such as OLS), if only price levels are included as an independent variable in the equation, the problem of endogeneity may be encountered. Due to such problems that may arise, methods for estimating the parameters between the nominal exchange rate and price levels were not preferred in this study. Instead, the real exchange rate stationarity was analysed in this study to examine the validity of the absolute PPP. To determine whether the real exchange rate is stationary, traditional tests that do not take structural breaks into account [the Augmented Dickey-Fuller-ADF (1981), the PP (1988), the DF-GLS (1996), the ERS-Point Optimal (1996), the KPSS (1992), the Ng and Perron (2001)] and tests that take structural breaks into account [the Lee and Strazicich-LS (2003), the Güriş (2019), the Otto (2021)] have been used.

There have been a lot of empirical studies on absolute PPP before. However, the fixed-b unit root test, which was not used in previous studies, was employed in this study. This test proposed by Otto (2021) has many advantages. The number of breaks in a trend of a series is not limited. This test can be used to make a robust estimate against autocorrelation and heteroscedasticity. This test can also be used for smooth and sharp breaks. This study aims to contribute to the literature by applying the fixed-b test, which has not previously been used for PPP, to absolute PPP and determine whether the absolute PPP is a valid theory between the British pound and the Turkish lira.

After the introductory part, the second part of the study presents the theoretical framework for the PPP theory. In the third part of the study, some examples of empirical literature of the PPP theory are presented. In the fourth part of the study, information about the data and methods used in the study's empirical analysis is presented. The results of the

empirical analysis are contained in the fifth part of the study. In the conclusion part of the study, a general evaluation was made, and recommendations were made.

2. Theoretical Framework for Purchasing Power Parity

Different theories have been developed to reveal the factors that determine the development of exchange rates. These theories are divided into two groups as *traditional exchange rate theories* and *new exchange rate theories*. Traditional exchange rate theories try to explain the development of exchange rates with the values of macroeconomic variables in the past and current periods. New exchange rate theories emphasize the expectations of market actors in explaining the development of exchange rates. Traditional exchange rate theories are divided into three groups. These are theories based only on goods markets, on financial markets, and both goods markets and financial markets. New exchange rate theories are divided into two groups. These are theories that assume market actors have irrational expectations and theories that assume they have rational expectations. The PPP theory is one of the theories based on goods markets (Sperber & Sprink, 2012: 152). PPP was systematically introduced by the famous Swedish economist Gustav Cassel (1916). However, Cassel (1918: 413) coined the term PPP for the first time in his 1918 work.

According to the PPP theory, the exchange rate between the currencies of two countries reflects the relationship between the price levels of the two countries (Krugman et al., 2015: 538). The PPP theory has two different approaches as absolute and relative. According to the absolute PPP theory, the price of a basket of goods will be the same in different countries if expressed in a common currency (Feenstra & Taylor, 2008: 506). According to the absolute PPP theory, it is possible to purchase the same goods at home and abroad with a specific currency. Suppose that in country A product x is P euro, in country B product x is P^* US dollar, and country A is the domestic country. In this case, the foreign country (country B) price multiplied by the exchange rate (in the form of direct quotation) must be the same as the domestic country (country A) price so that the absolute PPP is valid [Equation (1)]. In Equation (1), W indicates the exchange rate in direct quotation according to the absolute PPP. If W is left on one side alone, Equation (2) is obtained. It can be understood from Equation (2), according to absolute PPP, the exchange rate will be equal to the ratio of domestic and foreign prices to each other. For the absolute PPP to be valid, the real exchange rate must always be equal to one. In this case, since the real exchange rate (W_{real}) is calculated in the form of $[(P)]/[(P^*)(W)]$, $[(P)]/[(P^*)(W)]$ is equal to 1. If $W < (P)/(P^*)$, the real exchange rate will be greater than one and the national currency will become overvalued against foreign currency. In other words, more of the same good can be purchased abroad than in the domestic country with a certain amount of national currency. On the other hand, if $W > (P)/(P^*)$, the real exchange rate will be less than 1, and the national currency will be undervalued against foreign currency. In this case, less of the same good can be purchased abroad than in the domestic country with a certain amount of national currency (Moritz & Stadtmann, 2010: 127-129).

$$P = (P^*)(W) \tag{1}$$

$$W = \frac{(P)}{(P^*)} \tag{2}$$

$$(W)\% = (P)\% - (P^*)\% \tag{3}$$

$$(W_{real}) = \frac{(P^*)(W)}{(P)} \tag{4}$$

$$(W_{real})\% = (W)\% + (P^*)\% - (P)\% \tag{5}$$

Equation (2) can also be expressed in percent as in Equation (3). If the necessary adjustments are made, the real exchange rate is equal to Equation (4). In this case, the percentage change in real exchange rate will be as in Equation (5)[1]. If Equation (3) and Equation (5) are taken together, it is understood that the percentage change in real exchange rate should be zero according to the absolute PPP. For instance, if foreign prices increase by *a*% while domestic prices are stable and the nominal exchange rate decrease by *a*% then, absolute PPP will be valid. In such a case, the competitive advantage gained domestically due to the price increase abroad will be eliminated by the appreciation of the national currency against foreign currency (Rübel, 2013: 271-272). The PPP theory, in its absolute or powerful form, based on the *law of one price* (Dornbusch, 1985: 2). According to the law of one price, the prices of homogeneous goods purchased and sold in perfect competition markets- where there are no transportation costs and public restrictions (such as customs duties) on trade- will be the same in different countries if expressed in the same currency (Krugman et al., 2015: 537). According to the law of one price, if expressed in the same currency, the price difference between countries can only be short-lived due to arbitrage activities. As a result of arbitrage activities, goods will be bought from the country where they are cheap and sold to the country where they are expensive. The increase in demand seen as a result of arbitrage activities in the country where the goods are cheap will increase the prices in the relevant country. On the other hand, prices will decrease as the supply increases due to arbitrage in a country where goods are expensive. As a result, prices between countries will begin to equalize (Jarchow & Rühmann, 2000: 265).

$$\frac{\partial(W)}{(W)} = \frac{\partial(P)}{(P)} - \frac{\partial(P^*)}{(P^*)} \tag{6}$$

---

[1] *If the natural logarithmic transformation is made,* $\ln(W_{real}) = \ln(W) + \ln(P^*) - \ln(P)$ *Equality is obtained (Abuaf & Jorion, 1990: 158). If the absolute PPP is valid, the natural logarithm of the real exchange rate will be zero, so* $\ln(W_{real}) = \ln(W) + \ln(P^*) - \ln(P) = 0$ *Equality will be valid (MacDonald, 2007: 41).*

$$\partial\left[ln(W)\right] = \partial\left[ln(P)\right] - \partial\left[ln(P^*)\right] \tag{7}$$

$$\frac{\Delta(W)}{(W)} = \frac{\Delta(P)}{(P)} - \frac{\Delta(P^*)}{(P^*)} \tag{8}$$

$$\Delta\left[ln(W)\right] = \Delta\left[ln(P)\right] - \Delta\left[ln(P^*)\right] \tag{9}$$

$$\Delta\left[\ln(W_{real})\right] = \Delta\left[\ln(W)\right] + \Delta\left[\ln(P^*)\right] - \Delta\left[\ln(P)\right] \tag{10}$$

According to the relative PPP theory, changes in the nominal exchange rate (provided that the rate is in the form of direct quotation) between the currencies of two countries for a given period is equal to the difference between the domestic inflation rate and the foreign inflation rate (Shim et al., 2016: 2386). According to the relative PPP theory, the higher the domestic inflation rate than the foreign inflation rate is, the more the national currency will depreciate against the foreign currency (Moritz & Stadtmann, 2010: 134). It is possible to show the relative PPP equation as Equation (6). ∂ is the first-order derivative operator. Equation (6) is equal to Equation (7). In Equation (7) *ln* denotes the natural logarithm operator (Clements et al., 2007: 4). It is also possible to express the relative PPP as in Equation (8). Where Δ is the first difference operator, $\Delta(W)/(W)$ represents the relative change in the nominal exchange rate, $\Delta(P)/(P)$ indicates the domestic inflation rate and $\Delta(P^*)/(P^*)$ indicates the foreign inflation rate (Krugman et al., 2015: 540; Feenstra & Taylor, 2008: 507). Since the relative change in numbers algebraically is approximately equal to the first difference of the natural logarithmic transformed numbers, it is possible to show the relative PPP with Equation (9). Equation (10) is obtained if $\Delta[ln(P)]$ and $\Delta[ln(P^*)]$ in Equation (9) are taken to the left. If the relative PPP is valid, $\Delta[ln(W_{real})]$ must be equal to zero (Patterson, 2000: 558).

There are several factors that limit the validity of the PPP theory. For instance, the existence of heterogeneous goods between countries, the existence of non-tradable goods, government intervention, and the existence of transportation costs limit the validity of the absolute PPP theory (Rübel, 2013: 273). Apart from price changes, the exchange rate is also affected by the changes in some variables important for international trade, which limits the validity of the relative PPP theory. For instance, if the national income increases while other conditions are constant, the demand for imported goods will also increase. In this case, if the supply elasticity of imported goods is perfect, the price of imported goods will not increase. However, the demand for foreign currency and the value of imported goods in a foreign currency will increase (Rose, 1974: 97). The exchange rate system implemented by the countries is also important. A fixed exchange rate system can adversely affect the validity of the PPP theory because exchange rates cannot reflect relative price changes (Patterson, 2000: 556). Monetary problems also cause exchange rates to deviate from PPP, at least temporarily, that is, changes in real exchange rates. Apart from these, differences in productivity growth between countries cause real exchange rates to change trend

(Dornbusch, 1985:2). In this respect, in order for the exchange rate estimates based on PPP to be healthy, it must first be revealed whether the PPP theory is valid or not.

3. Empirical Literature

While some economic views consider the PPP theory a reality, some economic views consider the PPP theory unrealistic (Dornbusch, 1985: 1). According to the relationship between the absolute and relative PPP, if the absolute PPP is valid, the relative PPP is valid. However, if the absolute PPP theory is not valid, the relative PPP may be valid (Feenstra & Taylor, 2008: 508; Taylor & Taylor, 2004: 4). In this study, the validity of the relative PPP was not tested, as it was intended to test only the validity of absolute PPP (in terms of the Turkish lira and British pound). Most of the empirical studies on PPP use unit root tests, stationarity tests, or cointegration tests. A limited number of examples of empirical studies of PPP are presented in Table 1.

Table: 1
Empirical Studies Examples on Purchasing Power Parity

Author	Period/Region	Method	Main Finding
Frenkel (1978)	1921M02-1925M05/France, UK, USA	Regression Analysis / Causality Analysis	It has been determined that absolute PPP is not valid. It has been observed that the relative PPP is only invalid between the pound and the US dollar. According to the causality test, a general one-way causality was determined from exchange rates to prices.
Dornbusch (1979)	1974M03-1978M05/Germany and the USA	Regression Analysis	It has been observed that PPP is not valid.
Taylor (1988)	1973M06-1985M12/USA, UK, West Germany, France, Canada, Japan	Cointegration Analysis	It has been determined that PPP is not valid.
MacDonald (1993)	1974M01-1990M06/Canada, France, Germany, Japan, UK, USA	Cointegration Analysis	In general, it has been determined that absolute PPP is not valid, and relative PPP is valid.
Frankel & Rose (1996)	1948-1992 (A)/150 Countries	Regression Analysis	It has been observed that PPP is valid.
Papell (1997)	1973M01-1994M09; 1973Q1-1994Q3/Monthly Data for 18 Countries, Quarterly Data for 21 Countries	Unit Root Analysis	As the base currency, it has been observed that the German mark supports PPP more than the US dollar. It was observed that the validity of PPP increased with the increase in the number of countries. It has been determined that monthly data support PPP more than quarterly data.
Baum et al. (1999)	1973M08-1995M12/For CPI Based Real Exchange Rate 17 Countries; For Wholesale Price Index Based Real Exchange Rate 12 Countries	ARFIMA/ Unit Root Analysis	It was found that absolute PPP is not valid.
Enders & Chumrusphonlert (2004)	1973M01-2001M07/USA, Korea, Singapore, Thailand;1973M01-2001M06/ Philippines;1973M01-2001M04/Malaysia;1973M01-2000M12/Indonesia;1990M01-2001M06/Hong Kong; Japan	Cointegration Analysis	It has been determined that the long-run PPP is valid for Indonesia, Korea, Malaysia, the Philippines, and Thailand in case the base currency is as Japanese yen. If the base currency is the US dollar, it was seen that the long-run PPP was valid for the analysed countries except for Japan.
Narayan (2005)	1973M01-2002M12 (For United Kingdom); 1973M01-2003M09/17 OECD Countries	Unit Root Analysis	It has been observed that the PPP is valid for only three countries if the base currency is the US dollar, and that the PPP is valid for seven countries if the base currency is the German mark.
Doğanlar (2006)	1995M01-2002M12/Azerbaijan, Kazakhstan, Kyrgyzstan, USA	Unit Root- Stationarity Analysis/ Cointegration Analysis / Bound Test Analysis/ Regression Analysis	It has been determined that PPP is not valid.
Bahmani-Oskooee & Kandil (2007)	1970-2004 (A)/14 MENA Countries (EF)	Unit Root - Stationarity Analysis /Bound Test Analysis	It has been determined that the PPP theory is valid for almost half of the countries analysed according to the KPSS test.

Baharumshah et al. (2008)	1976M01-1997M06; 1997M07-2002M09/South Korea, Thailand, Indonesia, Malaysia, Singapore, Philippines, USA, Japan	Bound Test Analysis /Half-Life Measure	It was determined that the relative PPP was not valid before the Asian financial crisis. After the Asian financial crisis, findings regarding the validity of relative PPP have been reached. It was found that the absolute PPP was not valid.
Dal Bianco (2008)	2006-1900 (A)/Argentina, USA	Unit Root - Stationarity Analysis /Cointegration Analysis	It has been determined that PPP is not valid.
Kalyoncu & Kalyoncu (2008)	1980Q1-2005Q4/25 OECD Countries, USA	Unit Root Analysis	It has been determined that PPP is valid.
Doğanlar et al. (2009)	1995M01-2005M12/Brazil, India, Indonesia, South Korea, Mexico, Pakistan, Peru, Philippines, South Africa, Turkey, USA	Cointegration Analysis	It was concluded that the PPP theory was valid only in Mexico and Peru among the analysed countries.
Acaravci & Ozturk (2010)	1992M01-2009M01/Bulgaria, Croatia, Czech Republic, Hungary, Macedonia, Poland, Romania, Slovakia (EF)	Unit Root - Stationarity Analysis	According to the unit root tests without a structural break, it has been observed that the PPP theory is not valid. According to the unit root tests with structural break(s), it was determined that the PPP theory is valid only for Bulgaria and Romania.
Chang et al. (2012)	1994M10-2008M09/ Cambodia; 1995M01-2008M06/ Vietnam; 1987M12-2008M06/ Laos; 1980M01-2008M09/ Indonesia, Malaysia, Philippines, Singapore, Thailand; USA	Unit Root Analysis	It was found that only in 3 out of 8 countries (Thailand, Malaysia, Indonesia) was the PPP valid.
Pan et al. (2012)	1985M01-2008M09/18 African Country, USA	Unit Root - Stationarity Analysis	PPP was valid in only four (Sierra Leone, Tanzania, Madagascar and Morocco) countries.
He & Chang (2013)	1994-2012 (Monthly and Quarterly Data)/14 Transition Countries (EF)	Unit Root - Stationarity Analysis	The PPP theory was determined to be valid in half of the countries analysed with the quarterly data. In terms of monthly data, it is found that the PPP theory is valid in most of the analysed countries. Countries in which the PPP theory is not valid according to monthly data are Bulgaria, Slovakia, Austria, and Romania.
Bahmani-Oskooee et al. (2014)	1971Q1-2012Q4/20 African Countries (EF)	Stationarity Analysis	It has been found that the PPP theory is valid in half of 20 African countries.
Karagöz & Saraç (2016)	2003M01-2014M06/Turkey (EF)	Unit Root Analysis	It has been found that the PPP theory is not valid.
Bahmani-Oskooee et al. (2018)	1971Q1-2015Q4 (For 22 Countries); 1980Q1-2015Q4 (For 7 Countries)/29 African Countries (EF)	Unit Root Analysis	It was concluded that the PPP theory is valid for 15 African countries.
Murad & Hossain (2018)	1973-2015 (A)/ ASEAN Member Countries, USA	Unit Root Analysis / Cointegration Analysis	It has been observed that the relative PPP is generally valid.
Mike & Kızılkaya (2019)	2001Q1-2016Q4/12 Emerging Market Economy, USA	Unit Root Analysis / Cointegration Analysis	According to the Fourier quantile unit root test results the PPP theory is valid for Colombia, India, the Philippines, Poland, South Africa, and Turkey. However, according to the KPSS Fourier cointegration analysis, the PPP theory is valid for Brazil, Colombia, India, Mexico, South Africa, Thailand, and Turkey.
Bahramian & Saliminezhad (2020)	1994M01-2018M09/Indonesia, Malaysia, Philippines, Thailand, Singapore (EF)	Unit Root Analysis	It was seen that PPP is only not valid for Malaysia.
Doğanlar et al. (2020)	2002M01-2018M10/Turkey, China, Euro Area, Russia, UK, USA	Unit Root Analysis	The PPP theory was found to be valid.
She et al. (2020)	1983Q1-2014Q4/Pakistan, 21 Countries	Unit Root - Stationarity Analysis / Regression Analysis	The PPP theory was found to be partially valid.

Note: A, Q, and M, denote annual, quarterly, and monthly data, respectively. EF denotes effective exchange rate.

4. Data and Methodology

In this study, the validity of the absolute PPP (in terms of the Turkish lira and British pound) was analysed between March 2001-and November 2020. The data used in the analysis are monthly frequency data. Since Turkey switched to the flexible exchange rate system at the end of February 2001 (February 22, 2001), February 2001 was not considered. To test the validity of the absolute PPP theory in relation to the Turkish Lira and British pound, the stationarity of the real exchange rate (*REXR*) was used. If the real exchange rate

is stationary, the real exchange rate will return to its previous parity in the face of a shock. This will mean that the absolute PPP is valid. In Baum et al. (1999: 365), consumer and wholesale price indexes were used to represent the price level. Similarly, in this study the nominal exchange rate and harmonized consumer price index (HCPI) (base year 2015) are used to calculate the real exchange rate between the British pound and the Turkish lira. The time path graph of the *REXR* series is as in Figure 2. Nominal exchange rate data were obtained from the Electronic Data Delivery System of the Central Bank of the Republic of Turkey (EDS). HCPI data for both countries were obtained from Eurostat. Descriptive statistics for the variable *REXR* are given in Table 2.

Table: 2
Descriptive Statistics Regarding the Variable

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
REXR	237	1,423	0,199	1,063	1,953

Figure: 2
The Time Path Graph of *REXR* Variable

Source: It was created by the author.

To analyse the stationarity of the *REXR* variable, some traditional tests that do not take into account the structural breaks were applied. These applied tests are the ADF (1981), the PP (1988), the DF-GLS (1996), the ERS-Point Optimal (1996), the KPSS (1992), and the Ng and Perron (2001). The ADF (1981) test is an extended version of the Dickey-Fuller [DF (1979)] unit root test. In the ADF (1981) unit root test, unlike the DF (1979) unit root test, the lagged values of the dependent variable are also included in the regression that tests the unit root (Hackl, 2013: 257-259). In the ADF (1981) unit root test proposed by Dickey and Fuller (1981), there are models with no deterministic term, with a constant term and a constant term and a trend term. The null hypothesis of this test states that the series contains a unit root (Greene, 2016: 954). The PP (1988) test, another traditional unit root test proposed by Phillips and Perron (1988), can also be examined in terms of three models (model with no deterministic term, constant model, constant and trend model). The null hypothesis of this unit root test states that the series contains a unit root. However, the PP (1988) test is non-parametric in terms of nuisance parameters (Phillips & Perron, 1988: 335). Unlike the ADF (1981) unit root test, the PP (1988) unit root test does not include the lags of the

dependent variable as an independent variable in the analysis to eliminate the autocorrelation seen in the residues. Against the potential problems, a correction factor is added to the test statistic of the DF (1979) unit root test in the PP (1988) unit root test (Patterson, 2000: 264). However, the test statistic of the PP (1988) unit root test has the same asymptotic distribution as the test statistic of the DF (1979) unit root test (Hackl, 2013: 261). Elliott et al. (1996) suggested the DF-GLS (1996) and ERS-Point Optimal (1996) tests to determine the stationarity of a series. The null hypothesis of both tests states that the series contains a unit root. The DF-GLS (1996) unit root test and ERS-Point Optimal (1996) tests can be applied for the constant model and the constant and trend model. In the DF-GLS (1996) unit root test, the ADF (1981) model without exogenous components is applied to the series after removing the series from their deterministic components using the appropriate method. In the ERS-Point Optimal (1996) test, the test statistic is based on residuals from quasi-difference regression (Elliott et al., 1996: 817, 819, 824-825). The KPSS (1992) stationarity test proposed by Kwiatkowski et al. (1992: 160-161, 166) can be applied for the constant model and the constant and trend model. The null hypothesis of the test states that the series is stationary. The null hypothesis of the Ng and Perron (2001) unit root test states that the series contains a unit root. This test can be applied for the constant model and the constant and trend model. In the Ng and Perron (2001) unit root test, four new test statistics (MZ_{α}^{GLS}, MZ_{t}^{GLS}, MSB^{GLS} and MP_{T}^{GLS}) are calculated by applying some modifications to the test statistics in Perron and Ng (1996) [MZ_{α} , MZ_{t} , MSB] and the ERS-Point Optimal (1996) test statistic (Ng & Perron, 2001: 1520, 1522-1524).

In the study, Bai and Perron (1998, 2003a) structural break test was applied to determine the number of structural breaks and regimes. Bai and Perron developed this test in 1998 and applied it in another study in 2003 (Bai & Perron, 2003a: 1). Bai and Perron (1998, 2003a) structural break test is used to determine the number of structural breaks internally in the linear regression model estimated using the least-squares method. In this test, the minimum sum of the squared residuals of the linear regression model is taken into account to predict various structural changes. The Bai and Perron (1998, 2003a) structure break test can take into account the general autocorrelation and heteroscedasticity of error terms, different error distributions, and independent variable distributions for different regimes. Assume that there is a multiple regression such as in Equation (11) and m + 1 (m represents the number of breaks) different regimes ($t = T_{j-1} + 1,\ldots,T_j$; $j = 1,\ldots, m+1$). In Equation (11), y_t is the dependent variable, x_t' ($x_t = px1$) and z_t' ($z_t = qx1$) are the independent variable vectors, and u_t is the error term. The aim is to estimate both the unknown regression parameters and the unknown break time(s) ($T_1,\ldots,T_m$) using the variables y_t, x_t, and z_t. The β parameter (as it can be understood that there is no subscript) is a parameter that does not vary according to different regimes. In this respect, models with β parameter are known as partial structural change models. However, models without the β parameter are pure structural change models (Bai & Perron, 1998: 47-49). In the Bai and Perron (1998, 2003a) structural break test, different test strategies determine the number of structural breaks and regimes in a series. In this study, the sequential break strategy was applied. In this strategy, the null hypothesis states that the number of breaks of a series is l,

and the alternative hypothesis states that the number of breaks of a series is l+1 (Bai & Perron, 2003a: 11-15, 18).

$$y_t = x_t'\beta + z_t'\delta_j + u_t \tag{11}$$

One of the unit root tests used in the study is the LS (2003) unit root test suggested by Lee and Strazicich (2003). The LS (2003) unit root test is similar to the Lee and Strazicich (2004) unit root test. However, unlike this test, the LS (2003) unit root test considers two structural breaks and not only one. Let it be assumed that the data generation process is as in Equation (12). In Equation (12), y_t is the analysed series, Z_t is the vector of exogenous variables and e_t is the error term [$e_t \sim$ iid $N(0,\sigma^2)$]. There are two types of models (model A and model C) in this unit root test. Model A examines structural breaks only at the level, while model C examines structural breaks at both the level and the trend. Considering Equation (12), [1, t, D_{1t}, D_{2t}]′ (D_{jt} = 1 for t $\geq$ $T_{Bj} + 1$ otherwise 0; j =1,2; T_{Bj} indicates the time when a structural break occurs) will be substituted for Z_t for model A and [1, t, D_{1t}, D_{2t}, DT_{1t}, DT_{2t}]′ (DT_{jt} = t - T_B for t $\geq$ $T_B + 1$ otherwise 0; j = 1, 2) will be substituted for Z_t for model C. In this unit root test, structural breaks are determined internally based on the LM statistic. The equation to be estimated to calculate the LM statistic in this unit root test is as in Equation (13). $\tilde{S}_t = y_t - \tilde{\psi}_x - Z_t\tilde{\delta}$, ($t$ = 2,…, T). $\tilde{\psi}_x$ is obtained with $y_1 - Z_1\tilde{\delta}$. The null hypothesis of this unit root test states that the series has unit root under structural breaks (Lee & Strazicich, 2003: 1082-1083).

$$y_t = \delta' Z_t + e_t, \quad [e_t = \beta e_{t-1} + \varepsilon_t]' \tag{12}$$

$$\Delta y_t = \delta' \Delta Z_t + \phi \tilde{S}_{t-1} + u_t \tag{13}$$

The other unit root test used in the study is the nonlinear unit root test with the Fourier function proposed by Güriş (2019). In terms of structural break and nonlinearity, traditional unit root tests may incorrectly show that the stationary series is non-stationary. The Güriş (2019) test is proposed against such problems that may arise. According to the simulation results, it has been determined that the Güriş (2019) test has more power than the Kruse (2011) and Kapetanios et al. (2003) tests. The Güriş (2019) test has a two-stage estimation process. In the first step, if the constant model is used, Equation (14) is estimated by OLS, and if the constant and trend model is used, Equation (15) is estimated by OLS. In the second stage of the test, the unit root test is performed with Equation (16), assuming that the residuals ($\hat{v}_t$) estimated from Equation (14) and (15) follow the ESTAR process. This Equation tests the unit root null hypothesis ($\delta_1 = \delta_2 = 0$) against the alternative hypothesis ($\delta_1 < 0, \delta_2 \neq 0$). In Equation (14) and (15), *sin* represents the sine function, *cos* is the cosine function, t is the linear trend term, k^* is the optimal frequency, α_0 is the constant term, T is the number of observations, and v_t represents the error term (Güriş, 2019: 3056-3058).

$$y_t = \alpha_0 + \alpha_1 \sin\left(\frac{2\pi k^* t}{T}\right) + \alpha_2 \cos\left(\frac{2\pi k^* t}{T}\right) + v_t \tag{14}$$

$$y_t = \alpha_0 + \gamma t + \alpha_1 \sin\left(\frac{2\pi k^* t}{T}\right) + \alpha_2 \cos\left(\frac{2\pi k^* t}{T}\right) + v_t \tag{15}$$

$$\Delta\hat{v}_t = \delta_1 \hat{v}_{t-1}^3 + \delta_2 \hat{v}_{t-1}^2 + \sum_{j=1}^{p} \varphi_j \Delta\hat{v}_{t-j} + \varepsilon_t \tag{16}$$

The fixed-b test was proposed by Otto (2021) to determine the stationarity of a series. This test can be used to determine the stationarity of time series without linear trend components. This test can be applied in the case of multiple breaks and different types of breaks (smooth or sharp). Another benefit of this test is that it can handle heteroscedasticity and autocorrelation. Corrections to the nuisance parameters provide results that are robust to heteroscedasticity. By using the pre-whitening process, autocorrelation is taken into account. The fixed-b statistic does not have the standard normal distribution. The null hypothesis of this test states that the series contains a unit root. To apply the fixed-b test, firstly, the series is divided into *T*-*B* overlapping blocks of length *B* [*B* is the block length; *T* is the number of observations. In fixed-b test *B* equals to $(b)\times(T)$]. The obtained blocks are treated as cross-section units in panel data, and pooled OLS is applied. The variable Δy_{j+t} is regressed on $(y_{j+t-1} - y_j)$ [here $2 \leq t \leq T$ and $1 \leq j \leq T - B$]. Then, the test statistic is obtained. The test statistic of the fixed-b test is as in Equation (17). The $\tilde{y}$ in Equation (17) and (18) shows the time-transformed series. $\tilde{y}_{1,T}$ and $\tilde{y}_{2,T}$ in Equation (17) are calculated with the related formulas in Equation (18). It should be noted that the trend of the series analysed must meet the partial Lipschitz condition for these tests to be used (Otto, 2021: 86-88, 90, 94).

$$\tau\text{-Fixed-b} = \frac{\tilde{y}_{1,T}}{\hat{\sigma}\sqrt{\tilde{y}_{2,T}}} = \frac{\sum_{j=1}^{T-B}\sum_{t=2}^{B} \Delta\tilde{y}_{t+j}\left(\tilde{y}_{t+j-1} - \tilde{y}_j\right)}{\hat{\sigma}\sqrt{B\sum_{j=1}^{T-B}\sum_{t=2}^{B}\left(\tilde{y}_{t+j-1} - \tilde{y}_j\right)^2}} \tag{17}$$

$$\tilde{y}_{1,T} = \frac{1}{B^{3/2}T^{1/2}} \sum_{j=1}^{T-B}\sum_{t=2}^{B} \Delta\tilde{y}_{t+j}(\tilde{y}_{t+j-1} - \tilde{y}_j); \quad \tilde{y}_{2,T} = \frac{1}{B^2 T} \sum_{j=1}^{T-B}\sum_{t=2}^{B} (\tilde{y}_{t+j-1} - \tilde{y}_j)^2 \tag{18}$$

5. Results of the Empirical Analysis

First of all, Bai and Perron (1998, 2003a) test was applied to determine whether there is a structural break in the *REXR* series. According to the Bai and Perron (1998, 2003a) test results in Table 3, two sharp structural breaks (in December 2010 and March 2016) were detected in the *REXR* series. Figure 3 shows the predicted structural breaks and different

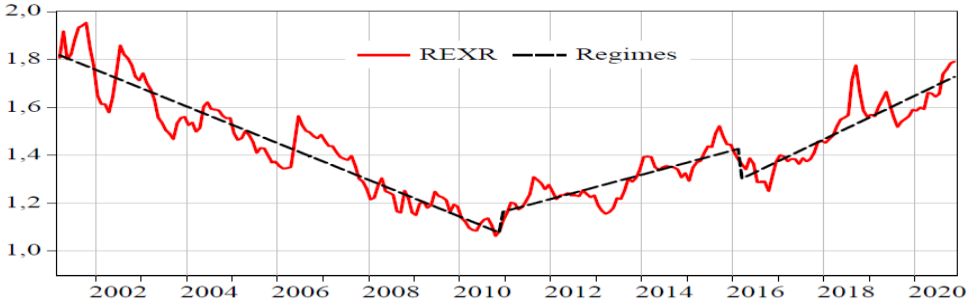
regimes according to the Bai and Perron (1998, 2003a) test. Since structural breaks were found in the *REXR* variable according to Bai and Perron (1998, 2003a) structural break analysis, it would be more appropriate to use unit root tests that take structural breaks into account. As Perron (1989: 1361) stated, unit root tests that do not take into account the structural break in case of structural break can perceive the series that is stationary as non-stationary.

Table: 3
Structural Break Analysis Results For *REXR*

Test for Break in Level and Trend	
$SubF_T(l+1\|l)$- Statistics	**Critical Values (5% Significance Level)**
$SubF_T(1\|0)$ = 359,990**	10,980
$SubF_T(2\|1)$ = 13,906**	12,550
$SubF_T(3\|2)$ = 10,863	13,460
Break Dates= December 2010, March 2016	

*Note: The maximum number of breaks has been chosen as three. ** indicates statistical significance at 5% significance level. The critical values are obtained from Bai and Perron (2003b).*

Figure: 3
Structural Breaks According to the Bai and Perron (1998, 2003a) Test



Source: It was created by the author.

Although structural breaks were found, the results of the traditional unit root tests are shown in Table 4 to compare the results of the traditional unit root tests with the results of the unit root tests that take structural breaks into account. According to all the traditional tests given in Table 4, the *REXR* variable is not stationary at the level. Therefore, it can be concluded that the absolute PPP between the British pound and the Turkish lira is not valid in the analysed period.

Table: 4
Results of Traditional Tests

Test Name	Constant and Trend Model			
	Test Statistics			
ADF[2]	-1,357 (16)			
DF-GLS[3]	-0,238 (16)			
ERS-Point Optimal[4]	36,118 [5]			
PP[2]	-1,278 [5]			
KPSS[5]	0,491** [11]			
Ng-Perron[6]	MZ_{α}^{GLS}	MZ_{t}^{GLS}	MSB^{GLS}	MP_{T}^{GLS}
	-1,637 [5]	-0,622 [5]	0,380 [5]	33,943 [5]

*Note: ** indicates significance at 5% level. Values in round brackets indicate the lag length, values in square brackets indicate the bandwidth length.*

As two structural breaks were found according to the Bai & Perron (1998, 2003a) test, the LS (2003) unit root test, which takes two structural breaks into account, was also used. The result of this unit root test is given in Table 5. According to the results in the Table, it is seen that the null hypothesis stating that the series contains a unit root under two structural breaks cannot be rejected. In this respect, the absolute PPP between the British pound and the Turkish lira is not valid in the period analysed according to the LS (2003) test results. The structural break dates predicted by the LS (2003) [September 2010, April 2016] test is very close to the break dates predicted by the Bai and Perron (1998, 2003a) [December 2010, March 2016] test. Although there are slight differences between months, the first structural break was predicted in 2010 and the second structural break in 2016, according to the results of the two tests. The European Debt Crisis may have been effective in the structural break seen in 2010. The European Debt Crisis first appeared in Greece in 2010 (Moeller, 2011: 3). Since the Debt Crisis in the European Union had a negative impact on economic relations between European countries, the European Debt Crisis also had a negative impact on the British economy.

On the other hand, it should be noted that there are important foreign trade partners for Turkey in the European Union and that Turkey was also negatively affected by the European Debt Crisis. The Brexit event may have caused the reason for the structural break in 2016. The Brexit referendum took place on June 23, 2016. However, the Brexit date was announced on February 20, 2016 (Cucinelli et al., 2020: 66). For this reason, the announcement of the Brexit referendum could be a cause of the structural break found in March 2016 or April 2016.

---

2 *The critical value is -3,450 for the 5% significance level. The critical value is obtained from Fuller (1996).*

3 *The critical value is -2,890 for the 5% significance level. The critical value is obtained from Elliot et al. (1996).*

4 *The critical value is 5,620 for the 5% significance level. The critical value is obtained from Elliot et al. (1996).*

5 *The critical value is 0,146 for the 5% significance level. The critical value is obtained from Kwiatkowski et al. (1992).*

6 *The critical values for MZ_{α}^{GLS}, MZ_{t}^{GLS}, MSB^{GLS} and MP_{T}^{GLS} according to 5% significance level are -17,300; -2,910; 0,168; 5,480; respectively. The critical values are obtained from Ng and Perron (2001).*

Table: 5
Results of Unit Root Test with Two Breaks

Break-in Level and Trend Model			
Test Statistics	***L***	**Critical Value (5% Significance Level)**	**Break Dates**
-5,276	12	-5,650	September 2010; April 2016

Note: The critical value is obtained from Lee and Strazicich (2003). L indicates the lag length.

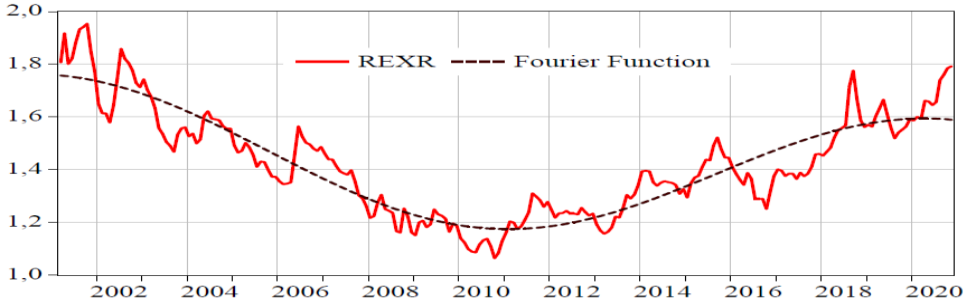
The results of the Güriş (2019) test, which takes into account smooth breaks and nonlinearity, are given in Table 6. According to the test, the optimal frequency was estimated as one. According to the results in the Table, since the test statistic is smaller than the 5% critical value, the null hypothesis of unit root cannot be rejected. In this respect, according to the results of the Güriş (2019) test, the *REXR* series is non-stationary at the level. Therefore, it can be said that the absolute PPP between the pound and the Turkish lira is not valid in the analysed period. Figure 4 shows the *REXR* series and the Fourier function (according to frequency one) for this series.

Table: 6
Results of Nonlinear Unit Root Test with Fourier Function

Constant and Trend Model			
Test Statistic	***k****	***L***	**Critical Value (5% Significance Level)**
9,559	1	12	18,400

Note: The critical value is obtained from Güriş (2019). k and L indicate the optimal frequency and lag length, respectively.*

Figure: 4
Fourier Function and *REXR* Series



Source: It was created by the author.

Table 7 shows the results of the fixed-b unit root test proposed by Otto (2021). For all block lengths in the Table, the *REXR* series is found to be non-stationary. In this respect, according to the fixed-b unit root test result, it was seen that the absolute PPP between the Turkish lira and the British pound was not a valid parity in the analysed period.

Table: 7
Fixed-b Unit Root Test Results

Test Statistic	L_B	Critical Values (5% Significance Level)
-0,103	135	-1,067
-0,171	157,500	-0,939
-0,213	180	-0,781
-0,155	202,500	-0,573

Note: The critical values are obtained from Otto (2021). L_B indicates block length.

According to the results of the unit root tests, which do not take into account structural breaks and take structural breaks into account, it is understood that the absolute PPP between the Turkish lira and the British pound is not a valid theory in the analysed period. The absolute PPP theory argues that the same basket at home and abroad can be purchased with a particular currency (Moritz & Stadtmann, 2010: 127). However, certain factors are necessary for absolute PPP to be valid. First of all, a period in which there was no fixed exchange rate system was selected (March 2001-November 2020). In a fixed exchange rate system, the nominal exchange rate cannot be expected to adapt to the price level. This may adversely affect the validity of the PPP theory (Patterson, 2000: 556). If the country data used are calculated with different techniques, it would not be correct to compare them. Considering this fact, the harmonized consumer price index (HCPI) data of Eurostat, which takes into account the same base year (2015), were used in the study. HCPI data are calculated according to harmonized and jointly determined methods[7]. The heterogeneity of foreign trade goods can cause the absolute PPP to be invalid (Rübel, 2013: 273).

The difference in quality (heterogeneity) of the same goods will be more pronounced, especially between developing and developed countries. Since the currency of a developing country (Turkish lira) and the developed country (British pound) are analysed in the study, it is expected that the quality will differ between the same goods. Therefore, the difference in the quality of the same kind of goods may have caused the absolute PPP between the Turkish Lira and British Pounds to be invalid. Another factor that can prevent absolute PPP from being valid is the presence of non-tradable goods (Rübel, 2013: 273). Goods produced in one country are considered non-tradable if they cannot or are not consumed in another country (Siebert, 1988: 2). There may be goods that Turkey and the United Kingdom have never bought from each other. This situation may cause the absolute PPP not to be valid. More or less, every state intervenes in the economy for different reasons.

Various interventions by governments make it difficult for absolute PPP to be valid (Rübel, 2013: 273). New public regulations have been introduced for the commercial relationship between Turkey and the United Kingdom. A new trade agreement was signed with the EU and the United Kingdom, following the final realization of Brexit on January 31, 2021. In parallel with this process, as a result of the negotiations between Turkey and the United Kingdom, a new Trade Agreement was signed on December 29, 2020. The signed

[7] *<https://ec.europa.eu/eurostat/de/web/hicp/>, June 30, 2021.*

treaty entered into force on 20 April 2021[8]. Apart from these, another factor limiting the validity of absolute PPP is the transportation costs in trade (Rübel, 2013: 273). High transportation costs will negatively affect foreign trade. High transport costs may result in some goods not being tradable at all. According to TSI data in 2020, Turkey's most used transportation channel in foreign trade was the sea route (share of maritime transport in exports is ~59,48%, and its share in imports is ~52,31%)[9].

Some previous empirical studies support the finding that the absolute PPP between the British pound and the Turkish lira is not valid. For example, according to the results of the regression analysis of Vergil and Özkan (2007), it can be seen that there is no absolute PPP between the Turkish lira and the British pound. According to the study of Aloy et al. (2011), the real exchange rate between the Turkish lira and the British pound was not stationary in either the linear stationarity test or the nonlinear unit root test. Therefore, according to the results of this study, it can be said that absolute PPP is not valid.

6. Conclusion

It is important to follow the development of exchange rates, especially for developing countries such as Turkey that need foreign exchange. If the absolute PPP is valid, the development of the exchange rates can be estimated considering the absolute PPP. On the other hand, the United Kingdom has an important place in Turkey's exports. Therefore, this study investigated the validity of the absolute PPP between the Turkish lira and the British pound. The research period is between March 2001 and- November 2020. Since Turkey switched to a flexible exchange rate system towards the end of February 2001 (on February 22, 2001), the period starts in March 2001. In the study, monthly British pound and Turkish lira real exchange rate data calculated by the author were used to test the absolute PPP. In calculating the real exchange rate, the nominal exchange rate between the Turkish lira and the British pound and the HCPI data for Turkey and the United Kingdom were used. Nominal exchange rate data were obtained from the EDS, and HCPI data were obtained from Eurostat.

In the study, the stationarity of the real exchange rate was analysed to test the absolute PPP. To determine the stationarity of the real exchange rate, both traditional unit root tests, which do not take structural breaks into account [ADF (1981), PP (1988), DF-GLS (1996), ERS-Point Optimal (1996), KPSS (1992), Ng and Perron (2001)], and unit root tests, which take structural breaks into account [LS (2003), Güriş (2019), Otto (2021)], were used. It is also possible to determine the validity of the absolute PPP by testing the relationship between the nominal exchange rate and the countries' price levels. However, such methods were not preferred due to the possible endogeneity problem. There are many previous studies on absolute PPP. However, the newly developed fixed-b test was applied for the first time in this study. It aims to contribute to the literature by comparing the new test results with the

---

8 *<https://ticaret.gov.tr/dis-iliskiler/brexit-ve-birlesik-krallik-sta>, June 30, 2021.*

9 *<https://data.tuik.gov.tr/Bulten/Index?p=Dis-Ticaret-Istatistikleri-Eylul-2020-33857>, June 30, 2021.*

existing tests' results. In this test proposed by Otto (2021), the fact that there is no limitation in the number of structural breaks and that it can be applied in smooth and sharp breaks provides an advantage over many unit-root tests. According to the findings, the real exchange rate variable between the British pound and the Turkish lira was found to be non-stationary, both according to the results of the traditional unit-root tests which do not take into account structural breaks, and according to the results of the unit-root tests which take into account structural breaks. For this reason, it has been determined that the absolute PPP between the Turkish lira and the British pound is not valid in the analysed period. For this reason, it is recommended not to estimate the Turkish lira/British pound exchange rate based on absolute PPP.

References

Abuaf, N. & P. Jorion (1990), "Purchasing Power Parity in the Long Run", *The Journal of Finance*, 45(1), 157-174.

Acaravci, A. & I. Ozturk (2010), "Testing Purchasing Power Parity in Transition Countries: Evidence from Structural Breaks", *Amfiteatru Economic Journal*, 12(27), 190-198.

Aloy, M. & M. Boutahar & K. Gente & A. Péguin-Feissolle (2011), "Purchasing Power Parity and the Long Memory Properties of Real Exchange Rates: Does One Size Fit All?", *Economic Modelling*, 28(3), 1279-1290.

Baharumshah, A.Z. & C. Tze-Haw & S. Fountas (2008), "Re-Examining Purchasing Power Parity for East-Asian Currencies: 1976-2002", *Applied Financial Economics*, 18(1), 75-85.

Bahmani-Oskooee, M. & M. Kandil (2007), "Real and Nominal Effective Exchange Rates in MENA Countries: 1970-2004", *Applied Economics*, 39(19), 2489-2501.

Bahmani-Oskooee, M. & T. Chang & T. Wu (2014), "Revisiting Purchasing Power Parity in African Countries: Panel Stationary Test with Sharp and Smooth Breaks", *Applied Financial Economics*, 24(22), 1429-1438.

Bahmani-Oskooee, M. & T. Chang & Z(M). Elmi & A. Gelan & O. Ranjbar (2018), "Non-Linear Quantile Unit Root Test and PPP: More Evidence from Africa", *Applied Economics Letters*, 25(7), 465-471.

Bahramian, P. & A. Saliminezhad (2020), "Revisiting Purchasing Power Parity in the ASEAN-5 Countries: Evidence from the Fourier Quantile Unit Root Test", *Applied Economics Letters*, 28(13), 1-6.

Bai, J. & P. Perron (1998), "Estimating and Testing Linear Models with Multiple Structural Changes", *Econometrica*, 66(1), 47-78.

Bai, J. & P. Perron (2003a), "Computation and Analysis of Multiple Structural Change Models", *Journal of Applied Econometrics*, 18(1), 1-22.

Bai, J. & P. Perron (2003b), "Critical Values for Multiple Structural Change Tests (Unpublished Tables)", *Unpublished Manuscript*.

Baum, C.F. & J.T. Barkoulas & M. Caglayan (1999), "Long Memory or Structural Breaks: Can Either Explain Nonstationary Real Exchange Rates Under the Current Float?", *Journal of International Financial Markets, Institutions and Money*, 9(4), 359-376.

Cassel, G. (1916), "The Present Situation of the Foreign Exchanges", *The Economic Journal*, 26(101), 62-65.

Cassel, G. (1918), "Abnormal Deviations in International Exchanges", *The Economic Journal*, 28(112), 413-415.

Chang, T. &C.-H. Lee & W-C. Liu (2012), "Nonlinear Adjustment to Purchasing Power Parity for ASEAN Countries", *Japan and the World Economy*, 24(4), 325-331.

Clements, K.W. & Y. Lan & S.P. Seah (2007), "The Big Mac Index 21 Years On: An Evaluation of Burgereconomics", *Discussion Paper*, University of Western Australia Department of Economics, 23.

Cucinelli, D. & V. Farina & P. Schwizer & M.G. Soana (2020), "Better the Devil You Know: The Impact of Brexit Political Uncertainty on European Financial Markets", *International Journal of Business and Management*, 15(6), 62-83.

Dal Bianco, M.J. (2008), "Argentinean Real Exchange Rate 1900-2006: Testing Purchasing Power Parity Theory", *Estudios de Economía*, 35(1), 33-64.

Dickey, D.A. & W.A. Fuller (1979), "Distribution of the Estimators for Autoregressive Time Series With a Unit Root", *Journal of the American Statistical Association*, 74(366), 427-431.

Dickey, D.A. & W.A. Fuller (1981), "Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root", *Econometrica*, 49(4), 1057-1072.

Doğanlar, M. & H. Bal & M. Özmen (2009), "Testing Long-Run Validity of Purchasing Power Parity for Selected Emerging Market Economies", *Applied Economics Letters*, 16(14), 1443-1448.

Doğanlar, M. & O. Kızılkaya & F. Mike (2020), "Testing the Long-Run PPP for Turkey: New Evidence from the Fourier Quantile Unit Root Test", *Applied Economics Letters*, 27(9), 729-735.

Doğanlar, M. (2006), "Long-Run Validity of Purchasing Power Parity and Cointegration Analysis for Central Asian Countries", *Applied Economics Letters*, 13(7), 457-461.

Dornbusch, R. (1979), "Monetary Policy Under Exchange Rate Flexibility", *NBER Working Paper Series*, 311.

Dornbusch, R. (1985), "Purchasing Power Parity", *NBER Working Paper Series*, 1591.

Elliott, G. & T. Rothenberg & J. Stock (1996), "Efficient Tests for an Autoregressive Unit Root", *Econometrica*, 64(4), 813-836.

Enders, W. & K. Chumrusphonlert (2004), "Threshold Cointegration and Purchasing Power Parity in the Pacific Nations", *Applied Economics*, 36(9), 889-896.

Feenstra, R.C. & A.M. Taylor (2008), *International Economics*, New York: Worth Publishers.

Frankel, J.A. & A.K. Rose (1996), "A Panel Project on Purchasing Power Parity: Mean Reversion Within and Between Countries", *Journal of International Economics*, 40(1-2), 209-224.

Frenkel, J.A. (1978), "Purchasing Power Parity: Doctrinal Perspective and Evidence from the 1920s", *Journal of International Economics*, 8(2), 169-191.

Fuller, W.A. (1996), *Introduction to Statistical Time Series*, Hoboken: John Wiley & Sons.

Greene, W. (2016), *Ekonometrik Çözümleme*, (Çev. Ü. Şenesen), Ankara: Palme Yayıncılık.

Güriş, B. (2019), "A New Nonlinear Unit Root Test with Fourier Function", *Communications in Statistics-Simulation and Computation*, 48(10), 3056-3062.

Hackl, P. (2013), *Einführung in die Ökonometrie*, München: Pearson Deutschland.

He, H. & T. Chang (2013), "Purchasing Power Parity in Transition Countries: Sequential Panel Selection Method", *Economic Modelling*, 35, 604-609.

Jarchow, H.-J. & P. Rühman (2000), *Monetäre Außenwirtschaft I: Monetäre Außenwirtschaftstheorie*, Göttingen: Vandenhoeck & Ruprecht.

Kalyoncu, H. & K. Kalyoncu (2008), "Purchasing Power Parity in OECD Countries: Evidence from Panel Unit Root", *Economic Modelling*, 25(3), 440-445.

Kapetanios, G. & Y. Shin & A. Snell (2003), "Testing for a Unit Root in the Non-linear STAR Framework", *Journal of Econometrics*, 112(2), 359-379.

Karagöz, K. & T.B. Saraç (2016), "Testing the Validity of PPP Theory for Turkey: Non-linear Unit Root Testing", *Procedia Economics and Finance*, 38, 458-467.

Krugman, P.R. & M. Obstfeld & M.J. Melitz (2015), *Internationale Wirtschaft: Theorie und Politik der Außenwirtschaft*, (Trans. A. Rietmann), Hallbergmoose: Pearson Deutschland.

Kruse, R. (2011), "A New Unit Root Test Against ESTAR Based on a Class of Modified Statistics", *Statistical Papers*, 52(1), 71-85.

Kwiatkowski, D. & P.C.B. Phillips & P. Schmidt & Y. Shin (1992), "Testing the Null Hypothesis of Stationarity Against the Alternative of a Unit Root: How Sure are we that Economic Time Series Have a Unit Root?", *Journal of Econometrics*, 54(1-3), 159-178.

Lee, J. & M.C. Strazicich (2003), "Minimum Lagrange Multiplier Unit Root Test with Two Structural Breaks", *The Review of Economics and Statistics*, 85(4), 1082-1089.

Lee, J. & M.C. Strazicich (2004), *Minimum LM Unit Root Test with One Structural Break*, <https://core.ac.uk/download/pdf/7080165.pdf>, 18.11.2020.

MacDonald, R. (1993), "Long-Run Purchasing Power Parity: Is it for Real?", *The Review of Economics and Statistics*, 75(4), 690-695.

MacDonald, R. (2007), *Exchange Rate Economics: Theories and Evidence*, London and New York: Routledge.

Mike, F. & O. Kızılkaya (2019), "Testing the Theory of PPP for Emerging Market Economies that Practice Flexible Exchange Rate Regimes", *Applied Economics Letters*, 26(17), 1411-1417.

Moeller, W. (2011), *Die Euro-Krise*, Norderstedt: Books on Demand.

Moritz, K.-H. & G. Stadtmann (2010), *Monetäre Außenwirtschaft*, München: Franz Vahlen.

Murad, S.W. & M.A. Hossain (2018), "The ASEAN Experience of the Purchasing Power Parity Theory", *Financial Innovation*, 4(1), 1-10.

Narayan, P.K. (2005), "New Evidence on Purchasing Power Parity from 17 OECD Countries", *Applied Economics*, 37(9), 1063-1071.

Ng, S. & P. Perron (2001), "Lag Length Selection and the Construction of Unit Root Tests with Good Size and Power", *Econometrica*, 69(6), 1519-1554.

Otto, S. (2021), "Unit Root Testing with Slowly Varying Trends", *Journal of Time Series Analysis*, 42(1), 85-106.

Pan, G. & T. Chang & C.-H. Lee & W.-C. Liu (2012), "Revisiting Purchasing Power Parity for 18 African Countries: Sequential Panel Selection Method", *Applied Economics Letters*, 19, 877-881.

Papell, D.H. (1997), "Searching for Stationarity: Purchasing Power Parity Under the Current Float", *Journal of International Economics*, 43(3-4), 313-332.

Patterson, K. (2000), *An Introduction to Applied Econometrics: A Time Series Approach*, Houndmills, Basingstoke, Hampshire: Macmillan Press.

Perron, P. & S. Ng (1996), "Useful Modifications to Some Unit Root Tests with Dependent Errors and their Local Asymptotic Properties", *The Review of Economic Studies*, 63(3), 435-463.

Perron, P. (1989), "The Great Crash, the Oil Price Shock, and the Unit Root Hypothesis", *Econometrica*, 57(6), 1361-1401.

Phillips, P.C. & P. Perron (1988), "Testing for a Unit Root in Time Series Regression", *Biometrika*, 75(2), 335-346.

Rose, K. (1974), *Theorie der Außenwirtschaft*, München: Franz Vahlen.

Rübel, G. (2013), *Außenwirtschaft: Grundlagen der Realen und Monetären Theorie*, München: Oldenbourg.

She, F. & M. Zakaria & M. Khan & W. Jun (2020), "Purchasing Power Parity in Pakistan: Evidence from Fourier Unit Root Tests", *Emerging Markets Finance and Trade*, 1-20.

Shim, H. & H. Kim & S. Kim & D. Ryu (2016), "Testing the Relative Purchasing Power Parity Hypothesis: The Case of Korea", *Applied Economics*, 48(25), 2383-2395.

Siebert, H. (1988), "Anpassungsprozesse in Einer Offenen Volkswirtschaft mit Nicht-Handelbaren Gütern", *Diskussionsbeiträge* - Serie II, No. 48, Universität Konstanz.

Sperber, H. & J. Sprink (2012), *Internationale Wirtschaft und Finanzen*, München: Oldenbourg.

Taylor, M.P. & M.P. Taylor (2004), "The Purchasing Power Parity Debate", *NBER Working Paper*, 10607.

Taylor, M.P. (1988), "An Empirical Examination of Long-Run Purchasing Power Parity Using Cointegration Techniques", *Applied Economics*, 20(10), 1369-1381.

Vergil, H. & F. Özkan (2007), "Purchasing Power Parity and ARIMA Models in Forecasting Exchange Rates: The Case of Turkey", *Istanbul Stock Exchange Review*, 9(35), 37-50.

<https://data.tuik.gov.tr/Bulten/Index?p=Dis-Ticaret-Istatistikleri-Ocak-2021-37413>, 29.06.2021.

<https://data.tuik.gov.tr/Bulten/Index?p=Dis-Ticaret-Istatistikleri-Eylul-2020-33857>, 30.06.2021.

<https://ec.europa.eu/eurostat/de/web/hicp/>, 30.06.2021.

<https://ec.europa.eu/eurostat/web/hicp/data/database>, 12.06.2021.

<https://evds2.tcmb.gov.tr/index.php?/evds/serieMarket>, 12.06.2021.

<https://ticaret.gov.tr/dis-iliskiler/brexit-ve-birlesik-krallik-sta>, 30.06.2021.

Erdoğmuş, M. (2021), “An Analysis of The Validity of Absolute Purchasing Power Parity: The Case of Turkish Lira and British Pound”, *Sosyoekonomi*, 29(50), 51-71.

Sosyoekonomi

2021, Vol. 29(50), 73-93

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.04
Date Submitted: 10.02.2021
Date Revised: 21.07.2021
Date Accepted: 12.08.2021

Social Networks, Female Unemployment, and the Urban-Rural Divide in Turkey: Evidence from Tree-Based Machine Learning Algorithms

Mehmet Güney CELBİŞ *(https://orcid.org/0000-0002-2790-6035), Yeditepe University, Turkey; United Nations University, Maastricht Economic and Social Research Institute on Innovation and Technology (UNU-MERIT), The Netherlands; celbis@merit.unu.edu*

Sosyal Ağlar, Kadın İşsizliği ve Türkiye'de Kentsel-Kırsal Farklılaşmaları: Ağaç Bazlı Makine Öğrenmesi Algoritmalarından Bulgular

Abstract

This study takes a novel, algorithmic approach for understanding the underlying mechanisms related to the employment status of individuals. Using the data from the most recent survey of the International Social Survey Programme (ISSP) on Turkey, the present study examines how social connectivity and location play a role in the prediction of employment status through the use of two tree-based modern machine learning techniques, namely random forest, and extreme gradient boosting. We obtain a wide array of observations, with gender being the most prominent finding when periphery and rural locations are considered.

Keywords : Machine Learning, Unemployment, Turkey, Rural, Urban.

JEL Classification Codes : L26, R10, R20, R51, C40.

Öz

Bu çalışma kişi bazında işsizlik durumlarının nedenlerini anlamak amacıyla yeni ve algoritmik bir yaklaşım getirmektedir. Uluslararası Sosyal Anket Programı'nın (International Social Survey Programme, ISSP) Türkiye üzerine olan en güncel verilerini kullanarak kişilerin sosyal bağlantılarının ve bulundukları lokasyonların işsizlik statülerini tahmin etmede oynadıkları roller iki farklı modern makine öğrenmesi tekniği ile irdelenmektedir. Bu teknikler rassal orman ve ekstrem gradyan artırma modelleridir. Çalışmanın bulgularından yola çıkarak kırsal ve çevre bölgeler özelinde cinsiyet faktörünün rolünün en önde gözüktüğü bir dizi gözlem yapılmaktadır.

Anahtar Sözcükler : Makine Öğrenmesi, İşsizlik, Türkiye, Kırsal, Kentsel.

1. Introduction

Unemployment in rural areas is a complex issue that is challenging to understand, primarily due to the ever evolving and continuously transforming nature of the labour markets in these areas (Lindsay et al., 2003). Accordingly, policy implementations and proposals vary primarily based on the country, region, industry, or period in question. For instance, Gash (1935) associated rural unemployment with the technological advances in agriculture and accessibility to capital, which affects the labour market's seasonality dynamics. In more recent research, however, different mechanisms have been highlighted, such as network externalities, communication technology, firm size, being distanced from the large markets in urban areas, skills, and other personal employability attributes (Jones, 2004; Halden et al., 2005; McQuaid et al., 2004; McQuaid & Lindsay, 2003; Lindsay et al., 2003). The role of networks, social exclusion, social support, and social contacts have drawn particular interest within the context of labour markets. In this regard, evidence linking social networks and employment status have been frequently observed with varying prominence depending on location and gender, among other settings (Topa, 2001; Calvo-Armengol & Jackson, 2004; Russell, 1999).

While impeding the well-being of the affected persons, unemployment in rural areas has also been frequently linked to migration. Individuals who experience difficulties finding jobs in rural areas are often forced to relocate to urban centres (Lyu et al., 2019; Zenou, 2011; Jones, 2004; Cartmel & Furlong, 2000). Particularly in the case of Turkey, significant disparities in standards of living across regions have fuelled large migration flows from rural areas to cities since the 1950s. Consequently, Turkey has experienced a rapid urbanization process, leading to agglomeration economies that benefit both workers and firms in cities (Özgüzel, 2020).

Studies using traditional methods have produced noteworthy findings, particularly concerning female employment and earnings in Turkey. The role of distance to urban markets in rural unemployment has been observed for Turkey (Adanacıoğlu et al., 2012). In another mode, a recent study, Maru (2016) finds evidence that social customs may be a restraining factor limiting women's participation in the labour market in rural Turkey. In contrast, Ciğerci-Ulukan (2019) argues that the rise in rural poverty led to an increase in women's workload, forcing them to undertake extra -- and often unpaid -- jobs in agriculture, resulting in the "feminization of agriculture" in Turkey. Along similar lines, a 2011 UN report highlighted that most women in rural Turkey are unpaid workers with almost no job opportunities in sectors other than agriculture (Olhan, 2011). İlkaracan et al. (2011), on the other hand, observe a decline in agricultural labour participation by women and young individuals following the implementation of the Agricultural Reform Implementation Project (ARIP).

Nevertheless, the above outlined earlier findings on the obstructiveness for women, presented by the rural environment in Turkey, Gülümser et al. (2011) observed that Turkish

women in rural areas have a remarkably high motivation for self-employment[1]. Furthermore, regardless of location, it has been shown that a persisting gap has been existing between the earnings of men and women in Turkey in the period 2005-2017 (Türk, 2020). Therefore, it is evident in the literature that rural unemployment is subject to sophisticated interrelationships among numerous factors specific to the environment at focus.

Almost all techniques employed in the literature explore rural unemployment from a quantitative viewpoint involve traditional -- mostly linear -- models and descriptive statistics. On the other hand, flexible algorithmic approaches can help discover helpful information and clarify underlying frameworks of complex issues such as unemployment in rural areas. Machine learning (ML) approaches present many advantages to researchers against the challenges posed by complicated research questions (Mullainathan & Spiess, 2017; Harding & Hersh, 2018; Athey, 2018; Varian, 2014).

ML techniques are scarcely ever applied even in the analysis of the broader subject of employment. A handful of illustrations involving the use of ML algorithms on unemployment are the applications of support vector machine and neural network approaches for the prediction of US unemployment rates by Kreiner and Duca (2019); Cook and Hall (2017); and Xu et al. (2013). Taking a different perspective, we use personal level data in this study and apply random forest and extreme gradient boosting algorithms to predict individual employment status. The use of algorithmic selection and assessment techniques applied on individual features that come from a broad collection of potential predictors enables us to discover patterns in the data that would not be possible to achieve through traditional methods (such as econometric models that are often employed in labour market research). As a result, our approach also contributes to the currently sparse number of ML implementations about unemployment.

The remainder of the present study is organized as follows. Section 2 describes the survey data used in the present study, defines the sub-samples used in our analysis, and documents specific steps taken to prepare the raw data for analysis through ML models. Section 3 presents the details of the two ML algorithms used to predict employment status and the assessment of top predictors. The empirical results of the ML models are elaborating in Section 4. The concluding discussion and the relevance of the findings to future academic and policy-focused efforts are presented in Section 5.

2. The Data

In many cases, people working in rural jobs are not eligible for unemployment benefits used to evaluate unemployment rates. Therefore, unemployed individuals in rural areas are generally underestimated (Lasley & Korsching, 1984). The 2017 Turkey module

[1] *Aside of the studies in the rural context, the collection of studies by Günseli Berik on female employment in Turkey, and female labour in the rural carpet weaving sector should be noted (e. g. Berik 1987, 1989; Berik & Bilginsoy 2000).*

of the Social Networks and Social Resources survey conducted by the International Social Survey Programme (ISSP) presents elucidative data on personal unemployment status within a larger social network-oriented setting. The present study uses the most recent round of the ISSP Turkey survey published in 2020 (ISSP, 2017). The raw data is made of 1521 rows and 116 columns[2].

In ISSP 2017, participants were classified based on their status of employment. The first two available categories were "unemployed and looking for a job" and "in paid work," alongside other classifications indicating being in education, domestic work, military service, retirement, etc. To make a proper comparison of the unemployed and employed persons possible, we reduced the number of categories into two classes by excluding individuals who do not fall into the first two classes. This subsetting step reduced the number of observations to 791. The data set does not include individuals younger than 19 years old. In other words, the requirement of being older than 15 years old for being included in the working-age population -- in line with the OECD (2020) definition designation -- is satisfied.

The ISSP 2017 Turkey survey also conveniently categorizes the participants by settlement hierarchy into the categories "a big city," "suburbs or outskirts of a big city," "town or a small city," "A country village," "farm or home in the country." It is important to note that the category "suburbs or outskirts of a big city" has been translated into Turkish in the Turkey module of the ISSP as "an outer neighbourhood, a ghetto." Therefore, Turkey's socioeconomic attributes pertaining to this category are different from European or North American countries, where the word "suburb" has a different meaning. Taking this definition into account, we regroup the categories in the data set into two classifications: "Periphery and Rural" and "Urban Centres" with 352 and 439 observations, respectively.

The complete ISSP - Turkey data includes a considerable number of variables with many missing values, significantly restricting the number of persons used in the ML models. We identified and dropped, one at a time, the variables or the combinations of variables that have the most significant number of missing values, causing the data to become unworkable[3]. The ISSP-Turkey data set also contains numerous identifier columns (e.g., study number, date of interview, etc.), which we removed. Subsequently, we encoded all classes belonging to categorical features into binary variables.

The measures above yielded a sample with 229 and 287 observations for periphery and rural areas and urban centres, respectively, with 281 predictors. Unsurprisingly, the unemployed persons are the minority in both samples (about 11\% of all individuals). Such a large disparity between the number of observations of each category in a two-class framework may lead to biased predictions; the models will reach about 88% accuracy even

---

[2] *The term "columns" is deliberately used instead of "variables" or "predictors," as at this stage, several of the columns were administrative identifiers which cannot be defined as actual variables.*

[3] *The code, written in the R language, used for the aforementioned steps, alongside with the script random forest and extreme gradient boosting algorithms can be shared with the reviewers if requested.*

if everyone is predicted as employed. While the ISSP - Turkey data set provides valuable and unique information, the samples are imbalanced and of mediocre size when the data is split based on settlement hierarchy, and only the individuals in the labour force are considered. A common remedy for dealing with this issue is to use the Synthetic Minority Over-Sampling Technique (SMOTE) developed by Chawla et al. (2002). SMOTE makes use of the *k*-nearest neighbours' algorithm to generate new synthetic minority instances for imbalanced data sets (Chawla et al., 2002). Using some nearest neighbours of 3 and creating new synthetic observations, we expanded our sample sizes to 415 and 542 for periphery and rural areas and urban centres, respectively. The unemployed individuals account for about 44%.

Even though we have taken various necessary steps to drop several variables, numerous predictors are available to the ML algorithms employed in this study. For this reason, we rename and list the definitions of only the variables selected by the random forest and extreme gradient boosting algorithms. The complete ISSP 2017 - Turkey data and the full variable documentation are available on the internet site of the ISSP. Our derived data set can also be downloaded for cross-checking[4].

3. Machine Learning Algorithms

We apply two tree-based algorithms on our rural/periphery and urban samples. These applications are the random forest method (Breiman, 2001) and the Extreme Gradient Boosting approach (XGBoost, Chen & Guestrin, 2016), which is an extension of the gradient boosting machine and the stochastic gradient boosting machine algorithms as established in Friedman et al. (2001) and Friedman (2002). The two approaches present different advantages. The random forest method aims to decorrelate the trees in the ensemble and generates a prediction through introducing randomizations to both the sampling and feature selection processes. On the other hand, Gradient boosting is a sequential learning procedure where each tree improves upon the previous tree's prediction. XGBoost, a highly acclaimed award-winning algorithm that has become increasingly popular, expands the gradient boosting method by introducing regularization, further randomization parameters, and increased computational efficiency.

Each single classification tree in both the random forest and gradient boosting ensembles follows the partitioning steps established in the Classification and Regression Trees (CART) algorithm of Breiman et al. (1984). In a classification framework, the impurity measure for a node k is $G_k = \sum_{z=1}^{Z} w_{kz}(1 - w_{kz})$ and $w_{kz} = \frac{1}{N_k}\sum_{i \in M_k} \mathbf{1}\,(y_i = z)$ where y_i is the observed employment outcome for the i'th person in the training data set $(i = 1, \ldots, N)$, z is the index for the observed class, and M_j the group of persons that fall into

[4] *The sample used in this present study is available on the link: <https://drive.google.com/file/d/1cDqr7IxLF62WR0eSRONKZn2r_SKAsenm/view?usp=sharing>. The ISSP 2017 - Turkey data and the survey and variable documentation is available on the link: <https://dbk.gesis.org/dbksearch/sdesc2.asp?no=5521&db=e>.*

the k'th tree node, and N_k is the number of observations in k (James et al., 2013; Friedman, 2001)[5],[6]. A split feature x_c is selected, at each partition, from the feature space where $c = (1, \ldots, C)$ alongside with its splitter value v, minimizing the aggregate weighted Gini values:

$$\min_{c,v} \left[\frac{N_{k_1}(c,v)}{N} G_{k_1}(c,v) + \frac{N_{k_2}(c,v)}{N} G_{k_2}(c,v) \right] \tag{1}$$

where k_1 and k_2 are the two sub-nodes of k, and N is the total observation number (Friedman, 2001; Breiman et al., 1984; James et al., 2013). Our two ML methods diverge after the above step. While both techniques grow many trees using the above outlined recursive process, overfitting the data is common when the partitioning is allowed to run recursively until no more splits are possible. As remedies to overfitting, XGBoost has a variety of parameters that can be used for regularization. On the other hand, the random forest algorithm builds an ensemble of unpruned trees while allowing for generalization through accommodating stochasticity. Firstly, as in a bootstrapped aggregation model, each J tree in the random forest ensemble draws a random sample of individuals $j = (1, \ldots, J)$ of size N from the training data (Breiman, 1996). A high correlation between predictors may result in the undesirable exclusion of features which may be highly relevant to the research question (Athey & Imbens, 2019; James et al., 2013). Since every tree uses the same feature space, this shortcoming could apply to all trees in the ensemble, leading to a correlation between trees (Friedman, 2001; James et al., 2013). Therefore secondly, the random forest algorithm restricts the feature space to a random set of $\sqrt{C}$ predictors (Breiman, 2001; Friedman, 2001)[7],[8],[9]. Resulting from the combination of the J separate binary recursive partitioning processes, the random forest prediction for the employment status of person i is equal to the majority class vote of all J classification trees.

Another statistical learning technique that builds multiple trees is the earlier mentioned gradient boosting machine algorithm. After its development, gradient boosting has been promptly extended by incorporating stochasticity into the learning process, leading to the stochastic gradient boosting technique Friedman et al. (2001); Friedman (2002). The sequential boosting technique used in the present study, on the other hand, utilizes the XGBoost algorithm, which is not essentially algorithmic, but a computational (code-

---

[5] *Because we use only two types of employment status,* $G_k = 2w_{k1}(1 - w_{k1})$.

[6] *For both data sets (i.e., rural/periphery and urban centres) a random sample of 70% of the corresponding data set is used as the training data, and rest as the test data.*

[7] *The number* $\sqrt{C}$ *is a generally accepted rule of thumb value for classification models.*

[8] *The training data corresponds to the randomly sampled 70% of the complete data, and the test data consists of the remaining thirty percent.*

[9] *The present study utilized the following routines in the R software: randomForest written by Liaw and Wiener (2002) for the random forest model and the resulting proximity matrix, xgboost written by Chen et al. (2015) for the extreme gradient boosting procedure, pdp written by Greenwell (2017) for the individual conditional expectation and partial dependence plots, and ggplot2 written by Wickham (2011) for all visuals.*

specific) extension, for implementing Friedman's gradient boosting machine technique (Chen & Guestrin, 2016).

In classification models, the gradient boosting algorithm is initialized by minimizing the negative log-likelihood function of the observed data concerning the predicted value in log-odds (Friedman, 2002; 2001; Friedman et al., 2001). This computation equals the logarithm of the odds that an individual is unemployed. Unlike the trees in the random forest, the next tree is not grown from scratch but is based on the initial prediction, and the third tree is based on the second, and so on. More specifically, the residuals -- which are the negative gradients of the negative log-likelihood (the loss function) -- of the initial prediction is fit into the first regression tree in the sequence $s = (1, \ldots, S)$[10]. At each iteration, only a portion of each residual, determined by the learning rate α is used fto improve the earlier prediction (i.e., higher weights are given on the persons misclassified by the preceding tree). Denoting terminal nodes of a tree j as $\bar{j} = (1, \ldots, \bar{J})$, the residuals $\epsilon_{\bar{j},j}$ of the predictions generated at each terminal region of all J trees ($M_{\bar{j},j}$) are used at a given iteration j to compute the new prediction $\hat{y}_{i,j+1}$. The new prediction is determined recursively such that $\hat{y}_i$, i.e., the prediction of the preceding tree j for the individual i, is improved by adding the residuals -- weighted by the learning rate α -- of the terminal region that the person i fell into at the j'th iteration (Friedman, 2002; 2001; Friedman et al., 2001):

$$\hat{y}_{i,j+1} = \hat{y}_{ij} + \alpha\epsilon_{\bar{j}j}\mathbf{1}(i \in M_{\bar{j}j}) \tag{2}$$

Therefore, the learning process which emphasizes previous errors is incremental and decelerated. The algorithm comes to a stop when further improvements on the prediction can no longer be made. The benefit of slowing down the process through the learning rate α is that it permits for new opportunities to also correct previous false improvements, i.e., the worsening of predictions, by revising the prediction for i and approaching the actual value by an increment $\alpha\epsilon_{\bar{j}j}$ (Schonlau, 2005; James et al., 2013).

XGBoost adds various opportunities to introduce regularization to the construction of the individual trees in the gradient boosting sequence, adding to the generalization capacity of the algorithm. This feature is beneficial as highly complex trees may lead to overfitting Friedman (2002). The XGBoost algorithm allows a flexible implementation of gradient boosting thanks to its computational speed and has even been shown to be used to discover the Higgs boson using the data obtained from the Large Hadron Collider (Chen & He, 2015; Adam-Bourdarios et al., 2015). Another advantage of XGBoost is that it allows for cross-validation. We have used 10-fold cross-validation to determine the model parameters, which are: the learning rate (α), the subsample of individuals to be considered

[10] *Since the data (i.e., residuals) in this intermediate step are no longer categorical values, the regression tree applies recursive binary partitioning by minimizing total squared error loss functions instead of the impurity levels (Breiman et al., 1984).*

at each iteration which is the defining feature of stochastic gradient boosting (Friedman, 2002), the feature subset to be used at each tree and for each split, and the minimum number of individuals in a node. The process was done for both the periphery/rural and the urban samples. The maximum number of iterations (J) is 35 for the periphery/rural and 52 for the urban sample. The algorithm was tuned to stop if predictions do not improve after 10 iterations.

Upon predicting employment status, the random forest and extreme gradient boosting models report a "variable importance" metric for each feature. The metric ranks the predictors based on their relative efficacy in improving the prediction process. For a given feature x_c, the variable importance score is calculated by aggregating, for each tree j, the reduction in nodal Gini impurity resulting from each instance where a node is split using x_c. The value is then averaged over all J trees, where the impurity decrease at any given node k is equal to $\Delta G = G_k - [\frac{N_{k1}}{N} G_{k1} + \frac{N_{k2}}{N} G_{k2}]$ (Breiman, 2001; James et al., 2013)[11].

4. Empirical Findings

The 500-tree random forest application and the XGBoost algorithm predict the employment status of the persons in the test samples with accuracies of about 94 for both the periphery/rural and urban centre samples. The variable importance levels for the top twenty predictors are represented in the first rows of Figures 1 and 4 for the random forest and XGBoost applications, respectively. The definitions of the algorithmically selected features and their summary statistics are presented in Tables 1 and 2. For binary variables, the percentages of each category are reported, while for continuous and ordinal variables, the mean, standard deviation, minimum and maximum values are shown. The results suggest that the set of variables that contribute to the correct prediction of unemployment status considerably differ from those selected in the prediction for the individuals who live in urban centres. In particular, in both sets of results, FEMALE appears as the strongest predictor of employment status for the periphery and rural areas while not being selected at all in the case of individuals living in urban centres. This finding is particularly relevant given that in the case of Turkish provinces, agglomeration gains on labour productivity seem to be larger for female workers than male workers (Özgüzel, 2020). Many factors drive these differences. However, one possible explanation often proposed in the literature is that cities provide more employment opportunities for women who are more likely to suffer from mobility restrictions imposed by family ties (Özgüzel, 2020).

In both models, frequency of face-to-face contact with other people, being isolated from others, and lack of companionship is among the top predictors for individuals who live in urban centres. The situations above can hinder access to social networks necessary for job search, leading to long-term unemployment (Lindsay, 2009). The remaining features generally pertain to the individuals' occupations that the respondents know (family, friends,

[11] *The outcome for each feature is scaled into a value between 1 and 100.*

acquaintances etc.). This outcome is not surprising; Topa (2001); Conley and Topa (2002) found that employed persons are more likely to transfer information about job opportunities given that they are within the individual's social network. Among the top predictors, we also observe variables indicating whether the respondent has anyone to ask for help under various undesirable conditions and the relationship of these persons to the respondent. In this regard, Jones (1991) has shown that social support and help are particularly relevant in a job loss and are a strong determinant of reemployment. Furthermore, we observe that the attributes of the individual and their household demographics have been effective in the predictions, in line with the findings of Adanacioglu et al. (2012) for Turkey.

The observed relationships are likely to be subject to considerable non-linearities and interactions. Therefore, it would be a reductionist strategy to interpret ML output similarly to elasticities resulting from econometric estimations. The directions of the associations between the predictors and employment status can certainly be examined in detail. However, many predictors necessitate us to focus on a specific variable of interest, FEMALE, which plays a role in one sample and not in the other.

The observed association between unemployment and gender is displayed in the individual conditional expectation plots (ICE) in the second rows of Figures 1 and 4[12]. Being a binary variable, the ICE lines for this predictor exhibit a kink right at the transition from zero to one (at 0.5). We display the urban centres ICE plot for this variable even though it is not selected as a top predictor for that sample. In all four plots, we observe that being female is associated with a lower probability of employment. Regarding the periphery/rural sample for which FEMALE is the top predictor by both algorithms, the drop in probability can be up to about 20% for some individuals. Except for the XGBoost model for periphery and rural areas, the ICE lines suggest heterogeneity in the relationship between employment status and gender. It is important to note that our ML techniques learn and automatically adapt to this heterogeneity in generating predictions with very high accuracy levels and robust across the two tree-based models.

In Figure 2, the two-way partial dependence plots visualize the role of FEMALE with the level of education and age, which are frequently found to be important determinants of job status and earnings (Cartmel & Furlong, 2000; Chandler, 1989; Unay-Gailhard, 2016). The lack of education and training has been earlier shown to harm the employment opportunities of specific women and young individuals Chandler (1989); Cartmel and Furlong (2000); Bock (2004).

The lighter coloured pixels in Figure 2 indicate a higher probability of an individual being employed, and the darker colours represent higher unemployment probabilities. The random forest results highlight an apparent discrepancy between the two samples regarding the role of women's level of education. Women with higher degrees have a lower probability

---

[12] *The PDP is introduced by Friedman (2001), and the centred ICE and ICE graphs are based on the framework of Goldstein et al. (2015).*

of being employed in the periphery/rural areas, whereas the role of education is reversed in urban centres where higher education is associated with a higher probability of employment. In relation to age, both plots suggest that younger individuals have a higher chance of being unemployed. It is possible that his finding indicates that in periphery/rural locations, opportunities for women exist only for low-skilled jobs (and young age is a disadvantage). In contrast, in urban centres high-educated middle-aged and older women have better opportunities. This result implies a clear disadvantage for the women in the periphery/rural locations and highlights the lagging features of these local economies in Turkey.

The relationship between education level, age, and the probability of employment is not very different for males in urban centres compared to their female counterparts, as seen in the two plots in the second column of Figure 2. This observation is consistent with the fact that FEMALE was not selected as a top predictor in the urban centre samples by the random forest and XGBoost models. In other words, gender does not play a clear role in determining employment probabilities as it does in periphery/rural areas in Turkey. On the other hand, the PDP plot for males living in periphery/rural locations presents a different picture than the women in these locations. The bias towards low-skilled labour is still observable, albeit to a lesser degree, while being a middle-aged male seems to be associated with higher chances of employment. Middle-aged men with some but low education levels are predicted to have the highest probability of employment. The XGBoost prediction routine yields PDP plots with very similar patterns for the periphery/rural sample. The findings of XGBoost differ for the Urban Centres sample. While higher education is still associated with being employed for men in urban centers, the effect is not apparent for females.

In contrast, age stands out as a feature with a clear pattern, strongly highlighting that young people face higher chances of unemployment in urban centres. For older individuals, employment probability gradually becomes somewhat higher for females while becoming much higher for men with above-average levels of education. In other words, becoming more educated helps the chance of women to become employed in a lesser way than it does for men, underlining a further disadvantage for females in the labour market.

Lastly, as a means to illustrate the effectiveness of the random forest model in differentiating the two employment categories, the multidimensional scaling (MDS) plots of the proximity matrix resulting from the random forest predictions are presented in the subfigures of Figure 3, in two and three dimensions. The dark circles mark the unemployed persons in all proximity plots, while the light ones mark the employed individuals. The degree of proximity between any given two persons is given by their frequency of being assigned into the same terminal node at each iteration in which they are out-of-bag; in other words, when the random forest algorithm does not draw them in that particular iteration (Breiman & Cutler, 2020; Friedman, 2001). All MDS plots indicate that the random forest model has been relatively efficient in differentiating the unemployed persons from employed ones.

Table: 1
Predictors Selected by the Random Forest Application (out of 281 Variables)

Name		Definition	Summary
BARBER_NO		Predictor specifying whether the respondent does not know anyone who is a hairdresser/barber.	**0: Yes** (71.57%), **1: No** (28.43%)
CHILDREN		The number of children living in the respondent's household.	**Mean:** 0.6, **Min:** 0, **Max:** 4, **Sd:** 0.81
COMP_LACK		Predictor measuring the frequency of experiencing the lack of companionship by the respondent.	**Mean:** 2.04, **Min:** 1, **Max:** 5, **Sd:** 0.97
CONTACT		The number of people the respondent has a contact within a typical weekday.	**Mean:** 2.7, **Min:** 1, **Max:** 6, **Sd:** 1.3
CONTACT_INT		Predictor measuring how often the respondent communicates with close friends and family members over the internet.	**Mean:** 2.6, **Min:** 1, **Max:** 5, **Sd:** 1.08
CONTACT_FAM		Frequency of contact of the respondent with their most commonly contacted family member.	**Mean:** 1.41, **Min:** 1, **Max:** 3, **Sd:** 0.66
CONTACT_FRN		Frequency of contact of the respondent with their closest, most commonly contacted friend.	**0: No** (83.3%), **1: Yes** 16.7%)
CSIBLING		The respondent's frequency of contact with their most commonly contacted sibling.	**0: No** (66.7%), **1: Yes** (33.3%)
DEMAND		Predictor measuring the respondent's perception on whether their friends, relatives, and family makes too many demands on them.	**Mean:** 2.58, **Min:** 1, **Max:** 5, **Sd:** 1.08
DRIVER_OTH		Predictor specifying whether the respondent knows someone who works as a bus or truck driver (who is not a relative or close friend).	**0: No** (67%), **1: Yes** (33%)
EDUCYRS		The number of years of schooling.	**Mean:** 11.25, **Min:** 8, **Max:** 15, **Sd:** 2.66
ELEMENTARY		Predictor specifying whether the respondent's main occupation - regardless of employment status - is elementary (e.g., domestic helpers, window or laundry cleaners).	**0: No** (58.4%), **1: Yes** (41.6%)
FACETOCACE		The number of people with whom the respondent has face-to-face contact on a typical weekday.	**Mean:** 2.333, **Min:** 1, **Max:** 4, **Sd:** 0.98
FAIR		Predictor measuring the respondent's perception of how fair other people are.	**Mean:** 2.5, **Min:** 1, **Max:** 4, **Sd:** 1
FAMILYC_IHELP		Predictor indicating whether the respondent would ask for help from their family members in case of serious illness.	**0: No** (33.3%), **1: Yes** (66.6%)
FEMALE		Categorical predictor specifying whether the respondent is female.	**0: No** (66.6%), **1: Yes** (33.3%)
FRIENDS_HELP		Predictor measuring how supportive the respondent is of the idea that people who are better off should help friends who are worse off.	**0: No** (33%), **1: Yes** (67%)
GHETTO		Predictor indicating whether the type of the respondent's place of residence is a ghetto or slum area.[13]	**0: No** (75%), **1: Yes** (25%)
GO_OUT		Predictor measuring how often the respondent goes out to eat or drink with friends.	**Mean:** 3, **Min:** 1, **Max:** 8, **Sd:** 2.59
HEALTH_GOVT		Predictor categorizing the respondent's opinion that the government should provide health care for the sick.	**0: No** (17%), **1: Yes** (83%)
HOUSEPOP		The number of people who live in the respondent's household.	**Mean:** 4, **Min:** 3, **Max:** 5, **Sd:** 0.85
INCDIFF		Predictor representing the perception of the respondent regarding the income inequality in their country.	**Mean:** 1.7, **Min:** 1, **Max:** 5, **Sd:** 1.15
ISOLATED		Predictor measuring how often the respondent felt isolated from others in the past month.	**Mean:** 2.33, **Min:** 1, **Max:** 5, **Sd:** 1.3
LANGUAGES		The number of languages the respondent can speak.	**0: No** (33%), **1: Yes** (67%)
LEISURE		Over the past 12 months, the frequency of leisure activities that the respondent has taken part in.	**Mean:** 4, **Min:** 2, **Max:** 5, **Sd:** 1.04
LEFTOUT		Predictor measuring how often the respondent felt left out in the past month.	**Mean:** 2.587, **Min:** 1, **Max:** 5, **Sd:** 1.67
MECHANIC_OTH		Predictor specifying whether the respondent knows someone who works as a car mechanic (who is not a relative or close friend).	**0: No** (84%), **1: Yes** (16%)
NO_ONE		Predictor indicating whether the respondent has no one to look after them in case of serious illness.	**0: No** (50%), **1: Yes** (50%)
NURSE_OTH		Predictor specifying whether the respondent knows someone who works as a nurse (who is not a relative or close friend).	**0: No** (91.7%), **1: Yes** (8.3%)
OLD_GOVT		Predictor categorizing the respondent's opinion that the government should provide care for older people.	**0: No** (17%), **1: Yes** (83%)

[13] *This designation for Turkey differs from the definition for the other countries surveyed by the ISSP where the area is simply defined as "the suburbs or outskirts of a large city."*

POLICE_NO	Predictor specifying whether the respondent does not know anyone who is a police officer.	**0: No** (75%), **1: Yes** (25%)
PRESSURE	Predictor measuring the respondent's perception regarding how much they are subject to pressure from family members about their way of life.	**Mean:** 1.83, **Min:** 1, **Max:** 3, **Sd:** 0.57
TR_DEGR	Predictor specifying the highest level of education the respondent has attained.	**Mean:** 4, **Min:** 2, **Max:** 6, **Sd:** 1.7
TRUST_PRIV	Score measuring the degree of trust that the respondent has in major private firms.	**Mean:** 4.5, **Min:** 1, **Max:** 10, **Sd:** 2.54

Note: Variable definitions in the above table may be similar or identical to the explanations in the original ISSP 2017 documentation (ISSP, 2017).

Table: 2
Predictors Selected by the XGBoost Application
(out of 281 Variables, not including previously defined features)

Name	Definition	Summary
BARBER_FRN	Predictor indicating whether the respondent has a friend who works as a hairdresser/barber.	**0: No** (59.33%), **1: Yes** (41.67%)
DECISION	Predictor specifying that the respondent believes they have no say about what the government does.	**Mean:** 2.583, **Min:** 1, **Max:** 5, **Sd:** 1.67
FAMILY_AHELP	Predictor indicating whether the respondent would ask for help from their family members regarding administrative problems.	**0: No** (50%), **1: Yes** (50%)
POLITICS	Predictor indicating whether the respondent has taken part in activities of political parties.	**Mean:** 4.417, **Min:** 1, **Max:** 5, **Sd:** 1.64
MECHANIC_FRN	Predictor specifying whether the respondent has a friend who works as a car mechanic.	**0: No** (66.7%), **1: Yes** (33.3%)
PARENTS	Predictor measuring how supportive the respondent is of the idea that adult children have a responsibility to look after their elderly parents.	**0: No** (83.3%), **1: Yes** 16.7%)

Note: Variable definitions in the above table may be similar or identical to the explanations in the original ISSP 2017 documentation (ISSP, 2017).

Figure: 1
Variable Importance and ICE Plots - Random Forest

A) Periphery and Rural **B) Urban Centres**

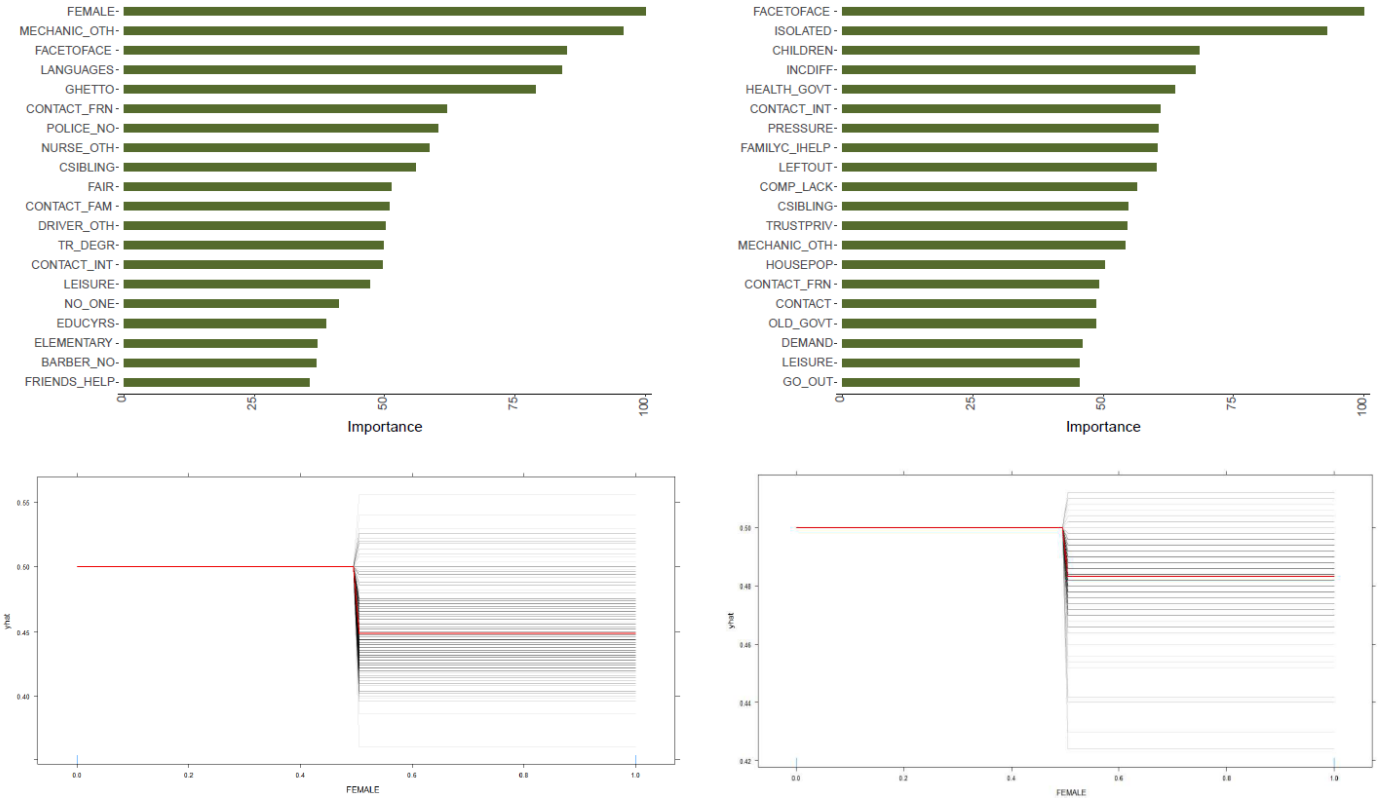


Figure: 2
Two-Way Random Forest Partial Dependence Plots

A) Periphery and Rural **B) Urban Centres**

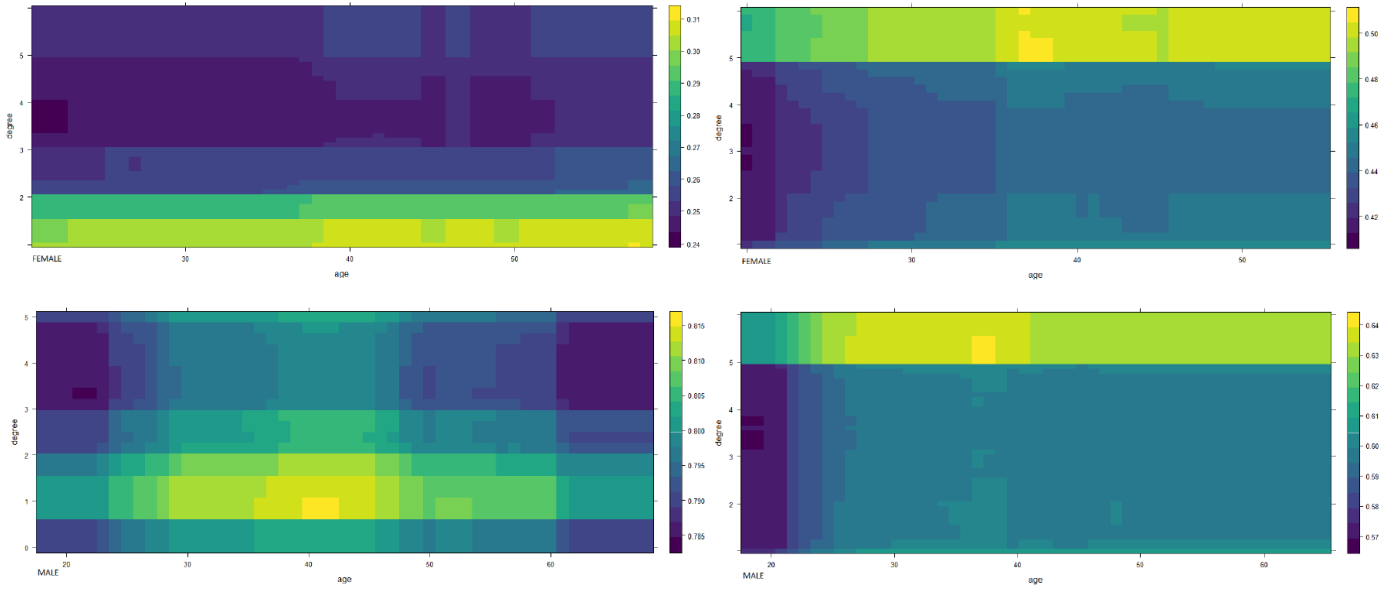


Figure: 3
MDS Proximity Plots Random Forest

A) Periphery and Rural **B) Urban Centres**

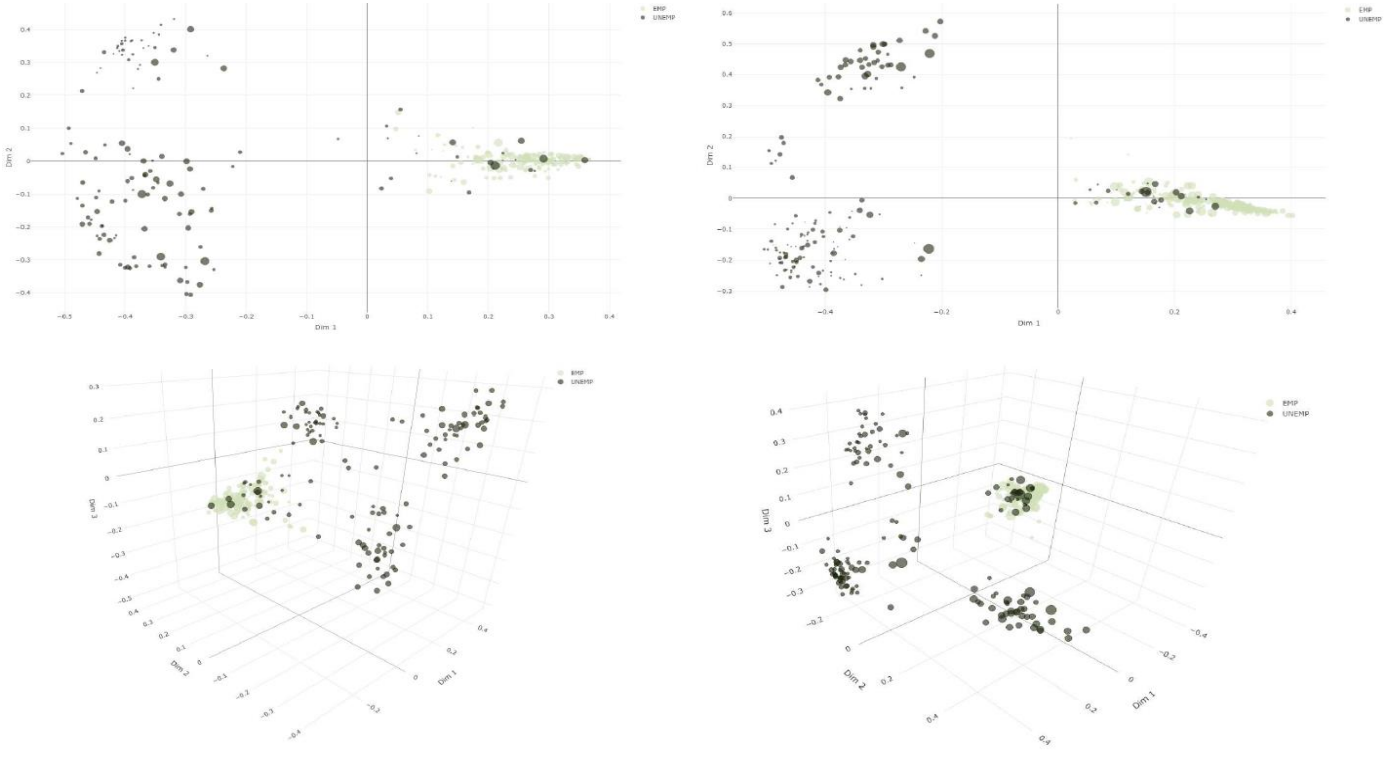


Figure: 4
Variable Importance and ICE Plots - XGBOOST

A) Periphery and Rural **B) Urban Centres**

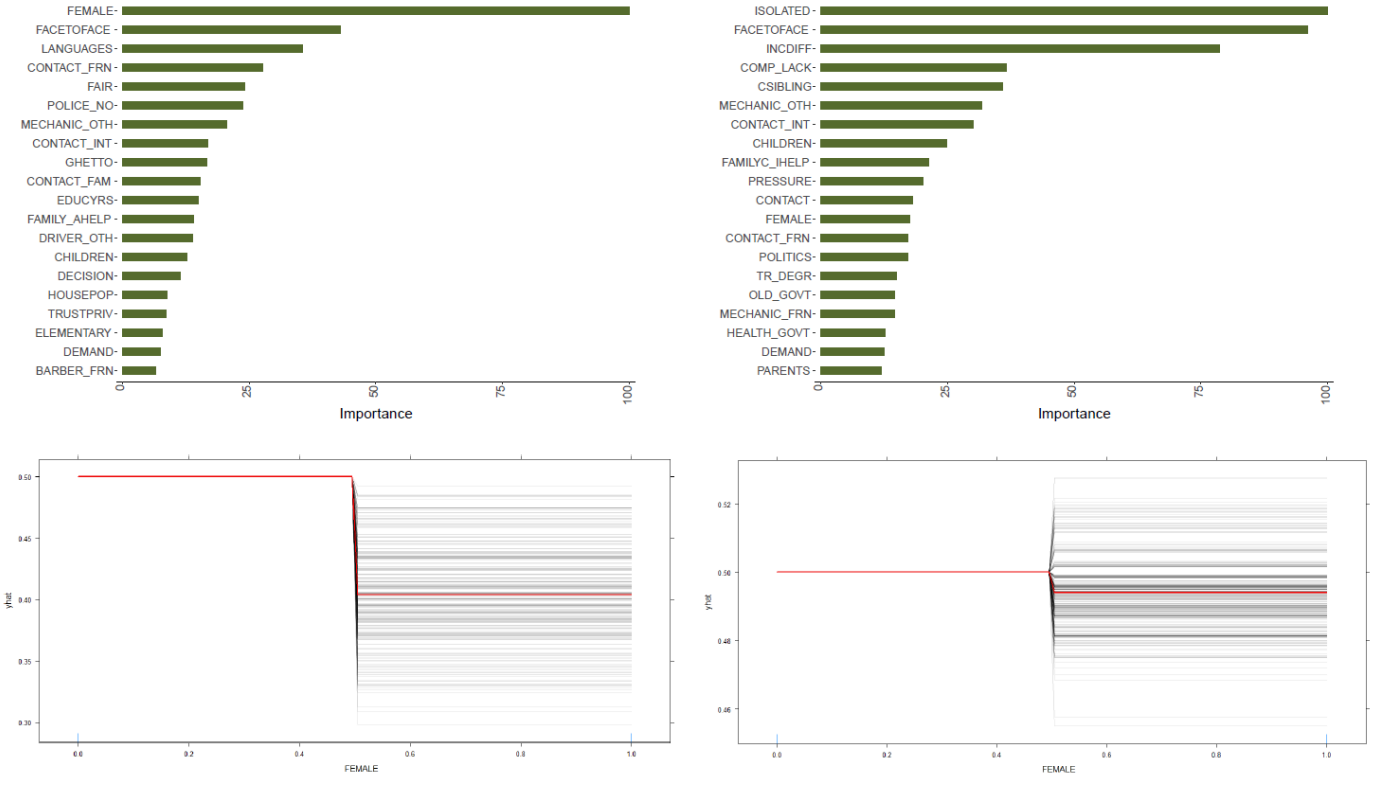
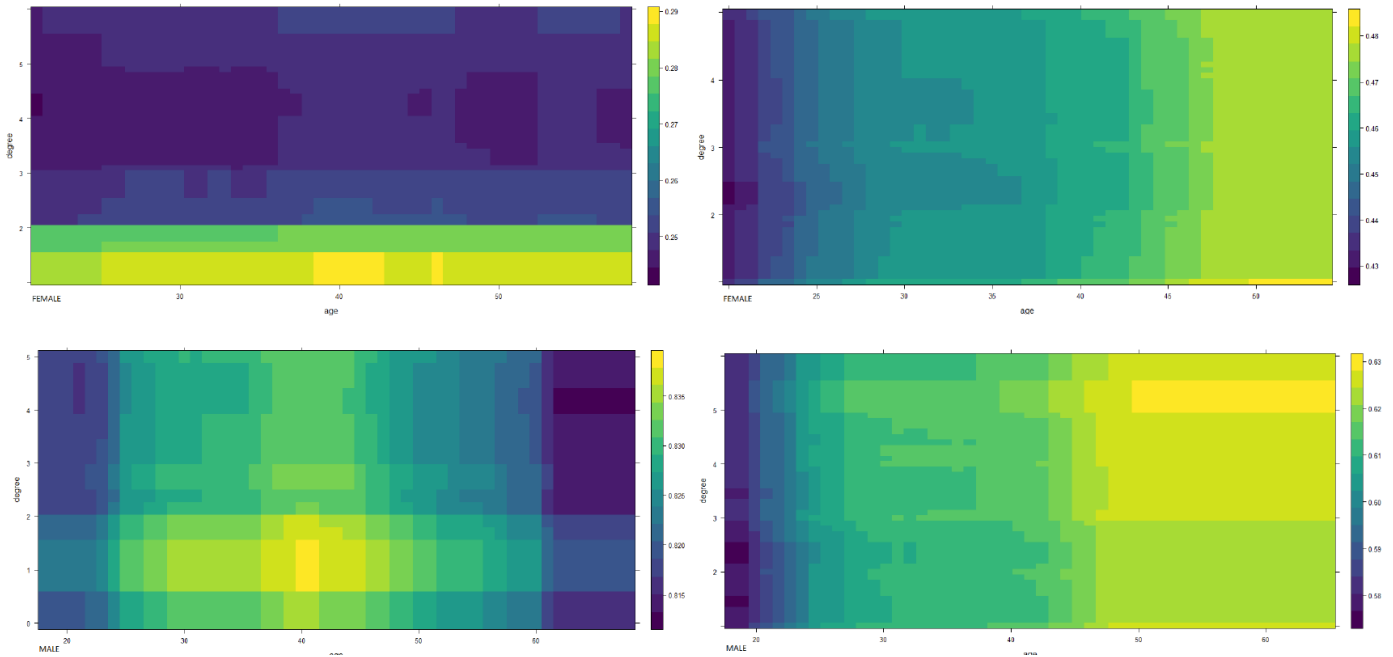


Figure: 5
Two-Way XGBoost Partial Dependence Plots

A) Periphery and Rural **B) Urban Centres**



5. Concluding Remarks

Being largely an outcome of macroeconomic effects, an individual's employment status depends on social, environmental, and personal characteristics. Given the same macroeconomic conditions, certain characteristics of individuals may be associated with their employment status in differing ways, based on the environment and social structures where they live. In the present study, gender was selected and assessed by two separate machine learning algorithms as one of such characteristics. This finding applies particularly to individuals who live in locations other than urban centres. Alongside the role of gender, we have observed that features representing social connections, the manner of contacting people, the employment status of an individual's friends, acquaintances, and family members, have been algorithmically selected and used as top predictors by our ML procedures.

It is reasonable to expect that the social and individual characteristics mentioned above may have highly non-linear and interactive relationships with employment status. It follows that a manual selection of features and theory-driven modelling of each of those features (e.g., deciding whether their relationships are linear or not) is infeasible, given the large number of variables in our data set. Such complicated mechanisms are very hard to capture using traditional techniques (Mullainathan & Spiess, 2017). Being still firmly grounded in the theoretical foundations, particularly concerning the social capital, we have used modern statistical, algorithmic techniques instead of traditional approaches to understanding particular dynamics of not general unemployment levels and rates, but individual unemployment. We have based our empirical analysis on samples divided by two main attributes; employment status individuals living in urbanised locations in Turkey were compared and contrasted to those who do not live in these locations. Results were illuminating and novel, underlining differences mainly related to gender and providing machine learning-based explanations and confirmations related to earlier literature claims. The results have implications on many dimensions of regional and national policies ranging from local commuting/infrastructure and safety policies to nationwide educational endeavours to support female employment in rural areas. In particular, the habits and established general approaches towards the division of labour between women and men need to be addressed on many levels, from manual labour positions to top management within the context of rural locations.

Lastly, by being the only application of ML algorithms on the topic, particularly for the case of Turkey, the present study brings new techniques under focus that can significantly help understand the issue in question and help the generation of policies for tackling unemployment in Turkey.

References

Adam-Bourdarios, C. & G. Cowan & C. Germain & I. Guyon & B. Kegl & D. Rousseau (2015), "The Higgs Boson Machine Learning Challenge", in: *NIPS 2014 Workshop on High-energy Physics and Machine Learning*, 19-55.

Adanacıoğlu, H. & S.G. Gümüş & F.A. Olgun (2012), "Rural Unemployment: The Problems which it Generates and Strategies to Reduce it: A Case-Study from Rural Turkey", *New Medit*, 11(2), 50-57.

Athey, S. & G.W. Imbens (2019), "Machine Learning Methods that Economists Should Know About", *Annual Review of Economics*, 11.

Athey, S. (2018), "The Impact of Machine Learning on Economics", in: *The economics of artificial intelligence: An agenda*, University of Chicago Press, 507-547.

Berik, G. & C. Bilginsoy (2000), "Type of Work Matters: Women's Labor Force Participation and the Child Sex Ratio in Turkey", *World Development*, 28(5), 861-878.

Berik, G. (1987), "Women Carpet Weavers in Rural Turkey: Patterns of Employment", *Earnings and Status (Geneva: International Labour Office, 1987)*, 13-15.

Berik, G. (1989), "Born Factories: Women's Labor in Carpet Workshops in Rural Turkey", *International Studies Notes*, 14(3), 62.

Bock, B. (2004), "It Still Matters Where You Live: Rural Women's Employment Throughout Europe", in: H. Buller & K. Hoggart (eds.), *Women in the European Countryside*, Ashgate Publishing Limited, 14-41.

Breiman, L. & A. Cutler, *Random Forests*, <https://www.stat.berkeley.edu/~breiman/RandomForests/cc_home.htm>, 02.01.2020.

Breiman, L. & J.H. Friedman & R.A. Olshen & C.J. Stone (1984), *Classification and Regression Trees*, Wadsworth and Brooks, Monterey, CA.

Breiman, L. (1996), "Bagging Predictors", *Machine Learning*, 24(2), 123-140.

Breiman, L. (2001), "Random Forests", *Machine Learning*, 45(1), 5-32.

Calvo-Armengol, A. & M.O. Jackson (2004), "The Effects of Social Networks on Employment and Inequality", *American Economic Review*, 94(3), 426-454.

Çarkoğlu, A. & E. Kalaycıoğlu (2020), *International Social Survey Programme 2017: Social Networks and Social Resources* - ISSP 2017 (Turkey).

Cartmel, F. & A. Furlong (2000), *Youth Unemployment in Rural Areas*, Number 18, York Publishing Services for the Joseph Rowntree Foundation York.

Chandler, J. (1989), "Youth Unemployment in Rural Areas: Local Government and Training Agencies", *Local Government Studies*, 15(3), 59-73.

Chawla, N.V. & K.W. Bowyer & L.O. Hall & W.P. Kegelmeyer (2002), "SMOTE: Synthetic Minority Over-Sampling Technique", *Journal of Artificial Intelligence Research*, 16, 321-357.

Chen, T. & C. Guestrin (2016), "XGBoost: A Scalable Tree Boosting System", *Proceedings of the 22nd ACM SIGKDD international conference on knowledge discovery and data mining*, 785-794.

Chen, T. & T. He & M. Benesty & V. Khotilovich & Y. Tang (2015), "XGBboost: Extreme Gradient Boosting", *R package version 0.4-2*, 1-4.

Chen, T. & T. He (2015), "Higgs Boson Discovery with Boosted Trees", *NIPS 2014 workshop on high-energy physics and machine learning*, 69-80.

Conley, T.G. & G. Topa (2002), "Socio-Economic Distance and Spatial Patterns in Unemployment", *Journal of Applied Econometrics*, 17(4), 303-327.

Cook, T. & A.S. Hall (2017), "Macroeconomic Indicator Forecasting with Deep Neural Networks", Federal Reserve Bank of Kansas City, *Research Working Paper*, (17-11).

Friedman, J. & T. Hastie & R. Tibshirani (2001), *The Elements of Statistical Learning*, Volume 1. Springer Series in Statistics, New York.

Friedman, J.H. (2001), "Greedy Function Approximation: A Gradient Boosting Machine", *Annals of Statistics*, 5, 1189-1232.

Friedman, J.H. (2002), "Stochastic Gradient Boosting", *Computational Statistics & Data Analysis*, 38(4), 367-378.

Gash, N. (1935), "Rural Unemployment, 1815-34", *The Economic History Review*, 6(1), 90.

Goldstein, A. & A. Kapelner & J. Bleich & E. Pitkin (2015), "Peeking Inside the Black Box: Visualizing Statistical Learning with Plots of Individual Conditional Expectation", *Journal of Computational and Graphical Statistics*, 24(1), 44-65.

Greenwell, B.M. (2017), "pdp: An R Package for Constructing Partial Dependence Plots", *The R Journal*, 9(1), 421-436.

Gülümser, A.A. & T. Baycan-Levent & P. Nijkamp (2011), "Changing Trends in Rural Self-Employment in Europe and Turkey", in: A. Torre & J. Traversac (eds.), *Territorial Governance*, Physica-Verlag HD, 3-25.

Halden, D. & R. McQuaid & M. Greig (2005), *Relationships Between Transport and the Rural Economies*, The Countryside Agency, Derek Halden Consultancy and Employment Research Institute, <http://www.dhc1.co.uk/projects/transport_rural_economies.html>, 07.12.2020.

Harding, M. & J. Hersh (2018), "Big Data in Economics", *IZA World of Labor*, (451).

İlkaracan, I. & I. Tunalı & B. Karapınar & F. Adaman & G. Özertan (2011), "Agricultural Transformation and the Rural Labor Market in Turkey", *Rethinking Structural Reform in Turkish Agriculture: Beyond the World Bank's Strategy*, 105-48.

James, G. & D. Witten & T. Hastie & R. Tibshirani (2013), *An Introduction to Statistical Learning*, Volume 112, Springer, New York.

Jones, L.P. (1991), "Unemployment: The Effect on Social Networks, Depression, and Reemployment", *Journal of Social Service Research*, 15(1-2), 1-22.

Jones, M.K. (2004), "Rural Labour Markets: The Welsh Example", *Local Economy*: *The Journal of the Local Economy Policy Unit*, 19(3), 226-248.

Kreiner, A. & J.V. Duca (2019), "Can Machine Learning on Economic Data Better Forecast the Unemployment Rate?", *Applied Economics Letters*, 1-4.

Lasley, P. & P.F. Korsching (1984), "Examining Rural Unemployment", *Journal of Extension*, 22(5), 32-36.

Liaw, A. & M. Wiener (2002), "Classification and Regression by Randomforest", *R News*, 2(3), 18-22.

Lindsay, C. & M. McCracken & R.W. McQuaid (2003), "Unemployment Duration and Employability in Remote Rural Labour Markets", *Journal of Rural Studies*, 19(2), 187-200.

Lindsay, C. (2009), "In a Lonely Place? Social Networks, Job Seeking and the Experience of Long-Term Unemployment", *Social Policy and Society*, 9(1), 25-37.

Lyu, H. & Z. Dong & M. Roobavannan & J. Kandasamy & S. Pande (2019), *Rural Unemployment Pushes Migrants to Urban Areas in Jiangsu Province, China*, Palgrave Communications, 5(1).

Maru, T. (2016), "How Social Customs Restrict EU Accession Effects on Female Labor Participation in Agricultural Production in Rural Adana, Turkey: A Simulation Analysis", *The Japanese Journal of Rural Economics*, 18(0), 17-31.

McQuaid, R. & C. Lindsay & M. Greig (2004), "'Reconnecting' The Unemployed information and Communication Technology and Services for Jobseekers in Rural Areas", *Information, Communication & Society*, 7(3), 364-388.

McQuaid, R.W. & C. Lindsay (2003), "Delivering Job Search Services for Unemployed People in Rural Areas: The Role of ICT", *43rd Congress of the European Regional Science Association: "Peripheries, Centres, and Spatial Development in the New Europe"*, 27th - 30th August 2003, Jyväskylä, Finland.

Mullainathan, S. & J. Spiess (2017), "Machine Learning: An Applied Econometric Approach", *Journal of Economic Perspectives*, 31(2), 87-106.

OECD (2020), Working Age Population (Indicator), <https://data.oecd.org/pop/working-age-population.htm>, 07.04.2020.

Olhan, E. (2011), "The Structure of Rural Employment in Turkey", *FAO Turkey Report 2011*.

Özgüzel, C. (2020), "Agglomeration Effects in a Developing Economy: Evidence from Turkey", *PSE Working Papers*, 2020-41.

Russell, H. (1999), "Friends in Low Places: Gender, Unemployment and Sociability", *Work, Employment and Society*, 13(2), 205-224.

Schonlau, M. (2005), "Boosted Regression (Boosting): An Introductory Tutorial and A Stata Plugin", *The Stata Journal*, 5(3), 330-354.

Topa, G. (2001), "Social Interactions, Local Spillovers and Unemployment", *The Review of Economic Studies*, 68(2), 261-295.

Türk, U. (2020), "Gelir Dağılımında Fırsat Eşitsizliği ve Alt Kırılımları: Türkiye Üzerine Bir Araştırma", *Alternatif Politika*, 12(2), 311-335.

Ulukan, U. & N. Ciğerci-Ulukan (2019), "Is Agriculture Feminized? Female Labor in Contemporary Rural Turkey", in: M. Meciar & K. Gökten & A.A. Eren (eds.), *Economic & Business Issues in Retrospect & Prospect*, IJOPEC Publication Limited, London.

Unay-Gailhard, I. (2016), "Job Access After Leaving Education: A Comparative Analysis of Young Women and Men in Rural Germany", *Journal of Youth Studies*, 19(10), 1355-1381.

Varian, H.R. (2014), "Big Data: New Tricks for Econometrics", *Journal of Economic Perspectives*, 28(2), 3-28.

Wickham, H. (2011), "ggplot2", *Wiley Interdisciplinary Reviews: Computational Statistics*, 3(2), 180-185.

Xu, W. & Z. Li & C. Cheng & T. Zheng (2013), *Data Mining for Unemployment Rate Prediction Using Search Engine Query Data, Volume 7*, Springer, 33-42.

Zenou, Y. (2011), "Rural-Urban Migration and Unemployment: Theory and Policy Implications", *Journal of Regional Science*, 51(1), 65-82.

Sosyoekonomi

2021, Vol. 29(50), 95-108

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.05
Date Submitted: 03.03.2021
Date Revised: 10.08.2021
Date Accepted: 16.08.2021

Investigation of the Effect of R&D, Education and Health Expenditures on Economic Growth by Panel Data Analysis Method

Durmuş GÖKKAYA *(https://orcid.org/0000-0002-6713-1748), Yozgat Bozok University, Turkey; durmus.gokkaya@yobu.edu.tr*

Osman ŞENOL *(https://orcid.org/0000-0001-5626-2921), Süleyman Demirel University, Turkey; osmansenol@sdu.edu.tr*

Ümit ÇIRAKLI *(https://orcid.org/0000-0002-3134-8830), Yozgat Bozok University, Turkey; umit.cirakli@bozok.edu.tr*

Ar-Ge, Eğitim ve Sağlık Harcamalarının Ekonomik Büyüme Üzerindeki Etkisinin Panel Veri Analizi Yöntemiyle Değerlendirilmesi

Abstract

This study aims to reveal the effects of R&D, education, and health expenditures on economic development. For this purpose, the study examines the 2000-2019 data of 45 countries in the middle-upper-income and high-income country groups by panel data analysis method. Errors encountered in panel data basic assumption tests were corrected with Driscoll-Kraay standard errors. As a result, it has been determined that a one-unit increase in education and health expenditures contributes more to economic growth than one unit. In contrast, R&D expenditures have a minor positive effect on economic growth in the short run but more in the long run.

Keywords : R&D, Economic Growth, Education Expenditure, Health Expenditure, Panel Data Analysis.

JEL Classification Codes : E00, I00, I15.

Öz

Bu çalışma Ar-Ge, eğitim ve sağlık harcamalarının ekonomik gelişme üzerinde etkileri ortaya koymayı amaçlamaktadır. Bu amaçla çalışma orta-üst gelir ve yüksek gelirli ülke gruplarında yer alan 45 ülkenin 2000-2019 verilerini panel veri analiz yöntemi ile incelemektedir. Panel veri temel varsayım testleri sonucu karşılaşılan hatalar Driscool-Kraay standart hatalar ile düzeltmiştir. Çalışma sonucunda eğitim ve sağlık harcamalarındaki bir birimlik artışın ekonomik büyümeye bir birimden daha fazla katkı sağladığı, Ar-Ge harcamalarının ise ekonomik büyüme üzerinde kısa vadede pozitif etkisi az iken, uzun vadede daha fazla olduğu belirlenmiştir.

Anahtar Sözcükler : Ar-Ge, Ekonomik Büyüme, Eğitim Harcaması, Sağlık Harcaması, Panel Veri Analizi.

1. Introduction

The number of educated people within the human social capital plays an important role in the growth and development of countries. For this reason, education is among the most critical issues of a country. Education provides important contributions to countries in providing a competitive advantage with the increase in competition conditions in every field in the globalizing world. It is possible to produce high-tech products in many sectors and areas, especially health, defence, and industry, and sell them in world markets with well-educated human resources. In addition, education performs an important function on many subjects such as increasing the qualifications of employees, producing and using information, using human resources effectively and efficiently, reaching the level of the information society, and ensuring that individuals gain awareness of healthy living behaviour and give importance to their health.

In parallel with the developments in the educational status, it is a known fact that individuals contribute to themselves individually, such as the rate of finding employment, working with high wages, working in their fields of expertise, and high performance and productivity in this direction. At the same time, it makes a significant contribution to everyone in using an educated and trained workforce in the market, business centres, and important state institutions (health, education, defence, and other institutions). For these and many other reasons, it is developed and developing countries prioritize education policies. In this respect, it can be stated that there is often a direct-way relationship between the increase in education levels and the level of development of a country. As a result, it is understood that education has vital importance in countries' economic growth and development.

In addition to education, research and development (R&D) activities also play an important role in increasing the competitiveness of a country and providing a competitive advantage. The importance of R&D and education investments in the production of high and advanced technological products is an undeniable fact. When we look at developed countries, it is known that they allocate significant shares from their national income in these two areas. When looking at the foundations of innovation, technological advancement, and producing products that create added value, it is seen that there are R&D activities. In addition, it is a fact that R&D activities play an essential role in many areas and product ranges, such as revealing new production processes, reducing costs, preventing occupational accidents, increasing employees' productivity and performance, and improving living standards. It can be stated that the economic gains it brings along with the due importance given to R&D are noticed early by developed countries. It is known that economic growth is achieved by exporting both technological and value-added products produced as a result of R&D activities. Therefore, maintaining economic development and growth by investing more in education and R&D should be among the main goals of countries.

On the other hand, one of the development indicators of a country or society is health. When the health indicators of economically developed countries and the country's

population's health level are examined, they are in a better position than undeveloped or developing countries. This can be stated that it is directly proportional to the high investments and expenditures in health. In addition, people who are a country's human capital must be healthy and sound mentally and physically. Investments and expenditures made in education ensure that individuals are mentally healthy, while investments and expenditures made in health ensure that individuals are physically healthy. In this context, it is evident that individuals who are developed and healthy both mentally and physically will contribute to the country's economic growth and development in their economic activities. Spending on health, especially those made on preventive and curative services, can be the locomotive or engine of the economy to ensure that individuals are born and healthily maintain their lives for a long time because health investments and expenditures are of vital importance in terms of contributing to the long and healthy life of individuals, decreasing infant and maternal mortality rates and increasing the population together with the reduction of accidental deaths. Thus, due to these investments and expenditures, it is evident that individuals living healthier and longer will contribute to a country's economic growth.

As stated above, it is important to measure the impact of R&D, education, and health expenditures on countries' economic growth at the macro level. In this direction, this study was carried out to determine the impact of countries' education, R&D, and health expenditures on economic growth using panel data econometric methods. Although there are differences in the sample, variable, and periods covered by the study in the literature, similar studies, and their findings are given below.

2. Literature Review

Various studies have been conducted with different period data sets that impact economic growth when the literature is examined. When the international literature is searched, there are various studies on the variables of R&D, education, and health expenditures. However, most of the studies on economic growth deal with one variable or two variables.

Looking at the literature, studies stand out examining the relationship between economic growth based on the R&D variable (Sylwester, 2001; Pessoa, 2010; Bozkurt, 2015; Mansfield, 1972; Stokey, 1995; Goel et al., 2008; Aghion & Howitt, 1996; Akcali & Sismanoglu, 2015; Griffith, 2000; Falk, 2007). Looking at the relationship between economic growth and education variables, there are a lot of studies (Barro, 2001; Gylfason, 2001; Mercan & Sezer, 2014; Gyimah-Brempong et al., 2006; Mariana, 2015; Chatterji, 1998; Romer, 1989; Hongyi & Huang, 2009; Hanushek & Woessmann, 2010; Stevens & Weale 2004) examining this relationship. Finally, when the health expenditures variable is considered, studies are investigating the relationship between economic growth and health expenditure (Bhargava et al., 2001; Elmi & Sadeghi, 2012; Wang, 2011; Bakare & Olubokun, 2011; Piabuo & Tieguhong, 2017; Kurt, 2015; Rivera & Currais, 1999; Mayer, 2001; Heshmati, 2001; Mishra & Mishra, 2015).

Woo et al., (2017) investigated the effect of education and R&D investments on regional economic growth in a study examining the regional differences of South Korea covering 16 different cities or regions using panel data analysis method with data between 1997-2009. As a result of the study, it has been determined that education and R&D expenditures positively affect economic growth. In addition, education and R&D expenditures have been observed to reduce regional inequalities. Tamang (2011) examines the relationship between education expenditures and economic growth in the Indian economy in his study. An econometric model was applied with time series analysis based on the data set between 1980-2008. As a result of the study, it was seen that there is a long-term relationship between education expenditures and economic growth. Gyimah-Brempong et al. (2006), using panel data for 1960-2000, examined the effect of higher education human capital on economic growth in African countries. As a result of the research, it was determined that all education levels, including higher education, have a positive and statistically significant effect on the growth rate of per capita income in African countries.

Falk (2007) conducted a study to estimate the impact of R&D investment on long-term economic growth. A dynamic empirical growth model was tried to be predicted using the panel data analysis method with the data covering the OECD countries and belonging to the years 1970-2004. According to the results of this study, it has been determined that both the ratio of R&D expenditures of commercial enterprises to GDP and the share of R&D investments in the high technology sector has strong positive effects on GDP per capita and GDP per hour worked in the long run. In his study, Mariana (2015) investigated the causality relationship between education, significantly higher education, and economic growth in Romania, based on 1980-2013. A vector error correction model is used to analyse the study's long-term relationship between education and economic growth. As a result of the econometric analysis, it has been seen that higher education has a positive effect on economic growth.

In the literature, some results in some of the few studies show that the effect or relationship of R&D and education on economic growth is not significant. Samimi and Alerasoul (2009) examined the impact of R&D on the economic growth of developing countries in their research. The research was conducted using the panel data regression model with a sample of 30 developing countries over the data for the period 2000-2006. Considering the findings obtained as a result of this research, it is seen that there is no significant positive effect between R&D expenditures and economic growth in the countries included in the sample. Barro (2001) conducted a study based on the education variable, one of the human capitals he saw as the determinant of economic growth. The study examined the effects of human capital, especially education, on economic growth with panel data covering 1960-1995 and 100 countries. According to the results of the study, it was determined that there is a positive relationship between education and growth between the number of students at secondary and higher education levels in adult male students or the average school acquisition; This situation was found to have a negative or insignificant relationship among female students at the same level. The researcher interpreted this result

as that women with higher education are not well used or employed in the labour market of many countries.

On the other hand, Hongyi and Huang (2009) reveal an empirical analysis by considering both health and education, human capital, in their study in China. Panel data models were used in the study based on provincial-level data covering the period 1978-2005. According to the study's findings, it has been determined that both health and education expenditures have positive and significant effects on economic growth. Heshmati (2001) examined the relationship between per capita health expenditures and economic growth, using the causality test in the context of the Solow model, based on the data of OECD countries between 1970-1992. As a result of the study, it was seen that health expenditures, that is, health expenditure per capita, had a positive effect on economic growth. Chang and Ying (2006), in their study covering 15 OECD countries, found that there is a positive and significant relationship between health expenditures and economic growth. Wang (2011) examined the causality between the increase in health expenditures and economic growth. The total health expenditure data of 31 countries from 1986-2007 were analysed by panel regression and quantitative regression methods. As a result of the study, it was found that the effect of health expenditure increases on economic growth in countries with medium and high levels of economic growth was found to be positive.

On the other hand, Güven, Şimşek (2018) found that health expenditures in MENA countries on economic growth are negative. Şen, Kaya, and Alpaslan (2018) examined the causality relationship between eight developing countries' health, education, and economic growth. They found that while there was a positive causality relationship in only two countries, the causality relationship was negative for one country (Indonesia).

When the studies using different samples and variables are examined, it is seen that R&D, education, and health expenditures positively affect economic growth in most studies. The findings of this study are similar to the findings of the study in the literature. In this study, countries in different sample groups were examined together, and the relationships between these variables were examined holistically. The methodological part of the research is given below.

3. Data and Methodology

3.1. Objective, Scope, and Method of the Research

The study aims to measure education and R&D expenditures, especially health expenditures, on economic growth. Accordingly, the relationship between the specified variables and the economic growth variable will be tested using the panel data analysis method. The analysis of the data was performed using EViews 10 and Stata 15.0 package programs.

3.2. Model and Data

This study was carried out to determine the relationship between economic growth, the most important variable of a country, and education, health, and R&D expenditures. While choosing the study's sample group, the World Bank's classification of countries according to income groups was considered. The country group included in the study included upper-middle-income countries and high-income countries. On the other hand, many variables affect the economic growth different from those mentioned in the study. However, in this study, the relations between the specified variables of the countries included in the sample from the developed and developing country groups and economic growth are tested. Therefore, the variables not included in the study on economic growth will be included in the model within the error term.

Considering the World Bank's country classification within the scope of the research, 132 countries constitute the universe of the research. However, the missing data for the countries caused the sample group to be narrowed. Forty-five countries were included in the study in line with the availability of data. In the study, the effect of these variables on economic growth was tried to be tested in upper middle income and high-income countries. When the literature was examined, it was seen that similar studies were conducted using different variables in different sample groups. The studies mentioned above were examined in the literature, and it was also desired to select the most appropriate variable to reflect the purpose of the study. The data types of the variables are annual. The time dimension of the study covers the period 2000-2019.

Table: 1
Variables of Study

Variable	Symbol
Gross Domestic Product	lngdp
Education Expenditures	dlneducationexp
R&D Expenditures	dlnrdexp
Health Expenditures	dlnhealthexp

The variables to be used in the model are specified in Table 1. First, the model's GDP variable, the dependent variable, was examined, and the stationarity check was made. The GDP variable was stable at the level, and its natural logarithm was taken to reduce its numerical value. The natural logarithmic transformation was first applied to the education expenditure variable, and it was found to be stationary at the first level. Since the series became stationary at the first level, the first level version was included in the model. Since the R&D and health expenditure series became stable at the first level, they were included in the model with their first differences.

Since there is only one dependent variable in the study, a single model will be created. In the model to be created, the GDP variable is used to represent economic growth and is included in the model as a dependent variable. Other variables specified were included in the model as independent variables. The mathematical representation of the created model is as follows:

$$\Delta LNGDP_{it} = C + \sum_{j=1}^{pi} \lambda_{ij}\, \Delta LNHEALTHEXP_{i,t-j} + \sum_{j=0}^{qi} \delta_{ij}\, \Delta LNEDUCATIONEXP_{i,t-j} + \sum_{j=0}^{qi} \varphi_{ij}\, \Delta LNRDEXP_{i,t-j} + \varepsilon_{it} \quad (1)$$

The output of the Model:

lngdp = 1.37023429653*dlnheawlthexp + 0.739014482971*dlneducationexp + 0.0722866026261*dlnrdexp + 24.1513547903 + eqn_01_efct

The left side of the specified equation gives the dependent variable. On the right side of the equation, "Δ" is the first difference operator, "LN" is the logarithm of the series, and "ε_{it}" is error term with zero mean and variance constant within each unit, "i" is the cross-section and finally "t" is the information about the period. Although different variables are used when estimating the dependent variable in panel data analysis models, some variables affect the dependent variable but cannot be measured or included. The effect of variables that we cannot predict within the model's scope or not included in the model is summed up in the error term.

3.3. Determination of Panel Data Model Methods

There are three basic approaches when creating a model in panel data analysis. These approaches are random model, fixed-effects model, and pooled panel data models. Which approach fits the model to be created will be determined with the help of relevant tests. In addition, panel data models are divided into micro and macro according to the number of periods covered. In this regard, Baltagi (2013: 1) classifies panels up to 20 periods as micro panels and panels with more than 20 periods as macro panels. Baltagi (2013) states that series in micro panels should not be seen as compulsory to provide stationarity and states that the stationarities of series should be ensured in macro panels. Since the number of periods of this research is 20, the model to be created enters the micro panel. The tests to be made will also be carried out under micro panel assumptions.

4. Findings

This part of the study will check whether the basic assumptions are met before panel data modelling. The results of the preliminary hypothesis tests and the outputs of the latest model created will be included in this direction.

4.1. Multiple Linear Connection Problem

When creating panel data models, one of the most critical assumptions is that the model should not have a multiple linear connection problem. First of all, variables with high correlation should not be used within the same model. As Gujarati (2004: 342) stated, using variables that have a high correlation simultaneously, a multiple linear connection problem will be encountered. Different tests and methods have been developed to detect the multiple linear connection problem in the panel data models created. One of these methods is the Variance Inflation Factor (VIF). It is important to calculate the variables' VIF values and

determine the variables above the threshold value. VIF values are accepted as a threshold value of 4 in some studies and 5 and 10 in some studies. The calculation of the VIF values of the variables is 1 / (1-R2) (Açıkgöz et al., 2015: 427; Brien, 2007: 673). The R2 value is the power of independent variables to explain dependent variables in the model. Each variable is selected as a dependent variable for one time only. A model is created for each dependent variable, and R2 value is obtained. With the obtained R2 value, the VIF value for each variable is calculated.

Table: 2
VIF Values of Variables

Variables	R^2	VIF Values
lngdp	0.55	2.22
dlneducationexp	0.47	1.88
dlnrdexp	0.43	1.75
dlnhealthexp	0.46	1.85

VIF values of the variables are given in Table 2. When the VIF values of the variables are examined, no variable can create a multiple linear connection problem in the model. It is seen that all variables have VIF values lower than 4, which is the smallest critical value. Because the variable VIF values are lower than the threshold value, all variables will be included in the model. After testing the multiple linear connection problem in the model, it is necessary to determine which approach is valid in the model.

4.2. Panel Data Model Identification Tests

First, it is checked whether the classical model is suitable for the model. The test statistic is tested by comparing it with the F distribution table at ((N-1 = 24, (N (T-1) -K) = 852 degrees of freedom). In other words, the classical model does not seem suitable for this model. In the next step, it is necessary to choose between fixed effects and random effects.

Table: 3
Panel Data Model Identification Tests

Model 1		
	Statistic Value	Probability
F-Fixed Effects	45.86	0.000
Hausman Test	55.40	0.000

As a result of the Hausman test conducted for the model, it is seen that the H0 hypothesis is rejected, and the random effects estimator is invalid, and the fixed effects estimator is valid. According to the test results obtained, the model was estimated with a fixed-effects approach. Autocorrelation, which is another assumption, should be controlled to obtain a robust model.

4.3. Autocorrelation Test

To obtain a robust model in panel data analysis, the model should not have an autocorrelation problem. The existence of autocorrelation in the model means that the error

terms of the variables are related to each other. In such a case, correct estimator coefficients cannot be obtained. The presence of this problem should be tested, and, if any, necessary correction tests should be performed.

Table: 4
Results of Autocorrelation Tests

Test	Model 1
Bhargava, Franzini, and Narendranathan's Durbin Watson Test	0.3289
Baltagi-Wu locally best invariant test	0.5436

In Table 4, Durbin Watson and Baltagi-Wu autocorrelation test results of model 1 are given. These tests are recommended tests to test the presence of autocorrelation in the fixed-effects model. In both test types, the H0 hypothesis that the autocorrelation coefficients are zero is tested. The literature pointed out that autocorrelation is important if these test values are less than 2. From a different point of view, it is understood that there is an autocorrelation problem in the model since the test values in this model are much lower than 2. This problem will be taken into consideration, and necessary correction tests will be applied. Another model that should be considered to obtain a robust and correct model is controlling heteroscedasticity.

4.3. Heteroscedasticity Test

In panel data studies, all models must be built on homoscedasticity. Therefore, homogeneity of variance should be tested for models. Since the fixed effects approach is adopted in the models, the Modified Wald Test, which gives the most accurate result in heteroscedasticity, was used.

Table: 5
Result of Heteroscedasticity Test

Test	Model 1	
	Chi^2	Probability
Modified Wald Test	1449.89	0.0000

When the Wald test result in Table 5 is examined, the H0 hypothesis is rejected, and it is seen that the variance varies according to the units. In other words, it is seen that there is heteroscedasticity in the model. Corrective tests will be carried out considering this problem. Another and last assumption for panel data modelling is to check whether there is cross-sectional dependency in the model.

4.4. Cross-Section Dependency Test

In Table 6, three different test results are given for the test of cross-sectional dependency of the model. The H0 hypothesis of all tests is established as there is no cross-sectional dependency.

Table: 6
Cross Section Dependency Test

Test	Model 1	
	Statistic	**Probability**
Breusch-Pagan LM	3838.241	0.000
Pesaran Scaled LM	64.009	0.000
Pesaran CD	0.216503	0.828

According to the results of Breusch-Pagan Lm and Pesaran Scaled LM tests, it is seen that there is cross-section dependence, whereas according to the Pesaran CD test, it is seen that there is no cross-section dependence. The presence of cross-sectional dependency in the model is accepted because the two tests give results that there is a cross-sectional dependency. In the case of autocorrelation, changing variance, and cross-section dependence in a panel data analysis model, Driscoll and Kraay estimator should be used to eliminate the effects of these three problems. Thanks to the Driscoll and Kraay robust correction test, the model will be free from the effects of these problems, and more resistant estimator coefficients will be obtained.

4.5. Panel Data Results of Driscoll and Kraay Standard Error

GDP variable was chosen as the dependent variable in Model 1. GDP is considered to be the most important indicator of a country's economic development level. On the other hand, the model uses education expenditure, health expenditure, and R&D expenditure variables as independent variables. Whether Model 1 provides the basic assumptions for panel data analysis were checked one by one. As a result of the basic assumption tests of Model 1, it was seen that there was autocorrelation, variance, and cross-section dependence. Driscoll and Kraay tests were applied to eliminate the effects of these problems among the robust correction tests. Whether the model is meaningful is understood by looking at the F statistic and F probability values.

Table: 7
Panel Data Results of Driscoll and Kraay Standard Error for Model 1

Dependent Variable	Period	Cross Section	Total Observation	
lngdp	2000-2019	45	900	
Variable	**Coefficient**	**Drisc/Kraay Standard Error**	**t-statistic**	**Probability**
dlneducationexp	1.086332	0.288182	3.77	0.001
dlnhealthexp	1.296649	2698781	4.80	0.000
dlnrdexp	0.074811	0.0657649	4.29	0.000
C	24.83612	0.7360859	33.74	0.000
R^2: 0.17	F-statistic: 15.54		Prob (F-Statistic): 0.000	

In this model, it is seen that the F statistic value is 15.54, while the F probability value is 0.000. In other words, it is seen that the model is significant as a whole. It is seen that the R2 value is 0.17 in the model. In other words, the power of independent variables to explain the dependent variable is seen as 0.17. Many variables affect the GDP of a country apart from those variables. This study was conducted to determine the relationship between the independent variables specified in the model and the GDP variable, and other variables were

ignored. When similar studies in the literature are examined, it is seen that R^2 values are close to each other.

It is seen that all of the independent variables included in the model are in a positive relationship with the dependent variable. In other words, it can be said that a positive development in independent variables may affect economic growth positively, and a negative development may negatively affect economic growth. It is foreseen that One unit of expenditure to be made by the country's administration for educational infrastructure and training needs can contribute to the economic growth by 1,086 units. It is estimated that GDP may increase by 1.29 units for a one-unit increase in health expenditures, resulting in a 1.29 unit increase in GDP. It is predicted that each unit of increase in R&D expenditures can increase 0.07 units in GDP. On the other hand, it is seen that the constant term in the model is significant, and the estimator coefficient is also relatively high.

5. Conclusion

Today, the most crucial goal of all countries and communities is to develop economically and prosper. For a society to reach an excellent economic level, it needs a healthy society, a trained workforce to produce, and goods and services with high added value. Although other factors are needed apart from these, the most important factors are that society is educated, healthy, and spends on R&D to produce value-added products and services. For these reasons, it is important to determine the relationship between the GDP level of health expenditures, education expenditures, and R&D expenditures of upper-middle-income countries and high-income countries.

In the model, the estimator coefficient is the minor R&D expenditure. It takes a very long process to produce products and services with a high added value anywhere. Every investment or effort made does not yield immediate results. On the other hand, when countries are analysed globally, it is known that countries with a certain economic level make investments for R&D expenditures. Today, in many countries, due to the short term of office of public administrators, resource allocation for areas that cannot be achieved immediately in the short term is limited. R&D expenditures are long-term investments, and their benefits and effects arise in the long term. In an environment where the country's resources are limited, long-term investments are inevitably postponed, focusing on short-term solutions. Another variable is healthcare spending. It is seen in the literature that many studies have been conducted between health expenditures and economic development. When these studies are examined, it is seen that there is a positive relationship between economic growth and health expenditures in some studies.

In contrast, a negative relationship is found in some studies. Meeting the healthcare needs of people and having the chance to intervene in health problems promptly contributes to the formation of a healthier society. In a healthier society, it is known that while absenteeism is less, work efficiency and work commitment levels are high. Accordingly, in this study, it is estimated that in one unit of expenditure for health expenditures, the

economic recycling will be more than 1 unit. Another variable is education expenditures. Today, in the world of technology and competitive conditions, it is known that the quality of the workforce is more important than quantity. It is known that the aim is to produce high value-added products and services rather than the number of products and services both at the country level and at the level of companies. The only condition for producing high value-added products in society is an educated and trained population. In this direction, parallel to the findings obtained in the model, it is predicted that the transformation into the economy will be more than 1 unit against one unit of resource spent for education. As a result, it is seen that a country needs a healthy population, an educated workforce, and high value-added products and services for economic development, and these variables have a substantial effect on economic growth.

References

Aghion, P. & P. Howitt (1996), "Research and development in the growth process", *Journal of Economic Growth*, 1(1), 49-73.

Akcali, B.Y. & E. Sismanoglu (2015), "Innovation and the effect of research and development (R&D) expenditure on growth in some developing and developed countries", *Procedia-Social and Behavioral Sciences*, 195, 768-775.

Bakare, A.A. & S. Olubokun (2011), "Health care expenditure and economic growth in Nigeria: An empirical study", *Journal of Emerging Trends in Economics and Management Sciences*, 2(2), 83-87.

Baltagi, B.H. (2013), *Econometric analysis of panel data*, Chichester: John Wiley & Sons.

Barro, R.J. (2001), "Education and economic growth", in: J.F. Helliwell (ed.), *The contribution of human and social capital to sustained economic growth and well-being*, OECD, 13-41.

Bhargava, A. & D.T. Jamison & L.J. Lau & C.J. Murray (2001), "Modeling the effects of health on economic growth", *Journal of health economics*, 20(3), 423-440.

Bozkurt, C. (2015), "R&D expenditures and economic growth relationship in Turkey", *International Journal of Economics and Financial Issues*, 5(1), 188.

Brien, R.M. (2007), "A caution regarding rules of thumb for variance inflation factors", *Quality & Quantity*, 41(5), 673-690.

Chang, K. & Y.H. Ying (2006), "Economic growth, human capital investment, and health expenditure: a study of OECD countries", *Hitotsubashi Journal of Economics*, 1-16.

Chatterji, M. (1998), "Tertiary education and economic growth", *Regional Studies*, 32(4), 349-354.

Elmi, Z.M. & S. Sadeghi (2012), "Health care expenditures and economic growth in developing countries: panel co-integration and causality", *Middle-East Journal of Scientific Research*, 12(1), 88-91.

Falk, M. (2007), "R&D Spending in the High-Tech Sector and Economic Growth", *Research in Economics*, 61(3), 140-147.

Goel, R.K. & J.E. Payne & R. Ram (2008), "R&D expenditures and US economic growth: A disaggregated approach", *Journal of policy modeling*, 30(2), 237-250.

Griffith, R. (2000), "How important is business R&D for economic growth and should the government subsidise it?", *IFS Briefing Note*, No. 12, The Institute for Fiscal Studies, London.

Gujarati, D.N. (2004), *Basic econometrics*, McGraw Hill: New York.

Güven, D. & T. Şimşek & A. Güven (2018), "Sağlık Yönetimi Kapsamında Sağlık Harcamalarının Ekonomik Büyüme Üzerine Etkisi: MENA Ülkeleri Üzerine Bir Panel Regresyon Analizi", *Sosyoekonomi*, 26(37), 33-55.

Gyimah-Brempong, K. & O. Paddison & W. Mitiku (2006), "Higher education and economic growth in Africa", *The Journal of Development Studies*, 42(3), 509-529.

Gylfason, T. (2001), "Natural resources, education, and economic development", *European economic review*, 45(4-6), 847-859.

Hanushek, E.A. & L. Woessmann (2010), "Education and economic growth", *Economics of education*, 60-67.

Heshmati, A. (2001), "On the Causality Between GDP and Health Care Expenditure in Augmented Solow Growth Model", *SSE/EFI Working Paper Series in Economics and Finance*, No. 423.

Hongyi, L.I. & L. Huang (2009), "Health, education, and economic growth in China: Empirical findings and implications", *China Economic Review*, 20(3), 374-387.

Kurt, S. (2015), "Government health expenditures and economic growth: a Feder-Ram approach for the case of Turkey", *International Journal of Economics and Financial Issues*, 5(2), 441-447.

Mansfield, E. (1972), "Contribution of R&D to economic growth in the United States", *Science*, 175(4021), 477-486.

Mariana, D.R. (2015), "Education as a determinant of the economic growth: The case of Romania", *Procedia-Social and Behavioral Sciences*, 197, 404-412.

Mayer, D. (2001), "The long-term impact of health on economic growth in Latin America", *World development*, 29(6), 1025-1033.

Mercan, M. & S. Sezer (2014), "The effect of education expenditure on economic growth: The case of Turkey", *Procedia-Social and Behavioral Sciences*, 109, 925-930.

Mishra, P.K. & S.K. Mishra (2015), "The Triangulation Dynamics between Education, Health and Economic Growth in India", *The Journal of Commerce*, 7(2), 69.

Pessoa, A. (2010), "R&D and economic growth: How strong is the link?", *Economics Letters*, 107(2), 152-154.

Piabuo, S.M. & J.C. Tieguhong (2017), "Health expenditure and economic growth-a review of the literature and an analysis between the economic community for central African states (CEMAC) and selected African countries", *Health economics review*, 7(1), 1-13.

Rivera IV, B. & L. Currais (1999), "Economic growth and health: direct impact or reverse causation?", *Applied Economics Letters*, 6(11),761-764.

Romer, P.M. (1989). "Human capital and growth: Theory and evidence", *NBER Working Paper*, 3173, National Bureau of Economic Research, Cambridge, Mass.

Samimi, A.J. & S.M. Alerasoul (2009), "R&D and economic growth: New evidence from some developing countries", *Australian Journal of Basic and Applied Sciences*, 3(4), 3464-3469.

Şen, H. & A. Kaya & B. Alpaslan (2018), "Education, Health, and Economic Growth Nexus: A Bootstrap Panel Granger Causality Analysis for Developing Countries", *Sosyoekonom*i, 26(36), 125-144.

Stevens, P. & M. Weale (2004), "Education and economic growth", *International handbook on the economics of education*, 27, 205-311.

Stokey, N.L. (1995), "R&D and economic growth", *The Review of economic studies*, 62(3), 469-489.

Sylwester, K. (2001), "R&D and economic growth", *Knowledge, Technology & Policy*, 13(4), 71-84.

Tamang, P. (2011), "The impact of education expenditure on India's economic growth", *Journal of International Academic Research*, 11(3), 14-20.

Wang, K.M. (2011), "Health care expenditure and economic growth: Quantile panel-type analysis", *Economic Modelling*, 28(4), 1536-1549.

Woo, Y. & E. Kim & J. Lim (2017), "The impact of education and R&D investment on regional economic growth", *Sustainability*, 9(5), 676.

Sosyoekonomi

2021, Vol. 29(50), 109-130

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.06
Date Submitted: 07.12.2019
Date Revised: 22.09.2021
Date Accepted: 26.09.2021

Legacy of the Truman Doctrine on Turkish-American Relations: A Political Economy Perspective

Emrullah Can KILIÇ *(https://orcid.org/0000-0002-0820-736X), Presidency of the Republic of Turkey, Turkey; ecan.kilic@tccb.gov.tr*

Itır ÖZER-İMER *(https://orcid.org/0000-0002-7779-1440), Hacettepe University, Turkey; itirozer@gmail.com*

Türk-Amerikan İlişkilerinde Truman Doktrini'nin Mirası: Bir Ekonomi Politik Perspektifi

Abstract

This paper aims to scrutinise the need for a new path in Turkish-American relations from a political economy perspective with a strong emphasis on the legacy of the Truman Doctrine. The paper is based on the assumption that Turkish-American relations need a renewed policy paradigm and argues that matters of controversy are likely to prevail unless such a paradigm is found on a political economy basis. Even though the task of reviving Turkish-American relations via tools of political economy is not an easy one, there are several steps to be taken, which can pave the way to this goal.

Keywords : Turkish-American Relations, Truman Doctrine, Political Economy.

JEL Classification Codes : F50, F52, F59.

Öz

Bu çalışma, Türk-Amerikan ilişkilerinde yeni bir yöne olan ihtiyacı Truman Doktrininin mirasına güçlü bir vurgu yaparak ekonomi politik perspektifinden incelemeyi amaçlamaktadır. Çalışma, Türk-Amerikan ilişkilerinin yenilenmiş bir politika paradigmasına ihtiyaç duyduğu varsayımına dayanmakta ve böyle bir paradigma ekonomi politik temeline dayandırılmadığı müddetçe, anlaşmazlıkların büyük olasılıkla devam edeceğini öne sürmektedir. Türk-Amerikan ilişkilerine ekonomi politik araçlarıyla canlılık kazandırmak kolay olmamakla birlikte, bu hedefe giden yolda atılabilecek belirli adımlar vardır.

Anahtar Sözcükler : Türk-Amerikan İlişkileri, Truman Doktrini, Ekonomi Politik.

1. Introduction

Dating back to 1800, Turkish-American relations can easily be classified as long-termed. Although bilateral relations were highly limited at the time of the Ottoman Empire, the predecessor of modern-day Turkey, the two countries were brought closer by historical milestones, namely wars. A mutually-beneficial alliance has become the main determinant of relations between Turkey and the United States.

Turkey has had shifting foreign policy patterns towards the United States after the Second World War II. In the aftermath of the war, Turkey has faced serious security problems rather than the economic ones. It was this search for security that resulted in Turkey's involvement in the Western bloc within the scope of the Truman Doctrine in 1947, which was supported by the Marshall Plan in 1948. Turkey finally became a member of the North Atlantic Treaty Organisation (NATO) in 1952. During the Cold War period, Turkey had been a reliable ally of the United States and a NATO member. Therefore, it is possible to put forward that security defined Turkish-American relations right from the start (Ozel, 2011: 56).

The end of the Cold War and the speeding up of the globalisation process fundamentally transformed the nature of Turkey's relations with the United States. The traditional patterns were no longer sufficient in guiding the bilateral relations (Lesser, 2006: 92). The recent times, especially, witnesses a great deal of discomfort in Turkish-American relations, which raises apprehension on both Turkish and American sides. It can be claimed that the current controversies in Turkish-American relations are more wide-ranging in scope than the previous ones as they comprise numerous issues, spheres, and nations. These controversies are also reflected in the opinion of the Turkish people. According to Pew Research Center survey in 2017, only 18% of the Turks have a favourable view of the United States. This is lower than the 30% favourable opinion in 2002[1]. In the meantime, the favourable view of Russia among the Turkish people seem to have increased to 32% for the same year from 17% in 2007[2]. This increase in favourable opinion regarding Russia is in accordance with the fact that Turkey seeks to be more active in regions such as the Middle East.

The aim of this study is not to provide a complete history of relations between Turkey and the United States, yet, a brief retrospect will be provided in the following section, and some milestones will be touched upon in the subsequent sections. As a matter of fact, it is not possible to examine such a wide area in its all dimensions in a single study. This can be observed in the extensive literature and in studies, each dwelling on different aspects of Turkish-American relations.

---

[1] *<https://www.pewresearch.org/global/database/indicator/1/country/TR>, 28.10.2019.*

[2] *<https://www.pewresearch.org/global/database/indicator/27/country/TR>, 28.10.2019.*

This article is based on the assumption that Turkish-American relations need a renewed policy paradigm and argues that matters of controversy are likely to prevail unless such a paradigm is found on a political economy basis. Such a paradigm is supposed to compromise expectations of both sides with post-Cold War realities. In approaching Turkish-American relations from a political economy perspective, this paper hopes to offer concrete, policy-relevant insights that will be of benefit to political leaders in Turkey and the United States, as well as academicians and policy makers.

2. Retrospect

In the 19th century, relations with the other were not a matter of priority for either Turks or Americans. It was American naval presence in the Mediterranean that laid the foundation of Turkish-American relations. In the early 1800s, increased American trade and diplomatic activity in the Mediterranean gave momentum to relations. Commercial exchanges mostly consisted of Ottoman imports of petroleum products and arms. However, American interest in Turkey was highly limited despite missionaries and commercial interests. In the following decades, Turkey's orientation was mostly European, with Germany being the leading strategic ally (Larrabee & Lesser, 2003: 160-1).

The eruption of the First World War (WWI) brought already limited contacts between the two countries to a halt. American declaration of war on Germany in 1917 inevitably led to the rupture of diplomatic relations between the Ottoman Empire and the United States, resulting in a decade-long break in relations. However, the ties between the two countries were revived after the foundation of the Republic of Turkey. Distinctive differences between the Ottoman Empire and the Young Republic were highly facilitative in the restoration of relations. The political and social reforms of the Turkish Republic such as secular construction of the state and replacement of the Arabic alphabet with Latin alphabet were indications of the country's Western orientation. This period of rapprochement also transformed the perception of "Turk" in Americans' mind (Yilmaz, 2006: 223-5).

Partly due to ongoing anti-Turkish propaganda by Armenians in America and partly due to lack of sound information about Turkey, the New Republic's reforms were met with scepticism by some Americans. However, these reforms prepared a favourable environment for Turkish-American relations to flourish. A variety of actors were part of the efforts for the restoration of relations between the two countries. The United States High Commissioner Admiral Mark Lambert Bristol or ambassadors such as Joseph C. Grew (1927-1932) and Charles H. Sherrill (1932-1933) paid considerable efforts for the improvement of relations (Trask, 1970: 41-44). On Turkish side, a very important figure of the independence war and nationalist writer Halide Edip Adıvar published works countering anti-Turk voices and described the Young Republic for Americans. Following remarks by Adıvar clearly demonstrates the Turkish willingness to improve ties with the United States in that period;

> "*America has raised the standard of the man in the street as it has never been raised before. Every American, from the poorest paid shop girl to the millionaire, is*

undergoing a perpetual education from the cradle to the grave. An enormous number of scientific and educational organizations handle the child almost from the moment of its birth. An enormous number of organizations keep the American in the street in touch with what is going on in the world - at large intellectual, artistic, political, and economic." (Adıvar, 1930: 244).

In addition, reciprocal visits and contacts by business people, companies, particular organisations and leading figures were also the driving force of Turkish-American rapprochement at that time. Improvement in relations during inter-war years can be considered to have built the groundwork of Turkish-American relations after the WWII.

The WWII was a breakthrough for not only global political and economic order but also for Turkish-American relations. Unlike the WWI, Turkey adopted the principle of non-belligerence in order to avoid being a part of the conflict and avoid occupation during the war. Even staying out of the war bore dramatic consequences for Turkey. Turkish economy, which was mostly based on agriculture, severely suffered from mobilisation of a large army. Notwithstanding the economic loss resulting from the war, Turkey survived the WWII, following a successful strategy of balance of power (Oran, 2011: 235-241).

Turkey's neutrality in the WWII did not exempt it from Soviet territorial claims on eastern provinces of Kars and Ardahan and demands for renewing the terms of the Montreux Convention which regulated the use of the Straits (Satterthwaite, 1972: 77). Soviets also stipulated that the 1925 Soviet-Turkish Treaty of Friendship and Neutrality could be renewed only when these demands were satisfied. Arguing the international nature of the Montreux Convention, Turkey ruled out negotiating the status of the Straits and surrendering any territory to the Soviet Union (as cited in Evered, 2010: 53).

The Soviet threat can be regarded as a key turning point for the political history of the modern Republic of Turkey. Turkey's strict rejection of the Soviet proposals and problems regarding the modernisation of its army led Turkey welcome the support of the Truman Doctrine. The Soviet threat not only paved the way for Turkey's Western alignment and membership to the NATO but also shaped the Cold War strategy of the United States.

3. The Truman Doctrine

Turkey was far from being able to counter alone the security threats from the Soviets in the aftermath of the WWII (Isyar, 2005: 22). "After the beginning of the Ottoman decline in the late seventeenth century, Turkey had always been compelled to look to one of the Great Powers to support her against Russia. Turkey had generally obtained this support either from Britain or Austria-Hungary or later from Germany, but mostly it came from Britain. Except during the Great War, which brought Britain and Turkey into two opposite camps, the traditional British policy was to support Turkey as a barrier against Russian expansion southwards. This was the case when the USSR sought to extend its political and territorial influence at the expense of Turkey in the immediate post-Second World War

period" (Bilgin & Morewood, 2004: 24). However after 1945, Britain was no longer in a position to provide economic and military support to Greece and Turkey. Therefore, by the late 1946, it became obvious that the United States was needed to assume the responsibility of confronting the Soviet pressure and protecting the interests of the western world following the waned British influence (Çalış, 1997: 76).

In February 1947, the British government communicated to the U.S that by April, Britain would terminate its military and economic support to Turkey, hoping that this would be assumed by the United States. Consequently, American evaluation of the situation demonstrated that unless the United States took over this responsibility, Turkey would face the risk of falling under the Soviet's sphere of influence. Aware of this unsavoury possibility, the U.S. President Harry Truman addressed the Congress on March 12, 1947 and underlined the utmost necessity of supporting Greece and Turkey (Satterthwaite, 1972: 74). The decision of the United States to assume this leadership role can be considered as the milestone in Turkey's relations with the West.

Following excerpts from Truman's speech, which laid the basis of the Truman Doctrine, before the Congress demonstrates the importance attached to Turkey and Greece in what would later become the Cold War strategy of the U.S.

> *"…The gravity of the situation which confronts the world today necessitates my appearance before a joint session of the Congress. The foreign policy and the national security of this country are involved. One aspect of the present situation, which I wish to present to you at this time for your consideration and decision, concerns Greece and Turkey.*
> *…The future of Turkey as an independent and economically sound state is clearly no less important to the freedom-loving peoples of the world than the future of Greece. The circumstances in which Turkey finds itself today are considerably different from those of Greece. Turkey has been spared the disasters that have beset Greece. And during the war, the United States and Great Britain furnished Turkey with material aid. Nevertheless, Turkey now needs our support.*
> *Since the war, Turkey has sought financial assistance from Great Britain and the United States for the purpose of effecting that modernization necessary for the maintenance of its national integrity. That integrity is essential to the preservation of order in the Middle East. The British government has informed us that, owing to its own difficulties can no longer extend financial or economic aid to Turkey.*
> *…As in the case of Greece, if Turkey is to have the assistance it needs, the United States must supply it. We are the only country able to provide that help. I am fully aware of the broad implications involved if the United States extends assistance to Greece and Turkey…"*

Many regarded Truman's speech as the universal declaration of the United States to incite geopolitical security via foreign economic policy (Evered, 2010: 50). As President Truman emphasised in his address to the Congress, there were "broad implications involved"

for not only the U.S. but also Turkey and the world politics itself. The Truman Doctrine is not only a milestone in the Cold War but can also be viewed as the turning point in American foreign policy (Merrill, 2006: 37). Thereafter, the aim of development was institutionalised for all world leaders. This characterised the beginning of the relationship between foreign economic policy and security for the United States. This, in addition, constituted the Cold War origins of development (Evered, 2010: 51).

Truman Doctrine also proved to be a turning point for the Young Republic. Military and economic implications of the U.S. aid to Turkey within the framework of Truman Doctrine considerably shaped the country's trajectory on the global arena.

With the enactment of "Public Law 75", the U.S. Congress approved the aid to Turkey and Greece. Public Law 75 set forth supporting these countries via "rendering financial aid", "personnel", "military services", and "instruction and training". According to Public Law 75, Greece and Turkey were entitled up to 400 million U.S. dollars for economic and military purposes.

By 1947, Turkey had a considerably large army which had to be mobilised during the WWII despite the neutrality of the county. Notwithstanding its largesse, Turkish army's capabilities were obsolete and it was ill-equipped. In this regard, American military aid played a significant role in modernisation and re-organisation of the army. Especially, the Turkish Air Force (TAF) was in a dire situation at the time. The TAF's inventory consisted of uncompetitive aircrafts and there was lack of adequate advanced training. Besides, TAF suffered shortage of ammunition and spare parts. To strengthen the TAF's battle capabilities, the U.S. provided aircrafts, aircrew training, ammunition, supply and maintenance as well as airfield construction and air defence artillery. The TAF's communication network was also enhanced via radios, telephones and radars. In addition to material capacity of the military, the U.S. also contributed to institutional development and reorganisation of the Turkish military establishment. This close cooperation on military affairs paved the way for Turkey's formal alliance with the West (Livingston, 1994).

Military assistance in Turkey had broader positive externalites for the Turkish economy. Due to military support, a transportation network was built throughout the country, which brought about considerable economic gains for the Turkish economy (Kindleberger, 1968: 375). From another perspective, construction of these roads as part of the military assistance program made it possible for Turkey to devote its resources for economic purposes. By the time the program was launched, there were almost no all-weather road in the country (Satterthwaite, 1972: 80-2).

In Merrill's (2006: 28) words, "Truman's prescription centred on a positive program of aid giving to allies, and an ambitious agenda for nation building. The ideology of development is traceable to the early nineteenth century, an age of nascent industrialisation and continental expansion. Truman era officials respected those traditions, but drew on Keynesian theory to unleash the power of public financing and internationalise capitalism."

As underlined by Evered (2010: 51), "conjoined nature of U.S. development and security policies" and "universal prescription of this twofold policy approach" is mostly neglected. The twofold approach of the Truman Doctrine projected a structure for not only international security but also development. It would be proper to claim that although it is generally neglected in academic studies in this field, it was the Truman Doctrine that introduced development as a universal objective (Evered, 2010: 62).

Employing economic tools of statecraft for security purposes was the course of action that Americans adopted in the Cold War until the war in Korea. Economic bricks of Truman Doctrine's containment wall also laid the ground for the Marshall Plan which foresaw economic rehabilitation of Western Europe. As Kindleberger states: "In the Marshall Plan, the economics profession got an opportunity to spend $17 billion to test a theory about the relationships between economic dislocation and political behaviour. This experiment, too, was a success" (Kindleberger, 1968: 382).

According to Pollard (1985: 272-289), "the Truman presidency was probably more successful than any other post-war administration in planning and executing foreign economic policy". Truman administration employed economic power of its nation as the main tool in the U.S. security. However, the legacy of a barren understanding of the Truman doctrine constitutes a confining framework which reduces bilateral relations to a security-dominated approach. The need for a new path in Turkish-American relations has been voiced by many writers. This paper approaches to this need from a political economy perspective with a strong emphasis on the legacy of Truman Doctrine thinking. Truman Doctrine was a well-tailored response to potential expansion of the communist wave. The mind-set of the doctrine was a genius conjunction of security concerns and economic planning. In this regard, military aids were complemented by economic assistance, giving way to a strong amalgamation of "geo-politics" and "geo-economics". The aptly-use of economic instruments for the sake of geopolitical goals brought about the success of the Doctrine[3].

4. Turkey's Intrinsic Value

It was Turkey's search for a safe haven in the face of security threats from the Soviet Union that eventually led to Turkey's alliance with the West. In the formation of this alliance which was formalised with membership of Turkey in the NATO, Turkey's "strategic importance" was the key point for the U.S. (Atmaca, 2014: 19). Regarded as a pivotal country for the peace and security of the Western World, Turkey was included in the Truman

[3] *Some argue that the Truman Doctrine can be regarded as the meddling of the U.S. in both the independence and internal matters of Turkey (Ünlü-Bilgiç, 2015: 256-257). It is also claimed that "military and economic external dependence was founded by the Truman Doctrine" (Kalyon, 2010: 21; Koç & Koç, 2017: 103). For example, Turkey could use the military equipment provided by the U.S. on the condition that a foreign invasion took place. The following years witnessed the same condition imposed on the U.S. military assistance to Turkey, hence, it was claimed that it made Turkey politically and militarily dependent on the U.S. (Erhan & Sıvış, 2017: 93). Likewise, some attribute Turkey's loss of ability to independently design and perform defence policies to the Truman Doctrine (Kurç, 2010: 262).*

Doctrine, playing a historical role within the framework of the Cold War. The output of the Doctrine pointed to a win-win scenario for both parties; namely Turkey and the U.S. While the former significantly benefited from military and economic aid programs, the latter successfully carried out the Cold War strategy. However the end of the Cold War created new challenges for Turkey. With the disappearance of the common threat, Turkey ended up facing the unpleasant likelihood of losing its "strategic importance".

On the other hand, "its strategic importance" might also constitute a trap for Turkey. Especially after the end of the Cold War, Turkey sought to underline its strategic importance in order to strengthen its position in the Western Camp. With regard to Turkish-American relations, a similar dilemma faces Turkey. Therefore, the overemphasis on the concept of "strategic importance" points out to lack of "intrinsic value" in bilateral relations. In other words, the U.S. attaches an "instrumental value" to its relations with Turkey. This approach is most visible in cases of American military interventions in Iraq. Assigning the role of "stepping stone" to Turkey is likely to relegate Turkish-American relations from "strategic" to "tactical level".

In several occasions, Turkey sought to highlight its commitment to the Western alliance. For instance, by sending troops to the Korean War in 1950 and volunteering to host Jupiter missiles during the Cuban Missile Crisis in 1962, Turkey made efforts to underline and maintain its Western orientation. However, limiting Turkey's participation in the alliance to instrumental expectations is likely to tip the balance of win-win cooperation against Turkey's national interests. The Gulf War (1990-1991) and 2003 Invasion of Iraq offer adequate cases to analyse in this respect.

Following the invasion of Kuwait by Saddam Hussein's Iraq in 1990, the U.S. and Western nations took action to intervene. In response to Iraqi defiance to United Nations Security Council resolutions demanding the withdrawal of Iraqi troops, U.S.-led air strikes began against Iraqi army. Also known as "Operation Desert Storm", the military intervention resulted in a quick victory (Al-Marashi, 2018). On the other hand, the implications of the war was much more elaborate for Turkey. In the first place, Turkey sought to capitalise the Gulf War with a view to substantiate its geostrategic importance in the face of its chief ally, the U.S. Particularly, in the post-Cold War period, Turkey needed to reassert its commitment to and significance in this alliance. In this regard, Turkey agreed to deploy forces along its Iraqi border in order to divert Iraqi forces from Kuwait border. In addition, Turkish air space was open to the U.S. Furthermore, the Gulf War inflicted enormous economic loss on the Turkish economy. While cutting the oil supply from Iraqi pipelines, the economy suffered a loss of 1.2 billion $ by the end of the war (Kösebalaban, 2011: 123). Given that the war made hundreds of thousands of Iraqi Kurds take refuge in Turkey, the overall costs for Turkey can be considered much higher.

Upon urging from the U.S., Turkey made considerable contribution to the coalition effort in the Gulf War. However, Turkish expectations in the first place were replaced by disappointment and dissatisfaction (Larrabee & Lesser, 2003: 166). The war dramatically

affected the territorial integrity and military sovereignty of Iraq. Particularly the no-fly zone imposed over Kurdish region provided a safe haven for the PKK terrorist organisation, which created new challenges for Turkey's anti-terrorism struggle (Kösebalaban, 2011: 129).

The Truman Doctrine definitely played a historic role in Turkish-American relations and constructed a strong foundation on which bilateral relations can rise and diversify. However, matters of disagreement and diverging interests slowed the momentum of Turkish-American relations. In particular American military interventions in Iraq created dramatic consequences against Turkey's economic performance and its security. Therefore, Turkey's reaction was to seek for alternatives as an integral component of any sovereign state's foreign policy roadmap. Despite Turkey's commitment to Western alliance and Western institutions, the compass of national interest does not necessarily point to the West. On the other hand, Turkey's relations with Russia, Iran, Iraq and other countries in its hinterland are "intrinsically valuable". Constructed with fabrics of economy, historical links, culture, religion and politics, these relations prosper not as an alternative to those with the West but as complementary to them.

In Gelb's (2010) words, "GDP matters more than force" in today's world. Geoeconomic considerations should therefore complement geopolitics, if not replace it[4]. Bearing this pivotal consideration in mind, U.S. policy makers should define Turkey's intrinsic value as a partner in the Western alliance. Rather than determining Turkey's importance based on roles such as "bastion" or "buffer" assigned to it in American-fought wars, it is better to take into consideration the fact that Turkey is a representative of a strong statecraft and a long-lasting civilisation. Besides, Turkey is a strong candidate to become a regional hub of "development", "industrialisation", "institutional prowess" and "stability".

5. Divergence of Interests and Choke Points in Turkish-American Relations

Divergence of interests between Turkey and the U.S. became more visible in the years after the end of the Gulf War. Iraqi War in 2003 further deteriorated two countries' bilateral relations. On 1 March 2003, the government proposal to allow American forces to open a northern front on Turkish territory in the war failed to pass in Turkish Parliament. Also known as "1 March Crisis", the incident deepened the disagreements in Turkish-American relations. Lessons from the 1990-1991 Gulf War considerably shaped Turkey's position on 2003 Iraq War. Undergoing adverse effects of the Gulf War both economically and security-wise, Turkey pursued a more discreet policy in 2003. What is known as the "Hood Incident" came as another blow to Turkish-American relations in this period (Atmaca, 2011: 177). The arrest of 11 Turkish Commandos by U.S. soldiers added "loss of

[4] *The term geoeconomics has recently been introduced to the political economy literature, which means "the use of economic instruments to promote and defend national interests, and to produce beneficial geopolitical results; and the effects of other nations' economic actions on a country's geopolitical goals" (Blackwill & Harris 2016: 9).*

trust" to diverging interest over Iraq (Müftüler-Bac, 2005: 61-81). On the other hand, these rifts between two countries led to rise of Anti-Americanism in Turkey . However, it should be noted that the Anti-Americanism in Turkey is not a direct opposition to "what the U.S. is or stands for in terms of civilisation" but to "what the U.S. does". While anti-Americanism results from historical reasons in other Mediterranean countries, the situation in Turkey is highly different (Grigoriadis, 2010: 54-55). To put it in other words, Anti-Americanism in Turkey can be classified as a "reactionary defiance" to American policies rather than a "principal antagonism" to American values, which suggests that there is no existential threat to the Turkish-American alliance.

As the important events and turning points mentioned so far demonstrate, in Turkish-American relations, the main motivation of Turkey was to assert its importance in Turkish-American alliance. However, it should be noted that Turkey has been resolute to keep it as a "win-win" alliance. For this purpose, Turkish-American relations should be reconfigured in accordance with post-Cold War realities. In other words, assigning merely "strategic importance" to Turkey and unilateral expectations would fail to promote Turkish-American relations.

To restate it in Lesser's (2006: 83) words, "Turkish-U.S. relations have been prisoners of a narrow concept of geopolitics". Assigning such relational roles as "bridge", "flank", "front" or "barrier" to Turkey will confine Turkish-American relations to a myopic vision.

In the post-Cold War period, the agenda of Turkish-American relations risk falling hostage to a number of negative subject matters which can be regarded as "choke points". Cyprus issue, successive military operations in Iraq, Armenian issue and Israel can be enumerated in this regard. The urgency of unshackling Turkish-American relations from aforementioned "choke points" is addressed by several writers. In this regard, emphasizing the need for "chartering a new way for Turkish-American relations", Stein (2011: 14) argues that "both countries have to work together to clearly enumerate each other's immediate interests, identify areas of convergence, and respect areas of disagreement". Gunter (2005: 122) mentions the call for a "new thinking on part of both partners" on issues such as Iraqi Kurds, Cyprus and Turkey's EU candidacy. According to Larrabee (2010), "revitalising the U.S.-Turkey relationship" is a key priority and efforts for this purpose should include the issues of "Northern Iraq and the PKK", "the Middle East", "Armenian issues", "Turkey's membership in the EU", "Cyprus" and "Defence cooperation". For Gordon and Taspinar (2008: 61-85), there are several important steps to be taken in order to put Turkish-American relations back on track. These are "promoting a grand bargain between Turkey and the Kurds", "support liberalism and democracy in Turkey", "promote historic compromise with Armenia", and "promote a political settlement in Cyprus".

Danford (2021: 6) refers to the current situation of the relationship between Turkey and the West as: "a hostile dance", however, Danford also adds that neither Turkey, nor the West can take the risk of an actual rift. The resilience of Turkey's relationship with the West,

in general, and the U.S., specifically is touched upon by others as well (Beyoghlow, 2020; Buhari-Gulmez, 2020). It is believed that neither side would want to give an irreversable damage to their mutual relation (Beyoghlow, 2020: 71). However, if the Turkish-American relations were to worsen, the possible consequences of this rift gains importance. Flanagan & Wilson (2021: 194-197) touch upon four possible scenarios with regard to Turkey's future: i)"difficult ally", ii) "resurgent democracy", iii) "strategic balancer", iv) "Eurasian power". The fourth scenario is the one, where tensions between Turkey and the West reaches its limit, Turkey formally leaves the Western alliance, NATO, and turns to countries in the Middle East and Eurasia (Flanagan & Wilson, 2021: 197). If this is the case, the possible implications for Turkey would be: "i) Relations with the United States become distant, sometimes adversarial, ii) Routine alignment with Russia, Iran, and China to limit or offset U.S. influence, iii) Defense and military cooperation with the United States and NATO curtailed; access to bases denied. iv) Possible military incidents" (Flanagan & Wilson, 2021: 198). It should also ben mentioned that in such a case, further economic sanctions from the U.S. would add to the problems of the already vulnerable Turkish economy.

Based on the above mentioned political, security and economic implications that would arise if the Turkish American relations are not improved, it can be argued that it would be more appropriate to take the necessary steps for the sake of improving Turkish-American relations rather than taking into consideration the long-term and waiting for the opportunities that may arise over time, and taking advantage of them in terms of improving and maintaining relations. The concrete reasons for this are the main negative consequences of the possible political, security and economic problems in case of a deterioration in Turkish-American relations[5].

The emphasis that writers put on "choke points"; namely Cyprus and Armenian issues, relations with Kurds and the PKK is ultimately important. Policy makers in both countries should take required measures to make sure that these matters of controversy don't poison bilateral relations. However, there is a shortage of "positive matters of engagement" in Turkish-American relations, which is widely neglected in the literature. In the absence of a common enemy, the need for "common interests" becomes even more obvious. At this point, economic interdependence and a win-win cooperation on economic development might add a positive dimension to bilateral relations.

6. Not Only Security but Also Economics Matters

In the post-Cold War international order, security challenges still continue to occupy an important place on countries' agenda. On the other hand, issues such as economic growth, infrastructure, development, energy security, industrialisation and social welfare increasingly dominate domestic and foreign policy making. Besides, multipolar nature of the international system allows nations pursue multidirectional policies in order to achieve

[5] *The future of Turkish-American relations is a heavily discussed issue. See: Arısan-Eralp et al. (2021), RAND Corporation (2021), Ülgen (2021) for further discussions.*

these goals. Therefore, Turkish-American relations need to focus on not only security but also economic matters. It was the dual nature of the Truman Doctrine that brought about its success and made a win-win cooperation possible. In this respect, remembering the economic success of it will help today's decision makers construct a cooperation based on positive matters of engagement. In the absence of a common threat, both countries are expected to focus on a positive agenda so that relations can prosper in a mutually beneficial way.

Since the turn of the 21st century, Turkey has been implementing a multi-directional foreign policy in a pragmatic way in order to promote its economic growth and political clout in the region. In accordance with this approach, economic considerations led to a considerable rapprochement between Turkey and its neighbours such as Russia, Iraq and Iran. Particularly, Turkey's relations with the villain of the Cold War dramatically improved in the last two decades. While Turkish-Russian relations were mostly characterised as hostile throughout the history, economic pragmatism and improved trade have brought two countries ever closer. Complementary nature of two countries' economies and highly intertwined interests overs energy projects in the region made cooperation inevitable. In addition to increased trade volume and energy cooperation, a number of issues such as tourism, technology transfer and people-to-people interactions play significant role in this rapprochement. On the other hand, Turkey built mutually beneficial economic cooperation with Iran and Iraq. While Iraq has become one of Turkey's top export markets, energy trade with Iran significantly improved. Despite controversial matters such as regional rivalry, sectarian differences, water issues and security matters, the trilogy was able to overcome their differences for the sake of pragmatic expectations (Kılıç, 2017: 55-64).

With indispensable economic considerations in question for both countries, Turkey and Russia achieved an unprecedented improvement in bilateral relations in the period after 2000. That is, trade with Russia has been an important driving force behind the visible improvement in Turkish-Russian relations (Larrabee, 2010: 160). A great number of high level state visits have been conducted reciprocally. While trade and energy have been up on the agenda during these visits, trade volume between the two countries witnessed such a considerable increase that Turkish-Russian economic rapprochement matched political dialogue which was also propelled by economic pragmatism. A bilateral trade of approximately $4.5 billion in 2000 increased to more than $22.3 billion in 2020, demonstrating the extent of the role of trade in Turkish-Russian cooperation in the last two decades. Trade volume in 2020 was accompanied by a trade deficit to Turkey's disadvantage with a great portion of Turkey's trade deficit with Russia being based on its energy imports from the Russian Federation. As an energy-dependent country, Turkey imported a total of 45.211,47 million sm^3 of natural gas in 2019. Russia is the largest supplier of natural gas to Turkey, with the share of 33.61%, which amounts to 15.196 million sm^3 for the same year (EPDK, 2019). In addition to trade in goods, two countries' services trade also strengthens this mutual dependence. While Turkish and Russian products complement each other, Turkish services exports in tourism and construction fields constitutes a key component of interdependence.

It is argued in the literature that economic cooperation is one of a number of major subjects on which Turkish-Iranian relations are based (Calabrese, 1998). To denote the decreasing importance of security-related issues straining relations between the two countries, Aras and Karakaya Polat (2008) uses concept of "de-securitisation", which refers to shifting from a constant state of alert into a state of pragmatic and strategic calculations, while Sinkaya (2012) describes Turkey's pragmatic approach to relations with Iran as "rationalisation of Turkish-Iranian relations". In line with Turkey's post-2000 foreign policy, bilateral trade between Turkey and Iran increased. Turkish-Iranian trade volume was slightly more than $1 billion in 2000, and it increased approximately to $2.5 billion in the first 6 months of 2021[6]. It should be noted that Iran is the 3rd natural gas supplier for Turkey with 7.736 million sm^3 after Russia and Azerbiajan (EPDK, 2019).

Despite the fact that geographical proximity between Turkey and Iraq is of pivotal importance with regard to the volume of trade, Iraq was not among the top destinations for Turkish exports in the early 2000s. However, this has changed in the last two decades. Iraq was the 3rd export partner of Turkey with 5.4% share in 2019. This illustrates that Turkey maintains highly important trade links with Iraq. In Müftüler-Baç's (2014) words, Turkey has been using trade and foreign direct investment as foreign policy tools strengthening its engagement with Iraq, which refers to use of trade as a "means". On the other hand, in line with Turkey's growing economy which is dependent on exports, Turkey wants to enlarge its export markets in Iraq (Barkey, 2011), making the use of trade an "end" in this regard.

Turkey's growing activism in the Middle East, Africa and Central Asia and strengthening relations with non-western countries led to debates on Turkey's western orientation. It was alleged that the axis of Turkish foreign policy began to shift from the west to the east (Kutlay, 2011; Civan, Genç, Taser & Atakul, 2013; Babacan, 2011; Öniş, 2011). However such allegations are considered to be exaggerations. Turkey's bid to benefit from emerging possibilities in its environment, especially its drive to make it to exclusive club of developed economies should be understood as sovereign nations' right to follow an independent foreign policy in search and wealth and power.

Positive externalities of economic interdependence and peace-inducing effects of trade links are widely appreciated. On the other hand, economic interests are capable of creating "common constituencies" for bilateral relations. Raising the stakes for all parties, economic interdependence also function as an "insurance mechanism" in case of crises. In this regard, Turkish-Russian relations provide a good case study to highlight these positive externalities from economic interdependence. Due to complementary nature of both economies and high level cooperation in mega projects, relations between Turkey and Russia have become considerably crisis-resistant. Two countries' prudent handling of "2015 Jet Crisis" and restricted actions afterwards point to mitigating effects of positive matters of engagement.

---

6 *See the data in Turkish Statistical Institute, <https://data.tuik.gov.tr>, 28.10.2019.*

The possibilities of creating "common constituencies" and "insurance mechanisms" for Turkey and the U.S. can be examined by scrutinising trade and investment between these countries.

Table: 1
Turkey's Imports by Country and Year, Share in Total Imports (%)

Rank	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Country/Year	Russian Federation	Germany	China	**United States**	Italy	France	India	Korea, Rep.	United Kingdom	Spain
1990	..	15,7	1,1	**10,2**	7,7	6,0	0,4	1,4	4,5	1,5
1991	..	15,4	0,8	**10,7**	8,8	5,8	0,4	1,7	5,5	1,5
1992	4,6	16,4	0,8	**11,4**	8,4	5,9	0,4	1,6	5,2	1,4
1993	5,2	15,4	0,9	**11,4**	8,7	6,6	0,5	2,1	5,3	1,5
1994	4,5	15,7	1,1	**10,4**	8,6	6,3	0,5	1,2	5,0	1,6
1995	5,8	15,5	1,5	**10,4**	8,9	5,6	0,6	1,6	5,1	1,7
1996	4,4	17,7	1,3	**7,7**	9,9	6,4	0,6	1,7	5,8	2,3
1997	4,5	16,5	1,6	**8,9**	9,2	6,1	0,6	2,2	5,7	2,6
1998	4,7	15,9	1,8	**8,8**	9,2	6,6	0,6	2,4	5,8	2,8
1999	5,8	14,5	2,2	**7,6**	7,8	7,7	0,6	2,1	5,4	3,1
2000	7,2	13,2	2,4	**7,2**	8,0	6,5	0,8	2,2	5,0	3,1
2001	8,3	12,9	2,2	**7,9**	8,4	5,5	0,9	1,8	4,6	2,6
2002	7,5	13,7	2,7	**6,0**	8,1	5,9	1,1	1,8	4,7	2,7
2003	7,9	13,6	3,8	**5,0**	7,9	6,0	1,0	1,9	5,0	2,9
2004	9,3	12,8	4,6	**4,9**	7,0	6,4	1,1	2,6	4,4	3,3
2005	11,1	11,7	5,9	**4,6**	6,5	5,0	1,1	3,0	4,0	3,0
2006	12,8	10,6	6,9	**4,5**	6,2	5,2	1,1	2,5	3,7	2,7
2007	13,8	10,3	7,8	**4,8**	5,9	4,6	1,4	2,6	3,2	2,6
2008	15,5	9,3	7,8	**5,9**	5,3	4,5	1,2	2,0	2,6	2,3
2009	13,8	10,0	9,0	**6,1**	5,4	5,0	1,4	2,2	2,5	2,7
2010	11,6	9,5	9,3	**6,6**	5,5	4,4	1,8	2,6	2,5	2,6
2011	9,9	9,5	9,0	**6,7**	5,6	3,8	2,7	2,6	2,4	2,6
2012	11,3	9,0	9,0	**6,0**	5,6	3,6	2,5	2,4	2,4	2,5
2013	10,0	9,6	9,8	**5,0**	5,1	3,2	2,5	2,4	2,5	2,6
2014	10,4	9,2	10,3	**5,3**	5,0	3,4	2,8	3,1	2,4	2,5
2015	9,8	10,3	12,0	**5,4**	5,1	3,7	2,7	3,4	2,7	2,7
2016	7,6	10,8	12,8	**5,5**	5,1	3,7	2,9	3,2	2,7	2,9
2017	8,3	9,1	10,0	**5,1**	4,8	3,5	2,7	2,8	2,8	2,7
2018	9,9	9,1	9,3	**5,5**	4,6	3,3	3,4	2,8	3,3	2,5
2019	11,0	9,2	9,1	**5,6**	4,4	3,2	3,2	2,7	2,7	2,1

Source: World Bank, 2021[7].

As can be seen in Table 1., after the Russian Federation, Germany and China with 11%, 9,2% and 9,1% shares, respectively in Turkey's imports, the United States has a share of 5,1 % in 2019, and this share was relatively stable in the past few years. However, compared to the 1990 and 2000 shares of 10,2% and 7,2%, respectively, this share in 2019 is lower. Turkey's goods imports from the U.S. amounted to $11,9 billion in 2019, with a decrease from the value of $12.4 billion in 2018[8].

[7] *See: <https://wits.worldbank.org>, 28.10.2021.*

[8] *See: <https://wits.worldbank.org>, 28.10.202. Table A.1 in the Appendix comprises Turkey's imports from the United States.*

Table: 2
Turkey's Exports by Country and Year, Share in Total Exports (%)

Rank	1	2	3	4	5	6	7	8	9	10
Country/Year	**Germany**	**United Kingdom**	**Iraq**	**Italy**	**United States**	**Spain**	**France**	**Netherlands**	**Israel**	**Russian Federation**
1990	23,6	5,7	1,7	8,5	**7,5**	1,5	5,7	3,4	0,4	..
1991	25,1	5,0	0,9	7,1	**6,7**	1,8	5,1	3,5	0,6	..
1992	24,9	5,4	1,4	6,4	**5,9**	2,0	5,5	3,4	0,6	3,0
1993	23,8	5,4	1,0	4,9	**6,4**	1,3	5,0	3,4	0,5	3,3
1994	21,7	4,9	0,8	5,7	**8,4**	1,3	4,7	3,4	1,0	4,5
1995	23,3	5,3	0,6	6,7	**7,0**	1,7	4,8	3,4	1,1	5,7
1996	22,4	5,4	0,8	6,2	**7,0**	1,6	4,5	3,3	1,1	6,5
1997	20,0	5,8	0,2	5,3	**7,7**	1,7	4,4	3,0	1,5	7,8
1998	20,3	6,4	0,0	5,8	**8,3**	1,9	4,8	3,3	1,8	5,0
1999	20,6	6,9	..	6,3	**9,2**	2,9	5,9	3,5	2,2	2,2
2000	18,8	7,4	..	6,4	**11,2**	2,6	6,0	3,2	2,3	2,3
2001	17,1	6,9	..	7,5	**10,0**	3,0	6,0	2,8	2,6	2,9
2002	16,3	8,4	..	6,6	**9,3**	3,1	5,9	2,9	2,4	3,3
2003	15,8	7,8	1,8	6,8	**7,9**	3,8	6,0	3,2	2,3	2,9
2004	13,9	8,8	2,9	7,4	**7,7**	4,1	5,8	3,4	2,1	2,9
2005	12,9	8,1	3,7	7,6	**6,7**	4,1	5,2	3,4	2,0	3,2
2006	11,3	8,0	3,0	7,9	**5,9**	4,4	5,4	3,0	1,8	3,8
2007	11,2	8,0	2,7	7,0	**3,9**	4,3	5,6	2,8	1,5	4,4
2008	9,8	6,2	3,0	5,9	**3,3**	3,1	5,0	2,4	1,5	4,9
2009	9,6	5,8	5,0	5,8	**3,2**	2,8	6,1	2,1	1,5	3,1
2010	10,1	6,4	5,3	5,7	**3,3**	3,1	5,3	2,2	1,8	4,1
2011	10,3	6,0	6,2	5,8	**3,4**	2,9	5,0	2,4	1,8	4,4
2012	8,6	5,7	7,1	4,2	**3,7**	2,4	4,1	2,1	1,5	4,4
2013	9,0	5,8	7,9	4,4	**3,7**	2,9	4,2	2,3	1,7	4,6
2014	9,6	6,3	6,9	4,5	**4,0**	3,0	4,1	2,2	1,9	3,8
2015	9,3	7,3	5,9	4,8	**4,4**	3,3	4,1	2,2	1,9	2,5
2016	9,8	8,2	5,4	5,3	**4,6**	3,5	4,2	2,5	2,1	1,2
2017	9,6	6,1	5,8	5,4	**5,5**	4,0	4,2	2,5	2,2	1,7
2018	9,6	6,6	5,0	5,7	**4,9**	4,6	4,3	2,8	2,3	2,0
2019	9,2	6,2	5,7	5,4	**5,0**	4,5	4,4	3,2	2,5	2,3

Source: World Bank, 2021[9].

According to Table 2., United States comes after Germany (9,2%), United Kingdom (6,2%), Iraq (5,7%) and Italy (5,4%), with a 5 % share in Turkey's exports in 2019. This share was again stable in recent years. However, compared to the shares of 7.5% and 11,2% in 1990 and 2000, respectively, this share in 2019 is lower. Turkey's goods exports to the U.S. was approximately $9 billion in 2019, with an increase from $8,3 billion in 2018[10].[11] With regard to trade, it can be stated that despite the increase in the overall trade between Turkey and the U.S. from $10,8 billion in 2009 to approximately $20,9 billion in 2019, this volume of trade is still below its potential.

[9] *See the data in <https://wits.worldbank.org>, 28.10.2021.*

[10] *See the data in <https://wits.worldbank.org>, 28.10.2021. Table A.2 in the Appendix comprises Turkey's exports to the United States.*

[11].

Table: 3
Turkey's Foreign Direct Investment by Partner Country (Flow), US Dollar, Millions

	Inward FDI from	Outward FDI to
	United States	United States
2015	1578.2	1334.5
2016	507.6	831.0
2017	233.7	796.2
2018	498.0	775.4
2019	349.5	595.3

Source: OECD, 2021[12].

With regard to investment, U.S. foreign direct investment (FDI) to Turkey amounted to approximately $3.5 billion in 2019, with a decrease from the 2018 value of approximately $5 billion, while FDI from Turkey to U.S. was approximately $6 billion in 2019, again with a decrease from the 2018 value of approximately $7.8 billion. As can be seen in Table 3, FDI between Turkey and the U.S. decreased in years, referring to a capacity below its potential as in the case of trade. Manufacturing, wholesale trade, and depository institutions constitute the main categories of U.S. foreign direct investment in Turkey[13].

It can be argued that there are considerable but neglected cooperation areas such as trade and investment in Turkish-American relations. Hence, although security issues dominated bilateral relations because of strong intellectual, political and geostrategic roots (Larrabee and Lesser 2003: 163), in addition to these security issues and the relations in the political sphere, it is also this economic dimension that needs to be taken into account when considering Turkish-American relations and making policy recommendations. In fact, the relationship between economic and political domains is mutual. Just like politics, economics itself cannot give a complete picture of the dynamics behind the events. In Okyar's words: "Experience and history teach us that noneconomic factors - political, strategic, and perhaps cultural - always influence in varying degree the course of economic policy. This is illustrated by the example of Turkey, where, in addition to purely economic motives, these factors have been influential in shaping economic policies throughout the history of the Republic" (Okyar 1979: 326). Hence, a study, which does not take into consideration this mutual relationship would be incomplete. This study also aims to contribute to the literature with its emphasis on this reality and to provide the very much needed political economy approach.

7. Conclusion

Since 1945, Turkey's relations with the United States have been an important component of its foreign and security policy. This relationship has remained crucial for both sides for decades, and it still bears prominence. The membership of Turkey in NATO comprised comprehensive relations with the United States in political and economic spheres as well as the military ties. After WWII, the world political leaders were aware of the fact

---

[12] *See the data in <https://data.oecd.org/>, 28.10.2021.*

[13] *See <https://ustr.gov/countries-regions/europe-middle-east/europe/turkey>, 13.09.2021.*

that national security could not be considered independent of the conditions in the world economy. In this sense, the United States made use of its unchallenged economic position in securing its strategic aims (Pollard, 1985: 289).

The two emphasis of this paper - legacy of the Truman Doctrine and the importance of political economy lessons to be learned from - become even more relevant in the light of the recent developments in Turkish-American relations. Particularly, in the wake of the uprising in Syria, two countries' relative positions and moves on the ground led to ever-greater rifts in bilateral relations. Once again in the history of Turkish-American relations, security and geopolitics captured the relations. In the face of the growing security threats originating from Syria, Turkey has engaged in increased cooperation with other actors such as Russian and Iran, which has long been designated by the US as threats to the international order. Moreover, Turkey's purchases of S-400 air defence systems from Russia has further deteriorated the mutual trust between Turkey and the U.S., while the former blames the latter for supporting groups regarded as terorist organisations and the latter accuses the former for acting against American interests and Western preferences.

The significance of economic relations in Turkish-American relations, on the other hand, has once again come to the forefront following the American threats to impose sanctions on the Turkish economy unless Turkey restructures its relative positions in line with those of the U.S. While economic tools offer alternative punitive policy moves for the U.S., inclusion of economic gains as a motivation for both sides would make significant contributions to Turkish-American relations. As Alzawawy stated (2021: 25): "Turkey has been a cornerstone of the American strategy to contain Russia since the time of the famed Truman Doctrine". Since one of the main U.S. strategies during the current Joe Biden Presidency still comprises "containing Russia" (as cited in Alzawawy 2021: 25) in addition to the others, it can be claimed that legacy of the Truman Doctrine is still valid for the current Turkish-American relations.

In the past few decades, the world economy has been witnessing immense flows of financial capital, strong trading blocs have emerged, there is increase in high-technology production, and accordingly, developing countries feel the need to transfer this technology. In this sense, Turkey's relations with the United States is decisive. A self-sustained economy does not imply an economy merely depending on itself but it rather includes achieving not only self-sufficiency as a nation but it also has the aim of increasing its capacity in international trade and exchange of services and factors of production in order to integrate with the world economy (Okyar, 1979: 340). From this point of view, stakes are high for both Turkey and United States if they can enhance their economic relations. Increased economic interdependence, in turn, would foster political relations, and help the two nations overcome the choke points.

Despite the fact that the task of reviving Turkish-American relations via tools of political economy is not an easy one, there are a number of steps to be taken which can pave the way to this goal. Firstly, both parties should bear in mind that the U.S. possess the

greatest military and economic power in the world. American military and technological myth should be regarded as a potential propeller for bilateral relations. According to the FDI statistics in Turkey, the U.S. lags behind European countries such as Germany, Austria, Belgium, Netherlands, England and Spain, making it the 10th biggest investor in Turkey. Despite the geographical distance between two countries, bilateral trade volume can be increased. In addition, an increased flow of U.S. technology and investment into Turkey should be encouraged by both policy makers and business groups. Greater American role in Turkey's industrialisation journey would not only enhance both parties' commitment to bilateral relations but also provide a regional economic strategy for American business makers. In other words, regarding Turkey as an industrial production hub rather than a military headquarter is more likely to create a mutually-acceptable partnership. Turkish business groups have made efforts for the sake of increasing investment and trade ties between the two countries. As an example, the opening up of a representative office of TUSIAD in Washington can be given (Larrabee & Lesser, 2003: 180). In this sense, the private sector can take a more active role in deepening economic relations in addition to the state policies implemented. On the other hand, joint ventures in terms of military technology would also revive Turkish-American military cooperation. In this regard, Turkey's bid for greater participation in international consortium for manufacturing of F-35 Joint Strike Fighter aircrafts should be supported by the U.S. Remembering Turkish appreciation of American military assistance as part of the Truman Doctrine and the contribution it made to development of Turkish-American strategic partnership, such joint ventures would be highly welcomed by Turkey that seeks to nationalise its military industry. Secondly the U.S. should seek quest for greater engagement in Turkey's efforts to achieve peaceful use of nuclear energy for the sake of its economic growth. As a net importer of energy sources, Turkey actively cooperates with Russia and Japan for the construction of nuclear energy power plants in Sinop and Mersin provinces. Increased American participation in such mega projects designed by Turkey would not only mitigate American concerns with regard to Turkey's political orientation, but also help Turkey diversify its supply sources and increase its bargaining power. Thirdly, only a few of the Americans are informed about Turkey, while the positive image of the United States is in decline in the eyes of the Turks as previously mentioned in this paper. The U.S. should bear in mind that every American policy which creates negative outcomes for Turkey consequently lead to rise of anti-Americanism in the country. However, the U.S. should also remember that in Turkey, there is no "principal anti-Americanism", which opposes American values. To put it differently, the U.S. can win hearts and minds of Turkish people as long as U.S. decision makers pay plenty of attention to Turkey's expectation and sensitivities. Increased visibility of American support to educational, scientific, cultural and social life in Turkey would be the right course of action to be taken for this purpose.

To sum up, learning from the success of the Truman Doctrine and refraining from letting its legacy choke Turkish-American relations is pivotal for the future of the two countries' bilateral relations. Besides, both parties should make efforts to inject "positive matters of cooperation" into their common agenda on every occasion.

References

Adıvar, H. (1930), *Turkey faces West*, New Haven: Yale University Press.

Al-Marashi, I. (2018), *The enduring legacy of Operation Desert Storm*, <https://www.aljazeera.com/indepth/opinion/2016/01/operation-desert-storm-25-years-iraq-saddam-hussein-kuwait-160117064302534.html>, 27.11.2019.

Alzawawy, M.S. (2021) "What Biden May Bring to the Eastern Mediterranean Region", *Insight Turkey*, 23(1), 23-34.

Aras, B. & R. Karakaya-Polat (2008), "From Conflict to Cooperation: Desecuritization of Turkey's Relations with Syria and Iran", *Security Dialogue*, 39(5), 495-515.

Arısan-Eralp, N. & S. Aydın-Düzgit & A. Eralp & E.F. Keyman & Ç. Nas (2021) "Turkey-U.S. Relations in the changing transatlantic context", *IPC Policy Brief*.

Atmaca, A.Ö. (2011) "Yeni Dünyada Eski Oyun: Eleştirel Perspektiften Türk-Amerikan İlişkileri", *Ortadoğu Etütleri*, 3(1), 157-191.

Atmaca, A.Ö. (2014) "The Geopolitical Origins of Turkish-American Relations: Revisiting the Cold War Years", *All Azimuth*, 3(1), 19-34.

Babacan, M. (2011), "Whither an axis shift: a perspective from Turkey's foreign trade", *Insight Turkey*, 13(1), 129-157.

Barkey, H.J. (2011), "Turkey and Iraq: The Making of a Partnership", *Turkish Studies*, 12(4), 663-674.

Beyoghlow, K.A. (2020), *Turkey and the United States on the Brink: Implications for Nato and the US-Turkish Strategic and Military Partnership*, Strategic Studies Institute and U.S. Army War College Press.

Bilgin, M.S. & S. Morewood (2004), "Turkey's Reliance on Britain: British Political and Diplomatic Support for Turkey against Soviet Demands", *Middle Eastern Studies*, 40(2), 24-57.

Blackwill, R.D. & J.M. Harris (2016), *War by Other Means. Geoeconomics and Statecraft*, Cambridge, Massachusetts London, England: The Belknap Press of Harvard University Press.

Buhari-Gulmez, D. (2020), "The resilience of the US-Turkey alliance: divergent threat perceptions and worldviews", *Contemporary Politics*, 26(4), 475-492.

Calabrese, J. (1998) "Turkey and Iran: Limits of a Stable Relationship", *Journal of Middle Eastern Studies*, 25(1), 75-94.

Civan, A. & S. Genc & D. Taser & S. Atakul (2013), "The effect of new Turkish foreign policy on international trade", *Insight Turkey*, 15(3), 107-122.

Çalış, S. (1997), "Turkey in the International System of Western States", *Pakistan Horizon*, 50(3), 75-100.

Danforth, N. (2021) "A Cool, Cautious Calm: US-Turkey Relations Six Months into the Biden Administration", *Foreign Policy at Brookings*.

EPDK (Republic of Turkey, Energy Market Regulatory Authority), (2019), *Turkish Natural Gas Market Report*.

Erhan, Ç. & E. Sıvış (2017) "Determinants of Turkish-American Relations and Prospects for the Future", *Insight Turkey*, 19(1), 89-116.

Evered, K. (2010), "The Truman Doctrine in Greece and Turkey: America's Cold War fusion of development and security", *Arab World Geographer*, 13, 50-65.

Flanagan, S.J. & P.A. Wilson (2021) "Implications for the U.S.-Turkish Partnership and the U.S. Army", in: RAND Corporation, *Turkey's Nationalist Discourse, Implications for the U.S.-Turkish Strategic Partnership and the U.S. Army*. Santa Monica: RAND Corporation.

Gelb, L. (2010), "GDP Now Matters More Than Force: A U.S. Foreign Policy for the Age of Economic Power", *Foreign Affairs*, 89(6), 35-43.

Gordon, P. & O. Taspinar (2008), *Winning Turkey*, Harrisonburg,Virginia: R.R. Donnelley.

Grigoriadis, I. (2010), "Friends No More? The Rise of Anti-American Nationalism in Turkey", *Middle East Journal*, 64(1), 51-66.

Gunter, M. (2005), "The U.S.-Turkish Alliance in Disarray", *World Affairs*, 167(3), 113-123.

Isyar, Ö.G. (2005) "An Analysis of Turkish-American Relations from 1945 to 2004: Initiatives and Reactions in Turkish Foreign Policy", *Alternatives: Turkish Journal of International Relations*, 4(3), 21-52.

Kalyon, L. (2010) "Truman Doktrini Üzerine Bir Analiz", *Güvenlik Stratejileri Dergisi*, 6(11), 7-26.

Kılıç, E. (2017), "The Political Economy of Turkey's Trade Relations: Expensive Enmities and Cheap Amities", *Master's Thesis*, Hacettepe University.

Kindleberger, C. (1968), "The Marshall Plan and the Cold War", *International Journal*, 23(3), 369-382.

Kosebalaban, H. (2011), *Turkish Foreign Policy*, New York: Palgrave Macmillan.

Kurç, Ç. (2017) "Between defence autarky and dependency: the dynamics of Turkish defence industrialization", *Defence Studies*, 17(3), 260-281.

Kutlay, M. (2011), "Economy as the 'practical hand' of 'new Turkish foreign policy': a political economy explanation", *Insight Turkey*, 13(1), 67-88.

Larrabee, F. & I. Lesser (2003), "Turkey and The United States", in: *Turkish Foreign Policy in an Age of Uncertainty*, Santa Monica, CA; Arlington, VA; Pittsburgh, PA: RAND Corporation, 159-186.

Larrabee, F. (2010), *Troubled Partnership: U.S.-Turkish Relations in an Era of Global Geopolitical Change*, Santa Monica, CA; Arlington, VA; Pittsburgh, PA: RAND Corporation.

Larrabee, S.F. (2010), "Turkey's New Geopolitics", *Survival*, 52(2), 157-180.

Lesser, I.O. (2006), "Turkey, the United States and the Delusion of geopolitics", *Survival*, 48, 83-96.

Livingston, C. (1994), " 'One Thousand Wings': The United States Air Force Group and the American Mission for Aid to Turkey, 1947-50", *Middle Eastern Studies*, 30(4), 778-825.

Merrill, D. (2006), "The Truman Doctrine: Containing Communism and Modernity", *Presidential Studies Quarterly*, 36(1), 27-37.

Müftüler-Bac, M. (2005), "Turkey and the United States: The Impact of the War in Iraq", *International Journal*, 61(1), 61-81.

Müftüler-Baç, M. (2014), "Changing Turkish foreign policy towards Iraq: New tools of engagement", *Cambridge Review of International Affairs*, 27(3), 538-552.

Nurgün-Koç, N., & B. Koç. (2017) "Effects of Marshall Plan on Turkish Economy", *Sociology Study*, 7(2), 83-121.

Okyar, O. (1979), "Development Background of the Turkish Economy, 1923-1973", *International Journal of Middle East Studies*, 10(3), 325- 344.

Oran, B. (2011), *Turkish Foreign Policy, 1919-2006*, Salt Lake City: The University of Utah Press.

Ozel, S. (2011), "Indispensable even when unreliable: An anatomy of Turkish-American relations", *International Journal*, 67(1), 53-64.

Öniş, Z. (2011), "Multiple faces of the 'new' Turkish foreign policy: underlying dynamics and a critique", *Insight Turkey*, 13(1), 47-65.

Pollard, R. (1985), "Economic Security and the Origins of the Cold War: Bretton Woods, the Marshall Plan, and American Rearmament, 1944-50", *Diplomatic History*, 9(3), 271-289.

RAND Corporation (2021), *Turkey's Nationalist Discourse, Implications for the U.S.-Turkish Strategic Partnership and the U.S. Army*, Santa Monica: RAND Corporation.

Satterthwaite, J. (1972), "The Truman Doctrine: Turkey", *The Annals of the American Academy of Political and Social Science*, 401, 74-84.

Sinkaya, B. (2012), "Rationalization of Turkey-Iran Relations: Prospects and Limits", *Insight Turkey*, 14(2), 137-156.

Stein, A. (2011), "Resetting U.S.-Turkish Relations: Charting a New Way Forward", *Journal of Strategic Security*, 4(1), 1-18.

Trask, R. (1970), "The "Terrible Turk" and Turkish-American Relations in the Interwar Period", *The Historian*, 33(1), 40-53.

Ülgen, S. (2021) "Redefining the U.S.-Turkey Relationship", *Carnegie Endowment for International Peace Working Paper*.

Ünlü-Bilgiç, T. (2015), "The Roots of Anti-Americanism in Turkey 1945-1960", *Bilig*, 72, 251-280.

Yilmaz, Ş. (2006), "Challenging the Stereotypes: Turkish-American Relations in the Inter-War Era", *Middle Eastern Studies*, 42(2), 223-237.

Appendix

Table: A.1
Turkey's Imports from United States of America[14]

Product Code	Product Label	Value in 2020, USD thousand	Annual growth in value between 2016-2020, %	Share in Turkey's imports, %
'88	Aircraft, spacecraft, and parts thereof	1903349	0	51
'75	Nickel and articles thereof	96535	8	44
'81	Other base metals; cermets; articles thereof	92440	16	42
'08	Edible fruit and nuts; peel of citrus fruit or melons	243144	15	27
'02	Meat and edible meat offal	17923		24
'52	Cotton	592352	1	23
'47	Pulp of wood or of other fibrous cellulosic material; recovered (waste and scrap) paper or **...**	156010	2	17
'90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical **...**	648453	-1	14

[14] *For the complete data set see: <https://www.trademap.org/Bilateral.aspx?nvpm=1%7c792%7c%7c842%7c%7cTOTAL%7c%7c%7c2%7c1%7c1%7c1%7c1%7c%7c1%7c1%7c>, 01.09.2021.*

'37	Photographic or cinematographic goods	15003	12	13
'36	Explosives; pyrotechnic products; matches; pyrophoric alloys; certain combustible preparations	5658	33	13
'22	Beverages, spirits and vinegar	57144	25	12
'30	Pharmaceutical products	536507	0	11
'23	Residues and waste from the food industries; prepared animal fodder	179386	-13	10
'05	Products of animal origin, not elsewhere specified or included	5249	-10	10
'27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral **...**	1007407	11	9
'29	Organic chemicals	497248	22	9
'44	Wood and articles of wood; wood charcoal	39414	-30	9
'72	Iron and steel	1262238	11	8
'97	Works of art, collectors' pieces and antiques	586	-52	8

Source: ITC, Trade Map, 2021.

Table: A.2
Turkey's Exports to United States of America[15]

		Value in 2020, USD thousand	**Annual growth in value between 2016-2020, %**	**Share in Turkey's exports, %**
'93	Arms and ammunition; parts and accessories thereof	332252	28	65
'57	Carpets and other textile floor coverings	942942	28	36
'68	Articles of stone, plaster, cement, asbestos, mica or similar materials	382094	5	26
'88	Aircraft, spacecraft, and parts thereof	238118	-9	26
'81	Other base metals; cermets; articles thereof	38102	142	26
'09	Coffee, tea, maté and spices	58834	23	23
'80	Tin and articles thereof	1455	124	20
'17	Sugars and sugar confectionery	105996	8	16
'71	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad **...**	962247	38	14
'69	Ceramic products	156351	19	13
'24	Tobacco and manufactured tobacco substitutes	111154	-13	12
'91	Clocks and watches and parts thereof	4027	32	12
'63	Other made-up textile articles; sets; worn clothing and worn textile articles; rags	281599	3	11
'56	Wadding, felt and nonwovens; special yarns; twine, cordage, ropes and cables and articles thereof	103297	18	11
'12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal **...**	45548	-14	11
'25	Salt; sulphur; earths and stone; plastering materials, lime and cement	270182	24	10
'20	Preparations of vegetables, fruit, nuts or other parts of plants	246695	20	10
'55	Man-made staple fibres	88709	3	10
'46	Manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork	201	179	10
'34	Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial **...**	100672	82	9
'33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations	82269	77	9
'36	Explosives; pyrotechnic products; matches; pyrophoric alloys; certain combustible preparations	2039	56	9
'97	Works of art, collectors' pieces and antiques	957	-3	9
'92	Musical instruments; parts and accessories of such articles	955	4	9

Source: ITC, Trade Map, 2021.

[15] *For the complete data set see: <https://www.trademap.org/Bilateral.aspx?nvpm=1%7c792%7c%7c842%7c%7cTOTAL%7c%7c%7c2%7c1%7c1%7c2%7c1%7c%7c1%7c1%7c1%7c1%7c1>, 01.09. 2021.*

Sosyoekonomi

2021, Vol. 29(50), 131-147

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.07
Date Submitted: 16.03.2020
Date Revised: 17.08.2021
Date Accepted: 20.08.2021

Tax Awareness and Morality in the Effectiveness of Tax Revenues: Secondary School Teachers' Tax Perception Analysis in Manavgat, Antalya

Emine UZUNALİ *(https://orcid.org/0000-0002-7610-1567), Akdeniz University, Turkey; euzunali@akdeniz.edu.tr*

Yasin OĞUZ *(https://orcid.org/0000-0002-7509-4035), Akdeniz University, Turkey; oguzyasin.007@gmail.com*

Volkan OLCA *(https://orcid.org/0000-0002-6357-5990), Akdeniz University, Turkey; volkanolca07@gmail.com*

Mehmet DAĞ *(https://orcid.org/0000-0003-2206-2184), Siirt University, Turkey; mehmet.dag@siirt.edu.tr*

Kazım KUMAŞ *(https://orcid.org/0000-0002-2348-4664), Burdur Mehmet Akif Ersoy University, Turkey; kkumas@mehmetakif.edu.tr*

Afşin GÜNGÖR *(https://orcid.org/0000-0002-4245-7741), Akdeniz University, Turkey; afsingungor@hotmail.com*

Vergi Gelirlerinin Etkinliğinde Vergi Bilinci ve Vergi Ahlakının Önemi: Antalya İli Manavgat İlçesi Ortaokul Öğretmenleri Üzerinde Bir Algı Analizi Çalışması

Abstract

This study aims to examine the tax awareness and moral perceptions of teachers. In this context, a survey was conducted with 124 teachers working in Antalya Province, Manavgat District, and the obtained data were analysed with Kruskal-Wallis H. Tests using the SPSS program. According to the study's findings, it was seen that the tax awareness of the teachers who gave the training to increase tax awareness and morality was not sufficient. The study's findings are significant because no study is conducted on teachers on tax awareness and morality in the literature.

Keywords : Budget, Tax, Tax Awareness, Tax Administration, Tax Education.

JEL Classification Codes : H20, H29.

Öz

Bu çalışmanın amacı öğretmenlerin vergi bilinci ve ahlaki algılarının incelenmesidir. Bu çerçevede, Antalya İli, Manavgat İlçesinde görev yapan 124 öğretmen ile anket yapılmış ve elde edilen veriler SPSS programı kullanılarak Kruskal-Wallis H. Testleri ile analiz edilmiştir. Çalışma bulgularına göre, vergi bilinci ve ahlakını artırma eğitimi veren öğretmenlerin vergi bilincinin yeterli olmadığı görülmüştür. Literatürde vergi bilinci ve ahlakı konusunda öğretmenler üzerinde yapılmış bir çalışma bulunmaması nedeniyle çalışmanın bulguları önem taşımaktadır.

Anahtar Sözcükler : Bütçe, Vergi, Vergi Bilinci, Vergi Yönetimi, Vergi Eğitimi.

1. Introduction

Taxes are undoubtedly the most important source of financing for the increase in public expenditures due to the increase in government activities. The total proceeds of taxes, which currently account for 80% to 90% of public revenues, are influenced by the attitudes and behaviours of taxpayers toward taxes.

Taxpayers develop perceptions and attitudes towards taxation as it restricts their spending and reduces savings to share their available income. Due to the negative perceptions surrounding tax collection and lack of awareness, the tax administration should improve citizens' attitudes and ethics regarding taxes to increase tax revenues. One of the most effective methods of improving tax awareness and ethics is to start a process from the students and the teachers. Because a teacher's tax awareness and moral perception are particularly important as they need to instil these values in their students who are potential future taxpayers. Therefore, the target group chosen were teachers, and the focus was their tax perception and awareness. Furthermore, this study will fill a significant gap in the literature by investigating the perception of taxation amongst teachers charged with providing education on this very topic.

In 2007, the 'Vergibil'' Project was launched in Turkey with a protocol signed between the Ministry of National Education (MONE) and the Revenue Administration (IOP). Through this protocol, lessons for increasing tax awareness and morality were added to the curriculum and currently remain so. Because children in family life initially form perceptions regarding taxation, and because each child is a potential future taxpayer, these perceptions will play an active role in increasing tax awareness and the moral level of society together with knowledge gained on the concept of taxation in early educational stages. Moreover, another important issue is teachers' awareness and moral perception regarding taxation, as they are expected to educate students on the concept of taxes.

In this study, first, the conceptual framework related to the subject was investigated. Subsequently, 124 of 281 teachers working in secondary schools in Manavgat, Antalya Province administered a survey. The resulting data were analysed using the SPSS 22 (Statistical Package for the Social Sciences) program, Reliability Analysis T-test, the Mann-Whitney U test, and the Kruskal-Wallis H Tests. Finally, recommendations were developed within the framework of the findings.

The literature review during the preparation of this study found no prior studies on teachers. Therefore, the motivating aspect of the study is that it is a first in the field.

2. Conceptual Framework

Today, taxes are undoubtedly the main source that states use to meet public needs. In parallel with the increase in the functions of the state, the tax burden on taxpayers has increased (Ömürbek et al., 2007: 103). Taxes are one of the basic building blocks of

government revenues. The importance of taxation has increased day by day as the interventionist understanding of the state has become widespread, and its income needs have increased. States also need to obtain regular tax revenue for the maintenance of continuity. If the stability of taxation cannot be achieved, the state's financial structure is disrupted, and financial problems are encountered. In addition, taxes are more than they provide for the state, as they have other fiscal functions such as serving economic and social issues. (Ozen et al., 2015: 279; Izgi, 2011: 13).

Furthermore, taxpayers are required to participate more in public expenditures with increasing public expenditures. Therefore, the tax burden increases when taxpayers surrender more tax from their income due to their labour (Yegen, 2013: 7). The unfair distribution of the tax burden will adversely affect taxpayers' view of taxes, thus preventing the achievement of the fiscal and extra-fiscal objectives of the tax. The increase in states' responsibilities also increases individuals' tax burdens, and the relationship between states and taxpayers has gained importance while the necessity of addressing the psychological and sociological aspects of taxation has come to the forefront (Organ & Yegen, 2013: 243).

How taxpayers perceive tax is important to have a regular and efficient tax system (Özgün, 2017: 43). Furthermore, tax is also important in achieving the state's social, economic, and political goals. To achieve these objectives, a society's tax awareness and morality should be cultivated to help generate the required tax revenue.

To help attain the expected goals through taxation, it is first necessary to ensure the voluntary compliance of individuals regarding taxation. To increase the voluntary compliance of taxpayers, members of the community should be aware of taxes and be able to perceive them correctly (Alkan, 2009: 16). The main issue in modern taxation systems is tax-based taxation. In Turkey, whether this type of system can be applied to encourage the fulfilment of tax obligations by the people themselves is in question. Furthermore, even if taxpayers voluntarily fulfil their obligations, it does not necessarily ensure that the system will work efficiently (Ömürbek et al., 2007: 105).

Tax consciousness studies became more prevalent after 1970 (Scott, 2013: 320). There are a limited number of definitions due to the lack of studies on tax awareness. Some of these are:

Akdoğan (2011: 189) defined tax awareness as the level of individuals' willingness to know the importance of tax in realizing public services in fulfilling tax duties. Edizdogan et al. (2011: 220): "Tax awareness is the level of willingness of individuals who know the importance of taxation in the realization of public services in fulfilling their tax-related financial obligations."

According to these definitions, taxpayers can also improve tax awareness, reduce tax loss and leakage, and ensure fairness in taxation. When these definitions of tax awareness are considered, the main factor is that taxpayers perceive the tax correctly and reflect this

perception positively in their behaviour (Yardımcıoğlu et al., 2014: 98). A higher level of willingness to pay taxes results in a higher likelihood of meeting the tax's objectives. Tax awareness should be perceived as the consciousness of paying tax and the control of the expenditure dimension of the collected tax (Organ & Yegen, 2013: 243; Şener, 1997: 8-9).

Today, in almost every country, there are cases of tax evasion. However, in addition to tax evaders, some taxpayers do not even consider tax evasion and who fulfil their tax obligations in full (Kaynar-Bilgin, 2011: 260). At this point, we encountered the concept of tax morality, which is concerned with why people do not evade taxes.

In the 1960s, the first study of tax morality was conducted at the 'Cologne School of Tax Psychology', founded by Günter Schmölders. As a result of these studies, tax morality began to be viewed as a factor determining the relationship between states and individuals and affecting taxpayers' responses to tax (Özgün & Yüksel, 2018: 35). In addition, the German scientist Schmölders has examined tax morality as behaviour based on tax compliance and non-compliance and defined the complete and timely fulfilment of tax obligations (Ayas & Saruc, 2015: 178).

Tax morality, defined as the norm of behaviour that determines the relationship between the state and the taxpayer, appears as intrinsic motivation (Tosuner & Demir, 2007: 9). The intrinsic motivation here is voluntary payment without any coercion.

The difference between tax awareness and tax morality is that the former consists of all taxpayers' positive and negative perceptions concerning taxes. Conversely, tax morality is expressed as the behaviours in fulfilling tax obligations in accordance with the law (Teyyare & Kumbaşlı, 2016: 4).

Taxpayers must interact with the tax administration while fulfilling their obligations arising from tax legislation. Therefore, the taxpayer and administration relationship are as necessary as the tax paid (Karatoy, 2009: 76). This is because an administration's successful attitudes regarding taxpayer psychology will improve tax awareness and decrease the resistance to paying tax.

A tax system is acknowledged as being the taxes, duties, and charges imposed by law. This system is considered for economic, social, and financial purposes (Ayyıldız et al., 2014: 33). Tax system complexity negatively affects sentiment and morality and is also a factor that increases the cost of tax compliance. Due to the complexity of the tax system, taxpayers may inadvertently misreport. To prevent this, taxpayers often consult experts and are negatively affected due to the increased cost of tax preparation (Cibo, 2019: 41-42). Moreover, the complexity of tax systems poses difficulties for taxpayers and supervisors, judicial bodies, and tax administrations.

At present, there is no generally accepted index for measuring the complexity of tax systems. However, various indicators have been used to measure taxation complexity both

directly and indirectly. These indicators include the amount and length of tax legislation, the time spent to comply with taxes, the time spent by tax administrations to apply tax laws, the rate of taxpayers' use of tax experts, and various text analysis techniques, such as the level of ease with which tax laws can be interpreted (Karabacak, 2013: 40-45).

The results of various studies in Turkey have identified complexity in the taxation system. In these studies, the tax complexity rate has been found to vary between 58.1% and 84.2%. The rates are as follows: 58.1% (Akbulut, 2014: 53); 58.4% (Lifeless, 2006: 121); 68.6% (Alp & Töngür, 2018: 6); 78% (Savaşan & Odabaş, 2005: 78); 79.8% (Original, 2017: 108); 84.2% (Ipek & Kaynar, 2009: 182). The complexity of the tax system is an element affecting taxpayers' tax perceptions and attitudes.

The perspectives of taxpayers need to improve to reach the desired goals. (Çataloluk, 2008: 214). Therefore, while ensuring that penalties and supervision mechanisms work more lawfully, increasing tax awareness and tax morality amongst taxpayers is also necessary to increase the income expected from taxation in every country (Koban & Bulu 2017: 122).

Some students who have developed tax awareness and morality during childhood will only be taxpayers in adulthood, while others will be lawmakers or practitioners. For this reason, it is particularly important to know the tax perceptions and attitudes of teachers who provide tax awareness and moral instruction so that appropriate policies can be developed and implemented.

3. Research

3.1. Purpose of the Research

This study aims to improve the tax awareness and ethics education of teachers responsible for teaching the same and provide recommendations for policymakers and practitioners in light of the study's findings. It is believed that a teacher's morals and level of tax awareness affect the quality of the courses they instruct.

3.2. Importance of Research

This study fills an important gap in the literature by being the first in Turkey to study teachers' tax awareness and ethics in the Vergibil project. As a result of the surveys in the literature, it has been observed that there are several studies measuring tax awareness and morals in students. However, there is no research in this field, especially regarding teachers. In this respect, a significant omission in the literature is addressed by this study.

Teaching is a profession that contributes to an individual's future perspectives concerning education and training. This study examines primary education in Turkey for grades 5 to 8 in 2018-2019 and tries to identify the level of tax awareness of teachers responsible for these grades. Because teachers' tax awareness levels are critical in educating and training students, their tax awareness and perceptions were investigated in this study. In

conjunction with this project, tax awareness training was implemented in 2012-2013 for Turkey's third, fourth and fifth-grade students. Students in the sixth, seventh and eighth grades were included after expanding the program's scope to grapple with the informal economy. For this reason, secondary education was chosen for this study due to its subsequent inclusion in the project. Emerging data on the study's results are expected to contribute to teachers' tax awareness and morality.

3.3. Methodology

To measure teachers' tax awareness and moral level in this study, their thoughts regarding taxation were solicited via a questionnaire. Ankara was chosen as the pilot province in the "tax-know" project implemented within the scope of the protocol signed in 2007. The studies that came into force within this project's scope were first implemented in Ankara and were subsequently applied in other provinces. For this reason, Manavgat, which is far from Ankara and the city centre, was chosen to examine the effectiveness of the implemented projects. Considering the degree of accessibility of teachers, permission was obtained for a total of six schools, namely, Çağlayan Secondary School, Manavgat Secondary School, 75. Yıl Cumhuriyet Secondary School, Milli Egemenlik Secondary School, Şehit Ahmet Ozan Şarlak Secondary School and Yunus Emre Secondary School, all located in Manavgat, Antalya. Face-to-face surveys were conducted with 124 out of 281 teachers in these schools. In addition, the questionnaire was administered to 124 teachers. A total of 123 teachers were included in the analysis because one teacher gave incomplete answers to the questions. In this study, public schools were selected due to the teacher training implemented by the state, in the form of preparation seminars for the school term and tax awareness training. Before the questionnaires were administered, the teachers were assured that the answers given in this survey would be kept entirely confidential and used only for research purposes.

3.4. Analysis of Data

Survey questions were used to gather the necessary information in the study, which is similar to studies by Sağbaş and Başoğlu (2005), Taytak (2010), Karaot (2010), Zorlu (2012), Steel (2013), Khan (2015), Ozen, et al. (2015), Demir and Ciğerci (2016), and Ömürbek et al. (2007). A new questionnaire was prepared for this study.

Research results were evaluated using the SSPS 22.00 program (Statistical Package for the Social Sciences- Statistical Package for Social Sciences). The collected data was evaluated using Reliability Analysis, T-Test, Chi-Square Analysis, Mann Whitney U test, and Kruskal-Wallis H Tests.

As defined by Coşkun et al. (2017: 133) defines reliability is the degree to which a test or scale wants to measure something consistently. In this context, an attempt was made to measure the consistency of the teachers' answers to the questions posed in the survey. The primary method used in reliability analysis is Cronbach's alpha. In this analysis, the

alpha coefficient indicates the reliability of the questionnaire and has a value between 0 and 1. It is preferable for the alpha coefficient value in the analysis to be at least 0.7, but in this type of study, a value of 0.5 is considered reasonable by some researchers. Another analysis used in examining the data is the T-Test, which is widely used in social sciences. This analysis is used to determine whether there is a statistically significant difference between the two groups in terms of variables. In this analysis method, variables should be measured at the minimum interval level. The non-parametric equivalent of the T-Test analysis is the Mann Whitney U Test. In the Mann Whitney U Test, data are collected randomly without any conditions. While the Kruskal-Wallis H test is similar to the Mann Whitney U Test, it compares three or more groups. Finally, the Chi-Square test used in the analysis measures independence between variables (Coşkun et al., 2017: 190-219). In other words, this analysis is not used to determine relationships but to determine the differences between variables. According to this test, if the two variables are independent, there is no relationship between them.

3.4.1. Survey Results with Teachers

The survey of 123 teachers from a total of 281 teachers from 6 schools in Manavgat, Antalya, is as follows:

Table: 1
Demographic Information of the Surveyed Teachers

		Frequency	Percent (%)
Gender	Female	67	54.5
	Male	56	45.5
Age	25-35	58	47.2
	36-40	26	21.1
	41-45	24	19.5
	46-50	9	7.3
	51 and above	6	4.9
Marital Status	Married	103	83.7
	Single	20	16.3
Children	Yes	87	70.7
	No	36	29.3

According to Table 1, 54.5% of the teachers who participated in the survey were female, and 45.5% were male. There were 58 participants between the ages of 25-35, 26 between the ages of 36-40, 24 between the ages of 41-45, 24 between the ages of 46-50, and 6 over the age of 51. Of the teachers who participated in the survey, 83.7% were married, and 16.3% were single. Amongst married participants of the survey, 70.7% had children, while 29.3% were childless.

*** and ** represent values below and above the average, respectively.**

The table above shows that all the hypotheses tested for tax awareness were accepted (mean value 2 and $\alpha = 0.05$). According to the test results, all the results obtained are different from the average.

The hypothesis test was applied to the questions prepared according to a 22 triple Likert scale on tax awareness. Questions were scored as 1=no, 2=partially, and 3=yes, and the average value was taken as 2 points. The question of whether a one-sample t-test analysed different responses deviated from the mean. According to the results of the analysis, the average scores of the scale were as follows:

- I think that taxes paid are used by the state on-site 1,697,
- I examine the budget items when the fiscal year starts 1,557,
- In Turkey, I think there is too much tax legislation 1,508,
- I think the tax legislation is easy and straightforward 1,463,
- I think the tax system is fair 1,270,
- I think that sufficient training has been given to increase tax awareness. 1,298,
- During the tax weeks, the revenue administration (tax offices) does activity 1,479,
- On 13.06.2007, I was informed about the taxable working protocol signed between MoNE and the Ministry of Finance 1,303,
- I was informed about vergibilinci.gov.tr created after the protocol signed in 2007 1,248,
- I was informed about the tax awareness of the students in the seminars given by the Ministry of Education 1,508 points

by taking below the average value.

- I am aware of the taxes that one pays as a taxpayer 2,504,
- Knowing which tax is being paid makes it easy to pay taxes 2,715,
- Even if the seller does not give receipts/invoices during shopping, I would like receipts and invoices. 2,602,
- Today, I think that unpaid taxes increase the tax or debt burden of future generations 2,569,
- I find it true that tax is perceived as a burden among society 2,276,
- I think that applying heavy sanctions to tax evaders will reduce tax evasion 2,634,
- I think that amnesties adversely affect tax awareness 2,577,
- More transparent and accountable state administration increases tax awareness 2,852,
- I think increasing the education level in society will increase tax awareness 2,516,
- I think that emphasizing that tax is a responsibility of citizenship in the media, in symposiums and congresses will increase tax awareness 2,385,
- The tax awareness issue, which is said to be included in the Ministry of National Education curriculum action plan covering 2011-2013 for the fight against the informal economy, would be useful 2355 points.

The values given above are over the average.

Table: 2
Reliability Analysis for Tax Awareness (Croncbach Alpha Coefficients)

	Question- all correlations	Alpha coefficient when the question is deleted
Q.1: Are you aware of the taxes you pay as a taxpayer?	211	.15
Q.2: Does it make it easier for you to know how much tax is paid?	356	.704
Q.3: Do you think that the tax you pay is used by the government on-site?	. 447	. 695
Q.4: Would you like it if sellers did not issue vouchers/invoices during purchasing?	127	722
Q.5: Can you review the budget items when the fiscal year starts?	144	722
Q.6: Do you think that unpaid taxes increase the tax or debt burden of future generations?	248	.712
Q.7: Do you think that tax is perceived as a burden on society?	232	714
Q.8: Do you think that heavy sanctions on tax evaders will reduce tax evasion?	.403	700
Q.9: Do you think that amnesties negatively affect tax awareness?	.004	.734
Q.10: Do you think there is too much tax legislation in Turkey?	.031	729
Q.11: Do you think tax legislation is easy and understandable?	232	.713
Q.12: Do you think the tax system is fair?	223	714
Q.13: Will more transparent and accountable government administration raise tax awareness?	117	720
Q.14: Do you think that sufficient training is provided to raise tax awareness?	.264	711
Q.15: Do you think that increasing the education level of society will increase tax awareness?	329	705
Q.16: Do you think emphasizing that tax is a responsibility of citizenship in the media, symposiums, and congresses will increase tax awareness?	442	.694
Q.17: Does the revenue administration (tax offices) carry out any activities during the tax weeks?	210	.715
Q.18: Do you think the Interactive Tax Office, where you can handle all your transactions without coming to the tax office opened in February 2018, will help improve tax awareness?	405	700
Q.19: Have you been informed about the taxable working protocol signed between the Ministry of National Education and Finance on 13.06.2007?	.438	.697
Q.20: Were you informed about vergibilinci.gov.tr created after the protocol was signed in 2007?	379	.703
Q.21: Would the activities to increase tax awareness included in the 2011-2013 curriculum of the Ministry of National Education action plan be beneficial for the fight against the informal economy?	.413	698
Q.22: Have you been informed about how to instil tax awareness in students in seminars given by the Ministry of National Education?	404	698
Reliability alpha coefficient: 0.720		

The teachers' responses to the survey were subjected to reliability analysis. As shown in Table 2, the reliability coefficient was determined to be 0.72. Accordingly, it was concluded that the scale was reliable. If the following questions are removed from the scale, the scale's reliability increases: "Would you like it if sellers did not issue vouchers/invoices during purchasing?", "Can you review the budget items when the fiscal year starts?", "Do you think that amnesties negatively affect tax awareness?". If any of the other questions are removed from the scale, its reliability decreases.

Table: 3
Mann Whitney U Test Results for Tax Awareness and Gender

	Average of rankings		Mann Whitney U test	Z	Probability p
	Woman	Male			
Q.1: Are you aware of the taxes you pay as a taxpayer?	57.36	67.55	1565.000	-1.814	0.070 **
Q.2: Does it make it easier for you to know how much tax is paid?	57.17	67.78	1552.500	-2.343	0.019 *
Q.3: Do you think that the tax you pay is used by the government on-site?	59.15	65.41	1685.000	-1.063	.288
Q.4: Would you like it if sellers did not issue vouchers/invoices during purchasing?	62.79	61.05	1823.000	-0.337	.736
Q.5: Can you review the budget items when the fiscal year starts?	56.90	68.11	1534.000	-1.951	0.051 **
Q.6: Do you think that unpaid taxes increase the tax or debt burden of future generations?	60.78	63.46	1794.500	-0.498	0.618
Q.7: Do you think that tax is perceived as a burden on society?	57.18	67.77	1553.000	-1.779	0.075 **
Q.8: Do you think that heavy sanctions on tax evaders will reduce tax evasion?	58.82	65.80	1663.000	-1.357	.175
Q.9: Do you think that amnesties negatively affect tax awareness?	55.92	69.28	1468.500	-2.545	0.011 *
Q.10: Do you think there is too much tax legislation in Turkey?	62.78	61.07	1824.000	-0.300	.764
Q.11: Do you think tax legislation is easy and understandable?	65.57	57.72	1636.500	-1.402	.161
Q.12: Do you think the tax system is fair?	65,00	58.41	1675.000	-1.380	0.168
Q.13: Will more transparent and accountable government administration raise tax awareness?	58.34	66.38	1630.500	-2.196	0.028 *
Q.14: Do you think that sufficient training is provided to raise tax awareness?	58.90	65.71	1668.000	-1.342	.179
Q.15: Do you think that increasing the education level of society will increase tax awareness?	62.16	61.81	1865.500	-0.065	.948
Q.16: Do you think emphasizing that tax is a responsibility of citizenship in the media, symposiums, and congresses will increase tax awareness?	60.02	64.37	1743.500	-0.743	.457
Q.17: Does the revenue administration (tax offices) carry out any activities during the tax weeks?	58,52	66.16	1643.000	-1.332	.183
Q.18: Do you think the Interactive Tax Office, where you can handle all your transactions without coming to the tax office opened in February 2018, will help improve tax awareness?	59.93	64.47	1737.500	-0.784	0.433
Q.19: Have you been informed about the taxable working protocol signed between the Ministry of National Education and Finance on 13.06.2007?	57.06	67.91	1545.000	-2.327	0.020 *
Q.20: Were you informed about vergibilinci.gov.tr created after the protocol was signed in 2007?	58.51	66.17	1642.500	-1.691	0.091 **
Q.21: Would the activities to increase tax awareness included in the 2011-2013 curriculum of the Ministry of National Education action plan be beneficial for the fight against the informal economy?	59.94	64.46	1738.000	-0.772	.440
Q.22: Have you been informed about how to instil tax awareness in students in seminars given by the Ministry of National Education?	55.90	69.29	1467.500	-2.424	0.015 *

** and ** represent significance at the 5% and 10% levels, respectively. The responses to the questions in the scale according to gender are also different from questions indicated with * according to the 5% significance level and the questions indicated with ** according to the 10% significance level.*

The Mann-Whitney U test was used to determine whether the answers to the questions in the scale differed according to gender. According to the teachers' answers, the Mann-Whitney U Test yielded $p<0.05$ in questions Q.2, Q.9, Q.13, Q.19, and Q.22. Accordingly, these questions' responses differed according to gender.

According to the answers given in Q.2, where the analysis yields a significant difference, women's average score is 57.17, and the average rank for men is 67.78. According to these results, men believe that they will increase their tax awareness if they know where taxes are being spent compared to women. In addition, according to S.9, the average rank for women was 55.92, and that for men was 69.92. In this context, men are more likely to believe that tax amnesties affect tax awareness negatively than women. In the same context, in Q.13, where the average rank for males is high, they believe that transparent and accountable state administration will increase tax awareness.

Table: 4
Mann Whitney U Test Results for Tax Awareness and Marital Status

	Average of rankings		Mann Whitney U test	Z	Probability p
	Married	Single			
Q.1: Are you aware of the taxes you pay as a taxpayer?	61.19	66.15	947.000	-0.653	.514
Q.2: Does it make it easier for you to know how much tax is paid?	62.13	61.33	1016.500	-0.132	.895
Q.3: Do you think that the tax you pay is used by the government on-site?	60.47	69.90	872.000	-1.186	0.235
Q.4: Would you like it if sellers did not issue vouchers/invoices during purchasing?	63.13	56.20	914.000	-0.995	.320
Q.5: Can you review the budget items when the fiscal year starts?	61.71	63.50	1000.000	-0.231	.817
Q.6: Do you think that unpaid taxes increase the tax or debt burden of future generations?	63.27	55.48	899.500	-1.077	.281
Q.7: Do you think that tax is perceived as a burden on society?	63.65	53.50	860,000	-1.264	.206
Q.8: Do you think that heavy sanctions on tax evaders will reduce tax evasion?	62.38	60.05	991.000	-0.335	.737
Q.9: Do you think that amnesties negatively affect tax awareness?	64.87	47.23	734.500	-2.491	0.013 *
Q.10: Do you think there is too much tax legislation in Turkey?	61.97	62.15	1027.000	-0.023	.981
Q.11: Do you think tax legislation is easy and understandable?	57.73	83.98	590.500	-3.473	0.001 ***
Q.12: Do you think the tax system is fair?	60.64	69.03	889.500	-1.302	.193
Q.13: Will more transparent and accountable government administration raise tax awareness?	63.52	54.15	873.000	-1.895	0.058 **
Q.14: Do you think that sufficient training is provided to raise tax awareness?	61.68	63.63	997.500	-0.283	.777
Q.15: Do you think that increasing the education level of society will increase tax awareness?	61.77	63.20	1006.000	-0.200	.841
Q.16: Do you think emphasizing that tax is a responsibility of citizenship in the media, symposiums, and congresses will increase tax awareness?	62.27	60.63	1002.500	-0.208	0.835
Q.17: Does the revenue administration (tax offices) carry out any activities during the tax weeks?	62.08	61.60	1022.000	-0.062	.951
Q.18: Do you think the Interactive Tax Office, where you can handle all your transactions without coming to the tax office opened in February 2018, will help improve tax awareness?	64.19	50.73	804.500	-1.722	0.085 **
Q.19: Have you been informed about the taxable working protocol signed between the Ministry of National Education and Finance on 13.06.2007?	60.28	70.88	852.500	-1.684	0.092 **
Q.20: Were you informed about vergibilinci.gov.tr created after the protocol was signed in 2007?	60.88	67.78	914.500	-1.129	0.259
Q.21: Would the activities to increase tax awareness included in the 2011-2013 curriculum of the Ministry of National Education action plan be beneficial for the fight against the informal economy?	61.75	63.28	1004.500	-0.192	.847
Q.22: Have you been informed about how to instil tax awareness in students in seminars given by the Ministry of National Education?	62.13	61.35	1017.000	-0.104	.917

, **, * express significance at the 5%, 10% and 1% significance levels, respectively. According to marital status, the responses to the questions in the scale are different according to the 5% significance level as indicated with * and 10% significance level with **, and questions indicated with *** are different from the 1% significance level.*

The Mann-Whitney U test was used to determine whether the answers to the questions in the scale differ according to marital status. According to the responses from teachers, at the end of the Mann-Whitney U Test, $p < 0.05$ was reached in questions Q.9 and S.11. The answers to these questions differed according to whether the respondents were married or single.

The results of the Mann Whitney U test revealed that there was a significant difference in S.9. The mean score for married people was 64.87, while that for males was 47.83. According to this average, married respondents were more likely than single ones to believe that amnesties will adversely affect tax awareness. In Q.11, where a difference arose, the average for the married respondents was 57.73, while the average for single respondents was 83.98. According to this, single respondents are more likely than married ones to believe that tax legislation is easy and understandable.

Table: 5
Mann Whitney U Test Results for Tax Awareness and Childhood Status

	Average of rankings		Mann Whitney U test	Z	Probability p
	Yes	No			
Q.1: Are you aware of the taxes you pay as a taxpayer?	62.46	60.89	1526.000	-0.255	.798
Q.2: Does it make it easier for you to know how much tax is paid?	64.55	55.85	1344.500	-1.756	0.079 **
Q.3: Do you think that the tax you pay is used by the government on-site?	60.27	66.18	1415.500	-0.916	.359
Q.4: Would you like it if sellers did not issue vouchers/invoices during purchasing?	63.17	59.17	1464.000	-0.710	.478
Q.5: Can you review the budget items when the fiscal year starts?	61.95	62.13	1561.500	-0.028	.978
Q.6: Do you think that unpaid taxes increase the tax or debt burden of future generations?	65.54	53.44	1258.000	-2.062	0.039 *
Q.7: Do you think that tax is perceived as a burden on society?	64.93	54.92	860,000	-1.264	.206
Q.8: Do you think that heavy sanctions on tax evaders will reduce tax evasion?	62.62	60.50	1311.000	-1.538	.124
Q.9: Do you think that amnesties negatively affect tax awareness?	64.00	57.17	1392.000	-1.190	.234
Q.10: Do you think there is too much tax legislation in Turkey?	61.70	62.72	1540.000	-0.164	.869
Q.11: Do you think tax legislation is easy and understandable?	57.29	73.39	1156.000	-2.627	0.009 ***
Q.12: Do you think the tax system is fair?	61.82	62.43	1550.500	-0.116	.907
Q.13: Will more transparent and accountable government administration raise tax awareness?	63.74	57.79	1414.500	-1.483	.138
Q.14: Do you think that sufficient training is provided to raise tax awareness?	61.52	63.15	1524.500	-0.293	.769
Q.15: Do you think that increasing the education level of society will increase tax awareness?	61.43	63.38	1516.500	-0.335	.737
Q.16: Do you think emphasizing that tax is a responsibility of citizenship in the media, symposiums, and congresses will increase tax awareness?	61.67	62.79	1537.500	-0.175	.861
Q.17: Does the revenue administration (tax offices) carry out any activities during the tax weeks?	61.33	63.63	1507.500	-0.366	.714
Q.18: Do you think the Interactive Tax Office, where you can handle all your transactions without coming to the tax office opened in February 2018, will help improve tax awareness?	64.14	56.82	1379.500	-1.155	.248
Q.19: Have you been informed about the taxable working protocol signed between the Ministry of National Education and Finance on 13.06.2007?	61.39	63.49	1512.500	-0.412	.681
Q.20: Were you informed about vergibilinci.gov.tr created after the protocol was signed in 2007?	61.04	64.32	1482.500	-0.662	.508
Q.21: Would the activities to increase tax awareness included in the 2011-2013 curriculum of the Ministry of National Education action plan be beneficial for the fight against the informal economy?	61.30	63.68	1505.500	-0.370	0.711
Q.22: Have you been informed about how to instil tax awareness in students in seminars given by the Ministry of National Education?	61.52	63.15	1524.500	-0.270	.788

, **, * express significance at the 5%, 10% and 1% significance levels, respectively. According to marital status, the answers given to the questions in the scale are different according to the 5% significance level when indicated with the ** and the 10% significance level with the **, and questions indicated with *** are different from the 1% significance level.*

The Mann-Whitney U test was used to analyse whether the responses in the scale vary according to whether the respondents have children. According to the results of the analysis, these questions differed according to whether they have children, as the answers given by the teachers in the questionnaire were found to be $p < 0.05$ in Q.6 and Q.11.

Upon examination of the Mann Whitney U test results, it was found that there was a significant difference in Q.6. The mean of the respondents who had children was 65.54, while those without children were 53.44. According to these average scores, children believe that taxes not collected today will increase future generations' tax or debt burden. In Q.11, where another difference arose, the average rank for respondents with children was 57.29, while the rank for those who did not was 73.39. According to this, respondents who do not have children believe that tax legislation is easy and understandable.

Table: 6
Kruskal Wallis-H Test Results of Tax Awareness Statements by Age Groups

	Mean Rank (Average of rankings)					Chi-square	Probability (p)
	25-35	36-40	41-45	46-50	51 +		
Q.1: Are you aware of the taxes you pay as a taxpayer?	58.34	60.19	62.88	80.78	73.50	5.026	.285
Q.2: Does it make it easier for you to know how much tax is paid?	60.97	62.67	61.17	60.56	74.50	1.673	.796
Q.3: Do you think that the tax you pay is used by the government on-site?	60.86	64.67	60.69	76.67	44.67	3.815	0.432
Q.4: Would you like it if sellers did not issue vouchers/invoices during purchasing?	59.50	59.58	75.42	43.44	70.83	10.354	0.035 *
Q.5: Can you review the budget items when the fiscal year starts?	59.84	58.96	69.29	53.17	80.17	4.439	0.350
Q.6: Do you think that unpaid taxes increase the tax or debt burden of future generations?	58.97	63.85	62.29	61.72	82.50	3.586	0.465
Q.7: Do you think that tax is perceived as a burden on society?	56.72	67.23	68.38	77.11	42.17	7.144	.128
Q.8: Do you think that heavy sanctions on tax evaders will reduce tax evasion?	68.21	61.08	48.50	65.33	55.00	8.701	0.069 **
Q.9: Do you think that amnesties negatively affect tax awareness?	65.59	57.12	56.60	62.83	68-75	2.795	.593
Q.10: Do you think there is too much tax legislation in Turkey?	63.96	66.96	56.69	54.33	54.33	2.466	.651
Q.11: Do you think tax legislation is easy and understandable?	65.18	63.98	62.65	43.94	47.17	5.179	0.269
Q.12: Do you think the tax system is fair?	63.41	58.94	70.98	47.50	47.50	7.833	0.098 **
Q.13: Will more transparent and accountable government administration raise tax awareness?	59.92	60.00	67.00	69.50	59.50	3.655	0.455
Q.14: Do you think that sufficient training is provided to raise tax awareness?	55.03	63.90	77.56	51.28	75.00	13.691	0.008 *
Q.15: Do you think that increasing the education level of society will increase tax awareness?	65.72	51.37	65.46	52.28	72.92	6.531	.163
Q.16: Do you think emphasizing that tax is a responsibility of citizenship in the media, symposiums, and congresses will increase tax awareness?	60.61	55.06	72.46	64.50	59.92	3.910	.418
Q.17: Does the revenue administration (tax offices) carry out any activities during the tax weeks?	60.50	56.90	63.33	87.39	55.17	6.913	0.141
Q.18: Do you think the Interactive Tax Office, where you can handle all your transactions without coming to the tax office opened in February 2018, will help improve tax awareness?	62.00	59.79	64.00	66.28	57.17	.516	.972
Q.19: Have you been informed about the taxable working protocol signed between the Ministry of National Education and Finance on 13.06.2007?	62.15	58.69	63.17	70.22	57.92	1.548	.818
Q.20: Were you informed about vergibilinci.gov.tr created after the protocol was signed in 2007?	60.11	58.58	66.81	71.72	61.25	3.073	.546
Q.21: Would the activities to increase tax awareness included in the 2011-2013 curriculum of the Ministry of National Education action plan be beneficial for the fight against the informal economy?	60.03	54.88	67.35	64.61	86.58	5.643	0.227
Q.22: Have you been informed about how to instil tax awareness in students in seminars given by the Ministry of National Education?	58.75	64.46	63.96	73.83	57.17	2.430	.657

** and ** represent significance at the 5% and 10% significance levels, respectively. The responses in the scale according to age groups are also different according to the 5% significance level of the questions indicated with * and the 10% significance level of the questions indicated with **.*

The Kruskal Wallis-H Test was used to determine whether the tax-conscious statements in the scale differed according to age group. According to the analysis, if sellers do not give vouchers/invoices during purchasing, the responses to the question "Do you think sufficient training is provided to increase tax awareness?" and $p < 0.05$ differ according to age group.

If the results are examined, teachers between the ages of 41 and 45 are more conscious of receiving vouchers/invoices during purchasing than other groups. The least conscious are teachers in the 45-50 age groups.

Another difference in the analysis arises from the question: 'Do you think sufficient training is provided to increase tax awareness?' According to the responses, teachers between the ages of 41 and 45 believe in the adequacy of tax awareness in education with a rate of 77.56. Contrastingly, teachers aged 45 and 50 had the lowest rate at 51.28 compared to other age groups, indicating their belief that the education provided is insufficient.

3.4.2. Findings of the Teacher Tax Perception Questionnaire

Of the teacher tax perception survey participants, 54.5% are female, and 45.5% are male. The most significant participants fall into the 25-35 age group, accounting for 47.2% of survey respondents. Furthermore, 83.7% of the participants are married, while 70.7% have children.

The questionnaire was tested with reliability analysis. In the reliability analysis, although a Cronbach alpha coefficient above 0.5 was considered reliable by some researchers in similar studies, it was generally accepted that a value over 0.7 was reliable (Coşkun et al., 2017: 133). As a result of the analysis, the Cronbach alpha coefficient was found to be 0.72, and the scale was determined to be reliable. Although some of the questions in the scale are below the alpha coefficient, the majority of them are above it.

The relationship between tax awareness and gender was analysed using the Mann-Whitney U test in the questionnaire. As a result of the analysis, although there was no significant correlation between tax awareness and gender in most of the questions, it was concluded that men were more conscious than women according to the responses to some questions.

The Mann-Whitney U test was performed by considering the tax awareness and marital status of the participants. As a result of the test, no significant correlation was found between tax awareness and marital status, according to most of the responses. In addition, the Mann Whitney U test was used to assess whether parenthood is a factor in tax awareness. According to most responses, again, no significant correlation was found between tax awareness and parenthood due to the evaluation.

The study analyzed the relationship between tax awareness and various age groups using the Kruskal Wallis-H test. According to the analysis findings, it was concluded that teachers between the ages of 41 and 45 years were the most conscious.

4. Conclusion

The development of tax awareness in society is significant for both governments and taxpayers. From the state's perspective, tax revenues will increase as taxpayers willingly fulfil tax-conscious societies' obligations. In addition, since taxpayers will fulfil their tax duties in a thorough and timely manner, the audit burden of the state and the costs incurred for tax collection will be reduced. In terms of taxpayers, citizens will develop citizenship awareness. They will question how tax revenues are used by the state and ensure that taxes are returned as services most effectively.

The formation and development of tax awareness in society are influenced by many elements, such as sociological, psychological, and structural factors. For example, people can be affected by environmental factors and view taxes as a burden. They may react in such a way as to avoid this burden, resulting in loss of tax revenue. The most significant problem countries are trying to tackle reducing tax revenue losses and tax delinquency by citizens seeking to avoid taxes. In this context, countries have restructured their revenue administrations, switched to a taxpayer-oriented approach, and implemented efforts to improve tax awareness in society.

Tax education at a young age is more effective than at a later age. Because people's education at a young age shapes their futures, they will be prevented from acquiring negative thoughts about taxation from their family or environment. In this context, to raise tax awareness at an early age, tax has started to be addressed in secondary school classes in partnership with the Ministry of National Education and The Revenue Administration. However, the importance here lies in each taxpayer's attitude towards taxation. It is believed that it would be more effective for teachers who have positive attitudes towards taxation to explain it to students at the beginning of their academic life.

Having been developed as a result of current research and surveys, the findings and results from this study have been used to formulate some suggestions. These proposals were developed to prevent tax adversities and ensure that taxpayers fulfil their obligations fully by developing tax awareness in society. They are:

- Teachers who undertake tax awareness training should be pre-educated in this field.
- It would be helpful to add the issue of tax morality to the curriculum of university students who are candidates for teacher training in tax awareness.

References

Akbulut, E. (2014), "Mükelleflerin Vergiyi Algılama ve Tutum Analizi; Erzincan Örneği", *Yayınlanmamış Yüksek Lisans Tezi*, Erzincan Üniversitesi Sosyal Bilimleri Enstitüsü, Erzincan.

Akdoğan, A. (2011), *Kamu Maliyesi*, Gazi Kitapevi, Ankara.

Alabede, J. & Z.Z. Ariffin & K. Idris (2011), "Individual taxpayers' attitude and compliance behaviour in Nigeria: The moderating role of financial condition and risk preference", *Journal of Accounting and Taxation*, 3(5), 91-104.

Alkan, A. (2009), "Vergi Bilinci ve Vergi Uygulamaları Karşısında Mükellef Davranışlarının Tespiti: Zonguldak İli Örneği", *Yayınlanmamış Yüksek Lisans Tezi*, Zonguldak Bülent Ecevit Üniversitesi Sosyal Bilimleri Enstitüsü, Zonguldak.

Alp, B. & Ü. Töngür (2018), "Vergi Dairesi Başkanlığı Çalışanlarının Vergi Algıları: Antalya İli Örneği", *Akdeniz Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 38, 151-172.

Ayaş, I. & N.T. Saruç (2015), "Vergi Kültürü ve Vergi Ahlakı: İtalya- Türkiye", *Afyon Kocatepe Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 17(2), 179-188.

Ayyıldız, Y. & T. Vural & Y. Demirli (2014), *Vergiye Gönüllü Uyumu Etkileyen Faktörler: Bolu İli Alan Çalışması*, Abant İzzet Baysal Üniversitesi Yayınları: 2014/1.

Cansız, H. (2006), "Vergi Mükelleflerinin Vergiyi algılama Hakkındaki Görüşleri: Afyonkarahisar İli Örneği", *Afyon Kocatepe Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 8(2), 115-138.

Çataloluk, C. (2008), "Vergi Karşısında Mükelleflerin Tutum ve Davranışları", *Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 20, 213-228.

Çelik, K. (2013), "İlköğretim Çağında Vergi Algısının İncelenmesi: Zonguldak İli Örneği", *Yayınlanmamış Yüksek Lisans Tezi*, Bülent Ecevit Üniversitesi Sosyal Bilimler Enstitüsü, Zonguldak.

Cibo, H. (2019), "Vergisel Uyuşmazlıkların Uzlaşma Yoluyla Çözümünün Vergiye Gönüllü Uyuma Etkisi", *Yayınlanmamış Doktora Tezi*, Zonguldak Bülent Ecevit Üniversitesi Sosyal Bilimleri Enstitüsü, Zonguldak.

Coşkun, R. & R. Altunışık & E. Yıldırım. (2017), *Sosyal Bilimlerde Araştırma Yöntemleri (SSPS Uygulamalı)*, Sakarya Kitabevi, Sakarya.

Demir, İ.C. & İ. Ciğerci (2016), "Vergi Bilincinin Oluşumunda Eğitimin Rolü: İlköğretim Öğrencileriyle Ampirik Bir Çalışma", *Yönetim ve Ekonomi*, 23(1), 127-143.

Edizdoğan, N. & Ö. Çetinkaya & E. Gümüş (2011), *Kamu Maliyesi*, Ekin Kitapevi, Bursa.

İpek, S. & İ. Kaynar (2009), "Demografik Faktörlerin Vergi Uyumuna Etkisi: Bir Anket Çalışmasının Sonuçları", *Maliye Dergisi*, 157, 116-130.

İzgi, K. (2011), "Vergi Ahlakını Etkileyen Faktörler: Sakarya Üniversitesi Örneği", *Yayınlanmamış Yüksek Lisans Tezi*, Sakarya Üniversitesi Sosyal Bilimleri Enstitüsü, Sakarya.

Karaca, R. (2015), "Vergi Bilinci ve Vergi Algısı: Kütahya İlinde İlköğretim Öğrencileri Üzerine Bir Araştırma", *Yayınlanmamış Yüksek Lisans Tezi*, Dumlupınar Üniversitesi Sosyal Bilimler Enstitüsü, Kütahya.

Karaot, A. (2010), "İlköğretim Çağındaki Öğrencilerin Vergi Bilinç Düzeyi: İzmir İli Aliağa İlçesi Örneği", *Yayınlanmamış Yüksek Lisans Tezi*, Çanakkale Onsekiz Mart Üniversitesi Sosyal Bilimleri Enstitüsü, Çanakkale

Karatoy, B. (2009), "Vergiye Gönüllü Uyumu Sağlamaya Hizmet Edecek Vergi Uygulamaları ve Politikaları", *Yayınlanmamış Yüksek Lisans Tezi*, Marmara Üniversitesi Sosyal Bilimleri Enstitüsü, İstanbul.

Koban, E. & J. Bulu (2017), "Yükseköğretim Öğrencilerinin Vergi Farkındalığı ve Vergiye Gönüllü Uyuma Yönelik Yaklaşımlarının Değerlendirilmesi (Gaziantep Üniversitesi Özelinde Bir Değerlendirme)", *Sosyal Bilimler Dergisi*, 4(12), 118-139.

Ömürbek, N. & H.G. Çiçek & S. Çiçek (2007), "Vergi Bilinci Üzerine Bir İnceleme: Üniversite Öğrencileri Üzerinde Yapılan Anketin Bulguları", *Maliye Dergisi*, 153, 102-122.

Organ, İ. & B. Yegen (2013), "Vergi Bilinci ve Vergi Ahlakı Oluşumunda Muhasebe Meslek Mensuplarının Rolü: Adana Örneği", *Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 27(4), 241-271.

Özen, A. & B.K. Altunoğlu & E. Öztornacı (2015), "Orta Öğretim Düzeyindeki Öğrencilerin Vergi Algılama Düzeylerine İlişkin Ampirik Bir Değerlendirme", *Yönetim ve Ekonomi*, 22(2), 279-289.

Özgün, Z. & C. Yüksel (2018), "Mersin'de Mükelleflerin Vergi Algısı, Vergi Bilinci ve Vergi Ahlakı Düzeyinin Ölçülmesi", *Mersin Sosyal Bilimler Enstitüsü Dergisi*, 1(2), 33-48.

Özgün, Z. (2017), "Maliye Disiplininde Alternatif Bir Yöntem Olarak "Mali Sosyoloji": Vergi Algısı ve Bilinci Üzerine Sosyolojik Bir Analiz", *Yayınlanmamış Yüksek Lisans Tezi*, Mersin Üniversitesi Sosyal Bilimleri Enstitüsü, Mersin.

Sağbaş, İ. & A. Başoğlu (2005), "İlköğretim Çağındaki Öğrencilerin Vergileri Algılaması: Afyonkarahisar İli Örneği", *Afyon Kocatepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 7(2), 123-144.

Sağlam, M. (2013), "Vergi Algısı ve Vergi Bilinci Üzerine Bir Araştırma: İktisadi ve İdari Bilimler Fakültesi Öğrencilerinde Vergi Algısı ve Bilinci", *Sosyoekonomi*, 19(19), 316-334.

Savaşan, F. & H. Odabaş (2005), "Türkiye'de Vergi Kayıp ve Kaçaklarının Nedenleri Üzerine Ampirik Bir Çalışma", *Sosyal ve Ekonomik Araştırmalar Dergisi*, 5(10), 1-28.

Teyyare, E. & E. Kumbaşlı (2016), "Vergi Bilinci ve Vergi Ahlakının Gelişmesinde Maliye Bölümü Eğitiminin Rolü", *Abant İzzet Baysal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 16(4), 1-29.

Tosuner, M. & İ.C. Demir (2007), "Toplumsal Bir Olgu Olarak Vergi Ahlakı", *Gazi Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 9(3), 1-20.

Yardımcıoğlu, F. & K. Şahpaz & Ö. Akgül (2014), "Fırıncı Esnafın Vergi Bilinci ve Vergi Algısı: Sakarya İli Örneği", *Siyaset, Ekonomi ve Yönetim Araştırmaları Dergisi*, 2(3), 59-81.

Yegen, B. (2013), "Vergi Bilinci ve Vergi Ahlakı Oluşumunda Muhasebe Meslek Mensuplarının Rolü: Adana İli Örneği", *Yayınlanmamış Yüksek Lisans Tezi*, Pamukkale Üniversitesi Sosyal Bilimleri Enstitüsü, Denizli.

Zorlu, Ö. (2012), "İlköğretim Çağındaki Öğrencilerin Vergi Bilinci Düzeyi ve Vergi Bilinci Düzeyi İle İlgili Örnek Uygulama (Ankara İli Örneği)", *Yayınlanmamış Yüksek Lisans Tezi*, Gazi Üniversitesi Eğitim Bilimleri Enstitüsü, Ankara.

Sosyoekonomi

2021, Vol. 29(50), 149-168

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.08
Date Submitted: 08.06.2020
Date Revised: 03.10.2021
Date Accepted: 06.10.2021

Validity of J-Curve for Turkey and Its Main External Trade Partners: An Application of a Panel Data Approach

Mehmet Çağrı GÖZEN *(https://orcid.org/0000-0001-6493-9592), Kocaeli University, Turkey; cagri.gozen@gmail.com*

Fikriye Ceren BOSTANCI *(https://orcid.org/0000-0001-8291-062X), Kocaeli University, Turkey; ceren.bostanci@kocaeli.edu.tr*

Türkiye ve Ana Ticaret Partnerleri için J Eğrisinin Geçerliliğinin Analizi: Panel Veri Yaklaşımı Uygulaması

Abstract

External trade cannot create the expected result for some countries due to their economic structures or policies. Economies could encounter severe foreign trade deficits and the risk of an economic crisis. Thus, researchers and policymakers analyse the dynamics of countries' external trade balances. Turkey's persistent current account deficit is one of the most significant macroeconomic problems. Turkey depreciated the Turkish Lira against foreign currencies to reduce its foreign trade deficit in the past. Using panel data analysis, the current study tests the J-curve for Turkey and its six main foreign trade partner countries - Russia, USA, Germany, UK, Italy, and China. Results do not support the validity of the J-curve hypothesis in the long run. Test results analysing the short-run indicate that the whole panel is statistically insignificant.

Keywords : J-Curve, External Trade Deficits, Westerlund Panel Cointegration Analysis, DOLS Method, DCCE Model.

JEL Classification Codes : C33, F10.

Öz

Dış ticaret ekonomik yapılarından veya uyguladıkları ekonomi politikalarından dolayı bazı ülkeler için arzu edilen sonuçlar doğurmaz ve ülkeler bundan dolayı önemli dış ticaret açıkları veya ekonomik krizlerle yüz yüze gelebilir. Bu yüzden araştırmacılar ve politika yapıcılar ülkelerin dış ticaret dengelerinin dinamiklerini analiz ederler. Türkiye'nin kronik cari işlemler açığı en önemli makroekonomik sorunlarından biridir ve geçmişte Türkiye parasının değerini düşürerek dış ticaret açığını azaltmaya çalışmıştır. Bu çalışmada Türkiye ve onun 6 ana dış ticaret partneri için - Rusya, ABD, Almanya, Birleşik Krallık, İtalya ve Çin- J eğrisi hipotezinin geçerliliği sınanmıştır. Kısa dönemi analiz eden test sonuçlarına göre bütün panel istatistiksel olarak anlamsız çıkmıştır.

Anahtar Sözcükler : J Eğrisi, Dış Ticaret Açığı, Westerlund Panel Eşbütünleşme Analizi, DOLS Metodu, DCCE Modeli.

1. Introduction

Structural changes in the world economy make it essential for the countries to harmonize their policies with global economic policies appropriately. Thus, most of the countries, including Turkey, get involved in free foreign trade policy. Memberships of India and China to the World Trade Organization and customs union agreement between the European Union and Turkey could be cited as attempts of countries to be part of an international economic system. As a result of free international trade, economies are affected more by the emerging developments regarding exchange rates and foreign trade policies. Hence, due to capital flows reaching higher volumes and growing international trade, any country's negative economic or political condition could negatively impact other countries. It even sometimes gives rise to significant political tensions. Recently, currency wars between the USA and China could be given an embodiment of this situation. Currency wars are continuing to happen. The current situation will negatively affect the global economy, resulting in economic losses for countries in anticipation of policymakers.

Countries could struggle to raise competitiveness by devaluating their currencies to remove their deficits or take preventive precautions under the circumstances mentioned above. Adopted exchange rate policies have an effect not only upon the balance of payments but also upon macroeconomic variables. The theory states that domestic products will be cheaper for foreign customers when the exchange rate increases, increasing foreign demand. Demand increase has a positive impact on a country whose currency depreciates. Besides, import goods will be relatively expensive due to increased exchange rates, and domestic consumers must pay more to buy them. This causes a decrease in demand for imported goods. Therefore, countries try to enhance their competitiveness in international trade occasionally.

In consequence of devaluation made by related policymakers in the countries implying fixed exchange rates or by increasing the exchange rates on the market in the countries applying free exchange rate system, the relative price of tradable goods will change. This also changes the import and export. Effects of these changes are dependent on the elasticity of demand and supply of tradable goods. Marshall (1923) and Lerner (1944) specify that the summation of demand and supply elasticities should be more significant than one so that devaluation can give desirable results. This statement, known as the Marshall-Lerner condition, explains demands of export and import goods depending on price elasticities could remove external trade deficits. This condition is shown as $e_m + e_x \geq 1$. Here, e_m and e_x represent domestic demand elasticities of import goods and export goods, respectively. The more their summation is above 1, the more trade deficit is removed associated with changes in real exchange rates (Köseyaylaoğlu & Karataşlı, 2018: 834).

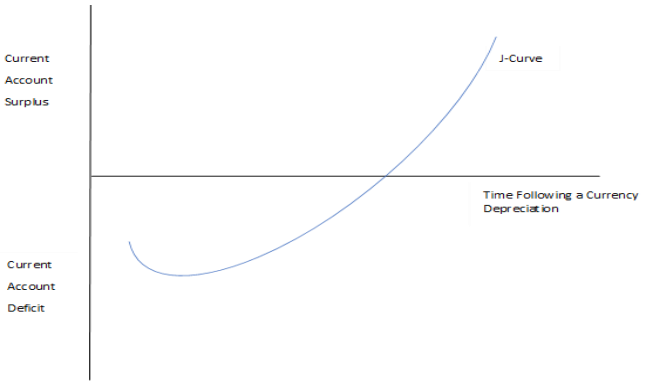
Analysing the competition power in foreign trade gained from exchange rate policies becomes significant. If it is looked at from the viewpoint of competition power, short-term and long-term effects of devaluation emphasize the price factor in determining competition power. To see the efficiency of the price factor, as specified in the Marshall-Lerner

condition, it should be checked whether changing exchange rates in consequence of devaluation generates worsening trade balance. On the other hand, the foreign trade balance will recover long-term, and J-curve will arise. According to results obtained, competition based on price or non-price factors produces more effective, decisive results.

The J-curve phenomenon explains how to trade balance responds to devaluation. Magee (1973), introducing this phenomenon, asserts that devaluations cannot generate expected impact at first due to reasons such as production, contracts, or deliveries. External trade deficit becomes higher at the beginning of devaluation, in the following process, external trade deficit decreases. Volume and price cause this situation to occur. Short-time elasticities are low since import and export contracts are made in advance, and thus, exchange rate changes do not change the external trade volume. Changes in exchange rates show their impacts in the long term. However, the price effect instantly shows its impact on external trade. After the devaluation, the price of export goods abroad decreases, and the price of import goods in terms of national currency increases. This situation, at first, creates more trade deficits. But new contracts are made with the adjustment of importer and exporter to the new exchange rate level. In this case, demand for import goods decreases while demand for export goods increases. In the long run, the external trade deficit begins to close. This situation is called the J-curve effect. The J-curve approach points out that there are price rigidities in the short run and domestic currency depreciation deteriorates the trade balance. After the short-run response worsening the trade balance deficit, depreciation improves the external trade balance in the long run, and the external trade balance gap begins to close.

As shown in Figure 1, J-curve is a trendline starting with a dramatic increase in loss followed by a long-term gain immediately afterward. Following the depreciation of its currency, since import goods become more expensive and export goods are cheaper country's current account deficit increases. That is, the balance of payment worsens initially. After that, as export goods are cheaper, more export goods are sold to the foreign countries, and less import goods are bought from the other countries because they are more expensive. Thus, the recovery process for trade balance starts, and the current account deficit decreases, or the current account surplus happens in the long term. Due to the pre-existing contracts, the total import volume will increase, and export volume will remain unchanged. In addition, since consumers need time to search for cheaper alternative products, demand for the more expensive import goods remains price inelastic. These are why import prices rise, and the trade balance worsens in the short run because of depreciation. In the short run, as there is a lag in demand for import goods, a drop followed by the lag arises in import volume. In the long run, consumers stop demanding expensive import goods, and this, along with the increase in export volume, causes either a smaller deficit or a more significant surplus. The expected outcome from domestic currency depreciation over the longer term is to have a better current account balance because domestic consumers prefer domestic goods more than imported goods. Equally, foreign consumers are now more willing to prefer the products imported to their country, depreciating its currency because they are cheaper.

Figure: 1
J-Curve



Turkey has a chronicle balance of payments problem. Turkish Lira has been devaluated many times to solve this problem, but the effects of these devaluations were limited. It gives better results to include the main trade partners of Turkey into the model to detect the validity of the J-curve analysis. In the literature, the validity of the J-curve is evaluated just for Turkey or in a group not including all main trade partners of Turkey. Some studies examine the validity of J-curve analysis for Turkey and its trade partners, but they do not use aggregate data. This study differs from the related literature on the J-curve effect in Turkey on three accounts. Firstly, unlike other studies, we analyse Turkey and its main trade partners by using aggregate data. Secondly, DOLS long-term and DCCE short-term estimators whose short- and long-term power is proven by Monte Carlo experiments are utilized to estimate parameters. Previous studies concerning the J-curve hypothesis for Turkey did not apply these estimators. Finally, by analysing the validity of J-curve as a group and different country, whether they exhibit the same behaviour as an individual country and a panel group could be seen. In this way, more consistent and stronger evidence could be given to detect the validity of the J-curve.

The trade balance is dependent on its leading trade partners' trade balance and economic condition. Thus, the validity of the J-curve for a country should be analysed together with its main trade partners. Despite a lot of studies in this literature, many of the researchers preferred time series analysis methods. Due to the economic dependency between the countries, this cross-sectional dependency could be included in the model via panel data methods, and the effects of the dependency on test results can be represented. On the other hand, short- and long-term parameter estimations should be conducted. Therefore, panel time-series techniques are preferred. Aggregate, bilateral and sectoral data are used in the j-curve analysis. Aggregate data is preferred in this study, although the models used to use three kinds of data. By using aggregate data, countries in the panel, including Turkey, could be analysed as a group, unlike bilateral data. As a group, behaviours of countries in the panel could be evaluated economically when aggregate data is used. Apart from the J-

curve literature for Turkey, findings from this study are considered complementary to the literature in showing the invalidity of J-curve both for all countries individually and as a group. These results give stronger and more valid findings of Turkey and its main trade partners. Devaluation of the domestic currency will not give the desired result.

In this study, the validity of the J-curve hypothesis for Turkey and its main trading partners is examined by utilizing Westerlund Panel Cointegration Test, Dynamic Ordinary Least Squares Mean Group Estimator methods, and annual data covering the period over 1995-2018 is employed. Preliminary tests support the suitability of methods employed in this study, contributing to the originality of this paper. The superiority of these methods, in comparison with other methods, is emphasized by different researchers. These comparisons are mentioned in the data and methodology section in more detail. The paper will be organized as follows. Literature is presented in the following section. After that methodology and data section is introduced. Following this, we present the test results section. The Paper will be finished with a conclusion section.

2. Literature Review

Since this study is about Turkey and its main trading partners, a broad part of the literature review is about the validity of the J-curve for Turkey. It is seen from the related literature for both Turkey and other countries that the validity of this approach has been tested by using different variables having data with various frequencies and utilizing various econometric methods. Time series analysis methods, especially for Turkey, are mainly preferred in empirical studies in the J-curve literature. A great many studies testing this phenomenon use single and multivariate cointegration methods. These empirical studies have two major trends, one of which is the aggregate trade balance approach. The other studies employ a bilateral trade balance approach. Time series of a country utilized in the analysis are influenced not only by the country's dynamics but also by the dynamics of countries with which the country has intense trade ties. Thus, this study aims to contribute to the related literature by using panel data analysis, which allows the effects of main trading partners' dynamics on Turkey.

Rose (1990) employs a three-stage least square method for testing the J-curve for 30 countries, including Turkey, for the period 1970-1988. Empirical results indicate that there is no substantial effect of real exchange rates on the trade balance. Using quarterly data from 1969 to 1993, Brada et al. (1997) examine the reaction of the trade balance of Turkey to the devaluation by employing time series methods. They conclude that real exchange rates influence trade balance in the long run and trade liberalization during the 1980s. Yazıcı and Klasra (2010) investigated the response of devaluation on the Turkish economy's trade balance by employing the Almon lag technique, cointegration method, and impulse response function for the data covering 1986 to 1998. J-curve is not valid for manufacturing and mining industries.

Elmas and Elmas (2019), in their study, investigated the validity of the J-curve in the Bandırma district by employing cointegration, causality, and Wilcoxon Sign Rank Test. In this study for the period of 1996-2015, it was found that there is a cointegration relationship between the foreign trade balance and the real exchange rate, and the real exchange rate is the cause of the Granger foreign trade balance. The researchers, who stated that the cointegration analysis did not give much information about the J-curve, continued with the Wilcoxon Sign Rank Test. The researchers concluded that the J-curve is valid in the Bandırma district according to the relevant test results. Akkaya (2018) examined whether the J-curve is valid with the bound test approach in Turkey and Turkey's 13 foreign trade partners (Belgium, Canada, China, Finland, France, Germany, Italy, Netherlands, Portugal, Spain, Sweden, UK, and the USA). According to the results, after the devaluation of the Turkish Lira, it is concluded that the J-curve is not valid in Belgium, Canada, Finland, and the UK. France, Germany, and Holland are positively affected by this loss. Yılmaz et al. (2017) examined the short-term, and long-term relationship between the foreign trade deficit, the real exchange rates, and the Gross Domestic Product (GDP) variables with the ARDL bound test approach to investigate the validity of the J-curve hypothesis in Turkey. According to the analysis results, it was concluded that the real exchange rates did not statistically affect the foreign trade deficit. Authors interpreting this situation mention foreign trade structure is becoming more and more liberated and point out the nonexistence of J-curve in the corresponding period in Turkey.

The relationship between real exchange rate, export price index, and import price index for Turkey is analysed by Hepaktan (2016) via Maki Cointegration Analysis, allowing multiple structural breaks with the help of quarterly data covering the period 1990-2016. Test results do not show long-term cointegration relation among the series. Findings from the Toda-Yamamato causality test point out a unidirectional causality from two variables to real exchange rates. Kemeç and Kösekahyaoğlu (2015) analyse the validity of the Marshall Lerner condition and J-curve for Turkey over 1997-2013. The VAR model and Granger causality test are utilized using quarterly data, supporting the Marshall Lerner condition and J-curve hypothesis. Bal and Demiral (2012) examine bilateral trade of Turkey with Germany over the period 2002-2012 by using monthly data. Evidence obtained from the vector error correction model and causality test reveal Marshall Lerner condition does not hold in the short-run since the elasticity of exchange rates in the trade balance is positive in the long run and negative in the short-run. Findings from this study support the J-curve adjustment process. In this study using quarterly data over 1985-2005, Halicioglu (2008) empirically investigates the J-curve adjustment process of Turkey and its 13 main trading partners. Bounds cointegration testing and error correction model are utilized, and findings indicate no evidence for J-curve in the short run. At the same time, the trade balance of Turkey with the UK and the U.S. is positively affected by real depreciation in the long run. Akbostancı (2004) investigated the J-curve effect in Turkey for the 1987-2000 period by VECM and impulse-response function. According to the study results, although the long-term relationship between variables supports the J-curve effect, the short-term relationship does not support this effect.

Rose and Yellen (1989) analysed the J-curve between the US and its six main trading partners and started the bilateral trade balance trends. They used the data covering for 1960-1985 and employed a cointegration test. It is concluded from the test results data does not support the convincing evidence of the existence of J-curve for both aggregate and bilateral approaches. Moffett (1989) examines the J-curve for the US over the period 1967-1987. Estimation results for the long-run trade balance imply a sine wave. An empirical evaluation for the import sector is consistent with the J-curve hypothesis. However, although export earnings increase due to dollar devaluation, this rise is insufficient to cover the increasing import expenditures. Backus et al. (1994) test J-curve effect for 11 developed countries, including the US, United Kingdom, Germany, and Italy, for the 1955-1990 period. Their findings show that net export and trade data are highly autocorrelated, and the cross-correlation function has an asymmetrical S shape. In their study, Demirden and Pastine (1995) employ the OLS method and its variations to analyse the J-curve hypothesis using US data covering 1978-1993. Signs of the variables' coefficients do not support the evidence of J-curve. Ali and Anwar (2017) employ the dynamic stochastic general equilibrium model to explain the J-curve phenomenon. Their findings mention an increase in the intensity of the J-curve effect with the cost channel of monetary policy.

To determine the nonlinear nexus between real exchange rates and trade balance for China and its 21 trading partners, Bahmani-Oskooee et al. (2018) employ NARDL methodology using quarterly data from 2000-2015. Their findings indicate the adjustment asymmetry for 11 partners in the short and long run, and asymmetric effects exist in cases of five partners. Nusair (2017) utilizes linear and nonlinear ARDL (NARDL) model using quarterly data to examine the existence J-curve hypothesis for 16 European transition economies. The results of the linear ARDL model do not support the J-curve hypothesis, while the NARDL model shows evidence for the validity of the J-curve hypothesis in 12 economies. By using quarterly bilateral data over the period 1971-2013, Bahmani-Oskooee and Fariditavana (2016) analyse the existence of J-curve for the US and its major trading partners (Canada, France, Germany, Italy, Japan, and the UK). NARDL approach is applied to determine the J-curve effect. The introduction of a nonlinear adjustment process supports more evidence favouring the J-curve than the linear model. In their study, Bahmani-Oskooee and Fariditavana (2015) search for evidence of the J-curve by introducing non-linearity for 1973-2014. For Canada, the USA, China, and Japan, trade balance models are estimated using linear and nonlinear ARDL, and quarterly data is analysed. The linear process supports the validity of the J-curve for the USA, while evidence from the nonlinear process shows that the J-curve is valid for China and the USA.

For China and its 18 trading partners, Wang et al. (2012) investigate the J-curve hypothesis in the short run and the trade balance effect of the real exchange rate over the period 2005-2008 using monthly data. A fully modified OLS for heterogeneous cointegrated panel (panel FMOLS) model and panel error correction model (panel ECM) is utilized to detect the validity of the J-curve hypothesis. Their results reveal the fact that RMB is not of long-run effect on the trade balance of China. Bahmani-Oskooee and Hajilee (2012) investigated the trade balance response of industries in case of depreciation of Euro between

Germany and the U.S. According to results, using annual data over the period 1962-2009 and bounds testing approach, 91 industries respond to exchange rate fluctuations in the short-run, but J-curve is valid only for eight industries. Evidence also supports improvement in the trade balance for 31 industries in the event of currency depreciation. Hsing and Sergi (2010) examined the validity of the J-curve for the 1980-2007 period in Australia, Canada, New Zealand, and the UK by vector error correction model (VECM) and generalized impact response function. While evidence of the J-curve exists in New Zealand, it is concluded that it is not valid in Australia, Canada, and the UK. Bahmani-Oskooee and Kutan (2009) test the J-curve hypothesis for 11 east European countries. This study uses monthly data covers for 1990-2005 and uses the bound test approach and error correction model. Findings support the J-curve hypothesis in Bulgaria, Croatia, and Russia. Bahmani-Oskooee and Wang (2006), in their study, highlighted that the use of aggregate trade data in previous studies investigating the existence of the J-curve in China yielded complex results and decomposed the data for China and 13 trading partners. They analysed the appropriate data for the period 1983-2002 by the ARDL approach. As a result of the study, no positive results were found in the direction of the J-curve.

3. Data and Methodology

In contrast to many studies in related literature for Turkey, six main trade partners of Turkey are included in panel data analysis to consider Turkey's internal dynamics and consider the effects of other countries' internal dynamics on the existence of J-curve for Turkey. All countries' data are available from 1995 to 2018. Annual data covering the period 1995-2018 is applied. Export Value Index/Import Value Index variable is employed as the dependent variable and denoted as *bop*. Variables are obtained from World Bank Statistics. *exc* variable describing real exchange rates is used as the independent variable for Turkey, Russia, USA, Germany, UK, Italy, and China. STATA 14.0 software is used to obtain results.

Studies conducted with panel data analysis examine the common dynamics of unit gathering for various reasons, while research conducted with time series analysis investigates dynamics of one unit in time. At this point, panel data analysis is often preferred in international economics literature to analyse the countries economically interdependently. Turkey has an economically intense relationship with its main trade partners. Therefore, as part of international economics literature, the J-curve hypothesis is analysed with panel data methods in this study. The long-term relationship among series being stationary in the same level but not I(0) is analysed via cointegration methods. Panel cointegration tests are studied under two topics based on whether they consist of interdivisional correlation. Depending on the homogeneity of these tests, the usage of appropriate test statistics is an important point.

Westerlund (2007) introduced four structural-based panel cointegration tests, and the null hypothesis for these tests is stated as no cointegration. The alternative hypothesis of this test's panel test statistics is that the whole panel is cointegrated, while the alternative

hypothesis of group test statistics is that there is at least one cointegrated unit. Westerlund (2007) started from the equation below to generate test statistics.

$$\Delta y_{it} = \delta_i' d_t + \alpha_i \left(y_{it-1} - \beta_i' x_{it-1} \right) + \sum_{j=1}^{p_i} \alpha_{ij} \Delta y_{it-j} + \sum_{j=0}^{p_i} \gamma_{ij} \Delta x_{it-j} + e_{it}, \tag{1}$$

$d_t = (1, t)'$ is a vector consisting of deterministic components and $\delta_i = (\delta_{1i}, \delta_{2i})'$ is a parameter of related deterministic components. The problem is to estimate the error correction parameter α_i. One way to estimate related parameter is to assume that β_i is known. In this case, α_i parameter is estimated by the OLS method. But Boswijk (1994) and Zivot (2000) indicate that tests based on a predetermined parameter are not similar and depend on nuisance parameters even if they are asymptotic. Separately multiplying parameters obtain an alternative approach to equation 1 with y_{it-1} and $\beta_i' x_{it-1}$.

$$\Delta y_{it} = \delta_i' d_t + \alpha_i y_{it-1} - \lambda_i' x_{it-1} + \sum_{j=1}^{p_i} \alpha_{ij} \Delta y_{it-j} + \sum_{j=0}^{p_i} \gamma_{ij} \Delta x_{it-j} + e_{it}, \tag{2}$$

In this approach, α_i parameter is independent of the choice β_i. Since λ_i it is unrestricted and cointegration vector is estimated indirectly from alternative hypothesis test based on α_i the parameter is asymptotic similar, and its distribution is not affected from nuisance parameters. That λ_i parameter is not restricted can be seen from the $\lambda_i = -\alpha_i \beta_i$ equation. Two of the four test statistics depending on estimation of α_i the parameter in equation 2 via OLS method are panel (homogeneous) statistics, and the other two are group mean (heterogeneous) statistics. Group mean statistics are obtained in 3 steps:

Step 1: Equation 2 is estimated for each unit by the OLS method.

$$\Delta y_{it} = \hat{\delta}_i' d_t + \hat{\alpha}_i y_{it-1} - \hat{\lambda}_i' x_{it-1} + \sum_{j=1}^{p_i} \hat{\alpha}_{ij} \Delta y_{it-j} + \sum_{j=0}^{p_i} \hat{\gamma}_{ij} \Delta x_{it-j} + \hat{e}_{it}, \tag{3}$$

Lag length p_i changes from unit to unit, and lag length is chosen with the help of a data-dependent rule, information criteria, or constant function T.

Step 2: $\alpha_i(1) = 1 - \sum_{j=1}^{p_i} \alpha_{ij}$ an equation is estimated. The most natural way to obtain this is to estimate $\alpha_i(1)$ by using $\tilde{\alpha}_i(1) = 1 - \sum_{j=1}^{p_i} \hat{\alpha}_{ij}$ an equation. $\tilde{\alpha}_i(1)$ based tests, especially when leg length p_i is big, weakly perform in the small sample sizes due to uncertainty in estimating autoregressive parameters. The kernel estimator approach solves this problem. $\hat{\alpha}_i$, semi-parametric kernel estimator of α_i, is obtained.

Step 3: Test statistics are generated.

$$G_\tau = \frac{1}{N}\sum_{i=1}^{N} \frac{\hat{\alpha}_i}{SE(\hat{\alpha}_i)} \quad G_\alpha = \frac{1}{N}\sum_{i=1}^{N} \frac{T\hat{\alpha}_i}{\hat{\alpha}_i(1)}$$

$SE(\hat{\alpha}_i)$ is the standard error of $\hat{\alpha}_i$. Panel statistics are also calculated in 3 steps.

Step 1: Lag length p_i is determined for each unit. Afterward, the regression models below are estimated.

$$\Delta\tilde{y}_{it} = \Delta y_{it} - \hat{\delta}_i' d_t - \hat{\lambda}_i' x_{it-1} - \sum_{j=1}^{p_i} \hat{\alpha}_{ij} \Delta y_{it-j} - \sum_{j=0}^{p_i} \hat{\gamma}_{ij} \Delta x_{it-j}, \tag{4}$$

$$\tilde{y}_{it-1} = y_{it-1} - \hat{\delta}_i' d_t - \hat{\lambda}_i' x_{it-1} - \sum_{j=1}^{p_i} \hat{\alpha}_{ij} \Delta y_{it-j} - \sum_{j=0}^{p_i} \hat{\gamma}_{ij} \Delta x_{it-j}. \tag{5}$$

Step 2: Common error correction parameter α and standard deviation are estimated.

$$\hat{\alpha} = \left(\sum_{i=1}^{N} \sum_{t=2}^{T} \tilde{y}_{it-1}^2 \right)^{-1} \sum_{i=1}^{N} \sum_{t=2}^{T} \frac{1}{\hat{\alpha}_i(1)} \tilde{y}_{it-1} \Delta\tilde{y}_{it.}$$

The standard error $\hat{\alpha}$ is calculated as below.

$$SE(\hat{\alpha}) = \left(\left(\hat{S}_N^2\right)^{-1} \sum_{i=1}^{N} \sum_{t=2}^{T} \tilde{y}_{it-1}^2 \right)^{-1/2}$$

$$\hat{S}_N^2 = \frac{1}{N}\sum_{i=1}^{N} \hat{S}_i^2 .$$

$\hat{\sigma}_i$ is the standard deviation obtained from equation 2. According to this, $\hat{S}_i$ it is calculated as $\hat{\sigma}_i / \hat{\alpha}_i(1)$.

Step 3: Panel statistics are calculated with the help of the equation below.

$$P_\tau = \frac{\hat{\alpha}}{SE(\hat{\alpha})} \quad P_\alpha = T\hat{\alpha}.$$

Westerlund (2007) proves via simulation that this test has higher power than the residual-based tests developed under the assumption that there is no correlation between units such as McCoskey and Kao (1998), Kao (1999), and Pedroni (1999, 2004) and shows good small sample size features having small disturbances. If variables are cointegrated, when one unit change in one variable happens, the movement of another variable in the long term is estimated with long-term estimation. Long-term estimators in panel data literature are determined according to whether they consider interdivisional correlation or homogeneous. In heterogeneous panels having interdivisional correlation, long-term estimation is made with The Panel Dynamic Ordinary Least Squares Mean Group (DOLSMG) method. This estimation method is derived from the equation below.

$$y_{it} = \mu_i + \beta_i x_{it} + e_{it} \qquad i = 1,..,N \quad t = 1,...,T$$

Indices in the constant and slope parameters indicate model changes based on units; the model is heterogeneous. Z_{it} expressed as $Z_{it} = \left(x_{it}, \bar{x}_i, \Delta x_{it-k}, ..., \Delta x_{it+k}\right)$ is the explanatory variables vector. According to this, DOLSMG estimation is made with the formula below.

$$\hat{\beta}_{DOLSMG} = N^{-1}\left[\sum_{i=1}^{N}\left(\sum_{t=1}^{T}\left(Z_{it}Z'_{it}\right)\right)^{-1}\right]\left(\sum_{t=1}^{T}\left(Z_{it}\bar{Y}_{it}\right)\right)$$

$$\bar{Y}_{it} = Y_{it} - \bar{Y}_i$$

DOLSMG estimator is calculated by taking the average of DOLS estimators calculated for each unit.

$$\hat{\beta}_{DOLSMG} = N^{-1}\sum_{i=1}^{N}\hat{\beta}_{DOLS,i}$$

Mark and Sul (1999) conducted the Monte Carlo simulation to evaluate the performance of the DOLS estimator. They applied Panel Dynamic OLS estimator and Weighted Panel Dynamic OLS estimator to the pooled data. They point out that the Weighted Panel Dynamic OLS estimator demonstrates small sample bias and recommend

employing DOLS estimator. If long term relationship among variables is detected as a result of cointegration tests error correction model is utilized to analyse long and short-term relationships together. Panel error correction models are considered according to whether they consist of interdivisional correlation or are homogeneous. The dynamic common correlated effect (DCCE) estimator suggested by Chudik ve Peseran (2015) is a heterogeneous error correction model consisting of interdivisional correlation. The commonly correlated effect estimator suggested by Peseran (2006) is not robust in the existence of lagged dependent variables and weak exogenous independent variables. To solve these problems, a DCCE estimator is developed. In the DCCE estimator assuming y and x variables are stationary in their first differences (I(1)), cross-section means are added to the model to represent the unobserved factors. This model is shown below. Chudik and Pesaran (2015), in contrast with approaches of Bai (2009), Moon and Weidner (2010,2012), and Song (2013), emphasize that CCE (Common Correlated Effect) type estimators extended with an appropriate number of lags and cross-sectional means perform well even in dynamic models being of weak exogenous variables.

$$\Delta y_{it} = \alpha_i \left(y_{it-1} - \lambda_i' x_{it-1} \right) + \sum_{j=1}^{p} \varphi_j \Delta y_{it-j} + \sum_{j=0}^{p} \gamma_j x_{it-j} + \sum_{j=1}^{p} \beta_j \Delta y_{t-j} + \sum_{j=1}^{p} \phi_j \Delta x_{t-j} + e_{it} \tag{6}$$

4. Test Results

Panel unit root tests are analysed under two generations as regards whether units consist of cross-sectional dependency. Tests of two generations differ by changes of autoregressive parameter, that is, by the homogeneity of the autoregressive parameter. Thus, it is required to test cross-sectional dependency and homogeneity by utilizing Dickey and Fuller's (1979) specification to determine the appropriate panel unit root test. Since panel data structure in this study is T>N Breusch, and Pagan LM test whose asymptotic features is T>N is used to test cross-sectional dependency. Swamy's S test is preferred to analyse for homogeneity.

Breusch Pagan LM and Swamy's S tests are applied to error terms obtained from the Dickey-Fuller Test equation with one lag represented in Equations 7 and 8 below.

$$\Delta bop_{it} = \alpha_0 + \alpha_1 bop_{it-1} + \varphi \Delta bop_{it-1} + \varepsilon_{it} \xrightarrow{OLS} \hat{\varepsilon}_{it} \tag{7}$$

$$\Delta exc_{it} = \beta_0 + \beta_1 exc_{it-1} + \theta \Delta exc_{it-1} + v_{it} \xrightarrow{OLS} \hat{v}_{it} \tag{8}$$

Breusch Pagan LM test results show cross-sectional dependency for both series. Swamy's S test results show that while the bop series exhibits heterogeneous features, the exc series shows homogeneous features. Thus, Pesaran's CADF test and Robust Breitung test are applied to the related series, respectively. Test results can be seen in Table 1.

Table: 1
Panel Unit Root Test Results

	Panel Unit Root Tests	Unit Root Test Statistics	p-value
bop	Pesaran's CADF Test	-1.841	0.41
exc	Robust Breitung Test	-0.6276	0.26

Panel unit root test results indicate that both series have unit root in the level. The first difference is taken for each series to determine the integration order, and the same panel unit root tests are applied. Results are shown in Table 2.

Table: 2
Panel Unit Root Test Results

Variable	Panel Unit Root Test	Unit Root Test Statistics	Test Statistics Probability Value
Δ(bop)	Pesaran CADF Test	-3.125	0.00
Δ(exc)	Robust Breitung Test	-4.026	0.00

Unit root test results indicate that both series are stationary. So, a panel cointegration test could be applied to these series as they are stationary in their first difference. Panel cointegration tests are investigated under two generations according to whether error terms obtained from model estimation have a cross-sectional dependency. These tests become diversified regarding the existence of error correction-based and residual-based cointegration tests and at the same time regarding homogeneity and heterogeneity of units. As Monte Carlo simulations show that error correction model-based tests give better results, it is decided to use error correction-based cointegration tests. The convenient panel cointegration test utilizes Breusch and Pagan LM test and Swamy's S test in equation 11 below. Dummy variables are added to this model to consider the structural breaks, and CUSUM and CUSUM SQ tests are employed. Structural break dates are shown in Table 3.

Table: 3
Structural Breaks

Countries	Time of Break
China	2009
Germany	2003
Italy	2013
Russian Federation	1999
Turkey	2001
United Kingdom	2011
United States	2013

$$\Delta bop_{it} = a_0 + \alpha_1 \Delta exc_{it} + \alpha_2 bop_{it-1} + \alpha_3 exc_{it-1} + \alpha_4 \Delta bop_{it-1} + \alpha_5 \Delta exc_{it-1} + \alpha_6 Dummy_{it} + \varepsilon_{it} \xrightarrow{OLS} \hat{\varepsilon}_{it} \quad (11)$$

Breusch Pagan LM test results show no cross-sectional dependency in the residuals obtained from the error correction model. At the same time, it is determined that residuals mentioned above have heterogenous features due to Swamy's S test. It is appropriate to consider the Heterogenous Test Statistics results of the Westerlund Panel Cointegration test. These results can be seen in Table 4.

Table: 4
Results of Westerlund Group Test Statistics

Test Statistics Type	Test Statistics	Test Statistics Probability
G_t	-2.496	0.00
G_α	-2.117	0.01

Since the p-value is smaller than both Westerlund group test statistics G_t and $G\alpha$ null hypothesis stating nonexistence of cointegration is rejected, there is a cointegration relationship between the balance of payments and exchange rates, a long-term estimation can be applied after this test, long-term panel estimators are called first or second-generation regarding whether there is cross-sectional dependency and called homogenous or heterogeneous estimators based on homogeneity, to be able to find a long-term estimator, cross-sectional dependency and homogeneity tests should be applied. Among first and second-generation tests, the Breusch Pagan LM test and Swamy's S test are applied to the error term obtained from equation 12. Test results reject the null hypothesis, which mentions no cross-sectional dependency.

$$bop_{it} = a_0 + \alpha_1 exc_{it} + \alpha_2 Dummy_{it} + \varepsilon_{it} \xrightarrow{OLS} \hat{\varepsilon}_{it} \tag{12}$$

By using the same model, Swamy's S test is utilized to determine estimators among second-generation estimators. The null hypothesis expressing homogeneity is rejected. So, parameters are heterogeneous. Findings refer to the Dynamic Ordinary Least Squares Mean Group (DOLSMG) estimator. Dynamic Ordinary Least Squares could estimate variables by taking differences from cross-sectional means for units and whole panel by Pedroni's (2001) DOLSMG estimator, whose results are presented in Table 5.

Table: 5
DOLSMG Test Results for Panel

Variables	Coefficient	t-Stat
Exchange Rates	0.0006299	-1.846
Dummy	0.03793	8.011

Results do not show any meaningful relationship between exchange rates and balance of payments for %5 significance level. Even if the coefficient has the expected sign for the validity of the J-curve, it is not valid since the variable is not statistically significant for the whole panel. Dummy variable consisting of structural breaks is significant in the long term. Findings of the DOLS test are in the tables below.

Table: 6
DOLS Test Results for Units

1. Variable: China		
Variables	Coefficient	t-Stat
Exchange Rates	0.002231	1.472
Dummy	-0.1843	-1.894
2. Variable:Germany		
Variables	Coefficient	t-Stat
Exchange Rates	-0.004287	-7.282
Dummy	0.1339	14.33
3. Variable:Italy		
Variables	Coefficient	t-Stat
Exchange Rates	0.002872	0.7648
Dummy	0.2285	6.247
4. Variable:Russian Federation		
Variables	Coefficient	t-Stat
Exchange Rates	0.0005486	0.3098
Dummy	0.4417	4.338
5. Variable:Turkey		
Variables	Coefficient	t-Stat
Exchange Rates	0.002482	0.8074
Dummy	0.06817	0.6916
6. Variable:United Kingdom		
Variables	Coefficient	t-Stat
Exchange Rates	0.003609	0.967
Dummy	-0.3098	-1.28
7. Variable:United States		
Variables	Coefficient	t-Stat
Exchange Rates	-0.003045	-1.923
Dummy	-0.1127	-1.24

Statistical results of individual countries, except Germany, for long-term parameters, are insignificant, but although Germany's test results are significant coefficient sign is negative. Exchange rates do not have any effect on the balance of payments for China. J-curve is not valid. In the same way, the structural break in 2009 does not influence the long-term balance of payments. When considering test results for Germany, it is shown from Table 6 exchange rates impact the balance of payments in a negative direction. That is, an increase in import becomes bigger than the increase in export as exchange rates rise. Thus, the J-curve approach is not valid for Germany but the structural break happening in 2003 affects the balance of payments in the long term. Exchange rates do not affect the balance of payments for Italy, Russia, Turkey, and the UK. So, J-curve is not valid. A structural break in 2013 for Italy affects the balance of payments in the long term. For Russia, a structural break in 1999 had a long-term effect on the balance of payments. A structural break in 2001 for UK and Turkey does not affect the balance of payments in the long term. For the USA, exchange rates have an impact on the balance of payments in a negative direction. Thus, the J-curve approach is not valid, but the structural break in 2013 does not affect the balance of payments in the long term.

As panel and individual country, J-curve is not valid according to findings. Panel error correction estimation is employed to check the short-term results and control if the correction mechanism works properly. There are two generations of panel error correction models depending on cross-sectional dependency, and these models vary among them as homogenous and heterogenous panel error correction models. Cross-sectional dependency and homogeneity tests are applied on error obtained from equation 13.

$$\Delta bop_{it} = a_0 + \alpha_1 \Delta exc_{it} + \alpha_2 bop_{it-1} + \alpha_3 exc_{it-1} + \alpha_4 \Delta bop_{it-1} + \alpha_5 \Delta exc_{it-1} + \alpha_6 Dummy_{it} + \varepsilon_{it} \xrightarrow{OLS} \hat{\varepsilon}_{it} \quad (13)$$

Since there is no cross-sectional dependency and residuals show heterogenous features second-generation heterogenous panel error correction model is preferred. Among these tests, as Common Correlated Effect (CCE) and Augmented Mean Group (AMG) estimators are not consistent under the assumption of weak exogeneity Dynamic Common Correlated Effect (DCCE) estimator is preferred. Results are shown in Table 7 below. From the whole panel, exchange rates do not affect the balance of payment in the short term. Even though the coefficient has the expected sign, it is insignificant. So, J-curve is not valid.

Table: 7
DCCE Test Results for Panel

Variables	Coefficient	p-value
Δ(exc)	-0.000774	0.688

Table: 8
DCCE Test Results for Units

1. Unit - China		
Variables	Coefficient	p-value
Δ(exc)	0.006907	0.665
2. Unit - Germany		
Variables	Coefficient	p-value
Δ(exc)	0.000948	0.000
3. Unit - Italy		
Variables	Coefficient	p-value
Δ(exc)	-0.006646	0.208
4. Unit - Russian Federation		
Variables	Coefficient	p-value
Δ(exc)	-0.00012	0.000
5. Unit - Turkey		
Variables	Coefficient	p-value
Δ(exc)	-0.007437	0.764
6. Unit - United Kingdom		
Variables	Coefficient	p-value
Δ(exc)	0.002858	0.334
7. Unit - United States		
Variables	Coefficient	p-value
Δ(exc)	-0.001932	0.070

In the short term, test results are significant for Germany and Russia, but they are insignificant for other countries individually. Exchange rates do not affect the balance of payments in China, but it affects the balance of payments in Germany. However, the coefficient sign is the opposite; thus, J-curve is not valid in Germany. In the long run, exchange rates affect the balance of payments in a negative direction for Germany. So, J-curve is moving in the opposite of the expected direction.

In the short term, exchange rates do not affect the balance of payments in Italy. In Russia, exchange rates have a negative effect on the balance of payments. This is a condition for the validity of the J-curve, but since exchange rates do not impact the balance of payments, in the long run, there is not enough evidence for the validity of the J-curve. In the short term, exchange rates do not affect the balance of payments in Turkey and the UK. For the USA, exchange rates affect the balance of payments in the %90 confidence level.

5. Conclusion

Numerous studies have sought the validity of J-curve in the past few decades. However, conclusive evidence from the studies has not been reached. The short-run and long-run impact of currency depreciation on Turkey's trade balance are argued with the help of the J-curve phenomenon in the literature, suggesting that trade balance after depreciation deteriorates in the short run but improves in the long run. Previous studies searching for the existence of J-curve for Turkey and other countries reached mixed results. They mainly employ time series methods, not considering the impacts of main trading partners' dynamics on the existence of J-curve. Rose and Yellen (1989), Moffett (1989), Backus et al. (1994), Demirden and Pastine (1995), Hsing and Sergi (2010), and Bahmani-Oskooee and Wang (2006) prefer to employ time series methods, and their findings do not support the existence of J-curve.

On the other hand, Bahmani-Oskooee et al. (2018), Nusair (2017), Bahmani-Oskooee and Fariditavana (2016), Bahmani-Oskooee and Fariditavana (2015), and Bahmani-Oskooee and Kutan (2009) use time series methods, but empirical results from these studies support the validity of J-curve. Panel data methods utilized in this study allow us to include the impacts of the dynamics of six main trading partners on the existence of J-curve for Turkey, which makes this study different from the previous studies. Thus, J-curve is tested by using an annual panel dataset covering the period 1995-2018.

For each country, findings from DOLS estimation results do not provide any evidence to support the validity of J-curve since t statistics are insignificant in all countries, excluding Germany being of negative coefficient sign denoting that J-curve is invalid in the long run. Test results analysing the short run show whole panel is statistically insignificant. Global economic system makes countries dependent on imports for consumption and production needs. Most of the developing and developed countries become dependent on imports, particularly energy, for export. Moreover, rising exchange rates increase the cost of entry of high value-added advanced technology and capital goods into the country. In addition to these reasons, opportunities for developing countries with chronicle balance of payment deficit problems to compete with developed countries and their reflexes to make different productions to respond to changing foreign demands are limited. Because of these reasons, the devaluation of domestic currencies does not generate the desired results in the short- and long-run.

Turkey is also dependent on imports, and Turkey's largest import item is energy. Thus, devaluation makes Euro and US Dollar more expensive relative to the Turkish Lira. This, in turn, increases the cost of export products and makes them expensive. In the short run, t statistics are significant for Germany and Russia, but Germany has an unexpected sign. J-curve is not valid since it does not have an expected coefficient sign in the long and short run. Germany was the third-largest exporter and importer country in 2018. Devaluation is expected to have a negative impact on Germany's balance of payments. Still, Germany's balance of payments recovers in the short term and worsens in the long run, contrary to

expectations. When there is a devaluation in Euro, that means devaluation happens in all Euro-Area countries. Germany's import and export partner shares in Euro-Area are about %36 and %39 respectively. A large part of Germany's trade is with Euro-Area countries, and this might be one of the reasons for the invalidity of J-Curve analysis for Germany. Although this is the topic for another research, it might be why the competition power of Euro Area countries in prices could be higher than Germany.

Even though Russia has expected sign in the short run, its t-statistics is insignificant in the long run. Thus, J-curve does not exist in Russia. For Turkey, these findings are in line with the findings of Rose (1990), Yazıcı and Klasra (2010), Akkaya (2018), Yılmaz et al. (2017), Hepaktan (2016), Halicioglu (2008) and Akbostancı (2004) but inconsistent with the findings of Brada et al. (1997), Kemeç and Kösekahyaoğlu (2015) and Bal and Demiral (2012). Time-series methods are employed for most of the J-curve literature for Turkey. Using panel data methods in this literature could provide better reliable results and enable conclusive evidence.

References

Akbostanci, E. (2004), "Dynamics of The Trade Balance the Turkish J-curve", *Emerging Markets Finance and Trade*, 40(5), 57-73.

Akkaya, O. (2018), "Türkiye ve Türkiye'nin Dış Ticaret Partnerleri Arasındaki İki Yanlı J eğrisi: 1996-2006 Dönemi İncelemesi", *Finans Ekonomi ve Sosyal Araştırmalar Dergisi (FESA)*, 3(1), 328-338.

Ali, S.Z. & S. Anwar (2018), "Anticipated versus Unanticipated Terms of Trade Shocks and the J-Curve Phenomenon", *Journal of International Money and Finance*, 81, 1-19.

Backus, D.K. & P.J. Kehoe & F.E. Kydland (1994), "Dynamics of Trade Balance and the Terms of Trade: the J-Curve?", *American Economic Review*, 84(1), 84-103.

Bahmani-Oskooee, M. & A.M. Kutan (2009), "The J-curve in the Emerging Economies of Eastern Europe", *Applied Economics*, 41(20), 2523-2532.

Bahmani-Oskooee, M. & H. Fariditavana (2015), "Nonlinear ARDL Approach, Asymmetric Effects and the J-curve", *Journal of Economic Studies*, 42(3), 9-530.

Bahmani-Oskooee, M. & H. Fariditavana (2016), "Nonlinear ARDL Approach and the J-curve Phenomenon", *Open Economies Review*, 27(1), 51-70.

Bahmani-Oskooee, M. & H. Masoomeh (2012), "German-US Commodity Trade: Is There a J-curve Effect?", *Applied Economics Quarterly*, 58(4), 327-353.

Bahmani-Oskooee, M. & N. Bose & Y. Zhang (2018), "Asymmetric Cointegration, Nonlinear ARDL, and the J-curve: a Bilateral Analysis of China and its 21 Trading Partners", *Emerging Markets Finance and Trade*, 54(13), 3131-3151.

Bai, J. (2009), "Panel Data Models with Interactive Fixed Effects", *Econometrica*, 77(4), 1229-1279.

Bal, H. & M. Demiral (2012), "Reel Döviz Kuru ve Ticaret Dengesi: Türkiye'nin Almanya ile Ticareti Örneği (2002.01-2012.09)", *Ç.Ü. İ.İ.B.F. Dergisi*, 16(2),45-64.

Brada, J.C. & A.M. Kutan & S. Zhou (1997), "The Exchange Rate and the Balance of Trade: The Turkish Experience", *The Journal of Development Studies*, 33(5), 675-692.

Breitung, J. & S. Das (2005), "Panel Unit Root Tests Under Cross-Sectional Dependence", *Statistica Neerlandica*, 59(4), 414-433.

Breusch, T.S. & A.R. Pagan (1980), "The Lagrange Multiplier Test and its Applications to Model Specification in Econometrics", *The Review of Economic Studies*, 47(1), 239-253.

Chudik, A. & M.H. Pesaran (2015), "Common Correlated Effects Estimation of Heterogeneous Dynamic Panel Data Models with Weakly Exogenous Regressors", *Journal of Econometrics*, 188(2), 393-420.

Demirden, T. & I. Pastine (1995), "Flexible Exchange Rates and the J-curve: An Alternative Approach", *Economics Letters*, 48, 373-377.

Dickey, D.A. & W.A. Fuller (1979), "Distribution of the Estimators for Autoregressive Time Series with a Unit Root", *Journal of the American Statistical Association*, 74(366a), 427-431.

Elmas, Y. & Y. Elmas (2019), "J Eğrisi Etkisinin Eşbütünleşme, Nedensellik ve Wilcoxon İşaret Sıra Testi ile Değerlendirilmesi: Bandırma İlçesi Örneği", *2. Uluslararası Bandırma ve Çevresi Sempozyumu*, 17-19 Eylül 2019, Bandırma, 295-312.

Halicioglu, F. (2008), "The Bilateral J-curve: Turkey versus her 13 Trading Partner", *Journal of Asian Economics*, 19(3), 236-243.

Hepaktan, C.E. (2016), "Yapısal Kırılmalar Altında Türkiye'de J Eğrisinin Analizi", *Celal Bayar Üniversitesi Sosyal Bilimler Dergisi*, 14(4), 75-102.

Hsing, Y. & B.S. Sergi (2010), "Test of the Bilateral Trade J-curve between the USA and Australia, Canada, New Zealand and The UK", *International Journal of Trade and Global Markets*, 3(2), 189-198.

Kao, C. (1999), "Spurious Regression and Residual-based Tests for Cointegration in Panel Data", *Journal of Econometrics*, 90(1), 1-44.

Kösekahyaoğlu, L. & A. Kemeç (2015), "J Eğrisi Analizi ve Türkiye Üzerine Bir Uygulama" *Uluslararası İktisadi ve İdari Bilimler Dergisi*, 1(2), 1-29.

Kösekahyaoğlu, L. & İ. Karataşlı (2018), "Türkiye - AB Dış Ticaretinde J Eğrisi Etkisi : 1994- 2016 Dönemi Üzerine Ampirik Bir İnceleme", *SDÜ İİBF Dergisi*, 23(Özel Sayı), 831-844.

Lerner, A.P. (1944), *The Economics of Control: Principles of Welfare Economics*, The Macmillan Company, New York.

Magee, S.P. (1973), "Currency Contracts, Pass-through, and Devaluation", *Brookings Papers of Economic Activity*, 1973(1), 303-323.

Mark, N. & D. Sul (1999), "A Computationally Simple Cointegration Vector Estimator for Panel Data", *Ohio State University Manuscript*, <https://www.researchgate.net/publication/2312524_A_Computationally_Simple_Cointegration_Vector_Estimator_for_Panel_Data>, 01.05.2020.

Marshall, A. (1923), *Money, Credit and Commerce*, Macmillan, London.

McCoskey, S. & C. Kao (1998), "A Residual-based Test of the Null of Cointegration in Panel Data", *Econometric Reviews*, 17(1), 57-84.

Moffett, M.H. (1989), "The J-Curve Revisited: An Empirical Examination for the United States", *Journal of International Maney and Finance*, 8(3), 425-444.

Moon, H.R. & M. Weidner (2010), "Dynamic Linear Panel Data Regression Models with Interactive Fixed Effects", *Working Paper*, University of Southern California.

Moon, H.R. & M. Weidner (2012), "Linear Regression for Panel with Unknown Number of Factors as Interactive Fixed Effects", *Working Paper*, University of Southern California.

Nusair, S.A. (2017), "The J-curve Phenomenon in European Transition Economies: a Nonlinear ARDL Approach", *International Review of Applied Economics*, 31(1), 1-27.

Pedroni, P. (1999), "Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors", *Oxford Bulletin of Economics and Statistics*, 61(1), 653-670.

Pedroni, P. (2001), "Purchasing Power Parity tests in Cointegrated Panels", *Review of Economics and Statistics*, 83(4), 727-731.

Pedroni, P. (2004), "Panel Cointegration: Asymptotic and Finite Sample Properties of Pooled Time Series Tests with an Application to the PPP Hypothesis", *Econometric Theory*, 20(3), 597-625.

Pesaran, M.H. (2007), "A Simple Panel Unit Root Test in the Presence of Cross-section Dependence", *Journal of Applied Econometrics*, 22(2), 265-312.

Rose, A.K. & J.L. Yellen (1989), "Is There a J-Curve", *Journal of Monetary Economics*, 24, 53-68.

Rose, A.K. (1990), "Exchange Rates and Trade Balance: Some Evidence from Developing Countries", *Economic Letters*, 34(3), 271-275.

Salmon, P. (2003), *Decentralization and Supranationalty: The Case of the European Union*, <http://www.imf.org/external/pubs/fiscal/salmon.pdf>, 02.10.2003.

Song, M. (2013), "Asymptotic Theory for Dynamic Heterogeneous Panels with Cross-sectional Dependence and its Applications", *Working Paper*.

Swamy, P.A.V.B. (1970), "Efficient Inference in a Random Coefficient Regression Model", *Econometrica: Journal of the Econometric Society*, 38(2), 311-323.

Wang, C. & C.A. Lin & C. Yang (2012), "Short-run and Long-run Effects of Exchange Rate Change on Trade Balance: Evidence from China and its Trading Partners", *Japan and the World Economy*, 24(4), 266-273.

Westerlund, J. (2007), "Testing for Error Correction in Panel Data", *Oxford Bulletin of Economics and Statistics*, 69(6), 709-748.

Yazici, M. & M.A. Klasra (2010), "Import Content of Exports and J-curve Effect", *Applied Economics*, 42(6), 769-776.

Yılmaz, S. & İ. Özaytürk & G. Oransay (2017), "Testing the Hypothesis of J-curve for Turkish Economy", *Chinese Business Review*, 16(9), 419-428.

Sosyoekonomi

2021, Vol. 29(50), 169-196

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.09
Date Submitted: 11.12.2020
Date Revised: 03.09.2021
Date Accepted: 06.09.2021

Another Perspective of The Effects of Migration as A Determinant of Foreign Direct Investment: Evidence-Based on Panel Gravity Model from Turkey and OECD Countries

Hande AKSÖZ-YILMAZ *(https://orcid.org/0000-0002-1115-7535), Kırşehir Ahi Evran University, Turkey; hande.yilmaz@ahievran.edu.tr*

Doğrudan Yabancı Yatırımın Belirleyicisi Olarak Göçün Etkilerine Farklı Bir Bakış: Türkiye ve OECD Ülkeleri Üzerine Panel Çekim Modelinden Bulgular

Abstract

This paper aims to investigate the impact of immigration on FDI between Turkey and OECD countries. The paper uses data spanning the period 2003-2019. There is employed PPML estimation method which presented efficient output in the presence of heteroskedasticity and non-large zero values of inward FDI in Panel Gravity Model. However, outward FDI is estimated using the ZINB model for outward FDI data has overdispersion and excess zero flows. The results show that immigrant flows to OECD from Turkey on the FDI flows are relatively more effective than the immigrant flows to Turkey from OECD.

Keywords : Migration, Foreign Direct Investment, PPML Estimation Method.

JEL Classification Codes : C23, F22, F23.

Öz

Bu çalışma, Türkiye ve OECD ülkeleri arasındaki Doğrudan Yabancı Yatırım akışları üzerinde göçün etkisini incelemeyi amaçlamaktadır. Bu amaçla, çalışma 2003-2019 dönemini kapsayan verileri kullanmaktadır. Panel Çekim Modelinde değişen varyansın ve içe dönük DYY'lerde büyük sayıda olmayan sıfır gözlem değerlerinin varlığında etkin sonuçlar sunan PPML tahmin yöntemi uygulamaktadır. Bununla birlikte, dışa doğru DYY'ler, aşırı dağılıma ve aşırı sıfır değerine sahip olan dışa doğru DYY verileri nedeniyle ZINB modeli kullanılarak tahmin edilmektedir. Sonuçlar, Türkiye'den OECD'ye giden göçmenlerin DYY'ler üzerindeki etkisinin, OECD'den Türkiye'ye gelen göçmenlere göre daha etkili olduğunu göstermektedir.

Anahtar Sözcükler : Göç, Doğrudan Yabancı Yatırım, PPML Tahmin Yöntemi.

1. Introduction

Immigrant groups living outside their source countries create various formal and informal cooperation channels. These cooperation's have customarily been based on relationship, language, and country of origin characteristics. They were set up relatively to ensure support for those in need, particularly new immigrants. As an ethnic immigrant community increases its population, these institutions begin to serve as information exchange centres between the supply and demand of investments, both regionally and internationally.

The fundamental ground of the literature is that international trade and investment transactions are struggling with unofficial trade barriers, in addition to official trade barriers such as transportation costs and tariffs (Javorcik et al., 2011: 232). Access to information on many topics, including potential market opportunities and difficulties in executing contracts across national borders, are among these barriers. The language skills of immigrants and compatibility with a foreign country can significantly reduce communication costs. In both economies, knowledge of market structure, consumer preferences, work ethic, and trade structures are important in establishing new business contacts. Similarly, information sharing and enforcement of contracts across national boundaries are also very important in investment decisions. FDI activities face more significant information asymmetry than international trade transactions. Labour, raw material cost, distributors, and sectoral characteristics are meaningful in evaluating the profitability of an investment-related project. FDI requires long-term business interaction and detailed knowledge. If foreign investors know little about the country they will invest in, they will encounter many difficulties. Any foreign investor should be sure of the reliability of the legal system of the country of investment for the reliability of their agreements with their stakeholders. Therefore, investment barriers can be high in countries where institutional effectiveness is limited, and the legal environment does not provide sufficient security (Gao, 2003: 612; Ligthart & Singer, 2009: 3; Javorcik et al., 2011: 231-2). Immigrants contribute to overcoming barriers in investment issues and reducing investment costs, increasing the investment volume between the homeland, and receiving countries.

As in all developing countries, Turkey needs direct foreign investments in its economic development, growth, and current account balance. Turkey's domestic savings and resources are insufficient for realizing the necessary investments in the development of Turkey. This situation reveals the mandatory need of Turkey for foreign direct investments. The importance of foreign direct investments for Turkey can also be seen in the development plans prepared in 5-year periods. Encouraging foreign direct investments has been one of the policies emphasized in the eighth, ninth, and tenth development plans. The Tenth Development Plan has adopted the principle of ensuring the improvement of the investment environment by implementing incentives and supporting FDI policies and making progress in bureaucratic and legal processes. By focusing on the priority problems of the business and investment environment, it aims to eliminate the uncertainties faced by the investors and solve the problems rapidly, increasing investments by improving the existing mechanisms

(Republic of Turkey Ministry of Development, 2014). This paper mainly aims to understand to what extent the immigrant flows between Turkey-OECD countries have fostered FDI flows between Turkey-OECD countries over the period 2003-2019. To achieve this goal, we use data based on migration, FDI, demographic-economic property, and the geographical distance of 20 OECD countries. This study seeks to answer the question "What is the impact of the immigrant flows between Turkey and OECD countries on the FDI between OECD countries and Turkey?"

The hypotheses of the paper are constituted as follows:

Hypothesis-1: The immigrant flows between 20 OECD countries and Turkey positively affect the inward FDI to Turkey from 20 OECD countries over the period 2003-2019.
Hypothesis-2: The immigrant flows between Turkey and 20 OECD countries positively affect the outward FDI from Turkey to 20 OECD countries over the period 2003-2019.

This paper analyses impact of the immigrant flows between OECD and Turkey on FDI flows between Turkey and OECD countries. There are important reasons for using FDI and migration data of Turkey and OECD countries to analyse the link between FDI and migration flows. Primarily, OECD countries host more than half of the total Turkish immigrant stock globally, and OECD countries make a significant majority of total inward FDI to Turkey. Also, the considerable literature in the past has engaged in substantial discussion on selecting the appropriate model and the estimation technique in the analysis of this relationship. Zero FDI flows are an important problem in the analysis of FDI flows. Indeed, Helpman et al. (2008: 443) also report that 50% of the 158 countries in its sample have zero trade flows. Bergeijk and Brakman (2010) emphasize that if the gravity equation is applied to FDI flows, this number will exceed 80%. The standard procedure for solving zero FDI flows is to drop the zero flows from the sample or add a small constant to all FDI flows to estimate a log-linear equation. Silva & Tenreyro (2006) suggest the PPML estimation method, which provides efficient, consistent estimators by keeping the zero values of the dependent variable in the model. The PPML method suffers from underpredicting the number of zero observations. When faced with a sample containing many zeros, the two-stage estimation method (Bosker & Garretsen, 2010). However, although two-stage estimation provides an avenue of using information from zero trade observation and has a theoretically sound method, it is difficult to satisfy the exclusion restriction because the instrumental variable is often challenging to find (Burger et al., 2009; Brakman et al., 2010). To deal with zero FDI flows, Brakman et al. (2010) proposed a zero-inflated approach- The Zero-Inflated Negative Binomial (ZINB) model- as used by Lambert (1992). ZINB method is the generalized form of the Poisson model and has few restrictions as it does not assume normality as in the two-stage estimation. Zero Inflated Models have good performance as they correct for excessive zeros and excessive distribution in the dependent variables.

This paper focuses on the FDI and immigrant flows between Turkey and OECD countries based on the explanations above. The contributions of the paper to the international economics literature are threefold. First, this study reveals the relationship between the two main production factors, human and capital mobility, for Turkey and OECD countries, indicating a significant relationship between them[1]. Second, zero FDI flows are an important problem in the analysis of FDI flows. To solve zero outward FDI flows, we consider the ZINB model suggested by Brakman et al. (2010) as an alternative to the two-stage estimation in the analysis of FDI flows. Our third contribution is based on these explanations. While the inward FDI model is estimated using the PPML estimator, in the outward FDI model, the ZINB estimator is preferred instead of the PPML estimator because the PPML method suffers from underpredicting the number of zero observations. Therefore, a key strength of our paper is that it is the first empirical paper that tests with the PPML method to the nonlinear model link between immigration and inward FDI flows and which tests with the ZINB method to the link between immigration and outward FDI flows under the case of OECD countries and Turkey in the extant international economics literature.

The rest of the paper is organized as follows: section 2 presents literature investigating the links between migration and FDI flows worldwide. Section 3 introduces the methodology. Variables, definitions, and data sources are given in Section 4. Model and Result the findings are introduced in Section 5. Section 6 concludes with findings and some policy recommendation.

2. Literature Review

Most of the studies on FDI reveal the relationships between the determinants of FDI and economic growth. FDI is under the influence of factors such as large regional market, good infrastructure, commercial openness, human capital intensity, wage level, and political stability (Cheng & Kwan, 2000: 380; Asiedu, 2002: 115; Ali & Guo, 2005: 26; Wahid et al., 2009: 8; Alfaro & Chen, 2010: 22; Bal & Akça, 2016: 109). On the other hand, foreign investors may face more difficulties if they are unfamiliar with the host country's legal regulations, language, and business relations. Immigrants facilitate their investments in the countries of their origin through the network channel. With the contribution of globalization, the speedy growth of the foreign population and investment in many countries in recent years has urged a lot of analysis on the determinants of migration and FDI flows. The earliest studies investigated the relationship between immigrant networks and bilateral foreign trade (Gould, 1994: 314; Head & Ries, 1998: 60-1; Dunlevy & Hutchinson, 1999/2001: 1058/21; Girma & Yu, 2002:128-9; Rauch & Trindade, 2002: 129; Combes et al., 2002: 23; Bellino & Giuseppe, 2016: 25). Immigrants also bring their individual and corporate information based on their country of origin to destination countries. These social networks can reduce potential difficulties and barriers to international investment, as immigrants have vital

[1] *Several empirical studies have been devoted to human mobility rather than taking account capital mobility (Gould, 1994: 314; Head & Ries, 1998: 60-1; Dunlevy & Hutchinson, 1999/2001: 1058/21; Girma & Yu, 2002: 128-9; Rauch & Trindade, 2002: 129; Combes et al., 2002: 23; Bellino & Giuseppe, 2016: 25).*

knowledge of market characteristics, preferences, business ethics, and business rules. This leads to the promotion of investment activities between countries (Garas et al., 2016: 3). Emerging international economics literature suggests that immigrant networks can help overcome information barriers to international capital flows and may increase inward FDI to their country of origin. The relationship between FDI and migration has been considered from two divergent manners in the international economics literature. The first one is the studies that take advantage of the theoretical research. These studies prioritized theoretical foundations. The theoretical foundations of FDI are underlined by Helpman (1984) and Markusen (1995) based on investment location by emphasizing the role of multinational corporations (MNCs). Barry (2002) made the first systematic study to theoretically address the relationship between FDI, infrastructure, labour migration, and domestic welfare. The second is the studies discussing the FDI flows within the social structure in the context of the immigrant network. These studies mainly focused on empirical analysis by taking advantage of the gravity model (Gao, 2003: 617; Tong, 2005: 564; Ligthart & Singer, 2009: 5; Garas et al., 2016:15).

Ethnic and social networks take on a critical mission in promoting countries' FDIs. Rauch and Trindade (2002) are pioneering studies examining the economic effects of immigrants' ethnic and social networks. Rauch and Trindade (2002) emphasize primarily that ethnic Chinese networks increase bilateral trade through formal and informal intercourse. Gao (2003) and Tong (2005) empirically investigate the role of ethnic Chinese networks in promoting FDI. Gao (2003) finds a significant positive effect in inward FDI of ethnic Chinese networks in the investing country. Tong (2005) found that ethnic Chinese networks are significant in catalysing cross-border investment between countries. Also, he suggests that ethnic Chinese networks are more effective in promoting FDIs to countries with higher bureaucratic quality. Ligthart and Singer (2009) emphasize that migrant networks encourage FDI in countries with relatively weak institutions. When the institutional quality is relatively poor, the incentive power of migrant networks increases FDI significantly.

Ethnic networks serve as a consequential channel of information about business conditions and advantages abroad (Javorcik et al., 2011: 231-2). The size of the foreign origin group living in any country positively affects the FDI flows from that group's country of origin. On the one hand, Buch et al. (2006) find that German states with a sizeable foreign population from the same country of origin have more stocks of FDI. On the other hand, Bhattacharya and Groznik (2008) express those U.S. investments in a foreign country are positively affected by the size of the foreign-origin group from that country living in the U.S. Likewise, Javorcik et al. (2011) suggest that the outward FDI flows from the US. are correlated with migrants from the host country. Ligthart and Singer (2009) empirically research the role of immigrants in Dutch outward FDI. They find that immigrant flows are significant in facilitating outward FDI to their countries of origin. Murat et al. (2008) analysed the link between migrant networks and Italian FDI using the model (OLS-IV) based on the stocks of Italian emigrants abroad and immigrants in Italy. They thus evaluate how institutional and economic development of source and destination countries affect network

connections by drawing attention to informal barriers that can create informal barriers to socio-cultural and institutional differences between countries and encourage international investment decisions. Studies based on national-level data face some identification problems. Investment and migration drain to prosperous countries, bordering countries, steady political orders, and a common language. These similarities lead to an identity problem. Foad (2012) examined the regional distribution of FDI and immigration in the U.S., taking into account identification problems and reveals how immigrants in the U.S. states attract FDI from their source countries to the U.S. He seeks the answer to the question of whether immigration actually causes FDI or is mainly affected by the same unobserved variable.

FDI decisions are made depending on many economic factors. Clemens and Williamson (2000) examine which countries and motives the British capital go as FDI. They conclude that the British capital goes abroad to natural resources, educated populations, immigrants, and young populations. Clemens and Williamson's (2000)'s paper suggests that immigrant flows have a vital role in the FDI. Factors such as institutional quality, deepened financial system, and the importance of law have vital effects on international capital flows. Similarly, Tong (2005) evaluates that the destination country's economic growth and institutional development and its source country do not affect the immigrant network. Malan (2015) stated that both east-west migrations positively impact FDI flows, and west-east FDI flows have positively influenced the east-west migration since the 1990s, considering the existence of an endogenous relationship between FDI and migration. However, empirical studies have shown that FDI and migrant flows are much more than complementary (Gao, 2003: 623-4; Tong, 2005: 576-7; Buch et al., 2006: 2032; Murat et al., 2008: 11-2; Bhattacharya & Groznik, 2008: 243; Ligthart & Singer, 2009: 18-9; Javorcik, 2011: 232; Foad, 2012: 257-8; Malan, 2015: 205; Garas et al., 2016: 23).

There are a limited number of studies at the point of investigating the connection between migration and FDI using Turkey's migration and FDI data. One of these limited studies is the Akkoyunlu (2010) which investigated the effect of FDIs on migration. Akkoyunlu (2010) explores the impact of FDIs on Turkish immigrants to Germany, while our study investigates the impact of migration on FDIs using data on migration and FDI between OECD and Turkey. Akkoyunlu (2010) stated that the increase in foreign direct investments positively impacts migration in the short run but negatively affects only in the long run. Özaydın and Ilgazi (2019) analysed the effects of investments made by businessmen of Syrian origin on the Turkish economy. They argued that investments of Syrian origin contributed positively to Turkey's economic growth. The contribution of our study is to analyse the migration-FDI link between Turkey and OECD countries.

To put forward the linkage between immigrant and FDI flows, the overall approach uses the gravity model[2]. (Gao, 2003: 617; Tong, 2005: 564; Ligthart & Singer, 2009: 14; Malan, 2015; Garas et al, 2016: 23-4). Gao (2003) used the OLS estimation method because it did not encounter zero FDI problems in the gravity model, whose dependent variable is the log of cumulative FDI in China. Tong (2005) applied OLS and Tobit methods to estimate the gravity model, with OLS being the base model, considering the potential endogeneity of migration in FDI models significantly the estimation results[3]. To estimate the gravity model, Ligthart and Singer (2009) and Murat et al. (2008) explicitly controlled for the potential endogeneity of the immigrant and independent variables by using instrumental variables (IV) Tobit analysis. However, Malan et al. (2015) employed the Pseudo Poisson Maximum Vraissemblance (PPMV) method proposed by Silva and Tenreyro (2006) for the same endogeneity problem. Although Garas et al. (2016) used PPML as the baseline model in estimating the gravity model, they also employed a negative binomial regression model as an additional estimation technique to address the possibility that the dependent variable is over dispersed is not sufficiently described by a Poisson distribution.

3. Methodology

The gravity model originated from the fundamental gravitational equation in Newtonian physics and explained FDI flows between two countries by the size and distance between the two countries. The gravity model generally states the relationship between, on the one hand, flows between different locations and, on the other hand, the "weight" of these locations and the inverse of the distance (Bergeijk & Brakman, 2010). Ravenstein (1885) stands out as a pioneering work using gravity models in social sciences, revealing that migration flows are oriented according to the absorption capacity of trade and industrial centres. He states that most immigrants go to neighbouring and close countries where they have job opportunities. Bertoli and Moraga (2017) expose, as with trade, that bilateral migration costs are an increasing function of physical distance. However, Tinbergen (1962) made the first mathematical formulation and empirical application of the gravity model and took its place in the international trade literature in explaining the trade potential between the two countries. Anderson and Van Wincoop (2003) developed some assumptions on the

---

[2] *To investigate the link between FDI and immigrant flows, Buch et al. (2006) used to agglomeration method, Bhattacharya & Groznik (2008) found through their cross-section and panel data analyses, that a positive relationship exists between the variables.*

[3] *Javorcik et al. (2011) stated that the problem of endogeneity arises because migration and FDI flows have impacts on each other. First, FDI inflows to a country mean the arrival of capital, new technology and knowledge. In this way, FDI fosters economic growth in host countries. The entry of multinational firms can increase employment and wages. Therefore, FDI entries can reduce people's desire to migrate. Later, local employees can be dispatched to organizations of the multinational company in other countries and FDI flows begin to have a positive impact on migration.*

microeconomic basis of traditional gravity equations and proposed a gravity equation containing multilateral resistance terms (MRT)[4].

The gravity model is inspired by the basic gravitational equation in Newtonian physics and describes FDI flows between two countries by the size of the two countries (host and source) and the distance between the two. It has good explanatory power as the equations fit well statistically and give quite similar outcomes in many different datasets with varying distances and trade costs (Anderson, 2010). The basic form of the gravity equation is as follows:

$$T_{ij} = \frac{GDP_i^{\propto} GDP_j^{\beta}}{D_{ij}^{\theta}} \tag{1}$$

where: T_{ij} indicates foreign trade between country i, and j; GDP_i and GDP_j state the economic size of i and j countries, measured by GDP; and D_{ij} shows the bilateral distance between the two countries. Anderson (1979), Bergstrand (1985), (1989), and Deardorff (1995) suggest that gravity specification provides convenience in various trade models. Also, many variables considered to affect trade are taken into account in standard gravity models. These variables are geographical distance, cultural distance, colonial link, a common language, and geographic contiguity. The primary gravity approach is frequently applied to study the determinants of bilateral FDI flows. It is assumed that FDI flows are more significant both between large economies and between close neighbouring countries. However, Globerman and Shapiro (1999), Bevan et al. (2004), Zwinkels and Beugelsdijk (2010), and Cuervo-Cazurra (2008) build an augmented gravity model, incorporating several variables (i.e., political stability, cultural distance, and standard language as explanatory variables) to the basic gravity model for analysing the FDI flows. Thanks to these augmented gravity models have been obtained clear empirical findings with high explanatory power. The augmented form of the gravitational equation including the determinants of the FDIs is as follows:

$$\ln FDI_{ijt} = \beta_0 + \beta_1 \ln gdp_{it} + \beta_2 \ln gdpt_{jt} + \beta_3 \ln mig_{(inflow)ijt} + \beta_4 \ln mig_{(outflow)ijt} + \beta_5 \ln distance_{ij} + \beta_6 \ln polity_{it} + \beta_7 \ln polityt_{jt} + e_{ijt} \tag{2}$$

Empirical studies detailing the determinants of foreign direct investment consider a wide variety of factors as well as key variables. The control variables considered here are those used in other empirical studies investigating the relationship between migration and FDI. On the one hand, adding the $\ln mig_{(inflow)ijt}$ and $\ln mig_{(outflow)ijt}$ variables to the basic gravity model is wanted to take into account the network effect migration on FDIs. On the other hand, the $\ln polity_{it}$ and $\ln polityt_{jt}$ measures the political stability level is included in the

[4] *Three alternatives have been proposed in the literature to deal with MRT. First, the multilateral resistance terms are unobserved but can be estimated using fixed-effects Rose and van Wincoop (2001). Second, nonlinear models can be linearized and solved analytically (Anderson van Wincoop, 2003). Third, Baier and Bergstrand (2009) proposed first apply first-order Taylor-series expansion to the multilateral resistance terms, and substitute these in the equation.*

model, especially following Zwinkels and Beugelsdijk (2010) line, as the political stability of countries is considered that an essential factor in attracting FDIs.

While the theoretical justification of the gravity model is no longer in doubt, its empirical application is controversial. These are particularly relevant to choosing the appropriate estimating method in the presence of zero FDI flows. Initial studies utilized the gravity equation using OLS by dropping all countries for which the sample's FDI and immigration data are not available. The other practice in the literature employed to deal with the problem of zero FDI flows is using censored regression techniques (Tobit). The consistency of the estimates in the Tobit method is questionable due to arbitrarily chosen censoring value (Silva & Tenreyro, 2006). Keeping the zero observation values in the model with appropriate estimation methods prevents downward bias coefficients. Many authors have encountered problems in consistently estimating the dependent variable's conditional mean using the dependent variable's logarithm when calculating elasticity in logarithmic linear models. Goldberger (1968), Manning and Mullahy (2001), Frankel and Wei (1993) used the nonlinear least squares (NLS) method for estimating multiplicative models. However, the NLS estimator is not effective as it does not take into account heteroskedasticity. It is misleading to interpret the parameters of logarithmic linearized models estimated with OLS as flexibility in the presence of heteroskedasticity. Estimation results are inconsistent in the presence of heteroskedasticity in log-linear models. Because of misleading estimates, constant elasticity models should be estimated in multiplicative form. Therefore, a simple Poisson estimator is recommended due to zero-valued observations. The Poisson PML estimator is simple and reliable to apply in a wide variety of situations. The PPML estimator has the basic features required to estimate the constant elasticity model (Silva & Tenreyro, 2006: 645). To deal with zero value, Silva and Tenreyro (2006) recommend using the PPML estimator when the data is substantially zero, as it does not assume a normal distribution to provide consistent estimators. They compared the performance of the PPML estimator with that of OLS (in the log-linear specification, employing conventional and the fixed-effects gravity equations) using Monte-Carlo simulations. In models with heteroscedasticity, the estimation results obtained with the help of log models are largely biased, and the obtained coefficient estimates are biased. These biases may mislead policymakers regarding the comparative evaluation of economic theories and evaluating the effects of different policies. When the gravity equation is estimated by a simple pseudo-maximum likelihood (PML) estimation method in multiplier form, it provides an efficient way for estimations that are consistent by keeping the zero values of the dependent variable in the model even if the model has heteroscedasticity (Silva & Tenreyro, 2006: 649). Burger et al. (2009) disputed that the PPML model is defenceless to overdispersion in the dependent variable and excess zero flows. The PPML method only takes care of observed heterogeneity and unobserved ones. Especially when the number of zero observations is substantial, standard Poisson estimation severely underpredicts these zero observations. Bosker (2008) and Bosker and Garretsen (2010) stated that Poisson estimates suffer from underpredicting the number of zero observations. They proposed the two-stage estimation method when faced with a sample containing a large number of zeros.

Helpman et al. (2007) apply the two-stage estimation method to assess countries with zero value trade flows (similar to Heckman selection models). A two-stage estimation is a two-step approach under the normality assumption: first, estimation of the probability of trade with the help of probit regression; second, use the first approach to estimate the volume of trade. Although two-stage estimation provides an avenue of using information from zero trade observation and has a theoretically sound method, it is difficult to satisfy the exclusion restriction because the instrumental variable is often difficult to find (Burger et al., 2009; Brakman et al., 2010) and do not control for heteroscedasticity that is common in the trade and FDI (Flam & Nordstrom, 2011; Silva & Tenreyro, 2009). Brakman et al. (2010) preferred the ZINB model instead of the two-stage estimation method, which is difficult to satisfy the exclusion restriction because the instrumental variable is often difficult to find and requires normal distribution in the data. The zero-inflated approach offers a flexible way in practice in the zero FDI flow problem, and it has few restrictions as it does not assume normality as in the Heckman model. The negative binomial regression model is the generalized form of the Poisson model. While the Poisson model submits the restriction that the conditional mean of the dependent variable is equal to its variance, the negative binomial regression model includes the individual unobserved effect in the conditional mean, which allows for overdispersion in the data (Wooldridge, 2002). Zero Inflated Models have good performance as they correct for excessive zeros and excessive distribution in the dependent variables. Zero Inflated Models may be preferred where the observed zero value of the FDI is not greater than the number of zeros predicted by the model.

The reliability of the regression estimation results comes into question because the standard gravity models include non-stationary variables (FDI flows and GDP). It is shown that GDP and FDI data are not stationary in Appendix Table 8. Faruqee (2004) and Fidrmuc (2009) are rare studies that analyse the effect of nonstationary of variables on the results of gravity models based on panel data. On the one hand, the fixed-effects estimator shows the long-run relationship between the gravity variables, including the endogeneity between GDP and FDI flows. On the other hand, the possible bias of studies based on fixed-effects models due to the nonstationary of gravity models is relatively small (Fidrmuc, 2009: 444). Consequently, the fixed-effect PPML estimator was preferred to analyse the effect of migration flows on FDI flows[5].

4. The FDI and Migration Data of Turkey-OECD Countries

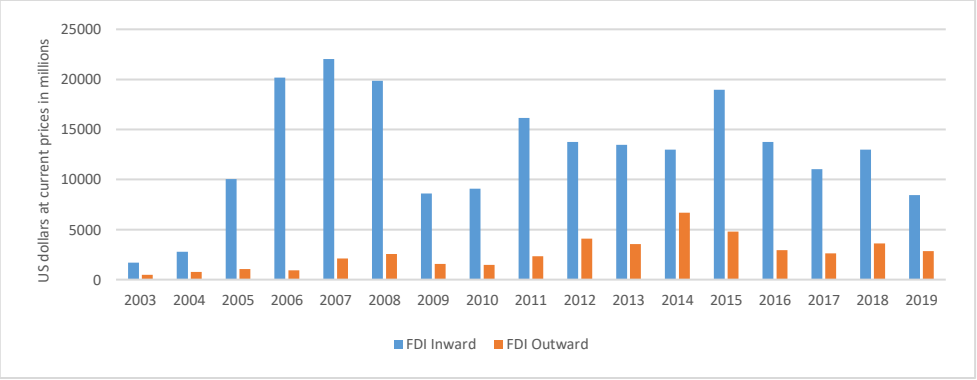
This analysis has been carried using a database of 340 observations. This database considers data on annual migration and FDI flows between 20 OECD countries and Turkey over 2003-2019. The OECD includes 37 members. On account of a lack of data on some members, countries with no access to data were excluded from the model. Our purpose is to

[5] *While Model 1 unilaterally accepts FDI flows from OECD countries to Turkey as a dependent variable; Model 2 unilaterally reveals FDI flows from Turkey to OECD countries as a dependent variable. Due to the modelling of unilateral FDI flows between Turkey and OECD countries, it is not necessary to use country fixed effects such as exporter and importer, which Anderson and van Wincoop (2003) state, to control MRT.*

determine the impact of the migration flows on FDI flows between OECD countries and Turkey. A great majority of Turkey's inward FDI originates from the OECD countries included. Annual data covering 2003-2019 for the 20 OECD countries (i.e., Australia, Austria, Belgium, Czech Republic, Denmark, Finland, Germany, Hungary, Iceland, Italy, Japan, South Korea, Luxembourg, Netherlands, New Zealand, Norway, Slovakia, Spain, Sweden, Switzerland) are utilized in this study.

Turkey's inward and outward FDI amount is shown in graph 1-2. According to this, Turkey's total inward FDI amount was 1,702 million dollars in 2003; it reached 22.047 million dollars in 2008. However, it decreased significantly after 2008 with the impact of the global economic crisis. While Turkey's total inward foreign direct investments were realized as 12,981 million dollars in 2018, this amount decreased to 8,344 million dollars in 2019 due to the effect of global pandemic conditions. Turkey's total outward FDI amount was 480 million dollars in 2003; it was 2.549 million dollars in 2008. With the effect of the global crisis, it started to decrease after 2008. While Turkey's total outward foreign direct investments were realized at the level of 6,682 million dollars in 2014, this amount decreased to the level of 2008 with 2,841 million dollars in 2019 due to the effect of global pandemic conditions. Turkey's percentage share of inward and outward FDI in the entire world is shown in graph 2. Turkey's inward FDI rate increased from 0.30% to 1.4% between 2003-2006 years. Although the inward FDI ratio decreased after 2008 due to the global economic crisis, it generally increased until 2016. Turkey's inward FDI rate has always been higher than the outward FDI rate when examined as covering the years 2003-2019 periods.

Graph: 1
Turkey's Total Inward FDI and Outward FDI

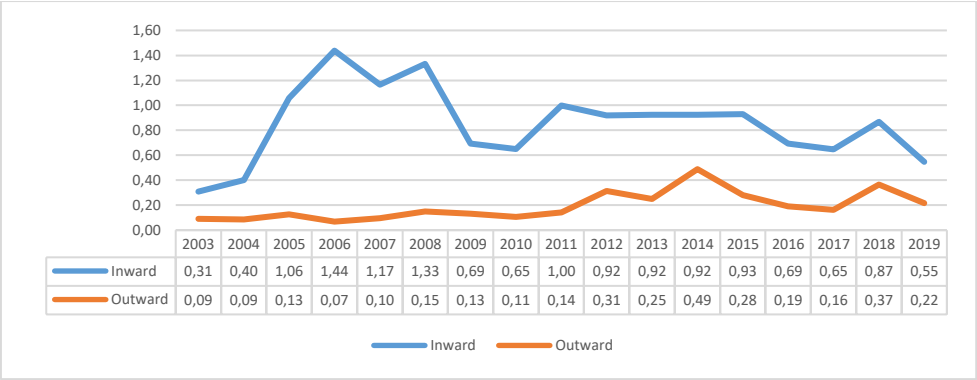


Source: UNCTAD Database.

OECD countries make most of the total inward FDI to Turkey (Appendix Table 6 and 7). Although the group of OECD countries has the highest share in Turkey's total inward FDI positions, the European countries group has the highest share in total outward FDI positions. Given the impact and volume of FDI positions on the country's economy, it seems

reasonable to include the OECD country group, which realizes the highest inward FDI flows to Turkey, within the scope of the study.

Graph: 2
Turkey's Percentage Share of Inward and Outward FDI in World



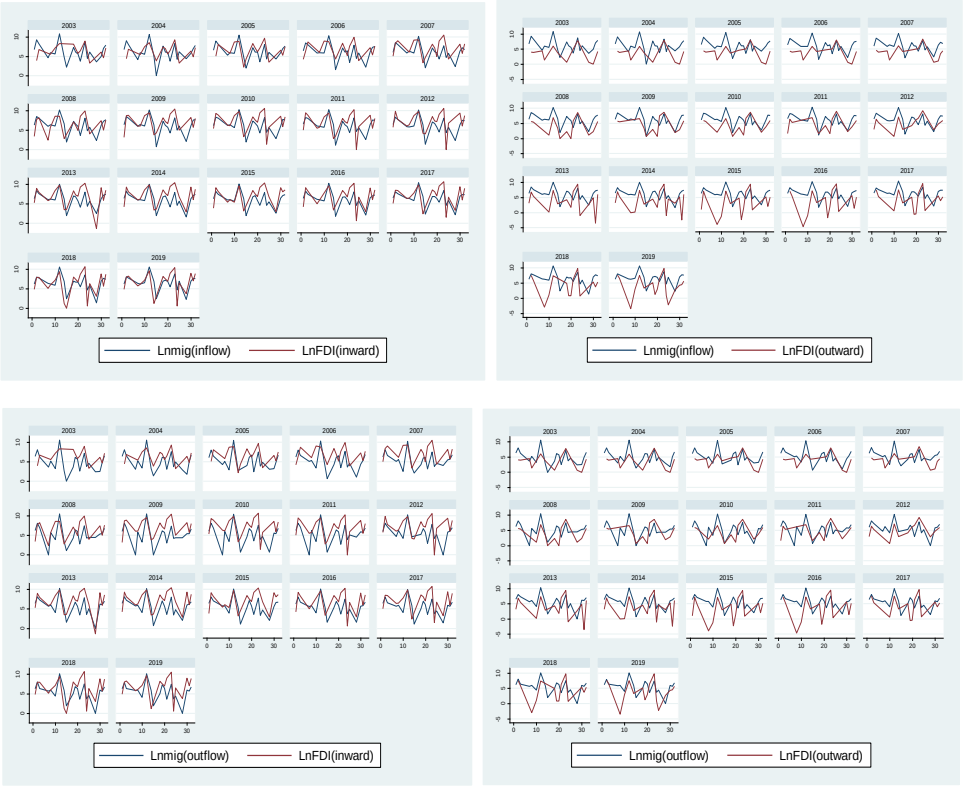
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Inward	0,31	0,40	1,06	1,44	1,17	1,33	0,69	0,65	1,00	0,92	0,92	0,92	0,93	0,69	0,65	0,87	0,55
Outward	0,09	0,09	0,13	0,07	0,10	0,15	0,13	0,11	0,14	0,31	0,25	0,49	0,28	0,19	0,16	0,37	0,22

Source: UNCTAD Database.

In the migration from Turkey to other countries, developed countries are mostly preferred as destination countries. Due to its geographical location, Turkey is a transit country between underdeveloped and developed countries. "Historically, Turkey has been a country of origin, transit, and destination for migrants and was a crossroads between Europe and Asia. Recent regional events have contributed to Turkey increasingly becoming a major destination and transit country for those fleeing conflict, poverty, and disasters" (IOM, 2021). In this sense, it is difficult to distinguish the effects of migration flows to Turkey as a destination country and migration flows to Turkey for transition to developed countries. When the migrants who left their countries due to war and political turmoil and took refuge in Turkey are not considered, there is a heavy volume of migration between OECD countries and Turkey as the destination and source country in the migration flows. In 1990, the stock of Turkish immigrants in the world was 2.512.944, including 1.349.675 males and 1.163.269 females. Germany is one of the countries hosting the most extensive Turkish immigrant stock. At the beginning of 1960, many workers migrated from Turkey to Germany to meet the labor demand of Western Europe and especially Germany. Although the workers who went to Germany with the government's approval aimed to return to their homeland, they did not tend to return afterward. With the family reunification and the increase of the immigrant network over time, there have been significant migration flows to Western Europe, especially Germany. As of 2020, the total stock of Turkish immigrants in Germany was 1,476,410 people (OECD.stat, 2021). The total stock of Turkish immigrants worldwide is 3.411.408, including 1.766.026 males and 1.645.382 females (IOM, 2021). Since OECD countries host more than half of the total Turkish immigrant stock in the World. In 2019, the highest immigration flowed from Turkey to OECD countries were Germany, the United

States, France, and Austria. The highest immigration flows from OECD countries to Turkey were Germany, Austria, the Netherlands, and Japan (OECD.stat, 2021).

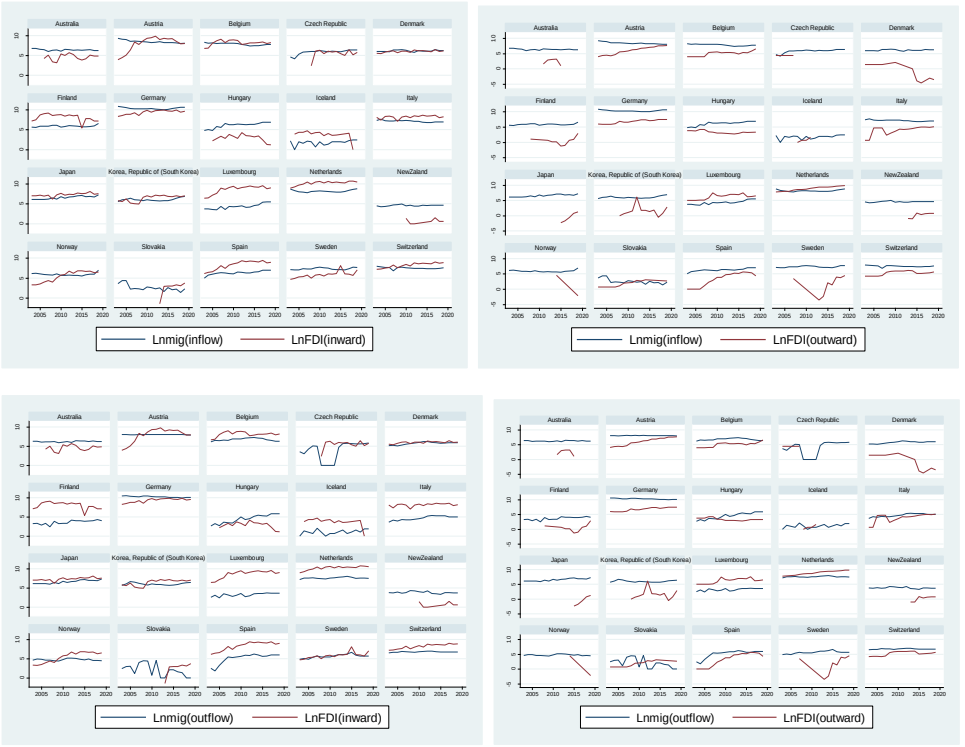
Graph: 3
The FDI and Migration Flows by Years for 20 OECD Countries



While the volume of free capital movements increased with globalization after 1980, as in the whole world, migration mobility has increased with the contribution of transportation and technological developments in Turkey, migration flows have a wide range of effects on destination and source countries. One of the deviational contributions of migration flows is that it affects investment relations between source and destination countries. When people migrate from one country to another, besides their labour and capital, they also bring in a social network connected to their home country. These social networks play a leading role in reducing barriers to international investment, such as political risk and asymmetric information (Foad, 2012: 238). Therefore, immigrants are a bridge in which capital can move more easily between their homeland and current countries. It is shown the relationship between migration flows and foreign direct investments for Turkey

and OECD countries by years and by countries in Graph 3. It is seen that migration flows from Turkey to the OECD and Turkey's inward FDI tend to act together in the period covering the years 2003-2013, especially in 2005, 2014, 2015, 2017, 2018, and 2019 years. If the trend of Turkey's outward FDI (to OECD) and the immigrant flows between Turkey and OECD countries (inflow and outflow) is followed, it is difficult to say that they exhibit a similar trend. Let's examine the trend of FDI and immigrant flows in the period between 2003-2019 of the countries in the panel. These two variables tend to act together for Belgium, Denmark, Germany, Japan, and the Netherlands.

Graph: 4
The FDI and Migration Flows by the Country for the Years 2003-2019



The variables in this study consist of outward and inward FDI positions (FDI positions measured in US$ Millions), per capita GDP (GDP measured in constant 2010 US$), distance (geographical distance measured in between the most populated cities of 20 OECD countries and Istanbul), polity Score (Polity measured in ranges from -10 to +10), inflow and outflow migration (total inflow migration from Turkey to OECD countries and total outflow migration from Turkey to OECD countries). This study used total inflow

migration, outflow migration, per capita GDP, distance, and polity score in natural logarithm form as independent variables; total inward FDI and outward FDI in level as dependent variables. The outward and inward FDI data, per capita GDP, inflow, and outflow migration is collected from the Organisation for Economic Co-operation and Development (OECD) databank. The data on distance is collected from the CEPII database, and the data on polity score is obtained from the Integrated Network for Societal Conflict Research (INSCR).

Table: 1
Explanation of Variables and Data Sources

Variables	Explanation
lnpolity (INSCR)	Polity Score measured in ranges from -10 to +10 in OECD countries, in natural logarithm form (log)
lnpolityt (INSCR)	Polity Score measured in ranges from -10 to +10 in Turkey, (log)
lngdp (OECD)	Per Capita Gross Domestic Product (constant 2010 US$) in OECD countries, (log)
lngdpt (OECD)	Per Capita Gross Domestic Product (constant 2010 US$) in Turkey, (log)
lndistance (CEPII)	The geographical distances (km) between the source and host countries, (log)
$lnmig_{inflow}$ (OECD)	Total inflow migration from Turkey to OECD countries, (log)
$lnmig_{outflow}$ (OECD)	Total outflow migration to Turkey from OECD countries, (log)
FDI_{inward} (OECD)	Total inward FDI flows to Turkey to OECD countries
$FDI_{outward}$ (OECD)	Total outward FDI flows from Turkey to OECD countries
lan	Dummy variable = 1 if OECD countries have a common official language; 0 otherwise
eu	Dummy variable = 1 if OECD countries are the member of the Europe Union; 0 otherwise

5. Models and Results

In this study, $FDI_{(inward)ijt}$ and $FDI_{(outward)ijt}$ represent dependent variables; inward and outward FDI flows between the source countries i (i.e., 20 OECD countries) and the destination country j (Turkey) using data spanning the period (2003-2019). GDP per capita of Turkey i and the OECD countries j in year t has been expressed by $lngdp_{it}$ and $lngdpt_{jt}$, respectively. The polity score of Turkey i and the OECD countries j in year t has been indicated by $lnpolity_{it}$ and $lnpolityt_{jt}$, respectively. The immigrant flows to OECD countries j from Turkey i in year t has been expressed by $lnmig_{(inflow)ijt}$. The immigrant flows to Turkey i from OECD j in year t has been expressed by $lnmig_{(outflow)ijt}$. The distance between countries i and j have been shown by $lndistance_{ij,}$ and ε_{ijt} is the error term. The gravity model (inward FDI Model) is formulated as:

$$\text{Inward FDI Model 1: } FDI_{(inward)ijt} = \beta_0 + \beta_1 lngdp_{it} + \beta_2 lngdpt_{jt} + \beta_3 lnmig_{(inflow)ijt} + \beta_4 lndistance_{ij} + \beta_5 lnpolity_{it} + \beta_6 lnpolityt_{jt} + e_{ijt} \quad (3)$$

$$\text{Inward FDI Model 2: } FDI_{(inward)ijt} = \beta_0 + \beta_1 lngdp_{it} + \beta_2 lngdpt_{jt} + \beta_3 lnmig_{(outflow)ijt} + \beta_4 lndistance_{ij} + \beta_5 lnpolity_{it} + \beta_6 lnpolityt_{jt} + e_{ijt} \quad (4)$$

Table 2 states ZINB regression and PPML estimation results for inward FDI model 1 and inward FDI model 2.

Table: 2
ZINB and PPML Estimates

Variables	ZINB				PPML	
	Active Category		Passive Category			
FDI_{inward}	Negative Binomial		Logit			
lnpolity	1.156	0.931	11.258**	12.580***	1.726**	1.806**
	(1.157)	(1.169)	(4.778)	(4.950)	(0.773)	(0.846)
lnpolityt	1.901*	0.477	-4.049	-3.399	1.835	1.187
	(1.103)	(1.121)	(3.772)	(3.652)	(1.357)	(1.334)
$lnmig_{inflow}$	0.622***		-0.650***		0.449***	
	(0.051)		(0.144)		(0.032)	
$lnmig_{outflow}$		0.400***		-0.455***		0.347***
		(0.040)		(0.126)		(0.024)
lndistance	-0.364**	-0.942***	1.223***	1.326***	-0.274***	-0.441***
	(0.164)	(0.153)	(0.318)	(0.300)	(0.073)	(0.071)
lngdp	2.147***	1.582***	-7.313***	-7.093***	1.851***	1.710***
	(0.276)	(0.294)	(1.473)	(1.349)	(0.214)	(0.196)
lngdpt	-1.099*	-0.491	-0.050	-0.128	-0.455	-0.236
	(0.641)	(0.636)	(2.210)	(2.125)	(0.626)	(0.647)
Constant	-11.911**	-1.986	50.498***	-42.453**	-15.805***	-12.981***
	(5.889)	(5.653)	(18.115)	(17.732)	(4.727)	(4.984)
Observation	340	338	340	340	340	338
Pseudo R^2					0.46	0.44

*Note: Dependent variables is FDI_{inward}, ***p<0.01, **p<0.05, *p<0.1, Robust standard errors clustered in parentheses.*

ZINB and PPML estimators show the gravity model results established to reveal the effect of Turkey-OECD migrant flows on inward FDI to Turkey from OECD countries. Except for the lnpolity variables, the same characteristics for both groups in the ZINB model. The signs for these variables are often opposite, which makes logical and consistent with a priori expectation. The estimation results for the Active Group in Table 2 show that typical gravity variables and migrant flows variables help explain FDI flows between countries. A country's political stability impacts FDI flows as it can generate transaction costs (Leibrecht & Riedl, 2013). While Turkey's political stability has a positive impact on inward FDI to Turkey from the OECD, the political stability of OECD countries is not significant on inward FDI to Turkey from OECD. The GDP variable used to measure the market size has different effects for source and target countries. While Turkey's GDP variable has a negative effect, OECD countries' GDP variable has a positive effect on FDI flows. If countries are geographically distant, this can increase monitoring and investment costs (Leibrecht & Riedl, 2013: 1215). The negative sign of the distance variable is consistent with this line of reasoning. That is, the lower the distance, the higher the FDI flows. In addition to the higher coefficient of migrant flows from Turkey to OECD countries, both the immigrant flows from Turkey to the OECD countries and from the OECD countries to Turkey positively affect inward FDI to Turkey from the OECD country. When faced with a sample with many zeros, Bosker and Garretsen (2010) recommend the two-stage estimation method, while Brakman et al. (2010) suggested a zero-inflated approach. In the data of inward FDI to Turkey from OECD countries, 35 of 340 observations have a zero value. That is, the zero-observation value in the sample is about 10%. In this case, Burger (2009), Brakman et al. (2009), and Bosker and Garretsen (2010) statements about the importance of the number of zero-value observations are instructive at the point of preferring the results of the PPML estimation method instead of the ZINB estimator. Hence, Silva and Tenreyro (2011) argue that the

PPML estimator performs well even with overdistribution and large zero values in the dependent variable. Therefore, it would be appropriate to consider the PPML estimation results. Although the PPML estimation results are similar to the ZINB estimation results in terms of the significance of the variables except for the political stability of the destination and source countries, the coefficients obtained from the PPML estimator are lower than the ZINB estimation results. The coefficients on lnpolity are positive (1.72 and 1.80), suggesting that the political stability of OECD countries significantly increases inward FDI to Turkey from the OECD. The immigrant flows between Turkey and OECD have a positive effect on inward FDI to Turkey from OECD, and the immigrant flows from Turkey to OECD countries are more effective on inward FDI to Turkey. In other words, a 1% increase in the immigrant flows to OECD from Turkey will correspond to an increase in inward FDI to Turkey from OECD of 0.44%. This finding is similar to Gao's (2003) and Tong (2005) findings that stated that the FDI stock increases by 6.2% when the population share of ethnic Chinese in the source country increases by 1% point. It should be noted that comparing the coefficients of Gao (2003) and our study would not be an accurate interpretation. Although FDI flows were considered in our study, Gao (2003) focused on FDI stock. However, we should say that Gao (2003) and our study revealed similar findings. Also, Tong (2005) highlighted that the magnitude of the estimates on ethnic Chinese is larger for FDI from industrial countries (0.28) than for FDI from developing countries (0.15). There are almost the same our coefficient (0.44) and Tong (2005)' coefficient (0.15+0.28=0.43). A 1% increase in the immigrant flows from OECD to Turkey will correspond to an increase in inward FDI to Turkey from OECD of 0.34%. Likewise, Buch et al. (2006) find that German states with a large foreign population from the same country of origin have more stocks of FDI. In addition to the fact that the distance between countries negatively affects FDI flows, the PPML estimation results show that distance has a smaller effect on FDI flows than the ZINB estimation results. The coefficients on distance are negative (-0.27 and -0.44) and, advising that the distance between Turkey and OECD countries significantly decreases inward FDI to Turkey from OECD. The GDP of OECD countries is significant on FDI flows, and its coefficient is the highest compared to the coefficients of other variables. Though political stability and GDP are attractive factors for FDIs, these variables have not been found to impact FDIs inward to Turkey. In the present case, examining the effectiveness of other economic and diplomacy channels between Turkey and OECD countries will provide us with new ideas.

Outward FDI Model 1: $FDI_{(outward)ijt} = \beta_0 + \beta_1 lngdp_{it} + \beta_2 lngdpt_{jt} + \beta_3 lnmig_{(inflow)ijt} + \beta_4 lndistance_{ij} + \beta_5 lnpolity_{it} + \beta_6 lnpolityt_{jt} + e_{ijt}$ (5)

Outward FDI Model 2: $FDI_{(outward)ijt} = \beta_0 + \beta_1 lngdp_{it} + \beta_2 lngdpt_{jt} + \beta_3 lnmig_{(ourflow)ijt} + \beta_4 lndistance_{ij} + \beta_5 lnpolity_{it} + \beta_6 lnpolityt_{jt} + e_{ijt}$ (6)

The zero-inflated model assumes that there are two latent groups of observations (active and passive). The definition of an active and passive group is given by Brakman et al. (2010) as follows:

> "…an observation in the (always 0) Passive Group has an outcome of 0 with a probability of 1; an observation in the (potentially) Active Group might have a zero outcome, but there is a positive probability that there is a non-zero outcome.."

Table 3 presents the Zero Inflated Negative Binomial regression and PPML estimation results for the outward FDI model 1 and outward FDI model 2. The columns related to the active group give estimates for the group for which the observations are not necessarily zero; the columns concerning the passive group give estimates for the always-zero group of observations.

Table: 3
ZINB and PPML Estimates

Variables	ZINB				PPML	
	Active Category		Passive Category			
$FDI_{outward}$	Negative Binomial		Logit			
lnpolity	-4.293**	-2.903	2.794	2.780	6.062***	6.187***
	(2.149)	(2.039)	(2.317)	(2.321)	(1.401)	(1.576)
lnpolityt	7.857***	6.554	-0.748	-0.548	3.211	2.150
	(1.956)	(1.883)	(2.028)	(2.064)	(2.789)	(2.811)
$lnmig_{inflow}$	0.683***		-0.334***		0.614***	
	(0.062)		(0.076)		(0.061)	
$lnmig_{outflow}$		0.652***		-0.330***		0.488***
		(0.054)		(0.069)		(0.040)
lndistance	-0.957***	-1.133***	1.669***	1.835***	-0.140	-0.324***
	(0.237)	(0.232)	(0.426)	(0.439)	(0.111)	(0.105)
lngdp	3.159***	2.890***	-0.226	-0.185	2.603***	2.489***
	(0.376)	(0.342)	(0.451)	(0.456)	(0.320)	(0.272)
lngdpt	-3.250***	-2.562***	-1.055	-0.966	-0.061	0.420
	(1.052)	(0.973)	(1.090)	(1.102)	(1.407)	(1.523)
eu	2.036***	2.022***	0.913	0.799		
	(0.337)	(0.336)	(0.593)	(0.590)		
lan			-1.131*	-1.311**		
			(0.670)	(0.678)		
Constant	-1.378	-3.672	-4.587	-7.877	-45.011***	-43.904***
	(7.295)	(6.794)	(9.775)	(9.788)	(10.854)	(11.552)
Observation	340	338	340	340	340	338
Pseudo R^2					0.41	0.40

*Note: Dependent variables is $FDI_{outward}$, ***p<0.01, **p<0.05, *p<0.1, Robust standard errors clustered in parentheses.*

The estimation results of these models based on the ZINB and PPML method address the impact of immigrant flows between Turkey and OECD on outward FDI from Turkey to the OECD. The outward FDI model 1 and outward FDI model 2 have 340 FDI flow data, 107 of which have a zero-value observation. The number of zero flows constitutes approximately 32% of the total number of observations in the sample. In this case, Burger et al. (2009), Bosker and Garretsen (2010), and Brakman et al. (2010) mentioned in their study, especially when the number of zero observations is substantial, standard Poisson estimation severely underpredicts these zero observations. The estimation results of the ZINB model gain importance as becomes stronger the probability of underperforming the PPML estimator in such samples. ZINB model results reveal that the political stability of the destination country has a significant and negative effect on FDI flows. On the other hand,

political stability in Turkey also has a positive effect on outward FDI from Turkey to OECD countries.

While the GDP of the destination countries positively affects the outward FDI from Turkey to OECD countries, Turkey's GDP has a negative impact on FDI flows[6]. When Turkey's GDP increases, there is a decrease in outward FDI flows from Turkey to OECD countries due to domestic investors' inclination towards domestic investments. Although the importance of distance between countries for FDI flows is not as obvious as trade, it emphasizes costs such as monitoring countries' investment opportunities. Consistent with theoretical expectations, the distance between Turkey and OECD countries negatively affects the outward FDI from Turkey to OECD countries. While the immigrant flows between Turkey and OECD countries positively affect the outward FDI from Turkey to OECD countries, migrant flows from Turkey to OECD are higher than that of immigrant flows from OECD to Turkey. A 1% increase in the immigrant flows from Turkey to OECD will correspond to an increase in outward FDI from Turkey to OECD of 0.68%. This finding majorly coincides with the reality that those who want to become immigrants in developed countries have to take FDI to their destination countries. A 1% increase in the immigrant flows from OECD to Turkey will correspond to an increase in outward FDI from Turkey to OECD of 0.65%. Bhattacharya and Groznik (2008), Ligthart and Singer (2009), and Javorcik et al. (2011) have emphasized that immigrants provide FDI flows from receiving countries to their home countries. This finding is quite parallel to the finding of Bhattacharya and Groznik (2008) that U.S. investments in a foreign country are positively affected by the size of the foreign-origin group from that country living in the U.S. Javorcik et al. (2011) also highlighted the result that is in line with our finding. Javorcik et al. (2011) also highlighted the results that are in line with our finding by stating that the outward FDI flows from the U.S. are correlated with migrants from the host country. Along the same line, this finding is consistent with Ligthart and Singer (2009)' finding that immigrant flows are significant in facilitating outward FDI to their countries of origin.

6. Conclusion

In this paper, two different models were used for the direction of FDI flows. The most important feature that distinguishes these models from each other is the execution of different estimation techniques. First, the impact of migration on inward FDI flows was analysed with the gravity model based on the PPML estimation method. Second, the analysis of the impact of migration on outward FDI flows was estimated with the ZINB estimation method. To decide which of the PPML and ZINB estimation results are considered valid was taken into account in the density of zero-valued observations in the sample. We consider the ZINB estimation results in the outward FDI models since the ratio of zero-valued observations to the total observations is 32%. For this rate of 10% in the inward FDI models,

[6] *While the PPML estimation results confirm the positive effect of target countries' GDP on FDI flows, the effect of Turkey's GDP is insignificant on the outward FDI from Turkey to OECD countries.*

the PPML estimation results are binding. Estimation results in all models showed that the impact of immigrant flows and distance is significant on FDI flows.

Distance between countries has a negative effect on FDI flows. It is thought that as the distance between the countries increases, its bilateral FDI flows decrease. In this case, it might be said that the increase in the costs of examining investment opportunities reduces FDI flows between countries. Empirical findings show that migrant flows between Turkey and OECD positively affect both inward and outward FDIs between OECD countries and Turkey. The results show that the immigrant flows to OECD from Turkey are relatively more sensitive to the immigrant flows to Turkey from OECD. It should be clearly stated that the most significant impact is the positive effect of immigrants from Turkey to OECD countries on the outward FDI from Turkey to OECD countries. In terms of immigrants' impact on FDI flows, the most negligible impact is seen in the impact of OECD immigrants on inward FDI to Turkey. The effect of immigrant flows on FDI flows more clearly observed in Turkey's outward investments. Although immigrants from Turkey to OECD are increasing their investments from receiving countries to their homeland, they affect more the investments from their homeland to receiving countries through formal channels. Suppose the movement of Turkish citizens to the destination country (more developed OECD countries) depends on their investment in the destination country. In that case, it can be considered effective formal channels between immigration and outward FDI. Hence, according to the Ankara Agreement (starting in 1963 and ending on January 1, 2021), the U.K. government offered residence and work permits when Turkish citizens established a company in the U.K. Turkish immigrants who want to obtain residence and work permits in developed countries have to invest a certain amount in these countries according to the legal regulations of the relevant country. Turkish immigrants who want to benefit from developed countries' social and economic opportunities increase investments from Turkey to OECD countries through this formal channel. The finding that immigrant flows from Turkey to the OECD significantly affect Turkey's outward investments is an accurate finding due to the effectiveness of formal channels.

The results confirm the hypothesis that "the immigrant flows between Turkey and OECD countries positively affect the inward and outward FDI between Turkey and OECD countries over the period 2003-2019". International factor mobility consists of international migration, and capital flows are one of the most important features of the integrated global economy. When immigration and FDI are taken together, international investment channels and migration routes form a complex network of relations between countries. It is a remarkable finding that OECD immigrants coming to Turkey attract high amounts of FDI to their home countries. This information shows that OECD immigrants influence FDI flows through the network channel.

Moreover, immigrants from Turkey to OECD countries attract less FDI to their homeland. In this case, to improve the current balance of payments and meet the Turkish economy's foreign exchange need, it should be ensured that immigrants from Turkey to OECD countries attract more FDI to their homeland. Our recommendation is never policy

implementations to reduce outward FDI from Turkey to OECD countries. On the contrary, FDI flows between OECD and Turkey need to be improved. However, more attempts should be made to increase inward FDI to Turkey from OECD countries. In Turkey's 11th Development Plan, primarily foreign direct investments are aimed to be directed to the industrial sector and increase the share of new investments. Although the slowdown trend brought about by the environment of uncertainty due to be on decline global economy and the Covid-19 pandemic can be perceived as a threat, Turkey has jumped up ten places to be 33rd among 190 nations in the World Bank's 2020 Ease of Doing Business Index. It is also important to evaluate the effect of migration on the FDI flows at the point of directing new investments. Besides, the increasing migration with globalization becomes an important element of the labour supply. Policymakers should consider the positive impact of migration on inward FDI to Turkey. Keeping network channels open through individual and corporate organizations with outgoing immigrants from Turkey will increase the inward FDI for the ultimate economic goals of Turkey. These results imply that network developer policies can be pushed to the forefront to receive further FDI flows from OECD countries to Turkey. Network developer policies inform immigrants about investment opportunities by activating individual and institutional channels with their homeland, primarily verbal and written promotional activities that encourage individuals with investor and entrepreneurial potential to immigrate to Turkey. OECD countries with a high migrant flow from Turkey can be provided with cost-reducing facilities in their investments.

One of the most important results of this study is that although immigrants from Turkey to OECD are increasing their investments from receiving countries to their homeland, they affect more the investments from their homeland to receiving countries through the formal channel. We attach great importance to this finding for two reasons. First, our findings mostly coincide with the fact that the number of Turkish citizens who want to live and work in OECD member countries has increased recently. Second, much of the current debate revolved around the network channel, but our study revealed that an obligatory formal channel could be active on the relationship between immigration and FDI. Our study offers an analysis that has not been done previously, revealing the link between FDI and migration for Turkey and OECD countries. Also, there is an area for further development of this analysis. In particular, we recommend a detailed analysis of its effect on FDI flows by using disaggregated immigrant data. This can provide more insight into the relationship between migration and FDI. Finally, the concentrate on the current paper was placed on the influence of the immigration flows on inward and outward FDI between Turkey and OECD countries. Thus, examining how the immigrant flows affect the inward FDI to Turkey from Turkic Republics with historical ties or countries with free trade agreements could provide us with policy recommendations.

Moreover, the results obtained in this study say nothing inevitable about what informal barriers lead to the role of inward and outward FDI to Turkey. However, GDP, political stability, and immigration flows are used to explain FDI flows. A more thorough analysis of this would be worth the effort.

References

Akkoyunlu, Ş. (2010), "Can Trade, Aid, Foreign Direct Investments and Remittances Curb Migration from Turkey?", *Migration Letters*, 7(2), 144-158.

Alfaro, L. & M. Chen, (2010), "Surviving the Global Financial Crisis: Foreign Direct Investment and Establishment Performance", *Harvard Business School Working Paper*, No. 10/110.

Ali, S. & W. Guo (2005), "Determinants of FDI in China", *Journal of Global Business and Technology*, 1(2), 21-33.

Anderson, J.E. & E. Van Wincoop (2003), "Gravity with Gravitas: A Solution to the Border Puzzle", *American Economic Review*, 93(1), 170-192.

Anderson, J.E. (1979), "A theoretical Foundation for Gravity Equation", *American Economic Review*, 69(1), 106-116.

Asiedu, E. (2002), "On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa Different?", *World Development*, 30(1), 107-119.

Baier, S.L. & J.H. Bergstrand (2007), "Do Free Trade Agreements Actually Increase Members' International Trade?", *Working Paper*, No. 2005-3, Federal Reserve Bank of Atlanta.

Bal, H. & E.E. Akça (2016), "Doğrudan Yabancı Sermaye Yatırımlarının Belirleyicileri: Seçilmiş Doğu Asya ve Pasifik Ülkelerinden Ampirik Bulgular", *Sosyoekonomi*, 24(30), 91-112.

Barry, F. (2002), "E.U. Accession and FDI flows to CEE countries: Lessons from the Irish Experience", in: *Conference on Foreign Direct Investment in the Real and Financial Sector of Industrial Countries*, Bundesbank Eltville am Rhein.

Bellino, A. & G. Celi (2016), "The Migration-Trade Nexus in Presence of Vertical and Horizontal Product Differentiation", *Discussion Paper*, No. 137: University of Foggia.

Bergeijk, P.A.G. & S. Brakman (2010), "The Comeback of the Gravity Model", in: P.A. Van Bergeijk & S. Brakman (eds.), *The Gravity Model in International Trade: Advances and Applications*, Cambridge University Press.

Bergstrand, J.H. (1989), "The Generalized Gravity Equation, Monopolistic Competition, and the Factor-Proportions Theory in International Trade", *The Review of Economics and Statistics*, 71(1), 1435-153.

Bertoli, S. & J.F.H. Moraga (2017), "Gravity Models in the Migration and Development Nexus", *Revue d'économie du développement*, 25(3), 69-91.

Bevan, A. & S. Estrin & K. Meyer (2004), "Foreign Investment Location and Institutional Development in Transition Economies", *International Business Review*, 13(1), 43-64.

Bhattacharya, U. & P. Groznik (2008), "Melting Pot or Salad Bowl: Some Evidence from U.S. Investments Abroad", *Journal of Financial Markets*, 11(3), 228-258.

Bosker, E.M. & H. Garretsen (2010), "Trade Costs, Market Access and Economic Geography: Why the Empirical Specification of Trade Costs Matters", in: P.A. Van Bergeijk & S. Brakman (eds.), *The Gravity Model in International Trade: Advances and Applications*, Cambridge University Press.

Brakman, S. et al. (2010), "Economic and Financial Integration and the Rise of Cross-Border M&As", in: P.A. Van Bergeijk & S. Brakman (eds.), *The Gravity Model in International Trade: Advances and Applications*, Cambridge University Press.

Buch, C.M. et al. (2006), "Where Enterprises Lead, People Follow? Links Between Migration and FDI in Germany", *European Economic Review*, 50(8), 2017-2036.

Burger, M. & F.G. van Oort & G.M. Linders (2009), "On the Specification of the Gravity Model of Trade: Zeros, Excess Zeros and Zero-Inflated Estimation", *Spatial Economic Analysis*, 4(2), 167-90.

CEPII (2011), *Notes on CEPII's distances measures: The GeoDist database*, <http://www.cepii.fr/PDF_PUB/wp/2011/wp2011-25.pdf>, 31.08.2021.

Cheng, K.L. & Y.K. Kwan (2000), "What are The Determinants of The Location of Foreign Direct Investment? The Chinese Experience", *Journal of International Economics*, 51(2), 379-400.

Clemens, M.A. & J.G. Williamson (2000), "Where Did British Foreign Capital Go? Fundamentals, Failures and the Lucas Paradox: 1870-1913", *NBER Working Paper*, No. w8028: NBER.

Combes, P. & M. Lafourcade & T. Mayer (2002), "Can Business and Social Networks Explain the Border Effect Puzzle?", *CEPII Working Paper*, No. 2: CEPII.

Correia, S. & P. Guimaraes & T. Zylkin (2019), "PPMLHDFE: Fast Poisson Estimation with High-Dimensional Fixed Effects", <https://arxiv.org/pdf/1903.01690.pdf>, 31.08.2021.

Cuervo-Cazurra, A. (2008), "The Effectiveness of Law Against Bribery Abroad", *Journal of International Business Studies*, 39(4), 634-651.

Deardorff, A.V. (1998), J. Frankel (ed.), *Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World*, The Regionalization of the World Economy University of Chicago Press.

Dunlevy, J.A. & W.K. Hutchinson (1999), "The Impact of Immigration on American Import Trade in the Late Nineteenth and Early Twentieth Centuries", *Journal of Economic History*, 59(4), 1043-1062.

Dunlevy, J.A. & W.K. Hutchinson (2001), "The Pro-Trade Effect of Immigration on American Exports During the Late Nineteenth and Early Twentieth Centuries", *IZA Discussion Paper*: 375.

Eichengreen, B. & D.A. Irwin (1998), "The Role of History in Bilateral Trade Flows", in: *The Regionalization of the World Economy*, University of Chicago Press: NBER, 33-62.

Faruqee, H. (2004), "Measuring the Trade Effects of EMU", *Working Paper* No. 04/154, International Monetary Fund, Washington DC.

Fidrmuc, J. (2009), "Gravity Models in Integrated Panels", *Empir Econ*, 37, 435-446.

Foad, H. (2012), "FDI and Immigration: A Regional Analysis", *Ann Reg Sci*, 49, 237-259.

Frankel, J. & S. Wei (1993), "Trade Blocs and Currency Blocs", *NBER Working Paper*, No. 4335.

Gao, T. (2003), "Ethnic Chinese Networks and International Investment: Evidence from Inward FDI in China", *Journal of Asian Economics*, 14(4), 611-629.

Garas, A. & et al. (2016), "The Relation between Migration and FDI in the OECD from a Complex Network Perspective", *Advances in Complex Systems*, 19 No. 06n07 1650009.

Girma, S. & Z. Yu (2002), "The Link Between Immigration and Trade: Evidence from the United Kingdom", *Review of World Economics*, 138(1), 115-130.

Globerman, S. & D.M. Shapiro (1999), "The Impact of Government Policies on Foreign Direct Investment: The Canadian Experience", *Journal of International Business Studies*, 30(3), 513-532.

Goldberger, A. (1968), "The Interpretation and Estimation of Cobb-Douglas Functions", *Econometrica*, 36(3), 464-472.

Gómez-Herrera, E. (2013), "Comparing Alternative Methods to Estimate Gravity Models of Bilateral Trade", *Empirical Economics*, 44(3), 1087-1111.

Gould, D.M. (1994), "Immigrant Links to the Home Country: Empirical Implications for U.S. Bilateral Trade Flows", *The Review of Economics and Statistics*, 76(2), 302-316.

Guimarães, P. (2020), *PPMLHDFE: Fast Poisson Estimation with High Dimensional Fixed Effects*, <https://www.stata.com/meeting/portugal20/slides/Portugal20_Guimaraes.pdf>, 31.08.2021.

Head, K. & J. Ries (1998), "Immigration and Trade Creation: Econometric Evidence from Canada", *Canadian Journal of Economics*, 31, 47-62.

Helpman, E. & M. Melitz & Y. Rubenstein (2008), "Estimating Trade Flows: Trading Partners and Trading Volumes", *Quarterly Journal of Economics*, 123, 441-87.

Helpman, E. (1984), "A Simple Theory of International Trade with Multinational Corporations", *Journal of Political Economy*, 92(3), 451-71.

INSCR (2018), *Polity5: Regime Authority Characteristics and Transitions Datasets*, <http://www.systemicpeace.org/inscrdata.html>, 31.08.2021.

IOM (2021a), *Immigration & emigration statistics*, <https://www.migrationdataportal.org/>, 15.07.2021.

IOM (2021b), *Iom in Turkey*, <https://www.iom.int/countries/turkey>, 15.07.2021.

Jagdambea, S. & E. Kannan (2020), "Effects of ASEAN-India Free Trade Agreement on Agricultural Trade: The Gravity Model Approach", *World Development Perspectives*, 19.

Javorcik, B. & C. Ozden & M. Spatareanu & C. Neagu (2011), "Migrant Networks and Foreign Direct Investment", *Journal of Development Economics*, 94(2), 231-241.

Kugler, M. & H. Rapoport, (2007), "International Labor and Capital Flows: Complements or Substitutes?", *Economics Letters*, 94(2), 155-162.

Leibrecht, M. & A. Riedl (2014), "Modeling FDI Based on A Spatially Augmented Gravity Model: Evidence for Central and Eastern European Countries", *The Journal of International Trade & Economic Development*, 23(8), 1206-1237.

Ligthart, J.E. & D. Singer (2009), *Do Immigrants Promote Outward Foreign Direct Investment? Evidence from the Netherlands*, Unpublished: Tilburg University.

Malan, F.A. (2015), "Complementarity between FDI and Migration: Using the Fall of the Berlin Wall as a Natural Experiment", *IFAC-PapersOnLine*, 48(24), 201-206.

Manning, W.G. & J. Mullahy (2001), "Estimating Log Models: To Transform or Not to Transform?", *Journal of Health Economics*, (20), 461-494.

Markusen, J.L. (1995), "The Boundaries of Multinational Enterprises and the Theory of International Trade", *Journal of Economic Perspectives*, 9(2), 169-189.

Murat, M. & B. Pistoresi & A. Rinaldi (2011), "Transnational Social Capital and FDI: Evidence from Italian Associations Worldwide", *Journal of Economic Development*, 36(4), 1-15.

OECD (2021), <https://stats.oecd.org/>, 01.0812021.

Ozaydın, A. & A. Ilgazi (2019), "Syrian Refugees in Terms of Direct Foreign Capital Investment", *Gaziantep University Journal of Gaziantep University Faculty of Economics and Administrative Sciences*, 1(1), 130-160.

Rauch, J. E. & V. Tridade (2002), "Ethnic Chinese Networks in International Trade", *The Review of Economics and Statistics*, 84(1), 116-130.

Ravenstein, E.G. (1885) "The Laws of Migration", *Journal of the Statistical Society of London*, 48(2), 167-235.

Republic of Turkey Ministry of Development (2014), *The Tenth Development Plan (2014-2018)*, <https://sbb.gov.tr/wp-content/uploads/2018/11/The_Tenth_Development_Plan_2014-2018.pdf>, 18.08.2021.

Silva, J.S. & S. Tenreyro (2006), "The Log of Gravity", *The Review of Economics and Statistics*, 88(4), 641-658.

Silva, J.S. & S. Tenreyro (2011), "Further Simulation Evidence on the Performance of the Poisson-PML Estimator", *Economics Letters*, 112 (2), 220-222.

Tinbergen, J. (1962), *Shaping the World Economy*, New York: The Twentieth Century Fund.

Tong, S.Y. (2005), "Ethnic Networks in FDI and the Impact of Institutional Development", *Review of Development Economics*, 9(4), 563-580.

UNCTAD (2021), *Foreign Direct Investment: Inward and Outward Flows and Stock- Annual*, <https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx>, 31.08.2021.

Wahid, A.N.M. & R. Sawkut & R. Seetanah (2009), "Determinants of Foreign Direct Investments (FDI): Lessons from the African Economies", *Journal of Applied Business and Economics*, <http://www.na-businesspress.com/JABE/WahidWeb.pdf>, 31.08.2021.

Westerlund, J. & F. Wilhelmsson (2011), "Estimating the Gravity Model Without Gravity Using Panel Data", *Applied Economics*, 43(6), 641-649.

World Bank (2020), *Ease of Doing Business Rankings*, <https://www.doingbusiness.org/en/reports/global-reports/doing-business-2020>, 31.08.2021.

Zwinkels, R.C.J. & S. Beugelsdijk (2010), "Gravity Equations: Workhorse or Trojan Horse in Explaining Trade and FDI Patterns Across Time and Space?", *International Business Review*, 19, 102-115.

Appendix

Table: 1
Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis	Joint
lnpolity	340	2.227	0.065	2.079	2.302	0.000	0.000	0.000
lnpolityt	340	2.078	0.125	1.945	2.197	0.366	0.000	0.000
lngdp	340	10.612	0.315	9.778	11.578	0.006	0.003	0.001
lngdpt	340	9.899	0.244	9.507	10.254	0.143	0.000	0.000
lndistance	340	7.918	0.794	6.972	9.754	0.000	0.485	0.000
$lnmig_{inflow}$	340	6.256	1.946	0	10.815	0.000	0.019	0.000
$lnmig_{outflow}$	338	5.341	2.202	0	10.545	0.175	0.174	0.157
FDI_{inward}	340	4067.166	7369.212	0	44757.91	0.000	0.000	0.000
$FDI_{outward}$	340	595.393	2228.777	0	18232.98	0.000	0.000	0.000

Note: Std. Dev represents standard deviation; Max and Min represent maximum and minimum values, respectively. Skewness and Kurtosis are p-values of the normality test that examines the distribution of data.

Table: 2
Spearman's Rank Correlation Coefficients and Variance Inflation Factor (VIF)

Spearman's Rank Correlation Coefficients								
	FDI_{inward}	**lnpolity**	**lnpolityt**	**lngdp**	**lngdpt**	**lndistance**	**$lnmig_{inflow}$**	**$lnmig_{outflow}$**
FDI_{inward}	1.0000							
lnpolity	0.0425	1.0000						
lnpolityt	0.1687	-0.0379	1.0000					
lngdp	0.4140	0.2577	0.2529	1.0000				
lngdpt	0.1852	-0.0455	0.8660	0.3215	1.0000			
lndistance	-0.0839	-0.0634	0.0000	0.1016	0.0000	1.0000		
$lnmig_{inflow}$	0.5972	0.0036	0.0484	0.2138	0.0738	-0.1432	1.0000	
$lnmig_{outflow}$	0.5373	-0.0845	0.1216	0.2565	0.1262	0.0666	0.8615	1.00
VIF								
	lnpolity	**lnpolityt**	**lngdp**	**lngdpt**	**lndistance**	**$lnmig_{inflow}$**	**$lnmig_{outflow}$**	**Mean VIF**
	1.09	3.78	1.19	3.96	1.06	1.06		2.02
	1.09	3.81	1.20	3.99	1.02		1.04	2.02

Note: A high correlation coefficient was estimated between the $Lmig_{inflow}$ and $Lmig_{outflow}$ variables. However, the $Lmig_{inflow}$ and $Lmig_{outflow}$ are independent variables of different models. These variables were not included together in a single model. A Variance Inflation Factor (VIF) measures multicollinearity among the independent variables in a multiple regression model. Since VIF test results are less than 5, it is at a reasonable level.

Table: 3
Spearman's Rank Correlation Coefficients and VIF

	lnpolity	**lnpolityt**	**lngdp**	**lngdpt**	**lndistance**	**$lnmig_{inflow}$**	**$lnmig_{outflow}$**
lnpolity	1.0000						
lnpolityt	-0.0601	1.0000					
lngdp	0.2762	0.1697	1.0000				
lngdpt	-0.0652	0.8604	0.2381	1.0000			
lndistance	-0.1318	-0.0328	0.0158	-0.0308	1.0000		
$lnmig_{inflow}$	0.0239	-0.0188	0.0948	0.0005	-0.2103	1.0000	
$lnmig_{outflow}$	-0.0893	0.0799	0.1682	0.0733	0.0455	0.8396	1.0000
	lnpolityt	**lngdp**	**lngdpt**	**lndistance**	**$lnmig_{inflow}$**	**$lnmig_{outflow}$**	**Mean VIF**
	3.62	1.12	3.74	1.09	1.06		1.96
	3.65	1.13	3.76	1.04		1.01	1.95

Note: A high correlation coefficient was estimated between the $Lmig_{inflow}$ and $Lmig_{outflow}$ variables. However, the $Lmig_{inflow}$ and $Lmig_{outflow}$ are independent variables of different models. These variables were not included together in a single model. A VIF provides a measure of multicollinearity among the independent variables in a multiple regression model. Since VIF test results are less than 5, it is at a reasonable level.

Table: 4
Spearman's Rank Correlation Coefficients and VIF

Spearman's Rank Correlation Coefficients								
	$FDI_{outward}$	**Lpolity**	**Lpolityt**	**Lgdp**	**Lgdpt**	**Ldistance**	**$Lnmig_{inflow}$**	**$Lmig_{outflow}$**
$FDI_{outward}$	1.0000							
Lnpolity	0.0577	1.0000						
Lnpolityt **Lngdp**	0.1351 0.2715	-0.0379 0.2577	1.0000 0.2529	1.0000				
Lngdpt **Lndistance** **$Lnmig_{inflow}$**	0.1397 -0.3680 0.5262	-0.0455 -0.0634 0.0036	0.8660 0.0000 0.0484	0.3215 0.1016 0.2138	1.0000 0.0000 0.0738	1.0000 -0.1432	1.0000	
$Lnmig_{outflow}$	0.4587	-0.0845	0.1216	0.2565	0.1262	0.0666	0.8615	1.0000
VIF								
	Lpolity	**Lpolityt**	**Lgdp**	**Lgdpt**	**Ldistance**	**$Lnmig_{inflow}$**	**$Lmig_{outflow}$**	**Mean VIF**
	1.09	3.78	1.19	3.96	1.06	1.06		2.02
	1.09	3.81	1.20	3.99	1.02		1.04	2.02

Note: A high correlation coefficient was estimated between the $Lmig_{inflow}$ and $Lmig_{outflow}$ variables. However, the $Lmig_{inflow}$ and $Lmig_{outflow}$ are independent variables of different models. These variables were not included together in a single model. A VIF provides a measure of multicollinearity among the independent variables in a multiple regression model. Since VIF test results are less than 5, it is at a reasonable level.

Table 5: Spearman's Rank Correlation Coefficients and VIF

	lnpolity	**lnpolityt**	**lngdp**	**lngdpt**	**lndistance**	**$lnmig_{inflow}$**	**$lnmig_{outflow}$**
lnpolity	1.0000						
lnpolityt	-0.0293	1.0000					
lngdp	0.1623	0.2664	1.0000				
lngdpt	-0.0366	0.8578	0.3455	1.0000			
lndistance	-0.2519	0.2043	0.1497	0.2144	1.0000		
$lnmig_{inflow}$	0.0310	0.0152	0.2573	0.0423	0.0071	1.0000	
$lnmig_{outflow}$	-0.0720	0.1160	0.3041	0.1252	0.1457	0.8991	1.0000
	lnpolityt	**lngdp**	**lngdpt**	**lndistance**	**$lnmig_{inflow}$**	**$lnmig_{outflow}$**	**Mean VIF**
	3.85	1.17	4.02	1.20	1.05		2.07
	3.85	1.17	4.02	1.17		1.05	2.06

Note: A high correlation coefficient was estimated between the $Lmig_{inflow}$ and $Lmig_{outflow}$ variables. However, the $Lmig_{inflow}$ and $Lmig_{outflow}$ are independent variables of different models. These variables were not included together in a single model. A VIF provides a measure of multicollinearity among the independent variables in a multiple regression model. Since VIF test results are less than 5, it is at a reasonable level.

Table: 6
Turkey's Inward FDI Positions by Total and Country Groups

Years	Total Inward FDI Positions	OECD	Europe	Africa	America	Asia	Australia
2005	71297	**61478**	57706	70	7315	6206	0
2006	95089	**76823**	76772	78	9697	8470	72
2007	153950	**134002**	122827	151	18071	12743	156
2008	80227	**68906**	65135	113	6865	8082	32
2009	143723	**125029**	116142	199	13375	13982	24
2010	186936	**164489**	146330	359	20494	19528	222
2011	136450	**117002**	109379	176	10849	15893	153
2012	189900	**159196**	154966	279	12559	21791	304
2013	149764.2	**124770.7**	121660.7	162.29	8468.15	19284.59	188.44
2014	182064.6	**148699.6**	144940.7	251.06	11678.78	25126.46	67.65
2015	158077.6	**128754.9**	127019	194.89	6906.92	23909.08	47.69
2016	148428.2	**113579.5**	115363.8	122.76	6287.2	26586.22	68.26
2017	196877.4	**150664.5**	150414.2	199.62	9703.21	36397.04	163.34
2018	145554.6	**105555.1**	113387.5	130.85	6320.61	25588.56	127.07
2019	161650.1	**110679.3**	108625.7	204.23	5207.56	47476.91	135.75

Source: OECD Database.

Note: All FDI activities and U.S. dollars, million. The bolded values indicate the country group with the highest inward FDI positions.

Table: 7
Turkey's Outward FDI Positions by Total and Country Groups

Years	Total Outward FDI Positions	OECD	Europe	Africa	America	Asia	Australia
2005	8315	4684	**5083**	86	293	2853	0
2006	8866	4922	**5395**	90	293	3076	1
2007	12210	6138	**7968**	173	299	3706	0
2008	17846	9044	**10861**	381	1476	4777	1
2009	22250	10935	**13223**	470	2058	5968	6
2010	22509	10660	**12613**	831	2452	5967	68
2011	27681	13897	**15089**	845	3863	7356	61
2012	30968	16725	**18428**	799	2449	8499	274
2013	33317.89	19211.7	**21065.96**	1034.73	2917.02	8033.01	267.16
2014	39513.27	22480.56	**24346.69**	1126.04	3236.07	10482.85	321.6
2015	35614.96	19879.9	**25793.94**	966.63	3052.44	5530.37	271.58
2016	38368.58	22665.26	**29278.93**	1258.8	2868.27	4767.04	195.54
2017	45583.37	26993.54	**35741.85**	1568.69	3322.31	4819.25	131.27
2018	44496.57	29563.32	**36685.26**	1265.76	2240.15	4367.31	-61.91
2019	48979.37	32232.17	**37476.9**	1899.56	4197.91	5427.36	-22.36

Source: OECD Database.
Note: All FDI activities and U.S. dollars, million. The bolded values indicate the country group with the highest outward FDI positions.

Table: 8
Cross Section Dependence and Unit Root Test

Variable	FDI_{inward}	$FDI_{outward}$	lnpolity	lnpolityt	$lnmig_{inflow}$	$lnmig_{outflow}$	lndistance	lngdp	lngdpt
	23.47***	6.44***		56.83***	4.13***	7.80***		51.60***	56.83***
IPS	-3.14***	9.298	-1.923***		-5.930***	-3.382***		0.377	
Fisher PP	3.363***	-3.422	-4.472	6.077	0.684***	4.268***	-4.472	-4.420	-4.472
Fisher ADF	2.777***	-3.753	3.447***	-4.472	10.924***	5.404***	-4.472	-0.397	-4.472
CIPS	-2.150**	-1.417	2.044	2.610	-2.201**	-0.661	2.610	-1.432	2.610

*Note: ***p<0.01, **p<0.05, *p<0.1. Pesaran (2004) suggested test statistics in equation (5) as an alternative to the Breusch-Pagan LM test for testing cross-sectional dependence when T is small, and N is large. Monte-Carlo simulations showed that the test performance of Pesaran is better than the Breusch-Pagan LM test performance for N>T. CD=* $\sqrt{\frac{2T}{N/(N-1)}}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}\right)$ *and* $\hat{\rho}_{ij}=\hat{\rho}_{ji}=\frac{\sum_{t=1}^{T}e_{it}e_{jt}}{(\sum_{t=1}^{T}e_{it}^2)^{1/2}(\sum_{t=1}^{T}e_{jt}^2)^{1/2}}$. e_{it} *, shows the estimated residuals from each unit. In panel data analysis, it is necessary to test the cross-section dependence in the series before deciding on the model specification. The unit root tests to be used vary depending on whether there is a cross-sectional dependence or not. The* H_0 *hypothesis, which states that there is no cross-sectional dependence, was rejected. In the presence of cross-section dependence, should be considered second-generation stationarity that considers the cross-section dependence. The stationarity of the series, whether they contain a unit root or not, was tested with the second-generation unit root tests such as IPS, Fisher PP, Fisher ADF, and CIPS tests. In the test results of all the stationarity tests of the lndistance, lngdp and lngdpt series, the primary hypothesis that the series contains a unit root could not be rejected against the alternative hypothesis that the series does not contain a unit root.*

Sosyoekonomi

2021, Vol. 29(50), 197-227

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.10
Date Submitted: 07.03.2021
Date Revised: 19.08.2021
Date Accepted: 28.08.2021

Online Tertiary Education During The COVID-19 Pandemic in Turkey: A Country Profile Based on Survey With 13 Thousand Students[1]

Furkan TÜZÜN *(https://orcid.org/0000-0001-7431-211X), Social Sciences University of Ankara, Turkey; furkan.tuzun@asbu.edu.tr*

Nilay YÖRÜK-TORAMAN *(https://orcid.org/0000-0002-8309-502X), Social Sciences University of Ankara, Turkey; nilay.yoruk@asbu.edu.tr*

COVID-19 Pandemisi Döneminde Türkiye'de Yükseköğretim: 13bin Öğrenci ile Yapılan Anket Sonuçları Bazında bir Ülke Profili[2]

Abstract

Turkish higher education system experienced a rapid shift to online education due to the COVID-19 outbreak in March 2020. The present study aims at identifying countrywide variations in online education applications at the aggregate level with the help of a large survey conducted with over 13 thousand participants registered in Turkish universities. Findings are presented in a structured framework aiming to distinguish student-, faculty member-, and institution-related factors that would presumably drive students' satisfaction of online education during the pandemic. Preliminary results of multiple regression analysis in support of findings are complementarily supplemented in Appendix. Investigation of these factors provides important policy suggestions to higher education affiliates.

Keywords : Online Education, Distance Education, Tertiary Education, COVID-19, Turkey.

JEL Classification Codes : A2, I21, I23.

Öz

Mart 2020'de ortaya çıkan COVID-19 salgını nedeniyle Türk Yükseköğretim sistemi, çevrimiçi eğitime hızlı bir geçiş yapmak durumunda kalmıştır. Bu çalışma, salgın döneminde üniversite öğrencilerinin çevrimiçi eğitim memnuniyetini etkilemesi muhtemel faktörleri belirlemeyi amaçlamaktadır. Bu doğrultuda, Türkiye'deki üniversitelere kayıtlı 13 binden fazla öğrenci ile yapılan kapsamlı anket çalışması ile elde edilen bulgular kullanılarak öğrenci, akademisyen ve kurumlarla ilişkili çeşitli faktörlerin varlığı ortaya konulmuş ve tartışılmıştır. Bulguları destekleyen çoklu regresyon analizi sonuçları Ekler kısmında verilmiştir. Bulgular ışığında yükseköğretim paydaşlarına yönelik politika önerileri sunulmaktadır.

Anahtar Sözcükler : Çevrimiçi Eğitim, Uzaktan Eğitim, Yükseköğretim, COVID-19, Türkiye.

---

[1] *Data is available upon request.*

[2] *Talep olması halinde veriler paylaşılabilir.*

1. Introduction

Numerous universities switched to online education worldwide around the beginning of 2020 due to the COVID-19 pandemic. Given higher levels of welfare and increased prevalence of technology, it was relatively easier to implement and sustain some mode of online education in universities located in developed countries. Also, university students being familiar to some sort of online education within the default course structure before the pandemic was an experiential plus for both students and lecturers in these countries. However, the rapid adaptation of online university education in developing countries was more demanding. On the one hand, students experienced problems related to insufficient coverage of and uneven access to the Internet, lack of electronic device ownership, populous households, and unfamiliarity to newly implemented systems. On the other side, higher education institutions faced problems related to technological capacity including having reliable online systems and knowledgeable IT staff at hand, instructors inexperienced in online education, and failures to communicate with students. When health and psychological challenges of the pandemic were accounted for, shift to online education in the tertiary level was exhaustive in the developing world.

With close to eight million students registered in 207 higher education institutions, Turkey is one of those developing countries, which experienced an unexpectedly rapid shift to online education in the tertiary level. With the rise of COVID-19 spread, the Council of Higher Education in Turkey announced on March 23, 2020 that all institutions under its conduct will halt face-to-face education and adapt some sort of online education solutions for the rest of the spring semester. Although almost no higher education institution in Turkey, except for a handful of them, were devoid of the problems aforementioned, the rest of the process in which how, at what pace, using which criteria the institutions were to convert into online education was left to the higher education institutions' own preferences. Thus, there appeared great variation among Turkish higher education institutions with regards to the computer/online programs they employed, the date of full implementation of online education, the mode of online lessons-synchronous or asynchronous, the grading method and scheme, the communication channels to students and many more. Moreover, variation in online education practices not only happened among universities, but also among departments within the same university. When differences among university students in, such as, access to the Internet, electronic device ownership, household population during lockdown period are accounted for, the complete transition to online education in Turkish tertiary education experienced great challenges. An overview of important events and corresponding dates in Turkish higher education during the pandemic is provided in the Appendix-A.

Hence, the present study aims at *identifying* the current situation and preferences of university students in Turkey after the rapid shift to mass online education during the pandemic by a comprehensive survey conducted with more than 13 thousand participants. Complementarily, it also aims at *establishing* a quantitative base for future institutional policies specifically related to online tertiary education and regarding catastrophe

management in general for developing countries with similar characteristics. With this perspective in mind, we attempt to report aggregate indicators of and trends in online education that leads to the *identification* of possible factors affecting students` satisfaction from online education during the pandemic. After providing with general trends among students in satisfaction of and their preferences over online education, we next examine factors that carried potential to affect online education in three aspects as (i) student-related factors, (ii) faculty member-related factors, and (iii) institution-related factors. Investigation of these factors eventually leads to important policy suggestions to higher education agents for a smoother transition to and a strengthened maintenance of online education as well as for any unanticipated catastrophic change we might encounter in the future.

The present study is differentiated from some recent works on online education during pandemic in Turkey with respect to its research design, outcomes, and scope. Most previous works on online education-pandemic nexus in Turkey focused only on one specific university (Keskin & Özer-Kaya, 2020; Tarlakazan & Tarlakazan, 2020; İnce, Kabul & Diler, 2020; Sarıtaş & Barutçu, 2020; Aksoğan, 2020; Akbal & Akbal, 2020; Afşar & Büyükdoğan, 2020; Tüzün & Yörük-Toraman, 2020; Tüzün & Yörük-Toraman Forthcoming). While some only focused on one education program among different Turkish universities (Zan & Zan, 2020), some tried to have a grasp of the technological systems employed by Turkish universities during the pandemic (Durak, Çankaya & İzmirli, 2020) and others evaluated the legislative requirements of online education in Turkey (Esgice Gündüz, Kursun, Karaman, & Demirel, 2020). The study closest to ours have been conducted by Karadağ and Yücel (2020) with respect to its scope and sample size. Although they attempted to measure online education satisfaction levels of students registered in universities along Turkey, their study seems to lack providing explanation on the possible sources of the variation in online education satisfaction.

In comparison, thanks to a large dataset, the present work attempts to capture *aggregate* online education trends prevailing *throughout* the country during the pandemic, which allows to provide with stronger and relatively more reliable policy suggestions for the Turkish higher education system as a whole. Second, endeavour to the *identification of the factors* affecting students' online education satisfaction is the prominent feature of the present study distinguishes from previous works conducted in Turkey during the pandemic. Third, the psychological downsides of the pandemic including lockdown applications is examined for the first time in Turkey in relation to mass online education. Thus, as a first comprehensive attempt to examine the transition to online education during the pandemic in Turkey with large survey data, the study signifies importance for the country as well as the other developing ones with similar characteristics, to understand the factors affecting online education from the perspective of higher education students.

The rest of the paper is structured as the following: (ii) Survey Design and Sample section provides a detailed information on survey design, its distribution to the participants and provides with sample statistics; (iii) Survey Results and Implications section reports inferences obtained through survey data and consists of three main sub-sections related to

the factors related to students, faculty members, and institutions; and (iv) Conclusion section lists the policy suggestions for higher education agents and wraps up the article.

2. Survey Design and Sample

A country-wide online survey was conducted with 13330 undergrad and grad students registered in 146 Turkish universities between June-October 2020. First section of the survey consists of 17 questions capturing demographics and basics. The second section of the survey includes 19 questions related to the factual situation of respondents in online education such as how many courses they have taken, what kind of technical difficulties they have experienced, and what type of electronic devices they have used. The third section has 19 questions asking respondents' opinions and preferences regarding online education such as their general satisfaction from online education, their taste in (a) synchronous lessons, their take on fairness in online exams, and their choice of grading method and scheme. The last section of the survey includes seven questions related to COVID-19 and intended to capture the pandemic's psychological effects. The survey also carries two open-ended questions asking respondents' opinions about online education, and about what they learnt in life due to the pandemic. The estimated time required to fill out the whole survey is 8-9 min. Ethics statement was provided and volunteer agreement was taken at the initial phase of the survey. The survey was distributed through the higher education institutions. Applications was submitted to higher education institutions` rectorates in Turkey to obtain approval for sending the survey to their students. After the approval, each higher education institution sent the research survey to their own students through their own school emailing system.

A general profile of participants is presented in Table 1. Female participants slightly overrun males. 90% of participants are at most 25 years old, which closely corresponds to the 94% share of undergraduate students in our sample. While 1% of participants were diagnosed with COVID-19, 32% of them had some diagnosed relative or friend. More than 55% of participants are studying in either a Social Science or a Physical Science program in a broad sense. Slightly over 4.5% of participants' GPA stands lower than 1.5 out of four, which is the failure threshold in the Turkish higher education system. Only about 1% of participants froze their registration during the pandemic, which was given by universities as a right to students in case the student did not have means to continue online education efficiently. This shows that an overwhelming majority of data collected is very like to capture well participants' opinions on online education given that they in fact participated in the online education system. Moreover, a great chunk of participants has not taken any online course within or outside of university before the pandemic.

Table: 1
Participant Profile

	Frequency	Share
Gender		
Female	*7261*	*55.37%*
Male	*5726*	*43.66%*
Not Specificized	*127*	*0.97%*
Age		
17-22	*9128*	*69.61%*
23-25	*2629*	*20.05%*
26-29	*686*	*5.23%*
30≤	*671*	*5.12%*
COVID-19 Diagnosis		
Self	*129*	*0.98%*
Relative (1st degree)	*199*	*1.52%*
Relative (2nd degree)	*210*	*1.60%*
Relative (3rd degree)	*1037*	*7.91%*
Relative (Greater than 3rd degree)	*1961*	*14.95%*
Friend	*2054*	*15.66%*
None	*8759*	*66.79%*
Registration During Pandemic		
Freezed Registration	*151*	*1.15%*
Continued Education	*12963*	*98.85%*
Online Education Experience		
Experienced	*3911*	*29.82%*
No Experience	*9203*	*70.18%*

	Frequency	Share
Field of Study		
Social Sciences, Administrative Sciences, Humanities, Language, Theology	*3179*	*24.35%*
Physical Sciences, Life Sciences, Engineering, Space Sciences, Nautical Sciences, Applied Sciences	*4169*	*31.94%*
Educational Sciences	*1272*	*9.74%*
Architecture, Interior Architecture, Fine Arts, Design	*696*	*5.33%*
Medical Related Areas i.e., Pharmacy, Dentistry, Physiotherapy	*830*	*6.36%*
Medical School	*367*	*2.81%*
Law	*341*	*2.61%*
Forestry, Agriculture, Veterinary	*330*	*2.53%*
Conservatory, Music, Performing Arts	*71*	*0.54%*
Vocational School (2-year)	*1714*	*13.13%*
Other	*85*	*0.65%*
Class		
Prep School	*260*	*1.98%*
1st	*3218*	*24.54%*
2nd	*3443*	*26.26%*
3rd	*2656*	*20.25%*
4th	*2822*	*21.52%*
Masters	*518*	*3.95%*
PhD	*196*	*1.49%*
GPA (out of 4)		
<1.5	*612*	*4.67%*
1.5-1.99	*1657*	*12.64%*
2-2.49	*2950*	*22.50%*
2.5-2.99	*3496*	*26.66%*
3-3.49	*2986*	*22.77%*
≤3.5	*1413*	*10.77%*

3. Survey Results, Implications, and Suggestions

3.1. Students' Stance Toward Online Education During the Pandemic

Reported satisfaction levels on online education and evaluation of online education against face-to-face education were given in Figure 1-2. While around 34% of participants reported that they were either "not satisfied at all" or "satisfied very little", 42% of them said they were "satisfied" or "absolutely satisfied". This shows that overall online education experience during the pandemic varied considerably among students.

Moreover, the participants were asked to evaluate online vs face-to-face education according to different indicators related to their education. A dominating majority of participants reported their evaluation in favour of face-to-face education for all education indicators except one. While the share of participants who evaluated online education as "worse" or "way worse" are between 22%-41%, the share of participants who said it is "better" or "way better" varies only between 9%-14%. In addition, all indicators except one show almost a monotonic distribution in favour of face-to-face education, meaning that the percentages of reported evaluation options are increasing as going from "way better" to "way worse". The only indicator that violates the above evaluation trend was "allocating time on hobbies and other businesses". While slightly over 57% of participants evaluated online education as "better" or "way better", 27% of them reported it is "worse" or "way worse".

Figure: 1
Online Education Satisfaction During the Pandemic

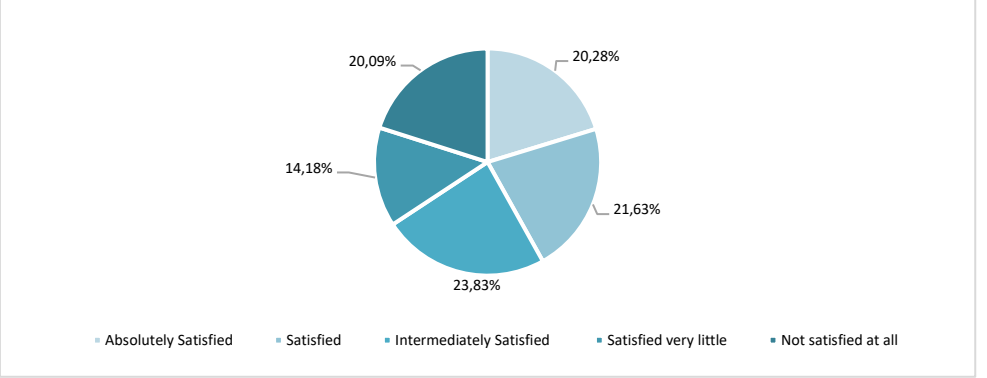
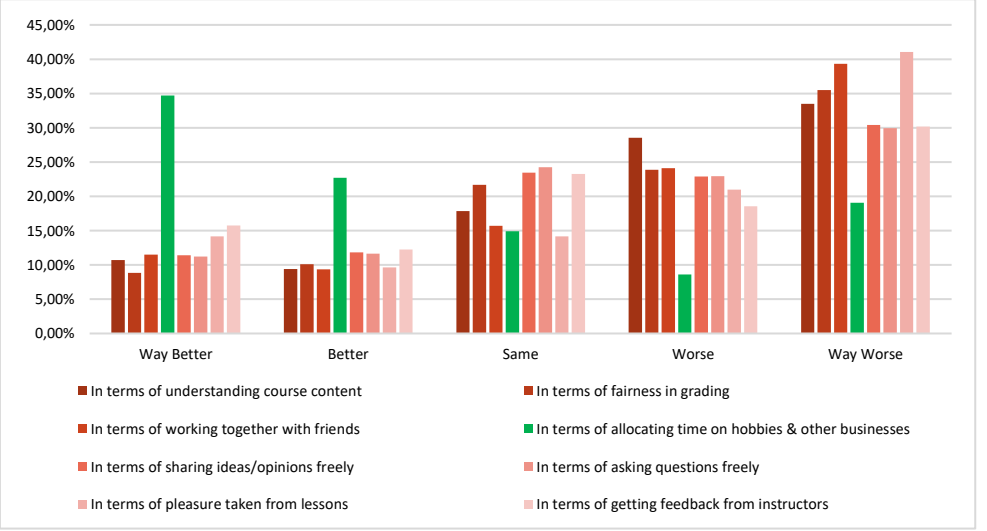


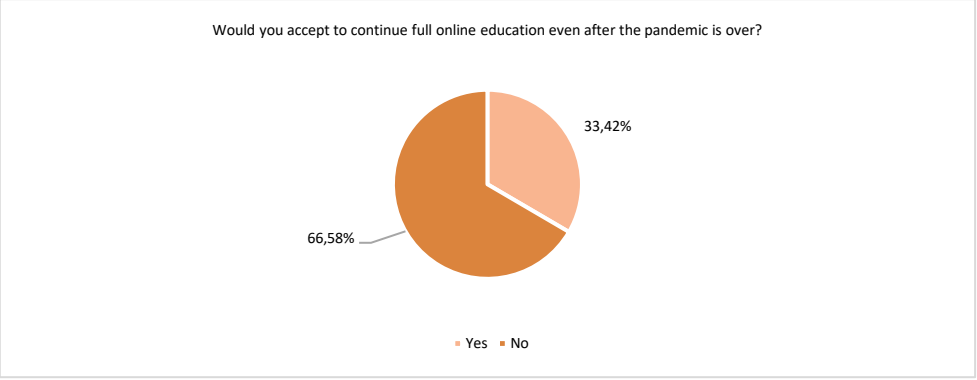
Figure: 2
Evaluation of Online vs Face-to-Face Education

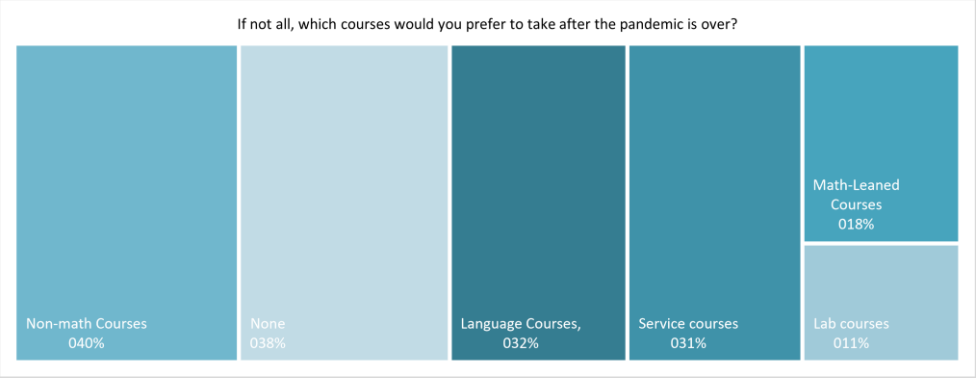


Furthermore, Figure 3 provides with participants anticipated preferences over online education after the pandemic. While slightly over 66% of participants mentioned that they would not accept shifting to full online education even after the pandemic is over, 33% them accepting such a dramatic change in tertiary education shows the potential of online education for some students.

Lastly, the participants were asked about (if not all) which type of courses would they be willing to take online after the pandemic is over. Although not-math courses, language courses, and service courses got the most support towards online education, the share of support still seems relatively low as it varies between 30%-40%. Online education of math-leaned courses and courses that include laboratory applications received the lowest support as about 18% and 11% respectively. Notwithstanding some support toward online education of different courses, 38% of participants reported that they do not want online education at all.

Figure: 3
Anticipated Online Education Preferences After the Pandemic





Overall, participant responses summarized above indicate a negative stance towards online education among higher education students. Where there is not a dominatingly negative stance toward an indicator, there is also not a dominatingly positive one. These results lead to questioning the origins of this negative and varying stance towards online education during the pandemic, which we discuss under the next section.

3.2. Factors Affecting Online Education Satisfaction

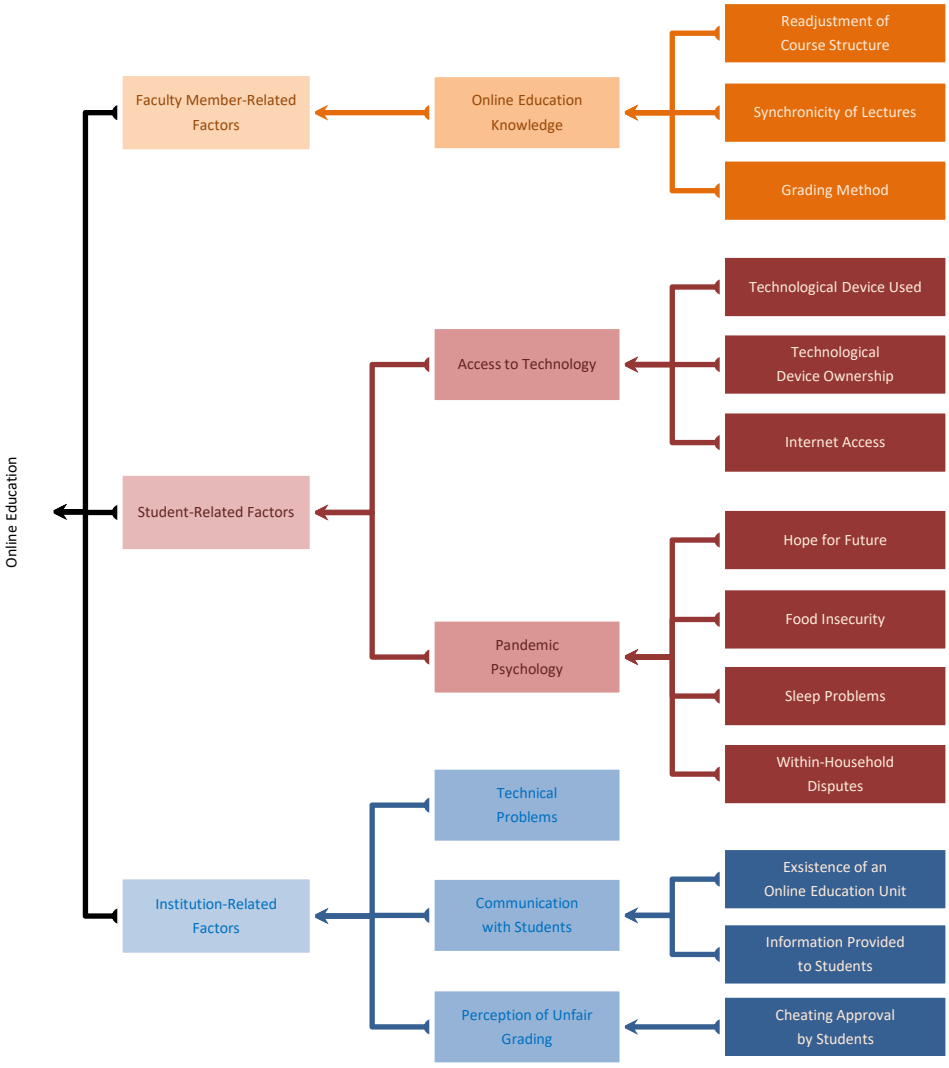
Possible factors affecting online education during the pandemic could be divided into three as student-related, faculty member-related, and institution-related according to which agent the factors are mostly dependent upon. First, student-related factors refer to the factors that are dependent on students` own living situation during the pandemic. As students without proper technological means cannot be included in online education, surveying electronic device types, their ownerships and the extent of Internet access is a prerequisite to investigate the current situation of students. Another student-related factor is the negative changes in psychological well-being due to the pandemic and lockdown applications.

Second, faculty member-related factors refer to their online education knowledge evaluated by students and extracted from their decisions related to the courses they have given during the pandemic. As courses originally structured for face-to-face education often times are not deemed compatible for online education processes, readjustment of course structure during the pandemic is an important decision to make by the faculty members. Moreover, decision over the synchronicity of online lectures is another crucial point when the advantages and shortcomings of the synchronous and asynchronous modes are considered. Lastly, the grading method employed by the faculty members need to be examined since YÖK and university administrations encouraged faculty members to use alternative grading methods such as assignments, presentations, projects, and term papers to avoid possible cheating occurrences in online exams due to lack of proper technological precautions by institutions.

Third, institution-related factors refer to factors that are dependent upon institutional efforts and decision-making processes during the pandemic such as technical problems, communication with students, and the perception of unfair grading due to high prevalence of online exam applications. Note that although these factors have been assigned to different higher education agents, they have been identified through the lenses of students. Thus, we neither claim to have identified *all* problems shouldered by these agents in transition to mass online education, nor reject the existence of some other agents in higher education system such as the technical staff, the administrative staff, YÖK, the government and the judiciary. Rather, we intent to focus on students as the very receiving end of the higher education system and attempt to capture possible factors related to *some* higher education agents through their perspective[3].

[3] *Sometimes relationship between factors and agents are intertwined such as the cases in grading method, perception of unfair grading or synchronicity of lectures since both institutional processes and faculty member decisions might coexist with different weights in taking relevant decisions. In these cases, we attach the factor to the agent according to whom the students most probably hold responsible for the decision made. Notwithstanding, if any of the factors are argued to be dependent on some other agent, it still does not invalidate the existence and importance of the factor.*

Figure: 4
Factors Possibly Affecting Online Education During the Pandemic



3.2.1. Student-Related Factors

3.2.1.1. Access to Technology

As students` access to the technological means is a prerequisite in transition to online education. Table 2 displays access to technology among the sample in mass online education

during the pandemic. A quarter of participants declared that they could only use their cell phones to follow up with online courses, which seems like a great obstacle when one has to watch online lectures or prepare assignments on a phone regardless of how smart it is. Moreover, about 15% of participants needed to ask a family member or a friend for having access to their electronic devices in order to follow up online courses. Although the share seems somewhat acceptable, sharing electronic devices could potentially create problems in case there are more than one people needs to use it at the same time during the pandemic. Lastly, very low share of participants (0.22%) used electronic devices provided by their universities.

It is also worth mentioning that computer prices have been hit hard in Turkey as a computer importing country within the last year. Turkish Lira (TL) has been depreciated against Dollar more than 25% from the beginning of the pandemic in March to November 2020 (TCMB Statistics). According to TurkStat, computer prices have risen about 31% between March and November 2020[4]. Considering that the average monthly income of participants in our sample is around 1500TL and an average laptop is priced around 6000TL, new purchase of computers has been more challenging for university students especially during the pandemic.

Table: 2
Access to Technological Means in Online Education

	Frequency	*Share*
Electronic Device Used for Online Education		
Cell Phone	*3326*	*25.47%*
Computer and/or Tablet	*9733*	*74.53%*
Electronic Device Ownership		
Owned	*11130*	*84.87%*
Belonged to Family or Friend	*1955*	*14.91%*
Belonged to University	*29*	*0.22%*
Internet Quota (Monthly)		
<10GB	*3061*	*23.34%*
10-19,99GB	*1514*	*11.54%*
20-49,99GB	*1120*	*8.54%*
50-99,99GB	*937*	*7.15%*
100≤	*3171*	*24.18%*
Not Aware of	*3311*	*25.25%*

When it comes to access to the Internet, about 44% of participants reported that they had less than 50 GB monthly Internet quota even when Internet access over cell phone providers is accounted for. Considering that a 60 min. high quality video watch requires around 1.5 GB and the average number of courses taken by survey participants is seven, a minimum 42 GB of Internet allowance is required for students to follow up with their courses properly without any Internet usage for other purposes. Although Turkish government took an early action to provide students with 6 GB of free Internet access, it clearly falls short when considering that this allowance is only eligible if the student reaches some course material over a specifically created online system called "YÖK Courses" platform. Thus, Internet access actually seems like another crucial obstacle before an efficient online

[4] *Yearly price change is more tremendous. Computer prices rose about 91% from Nov. 2019 to Nov. 2020.*

education. Moreover, according to Speedtest Global Index (2020), ranking both mobile and fixed broadband speeds from around the world on a monthly basis, Turkey ranks 102nd with a 28.74 Mbps in the fixed broadband, implying that the country performs way below the global average with 87.84 Mbps.

> ***Suggession 1:*** *"Governments should ensure the provision of technological means to students in mass online education since they are responsible of providing equal access to education as a human right to the citizens. This could be done through (i) increasing financial support to students conditional on its usage in technological means or (ii) by providing necessary technological devices in kind to students in need."*
> ***Suggession 2:*** *"Universities should take greater responsibility in providing students with technological means since lack of access to the education they are providing negatively affects their own existence at the first place. Although universities in developing countries like Turkey cannot reach huge funds most the time, they can strive to (i) develop collaboration with the private tech sector, or (ii) pioneer social organizations for an easier redistribution of technological means among their students in specific and throughout the public in general."*
> ***Suggestion 3:*** *"Governments should take further actions to provide students with greater Internet access for free or at a discount. They also need to take immediate action in increasing Internet speed and in expanding coverage even to the remotest areas given that many students are obliged to live in their villages in catastrophic times such as the pandemic. To this end, governments can use regulation and bargaining power over Internet providers since companies would not want to lose privileges in an oligopolistic (and occasionally monopolistic) market with an ever-increasing demand to the Internet after the pandemic."*

3.2.1.2. Pandemic Psychology

Pandemic psychology is thought to be one of the most important factors determining online education motivation and productivity of students. Table 3 presents reported variables related to psychological effect of the pandemic.

A great majority of participants, 62% of them, reported that the pandemic affected their psychological well-being either negatively or very negatively, while only slightly below 8% declared positive psychological effect of the pandemic. When it comes to hope and expectation from the future, only 18% of participants reported that the world would evolve to a better state after the pandemic. Thanks to Turkey being one of the self-sufficient countries around the globe in terms of agriculture, share of participants who worried about food insecurity due to pandemic stayed below 20%.

Approximately 57% of participants reported that they have gained weight during the lockdown period. Some studies (Kivimäki, Singh-Manoux, Shipley & Marmot, 2009)

demonstrated that there is a direct connection from mental disorders to risk of obesity. exist a positive correlation between stress levels and weight gain.

Moreover, slightly over 33% of participants reported that they experienced rise in sleep latency, and 26% of them said that their sleep duration has fallen. As sleep problems are indications of increased anxiety and tension (Plotnik, 2009: 575), these changes in sleep behaviour indicates some potential negative effect of the pandemic psychologically. Moreover, as number of studies (Irwin et al., 1994; Bower, 2002; Plotnik, 2009: 162) show, increased sleep latency and decreased sleep duration are also closely connected to immune system problems, concentration problems and unhappiness, which would most potentially have affected the online education performance of tertiary students during the pandemic. When combined, these indicators show that university students experienced the psychological downside of the pandemic to a great extent.

Table: 3
Indicators of Pandemic Psychology

	Frequency	*Share*		*Frequency*	*Share*
Psychological Effect			***Weight Gain***		
Affected Very Negatively	*4499*	*34.31%*	*Yes*	*7436*	*56.70%*
Affected Negatively	*3668*	*27.97%*	*None*	*5678*	*43.30%*
No Change	*3932*	*29.98%*	***Sleep latency***		
Affectly Very Positively	*624*	*4.76%*	*Decreased a lot*	*1665*	*12.70%*
Affected Very Positively	*391*	*2.98%*	*Decreased*	*1633*	*12.45%*
Hope for Future			*No Change*	*5448*	*41.54%*
World will better than before	*2365*	*18.03%*	*Increased*	*2121*	*16.17%*
World will worse than before	*6350*	*48.42%*	*Increased a lot*	*2247*	*17.13%*
World will be the same	*4399*	*33.54%*	***Sleep duration***		
Feeling of Food Insecurity			*Decreased a lot*	*1559*	*11.89%*
None	*5078*	*38.72%*	*Decreased*	*1839*	*14.02%*
Very Little	*2646*	*20.18%*	*No Change*	*4724*	*36.02%*
Some	*2881*	*21.97%*	*Increased*	*2971*	*22.66%*
Much	*1462*	*11.15%*	*Increased a lot*	*2021*	*15.41%*
Very Much	*1047*	*7.98%*			

As a next step, lockdown dynamics should also be accounted for to understand the psychological well-being of students during the pandemic, because some studies found (Hawryluck et al., 2004; Brooks et al., 2020) that lockdown applications might lead to weakened mental health, stress, and anger. Lockdown applications in major cities and shift to online education led to some temporary internal migration of students within the country. Table 4 summarizes the movement of students during the pandemic. A great majority of participants reported that they stayed at their own/family house during the lockdown, and only slightly less than 5% of participants lived in other places such as jointly rented student houses and dormitories. Also, results indicate that more than 60% of participants moved to a different city while the temporarily moved to a new city. When these two information are combined, it is deemed that most of students who changed city actually decided to live with their families during the lockdown. This, in turn, increased the population of household the participants lived in. Accordingly, 70% of participants reported that they have spent the lockdown period in a household with more than three people.

This leads us to question how number of internal disputes/conflicts within households changed during the lockdown period. About 50% of participants reported that they experienced greater number of household disputes/conflicts, while only around 12% of them reported a decrease. In short, the pandemic seems to have caused movement of students to their family houses that increased household population and in turn disputes/conflicts among household members rose. Thus, even when a student has all the technological means for online education, rise in disputes/conflicts under the same roof could potentially create a psychological obstacle against the learning process.

Table: 4
Lockdown Dynamics

	Frequency	*Share*
Lockdown by Temporary Movement		
Moved to a different city	*8027*	*61.21%*
Stayed in the same city	*5087*	*38.79%*
Moved to a different region	*5240*	*39.96%*
Stayed in the same region	*7874*	*60.04%*
Lockdown by Household Type		
Own or Family House	*12493*	*95.26%*
Relative or Friend House	*66*	*0.50%*
Private Dormitory	*56*	*0.43%*
State Dormitory	*45*	*0.34%*
Student House	*419*	*3.20%*
Other	*35*	*0.27%*
Lockdown by Household Population Lived Together		
1	*393*	*3.00%*
2	*954*	*7.27%*
3	*2625*	*20.02%*
4	*4483*	*34.18%*
5	*2663*	*20.31%*
6	*1174*	*8.95%*
7≤	*822*	*6.27%*
# of Disputes/Conflicts in Household		
Very Increased	*3629*	*27.67%*
Increased	*2894*	*22.07%*
No change	*4918*	*37.50%*
Decreased	*792*	*6.04%*
Very Decreased	*881*	*6.72%*

	Frequency	*Share*
Lockdown by Type of Residential Area Stayed		
Village	*1225*	*9.34%*
Town	*665*	*5.07%*
City Suburb	*2131*	*16.25%*
City Centre	*9093*	*69.34%*
# of Days Gone out during Lockdown		
0	*7021*	*53.54%*
1	*3400*	*25.93%*
2	*1391*	*10.61%*
3	*513*	*3.91%*
4≤	*789*	*6.02%*
Lockdown by Region Stayed		
Marmara	*3865*	*29.47%*
Central Anatolia	*3300*	*25.16%*
Mediterranean Region	*1848*	*14.09%*
Aegean Region	*1814*	*13.83%*
Black Sea Region	*913*	*6.96%*
South-eastern Anatolia	*807*	*6.15%*
Eastern Anatolia	*516*	*3.93%*
Abroad	*51*	*0.39%*
Lockdown by Province Stayed		
İstanbul	*1879*	*14.33%*
Ankara	*1359*	*10.36%*
Bursa	*918*	*7.00%*
İzmir	*860*	*6.56%*
Kayseri	*680*	*5.19%*
Antalya	*438*	*3.34%*
Adana	*423*	*3.23%*
Other provinces	*6506*	*49.61%*
Abroad	*51*	*0.39%*

It is also noteworthy that half the participants spent the lockdown period in the most populous provinces of Turkey and around 70% of participants lived in the city meanwhile. Accordingly, considering higher prevalence of COVID-19 cases in populous places, approximately 90% of participants reported that they only went out at most two days during this period. Thus, students' psychological well-being was thought to be further degraded, which potentially affected their online education performance and motivation negatively.

Suggestion 4: *"Governments and universities should take immediate action to improve the quality and coverage of psychological support among the public and students respectively. Although budget constraints intensified due to the pandemic, governments could still meet the increasing need for psychologic support with*

employing more social workers through short-term contracts and further decide the continuation of employment conditional on the pandemic. Universities, on the other side, should reach out its students, especially the ones who have COVID-19 diagnosis in their families, through establishing units dedicated to psychological support and more effective utilization of them if already exist."

3.2.2. Faculty Member-Related Factors

3.2.2.1. Online Education Knowledge

Recent research (Kalaycıoğlu et al., Forthcoming; Demir et al., 2020) investigating faculty members' online education practices in Turkey during the pandemic reveals that about 79% of the sample studied (n=6364) did not have any previous experience of giving an online course. Moreover, a great chunk of faculty members in Turkey also has a strong opposition to online education practices even after the pandemic is over. While around 30% of faculty members agreed on "not using online education at all unless necessary", 53% of them said, "online education should only be used as a complementary/supporting way". Thus, inexperienced and resistant faculty members seem to have found themselves in a very novel and challenging situation when they were required to give their courses online during the pandemic.

As seen in Table 5, between 54%-60% of participants reported lowest three sufficiency levels for their instructors' online education knowledge, course material shared by the instructor, or the lecture duration to understand the course. This makes the connection between students' increased time devotion to the learning process and the course structures that was not readjusted to online education by inexperienced and/or resistant faculty members.

Table: 5
Participants' Evaluation of Instructors

	Frequency	*Share*
Instructor's online education knowledge		
Not sufficient at all	*2081*	*15.87%*
Sufficient very little	*2377*	*18.13%*
Intermediately sufficient	*3207*	*24.45%*
Sufficient	*2972*	*22.66%*
Absolutely sufficient	*2477*	*18.89%*
Course material shared by instructor		
Not sufficient at all	*1930*	*14.72%*
Sufficient very little	*2205*	*16.81%*
Intermediately sufficient	*2930*	*22.34%*
Sufficient	*3022*	*23.04%*
Absolutely sufficient	*3027*	*23.08%*
Lecture duration to understand the course		
Not sufficient at all	*2512*	*19.16%*
Sufficient very little	*1804*	*13.76%*
Intermediately sufficient	*2766*	*21.09%*
Sufficient	*2759*	*21.04%*
Absolutely sufficient	*3273*	*24.96%*

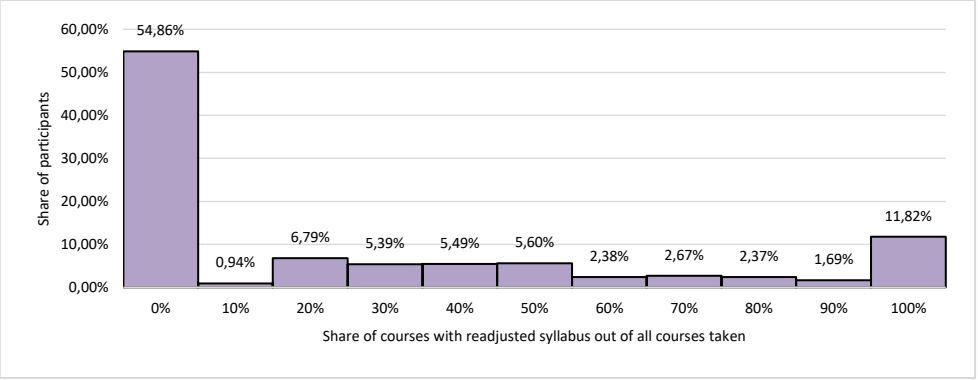
Suggestion 5: *"Universities should dedicate more resources to the education of educators regarding online education as it differs greatly from face-to-face education. They can organize webinars and/or publish guidelines to ensure faculty*

members are aware and knowledgeable of the nature of online education. They can also regulate online education more centrally to make sure education opportunities are accessible to all students and not distorted by faculty members' own choices that are not fitting to online education."

3.2.2.1.1. Readjustment of Course Structure

Course structures that have been designed for face-to-face education were usually directly carried to online education because of the rapid transition in Turkey. While some inexperienced instructors might have thought that any adjustment in content, lecture duration, and grading process would not be needed due to inexperience, others just might have not had time to readjust the course structure given the quick transition. However, since face-to-face and online education differ with respect to communication channels, time devotion, resource intensiveness (Kennedy, 2002), group discussions quality, (Eriksson, Goller & Muchin, 2001; Monk & Newton, 2018), suitability for different demographic and personality profiles (Romero & Usart, 2014), technical requirements, institutional capacity to provide technical supports (Jones, 2005), instructors responsiveness to students (Monk & Newton, 2018; Muramatsu & Wangmo, 2020), exam safety and many more, two modes of education certainly require different approaches to course design. A good online course structure might need to be more student-centred, involve more interactive instruments and require a more pedagogical approach (Erkut, 2020) considering the negative psychological effects of the pandemic.

Figure: 5
Share of Courses with Adjusted Syllabuses After Shift to Online Education
(Figure reads as: Y% of participants had X% of courses with adjusted syllabus)



Accordingly, readjustment of the course syllabus after shifting to online education is a good approximation for capturing if the faculty members considered these differences between online and face-to-face education in course structure. Figure 5 reveals that a dominating share of courses taken by participants did not experience a readjustment in

course syllabuses, which is deemed as forcing a course structure designed for face-to-face education into the online education system without considering possible issues related to the differences between the learning processes in two different concepts. Approximately 55% of participants reported zero readjustment in any of the courses taken. Here, it should be noted that readjustment of course syllabuses by inexperienced instructors who do not possess a comprehensive knowledge of the dynamics of online education might also cause problems and could be considered unappealing by students. For example, incorporation of exhausting number of assignments or a great decrease in topics previously covered might cause feeling of high course burden, discomfort and demotivation in students.

Course structures incompetent to online education might cause obstacles to the learning process of students. Table 6 displays change in time devoted to different sub-categories of the learning process within a course structure. About 42% of participants reported that they spend more time trying to comprehend the course content, which is followed by increased time devotion to doing assignments with a greater share of 53%. Albeit lower than previous two percentages, share of participants who devoted more time studying for exams still represents a great chunk of participants as 32%. It might well be the case that because most course structures did not readjust according to the nature of online education, students experienced difficulties understanding the lectures, which in turn made it difficult to complete assignments and prepare for exams[5].

Table: 6
Participants' Time Devotion to the Learning Process After Shift to Online Education

	Frequency	*Share*
Understanding the course content		
Significantly reduced	*1883*	*14.36%*
Decreased	*2128*	*16.23%*
Not changed	*3574*	*27.25%*
Increased	*2850*	*21.73%*
Significantly increased	*2679*	*20.43%*
Doing assignments		
Significantly decreased	*1414*	*10.78%*
Decreased	*1483*	*11.31%*
Not changed	*3286*	*25.06%*
Increased	*3475*	*26.50%*
Significantly increased	*3456*	*26.35%*
Studying for exams		
Significantly decreased	*2156*	*16.44%*
Decreased	*2810*	*21.43%*
Not changed	*3975*	*30.31%*
Increased	*2510*	*19.14%*
Significantly increased	*1663*	*12.68%*

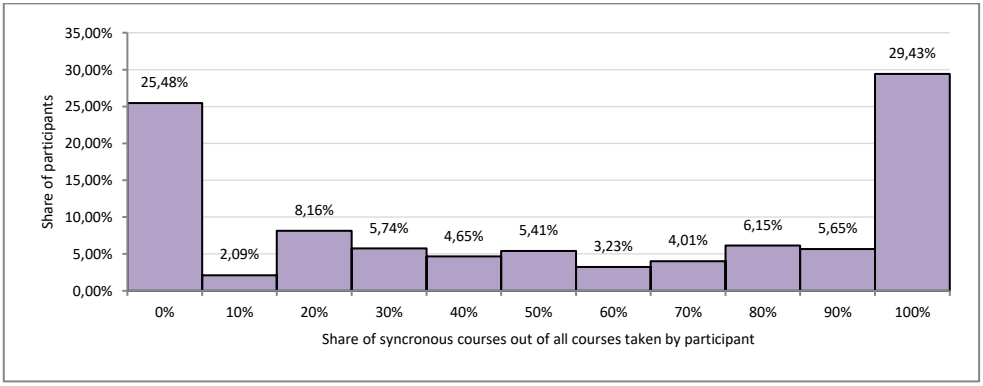
[5] *It might be argued that rise in time devoted to learning is just a reallocation of time saved from not going to campus. However, participants' comments written in response to the open-end question at the end of the survey strongly supports the argument of "course readjustment". Complaints about difficulties regarding understanding course content, information exchange, lecture duration, and assignment intensity far exceeds the positive statements about time saving advantage of online education.*

3.2.2.1.2. Synchronicity of Lectures

The mode of online education during the pandemic, whether it is to be synchronous or asynchronous, is an important decision to be made since both modes have their own advantages and disadvantages. Asynchronous mode is the relatively more flexible one among the two that allows students to adjust the pace of their learning process, maintain a better balance between education and other occupations, and sustain a more evenly distributed student participation in the course (Buxton, 2014; Alexander et al., 2014; Huang & Hsiao, 2012; Hrastinski, 2008). However, it also has some major disadvantages compared to the synchronous mode such as limiting students` critical thinking, existence of lagged communication/feedback, and creating an atmosphere that leads to a sense of loneliness during the learning process (Tunceren et al., 2015; Alexander et al., 2014; Huang & Hsiao, 2012; Chou, 2002; Branon & Essex, 2001). The other alternative, synchronous mode increases the sense of support and togetherness in the learning process due to simultaneous participation of students and the lecturer during online lessons. (Jaggars, 2014; Yamagata-Lynch, 2014; Huang & Hsiao, 2012). In addition, synchronous mode seems more advantageous with respect to providing with faster provision of feedback to students` questions and comments (Martin, Parker & Deale, 2012; Skylar, 2009), and allowing students to receive non-verbal communications signals from the lecturer`s gesticulations and body reactions as a support to their learning processes (Rudd & Rudd, 2014).

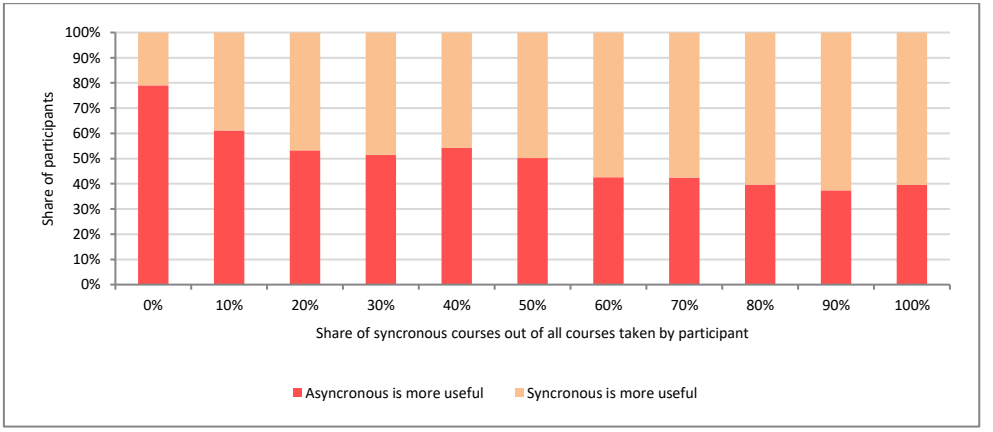
Because the synchronous mode creates a learning atmosphere more resembling to the face-to-face education, it seems more fitting for students in a situation where the transition to online education happened very quickly without any major previous experience. Also, the sense of support and togetherness in the learning process makes the synchronous mode better suited for students who were locked in their houses and minimized their social contact to overcome the psychological side effects of the pandemic.

Figure.6
Exposition to Synchronous Lectures
(Figure reads as: Y% of participants received synchronous courses X% of the times)



First, the share of participants who have received no synchronous lectures at all during the pandemic makes up about a quarter of the whole sample, while the share of participants who were fully exposed to synchronous lectures is about 29% in shown in Figure 6. The remaining 44% of participants had a mixture of synchronous and asynchronous courses. Unequal access to the advantages of the synchronous mode, as well as of the asynchronous mode if viewed from the opposite angle, among these three groups of students seem to a relevant variable that could affect their success in online courses. Figure 7 shows participants' preferences over the two modes of online education categorized by their exposition to synchronous courses. Not very interestingly, as more the students are more exposed to synchronous mode, the more they find the synchronous mode more useful compared to the asynchronous one.

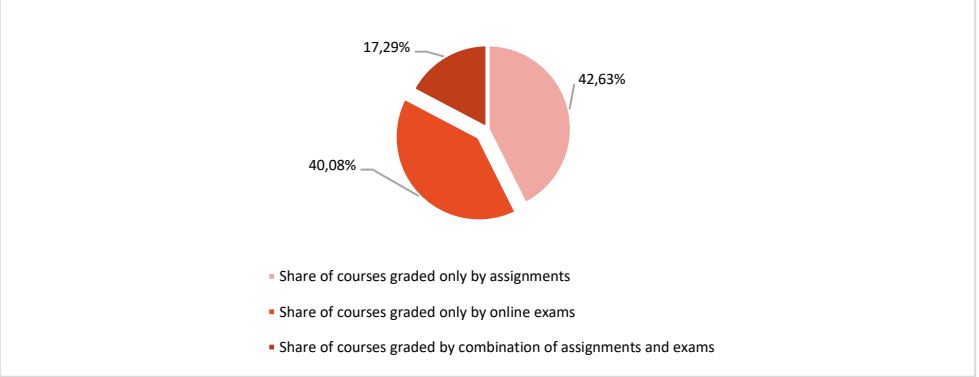
Figure: 7
Participants' Preferences Regarding Synchronicity of Lectures



3.2.2.1.3. Grading Method

Another way to sense faculty members` knowledge in online education is through investigating the grading method they have used in evaluating students` course performance. Organization and execution of online exams was problematic in Turkey during the pandemic due to couple of reasons such as high possibility of cheating among students, institutions` lack of technical/technological capabilities and faculty members` inexperience in designing online exams. Thus, the most appropriate method to evaluate students` course performance was to employ assignments, presentations, and project papers into the grading process whenever possible. Notwithstanding, as shown in Figure 8, share of courses graded only through online examination was as high as 40% on average throughout the sample. Considering that both YÖK and individual Turkish universities encouraged all faculty members to use grading methods different from online exams during the pandemic, the high share of online exam applications also indicates lack of adjustment to online education on the faculty members' side.

Figure: 8
Share of Courses by Grading Method



Suggestion 6: *Faculty members should readjust their course structures according to the nature and requirements of online education. Aspects of readjustment include lecture duration, content intensity, diversification of learning materials and grading procedures fitting to online education. They should also consider employing synchronous mode in online education more often as it creates a more interactive learning atmosphere similar to the face-to-face education. Moreover, faculty members should utilize alternative grading methods since possibility of high cheating prevalence risks properly measuring the students' understanding of the knowledge and skills required by courses.*

3.2.3. Institution-Related Factors

3.2.3.1. Technical Problems

Intensity of the technical problems experienced by students during online education might be regarded as institutions` inability to provide with necessary technical requirements for a proper functioning of education during the pandemic. Although some technical problems might be related to the student/instructor end of online sessions sound and video problems related to own Internet access and quality, many of them are mostly rooted in the server capacity of universities and their own Internet quality.

The share of participants who have experienced problems related to online platform malfunctioning is as high as 45%, which directly indicate technical problems rooted in institutions (Table 7). In addition, the share of participants who have encountered asynchrony between video and sound, and inability to upload assignments/exams are around 25%, which indicate indirect or probable origination of technical problems in institutions` own technical capacity. In comparison, approximately a quarter of participants reported to have had zero technical problems during online education. However, we should note that many of them felt a need to add a comment which says they chose the `*none*` option because their online education was only based on course material uploaded by instructors without

any video lectures. Thus, the real share of participants who reported zero technical problems is thought to have been even lower if they had video lectures as universities without proper technical capacity tend *not* to provide with video lectures. Furthermore, about 49% and 40% of participants reported to have solved technical problems by trial-and-error and by contacting the course instructor respectively, which together indicate a high burden shouldered personally by students and faculty members. In short, problems related to the malfunctioning of the online system, if not all, are deemed as an institutional challenge and could potentially play a role in students` online education satisfaction during the pandemic.

Table: 7
Technical Problems Experienced and Solution Channels

	Frequency	*Share*
Technical problems experienced		
Online platform extreme slowing down, freezing, crushing	*4533*	*44.45%*
Video problems	*2987*	*29.29%*
Sound problems	*2936*	*28.79%*
Asynchrony between video and sound	*2584*	*25.34%*
Internet problems	*3478*	*34.10%*
Inability to upload assignments	*2635*	*25.84%*
Inability to download or open course material	*1870*	*18.34%*
Other	*156*	*1.53%*
None	*2628*	*25.77%*

	Frequency	*Share*
Technical problems solved by		
Trial-and-error	*6471*	*49.34%*
Communicating with the instructor of the course	*5309*	*40.48%*
Getting support from friends	*5051*	*38.52%*
Communicating with own student advisor at the university	*1905*	*14.53%*
Communicating with the relevant unit at the university	*1895*	*14.45%*
Watching videos from YouTube	*1694*	*12.92%*
Checking websites of online platforms	*1542*	*11.76%*
Getting support from family members	*984*	*7.50%*
Communicating the assistant of the course	*737*	*5.62%*
Communicating with other faculty members	*393*	*3.00%*

Suggestion 7: *Universities should improve their technological capability including server capacity, Internet quality, and other services provided via integrated online platforms. Since every step in online education requires technical knowledge in computer engineering and software development, universities should also employ more IT staff for proper implementation and a continued maintenance of online education.*

3.2.3.2. Communication with Students

Since transition to online education during the pandemic happened very suddenly, many university students found themselves unexperienced and unknowledgeable about how to download and use online platforms, register for online courses, join online lessons, and enter online exams. In this situation, universities had greater responsibility of leading students by increased communication. Table 8 provides with insights on how successful universities were in communicating with students based on participant responses.

Although all public universities had a distance education centre in Turkey, only 58% of participants reported that there was not a special unit under their institution dedicated to online education[6]. Moreover, only 14% of participants reported that they contacted and/or

[6] *Around 88% of participants were registered in public universities. As indicated in Appendix-A, YÖK announced on June 4th that all public universities have a distance education centre with the establishment of 20 more during the pandemic. Knowledge on private universities is not available to the authors. However, they are likely to have some specific department overseeing online education during the pandemic given their competitively*

benefitted from the institutional unit dedicated to online education when faced a technical problem (See Table 8). Not knowing an existent institutional unit and thus not benefitting from it indicates an important shortcoming of good communication with students during the pandemic. Complementarily, more than half of participants reported that online education information provided by university was not at a sufficient level. This lack of good communication might be a source why around 62% of participants found their universities not prepared well for online education during the pandemic.

Table: 8
University Communication with Students During Transition to Online Education

	Frequency	*Share*
Existence of a special unit dedicated to online education		
Yes	*7648*	*58.32%*
No	*5466*	*41.68%*
Sufficiency of online education information provided by university		
Not sufficient at all	*1902*	*14.50%*
Sufficient very little	*2163*	*16.49%*
Intermediately sufficient	*2857*	*21.79%*
Sufficient	*2926*	*22.31%*
Absolutely sufficient	*3266*	*24.90%*
Preparedness of university for online education		
Not prepared at all	*2994*	*22.83%*
Prepared very little	*2252*	*17.17%*
Intermediately prepared	*2873*	*21.91%*
Prepared	*2571*	*19.61%*
Absolutely prepared	*2424*	*18.48%*

Suggestion 8: *"Universities should improve communication with students in order to lead them through rapid changes in extraordinary times. Quantity of communication channels should also be broadened by employing a greater variety of tools such as social media and SMSs beside regular emails and website announcements[7]. On the other hand, quality of communication can also be improved by employing a greater variety of tools such as infographics and handy informing videos."*

3.2.3.3. Perception of Unfair Grading

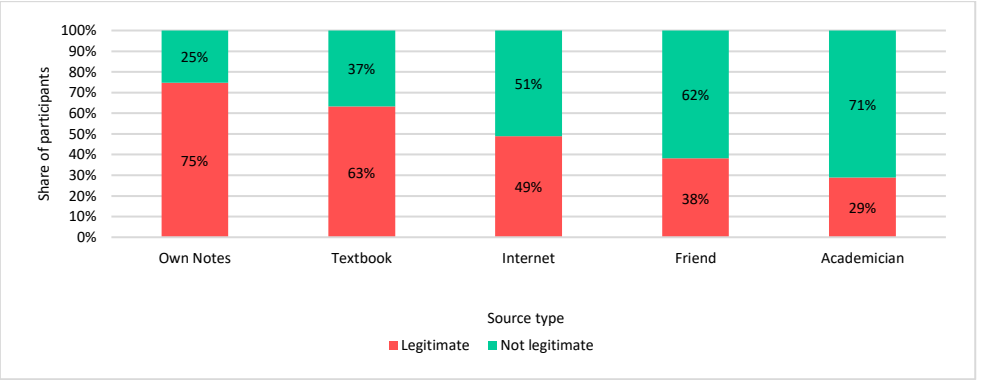
Cheating by students is a very probably case in online exam applications especially in a period where the whole order of life was unfairly changed against students. It might well be the case that university students regarded the rapid transition to online education unfair, given that most of them prefer face-to-face education with respect to different aspects of the educational process as shown previously. In turn, they might use this unfairness perception

dynamic nature to adjust compared to public universities, which are slower and more bureaucratic in decision-making processes.

[7] *Although the share of participants who checked their emails at least every two days increased from 38% to 77% before and after the pandemic respectively, information about online education applications provided by their universities was not at a sufficient level for 62% of participants. This leads to two possibilities. One is that students might just deem regularly continuous administrative emails unimportant. In this case, diversification of communication channels is a good step to hook students` attention. The second possibility is that students actually read administrative emails, but the content is not really informative or not written in way that could be easily followed. In this case, quality of communication becomes important.*

as a personal justification for cheating. Although we cannot exactly pinpoint the existence of cheating in online exams, some indicators suggest high possibility of cheating. As shown in Figure 9, majority of participants confirm the legitimacy of receiving help from textbook or own notes, while share of participants who give approval to benefitting from Internet resources or a friend ranges between 38%-49%. Albeit relatively low compared to other cheating types, the 29% approval rate of help from an academician might make the most crucial point, since it hints the existence of such an inadmissible cheating type[8]. The situation becomes clearer in Figure 10 where participants' evaluation over the success of online exams is examined. The share of participants who evaluate online exams as unsuccessful or completely unsuccessful in assessing the learnt course content is over 56%, while only 21% of participants evaluate online exams as successful or completely successful.

Figure: 9
Legitimacy of Receiving Help from Different Sources During an Online Exam



The relationship might be in both directions from cheating approval to online exam evaluation and vice versa. Cheating students might have assessed online exam as unsuccessful due to their internal knowledge about the existence of cheating. Another possibility is that students who normally do not tend to cheat but have struggled understanding course content due to previously discussed factors might have established justification for cheating, after the exams. Notwithstanding, cheating approval and online exam evaluation together are thought to shape a perception of unfair grading in online education when compared to face-to-face education. Indeed, existence of a perception of unfair grading among participants do seem exist within our sample. Almost 60% of participants reported online education as worse or a lot worse in terms of fair grading, and only around 20% of participants reported to be in favour of online education regarding fair grading.

---

[8] *The question was posed as `Is it appropriate to receive help from people working in the academia during an online exam?`.*

Figure: 10
Participants' Evaluation of Online Exam Success in Measuring Learnt Course Content

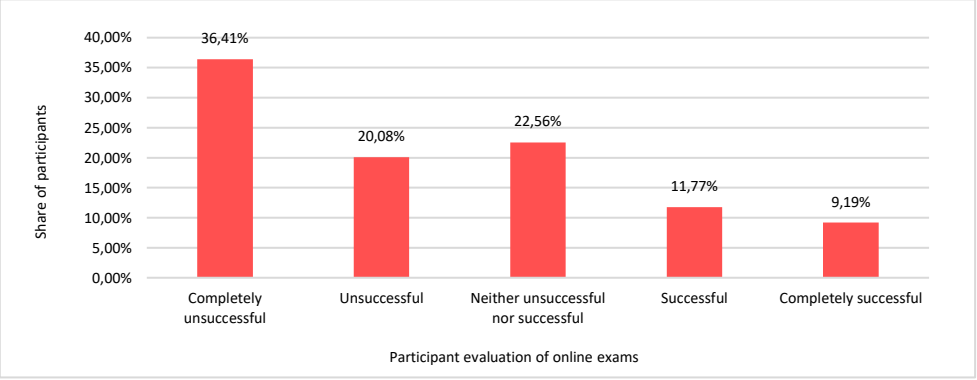
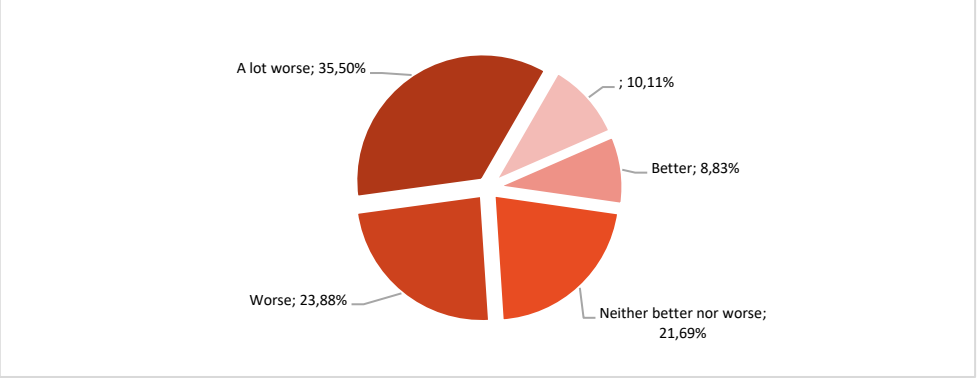


Figure: 11
Perception of Unfair Grading



Suggestion 9: *"Universities should ensure the integrity of online exams in order to prevent perception of unfair grading among students. They could encourage or even enforce faculty members to lean more on assignments, terms papers, and presentations in the grading process. If online exams are inescapable, they could still be organized to prevent cheating such as subjecting different questions to each student and shifting the order of questions using online tools. Otherwise, hard-working students will be subjected to injustice and discouraged in the short run. Its effect in the long run will be more pronounced. Entrance of graduates who have indulged in cheating in online exams will deplete the work force. As a university diploma will less powerfully signal the existence of knowledge and skills, differentiation between skilled and unskilled workers will be harder for employers. This, in turn, will further decrease the returns to higher education."*

4. Conclusion

By utilizing a country-wide representative survey with university students, the present study illustrated the online education experience en masse after the COVID-19 outbreak in Turkish tertiary education. After providing with students' satisfaction of and their preferences over online education, we attempted to identify factors associated with students, faculty members, and institutions that are deemed crucial for the proper functioning and maintenance of online education in universities. For the sake of brevity, multiple regression models related the significance of these factors are provided in Appendix-B. Examination of data and related regression results led to some important policy suggestions for the university administrations and the Turkish government. These policy suggestions also construct an initial framework for other developing country governments to start with implementing measures related to higher education ecosystems during and/or after the pandemic.

In a nutshell, close to 60% of the participants is, at most, intermediately satisfied with the mass tertiary online education implemented in Turkey after the pandemic. Between 49%-64% of them reported to have found online education *worse* or *way* worse than the face-to face education in terms of different educational processes including understanding the course content, sharing ideas freely, getting feedback from instructors and fairness in grading. With respect to online education preferences conditional on the end of the pandemic, support to the continuation of *full* online education by one third of the participants represents potential of the future implementation of the system as a whole. On the contrary, 38% of the participants rejecting to take *none* of the courses online after the pandemic signifies the resistance to even a *partially* online education system. This mix of support to and dissatisfaction from online education leads to the investigation of agent-specific factors that had potential to have affected the mass online education in the Turkish tertiary education during the pandemic.

We have categorized these factors as student-related, faculty member-related, and institution-related based on whose situation and/or whom scope of responsibility best encapsulate the variables associated to the factors. Insufficient access to proper technological means and the negatively affected psychological well-being due to the pandemic have been identified as the student-related factors. Instructors` applications in online courses during the pandemic including readjustment of course structure, synchronicity of lectures, and grading method represent poor online education knowledge on the instructors` side and have been identified as faculty member-related factors. Institution-related factors that could be captured through the lenses of students have been shown as technical problems, unsatisfactory communication with students, and the perception of unfair grading.

Appendix-A
Chronological Transition to Online Education in Turkey during the Pandemic

The Council of Higher Education (YOK) is an autonomous institution governing 207 higher education institutions with close to eight million students in Turkey. Although YOK's decrees are binding, they generally tend to lay principles and frameworks while leaving great room to rectorates and senates of individual higher education institutions for their own educational and administrative decisions. Starting from the pandemic at the beginning of 2020, measures taken by YOK are summarized in Table 9.

Table: 9
Important Events and Corresponding Dates Related to Turkish Higher Education During the Pandemic

Feb. 4th	• YÖK required from universities to take necessary measures to protect staff and students against the pandemic in advance.
Mar. 6th	• YÖK required from universities to establish "Coronavirus Commissions" in order to increase coordination. • YÖK asked universities to revaluate any visit abroad by their students and staff and cancel them if not deemed vital.
Mar. 11th	• First COVID-19 case was identified in Turkey.
Mar. 13th	• YÖK announced that higher education was to be suspended for three weeks starting from March 16 in order to evaluate technical and human resource capacities of universities in case of a possible transition to full online education if the pandemic was to worsen in the upcoming days. • YÖK announced that university staff over the age of 60, disabled staff and disadvantaged staff who has chronic illnesses could take 12 days off. • YÖK moreover asked universities to provide convenience for staff with children in preschool or elementary school to take a paid leave.
Mar. 17th	• YÖK decided to gather all available online education resources from different universities and give public access to them over an online system called "YÖK Courses" in the upcoming days. • YÖK announced that universities are free to choose between implementing synchronous and asynchronous methods and to determine which online platform to use in case of a full transition to online education in the prevailing days.
Mar. 19th	• YÖK decided that the entrance exams in postgraduate programs, regular thesis meetings, and thesis defences could be held online over the Internet.
Mar. 23rd	• Instead, YÖK announced to the transition to full online education as of March 30. • "YÖK Courses" platform was given public access for the usage of academic staff and students in online education.
Mar. 30th	• All universities started full online education.
Apr. 1st	• Considering that some students might not have appropriate digital means for online education in a very short notice, YÖK decided to allow university students to take a leave/freeze registration for the 2020 Spring semester.
Apr. 10th	• Government decided a general lockdown in 31 provinces during weekends, which later on extends to three to four days in the upcoming days[9]. This decision came after previous restrictions limited to the elderly and the children.
Apr. 29th	• YÖK announced that a 6 GB internet allowance was provided to all students by mobile operators run in Turkey for the usage of YÖK Courses platform.
May 5th	• YÖK announced that universities might return to face-to-face education as of June 15 if the pandemic was to be controlled (which was not implemented due to increased number of Covid-19 diagnosis in Turkey at the time)
May 7th	• YÖK asked universities to improve quality and quantity of course materials for students with disabilities in online education.
May 11th	• YÖK announced that no face-to-face exam was to be done during the 2020 Spring semester. Instead, universities were asked to utilize digital space for exams or make use of alternative methods such as homework and/or projects for the evaluation of the courses.
May 30th	• YÖK announced that Turkish students registered in universities abroad are given a one-shot opportunity to transfer into Turkish universities for the upcoming 2020 Fall semester without quota.
Jun. 3rd	• Lockdown was totally lifted including the elderly.

[9] *We refer to the period between the date of first COVID-19 diagnosis and the date of lockdown lift as the "lockdown period" throughout the paper. Although lockdown was only implemented during weekends and sometimes extended to three to four days, there was a clear shift in people's take on the pandemic due to the lockdown decision. For example, survey participants reported that they went out way less frequently during the lockdown period. While they were able to go out during weekdays, almost 80% of participants decided to go out just one day a week or none.*

Jun. 4th	• YÖK announced that the ratio of credits that could be taken from online courses over all credits required by undergraduate and graduate programs was increased from 30% to 40% in an attempt to enhance online education even after the pandemic. • YÖK also announced that all universities in Turkey have currently a "Distance Education Centre" with the establishment of 20 more of them from the beginning of the pandemic.
Jul. 30th	• YÖK published "New Normalization Process in the Wake of Pandemic[10]" as a guide to help for higher education institutions in Turkey to adapt the "new normal". • The guide provided suggestions on different subtopics as "Distance Education Applications", "Applied Education", "Assessment and Evaluation Applications", "Foreign Students", "Meetings", and "Congresses and Exchange Programs".
Aug. 13th	• YÖK required all universities to start 2020 Fall term as of Oct. 1 at the earliest. • While YÖK endorsed universities to continue online education in the upcoming semester, it allowed universities to decide whether to return face-to-face education, implement a mixture of online and face-to-face education, or continue online education over their preferred digital platforms and/ methods.

Sources: <yok.gov.tr>, <covid19.yok.gov.tr>.

Appendix-B
Preliminary Regression Analyses

Although the present paper is designed to provide with general trends and insights by reporting the survey results in a descriptive and illustrative manner, preliminary results of a simple regression analysis based on below specification is given in Table 10. Summary statistics and variable definitions are given in Table 11 and Table 12, respectively. Due to the existence of different scales used for certain variables, the standardized coefficient (Coeff.-Std. in Table 10) should be referred. Briefly, the standardized coefficient should be interpreted as a one standard deviation change in independent variable results in a standard deviation change in dependent variable by the standardized coefficient" (Dodge, 2008).

$$
\begin{aligned}
&Online\ education\ satisfaction_i \\
&= \beta_0 + \left(\sum_{j=1}^{8} \alpha_j\left(Demographic_{i.j}\right)\right) + \left(\sum_{j=1}^{9} \beta_j\left(Student\ related_{i,j}\right)\right) \\
&+ \left(\sum_{j=1}^{8} \gamma_j\left(Faculty\ member\ related_{i,j}\right)\right) \\
&+ \left(\sum_{j=1}^{4} \theta_j\left(Institution\ related_{i,j}\right)\right) + \varepsilon_i
\end{aligned}
$$

$$\varepsilon = iid\ error\ term$$

$$i = Number\ of\ observation$$

$$j = Number\ of\ explanatory\ variable$$

[10] *To reach the guideline: <https://www.yok.gov.tr/Documents/Yayinlar/Yayinlarimiz/2020/kuresel-salginda-yeni-normallesme-sureci-2020.pdf>.*

Table: 10
Regression Results Based On OLS

	Variables	Coeff.	Std. Err.	Coeff.-Std.	t-stat	Sig
	Constant	.563	.066		8.574	.000
Demographic	Gender	.008	.017	.003	.489	.625
	Level of education	.081	.037	.013	2.209	.027
	University type	-.186	.027	-.041	-6.938	.000
	GPA	-.023	.006	-.022	-3.658	.000
	Employment	-.011	.024	-.003	-.464	.643
	Income	.001	.002	.002	0.318	.751
	Lockdown place type	.031	.017	.010	1.812	.070
	Covid-19 diagnosis	.011	.077	0.0007939	0.145	.885
Student-related	Electronic device type	-.020	.019	-.006	-1.027	.304
	Electronic device ownership	-.014	.023	-.004	-.623	.534
	Internet quota	.028	.007	.024	3.791	.000
	COVID psychology	.061	.008	.045	7.222	.000
	Hope for future	.001	.011	.000	.081	.936
	Domestic conflict	-.055	.017	-.019	-3.191	.001
	Sleep latency	-.017	.017	-.006	-1.023	.306
	Sleep duration	-.015	.018	-.005	-.840	.401
	Food insecurity	.017	.006	.016	2.826	.005
Faculty member-related	Instructor online education knowledge	.122	.009	.117	13.167	0.000
	Sufficiency of material shared by instructor	.137	.009	.133	15.859	0.000
	# of readjusted courses	-.011	.004	-.017	-2.948	0.003
	% of readjusted courses	-.023	.018	-.007	-1.291	0.197
	# of synchronous courses	.017	.004	.026	4.423	0.000
	% of synchronous courses	.031	.016	.011	1.963	0.050
	# of courses with only online exam	-.002	.004	-.003	-.403	.687
	% of courses with only online exam	-.072	.024	-.025	-2.963	0.003
Institution-related	Sufficiency of information provided by university	.176	.009	.172	20.066	.000
	Preparedness of university for online education	.444	.009	.450	51.362	.000
	Existence of technical unit in university	.065	.017	.023	3.770	.000
	Perception of unfair grading	-.101	.007	-.093	-14.639	.000

Dependent Variable: Online education satisfaction
N=9310
Adj. R^2: 0.721
Durbin-Watson: 1.974

Table: 11
Summary Statistics

	N	Min.	Max.	Mean		Std. Dev.	Variance	Skewness		Kurtosis	
	Stat.	Stat.	Stat.	Stat.	Std. Er.	Stat.	Stat.	Stat.	Std. Er.	Stat.	Std. Er.
Online education satisfaction	13114	1	5	3.08	.012	1.402	1.967	-.135	.021	-1.226	.043
Gender	12987	0	1	.56	.004	.497	.247	-.238	.021	-1.944	.043
Level of education	13114	0	1	.05	.002	.227	.051	3.928	.021	13.430	.043
University type	13114	0	1	.12	.003	.321	.103	2.384	.021	3.683	.043
GPA	13114	1	6	3.83	.012	1.334	1.779	-.198	.021	-.684	.043
Employment	13114	0	1	.14	.003	.345	.119	2.093	.021	2.380	.043
Income	13114	1	13	4.76	.031	3.579	12.815	.741	.021	-.789	.043
Lockdown place type	13114	0	1	.69	.004	.461	.213	-.839	.021	-1.296	.043
Covid 19 diagnosis	13114	0	1	.01	.001	.102	.010	9.631	.021	90.768	.043
Electronic device type	13058	0	1	.25	.004	.436	.190	1.125	.021	-.735	.043
Electronic device ownership	13114	0	1	.15	.003	.358	.128	1.947	.021	1.789	.043
Internet quota	9803	1	5	4.04	.012	1.212	1.468	-.953	.025	-.314	.049
COVID psychology	13114	1	5	2.14	.009	1.040	1.082	.605	.021	-.175	.043
Hope for future	13114	1	3	1.70	.007	.756	.572	.568	.021	-1.052	.043
Domestic conflict	13114	0	1	.50	.004	.500	.250	.010	.021	-2.000	.043
Sleep latency	13114	0	1	.33	.004	.471	.222	.708	.021	-1.498	.043
Sleep duration	13114	0	1	.26	.004	.438	.192	1.100	.021	-.791	.043
Food insecurity	13114	1	5	2.29	.011	1.298	1.685	.624	.021	-.758	.043
Instructor online education knowledge	13114	1	5	3.11	.012	1.337	1.787	-.118	.021	-1.131	.043
Sufficiency of material shared by instructor	13114	1	5	3.23	.012	1.363	1.858	-.221	.021	-1.154	.043
# of readjusted courses	13114	0	6	1.65	.019	2.212	4.892	.997	.021	-.567	.043
% of readjusted courses	13008	0	10	.27	.004	.428	.184	5.304	.021	83.185	.043
# of synchronous courses	13114	0	5	2.75	.018	2.097	4.399	-.165	.021	-1.670	.043

% of synchronous courses	13114	0	3	.53	.004	.500	.250	-.103	.021	-1.815	.043
# of courses with only online exam	12716	0	10	3.04	.026	2.984	8.905	.640	.022	-.773	.043
% of courses with only online exam	13092	0	10	.46	.005	.555	.308	7.031	.021	104.206	.043
Sufficiency of information provided by university	13114	1	5	3.27	.012	1.376	1.894	-.246	.021	-1.169	.043
Preparedness of university	13114	1	5	2.94	.012	1.420	2.017	.019	.021	-1.292	.043
Existence of technical unit in university	13114	0	1	.58	.004	.493	.243	-.338	.021	-1.886	.043
Perception of unfair grading	13114	1	5	3.67	.011	1.290	1.663	-.643	.021	-.672	.043

Table: 12
Variable Definitions

Variables	Definitions
Online education satisfaction	Completely unsatisfied=1, Unsatisfied=2, Neither unsatisfied nor satisfied=3, Satisfied=4, Completely satisfied=5
Gender	Female=1, Male=0
Level of education	Undergraduate=0, Graduate=1
University type	Private=1, Public=0
GPA	< 1.50=1, 1.50-1.99=2, 2-2.49=3, 2.50-2.99=4 ,3-3.49=5, > 3.50=6)
Employment	Employed=1, Not employed=0
Income	0-250=1, 251-500=2, 501-750=3, 751-1000=4, 1001-1250=5, 1251-1500=6, 1501-1750=7, 1751-2000=8, 2001-3000=9, 3001-4000=10, 4001-6000=11, 6001-10000=12, >10000=13 (Turkish Lira)
Lockdown place type	City centre=1, Out of city centre=0
COVID-19 diagnosis	Diagnosed=1, Not diagnosed=0
Electronic device type	Cell Phone=1, Computer or tablet=0 (Electronic device used for online education)
Electronic device ownership	Belonged to family member, friend or university=1, Belonged to participant=0
Internet quota	0-1.99 GB=1, 2-4.99 GB=2, 5-9.99 GB=3, 10-19.99 GB=4 and more than 20 GB=5 (Monthly)
COVID-19 psychology	Very Negatively=1, Negatively=2, Neither negatively nor positively=3, Positively=4, Very Positively=5 (Psychology was affected by the pandemic…)
Hope for future	Way worse =1, Worse =2, Neither worse not better=3, Better=4, Way better =5 (World will be … than before after the pandemic)
Domestic conflict	Decreased=1, Neither increased nor decreased=2, Increased=3 (Change in conflicts in household after the pandemic)
Sleep latency	Increased=1, Same or decreased=0
Sleep duration	Decreased=1, Same or increased=0
Food insecurity felt	None=1, Little=2, Moderate=3, A lot=4, Overwhelming=5
Instructors' online education knowledge	Completely insufficient=1, Insufficient=2, Neither insufficient nor sufficient=3, Sufficient=4, Completely sufficient=5
Sufficiency of materials shared by instructor	Completely insufficient=1, Insufficient=2, Neither insufficient nor sufficient=3, Sufficient=4, Completely sufficient=5
# of readjusted courses	Number of readjusted courses the participant takes during online education
% of readjusted courses	Share of readjusted courses out of all courses the participant takes during online education
# of synchronous courses	Number of synchronous courses the participant takes during online education
% of synchronous courses	Share of synchronous courses out of all courses the participant takes during online education
# of courses with only online exam	Number of courses graded only by the exam (Not by homework or other methods)
% of courses with only online exam	Share of courses graded only by online exam (Not by homework or other methods) out of all courses taken
Sufficiency of information provided by university	Completely insufficient=1, Insufficient=2, Neither insufficient nor sufficient=3, Sufficient=4, Completely sufficient=5
Preparedness of university for online education	Completely insufficient=1, Insufficient=2, Neither insufficient nor sufficient=3, Sufficient=4, Completely sufficient=5
Existence of technical unit in university	Existent=1, Non-existent=0
Perception of unfair grading	Way better=1, Better=2, Neither better nor worse=3, Worse=4, Way worse=5 (Online education is … than face-to-face education with respect to fair grading)

References

Afşar, B. & B. Büyükdoğan (2020), "Covid-19 pandemisi döneminde İİBF ve SBBF öğrencilerinin uzaktan eğitim hakkındaki değerlendirmeleri", *Karatay Sosyal Araştırmalar Dergisi*, 5, 161-182.

Akbal, H. & H.İ. Akbal (2020), "Investigation of the Problems Related to Distance Education in the Covid-19 Pandemic Process by the AHP Method According to the Student's View", *Bartın University Journal of Faculty of Economics and Administrative Sciences*, 11(22), 533-536.

Aksoğan, M. (2020), "Opinions of Students About Distance Education in the Pandemi Process", *MTU Journal of Engineering and Natural Sciences, Special Issue*, 1-9.

Alexander, M.M. et al. (2014), "Snapshot of a hybrid learning environment", *Quarterly Review of Distance Education*, 15(1), 9-21.

Bower, B. (2002), *Sleepyheads' brains veer from restful path*, <https://www.sciencenews.org/article/sleepyheads-brains-veer-restful-path>, 11.12.2020.

Branon, R.F. & C. Essex (2001), "Synchronous and asynchronous communication tools in distance education", *Techtrends Tech Trends*, 45(1), 36.

Brooks, S.K. et al. (2020), "The psychological impact of quarantine and how to reduce it: rapid review of the evidence", *Lancet*, 395, 912-920.

Buxton, E.C.P. (2014), "Pharmacists' perception of synchronous versus asynchronous distance learning for continuing education programs", *American Journal of Pharmaceutical Education*, 78(1), 1-8.

Chou, C. (2002), "A comparative content analysis of student interaction in synchronous and asynchronous learning networks", *Proceedings of the 35th Annual Hawaii International Conference on System Sciences.*

Dodge, Y. (2008), *The Concise Encyclopedia of Statistics*, Verlag New York: Springer.

Durak, G. & S. Çankaya & S. İzmirli (2020), "Examining the Turkish Universities' Distance Education Systems during the COVID-19 Pandemic", *Necatibey Faculty of Education Electronic Journal of Science and Mathematics Education*, 14(1), 787-809.

Eriksson, T. et al. (2001), "Comparison of Online Communication in Distance Education and in Conventional Education", *Proceedings of the 31st ASEE/IEEE Frontiers in Education Conference*, T2F-20.

Erkut, E. (2020), "Covid-19 sonrası yükseköğretim", *Yükseköğretim Dergisi*, 10(2), 125-133.

Esgice-Gunduz, M. et al. (2020), "Problems, Expectations, and Amendments Regarding Distance Education Legislation in Higher Education Institutions in Turkey", *Turkish Online Journal of Distance Education-TOJDE*, 21(4), 173-194.

Hawryluck, L. et al. (2004), "SARS control and psychological effects of quarantine, Toronto, Canada", *Emerging Infectious Diseases*, 10(7), 1206-1212.

Hrastinski, S. (2008), "Asynchronous and synchronous e-learning: A study of asynchronous and synchronous online methods discovered that each supports different purposes", *Educause Quarterly*, 31(4), 51-55.

Huang, X.S. & E.L. Hsiao (2012), "Synchronous and asynchronous communication in an online environment: Faculty experiences and perceptions", *Quarterly Review of Distance Education*, 13(1), 15-30.

Irwin, M. et al. (1994), "Partial sleep deprivation reduces natural killer cell activity in humans", *Psychosomatic Medicine*, 56, 493-498.

Jaggars, S.S. (2014), "Choosing between online and face-to-face courses: Community college student voices", *American Journal of Distance Education*, 28(1), 27-38.

Jones, T. (2005), "Dual mode academics: A comparison of conventional and distance education experiences", *Turkish Online Journal of Distance Education-TOJDE*, 6(2), 110-114.

Kalaycıoğlu, D.B. et al. (Forthcoming), *Online Higher Education Practices during the COVID-19 Pandemic: The Case of Turkey*.

Demir, Ö. vd. (2020), *İzolasyon Döneminin Türkiye'deki Akademisyenler Üzerindeki Etkileri*, <http://omer-demir.net/wp-content/uploads/2020/07/Proje_Genel_Raporu_23.-07-2020-final.pdf>, 15.12.2020.

Karadağ, E. & C. Yücel (2020), "Distance Education at Universities during the Novel Coronavirus Pandemic: An Analysis of Undergraduate Students' Perceptions", *Yükseköğretim Dergisi*, 10(2), 181-192.

Kennedy, D.M. (2002), "Dimensions of distance: a comparison of classroom education and distance education", *Nurse Education Today*, 22, 409-416.

Keskin, M. & D. Özer-Kaya (2020), "Evaluation of Students' Feedbacks on Web-Based Distance Education in the COVID-19 Process", *İzmir Kâtip Çelebi Üniversitesi Sağlık Bilimleri Fakültesi Dergisi*, 5(2), 59-67.

Kivimäki, M. et al. (2009), "Common mental disorder and obesity: insight from four repeat measures over 19 years: prospective Whitehall II cohort study", *BMJ*, 339, b3765.

Martin, F. et al. (2012), "Examining interactivity in synchronous virtual classrooms", *The International Review of Research in Open and Distributed Learning*, 13(3), 228-261.

Monk, J.M. & G. Newton (2018), "Use of a Scaffolded Case Study Assignment to Enhance Students' Scientific Literacy Skills in Undergraduate Nutritional Science Education: Comparison between Traditional Lecture and Distance Education Course Formats", *International Journal of Higher Education*, 7(2), 95-106.

Muramatsu, K. & S. Wangmo (2020), "Comparison of Traditional and Online Education in Bhutan", *Proceedings of 19th European Conference on e-Learning*, 607-610.

Plotnik, R. (2009), *Psikoloji'ye Giriş*, İstanbul (Türkiye): Kaknüs Yayıncılık.

Romero, M. & M. Usart (2014), "The Temporal Perspective in Higher Education Learners: Comparisons Between Online and Onsite Learning", *European Journal of Open, Distance and e-Learning*, 17(1), 190-209.

Rudd, D.P.II & D.P. Rudd (2014), "The value of video in online instruction", *Journal of Instructional Pedagogies*, 13, 1-7.

Sarıtaş, E. & S. Barutçu (2020), "Digital transformation in education and students' readiness to learn online: A research on Pamukkale University students in the period of pandemic", *Journal of Internet Applications and Management*, 11(1), 5-22.

Skylar, A.A. (2009), "A comparison of asynchronous online textbased lectures and synchronous interactive web conferencing lectures", *Issues in Teacher Education*, 18(2), 69-84.

Speedtest Global Index (2020), <https://www.speedtest.net/global-index>, 05.01.2021.

Tarlakazan, E. & B.E. Tarlakazan (2020), "Covid 19 Distance Education Studies in Turkey during the Pandemic Process: Case of Kastamonu University", *Turkish Studies*, 15(7), 3107-3122.

TCMB Statistics (N/A), *Kurlar-Döviz Kurları (Exchange Rates)*, <https://evds2.tcmb.gov.tr/index.php?/evds/serieMarket/#collapse_2>, 03.12.2020.

TurkStat Statistics (N/A), *Madde Sepeti ve Ortalama Madde Fiyatları (2003 Based Consumer Price Index - Basket and Average Prices), Accessed through 2003 Based Consumer Price Index - Basket and Average Prices*, <https://data.tuik.gov.tr/Kategori/GetKategori?p=enflasyon-ve-fiyat-106&dil=1>, 03.12.2020.

Tüzün, F. & N. Yörük-Toraman (2020), "Covid-19 Sürecinde Uzaktan Eğitim Öğrenci Memnuniyetini Etkileyen Faktörlerin Sek Yöntemi ile Analizi", *Proceedings of the DILET2020 The 3rd International Conference on Distance Learning and Innovative Educational Technologies*, 302-316.

Tüzün, F. & N. Yörük-Toraman (2021), "Pandemi Döneminde Uzaktan Eğitimi Etkileyen Faktörler", *Ömer Halisdemir Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 14(3), 822-845.

Yamagata-Lynch, L.C. (2014), "Blending online asynchronous and synchronous learning", *International Review of Research in Open and Distance Learning*, 15(2), 189-212.

Yılmaz-İnce, E. et al. (2020), "Distance education in higher education in the COVID-19 pandemic process: A case of Isparta Applied Sciences University", *International Journal of Technology in Education and Science*, 4(4), 343-351.

Zan, N. & B.U. Zan (2020), "Education in Emergency at Coronavirus: Overview of Faculty of Letters Students Included to Distance Education System from Different Regions of Turkey", *Turkish Studies*, 15(4), 1367-1394.

Sosyoekonomi

2021, Vol. 29(50), 229-254

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.11
Date Submitted: 12.03.2021
Date Revised: 11.08.2021
Date Accepted: 17.08.2021

The Effect of Anthropomorphic Mascot on The Purchasing Intention of Consumers: An Experimental Study[1]

Kadir DELİGÖZ *(https://orcid.org/0000-0003-3247-9223), Atatürk University, Turkey; kadir.deligoz@atauni.edu.tr*

Sevtap ÜNAL *(https://orcid.org/0000-0002-3227-0756), İzmir Katip Çelebi University, Turkey; sevtap.unal@ikcu.edu.tr*

Tüketicilerin Satın Alma Niyetlerinde Antropomorfik Maskotun Etkisi: Deneysel Bir Çalışma[2]

Abstract

Anthropomorphism, the process of attributing human physical or mental characteristics to living beings, such as plants and animals, and inanimate beings, such as objects, or events, is one of the most effective ways to connect consumers and businesses. Anthropomorphism creates an opportunity for consumers to identify themselves with businesses, products, or services. This study explores the effect of anthropomorphic mascots on the purchasing intention of consumers in an experimental layout. The study, for which data was collected through surveys, was conducted in Erzurum, Turkey. The study results conclude that the anthropomorphic mascot positively affects consumers' purchasing intention towards brands. In addition, brand image, brand value, identity, personality, experience, and engagement towards brands using anthropomorphic mascots positively affect purchasing intent.

Keywords : Animism, Anthropomorphism, Brand, Mascot, Purchasing Intention.

JEL Classification Codes : M30, M31, M37.

Öz

Müşteriler, ürün veya hizmetleri kendileriyle özdeşleştirmek için evrensel bir eğilim içerisindedirler. Bu nedenle insana ait özelliklerin diğer varlıklara atfedilmesi olan antropomorfizm, tüketicilerin işletme, ürün veya hizmetler ile kendisini özdeşleştirmesi için bir fırsat yaratmaktadır. Bu çalışmada, tüketicilerin satın alma niyetlerinde antropomorfik maskotun etkisi deneysel serim şeklinde araştırılmıştır. Verileri anket yoluyla toplanan çalışma Erzurum ili merkez ilçelerinde yapılmıştır. Araştırma sonuçlarına göre tüketicilerin markalara yönelik satın alma niyetlerinde antropomorfik maskotun olumlu etkisi olduğu sonucuna varılmıştır. Ayrıca antropomorfik maskot kullanan markalara yönelik marka imajı, marka değeri, marka kimliği, marka kişiliği, marka deneyimi ve marka ilginliğinin satın alma niyeti üzerinde olumlu etkiye sahip olduğu sonucuna varılmıştır.

---

[1] *This study is derived from the doctoral dissertation of Kadir Deligoz entitled "The effect of anthropomorphic mascot of consumers' purchase intention towards brands: An experimental study", supervised by Sevtap UNAL in Erzurum Ataturk University, Institute of Social Sciences, 21/12/2018. The authors highly appreciate their contribution to the Ataturk University Methodology Office. Also, we would like to thank Assoc.Prof.Dr. Yasemin Taş and Asst.Prof.Dr. Mine Yazıcı.*

[2] *Bu çalışma Kadir Deligöz'ün 21/12/2018 tarihinde Erzurum Atatürk Üniversitesi Sosyal Bilimler Enstitüsü'nde Sevtap ÜNAL danışmanlığında savunulan "Tüketicilerin markalara yönelik satın alma niyetlerinde antropomorfik maskotun etkisi: Deneysel bir çalışma" başlıklı doktora tezine dayanarak hazırlanmıştır.*

Anahtar Sözcükler : Animizm, Antropomorfizm, Marka, Maskot, Satın Alma Niyeti.

1. Introduction

Animism believes that non-human beings have a soul (quoting from Proctor, 2018: 230). The effect this belief creates on humans is defined as anthropomorphism. Anthropomorphism is the process of attributing human physical or mental characteristics to living beings, such as plants and animals, and inanimate beings, such as objects or events. Before anthropomorphism, products, brands, and services were only represented as objective beings and considered abstract beings in the minds of consumers and perceived by them. Through anthropomorphism, brands provide characters that can move, think and feel. Businesses can transfer their emotions, thoughts, and personalities to the consumers through anthropomorphism and be differentiated in this way (Guthrie, 1997: 134).

In post-modern times, consumers demand much more than products or services from businesses. For this reason, from the point of view of businesses, they need to achieve much more than the wishes and needs of the consumers. In this context, using an anthropomorphic brand mascot provides various strategies for businesses to connect with consumers and maintain their existing connections. Using an anthropomorphic brand mascot, the businesses aim to achieve a competitive advantage and maintain the existing competitive power. Today, many global businesses use an anthropomorphic brand mascot.

The concept of anthropomorphism has been receiving a lot of attention in the last decade. In the literature on anthropomorphism and brand anthropomorphism, Delbaere et al. (2011) noted that the product's image in advertising representing a human feature could trigger anthropomorphism and increase brand appreciation (quoted from Aggarwal & McGill, 2012). May and Monga (2014) noted that anthropomorphism tends to cause people to spend time with mental states similar to themselves, reduce consumer patience, and affect consumers' purchasing decisions. In addition to these studies regarding consumers' attribution of human traits to inanimate beings, De Chernatony (1999) studied the relationship between brand identity and celebrity, Park et al. (1986) studied consumer emotions, and Fournier (1998) studied consumer behaviour. Fournier (1998) stated that consumers visualize the products in their minds and form a relationship with them, connect with the brands, leave them and sometimes even distance themselves from them (Hogg, 1998; Lee et al., 2009).

This study tries to determine the effect of the anthropomorphic mascot on the purchasing intents of the consumers towards brands through an experimental study. Experimental layout is mainly the most robust method used to measure the effect of anthropomorphic brand mascots. Therefore, an experimental layout is used in the application section of this study. The study tries to measure using a concrete inanimate being (anthropomorphic brand mascot) on hotel businesses from accommodation management that have abstraction (intangibleness), one of the most important characteristics of service

marketing. In addition, the study tries to determine the effect of brand image, brand value, brand identity, brand personality, brand experience, and brand engagement towards brands using anthropomorphic mascots on purchasing intent. The study examines the effect of using anthropomorphic brand mascots on consumers' brand concepts and purchasing intents. To this end, variables of purchasing intention, brand image, brand value, brand identity, brand personality, brand experience, and brand engagement were included in the study. Within the scope of the study, experiments and surveys were conducted with consumers aged 18 and older living in the provincial centre of Erzurum, one of the central provinces in eastern Turkey.

2. The Concept of Mascot

Mascot means an "object believed to bring luck" in Turkish and comes from the French word "Mascotte." A mascot is all human, animal, and inanimate characters that symbolize products and services (Tek, 2004: 29). In its most general definition, a mascot is a living (human, plant, animal) or inanimate (object) being used by businesses to communicate their products or services to consumers (Garretson & Niedrich, 2004).

The concept of mascot appears in various forms in the literature. For example, commercial character (Kirkpatrick, 1986; Mizerski, 1997; Phillips, 1996; Phillips & Gyoerick, 1999), spokes-character (Callcott & Alvey, 1991; Callcott & Lee, 1995; Peirce & Mcbride, 1999; Stafford et al., 2002; Garredson & Niedrich, 2004; Neeley & Schuman, 2004; Dotz & Husain, 2003), animated character (Auken & Lonial, 1985) and mascot (Tek, 2004; Baglole, 2002; Odabaşı, 2003) use this concept (Halıçınarlı, 2008: 44). The term "mascot" is used in our study to ensure integrity.

There are three types of relationships between the brands and the mascots. The first is the metaphorical relationship where the mascot embodies the brand. For example, Mr. Peanut becomes the peanut character and embodies the brand in the eyes of consumers. The second is the metonomic relationship, where the mascot abstracts the brand. For example, mascots such as the Marlboro Man, which is the mascot of the Marlboro cigarettes, are not embodied but only depicted in pictures.

Moreover, the third is a superficial relationship. In this relationship, the consumer knows the mascot but has difficulty associating it with the brand. Fido Dido (7-Up), Juan Sheet (Bounty), and Nicole Kidman (Channel) are examples of this type of mascot (Brown, 2011).

Mascots, the most important marketing communication tools businesses use to connect with consumers, should be easily recognized. For this reason, the mascot should be identified with the brand, product, or service and have a relationship between them. For example, they are using a traditional and modest mascot while designing a mascot related to a technological product that confuses consumers. A conflict among the brand, product or

service, and mascot triangle can lead to irreparable damages for businesses (John, 1999: 183).

3. The Concept of Anthropomorphism

The term animism is generally used to refer to the attribution of intentional action and a general concept of "life" to objects and natural phenomena. Anthropomorphism is more specifically the attribution of human mental states or affects to non-humans. These two concepts are distinct and, at the same time, strictly connected. We could say that animism is a weaker form of anthropomorphism. However, when humans attribute life to non-humans, they often also attribute human mental and affective states (Airenti, 2018: 2).

Anthropomorphism is the attribution of human physical and mental characteristics to non-human beings or events. It is a phenomenon that many people often encounter in their daily lives (Haigood, 1999: 149). It has been noted that throughout history, people tend to see non-human beings (animals, plants, inanimate beings, or objects) as human beings. Darwin (1872), Feuerbach (1873), Freud (1930), and Hume (1956) studied these tendencies and examined people's tendencies to anthropomorphism, what anthropomorphism represents, and suggested that anthropomorphism affects every aspect of life, from religious belief to marketing practices (Epley et al., 2007: 95).

People usually look for and see human characteristics in natural beings (for example, seeing a human face when looking at the clouds or the mountains). Already when they are 15-month-old, children engage with mothers in reciprocal imitation of pretence actions, and mothers' imitation predicts children's pretending (Markova & Legerstee, 2015: 12). David Hume (1956) suggested that people have a universal tendency to see all beings as themselves throughout history and noted that people try to find faces on the moon, armies in the clouds, and terrible men on the rocks. In addition to human shapes, human emotions are attributed to inanimate beings. For example, they liken the relationship between male and female birds to newlywed couples' flirtation. Sometimes people even consider their stuff, for example, cars or computers, their best friend, name them, react to them when they are angry, or try to convince them (Aggarwal & McGill, 2007: 468).

Researchers noted that highlighting human-like characteristics in products or services is a commonly used technique to increase product or service appreciation (Aaker, 1997; Brown, 2010; DiSalvio & Gemperle, 2003). Anthropomorphic brand mascots relax and assure the consumers before, during, and after purchasing (Shapiro, 2004). As consumers' hesitation about trust affects their purchases, this effect of anthropomorphic brand mascots is highly significant. In infancy, a fundamental feature of anthropomorphism is that two possible roles are attributed to the actors in these interactions. One character may cooperate with or obstacle to the other's supposed goals (Tomasello & Vaish, 2013: 240).

Guthrie (1993) proposed a cognitive and perceptual strategy that claims that the world is like a human being. Accordingly, the world is a living being, and all objects can be

anthropomorphized. The demand for the product can be maximized through anthropomorphism by adding additional characteristics to the already existing characteristics of the product (quoted from Rosch et al., 1976: 382). Anthropomorphism occurs in three ways according to Guthrie (1993): partial anthropomorphism (seeing inanimate beings or events as having some human characteristics, but not as human as a whole), incidental anthropomorphism (incidentally likening inanimate beings or events to humans), and complete anthropomorphism (seeing inanimate beings or events as a natural person in a way that all human characteristics are attributed to).

DiSalvio et al. (2005) stated that anthropomorphism occurs in four different ways. These include structural anthropomorphism (imitating human body, shape, structure, or functioning), signal anthropomorphism (focus on gestures, facial expressions, or hand-arm movements that humans use for communication), characteristic anthropomorphism (imitating human characteristics or functions), and conscious anthropomorphism (imitating human thought, intention, or questioning capacity).

Suggesting that people have anthropomorphic tendencies on products, animals, and mythological beings, Callcott and Lee (1995) stated that this anthropomorphism occurs in four different ways. These include highly anthropomorphized characters (which includes all characteristics of humans), well-anthropomorphized characters (which only includes talks and gestures), less anthropomorphized characters (which have a personality that only allows the consumer to connect to it), and slightly anthropomorphized characters (which only uses a limited set of words).

In addition to the rating by Callcott and Lee (1995), Khogeer (2013) also graded the level of anthropomorphism in a range ranging from low to high. From the highest to the lowest, these include limited words, storytelling, adding facial features such as mouth and nose, adding limbs such as arm and leg, improved posture, applying to clothing, adding personality, increased emotions, human features and being human, which is the highest level. For example, the design of the Michelin human depends on a stack of tires with the addition of limbs and a better posture. However, it has never uttered any word. Nevertheless, it is considered at a higher level than many anthropomorphic mascots using words.

Epley et al. (2007) noted that three motivating elements increase or decrease consumers' anthropomorphization. These are sociality motivation, affecting motivation, and psychological motivation. The sociality motivation is based on the desire to establish socials relations with other people as a human need. If people are deprived of social relations, they tend to anthropomorphize even non-human beings such as robots. This tendency compensates for the lack of social support and feelings of loneliness (Epley et al., 2007: 143).

The effecting motivation is a result of people's desire to understand, predict and control their environment. People often want to avoid uncertainty in their daily lives and continue their lives in a planned manner. The effecting motivation supports

anthropomorphism in this regard. Because people can eliminate the uncertainties around them by giving meaning to inanimate beings. People can easily access everything about inanimate beings or objects and have a sense of control over them. This way, anthropomorphism helps people satisfy their need to predict and control their environment (Gallese & Goldman, 1998; Meltzoff, 2007; Nickerson, 1999).

People use behavioural observations, intuitive inferences, and verbal reports to interpret the information they have acquired throughout their lives. Therefore, people's inferences about inanimate beings and events are not only the result of their actions. When making inferences about humans, plants, animals, and inanimate beings, people observe inanimate beings, make perceptual inferences about inanimate beings, and finally make use of other information about inanimate beings. Psychological motivation includes information about inanimate beings or objects in people's anthropomorphism tendencies (Higgins, 1996). This information consists of observations, intuitive inferences, and other information on the anthropomorphized entity (Epley et al., 2007: 868).

4. Significance and Objective of the Study

Anthropomorphic mascots started finding a place in the literature during the 2000s in Turkey and 1990s abroad. However, anthropomorphic mascots at the level of brands are a reasonably new concept, and the number of brands using anthropomorphic mascots is deficient in Turkey. Nevertheless, the use of anthropomorphic mascots is becoming widespread both in Turkey and abroad. Businesses try to provide significant advantages in the competition that are hard to imitate by developing strategies using anthropomorphic mascots.

When the concept of anthropomorphic mascots is viewed from a theoretical point of view, there are many questions to be answered as the concept is new in the literature. Studies on the con of anthropomorphic mascots have significantly contributed to the literature. However, these contributions are limited to specific groups of products and the general definition of the concept. Therefore, the literature on the subject needs to be supported and enriched.

Anthropomorphism makes each concept add value to the other by containing them within. The study examines consumers' relationship with each concept for brands using anthropomorphic brand mascots and contributes to businesses and literature on this issue.

This study examines the anthropomorphic mascot's effect on the consumers' purchasing intentions regarding hotel management from accommodation services. The most important reason for addressing hotel management is that the concept of abstraction (intangibleness), which is one of the features of service marketing, is embodied by the designed anthropomorphic brand mascot. Thus, the abstract features of the service are embodied.

The majority of the current hotel businesses involved in service marketing do not use anthropomorphic mascots. Supporting hotel management, abstract, with a concrete mascot, will help both subsequent work and practitioners. Thus, we aim to contribute to both practitioners and the literature.

The primary aim of this study is to determine the effect of anthropomorphic mascots on the purchasing intention of consumers aged 18 and older in Erzurum towards the brands. Hotel business and an anthropomorphic mascot were designed for the experimental study. The study has determined sub-goals as well as the main aim. These are to determine the effect of (1) brand image, (2) brand value, (3) brand identity, (4) brand personality, (5) brand experience, and (6) brand engagement in the purchasing intention towards brands using anthropomorphic mascots.

The scope of the study is limited in terms of target audience characteristics and the number of subjects considering the time and cost factors. Therefore, the scope of the study consists of consumers aged 18 and older living in the central district of the Erzurum province, one of the major provinces in eastern Turkey. The study was conducted on hotel services within the scope of service marketing.

4.1. Hypotheses

The aim of the study developed the following hypotheses.

H_1: Anthropomorphic brand mascots positively influence consumer purchasing intent.
H_2: Brand image for brands using anthropomorphic mascots has a positive effect on purchasing intent.
H_3: Brand value for brands using anthropomorphic mascots has a positive effect on purchasing intent.
H_4: Brand identity for brands using anthropomorphic mascots has a positive effect on purchasing intent.
H_5: Brand personality for brands using anthropomorphic mascots has a positive effect on purchasing intent.
H_6: Brand experience for brands using anthropomorphic mascots has a positive effect on purchasing intent.
H_7: Brand engagement for brands using anthropomorphic mascots has a positive effect on purchasing intent.

4.2. Methodology

The quantitative research methods used the experimental method to examine the cause-and-effect relationship between the study variables. The Pretest - Posttest design with the Non-Random Control Group from the experimental research types was applied in the study.

In the pretest and posttest, measurement-based research with a control group, the dependent variable in both groups is subjected to measurement before the experiment. Only the independent variable is added to the experimental group. After a certain period, dependent variables in the experimental group are measured (Gegez, 2010: 159). The dependent variable of our study is the purchasing intention, and the independent variable is the anthropomorphic brand mascot.

The important condition of the pretest is that the control group and the experimental group show similar purchasing intent. As the effect of anthropomorphic mascot on the purchasing intention of consumers towards brands is measured in our study, EG (01) = CG (0) (EG; experimental group - CG; control group). Therefore, a total of EG=50 and CG=50 subject consumers reached EG=30, and CG=30 subject consumers complying with the specified rule participated in the application. In addition, as it is believed that many external factors will affect both groups until the posttest measurement is performed, there was a one-day break between pretest and posttest.

4.3. Data Collection Tools

The data were collected using the face-to-face survey technique. 4 groups of questions were included in the survey form. The questions in the first group were prepared to determine the purchasing intention of the respondents. A 14-item "purchasing intention" scale designed by Chang and Liu (2009) and Ostrom (1969) was used to measure purchasing intentions of the participants. The scale was translated into Turkish by linguists, and the translations of the statements were shown to the experts in the Turkish/English language, and their approval was obtained. As a result of the reliability analysis, it was found that the Cronbach's Alpha value of the control group of the purchasing intention scale was (α) = .715, and the Cronbach's Alpha value for the experimental group was (α) = .733. This value is $\geq$0.7 indicates that the scale's internal consistency is good (DeVellis, 2016; George & Mallery, 2003; Kline, 2000).

The questions in the second group include the fundamental concepts regarding the brand. These questions were prepared to determine the brand images of brands using anthropomorphic mascots, the brand value of brands using anthropomorphic mascots, the brand identity of brands using anthropomorphic mascots, the brand personality of brands using anthropomorphic mascots, the brand experience of brands using anthropomorphic mascots, the brand engagement of brands using anthropomorphic mascots.

To measure brand image, the 11-item "Brand Image Perception" scale of Özüpek and Diker (2013), who adapted the items Aaker (1997) Sung and Kim (2010) used in their studies into Turkish, was used. The Cronbach's alpha value of the brand image was found to be 0.77 in this study.

To measure brand value, different scales consisting of 12 items were used to measure four different dimensions of brand value according to Aaker's (1991) model. The scale

developed by Kim et al. (2003) was used for brand loyalty variables; the scale developed by Baldauf et al. (2003) was used for perceived quality variables; the scale developed by Kim et al. (2003) was used for brand awareness variables; the scale developed by Kim et al. (2003) was used for brand association variables. The scales were translated by expert linguists within the scope of this study, from English to Turkish. The Cronbach's alpha value of the brand value was found to be 0.89 in this study.

The 3-item "Brand Identity" scale designed by Coleman (2011) was used to measure brand identity. Expert linguists translated the scales, and they were translated from English to Turkish. The Cronbach's alpha value of the brand image was found to be 0.83 in this study.

To measure brand experience, the 10-item "Brand Experience" scale designed by Brakus, Schmitt, and Zarantonello (2009) was used. Expert linguists translated the scales from English to Turkish. The Cronbach's alpha value of the brand image was found to be 0.91 in this study.

The 6-item "Brand Engagement" scale designed by Fung So, King, Sparks (2014) was used to measure brand engagement. Expert linguists translated the scales from English to Turkish. The Cronbach's alpha value of the brand image was found to be 0.96 in this study.

The statements in the second group were prepared according to the five-point Likert scale (1: Strongly disagree, 2: Disagree, 3: Neither agree nor disagree, 4: Agree, and 5: Strongly agree).

The questions of the third group measure the brand personality of the brands using anthropomorphic mascots. To measure brand personality, the 24-variable "Brand Personality" scale, which was designed and adapted to Turkey by Aksoy and Özsomer (2007), was used. The statements in the third group were prepared according to the five-point Likert scale (1: Not at all, 2: Partially defines, 3: Moderately defines, 4: Mostly defines, and 5: Totally defines). The Cronbach's alpha value of the brand image was found to be 0.89 in this study.

The questions in the fourth group were designed to determine the demographic characteristics of the respondents, such as gender, age, educational background, professional groups, and income level.

4.4. Sample

To minimize random assignment subject selection internal and external validity threats in the Non-Incidental Control Group Pretest - Posttest application, random assignment (unbiased assignment) subject selection was made in our study, as it is the most appropriate choice. The participants of the study consist of consumers aged 18 and older

living in the central district of the Erzurum province, one of the major provinces in eastern Turkey. Table 1 shows the demographic information about the participants.

Table: 1
Demographic Characteristics of the Participants

		Control Group		Experimental Group	
		Frequency (f)	**Percentage (%)**	**Frequency (f)**	**Percentage (%)**
Sex	Female	12	40	11	36.7
	Male	18	60	19	63.3
Age	18-25	11	36.7	8	26.7
	26-33	11	36.7	12	40
	34-41	7	23.3	10	33.3
	42-49	1	3.3	-	-
Educational Status	Secondary school	3	10	2	6.7
	Associate Degree	6	20	2	6.7
	University	13	43.3	20	66.7
	Master's Degree/Doctorate	8	26.7	6	20
Professional Groups	Student	9	30	9	30
	Office worker	9	30	7	23.3
	Self-employed	1	3.3	1	3.3
	Private Sector Employee	7	23.3	9	30
	Other	4	13.3	4	13.3
Income Level	₺1000 or less	5	16.7	8	26.7
	₺1001-2000	7	23.3	1	3.3
	₺2001-3000	6	20	3	10
	₺3001-4000	6	20	11	36.7
	₺4001-5000	3	10	5	16.7
	₺5001-6000	2	6.7	2	6.7
	₺6001-7000	1	3.3	-	-

By these results, it is seen that the majority of the control group respondents are men and women between the ages of 18-33, who have received a university education and are still studying, primarily students and civil servants with an income of 1001-2000 TL. It is seen that the majority of the experimental group respondents are men and women between the ages of 26-33, who have received a university education and are still studying, primarily students and private sector employees with an income of 3001-4000 TL.

4.4.1. Design of the Anthropomorphic Brand Mascot and the Commercial Film

The study was conducted on hotel businesses which are one of the most important markets of the service industry. The study researchers named the hotel they designed as SIS Hotel, *Sustainable, Intelligent, and Smart*. SIS Hotel is a technological hotel trying to implement the concept of sustainability, where all of the workers are robots. SIS Hotel is a type of hotel that consumes less energy and water, reduces CO_2 emissions, has a positive impact on global climate change, is built with environmentally friendly local and recyclable materials, and shows its investor's social and environmental responsibility.

Due to the principle of abstraction (intangibleness), which is the most important feature of the service industry, a concrete anthropomorphic mascot was designed in this industry. The anthropomorphic brand mascot was designed as a robot to create a technological perception. Shortly, more robots will be involved in our daily lives and will be used everywhere. An important aspect of socially interactive robots is the design of

effective human-robot interaction (HRI) and acceptance. The acceptance of robots by humans is a result of anthropomorphism (Duffy, 2002: 40).

For this reason, in our study, an anthropomorphic brand mascot and SIS Hotel were designed with open-code software "Blender and Maya" programs that enable the modelling (creation) of 3D objects. The mascot was named SISOT (the abbreviation of SIS Hotel) for the anthropomorphic brand mascot to establish an emotional bond with the consumers. Figure 1 shows technological character modelling, and Figure 2 shows the designed anthropomorphic brand mascot.

Figure: 1
Technological Character Modelling Stages

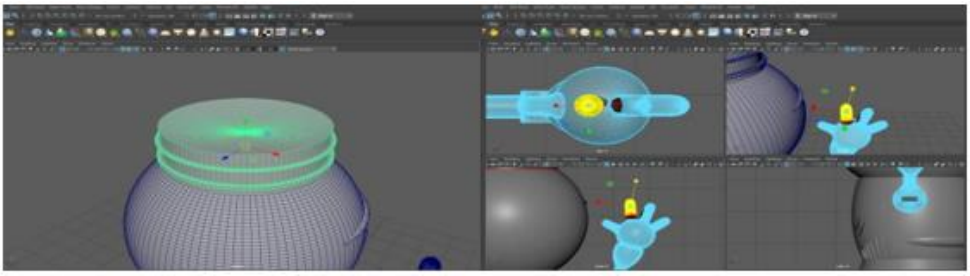
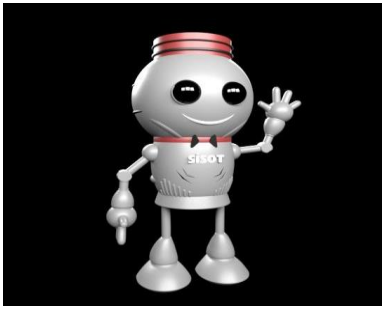


Figure: 2
Designed Anthropomorphic Brand Mascot



A commercial film involving the anthropomorphic brand mascot SISOT and the SIS Hotel, the application's hotel business, was made for the subjects in the experimental group to watch. Figure 3 shows the images of the design of the commercial film, and Figure 4 shows the images from the commercial film.

Figure: 3
Stages of Commercial Film Design

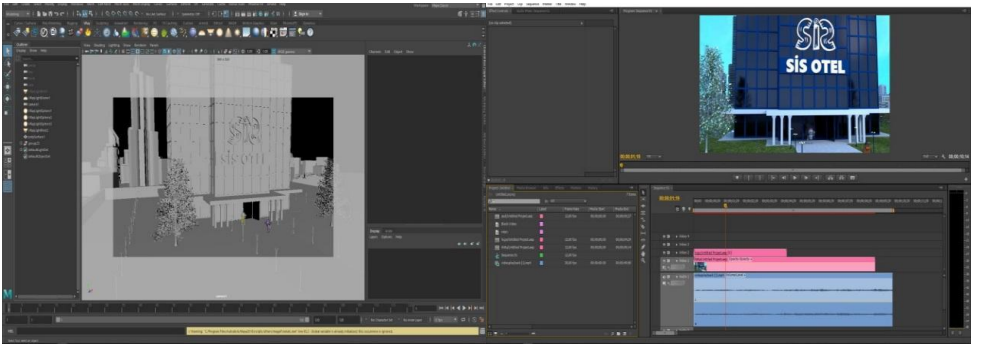


Figure: 4
Images from the Designed Commercial Film

4.4.2. Validity and Reliability in Experimental Research

Within the scope of the internal validity in the study, it is not expected that there will be a change in the mental and psychological state of the participants (maturation effect) by keeping the study short with a total of two sessions. In addition, we tried to eliminate the threats to internal validity by setting the time between two sessions today (past effect), not telling subjects what was being measured (test effect), testing the participants individually (effect of the measuring tool), selecting the participants randomly (error in test units), shortening the duration of the experiment (time effect) and choosing the groups with the same number and quality (subject loss) (Keith & Ben, 1969: 18; Kurtuluş, 2010: 73; Green & Donald, 1978: 89; Kavak, 2017: 124-126; Campbell & Stanley, 1963: 175).

Within the scope of external validity, we tried to experiment on the subject who can represent a more significant population (sample effect), ensured that the subjects were unaware of the experiment (the reactivity effect or the effect of expectations), and conducted a pretest in the study (pretest-experimental variable interaction effect) (Kaptan, 1973: 216-217; Karasar, 2009: 107, Büyüköztürk, 2001: 9). Reliability can be measured indirectly with the idea that research findings can be repeated, and results can be generalized beyond certain

conditions. External validity shows the reliability of the study in a sense (Kavak, 2017: 124). We discussed the theoretical background related to the variables and their causal relationships in a detailed manner within the scope of the structural validity (Hair et al., 2003: 302).

We ensured that the control and experimental groups were equivalent independent variable values before the experiment. We applied a non-random control group pretest and posttest design. In addition, the non-random control group pretest and posttest design is sensitive to selection bias that can occur at the stage of determining control and experimental groups. Subject loss is also a threat element affecting the Karasu non-random control group pretest and posttest design. To prevent this, we gave the anthropomorphic brand mascot (SISOT), which was created with a 3D printer, to the participants to participate in the experiment. Thus, we aimed to increase the motivation of participants to participate in the experiment.

4.4.3. Pre-study and Application of the Experiment

We conducted a pre-study before applying the experimental design. The advantages of the pre-study are increasing the main experiment's sensitivity through matching, determining whether there is a ceiling effect, testing individuals' views before the experiment conditions, and insight into intergroup comparability. In light of the data collected from the pre-study, we formed the final version of the experimental design.

On November 26, 2018, we conducted a pre-study with the control and experimental groups consisting of 15 subjects. We created the final version of the experimental design by the obtained results.

We carried out this study in a field experiment environment under real-life and internal validity conditions with less researcher control. We conducted the study in two separate sessions, as it was a pretest-posttest design with a non-random control group. In the first session of the experiment conducted on November 28, 2018, we asked 60 participants in the control (30 subjects) and experiment (30 subjects) groups to survey questions separately and collect data.

On November 29, 2018, we informed the participants in the experimental group about the hotel business (SIS Hotel) and the anthropomorphic brand mascot (SISOT). We made them watch the commercial film we prepared. We collected data on participants in the experimental group.

4.5. Data Analysis

The collected data were analysed with SPSS.22 program. We used descriptive statistics, regression, and independent samples t-test in the analysis of the data.

4.5.1. Descriptive Statistics of Pretest and Posttest Purchasing Intention Variables

Table 2 shows the mean and standard deviation values of the answers given to the "Purchasing Intention" scale statements directed to the control and experimental groups participants in the first session where the pretest was performed and that session where the posttest was performed.

Table: 2
Descriptive Statistics for Purchasing Intention Variables

	Pretest				Posttest			
	Control Group		Experimental Group		Control Group		Control Group	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Purchasing Intention	3.61	0.46	3.61	0.44	3.61	0.46	4.23	0.71

Participation levels in the statement "... Hotel would be my first choice." which is one of the purchasing intention variables of the control group, are highest with an average of 3.83. "I would recommend ... Hotel to my friends and relatives" is in the second place with an average of 3.80.

Participation levels in the "... Hotel would be my first choice." statement, which is one of the purchasing intention variables of the experimental group, are highest with an average of 4.23. "I would recommend ... Hotel to my friends and relatives" is in the second place.

4.5.2. Descriptive Statistics of Study Variables

Table 3 shows the descriptive statistics of the variables used in the study. The highest average is in the brand engagement variable with 4.46. We can say that the businesses using an anthropomorphic brand mascot try to bridge the consumers by using the brand's features. We can also infer descriptive statistics of study variables that businesses using anthropomorphic brand mascots add a high value to their brands.

Table: 3
Descriptive Statistics for Study Variables

	Mean	Standard Deviation
Brand Image	4.04	0.71
Brand Value	4.15	0.84
Brand Identity	4.32	0.75
Brand Personality	4.21	1.04
Brand Experience	4.36	0.77
Brand Engagement	4.46	0.69

The statement of "SIS Hotel is a cute brand." has the highest value in the brand image scale with an average of 4.60; The statement of "SIS Hotel is remarkable thanks to the SISOT mascot." has the highest value in the brand value scale with an average of 4.50; however, the statement of "SISOT, the anthropomorphic brand mascot of SIS Hotel, is an

important part of the hotel's identity." has the highest value in the brand identity scale with an average of 4.47; "Dynamic" statement has the highest value in the brand personality scale with an average of 4.77; the statement of "SIS Hotel and its mascot grabbed my attention." has the highest value in the brand image scale with an average of 4.63 and the statement of "Anything about SIS Hotel grabs my attention." has the highest value in the brand engagement scale with an average of 4.55.

4.5.3. Differences Between the Purchasing Intention of the Control Group and Experimental Group Respondents in the Pretest and Posttest Stages

In the first session where the pretest was applied, we conducted Independent Samples T-Test to examine whether there was a difference between the purchasing intentions of the respondents in the control group and the purchasing intentions of the respondents in the experimental group and the results obtained are shown in Table 2.4.

Table: 4
Differences Between the Purchasing Intention of the Control Group and Experimental Group Respondents in the Pretest Stage

Variables	Groups	Averages	Standard Deviation	t Value	Significance (2 Way)
Purchasing Intention	Control Group	3.6167	0.46144	0.48	0.962
	Experimental Group	3.6111	0.43623		

As shown in Table 4, there was no significant difference between the purchasing intentions of the control group respondents and the purchasing intentions of the experimental group respondents in the pretest. Purchasing intentions of both groups are very close to each other.

At the end of the application, we conducted independent samples t-test to examine whether there was a significant difference between the purchasing intentions of the respondents in the control group and the experimental group, and the results obtained are shown in Table 5.

Table: 5
Differences Between the Purchasing Intention of the Control Group and Experimental Group Respondents in the Posttest Stage

Variables	Groups	Averages	Standard Deviation	t Value	Significance (2 Way)
Purchasing Intention	Control Group	3.6167	0.46144	-2.976	0.002
	Experimental Group	4.2333	0.71331		

As shown in Table 5, there was a significant difference between the purchasing intentions of the control group respondents and the purchasing intentions of the experimental group respondents measured in the posttest. The averages given by the experimental group respondents to their purchasing intentions are higher than those of the control group. The obtained results show that consumers have a higher purchasing intention towards businesses using anthropomorphic brand mascots.

4.5.4. The Effect of Brand Image on Purchasing Intention towards Brands Using Anthropomorphic Mascots

Simple linear regression analysis was applied to see the effect of brand image on purchasing intention towards brands using anthropomorphic mascots. Table 6 shows the results of the analysis.

Table: 6
Regression Coefficients and Anova Test Results for the Effect of Brand Image on Purchasing Intention towards Brands Using Anthropomorphic Mascots

	R	R^2	Adjusted R^2	Standard Error of Predictions	
	0.702	0.492	0.474	0.5173	
ANOVA Values	**Sum of Squares**	**Degree of Freedom**	**Mean Square**	**F**	**Significance (p)**
Regression	7.262	1	7.262	21.133	.000
Remainders	7.494	28	0.268		
Total	14.756	29			
	Non-Standardized Coefficients		**Standardized Coefficients**	**t value**	**Significance (p)**
	B	**Standard Error**	**Beta**		
Fixed Variate	0.046	0.809		0,057	0,955
Brand Image	1.032	0.198	0,702	5,209	0,000

Table 6 shows the regression coefficients used for the regression equation and their significance levels. Brand image has a statistically significant and positive effect on the purchasing intention towards brands using anthropomorphic mascots ($p < 0.05$). The brand image helped explain 49% of the variance in purchasing intention towards brands using anthropomorphic mascots. Based on this finding, we can say that brand image significantly contributes to the purchasing intention towards brands using anthropomorphic mascots.

4.5.5. The Effect of Brand Value on Purchasing Intention towards Brands Using Anthropomorphic Mascots

Using anthropomorphic mascots, simple linear regression analysis was applied to see the effect of brand value on purchasing intention towards brands. Table 7 shows the results of the analysis.

Table: 7
Regression Coefficients and Anova Test Results for the Effect of Brand Value on Purchasing Intention towards Brands Using Anthropomorphic Mascots

	R	R^2	Adjusted R^2	Standard Error of Predictions	
	0.716	0.513	0.496	0.50657	
ANOVA Values	**Sum of Squares**	**Degree of Freedom**	**Mean Square**	**F**	**Significance (p)**
Regression	7.570	1	7.570	29.501	.000
Remainders	7.185	28	0.257		
Total	14.756	29			
	Non-Standardized Coefficients		**Standardized Coefficients**	**t value**	**Significance (p)**
	B	**Standard Error**	**Beta**		
Fixed Variate	0.301	0.730		0.412	0.683
Brand Value	0.931	0.171	0.716	5.431	0.000

Table 7 shows the regression coefficients used for the regression equation and their significance levels. Brand value (0.716) has a positive effect on the purchasing intention

towards brands using anthropomorphic mascots ($p < 0.05$). Brand value explained 51% of the variance in purchasing intention towards brands using anthropomorphic mascots. Based on this finding, we can say that brand value significantly contributes to the purchasing intention towards brands using anthropomorphic mascots. By these results, "*H_3: Brand value for brands using anthropomorphic mascots has a positive effect on the purchasing intent.*" hypothesis is accepted.

4.5.6. The Effect of Brand Identity on Purchasing Intention towards Brands Using Anthropomorphic Mascots

Simple linear regression analysis was applied to see the effect of brand identity on purchasing intention towards brands using anthropomorphic mascots. Table 8 shows the results of the analysis.

Table: 8
Regression Coefficients and Anova Test Results for the Effect of Brand Identity on Purchasing Intention towards Brands Using Anthropomorphic Mascots

	R	**R^2**	**Adjusted R^2**	**Standard Error of Predictions**	
	0.563	0.317	0.293	0.59986	
ANOVA Values	**Sum of Squares**	**Degree of Freedom**	**Mean Square**	**F**	**Significance (p)**
Regression	4.680	1	4.680	13.007	0.001
Remainders	10.075	28	0.360		
Total	14.756	29			
	Non-Standardized Coefficients		**Standardized Coefficients**	**t value**	**Significance (p)**
	B	**Standard Error**	**Beta**		
Fixed Variate	1.495	0.767		1.948	0.62
Brand Identity	0.624	0.173	0.563	3.607	0.001

Table 8 shows the regression coefficients used for the regression equation and their significance. Brand identity (0.563) affects the purchasing intention towards brands using anthropomorphic mascots (< 0.05). The variance explained by brand identity in purchasing intention for brands using anthropomorphic mascots is 32%. Based on this finding, we can say that brand identity significantly contributes to the purchasing intention towards brands using anthropomorphic mascots. By these results, "*H_4: Brand identity for brands using anthropomorphic mascots has a positive effect on the purchasing intent.*" hypothesis is accepted.

4.5.7. The Effect of Brand Personality on Purchasing Intention towards Brands Using Anthropomorphic Mascots

Simple linear regression analysis was applied to see the effect of brand personality on purchasing intention towards brands using anthropomorphic mascots. Table 9 shows the results of the analysis.

Table: 9
Regression Coefficients and Anova Test Results for the Effect of Brand Personality on Purchasing Intention towards Brands Using Anthropomorphic Mascots

	R	R^2	Adjusted R^2	Standard Error of Predictions	
	0.441	0.194	0.166	0.65160	
ANOVA Values	**Sum of Squares**	**Degree of Freedom**	**Mean Square**	**F**	**Significance (p)**
Regression	2.867	1	2.867	6.753	0.015
Remainders	11.888	28	0.425		
Total	14.756	29			
	Non-Standardized Coefficients		**Standardized Coefficients**	**t value**	**Significance (p)**
	B	**Standard Error**	**Beta**		
Fixed Variate	2.001	0.867		2.308	0.29
Brand Personality	0.530	0.204	0.441	2.599	0.015

Table 9 shows the regression coefficients used for the regression equation and their significance. Brand personality (0.441) has a positive effect on the purchasing intention towards brands using anthropomorphic mascots, and it is significant at ($p < 0.05$) level. Based on this finding, we can say that brand personality significantly contributes to the purchasing intention towards brands using anthropomorphic mascots. The variance explained by brand personality in purchasing intention for brands using anthropomorphic mascots is 19%. By these results, "*H_5: Brand personality for brands using anthropomorphic mascots has a positive effect on the purchasing intent.*" hypothesis is accepted.

4.5.8. The Effect of Brand Experience on Purchasing Intention towards Brands Using Anthropomorphic Mascots

Using anthropomorphic mascots, simple linear regression analysis was applied to see the effect of brand experience on purchasing intention towards brands. Table 10 shows the results of the analysis.

Table: 10
Regression Coefficients and Anova Test Results for the Effect of Brand Experience on Purchasing Intention towards Brands Using Anthropomorphic Mascots

	R	R^2	Adjusted R^2	Standard Error of Predictions	
	0.737	0.544	0.527	0.49036	
ANOVA Values	**Sum of Squares**	**Degree of Freedom**	**Mean Square**	**F**	**Significance (p)**
Regression	8.023	1	8.023	33.364	0.000
Remainders	6.733	28	0.204		
Total	14.756	29			
	Non-Standardized Coefficients		**Standardized Coefficients**	**t value**	**Significance (p)**
	B	**Standard Error**	**Beta**		
Fixed Variate	0.287	0.689		0.416	0.680
Brand Experience	0.905	0.157	0.737	5.776	0.000

Table 10 shows the regression coefficients used for the regression equation and their significance. Brand experience (0.737) has a positive effect on the purchasing intention towards brands using anthropomorphic mascots ($p < 0.05$). Based on this finding, we can say that brand identity significantly contributes to the purchasing intention towards brands using anthropomorphic mascots. The variance explained by brand experience in purchasing intention for brands using anthropomorphic mascots is 54%. By these results, "*H_6: Brand*

experience for brands using anthropomorphic mascots has a positive effect on the purchasing intent." hypothesis is accepted.

4.5.9. The Effect of Brand Engagement on Purchasing Intention towards Brands Using Anthropomorphic Mascots

Simple linear regression analysis was applied to see the effect of brand engagement on purchasing intention towards brands using anthropomorphic mascots. Table 11 shows the results of the analysis.

Table: 11
Regression Coefficients and Anova Test Results for the Effect of Brand Engagement on Purchasing Intention towards Brands Using Anthropomorphic Mascots

	R	**R^2**	**Adjusted R^2**	**Standard Error of Predictions**	
	0.667	0.445	0.425	0.54095	
ANOVA Values	**Sum of Squares**	**Degree of Freedom**	**Mean Square**	**F**	**Significance (p)**
Regression	6.562	1	6.562	22.425	0.000
Remainders	8.193	28	0.293		
Total	14.756	29			
	Non-Standardized Coefficients		**Standardized Coefficients**	**t value**	**Significance (p)**
	B	**Standard Error**	**Beta**		
Fixed Variate	0.881	0.715		1.233	0.228
Brand Engagement	0.753	0.159	0.667	4.736	0.000

Table 11 shows the regression coefficients used for the regression equation and their significance. Brand identity (0.667) has a positive effect on the purchasing intention towards brands using anthropomorphic mascots ($p < 0.05$). Based on this finding, we can say that brand engagement significantly contributes to the purchasing intention towards brands using anthropomorphic mascots. The variance explained by brand engagement in purchasing intention for brands using anthropomorphic mascots is 45%. Following these results, "*H_7: Brand engagement for brands using anthropomorphic mascots has a positive effect on the purchasing intent.*" hypothesis is accepted.

5. Conclusion and Recommendations

In the study, we tested the purchasing intentions of consumers towards brands using an experimental study pattern. The conducted analyses determined that consumers have a higher purchasing intention towards brands using anthropomorphic brand mascots. In addition, we found that all of the brand value, identity, personality, brand experience, and engagement positively predict purchasing intention towards brands using anthropomorphic mascots.

Businesses try to connect with consumers using anthropomorphism in their products or services. This study contributes to the perception of anthropomorphism and brand anthropomorphism both in terms of consumers and businesses. The study discusses numerous ways a business can anthropomorphize its brand and present one of these ways to both businesses and practitioners through experimental design.

In particular, the lack of literature related to anthropomorphism and brand anthropomorphism in Turkey compensates for this absence. Using an experimental study, the study offers advice on creating a compelling and beloved anthropomorphic brand mascot that consumers will love and embrace for many years. In addition, it also helps businesses discover the levels and determinants of anthropomorphic brand mascots that they can use in the future.

With this study, which we carried out by examining anthropomorphism and brand anthropomorphism in detail, progress was made in understanding the concept of brand anthropomorphism by participating in the current thoughts and the debates in the field of marketing and working in the field of application by businesses. As a part of this progress, we present inferences about the use of anthropomorphism by businesses, the design, development, maintenance, and sustainability of the anthropomorphic brand mascot.

The more the brand, which is introduced to the market by the businesses, conveys the personal human characteristics to the consumers, the more successful it is. Conveying personality to consumers benefits increasing brand loyalty and establishing consumer-brand solid relationships. Some of the studies in the literature address the process of anthropomorphism through the products used by consumers. Cars were used in some studies (Aggarwal & McGill, 2007), and mobile phones or personal computers (Landwehr et al., 2011) were used in others. We conducted our study on hotel services, an area of accommodation management in the service industry. The study has filled both the literature absence and the application absence in this field. As a result of the studies, we determined that providing products or services with human-like physical characteristics also leads to positive reactions from consumers.

Finally, a technological anthropomorphic mascot design for sustainable hotel business in service marketing is the right choice for businesses and practitioners. Due to the rapid development of technology, consumers tend to have technological products or services. The anthropomorphic brand mascot, designed as a robot for the experimental study, establishes a relationship between the consumer and the product or service. Consumers remember anthropomorphic brand mascots in their experience.

By obtained the results, the following recommendations can be proposed:

Anthropomorphism plays a vital role in the development of brand mascots and drawing the attention of consumers. It has become the centre of communication marketing applications in today's industries. Businesses establish an emotional connection by developing healthy communication with consumers with anthropomorphic brand mascots. Therefore, brand mascots have developed and continue to develop more than ever with the concept of anthropomorphism.

In today's competitive conditions, businesses can acquire a privileged and memorable position with the connection they will establish with the customer. Therefore, it will be

helpful for businesses to respond to consumers' expectations in their internal world by going beyond their wishes and needs. Businesses will connect with the consumer by reaching the inner world through the anthropomorphic brand mascot that they will design and use. Through this connection, businesses can achieve long-term profitability and competitive advantage. For example, the number of mascots used in hotel management is small, while anthropomorphic mascots are not used. A hotel business using an anthropomorphic mascot to connect with its customers will reach the customer more efficiently. As for customers, the connection with the anthropomorphic brand mascot will make them feel safe and eliminate risk perceptions. In this respect, we can say that the anthropomorphic brand mascot is mutually beneficial for both customers and businesses.

Businesses first need to do R&D work to design an anthropomorphic mascot, as a mistake at the design stage can lead to irreparable results for businesses. For this reason, anthropomorphic brand mascot design is a costly application for businesses and requires significant infrastructure. However, due to the work to be done, the anthropomorphic brand mascot that can establish a relationship with the consumers will take a leading position in the market by gaining a competitive advantage. Today, many businesses increase brand value financially and from a consumer point of view by using an anthropomorphic brand mascot. Therefore, businesses or practitioners should invest in anthropomorphic mascots.

Because of the features of services, primarily abstraction, consumers have higher perceptions of risk than products. To reduce this risk, the abstract service should be embodied in the minds of the consumers. Anthropomorphic mascots are important for the embodiment of abstract services in the minds of the consumers. Anthropomorphic brand mascots reduce the risks perceived by the consumers and positively impact consumer confidence. However, the process of designing an anthropomorphic brand mascot is fairly complex. A failed design can damage the desired message and, thus, the business image. Therefore, businesses desiring to create an anthropomorphic brand mascot should know and professionally apply the determinants and levels of anthropomorphism, as stated in the literature.

Developing a consistent and integrated self-identity in brand management can be considered the first stage in brand structuring. The second point that forms the basis of the brand structuring is the implementation of this self-identity, the axis. This is the main task of brand communication (Uztuğ, 2003: 66). At this point, anthropomorphic brand mascots can be used.

The study determined that all brand image concepts, value, identity, personality, experience, and engagement effectively purchase intention towards brands using anthropomorphic mascots. For this reason, businesses need to consider the basic brand concepts to achieve consumers' purchasing intentions by considering the model as a whole.

Using an anthropomorphic brand mascot is an innovative strategy. Businesses following and successfully implementing this strategy will be able to attract innovative

consumers. For this reason, using an anthropomorphic brand mascot as part of innovation will provide advantages for businesses desiring to maintain their presence in the industry.

Using an anthropomorphic mascot can create an advantage in promotion activities. For example, announcing promotion activities of the businesses with a cute anthropomorphic brand mascot will make it easier to communicate with customers, which, in turn, can provide the businesses with advantages in both cost and competition.

This study examines the effect of using an anthropomorphic mascot on consumers' purchasing intention in hotel services in the field of accommodation management. Addressing different products, brands, or services in further studies can help to enrich the literature on the subject.

The anthropomorphic mascot is addressed as an independent variable in the application stage. Future studies can address the anthropomorphic mascot as a tool or moderator.

One of the main branches of science that anthropomorphism involves is psychology. However, very little study has been done on the psychological aspect of anthropomorphism. Therefore, studies on the psychological study of anthropomorphism can be conducted. In future studies, it is recommended that studies be conducted to determine the purchasing intention between different product groups and demographic characteristics for a larger sample.

As previously stated, the literature on anthropomorphism is relatively new, and many questions need to be answered. For example, the effect of anthropomorphism on factors that affect the consumers' decision-making process can be studied. Thus, significant contributions can be made to both the literature and the application of anthropomorphism. In addition, applied research can be conducted on types of consumer anthropomorphism, and a rating map on anthropomorphic brand mascots used in Turkey can be drawn.

The study has some limitations that should be addressed. This study was conducted only on hotel businesses in Turkey. For this reason, the fact that the obtained results can be generalized for this industry but not for the others is a significant limitation. The data collection method chosen in the study causes limitations known as sample bias or selection tendency. In addition, other limitations include sample size and conduction of the study in one province due to time and cost constraints. Analysis techniques used in this study also constitute a limitation.

References

Aaker, D.A. (1991), *Managing Brand Equity*, San Francisco: Free Press.

Aaker, J.L. (1997), "Dimensions of Brand Personality", *Journal of Marketing Research*, 34, 347-356.

Aggarwal, P. & A.L. McGill (2007), "Is That Car Smiling at Me? Schema Congruity as A Basis for Evaluating Anthropomorphized Products", *Journal of Consumer Research*, 34, 468-479.

Aggarwal, P. & A.L. McGill (2012), "When Brands Seem Human, Do Humans Act Like Brands? Automatic Behavioral Priming Effects of Brand Anthropomorphism", *Journal of Consumer Research*, 39(2), 307-323.

Airenti, G. (2018), "The Development of Anthropomorphism in Interaction: Intersubjectivity", *Imagination, and Theory of Mind. Frontiers in Psychology*, 9, 1-13.

Aksoy, L. & A. Özsomer (2007), "Türkiye'de Marka Kişiliği Oluşturan Boyutlar", *12. Ulusal Pazarlama Kongresi Bildiriler Kitabı*, Sakarya Üniversitesi, 1-14.

Auken, V.S. & S.C. Lonial (1985), "Children's Perceptions of Human Versus Animate Characters: Assessing Implications for Children's Advertising", *Journal of Advertising*, 14 (2), 13-22.

Baglole, J. (2002), "Mascots Are Getting Bigger Role in Corporate Advertising Plans", *Wall Street Journal*, 239(69), 12.

Baldauf, A. et al. (2003), "Performance Consequences of Brand Equity Management: Evidence from Organizations in The Value Chain", *Journal of Product & Brand Management*, 12 (4), 220-236.

Brakus, J.J. et al. (2009), "Brand Experience: What is It? How is It Measured? Does It Affect Loyalty", *Journal Of Marketing*, 73, 52-68.

Brown, S. (2010), "Where the Wild Brands Are: Some Thoughts on Anthropomorphic Marketing", *The Marketing Review*, 10, 209-224.

Brown, S. (2011), "It's Alive Inside! A Note on The Prevalence of Personification", *Irish Marketing Review*, 21(1/2), 3-11.

Büyüköztürk, Ş. (2001), *Deneysel Desenler: Öntest-Sontest, Kontrol Grubu, Desen ve Veri Analizi*, Ankara: Pegem Akademi Yayıncılık.

Callcott, M.F. & P.A. Alvey (1991), "Toons Sell... and sometimes they don't: An advertising spokes-character typology and exploratory study", in: R. Holman (ed.), Proceedings of the 1991, *Conference of The American Academy of Advertising*, 43-52.

Callcott, M.F. & W.-N. Lee (1995), "Establishing the Spokes-Character in Academic Inquiry: Historical Overview and Framework for Definition", *Advances in Consumer Research*, 22, 144-151.

Campbell, D.T. & J.C. Stanley (1963), *Experimental and Quasi-Experimental Designs for Research*, USA: Rand McNally and Company.

Chang, H.-H. & Y.M. Liu (2009), "The Impact of Brand Equity on Brand Preference and Purchase Intentions in The Service Industries", *Service Industries Journal*, 29(12), 1687-1706.

Coleman, D.A. (2011), "Service Brand Identity: Definition, Measurement, Dimensionality and Influence on Brand Performance", *Unpublished Doctoral Dissertation*, Birmingham University.

Darwin, C. (1872), *The Expression of Emotions in Man and Animals*, London: John Murray.

De Chernatony, L. (2010), "Brand Management Through Narrowing the Gap Between Brand Identity and Brand Reputation", *Journal of Marketing Management*, 1 (3), 157-179.

Delbaere, M. et al. (2011), "Personification in Advertising", *Journal of Advertising*, 40(1), 121-130.

DeVellis, R.F. (2016), *Scale Development: Theory and Applications*, USA: Sage Company.

DiSalvio, C. & F. Gemperle (2003), "From Seduction to Fulfillment: The Use of Anthropomorphic Form in Design. Proceedings of the 2003", *New York International Conference on Designing Pleasurable Products and Interfaces*, 67-72.

Dotz, W. & M. Husain (2003), *Meet Mr. Product; The Art of the Advertising Character*, USA: Chronicle Books.

Duffy, B.R. (2002), "Anthropomorphism and Robotics", *Presented at the Symposium on Animating Expressive Characters of Social Interactions*, London: Imperial College.

Epley, N. et al. (2007), "On Seeing Human: A Three-Factor Theory Anthropomorphism", *Psychological Review*, 114(4), 864-886.

Feuerbach, L. (2004), *The Essence of Religion*, Amherst, New York: Prometheus Books, (Original work published 1873).

Fournier, S. (1998), "Consumers and Their Brands: Developing Relationship Theory in Consumer Research", *Journal of Consumer Research*, 24, 343-373.

Fung So, K.K. et al. (2014), "Customer Engagement with Tourism Brands: Scale Development and Validation", *Journal of Hospitality and Tourism Research*, 38(3), 304-329.

Gallese, V. & A.I. Goldman (1998), "Mirror Neurons and The Simulation Theory of Mind-Reading", *Trends in Cognitive Sciences*, 2, 493-501.

Garretson, J.A. & R.W. Niedrich (2004), "Spokes-Characters: Creating Character Trust and Positive Brand Attitudes", *Journal of Advertising*, 33(2), 25-36.

Gegez, E. (2010), *Pazarlama Araştırmaları*, İstanbul: Beta Basım Yayım Dağıtım.

George, D. & P. Mallery (2003), *SPSS for Windows Step by Step: A Simple Guide and Reference 11.0 Update*, Boston: Allyn & Bacon.

Green, P.E. & S.T. Donald (1978), *Research for Marketing Decisions*, Prentice Hall; Revised Edition.

Guthrie, S. (1997), "Anthropomorphism: A Definition and a Theory", in: R.W. Mitchell et al.(eds.), *Anthropomorphism, Anecdotes, and Animals Albany*, New York: State University of New York Press.

Guthrie, S.E. (1993), *Faces in the Clouds: A New Theory of Religion*, New York: Oxford University Press.

Haigood, T.L. (1999), "The Brand Personality Effect: An Empirical Investigation", *American Marketing Association Conference Proceedings*, 10(Winter), 140-149.

Hair, J.F. et al. (2003), *Marketing Research: Within a Changing Information Environment*, USA: McGraw-Hill Irwin.

Halıçınarlı, Ö. (2008), "Marka İletişiminde Ticari Karakterler: "Vadaa" Worldcard ve "Blue Lion"-Post Bank Örnek Olayı", *Yayımlanmamış Yüksek Lisans Tezi*, Eskişehir Anadolu Üniversitesi.

Higgins, E.T. (1996), "Knowledge Activation: Accessibility, Applicability, and Salience", in: E.T. Higgins & A.W. Kruglanski (eds.), *Social psychology: Handbook of basic principles*, New York: Guilford Press.

Hogg, M.K. (1998), "Anti-Constellations: Exploring the Impact of Negation on Consumption", *Journal Marketing Management*, 14, 133-58.

Hume, D. (1956), *The natural history of religion*, Stanford, CA: Stanford University Press, (Original work published 1757).

John, D.R. (1999), "Consumer Socialization of Children a Retrospective Look at Twenty-Five Years of Research", *Journal of Consumer Research*, 26(3), 183-200.

Kaptan, S. (1973), *Bilimsel Araştırma Teknikleri: Tez Hazırlama Yolları*, Ankara: Rehber Yayınevi.

Karasar, N. (2009), *Bilimsel Araştırma Yöntemi*, Ankara: Nobel Yayın.

Kavak, B. (2017), *Pazarlama ve Pazar Araştırmaları: Tasarım ve Analiz (2. Baskı)*, Ankara: Detay Yayıncılık.

Keith, K. & M.E. Ben (1969), *Experimentation for Marketing Decisions*, USA: International Textbook Company.

Khogeer, Y.K. (2013), "Brand Anthropomorphism: The Literary Lives of Marketing Mascots", *Doctoral Dissertation*, Management School, University of Liverpool.

Kim, H. et al. (2003), "The Effect of Consumer-Based Brand Equity on Firms' Financial Performance", *Journal of Consumer Marketing*, 20(4), 335-351.

Kirkpatrick, C.A. (1986), "Trade Characters in Promotion Programs", *The Journal of Marketing*, 17, 360-371.

Kline, P. (2000), *The Handbook of Psychological Testing*, London: Routledge.

Kurtuluş, K. (2010), *Araştırma Yöntemleri*, İstanbul: Türkmen Kitapevi.

Landwehr, J.R. et al. (2011), "It's got the look: The Effect of Friendly and Aggressive 'Facial' Expressions on Product Liking and Sales", *Journal of Marketing*, 75(3), 132-146.

Lee, M.S.W. et al. (2009), "Anti-Consumption and Brand Avoidance", *Journal of Business Research*, 62, 169-180.

Markova, G. & M. Legerstee (2015), "The Role of Maternal Behavior in Children's Pretense During the Second Year of Life", *Cognit. Dev.* 34, 3-15.

May, F. & A. Monga (2014), "When Time Has a Will of Its Own, The Powerless Don't Have the Will to Wait: Anthropomorphism of Time Can Decrease Patience", *Journal of Consumer Research*, 40, 924-942.

Meltzoff, A.N. (2007), "The "Like Me" Framework for Recognizing and Becoming an Intentional Agent", *Acta Psychologica*, 124, 26-43.

Mizerski R. (1997), "The Relationship Between Cartoon Trade Character Recognition and Attitude Toward Product Category in Young Children", *Social Marketing Quaterly*, 59, 58-70.

Neeley S.M. & D.W. Schumann (2004), "Using Animated Spokes-Characters in Advertising to Young Children", *Journal of Advertising*, 33 (3), 7-23.

Nickerson, R.S. (1999), "How We Know and Sometimes Misjudge What Others Know: Imputing One's Own Knowledge to Others", *Psychological Bulletin*, 125, 737-759.

Odabaşı, Y. (2003), *Tüketici Davranışı (2. Basım)*, İstanbul: Mediacat Yayınları.

Ostrom, T.M. (1969), "The Relationship Between the Affective, Behavioral, And Cognitive Components of Attitude", *Journal of Experimental Social Psychology*, 5(1), 10-99.

Özüpek, N.M. & E. Diker (2013), "İletişim Fakültesi Öğrencilerinin Cep Telefonu Markalarına Yönelik İmaj Algısı: Nokia ve Samsung Örneği", *e-Journal of New World Sciences Academy, NWSA -Humanities*, 8(1), 100-120.

Park, C.W. et al. (1986), "Strategic Brand Concept Image Management", *Journal of Marketing*, 50, 135-145.

Peirce, K. & M. Mcbride (1999), "Aunt Jemima Isn't Keeping Up with the Energizer Bunny: Stereotyping of Animated Spokescharacters in Advertising", *Sex Roles a Journal of Research*, 40, 959-968.

Philips, B.J. & B. Gyoeric (1999), "The Cow, The Cook and The Quaker: Fifty Years of Spokes Character Advertising", *Journalism and Mass Communication Quarterly*, 76(4), 713-728.

Phillips, B.J. (1996), "Defining Trade Characters and Their Role in American Popular Culture", *Journal of Popular Culture*, 29(4), 146-153.

Proctor, D. (2018), *Cybernetic Animism: Non-human Personhood and the Internet Digital Existence Ontology, Ethics and Transcendence in Digital Culture (1st edt)*, USA: Taylor & Francis eBooks.

Rosch, E. et al. (1976), "Basic Objects in Natural Categories", *Cognitive Psychology*, 8 (3), 382-439.

Shapiro, L. (2004), *Something from the Oven: Reinventing Dinnerin 1950's America*, New York: Viking Company.

Stafford, R.M. et al. (2013), "A Contingency Approach: The Effects of Spokesperson Type and Service Type on Service Advertising Perceptions", *Journal of Advertising*, 31(2), 17-35.

Tek, Ö.B. (2004), "Bütünleşik Pazarlama İletişiminde ve Markaların Yerleşiminde Maskotların Rolü ve Önemi", *Pazarlama Dünyası Dergisi*, 18(4), 28-32.

Tomasello, M. & A. Vaish (2013), "Origins of human cooperation and morality", *Annu. Rev. Psychol*. 64, 231-255

Uztuğ, F. (2003), *Markan Kadar Konuş! Marka İletişimi Stratejileri*, İstanbul: Mediacat Yayınları.

Sosyoekonomi

2021, Vol. 29(50), 255-276

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.12
Date Submitted: 16.03.2021
Date Revised: 30.09.2021
Date Accepted: 05.10.2021

COVID-19 Pandemisinin İnsan Kaynakları Yönetimi Üzerine Etkilerinin Belirlenmesine Yönelik Bir Araştırma

Selma KILIÇ-KIRILMAZ *(https://orcid.org/0000-0002-8478-1910), Sakarya University of Applied Sciences, Turkey; skirilmaz@subu.edu.tr*

A Research to Determine the Effects of COVID-19 Pandemic on Human Resources Management

Abstract

This research aims to determine the effects of the COVID-19 Pandemic on human resource management practices. Research data were collected from the Human Resources Managers (HRM) of the enterprises using a questionnaire. Within the scope of the research, 240 questionnaires were collected, and the analyses were carried out on these questionnaires. Hypotheses were tested using Chi-Square analysis. As a result of the research, it was found that the COVID-19 Pandemic caused changes in the transition of enterprises to remote or flexible working models, employee procurement and selection, training, performance management, career management, and motivation practices. It is thought that the research results will make an important contribution to both the literature and businesses.

Keywords : Human Resources Management (HRM), COVID-19, Pandemic.

JEL Classification Codes : M12, M54.

Öz

Bu araştırmanın amacı; COVID-19 Pandemisinin insan kaynakları yönetimi uygulamalarına olan etkilerinin belirlenmesidir. Araştırma verileri işletmelerin İnsan Kaynakları Yöneticilerinden (İKY) anket yolu ile toplanmıştır. Araştırma kapsamında 240 adet anket toplanmış ve analizler bu anketler üzerinden gerçekleştirilmiştir. Hipotezler Ki-Kare analizinden yararlanılarak test edilmiştir. Araştırma sonucunda COVID-19 Pandemisinin işletmelerin uzaktan veya esnek çalışma modeline geçmelerinde, çalışan tedarik ve seçiminde, eğitim, performans yönetimi, kariyer yönetimi ve motivasyon uygulamalarında değişikliklere neden olduğu bulunmuştur. Araştırma sonuçlarının hem literatüre hem de işletmelere önemli bir katkı sağlayacağı düşünülmektedir.

Anahtar Sözcükler : İnsan Kaynakları Yönetimi (İKY), COVID-19, Pandemi.

1. Giriş

COVID-19 Pandemisi, Aralık 2019'da Çin'in Hubei bölgesi başkenti Wuhan'da başladıktan kısa bir süre sonra tüm dünyaya yayılmıştır ve 11 Mart 2020'de Dünya Sağlık Örgütü tarafından bu salgın Pandemi olarak ilan edilmiştir (WHO, 2020). COVID-19 Pandemisi tüm toplumu, çalışanları ve işletmeleri derinden etkilemiş, çalışma hayatında önemli değişikliklere neden olmuştur. İşletmeler çalışma koşullarını düzenleyebilmek için temizlik, mesafe ve iş yerlerinin yeniden düzenlenmesi gibi ilave tedbirler almak zorunda kalmışlardır. Hatta pandeminin yoğun olduğu dönemlerde işletmelerin çalışmalarına ara vermeleri gerekmiştir. Ayrıca, birçok işletme uzaktan/evden çalışma ya da esnek çalışma modeline geçmiştir.

Bu araştırma, COVID-19 Pandemisinin insan kaynakları uygulamalarına olan etkilerinin belirlenmesi amacıyla yapılmıştır. Bu amaçla, COVID-19 Pandemisinin insan kaynakları uygulamalarından olan çalışan tedarik ve seçimi, eğitim, ücret, performans değerlendirme sistemi, kariyer gelişimi takibi ve motivasyona olan etkileri ortaya konulmaya çalışılmıştır.

Carnevale ve Hatak (2020), COVID-19 Pandemisinin, İKY için özellikle zorlu bir ortam yarattığını, İKY birimlerinin çalışanların iş çevresinde ve sosyal çevrede meydana gelen radikal değişikliklere uyum sağlamasında ve "bilinmeyen bilinmeyenlere" adapte olmalarında destek olmak zorunda kaldıklarını belirtmiştir. Örneğin, daha önce zamanlarının tamamını veya çoğunu işletmelerinin fiziksel sınırları içinde geçiren çalışanlar, artık uzaktan çalışmak zorunda kalmışlardır. Çalışanların bu yeni çalışma sistemine uyum sağlamasında İKY birimleri önemli bir rol oynamışlardır.

COVID-19 Pandemisi döneminde, işletmelerin yaklaşık üçte biri çalışanlarının bir kısmını işten çıkarmışlar ya da izne yollamışlardır. Benzer şekilde işletmelerin yaklaşık üçte biri COVID-19 krizinin uzun vadeli belirsizliğine karşı bir önlem olarak geçici işçiler çalıştırmışlardır (Campion vd., 2021). Dolayısıyla COVID-19 Pandemisi döneminde işletmelerin çalışan tedarik ve seçim politikalarında değişiklikler yapmaları gerekmiştir. Ayrıca, COVID-19 Pandemisi döneminde çalışanların salgın koşulları ve işin mevcut durumu hakkında bilgilendirme yapılmasında İKY birimleri önemli bir görev üstlenmişlerdir (Dirani vd., 2020: 383). Bu dönemde İKY'nin eğitim işlevi sayesinde çalışanların yeni çalışma koşullarına uyum sağlamalarına destek olunmuştur. COVID-19 Pandemisi döneminde bir başka önemli konu çalışan motivasyonu olmuştur. Provino'ya göre ise (2020), COVID-19 sürecinde iş gücünün büyük bir kısmı artık evde çalıştığından dolayı çalışanların sağlığı İK birimleri için yüksek bir öncelik olmalıdır. Çalışanların ofisten uzakta çalışırken olabildiğince mutlu olmaları sağlanmalıdır. Çünkü çalışan performansı çalışan mutluluğuna ve motivasyonuna bağlıdır. Eğer bu motivasyon ve mutluluk sağlanamazsa yapılan işlerin başarısı risk altına girebilir.

COVID-19 Pandemisinin yukarıda bahsedildiği gibi hem işletmeler hem de çalışanlar üzerinde önemli etkileri olmuştur. Yapılan araştırma ile bu etkiler sistematik bir

şekilde ortaya konulmaya çalışılmıştır. Bu amaçla COVID-19 Pandemisinin İKY uygulamaları üzerinde etkili olduğuna yönelik hipotezler geliştirilmiştir. Araştırma hipotezleri paralelinde bir anket formu oluşturularak İKY sorumluları tarafından doldurulması sağlanmıştır.

Yapılan araştırma sonucunda; işletmelerin çalışan sayıları ile Pandemi sürecinde uzaktan veya esnek çalışma modeline geçmeleri arasında anlamlı ilişki olduğu; işletmelerde Pandemiden önce online iş başvurusu alınması ile Pandemi döneminde online iş başvurusu alınması arasında anlamlı ilişkinin olmadığı; işletmelerde Pandemiden önce online mülakat yapılması ile Pandemi döneminde online mülakat yapılması arasında anlamlı ilişki olduğu; işletmelerde Pandemi sürecinden önce online genel yetenek testleri yapılması ile Pandemi döneminde online genel yetenek testleri yapılması arasında anlamlı ilişki olduğu; işletmelerde Pandemiden önce online kişilik testleri yapılması ile Pandemi dönemi online kişilik testleri yapılması arasında anlamlı ilişki olduğu; Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile eğitim uygulamaları arasında anlamlı ilişki olduğu; Pandemi sürecinin işletmelerinin İKY uygulamalarında değişiklik yapması ile ücret uygulamaları arasında anlamlı ilişki olmadığı; Pandemi döneminde çalışanların ücretlerinde değişiklik olup olmaması ile kısa çalışma ödeneğinden faydalanma arasında anlamlı ilişki olduğu; işletmelerin çalışan sayıları ile Pandemi sürecinde kısa çalışma ödeneğinden faydalanmaları arasında anlamlı ilişki olduğu; Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile performans takip sistemleri arasında anlamlı ilişki olduğu; Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile Pandemi sürecinde çalışanların kariyer gelişimlerinin takip edilmesi arasında anlamlı ilişki olduğu; Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile Pandemi sürecinde çalışanların motivasyon ve memnuniyetini artırıcı faaliyetler yapılması arasında anlamlı ilişki olduğu belirlenmiştir.

Yapılan araştırma ile COVID-19 Pandemisinin İKY uygulamalarına önemli etkilerinin olduğu belirlenmiştir. Bu nedenle araştırma sonuçlarının hem işletmelere hem de literatüre önemli bir katkı sağlayacağı düşünülmektedir.

2. Kavramsal Çerçeve

Çin'in Hubei bölgesi başkenti olan Wuhan'da Aralık 2019'da başlayan COVID-19, önce Avrupa, Kuzey Amerika ve Asya-Pasifik ülkelerine yayılmış daha sonra tüm dünyaya yayılarak bir salgın haline dönüşmüştür (Aslan, 2020: 39). Ardından, 11 Mart 2020'de Dünya Sağlık Örgütü tarafından Pandemi olarak ilan edilmiştir (WHO, 2020). Pandemi ile beraber hayatın akışı ve ritmi tüm dünyada değişmiştir (Bozkurt, 2020: 113). COVID-19 virüsünün hızla yayılmasını kontrol etmek için dünyanın dört bir yanındaki hükümetler sınırların kapatılması, işletmelerin kapatılması (temel hizmetler hariç) dâhil olmak üzere katı kitle kontrol önlemleri almışlardır. Ayrıca, insanların yakın fiziksel temasını kısıtlayan tecrit ve sosyal mesafe kuralları koymuşlardır (Chadee vd. 2021: 1).

Alınan önleyici tedbirler toplumun tamamını etkilemiştir. Ekonomik açıdan da Pandemiyi önleyecek tedbirlerin özellikle işgücü piyasası üzerinde kritik etkileri olmuştur. Ekonomi üzerindeki bu etki, dolaylı olarak sosyolojik ve psikolojik çıktılara da neden olmuştur (Aydın-Göktepe, 2020: 631). Hükümetler bazı endüstrilerin faaliyetlerini kısıtladığı ve işgörenler evlerinden çalıştığı için, pek çok sektör arzla ilgili sorunlarla karşı karşıya kalmıştır. İşletmelerin gerekli sağlık koruma önlemlerinin uygulanması, azaltılmış üretim ve talep, tedarik zinciri kesintileri dahil olmak üzere bir dizi zorlukla mücadele etmesi gerekmiştir (Kraus vd., 2020: 1068).

İnsan kaynakları yönetimi, işletmelerin hedeflerine ulaşmak için yüksek düzeyde kararlı ve nitelikli bir işgücünün etkin istihdamı ve geliştirilmesine yönelik stratejik bir yaklaşımdır (Hecklaua vd., 2016: 2). İnsan kaynakları yönetimi uygulamaları, niteliği yüksek çalışanların iş yerine kazandırılması ve bu çalışanların işletme amaçları doğrultusunda etkin bir şekilde yönlendirilmesini sağlayarak, işletmelere önemli rekabet avantajları kazandırmaktadır (Erdil vd., 2004: 102). İnsan kaynakları fonksiyonları arasında; çalışan tedarik ve seçimi, eğitim ve geliştirme, ücret yönetimi, performans değerlendirme, kariyer yönetimi, çalışan motivasyon ve memnuniyetini sağlamak sayılabilir.

COVID-19 Pandemisi ile birlikte işletmelerin İKY birimlerinin önemi artmıştır. Bunun nedeni tüm işletmelerin bu COVID-19 Pandemisinden etkilenmesi ile birlikte çalışanlar ile işletme yöneticileri arasındaki tüm koordinasyonu yürütmek durumunda kalmış olmalarıdır. Ayrıca İKY birimleri değişen iş koşullarını düzenlemek ve çalışanların bu koşullarına adapte olmasını sağlamak durumunda kalmıştır. İşletmelerin birçok mevcut uygulamayı terk edip yenilerine yöneldikleri COVID-19 Pandemisi ortamında, bu dönüşümün yansıdığı yönetim uygulamaları alanlarından biri de tüm süreçlerin koordinasyonundaki merkezi rolü nedeniyle insan kaynakları yönetimi olmuştur (İlhan, 2020: 294).

COVID-19 Pandemisi, sağlık ve güvenlik sorunlarını merkeze taşımıştır ve uluslararası işgücünün sağlık ve güvenliğini yönetmede İKY'nin rolünü ortaya koymuştur (Caligiuri vd., 2020: 700). COVID-19 Pandemisinden hemen sonra çalışanlar ve yöneticiler yaşamış oldukları belirsizlik ve virüs tehdidi nedeniyle panik ve korku hissetmişlerdir. Bu panik ve korku hissi atlatıldıktan sonra yöneticiler ve insan kaynakları yöneticileri çok kısa bir süre içinde pek çok karar vermek zorunda kalmışlardır. Bunlar arasında; kimlerin işte kalacağı ve kimlerin eve gitmesi gerektiği, çalışanların dijital alana nasıl ve nerede taşınabileceği, önceliklerin neler olduğu ve bu önceliklerin çalışanlara en iyi şekilde nasıl iletilebileceği sayılabilir (Caligiuri vd., 2020: 697).

COVID-19 Pandemisi, İKY için özellikle zorlu bir ortam yaratmıştır. Yöneticiler, çalışanların iş çevresinde ve sosyal çevrede meydana gelen radikal değişikliklere uyum sağlamasına ve bunlarla başa çıkmasına yardımcı olmak için çabalarken "bilinmeyen bilinmeyenlere" hızlı bir şekilde adapte olmak zorunda kalmışlardır. Örneğin, daha önce zamanlarının tamamını veya çoğunu işletmelerinin fiziksel sınırları içinde geçiren çalışanlar, artık uzaktan çalışma ortamlarına hızla uyum sağlamak zorunda kalmışlardır (Carnevale &

Hatak, 2020: 183). Bu nedenle COVID-19 Pandemisi gibi bir kriz sırasında İKY'nin rolü kritik hale gelmektedir. Kriz durumlarında İKY, çalışanların sağlık ve organizasyonel ihtiyaçlarını karşılamaya çalışır. Diğer bir İKY rolü ise, çalışanlar ve liderler arasında bir bağlantı kurmaktır. Liderlerin kriz anında çalışanları dinlemeleri ve onlara psikolojik güçlendirme desteği sağlamaları gerekir. Bu noktada İK, çalışanların işle ilgili endişelerinin dile getirilmesi ve liderlere çözümler önerilmesinde önemli bir rol oynamaktadır. Ayrıca, çalışanların güncel tutulması ve işin mevcut durumu hakkında bilgilendirme yapılmasında İKY'nin önemli bir görevi bulunmaktadır (Dirani vd., 2020: 383).

COVID-19 Pandemisi döneminde, işletmelerin yaklaşık üçte biri çalışanlarının bir kısmını işten çıkarmışlar ya da izne yollamışlardır. Ayrıca, işletmelerin neredeyse yarısı işe alımları durdurmuştur. Ancak, işletmelerin yarısı çalışan seçme ve tedarik işlemlerini belli bir düzeyde sürdürmüştür. Bununla birlikte, COVID-19 Pandemisi işletmelerin üçte birinin resmi iş tanımlarında veya işe alma stratejilerinde de değişikliklere neden olmuştur. Son olarak, işletmelerin yaklaşık üçte biri, COVID-19 krizinin uzun vadeli belirsizliğine karşı bir önlem olarak geçici işçilerden faydalanmıştır (Campion vd., 2021: 5).

İşletmeler, COVID-19 Pandemisiyle birlikte, çalışanlarını farklı bölgelerde teknik, fiziksel ve sosyo-ekonomik olarak daha önce eşi görülmemiş bir zorlukla yönetme sorunu ile karşı karşıya kalmışlardır (Carnevale & Hatak, 2020: 183). COVID-19 Pandemisi, zaten sağlık riskinden dolayı stres altında olan birçok kişiyi evden çalışmak zorunda bırakmıştır. Bu stres faktörü ile birlikte birçok yöneticinin, bu dönemde ilk kez uzaktan çalışan ekiplere liderlik etmesi gerekmiştir (Caligiuri vd., 2020: 698). COVID-19 krizinin neden olduğu değişiklikler nedeniyle bazı çalışanların yaşadığı artan stres göz önüne alındığında, işletmelerin %60'ında çalışan yardım programları güncellenmiş veya teşvik edilmiş ve işletmelerin %40'ında daha fazla ruh sağlığı ve zindelik hizmetleri sunulmuştur. Neredeyse hiçbir işletme çalışanlara yardıma verdiği önemi azaltmamıştır (Campion vd., 2021: 5).

Provino'ya göre (2020: 31), COVID-19 sürecinde iş gücünün büyük bir kısmı artık evde çalıştığından dolayı, çalışanların sağlığı İKY departmanları için yüksek bir öncelik olmalıdır. Çalışanların ofisten uzakta çalışırken olabildiğince mutlu olmaları sağlanmalıdır. Çünkü çalışan performansı çalışan mutluluğuna ve motivasyonuna bağlıdır. Eğer bu motivasyon ve mutluluk sağlanamazsa yapılan işlerin başarısı risk altına girebilir. COVID-19 sürecinde, uzaktan çalışma, yalnız yaşayan ve sosyal etkileşim ihtiyacını daha çok ofiste karşılayanları olumsuz etkileyebilir. İK yöneticileri bu çalışanların motivasyon kaybını önlemek için yeni projelere veya öğrenme etkinliklerine ihtiyaç duyulabileceğini bilmelidir. İş gücünün büyük bir bölümü artık uzaktan çalışıyor olduğundan, çalışanların sağlığı her yerde İKY departmanları için yüksek bir öncelik olmalıdır. Her şey insanları ofisten uzakta çalışırken olabildiğince mutlu tutmakla ilgilidir (Jones, 2020: 39).

COVID-19 Pandemisi sürecinde çalışanların yaşadığı bir başka ve önemli sorun iş ve aile arasındaki çatışma potansiyelinin her zamankinden çok daha fazla olmasıdır. Özellikle uzaktan çalışmaya alışkın olmayanlar için uzaktan çalışmayı sürdürme sorunlarına ek olarak artan çocuk bakımı, aile ve arkadaşların sağlığı ve güvenliği konusundaki endişelerle de başa

çıkmak gerekmektedir. Bu nedenle iş ve aile arasındaki sınırları korumak çalışanlar için her zamankinden çok daha zor bir duruma gelmiştir (Carnevale & Hatak, 2020: 184). Dolayısıyla İKY birimlerinin olası çatışmaların çözümüne yönelik etkili stratejiler geliştirmesi gerekmektedir.

COVID-19 Pandemisinin üzerinden yaklaşık bir yıllık kısa bir süre geçmiş olmasına rağmen bu konu ile ilgili bir çok araştırma yapılmıştır. Bu çalışmalar kısaca özetlenmiştir. Kırpık (2020: 2402), yapmış olduğu çalışmada, COVID-19 Pandemisinin insan kaynakları üzerindeki etkisini, akademi, medya ve iş dünyası perspektifinden incelemiştir. İşletme yöneticilerinin geri dönüşü olmayan bir noktaya gelene kadar beklemeden, COVID-19 Pandemisi döneminde proaktif önlemler almaları ve hem kısa hem de orta vadeli stratejiler uygulamaları gerektiğini belirtmiştir. Akbaş Tuna ve Çelen (2020), işletmelerin İKY uygulamaları üzerinde COVID-19 Pandemisinin etkileri üzerinde durmuştur. İlhan (2020), COVID-19 ile mücadelede İKY uygulamalarında ihtiyaç duyulan aksiyonların belirlenmesine yönelik örgütsel müdahale yöntemi önerisi üzerinde durmuştur. Akbaş Tuna ve Türkmendağ (2020) yapmış oldukları araştırmada, COVID-19 Pandemi döneminde uzaktan çalışma uygulamaları ve çalışma motivasyonunu etkileyen faktörleri ele almışlardır. Akca ve Tepe Küçükoğlu (2020), COVID-19'un iş yaşamına etkileri ve evden çalışma üzerinde durmuşlardır. Şen ve Batı (2020), COVID-19 Pandemi krizinin yönetim ve ekonomi politikası üzerine olası etkilerini ele almışlardır. Aydın Göktepe (2020), COVID-19 krizi döneminde iş sürdürülebilirliğine yönelik yönetim uygulamalarını incelemiştir. Sayan (2020), COVID-19 Pandemisi sürecinde öğretim elemanlarının uzaktan eğitime ilişkin görüşlerini değerlendirilmiştir. Demir vd. (2020), COVID-19 Pandemisinin Türkiye'de turizm üzerindeki öncülleri, etkileri ve sonuçlarını incelemişlerdir. Serinikli (2021), COVID-19 Pandemisi sürecinde örgütsel değişimi uzaktan/evden çalışma modeli ile değerlendirmiştir. Acar (2020), COVID-19 Pandemisi ve turizm faaliyetlerine etkisini araştırmıştır. Ateş (2020), COVID-19'un işverenin iş sağlığı ve güvenliği konusunda alması gereken önlemlere etkisini değerlendirmiştir. Bozkurt (2020), COVID-19 pandemi süreci ve pandemi sonrası dünyada eğitime yönelik değerlendirmeler ile yeni normal ve yeni eğitim paradigması üzerinde durmuştur. Dönmez ve Gürbüz (2020), üniversite öğrencilerinin COVID-19 virüsü hakkında bilişsel yapılarının belirlenmesini incelemişlerdir. Yılmaz (2020), COVID-19 Pandemi sürecinin kamu çalışanları üzerine etkisini araştırmıştır. Akıncı (2020), COVID-19 Pandemisi kapsamında şirket yöneticilerinin almaları gereken önlemleri değerlendirmiştir. Yakut vd. (2020), sağlık personelinin COVID-19 korkusu ile tükenmişliği arasındaki ilişkide aşırı iş yükü ve algılanan sosyal desteğin etkisinin yapısal eşitlik modeliyle belirlenmesi üzerinde durmuşlardır. Şener ve Abunasser (2020), bireysel öncüllerinin iş-aile çatışmasına etkisinde, COVID-19 pandemisi nedeniyle evden çalışanlar üzerindeki etkisini araştırmışlardır. Lloyd-Jones (2021), insan ilişkileri/insan kaynakları geliştirme yaklaşımı ile COVID-19 Pandemisi sırasında duygusal, araçsal ve bilgilendirici öğrenci desteği için yetkinliklerin geliştirilmesi üzerinde durmuştur.

Yapılan araştırmalar dikkate alındığında COVID-19 Pandemisinin bir çok alana olduğu gibi insan Kaynakları üzerinde de önemli etkileri olmuştur. COVID-19 Pandemisi ile birlikte işletmelerde iş yapma biçimleri değişmiştir. Bunlardan en önemlisi uzaktan

çalışma sistemine geçilmiş olmasıdır. Aynı şekilde İK tedarik ve seçimi, eğitim, ücret politikaları, performans yönetimi, kariyer yönetimi ve motivasyon gibi bir çok insan kaynakları uygulamaları üzerinde COVID-19 Pandemisinin etkileri olmuştur.

3. Araştırmanın Yöntemi

COVID-19 Pandemisinin İKY'ye etkilerinin belirlenmesi amacıyla yapılan bu araştırmada, nicel araştırma yönteminden faydalanılmıştır. Araştırma için 23 maddeden oluşan bir soru formu oluşturulmuştur. Soru formunun oluşturulmasında geniş bir literatür taraması yapılmıştır. COVID-19 Pandemisinin insan kaynaklarına etkileri hakkında literatürde tartışılan en önemli konular soru formuna eklenmiştir. Soru formunun oluşturulmasında Mercer (2020), "COVID-19 Salgınının Türkiye'de Çalışma Hayatı Üzerine Etkileri Anketi", Deloitte (2020), "COVID-19 Workforce Strategies for Post-COVID- Recovery, Ahrendt vd. (2020), "Living, Working and COVID-19" ve ILO (2020), "Teleworking During the COVID-19 Pandemic and Beyond: A Practical Guide" raporlarından faydalanılmıştır.

Araştırma için Sakarya Uygulamalı Bilimler Üniversitesi Etik Kurulundan 19.02.2021 tarih ve E-26428519-044-4880 sayı ile etik kurul izni alınmıştır. Araştırmada kolayda örnekleme yöntemi kullanılmış olup, oluşturulan soru formu katılımcılara LinkedIn sosyal ağı üzerinden online olarak gönderilmiş ve doldurmaları istenmiştir. Bu yolla analiz edilebilir 240 adet anket toplanmış ve analizler bu anketler üzerinden gerçekleştirilmiştir. Elde edilen verilerin analizinde SPSS paket programı kullanılmıştır. Araştırma hipotezlerini test etmek için Ki-Kare analizinden yararlanılmıştır. Araştırma için geliştirilen hipotezler aşağıdaki gibidir:

$H_{1:}$ İşletmelerin çalışan sayıları ile Pandemi sürecinde uzaktan veya esnek çalışma modeline geçmeleri arasında anlamlı ilişki vardır.
$H_{2a:}$ İşletmelerde Pandemiden önce online iş başvurusu alınması ile Pandemi döneminde online iş başvurusu alınması arasında anlamlı ilişki vardır.
$H_{2b:}$ İşletmelerde Pandemiden önce online mülakat yapılması ile Pandemi döneminde online mülakat yapılması arasında anlamlı ilişki vardır.
$H_{2c:}$ İşletmelerde Pandemi sürecinden önce online genel yetenek testleri yapılması ile Pandemi döneminde online genel yetenek testleri yapılması arasında anlamlı ilişki vardır.
$H_{2d:}$ İşletmelerde Pandemiden önce online kişilik testleri yapılması ile Pandemi döneminde online kişilik testleri yapılması arasında anlamlı ilişki vardır.
$H_{3:}$ Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile eğitim uygulamaları arasında anlamlı ilişki vardır.
$H_{4:}$ Pandemi sürecinin işletmelerinin İKY uygulamalarında değişiklik yapması ile ücret uygulamaları arasında anlamlı ilişki vardır.
$H_{5:}$ Pandemi döneminde çalışanların ücretlerinde değişiklik olup olmaması ile kısa çalışma ödeneğinden faydalanma arasında anlamlı ilişki vardır.

H_6: İşletmelerin çalışan sayıları ile Pandemi sürecinde kısa çalışma ödeneğinden faydalanmaları arasında anlamlı ilişki vardır.
H_7: Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile performans takip sistemleri arasında anlamlı ilişki vardır.
H_8: Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile Pandemi sürecinde çalışanların kariyer gelişimlerinin takip edilmesi arasında anlamlı ilişki vardır.
H_9: Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile Pandemi sürecinde çalışanların motivasyon ve memnuniyetini artırıcı faaliyetler yapılması arasında anlamlı ilişki vardır.

4. Bulgular

Sektöre göre çalışan sayıları incelenerek sonuçlar Tablo 1'de gösterilmiştir. Sektöre göre çalışan sayılarına bakıldığında; Bilişim 7, Diğer 23, Eğitim 13, Elektronik 11, Enerji 8, Gıda 32, İmalat 20, İnşaat 6, Lojistik 19, İletişim 5, Metal 18, Otomotiv 32, Sağlık 13, Tekstil 22 ve Turizm 11 şeklinde bir dağılım olduğu görülmektedir.

Tablo: 1
Sektöre Göre Çalışan Sayısı

Sektör		Çalışan Sayısı			Toplam
		1-49	50-249	250+	
Bilişim	f	4	1	2	7
	%	57,1	14,3	28,6	100,0
Diğer	f	3	9	11	23
	%	13,0	39,1	47,8	100,0
Eğitim	f	7	1	5	13
	%	53,8	7,7	38,5	100,0
Elektronik	f	1	5	5	11
	%	9,1	45,5	45,5	100,0
Enerji	f	0	2	6	8
	%	,0	25,0	75,0	100,0
Gıda	f	3	5	24	32
	%	9,4	15,6	75,0	100,0
İmalat	f	1	6	13	20
	%	5,0	30,0	65,0	100,0
İnşaat	f	2	1	3	6
	%	33,3	16,7	50,0	100,0
Lojistik	f	1	7	11	19
	%	5,3	36,8	57,9	100,0
İletişim	f	1	1	3	5
	%	20,0	20,0	60,0	100,0
Metal	f	2	6	10	18
	%	11,1	33,3	55,6	100,0
Otomotiv	f	3	12	17	32
	%	9,4	37,5	53,1	100,0
Sağlık	f	0	5	8	13
	%	,0	38,5	61,5	100,0
Tekstil	f	1	9	12	22
	%	4,5	40,9	54,5	100,0
Turizm	f	2	3	6	11
	%	18,2	27,3	54,5	100,0
Toplam	f	31	73	136	240
	%	12,9	30,4	56,7	100,0

Çalışan sayısına göre işletmelerin Pandemi döneminde çalışan sayılarındaki değişim Tablo 2'de görülmektedir. Tablo 2'ye göre; 1-49 sayıda çalışanı olan işletmelerin

%25,8'inin çalışan sayısı artmış %22, 6'sının çalışan sayısı azalmışken yarıdan fazlasının (%51,6) çalışan sayısının değişmediği görülmektedir. 50-249 sayıda çalışanı olan işletmelerin %30,1'nin çalışan sayısı artmışken %20,5'nin çalışan sayısı azalmıştır. Bununla birlikte bu gruptaki işletmelerin yarıya yakınının (%49,3) çalışan sayısında değişiklik olmadığı görülmektedir. 250 ve üzeri çalışan sayısı olan işletmelerin %34,6'nın çalışan sayısı artmışken %18,4'nün çalışan sayısının azaldığı, yine yarıya yakınının (%47,1) çalışan sayısının değişmediği görülmektedir.

Tablo: 2
Mevcut Çalışan Sayısına Göre Pandemi Dönemi Çalışan Sayısı Değişimi

			Çalışan Sayısındaki Değişim			Toplam
			Arttı	Azaldı	Değişmedi	
Mevcut Çalışan Sayısı	1-49	f	8	7	16	31
		%	25,8	22,6	51,6	100,0
	50-249	f	22	15	36	73
		%	30,1	20,5	49,3	100,0
	250+	f	47	25	64	136
		%	34,6	18,4	47,1	100,0
Toplam		f	77	47	116	240
		%	32,1	19,6	48,3	100,0

İşletmelerin çalışan sayıları ile Pandemi sürecinde uzaktan veya esnek çalışma modeline geçip geçmedikleri arasındaki ilişkiyi incelemek amacıyla Ki-Kare (Chi-Square - $\chi 2$) analizi yapılmıştır. Elde edilen bulgular Tablo 3'te sunulmuştur.

İşletmelerin çalışan sayıları ile Pandemi sürecinde uzaktan veya esnek çalışma modeline geçip geçmemeleri arasındaki ilişkiyi belirlemek amacıyla yapılan Chi-square (χ^2) testi bulguları iki değişken arasında istatistiksel olarak anlamlı ilişki olduğunu göstermiştir (χ^2=18,858; p=0,004). Elde edilen bulgular neticesinde araştırmada ileri sürülen "H_1: *İşletmelerin çalışan sayıları ile Pandemi sürecinde uzaktan veya esnek çalışma modeline geçmeleri arasında anlamlı ilişki vardır."* hipotezi kabul edilmiştir.

Tablo: 3
Çalışan Sayısına Göre Uzaktan veya Esnek Çalışma Modeline Geçilmesi

			Uzaktan veya Esnek Çalışma Modeline Geçilmesi				Toplam	χ2	df	p
			Tamamen uzaktan çalışma modeli uygulandı	Dönüşümlü esnek çalışma modeli uygulandı	Bazen uzaktan bazen de esnek çalışma modeli uygulandı	Hayır				
Çalışan Sayısı	1-49	f	5	4	16	6	31	18,858	6	,004
		%	16,1	12,9	51,6	19,4	100,0			
	50-249	f	1	12	33	27	73			
		%	1,4	16,4	45,2	37,0	100,0			
	250+	f	7	29	76	24	136			
		%	5,1	21,3	55,9	17,6	100,0			
Toplam		f	13	45	125	57	240			
		%	5,4	18,8	52,1	23,8	100,0			

İşletmelerde Pandemiden önce online iş başvurusu alınması ile Pandemi sorası online iş başvurusu alınması arasındaki ilişkiyi incelemek amacıyla Ki-Kare (Chi-Square -$\chi 2$) analizi gerçekleştirilmiştir. Elde edilen bulgular Tablo 4'te yer almaktadır.

Pandemiden önce katılımcıların işletmelerinde online iş başvurusu alınması ile Pandemi dönemi online iş başvurusu alınması arasındaki ilişkiyi belirlemek amacıyla yapılan Chi-square (χ^2) testi bulguları iki değişken arasında istatistiksel olarak anlamlı bir ilişki *olmadığını* göstermiştir (χ^2=3,289; p=0,193). Elde edilen bulgular neticesinde araştırmada ileri sürülen "H_{2a}: *İşletmelerde Pandemiden önce online iş başvurusu alınması ile Pandemi döneminde online iş başvurusu alınması arasında anlamlı ilişki vardır."* hipotezi kabul *edilmemiştir*.

Tablo: 4
Pandemi Öncesi ve Pandemi Dönemi Online İş Başvurusu Alma

			Pandemi Dönemi Online İş Başvurusu			Toplam	χ^2	df	p
			Arttı	Değişmedi	Azaldı				
Pandemi Öncesi Online İş Başvurusu	Evet	f	112	74	5	191	3,289	2	,193
		%	58,6	38,7	2,6	100,0			
	Hayır	f	22	26	1	49			
		%	44,9	53,1	2,0	100,0			
Toplam		f	134	100	6	240			
		%	55,8	41,7	2,5	100,0			

İşletmelerde Pandemiden önce online mülakat yapılması ile Pandemiden döneminde online mülakat yapılması arasındaki ilişkiyi incelemek amacıyla Ki-Kare (Chi-Square -χ2) analizi gerçekleştirilmiştir. Elde edilen bulgular Tablo 5'te sunulmuştur.

İşletmelerde Pandemiden önce online mülakat yapılması ile Pandemi dönemi online mülakat yapılması arasındaki ilişkiyi incelemek amacıyla Chi-square (χ^2) testi bulguları iki değişken arasında istatistiksel olarak anlamlı bir ilişki olduğunu göstermiştir (χ^2=19,351; p=0,000). Elde edilen bulgular neticesinde araştırmada ileri sürülen "H_{2b}: *İşletmelerde Pandemiden önce online mülakat yapılması ile Pandemi döneminde online mülakat yapılması arasında anlamlı ilişki vardır."* hipotezi kabul edilmiştir.

Tablo: 5
Pandemi Öncesi ve Pandemi Dönemi Online Mülakat

			Pandemi Dönemi Online Mülakat			Toplam	χ^2	df	p
			Arttı	Değişmedi	Azaldı				
Pandemi Öncesi Online Mülakat	Evet	f	79	16	2	97	19,351	2	,000
		%	81,4	16,5	2,1	100,0			
	Hayır	f	77	59	7	143			
		%	53,8	41,3	4,9	100,0			
Toplam		f	156	75	9	240			
		%	65,0	31,3	3,8	100,0			

İşletmelerde Pandemiden önce online genel yetenek testleri yapılması ile Pandemi döneminde online genel yetenek testleri yapılması arasındaki ilişkiyi incelemek amacıyla Ki-Kare (Chi-Square -χ2) analizi gerçekleştirilmiştir. Elde edilen bulgular Tablo 6'da sunulmuştur.

İşletmelerde Pandemiden önce online genel yetenek testleri yapılması ile Pandemi dönemi online genel yetenek testleri yapılması arasındaki ilişkiyi belirlemek amacıyla yapılan Chi-square (χ^2) testi bulguları iki değişken arasında istatistiksel olarak anlamlı bir

ilişki olduğunu göstermiştir (χ^2=12,756; p=0,002). Elde edilen bulgular neticesinde araştırmada ileri sürülen "H_{2c}: *İşletmelerde Pandemi sürecinden önce online genel yetenek testleri yapılması ile Pandemi dönemi online genel yetenek testleri yapılması arasında anlamlı ilişki vardır."* hipotezi kabul edilmiştir.

Tablo: 6
Pandemi Öncesi ve Pandemi Dönemi Online Genel Yetenek Testleri

			Pandemi Dönemi Online Genel Yetenek Testleri			Toplam	χ^2	df	p
			Arttı	Değişmedi	Azaldı				
Pandemi Öncesi Online Genel Yetenek Testleri	Evet	f	47	41	3	91	12,756	2	,002
		%	51,6	45,1	3,3	100,0			
	Hayır	f	43	96	10	149			
		%	28,9	64,4	6,7	100,0			
Toplam		f	90	137	13	240			
		%	37,5	57,1	5,4	100,0			

İşletmelerde Pandemiden önce online kişilik testleri yapılması ile Pandemi döneminde online kişilik testleri yapılması arasındaki ilişkiyi incelemek amacıyla Ki-Kare (Chi-Square -χ2) analizi gerçekleştirilmiştir. Elde edilen bulgular Tablo 7'de sunulmuştur.

İşletmelerde Pandemiden önce online kişilik testleri yapılması ile Pandemi dönemi online kişilik testleri yapılması arasındaki ilişkiyi belirlemek amacıyla yapılan Chi-square (χ^2) testi bulguları iki değişken arasında istatistiksel olarak anlamlı bir ilişki olduğunu göstermiştir (χ^2=6,714; p=0,035). Elde edilen bulgular neticesinde araştırmada ileri sürülen "H_{2d}: *İşletmelerde Pandemiden önce online kişilik testleri yapılması ile Pandemi dönemi online kişilik testleri yapılması arasında anlamlı ilişki vardır."* hipotezi kabul edilmiştir.

Tablo: 7
Pandemi Öncesi ve Pandemi Dönemi Online Kişilik Testleri

			Pandemi Dönemi Online Kişilik Testleri			Toplam	χ^2	df	p
			Arttı	Değişmedi	Azaldı				
Pandemi Öncesi Online Kişilik Testleri	Evet	f	41	46	3	90	6,714	2	,035
		%	45,6	51,1	3,3	100,0			
	Hayır	f	44	97	9	150			
		%	29,3	64,7	6,0	100,0			
Toplam		f	85	143	12	240			
		%	35,4	59,6	5,0	100,0			

Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile eğitim uygulamaları arasındaki ilişkiyi incelemek amacıyla Ki-Kare (Chi-Square -χ2) analizi gerçekleştirilmiştir. Elde edilen bulgular Tablo 8'de sunulmuştur.

Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile eğitim uygulamaları arasındaki ilişkiyi belirlemek amacıyla yapılan Chi-square (χ^2) testi bulguları iki değişken arasında istatistiksel olarak anlamlı bir ilişki olduğunu göstermiştir (χ^2=24,201; p=0,000). Elde edilen bulgular neticesinde araştırmada ileri sürülen "H_3: *Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile eğitim uygulamaları arasında anlamlı ilişki vardır."* hipotezi kabul edilmiştir.

Tablo: 8
Pandemi Dönemi İKY ile Eğitimde Yaşanan Değişiklikler

			Eğitimde Yaşanan Değişiklikler			Toplam	χ^2	df	p
			Eğitimler tamamen online verilmeye başlandı	Eğitimler kısmen online verilmeye başlandı	Değişiklik olmadı				
Pandemi Dönemi İKY	Evet	f	89	65	46	200	24,201	2	,000
		%	44,5	32,5	23,0	100,0			
	Hayır	f	3	15	22	40			
		%	7,5	37,5	55,0	100,0			
Toplam		f	92	80	68	240			
		%	38,3	33,3	28,3	100,0			

Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile ücret uygulamaları arasındaki ilişkiyi incelemek amacıyla Ki-Kare (Chi-Square -$\chi 2$) analizi gerçekleştirilmiştir. Elde edilen bulgular Tablo 9'da sunulmuştur.

Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile ücret uygulamaları arasındaki ilişkiyi belirlemek amacıyla yapılan Chi-square (χ^2) testi bulguları iki değişken arasında istatistiksel olarak anlamlı bir ilişki olmadığını göstermiştir (χ^2=2,648; p=,266). Elde edilen bulgular neticesinde araştırmada ileri sürülen "$H_{4:}$ *Pandemi sürecinin işletmelerinin İKY uygulamalarında değişiklik yapması ile ücret uygulamaları arasında anlamlı ilişki vardır."* hipotezi kabul edilmemiştir.

Tablo: 9
Pandemi Dönemi İKY ile Ücret Değişikliği

			Ücret Değişikliği			Toplam	χ^2	df	p
			Arttı	Azaldı	Değişmedi				
Pandemi Dönemi İKY	Evet	f	42	10	148	200	2,648	2	,266
		%	21,0	5,0	74,0	100,0			
	Hayır	f	11	0	29	40			
		%	27,5	,0	72,5	100,0			
Toplam		f	53	10	177	240			
		%	22,1	4,2	73,8	100,0			

Pandemi döneminde çalışanların ücretlerinde değişiklik olup olmaması ile kısa çalışma ödeneğinden faydalanma arasındaki ilişkiyi incelemek amacıyla Ki-Kare (Chi-Square -$\chi 2$) analizi gerçekleştirilmiştir. Elde edilen bulgular Tablo 10'da sunulmuştur.

Tablo: 10
Ücret ve Kısa Çalışma Ödeneğinden Faydalanma

			Kısa Çalışma Ödeneğinden Faydalanma		Toplam	χ^2	df	p
			Evet	Hayır				
Ücret	Arttı	f	28	25	53	8,395	2	,015
		%	52,8	47,2	100,0			
	Azaldı	f	10	0	10			
		%	100,0	,0	100,0			
	Değişmedi	f	114	63	177			
		%	64,4	35,6	100,0			
Toplam		f	152	88	240			
		%	63,3	36,7	100,0			

Pandemi döneminde çalışanların ücretlerinde değişiklik olup olmaması ile kısa çalışma ödeneğinden faydalanma arasındaki ilişkiyi belirlemek amacıyla yapılan Chi-square

(χ^2) testi bulguları iki değişken arasında istatistiksel olarak anlamlı bir ilişki olduğunu göstermiştir (χ^2=8,395; p=0,015). Elde edilen bulgular neticesinde araştırmada ileri sürülen "H_5: *Pandemi döneminde çalışanların ücretlerinde değişiklik olup olmaması ile kısa çalışma ödeneğinden faydalanma arasında anlamlı ilişki vardır."* hipotezi kabul edilmiştir.

İşletmelerin çalışan sayıları ile Pandemi sürecinde kısa çalışma ödeneğinden faydalanmaları arasındaki ilişkiyi incelemek amacıyla Ki-Kare (Chi-Square -χ2) analizi gerçekleştirilmiştir. Elde edilen bulgular Tablo 11'de sunulmuştur.

İşletmelerin çalışan sayıları ile Pandemi sürecinde kısa çalışma ödeneğinden faydalanmaları arasındaki ilişkiyi belirlemek amacıyla yapılan Chi-square (χ^2) testi bulguları iki değişken arasında istatistiksel olarak anlamlı bir ilişki olduğunu göstermiştir (χ^2=9,404; p=0,009). Elde edilen bulgular neticesinde araştırmada ileri sürülen "H_6: *İşletmelerin çalışan sayıları ile Pandemi sürecinde kısa çalışma ödeneğinden faydalanmaları arasında anlamlı ilişki vardır."* hipotezi kabul edilmiştir.

Tablo: 11
Çalışan Sayısına Göre Kısa Çalışma Ödeneğinden Faydalanma

			Kısa Çalışma Ödeneğinden Faydalanma		Toplam	χ2	df	p
			Evet	Hayır				
Çalışan Sayısı	1-49	f	12	19	31	9,404	2	,009
		%	38,7	61,3	100,0			
	50-249	f	50	23	73			
		%	68,5	31,5	100,0			
	250+	f	90	46	136			
		%	66,2	33,8	100,0			
Toplam		f	152	88	240			
		%	63,3	36,7	100,0			

Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile performans takip sistemleri arasındaki ilişkiyi incelemek amacıyla Ki-Kare (Chi-Square -χ2) analizi gerçekleştirilmiştir. Elde edilen bulgular Tablo 12'de sunulmuştur.

Tablo: 12
Pandemi Dönemi İKY ile Performans Takip Sistemi

			Performans Takip Sistemi			Toplam	χ^2	df	p
			Değişiklik olmadı	Kısmen online hale getirildi	Tamamen online hale getirildi				
Pandemi Dönemi İKY	Evet	f	140	41	19	200	10,940	2	,004
		%	70,0	20,5	9,5	100,0			
	Hayır	f	38	1	1	40			
		%	95,0	2,5	2,5	100,0			
Toplam		f	178	42	20	240			
		%	74,2	17,5	8,3	100,0			

Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile performans takip sistemleri arasındaki ilişkiyi belirlemek amacıyla yapılan Chi-square (χ^2) testi bulguları iki değişken arasında istatistiksel olarak anlamlı bir ilişki olduğunu göstermiştir (χ^2=10,940; p=0,004). Elde edilen bulgular neticesinde araştırmada ileri sürülen *"H_7: Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile performans takip sistemleri arasında anlamlı ilişki vardır."* hipotezi kabul edilmiştir.

Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile Pandemi sürecinde çalışanların kariyer gelişimlerinin takip edilmesi arasındaki ilişkiyi incelemek amacıyla Ki-Kare (Chi-Square -$\chi 2$) analizi gerçekleştirilmiştir. Elde edilen bulgular Tablo 13'te sunulmuştur.

Tablo: 13
Pandemi Dönemi İKY ile Kariyer Takibi

			Kariyer Takibi		Toplam	χ^2	df	p
			Evet	Hayır				
Pandemi Dönemi İKY	Evet	f	150	50	200	6,566	1	,010
		%	75,0	25,0	100,0			
	Hayır	f	22	18	40			
		%	55,0	45,0	100,0			
Toplam		f	172	68	240			
		%	71,7	28,3	100,0			

Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile Pandemi sürecinde çalışanların kariyer gelişimlerinin takip edilmesi arasındaki ilişkiyi belirlemek amacıyla yapılan Chi-square (χ^2) testi bulguları iki değişken arasında istatistiksel olarak anlamlı bir ilişki olduğunu göstermiştir (χ^2=6,566; p=0,010). Elde edilen bulgular neticesinde araştırmada ileri sürülen *"$H_{8:}$ Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile Pandemi sürecinde çalışanların kariyer gelişimlerinin takip edilmesi arasında anlamlı ilişki vardır."* hipotezi kabul edilmiştir.

Pandemi sürecinin işletmelerinin İKY uygulamalarında değişiklik yapması ile Pandemi sürecinde çalışanların motivasyon ve memnuniyetini artırıcı faaliyetler yapılması arasındaki ilişkiyi incelemek amacıyla Ki-Kare (Chi-Square -$\chi 2$) analizi gerçekleştirilmiştir. Elde edilen bulgular Tablo 14'te sunulmuştur.

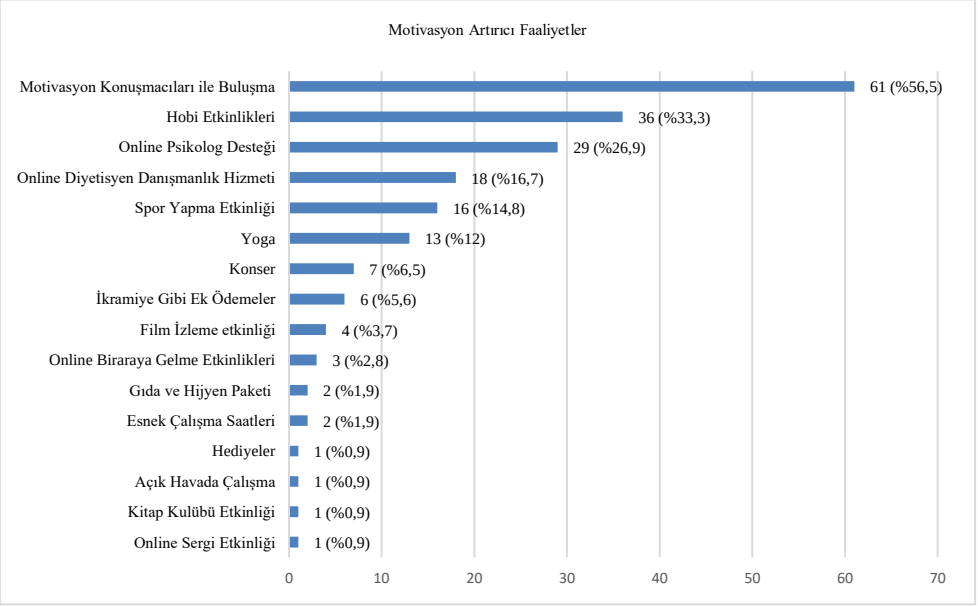
Tablo: 14
Pandemi Dönemi İKY ile Motivasyon

			Motivasyon		Toplam	χ^2	df	p
			Evet	Hayır				
Pandemi Dönemi İKY	Evet	f	97	103	200	13,045	1	,000
		%	48,5	51,5	100,0			
	Hayır	f	7	33	40			
		%	17,5	82,5	100,0			
Toplam		f	104	136	240			
		%	43,3	56,7	100,0			

Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile Pandemi sürecinde çalışanların motivasyon ve memnuniyetini artırıcı faaliyetler yapılması arasındaki ilişkiyi belirlemek amacıyla yapılan Chi-square (χ^2) testi bulguları iki değişken arasında istatistiksel olarak anlamlı bir ilişki olduğunu göstermiştir (χ^2=13,045; p=0,000). Elde edilen bulgular neticesinde araştırmada ileri sürülen "$H_{9:}$ *Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile Pandemi sürecinde çalışanların motivasyon ve memnuniyetini artırıcı faaliyetler yapılması arasında anlamlı ilişki vardır."* hipotezi kabul edilmiştir.

Pandemi sürecinde işletmelerin çalışanların motivasyon ve memnuniyetini artırmak için yapmış oldukları faaliyetler ise Grafik 1'de görülmektedir. Pandemi sürecinde işletmelerin çalışanların motivasyon ve memnuniyetini artırmak için yapmış oldukları faaliyetler arasında; motivasyon konuşmacıları ile buluşma (%56,5), hobi etkinlikleri (%33,3) online psikolog desteği (%26,9), online diyetisyen danışmanlık hizmeti (%16,7), spor yapma etkinliği (%14,8), yoga (%12), konser (%6,5), ikramiye gibi ek ödemeler (%5,6) olduğu görülmektedir.

Grafik: 1
Motivasyon Artırıcı Faaliyetler



5. Sonuç ve Değerlendirme

COVID-19 Pandemisinin İKY'ye etkilerinin belirlenmesi amacıyla yapılan bu araştırmanın sonuçlarına göre; işletmelerin çalışan sayıları ile Pandemi sürecinde uzaktan veya esnek çalışma modeline geçmeleri arasında anlamlı bir ilişki olduğu belirlenmiştir. Çalışan sayısı fark etmeksizin Pandemi döneminde hem uzaktan hem de esnek çalışma modeli uygulandığı görülmektedir. İşletmelerin Pandeminin yoğun olduğu dönemlerde çoğunlukla uzaktan, pandeminin nispeten daha az yoğun olduğu dönemlerde ise esnek çalışma modelini tercih ettikleri görülmektedir. Bununla birlikte 250 ve üzeri sayıda çalışanı olan işletmeler diğer işletmelere göre daha yüksek oranda hem uzaktan hem de esnek çalışma modelini kullanmıştır. Campion vd. (2021: 3) çalışanların ortalama %60'ının Mayıs-Haziran 2020'de evden çalışmaya geçtiğini, bu oranın Eylül ayı itibarıyla %80'den fazla olduğunu ve birçok işletmenin hem uzaktan hem de işyerinden olacak şekilde karma

bir çalışma modeli uyguladıklarını belirlemişlerdir. Campion vd. (2021: 3) göre çalışanların yarıdan fazlası evde çalışmayı tercih ederken, tüm çalışanlar evden çalışmayı tercih etmemektedir.

İşletmelerin çalışan tedarik ve seçimi uygulamalarında Pandemi öncesinde ve döneminde farklılık olup olmadığı belirlenmeye çalışılmıştır. İlk olarak işletmelerin online iş başvurusu alıp almamaları değerlendirilmiştir. *İşletmelerde Pandemiden önce online iş başvurusu alınması ile Pandemi döneminde online iş başvurusu alınması arasında anlamlı ilişki olmadığı belirlenmiştir.* İşletmelerin pandemiden önce de büyük çoğunluğunun online iş başvurusu aldıkları söylenebilir. İşletmelerin online başvuru alma işlemleri Pandemi döneminde artarak devam etmiştir. Pandemi döneminde işletmelerin çoğunlukla yeni çalışan istihdamı yoluna gitmedikleri söylenebilir. Haziran ayının ikinci haftasında yapılan bir ankete katılan özel sektör CEO'larının yüzde 59'u, işletmelerinin zararını azaltmak için ilk olarak işe alımları dondurduklarını belirtmişlerdir (Sines, 2020: 10). Bununla birlikte Pandemi döneminde yeni çalışan istihdamında bulunan işletmelerin çalışan tedarik ve seçim süreçlerinde bazı değişiklikler olmuştur.

İşletmelerde Pandemiden önce online mülakat yapılması ile Pandemi Döneminde online mülakat yapılması arasında anlamlı ilişki olduğu belirlenmiştir. Pandemi öncesi online mülakat yapanların büyük bir çoğunluğu Pandemi döneminde online mülakatların artmış olduğunu belirtmişlerdir. Pandemi döneminde işletmeler zorunlu olarak online mülakat yapmaya yönelmişlerdir.

İşletmelerde Pandemi sürecinden önce online genel yetenek testleri yapılması ile Pandemi döneminde online genel yetenek testleri yapılması arasında anlamlı ilişki olduğu belirlenmiştir. Pandemi döneminde işletmeler çalışan tedarikinde online genel yetenek testleri yapmaya yönelmişlerdir.

İşletmelerde Pandemiden önce online kişilik testleri yapılması ile Pandemi döneminde online kişilik testleri yapılması arasında anlamlı bir ilişki olduğu görülmüştür. Pandemi öncesi online kişilik testleri yapan işletmelerde %45,6'sının pandemi döneminde online kişilik testleri yapılması artmışken %51,1'inde bu yönde bir değişiklik olmadığı görülmektedir. Pandemi öncesi online kişilik testleri yapılmadığını belirten işletmelerin %64,7'sinin Pandemi döneminde de bu uygulamalarında bir değişikliğe gitmedikleri görülmektedir. Dolayısıyla Pandemi döneminde işletmelerde çalışan tedarik ve seçiminde online kişilik testleri uygulanması artmıştır.

Pandemiden önce daha çok yüz yüze yapılan mülakatlar pandemi ile birlikte neredeyse tamamen online ortamlarda yapılmaya başlanmıştır. Aynı şekilde başvuruların alınması, kişilik ve yetenek testlerinin yapılmasında da online platformların kullanımı artmıştır. Bu konuda araştırmadan elde edilen bulgular ile diğer araştırma bulguları ve şirketlerin açıklamaları paralellik göstermektedir. Örneğin; Amazon, yüz yüze görüşmelerin çoğunu iptal ederek, adayların işe alım uzmanları ile bağlantı kurmaları, gerekli belgeleri doldurmaları ve şirketin video konferans yazılımı olan Amazon Chime aracılığıyla

röportajlara katılmaları için sanal görüşme portalları kurmuştur (Maurer, 2020). Ayrıca, Mercer'ın yapmış olduğu araştırma sonucuna göre; COVID-19 Pandemisi sürecinde işletmelerin %59,9'unun işe alım süreçlerinin sanal/online olarak sürdürülmesi kararı aldıkları; işletmelerin %32,3'ünün değerlendirme merkezi uygulamalarının online ortamda sürdürülmesi kararı aldıkları belirlenmiştir (Mercer, 2020). Pandemi döneminde işletmeler çalışan tedarik ve seçimi süreçlerini online ortama taşımak durumunda kalmışlardır.

COVID-19 Pandemisi İKY birimlerinin önemli uygulamalarından birisi olan eğitim konusunda da önemli etkilere neden olmuştur. İşletmelerin büyük çoğunluğu eğitimlerini online platformlara taşımışlardır. *Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile eğitim uygulamaları arasında anlamlı bir ilişki olduğu belirlenmiştir.* Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yaptığını belirtenlerin %44,5'i Pandemi döneminde eğitimlerinin tamamen online verilmeye başlandığı belirtmişlerdir. Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapmadığını belirten işletmelerin ise %55'nin Pandemi döneminde eğitim uygulamalarında da değişiklik olmadığını belirttikleri görülmektedir. Dolayısıyla bu grupta yer alan işletmelerin yarıdan fazlasının iş ve işlemlerini online ortama taşımakta zorlandıkları söylenebilir. Araştırmadan elde edilen sonuçlara paralel olarak, Mercer'ın yapmış olduğu araştırma sonucuna göre de COVID-19 Pandemisi sürecinde işletmelerin %71,3'nün eğitimlerini sanal/online olarak sürdürme kararı aldıkları belirlenmiştir (Mercer, 2020).

COVID-19 pandemisinin işletmelerin ücret politikaları üzerindeki etkileri açısından incelendiğinde Pandemi sürecinin işletmelerinin İKY uygulamalarında değişiklik yapması ile ücret uygulamaları arasında anlamlı ilişki olmadığı görülmüştür. Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yaptığını belirtenlerin %74'ü, tüm katılımcıların ise %73,8'i çalışanların ücretlerinde bir değişiklik olmadığını belirtmişlerdir. Yaşanan Pandemi nedeniyle işletmelerin ücret artışına gidemedikleri görülmektedir. Campion vd. göre (2021: 5), işletmeler maliyeti azaltma çabaları içine çalışanlara yapılan ödemeleri de eklemişlerdir. Campion vd. (2021: 5), işletmelerin yaklaşık yarısının, bazı çalışanlar için yükselme ve ikramiyeleri iptal ettikleri, ertelediklerini veya dondurduklarını; üçte birinin ise bunları düşürdüklerini belirtmişlerdir.

İşletmeler hükümetler tarafından desteklenen "Kısa Çalışma Ödeneği"nden faydalanmışlardır. Bu ücret sisteminin amacı çalışanların işsiz kalmalarının önüne geçmek için maaşların bir kısmının devlet tarafından karşılanmasıdır. Bu sayede hem çalışanlar hem de işletmeler pandemi sürecinin olumsuz etkilerinden bir nebze de olsa kurtulabilmişlerdir. *Pandemi döneminde çalışanların ücretlerinde değişiklik olup olmaması ile kısa çalışma ödeneğinden faydalanma arasında anlamlı ilişki olduğu görülmüştür*. İşletmeler genel olarak çalışanlarının ücretlerinde artış yapamadıkları ya da çalışanların ücretlerini ödemek için kısa çalışma ödeneğinden faydalandıkları görülmektedir. Çalışanların ücreti arttı diyenlerin %52,8'i, azaldı diyenlerin %100'ü, değişmedi diyenlerin %64,4'nün Kısa Çalışma Ödeneğinden faydalanmakta olduğu görülmektedir.

İşletmelerin çalışan sayıları ile Pandemi sürecinde kısa çalışma ödeneğinden faydalanmaları arasında anlamlı ilişki olduğu görülmüştür. Çalışan sayısı 50-249 ile 250 ve üzeri olan işletmeler 1-49 arasında çalışanı olan işletmelere göre daha yüksek oranda Kısa Çalışma Ödeneğinden faydalanmaktadırlar. İşletmeler çalışan sayıları artıkça Pandemi döneminin olumsuz koşullarından kurtulmak için çalışan ücretlerinin bir kısmının devlet tarafından desteklenmesinden faydalanarak maliyetlerini düşürmek istemektedirler.

Yapılan araştırmada Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile performans takip sistemleri arasında anlamlı ilişki olduğu görülmüştür. Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yaptığını belirtenlerin %70'i; Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapmadığını belirtenlerin ise %95'nin performans takip sisteminde değişiklik olmadığını belirtmişlerdir. Tüm katılımcıların sadece %8,3 tamamen online hale getirildiğini belirtirken %17,5'i kısmen online hale getirildiğini belirtmektedir. Bu sonuçlar paralelinde işletmelerin performans takip sistemlerini online ortama taşımakta zorlandıkları belirtilebilir. Ayrıca, dijital teknolojiler sayesinde performans takibi kolaylaşmakla birlikte çalışanların içinde bulunduğu olağanüstü durumdan dolayı performans beklentilerinde değişikliklere gidilmesi gerekebilmektedir. Mercer'ın yapmış olduğu araştırma sonucuna göre; işletmelerin %74,3'ü kurumsal iş hedefleri ile birlikte çalışanların yılsonu performans hedeflerinin revize dileceğini bildirmişlerdir (Mercer, 2020).

Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile Pandemi sürecinde çalışanların kariyer gelişimlerinin takip edilmesi arasında anlamlı bir ilişki olduğu görülmüştür. Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yaptığını belirtenlerin %75'i çalışanlarının kariyer takibini yaptıklarını; Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapmadığını belirtenlerin ise %55'inin çalışanlarının kariyer takibini yaptıklarını belirtmişlerdir. Pandeminin getirdiği olumsuz koşullara rağmen işletmelerin çalışanlarının kariyer gelişimlerine önem verdikleri görülmektedir. Pandemi sürecinde çalışanların online kurslardan faydalanarak yeteneklerini geliştirmeleri kariyerlerinde olumlu bir ilerleme sağlayabilecektir. Jones'a göre (2020: 39-40) işletmeler Pandemi sürecini çalışanlarının ekipleri yönetme, yapay zekâ, makine öğrenimi, robotlarla çalışma, İKY analitiği ve İKY için güncellenmiş istihdam yönetmelikleri vb. konularında kurslar alarak geçirmelerini sağlamalıdır. Çünkü pandemiden sonra bu yeteneklere daha fazla ihtiyaç duyulacaktır.

Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapması ile Pandemi sürecinde çalışanların motivasyon ve memnuniyetini artırıcı faaliyetler yapılması arasında anlamlı ilişki olduğu görülmüştür. Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yaptığını belirtenlerin yarıya yakını (%48,5) çalışanlarına yönelik motivasyon ve memnuniyeti artırıcı faaliyetler yaptıklarını; Pandemi sürecinin işletmelerin İKY uygulamalarında değişiklik yapmadığını belirtenlerin ise sadece %17,5'nin çalışanlarına yönelik motivasyon ve memnuniyeti artırıcı faaliyetler yaptıklarını belirtmişlerdir. Tüm katılımcılar açısından bir değerlendirme yapıldığında işletmelerin yarıdan azının (%43,3) çalışanların motivasyon ve memnuniyetinin artırılmasına önem verdikleri görülmektedir.

Çalışanların Pandemi sürecinde yaşamış olduğu olağanüstü koşullar göz önüne alındığında işletmelerin bu konuya daha fazla önem verip çalışanların moral ve motivasyonlarını artırmaya odaklanmaları gerekmektedir. Yapılan araştırmanın sonuçlarına göre; işletmelerin çalışanlarının motivasyon ve memnuniyetini artırmak için en çok Motivasyon konuşmacıları ile buluşma (%56,5), hobi etkinlikleri (%33,3), online psikolog desteği (%26,9), online diyetisyen danışmanlık hizmeti (%16,7), spor yapma etkinliği (%14,8), yoga (%12), konser (%6,5), ikramiye gibi ek ödemeler (%5,6) den faydalandıkları görülmektedir.

Yapılan araştırma sonuçlarına göre COVID-19 Pandemisi işletmelerin İKY uygulamaları üzerinde önemli değişikliklere yol açmıştır. İşletmeler Pandemi döneminde daha fazla online mülakat, genel yetenek ve kişilik testi yapmışlardır. İş başvuruları pandemiden önce de büyük oranda online olarak alınsa da Pandemi döneminde bu oran artarak devam etmiştir. İşletmelerin Pandemi döneminde eğitim uygulamalarını çoğunlukla online ortama taşıdıkları, aynı şekilde performans takip sistemlerini online olarak gerçekleştirmeye çalıştıkları görülmektedir. Ancak bu noktada işletmelerin dijitalleşmeye gerekli önemi vermedikleri ya da dijitalleşme alt yapılarının yetersiz olduğu söylenebilir. İKY uygulamalarının dijital ortama taşınması Pandemi sonrasında da işletmelerin etkinlik ve verimliliklerini artıracaktır. İşletmelerin Pandemi sürecinde çalışanlarının kariyer gelişimlerine önem vermeleri ve çalışanların kariyer takibini yapmaları oldukça önemli bir sonuç olarak görülmektedir. Çünkü bu süreçte çalışanların kariyerlerinin desteklenmesi Pandemi sonrasında hem çalışanlar hem de işletmeler için olumlu sonuçlar ortaya koyacaktır. Pandemi sürecinde çalışanların yaşamış olduğu en önemli sorunlar arasında uzaktan çalışmadan kaynaklı problemler, virüs bulaşması endişesi, psikolojik sorunlar vb. sayılabilir. Bu sorunlar ile başa çıkabilmek için işletmeler tarafından çalışanların moral ve motivasyonlarını artırıcı faaliyetler düzenlemesi oldukça önemlidir. Ancak bu konuda işletmelerin gerektiği kadar çaba sarf etmedikleri görülmektedir. İşletmelerin çalışanlarının moral ve motivasyonlarını artırıcı faaliyetler düzenlemesinin hem çalışılanlar hem de işletmeler için oldukça fazla olumlu geri dönüşleri olabilir. Dolayısıyla işletmeler bu konuya daha fazla önem vermelidirler.

Araştırmadan elde dilen bulguların hem işletmelere hem de literatüre anlamlı katkı sağlayacağı düşünülmektedir. Ancak araştırmadan elde edilen bulguların genellenebilirliği açısından bundan sonra yapılacak araştırmalarda daha çok katılımcı ile yapılması gerekmektedir.

Kaynaklar

Acar, Y. (2020), "Yeni Koronavirüs (Covid-19) Salgını ve Turizm Faaliyetlerine Etkisi", *Güncel Turizm Araştırmaları Dergisi*, 4(1), 7-21.

Ahrendt, D. et al. (2020), *Living, Working and COVID-19,* COVID-19 Series, Publications Office of the European Union, Luxembourg.

Akbaş-Tuna, A. & O. Çelen (2020), "İşletmelerin İnsan Kaynakları Yönetimi Uygulamaları Üzerinde Covid-19 Pandemisinin Etkileri", *OPUS-Uluslararası Toplum Araştırmaları Dergisi*, 16(30), 2710-2759.

Akbaş-Tuna, A. & Z. Türkmendağ (2020), "Covid-19 Pandemi Döneminde Uzaktan Çalışma Uygulamaları ve Çalışma Motivasyonunu Etkileyen Faktörler", *İşletme Araştırmaları Dergisi*, 12 (3), 3246-3260.

Akca, M. & M. Tepe-Küçükoğlu (2020), "COVID-19 ve İş Yaşamına Etkileri: Evden Çalışma", *Journal of International Management, Educational and Economics Perspectives*, 8(1), 71-81.

Akıncı, E. (2020), "Covid-19 Salgını Kapsamında Şirket Yöneticilerinin Almaları Gereken Önlemlere Genel Bir Bakış", *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi*, 19(38), 202-223.

Aslan, R. (2020), "Tarihten Günümüze Epidemiler, Pandemiler ve Covid-19", *Ayrıntı Dergisi*, 8(85), 35-41.

Ateş, Z.G. (2020), "COVID-19'un İşverenin İş Sağlığı ve Güvenliği Konusunda Alması Gereken Önlemlere Etkisi", *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi*, 19(38), 161-179.

Aydın-Göktepe, E. (2020), "Kriz Döneminde İş Sürdürülebilirliğine Yönelik Yönetim Uygulamaları; Cavid-19 Pandemi Araştırması", *Journal of Social, Humanities and Administrative Sciences*, 6(26), 630-638.

Bozkurt, A. (2020), "Koronavirüs (Covid-19) Pandemi Süreci ve Pandemi Sonrası Dünyada Eğitime Yönelik Değerlendirmeler: Yeni Normal Ve Yeni Eğitim Paradigması", *Açıköğretim Uygulamaları ve Araştırmaları Dergisi*, 6(3), 112-142.

Caligiuri, P. vd. (2020), "International HRM Insights for Navigating the COVID-19 Pandemic: Implications for Future Research and Practice", *Journal of International Business Studies*, 51, 697-713.

Campion, E.D. et al. (2021), "Technical Report: Impact of COVID-19 and Human Resource Management Agility Practices", *The Industrial-Organizational Psychologist*, 58(3), 1-7.

Carnevale, J.B. & I. Hatak (2020), "Employee Adjustment and Well-Being in the Era of COVID-19: Implications for Human Resource Management", *Journal of Business Research*, 116, 183-187.

Chadee, D. et al. (2021), "Is Digital Technology the Magic Bullet for Performing Work at Home? Lessons Learned for Post COVID-19 Recovery in Hospitality Management", *International Journal of Hospitality Management*, 92, 1-8.

Deloitte (2020), *COVID-19 Workforce Strategies for Post-COVID- Recovery*, <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/about-deloitte/workforce-strategies-for-post-covid-19-recovery.pdf>, 14.01.2021.

Demir, M. vd. (2020), "Coronavirüs (Covid-19)'ün Türkiye'de Turizm Üzerindeki Öncüllerinin, Etkilerinin ve Sonuçlarının Değerlendirilmesi", *International Journal of Social Sciences and Education Research*, 6(1), 80-107.

Dirani, K.M. et al. (2020), "Leadership Competencies and the Essential Role of Human Resource Development in Times of Crisis: a Response to Covid-19 Pandemic", *Human Resource Development International*, 23(4), 380-394.

Dönmez, İ. & S. Gürbüz (2020), "Üniversite Öğrencilerinin Covid-19 Virüsü Hakkında Bilişsel Yapılarının Belirlenmesi", *Manas Sosyal Araştırmalar Dergisi*, 9(4), 2159-2172.

Erdil, O. vd. (2004), "İnsan Kaynakları Uygulamalarıyla Örgütsel Performans Arasındaki İlişkileri Araştırmaya Yönelik Bir İnceleme", *DEÜ İİBF Dergisi*, 19(2), 101-122.

Hecklaua, F. et al. (2016), "Holistic Approach for Human Resource Management in Industry 4.0", *Procedia CIRP*, 54, 1-6.

ILO (2020), *Teleworking During the COVID-19 Pandemic and Beyond: A Practical Guide*, July, Geneva.

İlhan, Ü.D. (2020), "Covid-19 ile Mücadelede İnsan Kaynakları Yönetimi Uygulamalarında İhtiyaç Duyulan Aksiyonların Belirlenmesine Yönelik Örgütsel Müdahale Yöntemi Önerisi", *Gaziantep Üniversitesi Sosyal Bilimler Dergisi*, 19, 288-307.

Jones, K. (2020), "HR in the Time of COVID-19", *Feature*, 2nd Quarter, 38-40.

Kırpık, G. (2020), "COVID-19 Pandemisinin İnsan Kaynakları Üzerindeki Etkisinin Akademi, Medya ve İş Dünyası Perspektifinden İncelenmesi", *Manas Sosyal Araştırmalar Dergisi*, 9(4), 2393-2406.

Kraus, S. et al. (2020), "The Economics of COVID-19: Initial Empirical Evidence on How Family Firms in Five European Countries Cope with the Corona Crisis", *International Journal of Entrepreneurial Behavior & Research*, 26(5), 1067-1092.

Lloyd-Jones, B. (2021), "Developing Competencies for Emotional, Instrumental, and Informational Student Support During the COVID-19 Pandemic: A Human Relations/Human Resource Development Approach", *Advances in Developing Human Resources*, 23(1), 41-54.

Maurer, R. (2020), "Job Interviews go Virtual in Response to COVID-19", *Society for Human Resources Management*, March 17.

Mercer (2020), *Covid-19 Salgınının Türkiye'de Çalışma Hayatı Üzerine Etkileri Anketi*, Nisan, <https://www.mercer.com.tr/rapor-makale-arastirma/nisan-covid19-anketi.html>, 14.01.2021.

Provino, J. (2020), "HR Should Not Waste the COVID-19 Crisis", *HR Future* May, 30-31.

Sayan, H. (2020), "COVİD-19 Pandemisi Sürecinde Öğretim Elemanlarının Uzaktan Eğitime İlişkin Görüşlerinin Değerlendirilmesi", *AJIT-e: Bilişim Teknolojileri Online Dergisi*, 11(42), 100-121.

Serinikli, N. (2021), "Covid 19 Salgın Sürecinde Örgütsel Değişim: Uzaktan/Evden Çalışma Modeli", *Fırat Üniversitesi Sosyal Bilimler Dergisi*, 31(1), 277-288.

Sines, D. (2020), "How Lean HR Teams Can Find Success Beyond COVID-19", *HR News Magazine*, November, 10-11.

Şen, E. & G.F. Batı (2020), "COVID-19 Pandemi Krizinin Yönetim ve Ekonomi Politik Üzerine Olası Etkileri", *Yönetim, Ekonomi ve Pazarlama Araştırmaları Dergisi*, 4(2), 71-84.

Şener, İ. & N. Abunasser (2020), "The Effect of Individual Antecedents on Work-Family Conflict: A Research on Employees Working from Home due to Covid-19 Pandemic", *İş ve İnsan Dergisi*, 7(2), 189-201.

WHO (2020), *WHO Director-General's opening remarks at the media briefing on COVID-19-11 March 2020*, <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>, 12.12.2020.

Yakut, E. vd. (2020), "Sağlık Personelinin Covid-19 Korkusu ile Tükenmişliği Arasındaki İlişkide Aşırı İş Yükü ve Algılanan Sosyal Desteğin Etkisinin Yapısal Eşitlik Modeliyle Belirlenmesi", *EKEV Akademi Dergisi*, 24(83), 241-262.

Yılmaz, B. (2020), "COVID-19 Pandemi Sürecinin Çalışanlar Üzerine Etkisi: Kamu Sektöründe Çalışanlar Üzerine Uygulamalı Bir Araştırma", *Üçüncü Sektör Sosyal Ekonomi Dergisi*, 55(3), 724-1740.

Sosyoekonomi

2021, Vol. 29(50), 277-297

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.13
Date Submitted: 25.05.2021
Date Revised: 01.10.2021
Date Accepted: 16.10.2021

COVID-19'un İktisadi Yaşama, Siyasi Alana ve Topluma Etkileri: Kapsamlı Bir Değerlendirme

Yıldırım YILDIRIM *(https://orcid.org/0000-0002-5851-7788), Düzce University, Turkey; yildirimyildirim@duzce.edu.tr*

The Effects of COVID-19 On Economic Life, Political Field, and Society: A Comprehensive Evaluation

Abstract

This study is conceptual and provides a comprehensive assessment of global public health that the whole world has been experiencing since March 2020. The study, in which what has happened in the past year is evaluated under three main headings: economic life, the political sphere, and social effects, offer some important insights to every stakeholder affected by the epidemic. Economic life has been examined under four sub-headings, and the reflection of the coronavirus on consumption, social media, online shopping, and service sector and economic indicators has been mentioned. In the political domain title, the responses of government policies in the people's eyes were evaluated, and the actions taken by countries in the international arena against this crisis were included. Sub-titles are discussed in depth under the title of social effects, social and psychological changes, corporate social responsibility practices, business ethics, and social life and flow. Although this global disaster is defined as a public health crisis, the wide-ranging effects of the epidemic should be addressed in all aspects, and proactive forms of communication should be adopted about its consequences. In this study, approximately 80 articles were examined, a review of the world literature on related topics was presented.

Keywords : COVID-19, Consumption, Service Sector, Business Ethics, Government Policies, Psychological Changes.

JEL Classification Codes : M31, H51, I1, E62.

Öz

Bu çalışma kavramsal nitelikte olup, Mart 2020 yılından beri tüm dünyanın yaşamakta olduğu küresel halk sağlığı ile ilgili kapsamlı bir değerlendirme sunmaktadır. Geçen bir yıl içinde olup bitenlerin iktisadi yaşam, siyasi alan ve toplumsal etkiler olmak üzere üç ana başlık altında değerlendirildiği çalışmada salgından etkilenen her paydaşa önemli bazı içgörüler sunmaktadır. İktisadi yaşam kendi içinde dört alt başlıkta incelenmiş olup, koronavirüsün tüketim, sosyal medya, çevrimiçi alışveriş ve hizmet sektörü ile ekonomik göstergelere olan yansımasına değinilmiştir. Siyasi alan başlığında hükümet politikalarının halk nezdindeki karşılıkları değerlendirilmiş, uluslararası arenada ülkelerin bu kriz karşısında aldıkları aksiyonlara yer verilmiştir. Toplumsal etkiler başlığında ise sosyal ve psikolojik değişimler, kurumsal sosyal sorumluluk uygulamaları, iş etiği ve sosyal hayat ve akış alt başlıkları derinlikle ele alınmıştır. Küresel olarak yaşanan bu felaket her ne kadar bir halk sağlığı krizi olarak tanımlansa da salgının geniş çaplı etkileri bütün yönleriyle ele alınmalı ve sonuçları hakkında proaktif iletişim biçimleri benimsenmelidir. Yaklaşık 80 makalenin incelendiği bu çalışmada ilgili başlıklara ilişkin dünya literatürünün de bir derlemesi sunulmuştur.

Anahtar Sözcükler : COVID-19, tüketim, hizmet sektörü, iş etiği, hükümet politikaları, psikolojik değişimler.

1. Giriş

2020 yılının Mart ayında tüm dünya genelinde pandemi olarak ilan edilen koronavirüs salgını bir yandan eşi görülmemiş ekonomik krizleri beraberinde getirirken, diğer yandan toplumsal ve sosyal dönüşüme neden olmuştur. Hem birey bazında hem de işletmeler ve ülkeler bazında herkesin her kurumun kendini değerlendirme ve dünya üzerindeki etkisini düşünebilme fırsatı veren bu salgın, düşünsel anlamda da birçok şeyi kökten değiştirmiş, değiştirmeye de devam etmektedir. Bulaş riskini azaltmak için hükümet düzeyinde alınan önlemler, uygulanan sokağa çıkma yasakları, sosyal mesafe ve izolasyon kuralları işletmelerin iş yapma biçimlerini etkilemiş, insanlar daha çok evde kaldıkça kendilerini keşfetme, yeni uğraşlar edinme ve zihinsel sorgulama fırsatı bulmuşlardır. Yapılan araştırmalarda sosyal medya kanallarında yemek tarifleri, spor ve egzersiz hareketleri, video/film aramalarının arttığı, yeni beceriler edinildiği, bulmaca çözme, maket yapma gibi hobilere başlandığı doğrulanmakta, öte yandan daha çok evde kalan insanların bazı psikolojik rahatsızlıklar yaşadığı, dışarı çıkamamanın verdiği yalnızlık duygusunu ağır şekilde yaşadığı görülmektedir.

COVID-19 salgınının ekonomik, toplumsal, sosyal etkileri araştırmacılar tarafından derhal ve hemen araştırma konusu olarak ele alınmış ve bu konuda sayısız makale yayımlanmıştır. Her ne kadar yaşanan olayın sağlık yönünün daha önemli olduğu vurgulansa da araştırmalar "Büyük Buhrandan" bu yana görülen en geniş kapsamlı etkiye sahip bu salgının hayatın pek çok yönünü doğrudan etkilediğini söylemektedir. Bu çalışma 2020 Mart - 2021 Mart tarihleri arasında dünyada ve Türkiye'de yaşanan değişimleri göstermekte, salgının birinci yıl dönümünde dünyanın hangi yöne doğru evrildiğine dair ipuçları sunmaktadır. Ayrıca çalışma iktisadi yaşam, sosyal alan ve toplumsal etki olmak üzere üç temel başlık etrafında şekillenmekte, ilgili başlıklar altında tüketici davranışları, sosyal medya, çevrimiçi alışveriş, hizmet sektörü, hükümet politikaları, uluslararası ilişkiler, ekonomik göstergeler, yalnızlık, sosyal hayat, sosyal sorumluluk ve iş etiği gibi on alt başlık derinlikle ele alınmaktadır. Kavramsal çalışmalar temel araştırmalar kapsamında olup, ileride yapılacak uygulamalı araştırmalara zemin hazırlamaktadır. Bu yüzden teorik çerçevede ele alınan çalışmaların dikkatlice okunması ve gelecekte yapılacak uygulama ve araştırmaların hangi yönde olacağının bilinmesi bakımından önem taşımaktadır.

2. İktisadi Yaşam

Aralık 2019'da başlayan, dünyada ise Mart 2020'de etkisini gösteren ve pandemi olarak ilan edilen koronavirüs - diğer adıyla COVID-19 - genel olarak halk sağlığı krizi olarak görülse de, en çok iktisadi yaşamı etkilediği ve ekonomik piyasalar üzerinde olumsuz etkilerinin olduğu bir gerçektir. Sektör ayırt etmeksizin bütün yaşamı etkisi altına alan bu salgının daha önceki salgınlarla karşılaştırıldığında etkisinin daha geniş, sonuçlarının ise daha ağır olduğu önceki çalışmalar tarafından vurgulanmaktadır. Bu başlık altında iktisadi yaşamın bir parçası olan tüketim, tüketici davranışları, sosyal medya ve çevrimiçi alışveriş, hizmet sektörü ele alınacak olup, ilgili alanlara dair ekonomik göstergeler rakam ve istatistiklerle ortaya konulmaya çalışılacaktır.

2.1. Tüketim ve Tüketici Davranışları

COVID-19'un dünya genelinde pandemi olarak ilan edildiği günden bu yana hızlıca yapılan araştırmalarda tüketici davranışlarının etkilendiği (Pantano vd., 2020; Sheu & Kuo, 2020) ve tüketicilerin afet ve kriz anlarında sıklıkla stok yapma, istifleme, panik satın alma eğiliminde (Wang vd., 2020; Loxton vd., 2020; He & Harris, 2020; Prentice, Chen & Stantic, 2020; Chronopoulos, Lukas & Wilson, 2020; Patil & Patil, 2020) oldukları vurgulanmaktadır. Tüketimdeki bu değişiklikler hem tüketici talebindeki hem de arz bulunabilirliğindeki değişimler arasında meydana gelen karşılıklı etkileşimin bir sonucudur. Örneğin Mart 2020'deki işlem sayısı 2019'a kıyasla çoğu perakende türü için azalırken, işlem değerinde aynı değişim yaşanmamıştır. İşlemlerin sayısındaki azalma ile birlikte işlemlerin değerindeki artış, tüketicilerin toplu olarak satın aldığını ve sık alışveriş yapma ihtiyacını sınırladığını göstermektedir (Hall vd., 2020; Watanabe & Omori, 2020). Bu davranış biçimi yalnızca yaklaşan sağlık krizi ve olası karantinaya alınma riskinin bir sonucu değil aynı zamanda fabrikaların üretimi durdurması ve tedarik zincirlerinin küresel olarak kesintiye uğraması endişesi ile (Baker vd., 2020; Laato, Islam, Farooq & Dhir, 2020), krize verilen psikolojik bir tepkinin sonucudur (Arafat vd., 2020; Akhtar vd., 2020; Prentice, Chen & Stantic, 2020). İnsanlar temel ihtiyaç olan mallar konusunda kıtlık yaşanacağını veya fiyatların artış gösterebileceğini önceden tahmin ettiler, bu yüzden marketlerdeki rafları boşaltırcasına satın almada bulundular (Yuen vd., 2020; Wang vd., 2020; Patil & Patil, 2020). Virüsün yayılmaya başladığı ilk zamanlarda çocuklu ailelerin daha fazla, erkeklerin ise daha az stok yaptıkları görülmüştür (Baker vd., 2020). Korku, belirsizlik, öfke, hayatta kalma, kaygı ve kişisel çıkar gibi duygularla yönlendirilen satın alma kararları birçok afet ve kriz anında plansız, mantık dışı ve içgüdüsel olabilmektedir (He & Harris, 2020). Bazı araştırmacılar bu satın almaları "olağan dışı" ve "alışılmadık" şeklinde ifade etmektedir (Laato vd., 2020).

İhtiyaçtan fazlasının satın alındığı "stoklama davranışının" temelde üç psikolojik dayanağı olduğu belirtilmektedir. Birincisi tüketicilerin ölümcül ve yüksek risk taşıyan felaketleri kontrolsüz olarak tanımlamaları ve kaybettikleri kontrolü geri almak istemeleridir (Arafat vd., 2020). Tüketiciler alternatif ve seçim bolluğundan bir anda seçim özgürlüğünün kısıtlandığı ve ürün kıtlığının yaşandığı bir döneme geçiş yaptılar. Ekonomik, sosyal ve politik istikrarsızlık bağlamında tüketici, "çevresi üzerinde kontrol kaybı" olarak hissedilen sistematik bir strese maruz kaldı (Botti & McGill, 2011) ve dolayısıyla bu durum onun çevrimdışı alıverişte kontrolü kaybetmesine neden oldu. İkincisi bireyin alışılmadık sonuçları olan riskleri bilinmeyen/belirsiz olarak görmesi (Yuen vd., 2020) ve son olarak ise bu kontrolsüz ve bilinmez olarak algılanan risklere bireyin maruz kalma düzeyiyle ilgili olarak korku duyması, afetler ve tercihler arasındaki bağın arkasındaki duygusal kanala başvurmasıdır (Akhtar vd., 2020; Wang vd., 2020). Tüketici bu korku dolu, stresli ve bilinmez olaylar dizisi karşısında ya kendisine rahatlık sağlayacak kaynakları elde etmek için para biriktirecek ya da gerekli gördüğü ürünleri satın alırken dürtüsel bir davranış sergileyecekti (Durante & Laran, 2016). Aksi halde ne zaman sona ereceğinden emin olamadığı bu istikrarsız ve güvensiz olarak algılanan felaketle başa çıkmak için gerekli

gördüğü ürünleri alamaması kendisinde pişmanlık duygusunu oluşturacaktı (Arafat vd., 2020).

Yapılan bir çalışmada tüketicilere neden gıda stokladıkları sorulmuş ve gıda stoklamalarının arkasındaki motivasyonlar öğrenilmeye çalışılmıştır. Araştırma sonucuna göre tüketicilerin stoklama motivasyonları arasında; daha az dışarı çıkma, çekecekleri kıtlığı önlemek, gıda fiyatlarının yükselişine karşı mücadele etmek ve kolaylık arayışı olduğu bulunmuştur (Wang vd., 2020).

Pandemiye yönelik uygulanan hükümet politikaları ve kısıtlamaların duyurulduğu zamanlar ile bu satın almalar arasında doğrusal bir ilişki olduğunu kanıtlayan çalışmalara rastlanılmaktadır. Yani bazı araştırmalar nedensel bir ilişki olduğunu iddia etmenin ihtiyatlı olduğunu söylese de bulgular hükümet önlemlerinin zamanlaması ile panik satın alma arasında bir bağlantı olduğunu ortaya koymakta ve bunu gerçek yaşamdan kanıtlar ile tartışmaktadır (Prentice, Chen & Stantic, 2020). Yani COVID-19 vakaları artıkça ve hükümetin sıkılaştırdığı dışarıya çıkma yasakları daha sert bir hale geldiğinde tüketici/hane halkı harcamalarında artış olduğu öne sürülmektedir (Baker vd., 2020, Chronopoulos, Lukas & Wilson, 2020). Bu durum yapılan başka bir araştırmanın sonuçlarıyla da tutarlı görünmektedir. Katılımcıların %99,66'sı satın alma davranışlarının kısıtlamalardan etkilendiğini kabul etmiştir (Patil & Patil, 2020).

Afetler ve kriz anlarında tüketimin zaman ve mekân değişimini konu alan çalışma, tüketicilerin deprem, salgın hastalık, terör olayları gibi durumlarda harcamalarını bulundukları yerden başka bir yere taşıdıklarını, daha seyrek fakat daha fazla satın aldıklarını ortaya koymaktadır (Hall vd., 2020). Yine benzer bir araştırma, alışveriş sıklığında azalma olduğunu ancak normal zamanlara göre miktar olarak daha fazla satın alım yapıldığını, buna karşılık alışveriş konumunda değişiklik olmadığını ortaya koymaktadır. Aynı araştırmada makarna ve sebzeler sağlık motivasyonları nedeniyle en çok satın alınan ürünler olurken, peynir, çikolata ve fındık türevleri ruh hallerini iyileştirmek için satın alındığı görülmüştür (Laguna vd., 2020).

Belirli ürün kategorilerinde gözle görülür artış meydana gelirken, bazı ürünlerin satışında aynı oranda artış gerçekleşmemiştir. Örneğin, temel ihtiyaç malzemeleri (pirinç, makarna, süt, et ve tavuk ürünleri vs.) en çok stoklanan ürün grupları arasındadır (Donthu & Gustafsson, 2020). Tüketimin yalnızca gıda boyutunda değil enerji kullanımında da değiştiği bilinmektedir. Ev içi elektrik kullanım miktarının arttığı, özellikle uzun süreli sokağa çıkma yasaklarının olduğu dönemlerde bu enerji tüketimlerinin arttığı gözlemlenmektedir. Kısıtlama dönemlerinde hafta içi elektrik kullanımının pandemi öncesi hafta sonu elektrik kullanımına yaklaştığı belirtilmektedir (Chen, de Rubens, Xu & Li, 2020).

2.2. Sosyal Medya ve Çevrimiçi Alışveriş

Hükümet tarafından uygulanan ve literatürde ilaç dışı müdahaleler (NPI - non-pharmaceutical interventions) olarak betimlenen kısıtlamalar, sosyal izolasyon, sokağa

çıkma yasakları (Gössling, Scott & Hall, 2020) insanların daha fazla sosyal medya ve internette vakit geçirmelerine neden olmuştur (Donthu & Gustafsson, 2020). Yeni koronavirüs enfeksiyonlarının yayılması özellikle yüz yüze teması içeren hizmetlere olan talebi keskin bir şekilde azaltırken, mobil uygulamalar ve e-ticaret gibi çevrimiçi mal ve hizmet talebini artırmaktadır (Hasanat vd., 2020). Çevrimiçi alışverişin sunduğu daha az taşıma maliyeti, karşılaştırma yapma imkânı ile zamandan tasarruf bu artışın ardındaki önemli nedenler arasındadır (Watanabe & Omori, 2020).

COVID-19 ve yemekle ilgili olarak insanların internet aramalarının, en çok izlenen YouTube videoların özelliklerinin ve Tweet gönderilen mesajların incelendiği bir araştırmada dönemsel olarak belirgin farkların olduğu gözlemlenmiştir. Buna göre internette "restoran" ve "tarif" kelime aramalarının popülerliği Ocak ve Şubat aylarında nispeten popülerken, 13 Marttan sonra "restoran" aramalarının büyük ölçüde azaldığı, 24 Marttan sonra ise yılın başına kıyasla üç kat daha düşük olduğu görülmüştür. Buna karşılık internette "yemek tarifi" ve "teslimat" aramaları Mart ve Nisan aylarında büyük bir artış göstermiştir (Laguna vd., 2020).

Tüketici davranışında bilginin rolünü anlamaya yönelik yapılan bir çalışmada çevrimiçi bilgi kaynaklarına maruz kalmanın, artan bilgi yüklemesine ve siberkondriye yol açtığı sonucuna varılmıştır. Büyük bir hızla artış gösteren koronavirüs salgını, tüm basılı ve görsel medya ile sosyal medyada tüketicilere mesaj bombardımanı şeklinde sunuldu. Birden fazla bilgi kaynağına maruz kalan tüketiciler aşırı olarak bilgi yüklendiler, bu durum siberkondrinin artmasına, artan siberkondri ise olağan dışı satın alım yapmaya ve kişinin kendi kendini izole etmesine neden oldu (Laato vd., 2020). Virüsün kendisi kadar salgın hakkındaki bilgiler ve yanlış bilgilerde hızla yayıldı, bu da halk arasında yaşanan paniğin artmasına neden oldu. Hatta sosyal medya paniğinin COVID-19'un yayılma hızından daha yüksek olduğu belirtilmektedir (Depoux vd., 2020). Halk sağlığı müdahalesini desteklemek için sosyal medya kullanılabilir ve kullanılmalıdır da. Örneğin, Çin'de toplum çapında büyük karantina sırasında, sosyal medyanın karantina nedenlerini iletme, söylentileri ve paniği önceden önlemek için güvence veren ve pratik tavsiyeler sunma fırsatı sağladığı için sosyal medyayı akıllıca kullanmak özellikle önemlidir. Hatta dijital teknolojiler, toplu karantina sırasında sosyal mesafe kısıtlamalarının üstesinden gelebilir ve kısıtlama zamanlarında kişilere zihinsel sağlık destek kaynakları ve dayanışma sağlayabilir (Saltzman, Hansel & Bordnick, 2020; Loades vd., 2020). Bu anlamda kitlesel panikle ancak bilgi yoluyla baş edilebilir fakat bilginin kontrollü yayılımı, yanlış bilgilerin doğrulardan arındırılması halkı güçlendirmeye yönelik çabaları artıracak ve halk sağlığı önlemlerinin ciddiye alınmasını sağlayacaktır (Depoux vd., 2020).

Bilgi çağında kitle iletişim araçları, kamuoyunu şekillendirmede ve yönlendirmede çok önemli bir rol oynar (Yang vd., 2019) ancak bu bilgi çağında, devam eden koronavirüs (COVID-19) salgını gibi salgınlar, medya çılgınlığına dönüşmekte ve medya kuruluşlarında güncellenmiş "son dakika" haberler tüketici davranışlarında olduğu kadar finansal piyasalarda ve yatırımcılar üzerinde de paniğe ve belirsizliğe neden olmaktadır (Haroon & Rizvi, 2020). Gerçekten de Kilgo ve arkadaşları (2019) ortaya çıkan krizlerde, medyanın

ağırlıklı olarak korkuyu kışkırtarak, haberlerin daha fazla dikkat çeken yönlerini vurgulayarak orantısız miktarda kaygıya katkıda bulunduğunu bildirmektedir.

2.3. Hizmet Sektörü

Koronavirüs birçok araştırmacı tarafından Büyük Buhrandan bu yana eşi görülmemiş, küresel etkisi olan bir kriz olarak tanımlansa da (Gössling, Scott & Hall, 2020; Georgieva, 2020; Donthu & Gustafsson, 2020; He & Harris, 2020; Laato vd., 2020) aynı zamanda işletmelere kendilerini revize etmede ve iş modellerini değiştirmede büyük fırsatlar sunmaktadır (Hall vd., 2020; Sigala, 2020). Bu salgından en fazla etkilenen sektörlerin turizm ve konaklama, ulaşım, eğlence gibi hizmet ağırlıklı sektörlerdir (Wang vd., 2020). Bilhassa otel ve seyahat endüstrisi küresel felaketlere karşı en hassas ve en savunmasız sektörler arasındadır (Jiang & Wen, 2020). Tüketici harcamalarındaki en büyük kesintiler bu sektörlerde meydana gelmektedir. Yine de geçmişte yaşanmış salgın hastalık, terör olayları, ekonomik krizler gibi felaketler turizm sektörünü dirençli hale getirmiştir. Bununla birlikte, COVID-19'un doğası, benzeri görülmemiş koşulları ve etkileri, bu krizin yalnızca farklı olmadığını, aynı zamanda sosyo-ekonomik faaliyet ve endüstri olarak turizmde köklü, uzun vadeli yapısal ve dönüşümsel değişikliklere neden olabileceğinin işaretlerini göstermektedir (Sigala, 2020). Her ne kadar literatürde koronavirüsten sonra seyahat faaliyetlerinin nasıl olacağına dair bazı spekülatif söylemler olsa da genel inanç COVID-19'un turizm sektörü için farklı ve dönüştürücü olacağı ve turizmin önceki krizlerde olduğu gibi toparlanacağı yönündedir (Gössling, Scott & Hall, 2020).

Ancak akademik araştırmalarda sorulan temel soru şudur: salgından sonra insanlar evlerinden çıkıp özledikleri yerleri ziyaret etmek, seyahat etmek ve dışarıda yemek yemek için sabırsızlanacak ve sonucunda tüketimde büyük bir artış mı meydana gelecek yoksa insanlar sorumlu ve sürdürülebilir tüketime doğru yönelip, bir sonraki seyahat için rezervasyon yapmadan önce bu seyahatin gerekli olup olmadığı ve yerel alternatiflerin neler olduğunu mu düşünecek? (He & Harris, 2020). Cevabı önceden kestirmek zor fakat bazı tahminler yapılmakta ve akademide farklı görüşler ortaya atılmaktadır. En başta hükümetlerin pandemi sonrası "aşırı turizm talebinin" önüne geçilmesi konusunda önlemler alması gerektiği vurgulanmaktadır (Bobylev, 2020). COVID-19 ve turizm ilişkisini ele alan çalışmalar krizlerin etkin olduğu bu tür dönüşümler konusunda paydaşları bilgilendirme, teşvik etme hatta yönetme konusunda öncülük etmelidir aksi halde krizleri birbiri ardına yaşamamız kaçınılmaz olacaktır (Lew, 2020).

Turizm ve krizlerle ilgili iki temel görüş bulunmaktadır. Bunlardan birincisi bireysel düzeyde algılanan risk (talep tarafında gerçekleşir), diğeri ise kolektif kriz yönetimidir (arz tarafında gerçekleşir). Turizmin, ortaya çıkan bu türden salgın hastalıkların yayılmasını artırıcı etkisi vardır. Turistler hastalığın çok olduğu bölgelerden kaçınma ve hastalığın olmadığı yerlere doğru seyahat etme eğilimindedir (Qiu vd., 2020). Ancak yine de salgın dönemlerinde bölge halkının turizme olan olumsuz bakış açısının değiştiğini, turizmin sosyal maliyetlerini karşılamak için bölge sakinlerinin gönüllü harcamalarda bulundukları da söylenebilir (Qiu vd., 2020). Çünkü alınan önlemler neticesinde bütün iş yerleri

kapanmış, halkın gelir kaynakları kesintiye uğramış durumdadır. Şehirlerarası giriş çıkışların dahi kontrol edildiği dönemlerde bölge sakinlerinin kendi aralarında alışveriş yaparak pandeminin sosyal maliyetlerini karşılamaları hem işletmeleri hem de o işletmede çalışan insanların hayatta kalma şanslarını artırmaktadır.

Turizm ve otelcilik endüstrisinin ortaya çıkan salgın hastalık durumlarında yapay zekâ, büyük veri ve veri analitiği ile robotik sistemler gibi teknolojik araçlardan yararlanmasının özellikle yüksek teması gerektiren ortamlarda misafirlerin ve ön saflardaki hizmet çalışanlarının korunmasına yardımcı olabileceği vurgulanmaktadır. Hijyen ve temizlik kurallarının uygulanması ile ilgili olarak hem paydaşlardan hem de otelde konaklayan misafirlerden veri toplanmasında büyük verinin kullanılmasının önemine dikkat çekilmektedir. (Jiang & Wen, 2020; Mariani & Perez-Vega, 2020). Teknolojiler her zaman bir kolaylaştırıcı, yenilik ve değişimin katalizörü ve krizde turizme dayanıklılık oluşturmak için bir araç olmuştur (Hall vd., 2017). Bu yüzden de COVID-19'un etkisini azaltmada ve salgınla mücadelede Endüstri 4.0 araçları bir yol haritası olarak önerilmektedir. Üstelik yalnızca turizm ve otelcilik endüstrisi değil aynı zamanda perakendecilik sektöründe de yapay zekâ ve nesnelerin interneti gibi araçların kullanımı perakendecilerin karşılaştığı kapasite azlığı ve talep fazlalığı gibi sorunlarının üstesinden gelmede faydalı olacaktır (Kumar vd., 2020). COVID-19 salgını sırasında perakendecilerin karşılaştığı operasyonel zorlukları belirlemeyi amaçlayan bir makalede geniş bir literatür taraması yapılmış ve bu sağlık krizi sırasında perakendecilerin karşılaştığı 12 önemli sorun ortaya konulmuştur (Kumar vd. 2020):

- Esnek olmayan tedarik zinciri
- Devlet desteği ve teşvik eksikliği
- Tedarik zinciri oyuncuları arasındaki güvensizlik
- Koordinasyon ve bilgi alışverişi sorunları
- Zayıf altyapı
- Personel ve malzeme güvenliğinin sağlanamaması
- Temel malzemelerin tedarikinde gecikme
- İnsan gücünde azalma
- Arz ve talep dengesizliği
- Çalışanların güvenliği
- Perakendeci ve tüketici arasında oluşan güven eksikliği
- Dağıtım ve taşıma yeteneğinde azalma

2.4. Ekonomik Göstergeler

COVID-19 ile ilgili betimlemelerden biri 2008 küresel ekonomik krizinden çok daha geniş çaplı ve olumsuz etkilerinin olduğu yönündedir (Shehzad, Xiaoxing & Kazouz, 2020). Bazı yazarlar ise bu salgını son 100 yılda iş dünyasının ve hükümetin karşılaştığı en önemli savaş hali dışındaki zorluklardan biri olarak tanımlamakta (Hall vd., 2020), sonuçlarının

emsalsiz olmasından dolayı insanların nasıl davranacakları konusunda referans alacakları net bir geçmiş deneyimin olmadığını belirtmektedir (Laato vd., 2020).

Uluslararası çevrimiçi perakende alışverişin geçen yılın aynı ayına göre %18 azaldığını ortaya koyan çalışmalar vardır. Bunun nedeni uluslararası taşımacılık ve nakliye hizmetlerine olan güvenin azalması olarak belirtilmektedir (Hall vd., 2020). Ayrıca yönetim merkezi 82 farklı ülkede bulunan 12 bini aşkın işletme üzerinde yapılan araştırma sonucunda, işletmeler 2020'nin ilk çeyreğinde COVID-19'un yayılmasıyla talepte düşüş, maliyetlerinde artış, tedarik zincirlerinde ise aksaklıklar yaşadıklarını, bu yüzden çalışanlarını işten çıkarma endişesi taşıdıklarını belirtmiştir (Hassan vd., 2020). COVID-19'un 26 ülkede borsada işlem gören firmaların likiditesi üzerindeki olası etkisini bir dizi senaryo aracılığıyla araştıran başka bir çalışmada ise firmaların likiditesinin satışlarda %25, %50 ve %75'lik bir düşüşe ne ölçüde dayanabileceği değerlendirilmektedir. Sonuca göre işletmelerin üçte birinin altı aydan daha kısa sürede iflas edebileceği, satışları %75 oranında düşen bir işletmenin ise en fazla 12 ay dayanabileceği ortaya konulmuştur (de Vito & Gomez, 2020).

Ekonomik büyüme hızı geçmişte olduğu gibi bugün de bu tarz salgın hastalıklarda azalma eğilimi göstermektedir çünkü insanlar salgın durumlarında daha az yatırım yapmakla ilgilenirken daha çok parayı ellerinde tutmayı istemektedirler (Donthu & Gustafsson, 2020). COVID-19'un yayılmasının bir sonucu olarak görülen bu durum başka bir çalışma ile de desteklenmektedir. COVID-19 vakalarının yüksek olduğu coğrafi bölgelerde ve fiziksel yakınlığın gerekli olduğu endüstrilerde yüksek gelirli bireylerin harcamalarını azalttığı bulunmuştur (Chetty vd., 2020). Dünyanın ekonomik yönden büyümesi, liberalleşme, özelleştirme ve küreselleşme düzeyine bağlıdır. Bunun dışında ekonomik büyüme, doğal kaynakların optimum kullanımı, yatırılan fonlar, insan gücü, üretimde kullanılan teknoloji ve tüketim düzeyi ile orantılıdır (Patil & Patil, 2020). Yaşanan pandeminin yatırımcılarda panik yarattığı ve dünya çapındaki finansal piyasalarda dalgalanmalara neden olduğu bir gerçektir (Haroon & Rizvi, 2020). Başka bir çalışmada sosyal girişimcilik (kâr amacı gütmeyen ve sosyal misyonlar için faaliyet gösteren sosyal girişimlere yatırım) fonlarının küresel ve finansal stres dönemlerinde yatırımcılar için güvenli bir yatırım alternatifi olduğu ortaya çıkmıştır (Mirza vd., 2020). COVID-19'un S&P 500'ün hisse senedi getirileri üzerinde ve ayrıca ABD, Almanya, İtalya, Çin ve Japonya borsalarının değişkenlikleri üzerinde önemli ve zararlı etkileri olduğu kanıtlanmıştır. İlaveten Avrupa ve ABD pazarlarının, Asya pazarlarına kıyasla COVID-19'dan daha fazla etkilendiği ortaya çıkmıştır. Bu da Asya piyasalarının finansal riski çeşitlendirmek için hala daha iyi fırsatlar sunduğunu göstermektedir (Shehzad, Xiaoxing & Kazouz, 2020). Başka bir çalışmada 2008 yılından bu yana meydana gelen salgın hastalıkların borsalar üzerindeki etkisi araştırılmış ve bu hastalıkların küresel ölçekte nispeten düşük bir ekonomik etkiye sahip olduğunu, yalnızca COVID-19'un küresel piyasalar üzerinde 30 günden daha uzun süreli olumsuz etkisinin olduğu ortaya konulmuştur (Schell, Wang & Huynh, 2020).

İşsizlikte en büyük artışların görüldüğü alanlar müşterinin fiziksel varlığını gerektiren ve doğası gereği hedonik olan turizm, eğlence ve konaklama hizmetleridir

(Donthu & Gustafsson, 2020). Yeme-içme, giyim, eğlence ve kişisel hizmetlere yönelik harcamaların azalması (Carvalho vd., 2020) bu sektörlerdeki mali baskıyı artırmış ve en çok işten çıkarmalar bu sektörlerde olmuştur. Adams-Prassl vd. (2020) yaptıkları araştırma istihdamdaki düşüşü rakamlarla ortaya koymaktadır. Buna göre çalışanların %57'si daha düşük ücretle iş buldukları, %8'inin işini kaybettiği ancak %33'ünün potansiyel olarak işini kaybetme ihtimalinin olduğu, %35'inin gelecek aylarda daha az kazanmayı beklediği ve %49'unun ise yüksek faturaların kendileri için bir sorun teşkil edeceğini belirttiği bulunmuştur.

3. Siyasal Alan

Ortaya çıkan yeni koronavirüs, ülkeleri ve devletleri büyük ve sonuçları belirsiz kararların eşiğine getirmiş, bu kararlar halkın genelinde hoşnutlukla karşılanmamış, bazı eleştirilere ve hükümet protestolarına neden olmuştur. "Evde kal" çağrıları, hafta sonu yasakları, işyeri kapanışları, sosyal mesafe kuralları her ne kadar virüsün yayılmasını engellemede büyük yararlar sağlasa da insanların yaşam biçimlerinde meydana gelen değişimler, halk sağlığı adına alınan bu kararların sorgulanmasına neden olmuştur. Uluslararası ilişkileri yeniden revize eden bu salgın krizi, ülkelerin diplomatik ilişkilerini, ülke vatandaşlarını ve iktidar güçlerini etkisi altına almıştır. Bu başlık altında hükümet politikaları ile bu politikaların olası sonuçları ele alınmakta, uluslararası ilişkiler bağlamında yaşananlara değinilmektedir.

3.1. Hükümet Politikaları

Toplumların temel ilkesi güvenlikten çok verimlilik ve ekonomik refaha dayanmaktadır. Bu yüzden salgın durumlarında birçok hükümetin hazırlıksız olduğu, önlemlerin alınmasında ve ihtiyaç duyulan gıda, enerji, tıbbi malzemelerin temininde yetersiz kaldığı açıkça söylenebilir (Donthu & Gustafsson, 2020). Yirmibirinci yüzyılda bile pandemiyle savaşacak araçların olmaması, aşı ve tedavi yöntemlerinin bulunmayışı hükümetleri salgını kontrol altına almada bazı uygulamalara yöneltmekte, bunun da ekonomik çok ağır sonuçları olabilmektedir (Gössling, Scott & Hall, 2020).

Ekonomik zorlukların yanı sıra ülkelerin ırkçı yaklaşımları hükümetlere siyasi açıdan baskı yapmaktadır. Bazı medya kanallarının ve ABD eski başkanı Trump'ın COVID-19'u "Çin virüsü" şeklinde tanımlaması Çinli vatandaşlara karşı ayrımcılığı kışkırttı. "*Çin, Asya'nın gerçek hasta adamıdır*" ve "*Çin çocukları evde kalıyor*" gibi ırkla ilgili diğer manşetler, basının yerel halkı yanlış yönlendirmesine ve gelecekte Çin'den gelecek potansiyel turist sayısının azalmasına neden olmaktadır (Wen vd., 2020). Bu anlamda hem merkezi yönetimin hem de yerel yönetimlerin İstanbul, Ankara, Antalya gibi önemli turizm destinasyonları sayılan büyük şehirlerde uygulanacak kamu politikalarını paydaşları da dikkate alarak belirlemelidir.

COVID-19'un yayılmasını sınırlamaya yönelik kamu politikası müdahalelerinin İngiltere (Lenoël & Young, 2020), ABD (Bartik vd., 2020; Haroon & Rizvi, 2020) gibi

ülkelerin GSMH, istihdam ile büyüme oranlarında ve ekonomilerinde ciddi daralmalar olduğunu ortaya koymaktadır. Ayrıca Almanya, İtalya, Çin ve Japonya borsalarındaki dalgalanmalar (Shehzad, Xiaoxing & Kazouz, 2020), geçmişteki halk sağlığı ile ilgili krizlerde olduğu gibi finansal piyasaların hassas ve aşırı duyarlı tepkiler verdiğini (Mirza, Naqvi & Rahat, 2020) ve büyük bir belirsizlik oluşturduğunu (Schell, Wang & Huynh, 2020) göstermektedir. Hükümetlerin karşı karşıya olduğu politika seçimi, genellikle hayat kurtarmakla ekonomiyi kurtarmak arasında basit bir değiş tokuş olarak tasvir edilir. İnsan hayatını kurtarmak en yüksek önceliğe sahipken, hükümetin zorunlu olarak uyguladığı kısıtlama politikalarının ve sosyal mesafenin benimsenmesinin küresel ekonomi üzerinde muazzam etkileri vardır (Schell, Wang & Huynh, 2020). Bu mantıkla, daha şiddetli kısıtlamalarla virüsü kontrol altına alma çabaları ölüm sayısını azaltmaya yardımcı olur ancak daha fazla hane harcamalarını kestikçe, daha fazla işletme iflas ettikçe ve daha fazla işçi işini kaybettikçe daha fazla ekonomik sıkıntıya neden olur (Andersen, Hansen, Johannesen & Sheridan, 2020). Çünkü koronavirüsün etkisi makroekonomik düzeyde kendini göstermektedir. Pandemi başlangıcının Çin'in Wuhan kentinde olması ve Çin'in birçok ülke için üretim merkezi sayılması, Çin'in üretimindeki herhangi bir aksaklığın basitçe tüm dünyada ekonomik küresel etki yaratmasına hem çevrimiçi hem de çevrimdışı ticaretin kesintiye uğramasına neden olmuştur (Hasanat vd., 2020: 85).

Vatandaşların - özelde tüketicilerin - hükümet politikalarına olan inançları, onların hareket özgürlükleri ile alışveriş özgürlüklerine yönelik uygulanan kısıtlamalara ait psikolojik tepkilerini ılımlaştırmaktadır. Tüketicilerin hükümet politikalarına olan güvenleri, alınan kararlara yönelik yüksek umutları ve beklentileri ile psikolojik tepkileri, bu türden salgın hastalıklarda direnci artırmakta ve hükümete olan olumlu düşüncelerin geliştirilmesinde rol oynamaktadır (Akhtar vd., 2020). ABD'de yapılan bir ankette tecrit altındaki anket katılımcılarının diğer katılımcılara göre başkana desteklerinin 6 puan azaldığını ortaya çıkarmıştır. Ekonomik zorlukların ve zor zamanların tıpkı bir savaş gibi adlandırılması, dolayısıyla da hükümete olan güvenin azalması beklenen bir durumdur (Coibion, Gorodnichenko & Weber, 2020). Küresel pandemilerin uzun vadede yıkıcı sosyal, politik ve kültürel etkileri vardır ve bu etkiler spekülatif söylemler tarafından şekillendirilir. Gerçek insan yaşamının kapsamlı bir şekilde değiştirilmesini ve şimdi olduğundan başka bir gelişme düzeyine geçmesi gerektiğini öngörür (Stanciu vd., 2020). Tıpkı 1942'deki savaş felaketini gözlemleyen Rus-Alman sosyoloğu Pitirim Sorokin'in "*toplumun, felaketlerden sonra önceki haline dönemeyeceğini"* söylemesi gibi, yaşanan bu salgın felaketinin de sosyal organizasyonları ve kurumları bozacağı ve dönüştüreceği, sosyal süreçleri katalize edeceği düşünülmektedir (Cohen, 2020).

Uygulanan hükümet politikaları finansal refaha ağır bir darbe vururken öte yandan üretim ve gelirde düşüşe, borçta, işsizlikte ve ipoteklerde artışa neden olmaktadır (Bobylev, 2020; Laato vd., 2020). Yasa dışı üretim ve kaçak avlanma, kaçak tüketim, ırkçılık, kitlelerin ruhsal dengesizlikleri, ekonomik eşitsizlik gibi çok çeşitli sorunlarla baş etmeye çalışan devlet, mali yaşam standardını yeniden sağlayabilmek veya en düşük yaşam standardını bile koruyabilmek için nakit akışlarını hızlandırmak zorundadır (Bobylev, 2020). COVID-19'un biyolojik bir virüs bulaşmasından bir finansal kriz bulaşmasına evrildiğini ve son

zamanlarda eski finansal rekabet gücü yeniden inşa etmek için ekonomik yönden savaş verildiğini belirten Sigala (2020), çalışmasında konuyu araştırma, eğitim, sosyoekonomik ve politik sistem bakımından bütüncül olarak ele almaktadır.

Yapılan araştırmalar uzun tecrit dönemlerini yaşayan insanların önümüzdeki on iki ayda işsizlik oranını %13 artıracağı ve üç ila beş yıllık zamanda daha yüksek işsizlikle karşılaşabileceklerini göstermektedir. Ayrıca, gelecekte daha düşük enflasyon beklentisi, daha yüksek belirsizlik ve 10 yıla kadar konut kredisine ilişkin daha düşük faiz oranları beklenmektedir (Coibion, Gorodnichenko & Weber, 2020). Benzer bir çalışmada koşullar izin verdiğinde ve normale dönüldüğünde ülkelerin merkez bankaları bizleri dışarı çıkarmaya teşvik etmek ve arabalara binip yeniden hayatımıza dönmemiz için faiz oranlarını düşürecekleri belirtilmektedir (Cohen, 2020).

COVID-19 salgını dolayısıyla bazı hükümetlerin anti-demokratik uygulamaları yürürlüğe soktukları, iktidar siyasetçilerinin bu durumdan yararlanarak devlet üzerindeki kontrollerini artırdıkları, karşıt görüşleri bastırarak demokratik sistemleri tehlikeye attıkları iddia edilmektedir. Örneğin "korona" kelimesinin kullanımını yasaklayan Türkmenistan ve Viktor Orban'ın süresiz olarak hüküm sürmesine izin veren Macaristan'dır (Donthu & Gustafsson, 2020).

3.2. Uluslararası İlişkiler

Çin'den yayılan koronavirüs hastalığının pandemi olarak ilan edilmesinden sonra Yeni Zelanda - 19 Mart (Hall vd., 2020), İspanya - 14 Mart (Laguna vd., 2020), Avustralya - 13 Mart (Prentice, Chen & Stantic, 2020) gibi birçok ülke olağanüstü hal ilan edip, sınır kapılarını Çinli vatandaşlara kapattı veyahut denizaşırı seyahat engeli koydu. Hatta Japonya, ABD, Avustralya ve Fransa'daki yolcu gemilerinde bulunan insanlarda artış gösteren COVID-19 enfeksiyonları birçok ülkenin yolcu gemilerinin limanlarına yanaşmasını yasaklamasına neden oldu (Al Jazeera, 2020). Buna rağmen 27 Mart itibarıyla 199 farklı ülke veya bölgede 465.915 doğrulanmış COVID-19 vakası vardı ve virüsün neden olduğu 21.031 doğrudan ölüm gerçekleşmişti (WHO, 2020).

Bazı yetkililer, virüsü taşıyabilecekleri için diğer ülkelerdeki insanların tehlikeli olduğunu ima ettiler. Kapalı bir sınır, tehdidin dışarıdan geldiği anlamına gelir. Ayrıca, uluslararası uçuşlar önümüzdeki yıllarda pek çok kişi için belki de bir seçenek olmayacak. Bu koşullar ile birlikte, ülkelerin bundan sonraki süreçte daha milliyetçi ve daha az düzeyde küresel bir görünüm sergileyecekleri düşünülebilir (Donthu & Gustafsson, 2020).

Pandeminin biyolojik bir silah olduğunu düşünenler, bunun ulusların güvenliğini tehdit eden örtük bir savaş olduğuna inananlar muhakkak ki bazı ülke insanlarına karşı milliyetçi bir tavır takınacaklardır. Ayrıca ülkelerin birbirine gönderdikleri tıbbi ekipman ile temizlik ve hijyen malzemelerinin yağmalanması, giden tırların/araçların durdurulması diplomatik bazı krizlere neden olacaktır. Tam tersi olarak komşuluk ilişkileri gelişmiş

ülkelerin birbirine daha çok yardım etmesi, ihtiyaç duyulan tıbbi ekipman ve hijyen malzemelerini göndermesi de diplomatik ilişkileri kuvvetlendirecektir.

4. Toplumsal Etkiler

2019 yılının Aralık ayında Çin'de ortaya çıkan, sonrasında ise 2020 yılının ilk çeyreğinde tüm dünyaya yayılan koronavirüs hakkında ortaya çıktığı günden beri genel halk sağlığı, tedbirler, uyulacak kurallar ve ekonomik sonuçları üzerinde hızlıca araştırmalar yapılmıştır. Oysaki bu pandemi durumunun kişilerin ruhsal, psikolojik iyi oluş halleri üzerinde çok ciddi sonuçları olabileceği geç fark edilmiştir. Yalnızlık, varoluşsal sorgulamalar, intihar girişimleri, manevi boşluk, uygulanan sosyal izolasyon ve sokağa çıkma kısıtlamaları ile birlikte artış göstermiş, toplumun yaşadığı ekonomik buhran kadar zihinsel bulanıklığı da beraberinde getirmiştir. Bu başlıkta koronavirüsün yalnızlık, sosyal sorumluluk ve iş etiği ile sosyal hayat ve akış üzerindeki etkileri tartışılacak, konuya ilişkin yapılan çalışmaların sonuçları paylaşılacaktır.

4.1. Sosyal ve Psikolojik Değişimler

Koronavirüsün yalnızca ekonomik değil sosyal ve toplumsal etkisinin de olduğu belirtilmekte (Hall vd., 2020; Hasanat vd., 2020), fiziksel, psikolojik ve duygusal sıkıntılara ve zararlara neden olan toplu travmatik bir olay olarak nitelendirilmektedir (He & Harris, 2020). Bu bakımdan sağlık krizi gibi görünen bu küresel olayın aslında bütünüyle yaşam tarzlarını değiştirdiği (Ho vd., 2020; Laguna vd., 2020; Sullivan, 2020), dolayısıyla dünyayı nasıl gördüğümüzü, nasıl yorumladığımızı ve nasıl yönettiğimizi de etkilediği belirtilmektedir (He & Harris, 2020). İnsanlar bu tür varoluşsal soruları daha geniş bir şekilde düşündükçe, karşılıklı eylemlerinin ve deneyimlerinin anlamını sorguladıkça, pandemiye verilen iç tepkiler ve manevi iç görüler ortaya çıkmaktadır. Bu durum hem işletmelerin müşterileriyle olan etkileşimlerinde bunun ne anlama gelebileceğini yeniden düşünmelerini sağlamakta hem de insanoğlunun dünya üzerindeki güç iddiasını ılımlaştırmakta ve hafifleştirmektedir (Karpen, 2020).

Sıklıkla ekonomiye yapılan vurgulamalar bu salgının sosyal ve toplumsal etkisini göz ardı etse de insanların evde kaldıkları süre boyunca daha çok psikolojik bunalıma girdikleri, aile içi şiddetin, kavgaların, boşanmaların hatta silah sahibi olma oranının arttığı (Campbell, 2020; Donthu & Gustafsson, 2020), intihar, madde kullanımı, sosyal kopukluk, bilişsel düşüş ve zihinsel sorunlara yol açtığı (Killgore vd., 2020a; Killgore vd., 2020b) yine araştırmalar tarafından ortaya konulmaktadır. Uygulanan sosyal mesafe kuralı, evde kal çağrıları ve kısıtlamaların, aile ve arkadaşlar ile sınırlı fiziksel teması zorunlu kılması kişileri yalnızlığa itmekte (Koh & Liew, 2020; Luchetti vd., 2020; Groarke vd., 2020), gerçek ve istenen sosyal etkileşimdeki tutarsızlık olarak adlandırılan yalnızlık (Perlman & Peplau, 1981), kişide depresyon, stres ve anksiyete (Torales vd., 2020) gibi birçok fiziksel ve ruhsal hastalıkların meydana gelmesine neden olmaktadır.

Her ne kadar sosyal izolasyon yalnızlıkla eşanlamlı olmasa da (Loades vd., 2020), ikisi arasında bir korelasyon olduğu yapılan araştırmalarca ortaya konulmaktadır (Groarke vd., 2020; Luchetti vd., 2020; Saltzman, Hansel & Bordnick, 2020). Kişilerin evde daha uzun vakitler geçirmeleri, sosyal bağlantılarından uzaklaşmaları, dışarı çıksalar bile zorunlu olmayan (hedonik tüketime dayalı) mal ve hizmet üreten işletmelerin kapalı olması (Lee, 2020) onları sosyalleşmekten ve dışarıda yapılacak aktivitelerden uzaklaştırmakta ve kendilerini daha yalnız hissetmelerine neden olmaktadır. Bilhassa pandeminin ilk üç ayında 50 eyaletten toplam 3.121 kişiden toplanan veriler, yalnızlığın pandeminin ilk üç ayında çok daha yüksek seviyelerde olduğunu göstermektedir (Killgore vd., 2020b) hatta bu yalnızlığın pandeminin ilk altı ayına (Eylül ayına) kadar önemli ölçüde artış gösterdiğini ortaya koyan çalışmalarda mevcuttur (Killgore vd., 2020c). Yalnızlığın yaşlılar arasında daha sık görüldüğü literatür tarafından ağızbirliği edilse de COVID-19 ile birlikte özellikle gençler, genç yetişkinler, ergenler ve sağlıklı çocuklar üzerinde de negatif etkileri olduğu bilinmektedir. Çünkü çocuklar ve ergenler uzun zamandır okullarından, öğretmenlerinden ve arkadaşlarından uzak bir yaşam sürüyorlar (Loades vd., 2020). Bu anlamda yalnızlığın yaşlılıkla sınırlı olmadığını savunan araştırmalara da rastlanılmaktadır (Luchetti, 2020).

Twitter'da yalnızlığın çeşitli topluluklar arasında nasıl tartışıldığını ve yalnızlığa dair neler konuşulduğunu, yalnızlıkla ilgili başa çıkma stratejilerini ortaya koymak için 4492 Tweet metin analizi yoluyla incelenmiş ve yalnızlığın sosyal ve duygusal gibi birden fazla boyutunun olduğu, sosyal medyanın ise yalnızlıkla başa çıkmada önemli bir araç olabileceği bulunmuştur (Koh & Liew, 2020). Teknolojiye erişimin kriz zamanlarında kişiye sosyal destek sağladığını, yalnızlıkla başa çıkmada yardımcı olduğunu ve salgının olumsuz sosyal sonuçlarını iyileştirebildiğini vurgulayan başka çalışmalarda mevcuttur (Saltzman, Hansel & Bordnick, 2020; Loades vd., 2020). Yalnızlık olgusu eskiden beri vardı (Cacioppo & Cacioppo, 2018) ancak COVID-19 süreciyle beraber yaşanan yalnızlığın önceki dönemlerde yaşanan yalnızlıkla benzer özellikler taşıyıp taşımadığı halen araştırılması gereken alanlardan biridir. Bazı araştırmalar pandemi öncesinde ve sonrasında yalnızlık için oluşan risk faktörlerinin aynı olduğunu savunmuştur. Örneğin, genç yetişkinler, kadınlar, daha düşük eğitim seviyesine veya gelire sahip insanlar, ekonomik olarak aktif olmayanlar, yalnız yaşayan insanlar, kronik bir hastalığı olanlar sadece pandemi sırasında değil, pandemi öncesinde de yalnız yaşama riski daha yüksek olan gruplardı (Bu, Steptoe & Fancourt, 2020). Bu konuda daha fazla araştırma yapılması, müdahalelerin daha yüksek riskli sosyo-demografik gruplara öncelikli olarak uygulanması bağlamında önem taşımaktadır.

Bu türden sosyal, psikolojik ve toplumsal dönüşümlerin meydana getirdiği acılar ileride gelecek nesillere birer kültürel miras olarak aktarılacaktır (He ve Harris, 2020). COVID-19 ile ilgili yapılan mental araştırmaların çoğunluğunda küresel olarak yaşanan bu felaketten dersler alınması gerektiği vurgulanmaktadır (He & Harris, 2020; Andersen vd., 2020).

4.2. Kurumsal Sosyal Sorumluluk ve İş Etiği

Koronavirüs pandemisi bazı şirketlerin çıkar sağlamaya ve haksız kazanç elde etmeye çalıştıkları bir fırsat olarak görüldü. Fiyatlar şişirilerek, yanıltıcı ürün vaatlerinde bulunularak alıcılar kandırılmaya çalışıldı. Bu da bazı şirketlerin kurumsal sosyal sorumluluk (KSS) ve iş etiği konusundaki samimiyetlerinin krizle beraber zor bir testten geçmesine neden oldu. Bu zor testten başarısız olan işletmeler müşteri gözünde onarılmaz imaj kaybına uğrarken, testi başarıyla geçen ve KSS uygulamalarına olan bağlılıklarını ispatlayan işletmelerse barış günlerine dönüldüğünde müşterilerin zihninde hak ettikleri üstün konuma ulaşacaklardır. Elbette bu türden etik olmayan davranışların yanı sıra, bazı işletmelerin virüsle mücadelede yardımcı olduklarını, üretimlerini medikal ürünlerin üretilmesi için seferber ettiğini de gördük (He & Harris, 2020).

Tıbbi ve yaşamsal malzemeleri elinde bulunduran bazı vicdandan yoksun kişiler onları çevrimiçi açık artırma siteleri aracılığıyla şişirilmiş fiyatlarla satışa sundular. Bazı tüketiciler ise pandemi dönemlerinde aldıkları ürünleri iade etmede güçlük çektiler ve kendi mali koşulları karşısında para iadesi yapmak istemeyen işletmelerin zorlayıcı davranışlarına maruz kaldılar. Sahte ilaçlar, sahte temizlik ve dezenfektan ürünleri piyasaya sürülürken, gelir kaybı yaşayan tüketiciler piyasaya göre ucuz olan bu ürünleri seçme özgürlüğü olmaksızın satın almak mecburiyetinde kaldı (Mathios vd., 2020). Bazı şirketlerin pandemiyi gerekçe göstererek çalışanlarını süresiz olarak ücretsiz izne çıkarması, zorunlu izinleri empoze etmesi çalışanların aylar süren mali belirsizlik ve endişeyle karşı karşıya kalmasına neden olmuştur (Chauhan & Shah, 2020; Cohen, 2020).

Etik kavramının yalnızca işletmelere özgü olmaması, devletinde gizlilik ve mahremiyet konusunda bazı sorumlulukları olduğunu göstermektedir. Cep telefonlarından GPS koordinatlarını kullanan mobilite ölçümleri, sosyal mesafeyi ölçmek için yaygın olarak kullanılmakta, bu durum gizliliği ve kişinin mahremiyet alanını tehlikeye düşürmektedir (Brodeur vd., 2020). Tüketicinin mahremiyeti ile halk sağlığı arasındaki denge hükümetin uyguladığı politikalara ve salgına yönelik verdiği tepkilere göre şekillenebilmektedir. Tüketicilerin nerede olduklarını ve kimlere yakın olduklarını izlemek için teknolojinin kullanılması, sosyal mesafe davranışının izlenmesi, hastalığın toplumda yayılmasını engellemeye çalışan hükümetler için önemli bir araç olabilir. Ancak burada sorulması gereken temel soru, özgür bir toplumda bu tür bir hükümet gözetiminin sınırlarının ne olduğu ve ne olması gerektiğidir. Bu tür izleme uygulamalarının bariz faydalarını, zorunlu olarak gerektireceği ciddi gizlilik ihlalleri ile dengelemek için hangi yönetişim kurallarına ihtiyaç olduğunu bilmek önem taşımaktadır. Muhakkak ki farklı hükümetlerin kurduğu denge, her ülkenin kültürüne ve tarihine göre değişiklik gösterecektir (Mathios vd., 2020).

Kriz anlarında KOBİ'leri inceleyen 69 makale üzerinden bir literatür çalışması yürüten Eggers (2020), harici krizlerin piyasaları altüst etmesinden en çok aile işletmelerinin etkilendiğini fakat buna karşılık yöneticinin girişimcilik uzmanlığının bunun üstesinden gelmede yararlı bir araç olabileceğini söylemektedir. KOBİ'lerin daha esnek karar verme

potansiyeli ve müşteri tabanına olan yakınlıkları, kriz dönemlerini en yenilikçi şekilde ve proaktif duruşlarla atlatmalarına ve yeni pazar fırsatları yakalamalarına yardımcı olabilir.

4.3. Sosyal Hayat ve Akış

Koronavirüsün yayılmasını önlemek ve bulaş riskini minimize etmek için ilk olarak yüz yüze gelmeyi gerektiren hizmetler kısıtlandı ve bu kapsamda okullar, AVM'ler, kuaförler, güzellik merkezleri, spor salonları, kafe ve restoranlar, eğlence mekanları, hatta camiler ve ibadethanelerin giriş-çıkışlarının yasaklanması, geniş çaplı uygulanan kısıtlamalar ve sürekli olarak vurgulanan "evde kal" çağrısı ile sosyal mesafe kuralları insanları çok dar bir alana hapsetmiştir. Dolayısıyla dışarıda yemek yeme, eğlenme, seyahat ve konaklama faaliyetlerinde keskin bir düşüş gözlenmiştir (Watanabe & Omori, 2020). Daha çok zorunlu hizmet vermeyen küçük ve yerel işletmelerin (esnaf lokantaları, mağaza ve dükkanlar vs.) geçici olarak kapanması COVID-19'un halk sağlığı etkisine ek olarak sosyal akış içindeki ekonomik etkisi de olumsuz oldu (Bartik vd., 2020). Bu yüzden kısıtlama önlemlerinin ve hedonik/sosyal tüketime yönelik işletmelerin kapatılmasının en çok 25 yaşın altındaki çalışanları, kadınları ve düşük gelirlileri etkilediği söylenebilir (Joyce & Xu, 2020). En çok etkilenen grubun genç ve düşük gelirlilerden oluşması (Adams-Prassl vd., 2020) potansiyel sosyal sorunları beraberinde getirecektir. Türkiye'de 11 Marttan itibaren alınan önlemler kapsamında 18 yaş altının sokağa çıkmasının kısıtlanması harcamaların ve sosyal akışın azalmasına neden olmuştur.

İlaveten sosyalleşmemizi sağlayan her türlü etkinlik, toplantı, konferans, sergi, galeri ve müzeler ve dahi kültürel uygulamalarımız olan düğünler/nişanlar, kız isteme ritüelleri, ev toplantıları yasaklandığından bir araya gelmemiz imkânsızlaştı. Türkiye'de 2020 yılı Mart ayından bu yana sosyal akışta yaşanan bazı hadiseler (Luppo almaya giden adam, ekmek almaya diye evden çıkıp gezenler, polis sireni duyduğunda kaçanların görüntüsü vs.) hem sosyal medyada hem de geleneksel medyada haberlere, mizahi video ve resimlere konu olmuştur. 11 Marttan bu yana sürekli olarak televizyonlarda halk sağlığı, enfeksiyon, kalp damar cerrahisi, göğüs hastalıkları, viroloji ve daha birçok farklı alanda uzman ve akademisyenlerin görüşlerini, hastalığa dair yeni gelişmeleri seyrettik. Virüsün dünyaya yayılmasından sonra bütün medya bunu birincil haber başlığı olarak sundu (Chronopoulos, Lukas & Wilson, 2020: 147). Gelişmeleri takip eden halk ise uzmanlara, bilim insanlarına ve akademisyenlere güvendi, onların yaptığı açıklamaları güvenilir buldu (Laguna vd., 2020). Ancak yine de sosyal medyada virüsten çok daha hızlı yayılan yanlış bilgiler ve söylentiler, halk arasında paniğin artmasına, sosyal hayat düzeninin bozulmasına neden olmaktadır (Depoux vd., 2020). Türkiye'de Nisan ayında hafta sonu yasaklarının cuma günü geç saatlerde açıklanması, halkın bakkal, fırın ve büfelerin önünde uzun kuyruklar oluşmasına neden olmuş, yaşanan pandemiyle hiç uyuşmayan bu görüntüler İçişleri Bakanı Süleyman Soylu'nun istifa etmesiyle sonuçlanmıştır. Türkiye başta olmak üzere bütün dünya ülkelerinde amaçlı iletişim stratejilerinin acilen geliştirilmesi, halkı güçlendirmeye yönelik çabaları artıracak ve halk sağlığı önlemleri doğrultusunda daha bilgili ve kişisel olarak kendine güvenen bir kitle oluşmasını sağlayacaktır. Bu anlamda COVID-19'un

etkisini azaltmak için sosyal medyanın (Depoux vd., 2020) ve dijital teknolojilerin (Kumar vd., 2020) gücünden istifade edilebilir.

Bazı vatandaşlar sosyal hayatın yeniden düzene dönmesi için kendi kendine izolasyon gibi bireysel çaba gösterirken, bazı vatandaşlar hükümetin uyguladığı yasaklara güçlükle uyabilmekteydi. Akış içindeki bu zıtlıklar hayatın içinde birçok noktada tartışmalara, kaos ve kargaşa oluşturan davranışlara neden oluyordu. Halkın devlet tarafından virüsün yayılmasının kontrol altına alınması için verilen emirlere uyması ve hastalıkta tıpkı savaştaki bir asker gibi hareket etmesi hastalığın yayılma zincirini kıracaktır (Patil & Patil, 2020). Bu anlamda izolasyon, COVID-19 gibi bulaşıcı hastalıklarda akılcı ve önerilen bir davranış şeklidir (Jiang & Wen, 2020). Kişinin öz yeterliliği (yani bireyin bir davranışı gerçekleştirebileceğine olan inancı) kendi kendini izole etme niyetini de olumlu yönde etkileyebilmektedir. Benzer şekilde satın alma konusunda da öz yeterliliği yüksek olan kişiler, olası karantina önlemlerinden veya küresel gıda tedarik zinciri kesintilerinden bağımsız olarak istediği zaman satın alma yapabileceği inancıyla gıda stoklamaya veya mantıksız alışveriş yapmaya ihtiyaç duymadılar (Laato vd., 2020).

Dünya genelinde birçok perakende devi stok mevcudiyetlerini korumak için ellerinden geleni yapacaklarını duyururken (Prentice, Chen & Stantic, 2020), Türkiye'de de yaşanan panik sonrası rafların boşalmasını durdurmak ve mal tedariki sıkıntısını azaltmak için Makarna Üreticileri Derneği başkanının *kimse panik yapmasın, Türkiye'yi makarnaya boğarız* açıklaması ülkeyi daha da büyümesi muhtemel olan bir olayın kıyısından döndürdü. Duyularımızı kullanmamamız gerektiği konusundaki baskılar (hiçbir yere dokunma, kimseye yaklaşma, maskeli nefes al gibi), salgından sonraki dönemde bizleri yaşam içinde oldukça zorlayacak gibi görünmektedir.

5. Sonuç

Araştırmaların çoğu henüz dünyada COVID-19 enfeksiyon vakalarının artış gösterdiği zamanlarda yapılmıştır. Hatta bazı çalışmalar kısıtlamaların ve önlemlerin en üst seviyede olduğu dönemlerde yazılmış, bu da yeni karşılaşılan bu küresel sağlık krizine yönelik işletmelerin, hükümetlerin, yasa koyucuların ve diğer paydaşların önemli iç görüler kazanmasını sağlamıştır. Aralık 2019'da başlayan sağlık krizinin Mart 2020'de pandemi olarak ilan edilmesinden sonra mali ve toplumsal krize dönüşmesi kaçınılmaz olmuştur. Emsalsiz olarak görülen COVID-19 pandemisi, birçok yazar tarafından son yüzyılın en büyük felaketi, 2008 küresel finansal krizinden ve Büyük Buhrandan yana görülmüş en önemli olay olarak nitelendirilmiştir.

Korku, belirsizlik, risk, gelecek kaygısı, panik, ölüm endişesi gibi duygularla eşleştirilen yeni koronavirüs salgını bilinen iş modellerini köktenci bir anlayışla değiştirmektedir. Daha önceden kredi kartların temassız özelliği bilinmezken veya kullanılmazken, şimdilerde bu özelliğin sıklıkla kullanıldığı, müşterilerin temassız karta sahip olmanın bir ayrıcalık olarak gördüğüne tanıklık etmekteyiz. Bankalar, devlet kurumları, üniversiteler bir yandan uzaktan çalışma sistemine uyum sağlamaya çalışırken,

öte yandan uzaktan iş yapmak kişilerin internet ve bilgisayar kullanımı becerisini geliştirmektedir. Teknolojiyi kabul etme ve daha önce teknolojiden habersiz olan belirli yaş gruplarının daha fazla teknolojik araçla yakın ilişkide olması birçok pazarın hedef kitlesini yeniden tanımlamasına neden olmuştur. Saatler süren toplantılar yerini 20 dakikalık Zoom görüşmelerine bırakırken, seyahat yoluyla gerçekleşen buluşmaların yerini alan dijital uygulamalar karbon ayak izinin azalmasına neden olmuştur.

Ayrıca akademik düzeyde yapılan disiplinlerarası çalışmalar hem hastalıkla ilgili tıbbi bilgilerin halka etkin şekilde iletilmesinde büyük rol oynamakta hem de sıradan insanların anlayabileceği şekilde sunulmasına yardım etmektedir (Wang, Kozak, Liu & Hou, 2020). Bu anlamda yeni koronavirüsle ilgili yapılacak çalışmalar bilineni tekrar etmek yerine güçlü kanıtlar sunmalı ve karşılaşılan felaketlerden en az zararla çıkmayı kolaylaştırmalıdır. Örneğin disiplinlerarası veya çok disiplinli çalışmalar krizlerle ilgili literatürü genişletebilir ve uygulamada pratik katkılar sunabilir. Bir psikolog, bir finans uzmanı ve bir perakende yöneticisinin ortak çalışması tüketici davranışlarını anlamaya yardımcı olabilir veya bir tıp doktoru, bir politikacı ve bir marka uzmanı şimdiye kadar fark edilmemiş bir gerçeği keşfedip, işletmelere ve topluma yönelik ampirik sonuçlar sunabilir.

Kaynaklar

Adams-Prassl, A. et al. (2020), "Inequality in the Impact of the Coronavirus Shock: New Survey Evidence for the UK", *Cambridge-INET Working Paper Series*, Number 2010.

Akhtar, N. et al. (2020), "COVID-19 restrictions and consumers' psychological reactance toward offline shopping freedom restoration", *The Service Industries Journal*, 40(13-14), 891-913.

Al Jazeera (2020), *Coronavirus: Travel restrictions, border shutdowns by country*, Al Jazeera and News Agencies, <https://www.aljazeera.com/news/2020/03/coronavirus-travel-restrictions-border-shutdowns-country-200318091505922.html>, 11.01.2021.

Andersen, A.L. et al. (2020), "Pandemic, Shutdown and Consumer Spending: Lessons from Scandinavian Policy Responses to COVID-19", *arXiv:2005.04630*.

Arafat, S.M.Y. et al. (2020), "Psychological underpinning of panic buying during pandemic (COVID-19)", *Psychiatry research*, doi: 10.1016/j.psychres.2020.113061

Baker, S.R. et al. (2020), "How does household spending respond to an epidemic? Consumption during the 2020 COVID-19 pandemic", *The Review of Asset Pricing Studies*, 10(4), 834-862.

Bartik, A.W. et al. (2020), "How are small businesses Adjusting to COVID-19? Early Evidence from a Survey", (No. w26989), National Bureau of Economic Research, *Working Paper* Number 26989.

Bobylev, S.N. (2020), "Environmental consequences of COVID-19 on the global and Russian Economics", *Population and Economics*, 4(2), 43-48.

Botti, S. & A.L. McGill (2011), "The Locus of Choice:Personal Causality and Satisfaction with Hedonic and Utilitarian Decisions", *Journal of Consumer Research*, 37(6), 1065-1078.

Brodeur, A. et al. (2020), "A Literature Review of the Economics of COVID-19", *IZA Discussion Paper*, No.13411.

Bu, F. et al. (2020), "Who is lonely in lockdown? Cross-cohort analyses of predictors of loneliness before and during the COVID-19 pandemic", *Public Health*, 186, 31-34.

Cacioppo, J.T. & S. Cacioppo (2018), "The growing problem of Loneliness", *Lancet*, 391(10119), 426.

Campbell, A.M. (2020), "An increasing risk of family violence during the COVID-19 pandemic: Strengthening community collaborations to save lives", *Forensic Science International: Reports* 2, 100089.

Chauhan, V. & H. Shah (2020), "An Empirical Analysis into Sentiments, Media Consumption Habits, and Consumer Behaviour during the Coronavirus (COVID-19) Outbreak", *Purakala (UGC Care Journal)*, 31(20), 352-378.

Chen, C.-F. et al. (2020), "Coronavirus comes home? Energy use, home energy management, and the social-psychological factors of COVID-19", *Energy Research & Social Science*, 68.

Chetty, R. et al. (2020), "How Did COVID-19 and Stabilization Policies Affect Spending and Employment? A New Real-Time Economic Tracker Based on Private Sector Data", *NBER Opportunity Insights Working Paper*, May (w27431).

Chronopoulos, D.K. et al. (2020), "Consumer spending responses to the COVID-19 pandemic: An assessment of Great Britain", in: C. Wyplosz (ed.), *COVID Economics Vetted and Real-Time Papers*, Centre for Economic Policy Research (CEPR), 34(3), 145-186.

Cohen, M.J. (2020), "Does the COVID-19 outbreak mark the onset of a sustainable consumption transition?", *Sustainability: Science, Practice and Policy*, 16(1), 1-3.

Coibion, O. et al. (2020), "The cost of the COVID-19 crisis: Lockdowns, macroeconomic expectations, and consumer spending", *National Bureau of Economic Research Working Paper* (No. w27141).

de Vito, A. & J.-P. Gómez (2020), "Estimating the COVID-19 cash crunch: Global evidence and policy", *Journal of Accounting and Public Policy*, 39(2).

Depoux, A. et al. (2020), "The pandemic of social media panic travels faster than the COVID-19 outbreak", *Journal of Travel Medicine*, 1-2.

Donthu, N. & A. Gustafsson (2020), "Effects of COVID-19 on business and research", *Journal of Business Research*, 117, 284-289.

Durante, K.M. & J. Laran (2016), "The effect of stress on consumer saving and spending", *Journal of Marketing Research*, 53(5), 814-828.

Eggers, F. (2020), "Masters of disasters? Challenges and opportunities for SMEs in times of crisis", *Journal of Business Research*, 116, 199-208.

Georgieva, K. (2020), *The Great Lockdown: Worst Economic Downturn Since the Great Depression*, <https://www.imf.org/en/News/Articles/2020/03/23/pr2098-imf-managing-director-statement-following-a-g20-ministerial-call-on-the-coronavirus-emergency>, 11.01.2021.

Gössling, S. et al. (2020), "Pandemics, tourism and global change: a rapid assessment of COVID-19", *Journal of Sustainable Tourism*, doi: 10.1080/09669582.2020.1758708

Groarke, J.M. et al. (2020), "Loneliness in the UK during the COVID-19 pandemic: Cross-sectional results from the COVID-19 Psychological Wellbeing Study", *PLoS ONE*, 15(9), e0239698 doi: 10.1371/journal.pone.0239698

Hall, C.M. et al. (2017), *Tourism and resilience: Individual, organisational and destination perspectives*, Blue Ridge Summit, PA: Channel View Publications.

Hall, M.C. et al. (2020). "Beyond panic buying: consumption displacement and COVID-19", *Journal of Service Management*, doi: 10.1108/JOSM-05-2020-0151

Haroon, O. & S.A.R. Rizvi (2020), "COVID-19: Media coverage and financial markets behavior-A sectoral Inquiry", *Journal of Behavioral and Experimental Finance*, 27, 1-5.

Hasanat, M.W. et al. (2020), "The Impact of Coronavirus (COVID-19) on E-Business in Malaysia", *Asian Journal of Multidisciplinary Studies*, 3(1), 85-90.

Hassan, T.A. et al. (2020), "Firm-level exposure to epidemic diseases: COVID-19, SARS, and H1N1", *National Bureau of Economic Research* (No. w26971).

He, H. & L. Harris (2020), "The impact of COVID-19 pandemic on corporate social responsibility and marketing Philosophy", *Journal of Business Research*, 116, 176-182.

Ho, J. et al. (2020), *Cautiously optimistic: Chinese consumer behavior post-COVID-19*, McKinsey&Company, <https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/cautiously-optimistic-chinese-consumer-behavior-post-COVID-19#>, 11.01.2021.

Jiang, Y. & J. Wen (2020), "Effects of COVID-19 on hotel marketing and management: a perspective article", *International Journal of Contemporary Hospitality Management*, 32(8), 2563-2573.

Joyce, R. & X. Xu (2020), "Sector Shutdowns during the Coronavirus Crisis: Which Workers are most Exposed?", *IFS Briefing Note*, Number BN278.

Jribi, S. et al. (2020), "COVID-19 virus outbreak lockdown: What impacts on household food wastage?", *Environment, Development and Sustainability*, 22(5), 3939-3955.

Karpen, I.O. & J. Conduit (2020), "Engaging in times of COVID-19 and beyond: theorizing customer engagement through different paradigmatic lenses", *Journal of Service Management*, 31(6), 1163-1174.

Kilgo, D.K. et al. (2019), "Spreading Ebola panic: newspaper and social media coverage of the 2014 Ebola health crisis", *Health Communication*, 34, 811-17.

Killgore, W.D.S. et al. (2020a), "Loneliness: A signature mental health concern in the era of COVID-19", Letter to Editor. *Psychiatry Research*, 290.

Killgore, W.D.S. et al. (2020b), "Three months of loneliness during the COVID-19 lockdown", *Psychiatry Research*, 293, 113392 doi: 10.1016/j.psychres.2020.113392

Killgore, W.D.S. et al. (2020c), "Loneliness during the first half-year of COVID-19 Lockdowns", *Psychiatry Research*, 294, 113551 doi: 10.1016/j.psychres.2020.113551

Kirk, C.P. & L.S. Rifkin (2020), "I'll trade you diamonds for toilet paper: Consumer reacting, coping and adapting behaviors in the COVID-19 pandemic", *Journal of Business Research*, 117, 124-131.

Knowles, J. et al. (2020), "Growth Opportunities for Brands During the COVID-19 Crisis", *MIT Sloan Management Review*, 61(4), 2-6.

Koh, J.X. & T.M. Liew (2020), "How loneliness is talked about in social media during COVID-19 pandemic: Text mining of 4,492 Twitter feeds", *Journal of Psychiatric Research*, in press article, doi: 10.1016/j.jpsychires.2020.11.015

Kumar, S. et al. (2020), "Applications of industry 4.0 to overcome the COVID-19 operational Challenges", *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 14, 1283-1289.

Laato, S. et al. (2020), "Unusual purchasing behavior during the early stages of the COVID-19 pandemic: The stimulus-organism-response approach", *Journal of Retailing and Consumer Services*, 57, 1-12.

Laguna, L. et al. (2020), "The impact of COVID-19 lockdown on food priorities: Results from a preliminary study using social media and an online survey with Spanish consumers", *Food Quality and Preference*, 86, 1-9.

Lee, A. (2020), *These states have implemented stay-at-home orders: Here's what that means for you*, <https://www.cnn.com/2020/03/23/us/coronavirus-which-states-stay-at-home-order-trnd/index.html>, 11.01.2021.

Lenoël, C. & G. Young (2020), "Prospects for the UK Economy", *National Institute Economic Review*, 252, F10-F43.

Lew, A. (2020), *How to Create a Better Post-COVID-19 World*, <https://medium.com/@alanalew/creating-a-better-post-COVID-19-world-36b2b3e8a7ae>, 11.01.2021.

Loades, M.E. et al. (2020), "Rapid Systematic Review: The Impact of Social Isolation and Loneliness on the Mental Health of Children and Adolescents in the Context of COVID-19", *Journal of the American Academy of Child & Adolescent Psychiatry*, article in press, doi: 10.1016/j.jaac.2020.05.009

Loxton, M. et al. (2020), "Consumer Behaviour during Crises: Preliminary Research on How Coronavirus Has Manifested Consumer Panic Buying, Herd Mentality, Changing Discretionary Spending and the Role of the Media in Influencing Behaviour", *Journal of Risk Financial Management*, 13(166).

Luchetti, M. et al. (2020), "The Trajectory of Loneliness in Response to COVID-19". *American Psychologist*, 75(7), 897-908.

Mariani, M.M. & R. Perez-Vega (2020), "Beyond the hype: psychological mechanisms enabling the acceptance, adoption, and engagement with artificial intelligence technology in marketing", *Psychology and Marketing*, forthcoming.

Mathios, A. et al. (2020), "Consumer Policy in the Age of COVID-19", *Journal of Consumer Policy*, 43, 433-435.

Mirza, N. et al. (2020), "Price reaction, volatility timing and funds' performance during COVID-19", *Finance Research Letters*, 36, doi: 10.1016/j.frl.2020.101657

Patil, B. & N. Patil (2020), "Impact of COVID-19 Pandemic on Consumer Behaviour", *Mukt Shabd Journal*, IX(V), 3074-3085.

Perlman, D. & L.A. Peplau (1981), "Toward a social psychology of Loneliness", in R. Gilmour, & S. Duck (eds.), *Personal Relationships: 3. Relationships in Disorder*,London: Academic Press, 31-56.

Prentice, C. et al. (2020), "Timed intervention in COVID-19 and panic buying", *Journal of Retailing and Consumer Services*, 57, 1-11.

Qiu, R.T. et al. (2020), "Social costs of tourism during the COVID-19 pandemic", *Annals of Tourism Research*, 84, 1-14.

Saltzman, L.Y. et al. (2020), "Loneliness, Isolation, and Social Support Factors in Post-COVID-19 Mental Health", *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(1), 55-57.

Schell, D. et al. (2020), "This time is indeed different: A study on global market reactions to public health crisis", *Journal of Behavioral and Experimental Finance*, 27 doi: 10.1016/j.jbef.2020.100349

Shehzad, K. et al. (2020), "COVID-19's disasters are perilous than Global Financial Crisis: A rumor or fact?", *Finance Research Letters*, doi: 10.1016/j.frl.2020.101669

Sheu, J.-B. & H.-T. Kuo (2020), "Dual speculative hoarding: a wholesaler-retailer channel behavioral phenomenon behind potential natural hazard threats", *International Journal of Disaster Risk Reduction*, 44, Art.101430.

Sigala, M. (2020), "Tourism and COVID-19: Impacts and implications for advancing and resetting industry and research", *Journal of Business Research*, 117, 312-321.

Song, W. et al. (2020), "Will Buying Follow Others Ease Their Threat of Death? An Analysis of Consumer Data during the Period of COVID-19 in China", *International Journal of Environmental Research and Public Health*, 17(9), doi:10.3390/ijerph17093215

Stanciu, S. et al. (2020), "Consumer Behavior in Crisis Situations: research on the effects of COVID-19 in Romania", *Annals of Dunarea de Jos University of Galati Fascicle I. Economics and Applied Informatics Years, XXVI* no1/2020, 4-13.

Sullivan, M. (2020), *All the things COVID-19 will change forever, according to 30 top experts*, <https://www.fastcompany.com/90486053/all-the-thingsCOVID-19-will-change-forever-according-to-30-top-experts>, 11.01.2021.

Torales, J. et al. (2020), "The outbreak of COVID-19 coronavirus and its impact on global mental health", *International Journal of Social Psychiatr*, 66(4), 317-320.

Wang, E. et al. (2020), "Consumer food stockpiling behavior and willingness to pay for food reserves in COVID 19", *Food Security*, 12, 739-747.

Watanabe, T. & Y. Omori (2020), "Online Consumption During the COVID-19 Crisis: Evidence from Japan", *Research Project on Central Bank Communication Design-working paper series*, University of Tokyo.

Wen, J. et al. (2020), "COVID-19: potential effects on Chinese citizens' lifestyle and travel", *Tourism Review*, 76(1), 74-87.

Wen, J. et al. (2020), "Many brains are better than one: the importance of interdisciplinary studies on COVID-19 in and beyond tourism", *Tourism Recreation Research*, doi: 10.1080/02508281.2020.1761120

WHO World Health Organisation (2020), *Coronavirus disease (COVID-19) pandemic*, <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>, 11.01.2021.

Yang, J. et al. (2019), "Does fdi presence make domestic firms greener in an emerging economy? The effect of media attention", *Academy of Management Proceedings*, 1, 16388-92.

Yuen, K.F. et al. (2020), "The psychological causes of panic buying following a health crisis", *International Journal of Environmental Research and Public Health*, 17(10), 3513 doi: 10.3390/ijerph17103513

Sosyoekonomi

2021, Vol. 29(50), 299-315

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.14
Date Submitted: 22.02.2021
Date Revised: 10.09.2021
Date Accepted: 13.09.2021

Cari Açık - Bütçe Açığı ve Faiz Oranı İlişkisi Bağlamında İkiz Açık ve Üçüz Açık Hipotezinin Geçerliliği: 1990-2019 Dönemi Türkiye Örneği

Selim İNANÇLI *(https://orcid.org/0000-0002-7363-6216), Sakarya University, Turkey; sinancli@sakarya.edu.tr*

Mustafa TORUSDAĞ *(https://orcid.org/0000-0002-8839-0562), Van Yüzüncü Yıl University, Turkey; mustafatorusdag@yyu.edu.tr*

Validity of Twin Deficit and Triplet Deficit Hypothesis in The Relation of Current Account Deficit - Budget Deficit and Interest Rate: 1990-2019 Case of Turkey

Abstract

In this study, 1990-2019 period for Turkey, 'twin deficits' and 'triplet deficit' validity was analysed with Bayer-Hanck (2012) cointegration test and Hacker-Hatemi-J causality test. According to the findings of the causality analysis of Hacker and Hatemi-J (2006), it is concluded that there is a one-way causality relationship from budget deficit to current account deficit, from budget deficit to interest rate, from interest rate to current account deficit, and from interest rate to net savings rate. In the period analysed for Turkey, 'Twin Deficits that the hypothesis is valid but that the triplet deficit hypothesis is not valid.

Keywords : Twin Deficit, Triplet Deficit, Current Account Deficit, Budget Deficit, Causality Test.

JEL Classification Codes : E43, H61, H62.

Öz

Bu çalışmada 1990-2019 dönemi için Türkiye'de net tasarruf oranı ve faiz oranları kapsamında 'ikiz açık' ve 'üçüz açık' hipotezlerinin geçerliliği Bayer-Hanck (2012) eşbütünleşme testi ve Hacker-Hatemi J (2006) nedensellik testi ile analiz edilmektedir. Hacker ve Hatemi-J (2006) nedensellik analizi bulgularına göre, bütçe açığından cari açığa, bütçe açığından faiz oranına, faiz oranından cari açığa ve faiz oranından tasarruf oranına doğru tek yönlü nedensellik ilişkisi olduğu sonucuna ulaşılmıştır. Türkiye için incelenen dönem için, 'İkiz Açık' hipotezinin geçerliliği kabul edilmekte ancak üçüz açık hipotezinin geçerli olmadığı sonucuna ulaşılmıştır.

Anahtar Sözcükler : İkiz Açık, Üçüz Açık, Cari Açık, Bütçe Açığı, Nedensellik Testi.

1. Giriş

1970'li yıllar, Keynesyen politikaların liberal politikalara yerini bıraktığı 1980'li yıllar ise dünya ekonomisinde küreselleşmenin hız kazandığı dönem olarak ifade edilmektedir. Küreselleşmenin de etkisiyle hem gelişmiş hem de gelişmekte olan ülkelerde hızlı bir sanayileşme sürecine girilmiştir. Artan yatırım oranları, üretim ve sermayenin küreselleşmesiyle birlikte özellikle gelişme yolundaki ülkelerde yeterli düzeyde iç tasarruf düzeyine ulaşılamamıştır. Yatırım düzeyi düşük olan bu ülkelerin dış finansman kaynaklarına yönelmesi ülke ekonomilerinin cari açık sorunuyla karşı karşıya kalmasına neden olmuştur. Ayrıca kamu harcamalarının vergi gelirleriyle karşılanamaması da bütçe açıklarına yol açmıştır. 1980'li yıllarda ABD ekonomisinde görülen cari açık ve bütçe açığı M. Feldstein tarafından 'ikiz açık hipotezi' olarak ifade edilmiştir (Saraç, 2019: 78; Karanfil & Kılıç, 2015: 2).

Dışa açık bir ekonominin makroekonomik dengesinin sağlanmasında iç ve dış dengeyi ifade eden değişkenler bütçe açığı ve cari açık göstergeleridir (Papadogonas & Stournaras, 2006: 595). Cari işlemler açığı ve bütçe açığı sadece gelişme yolunda ülkeler için değil gelişmiş ülkeler için de önemli bir iktisadi sorundur. Cari açık sorununun süreklilik gösterdiği ülke ekonomilerinde fiyat istikrarsızlığı, büyüme ve işsizlik gibi makro ekonomik sorunlar ortaya çıkmaktadır (Altunöz, 2018: 116). İç ekonomik denge ise özel kesimin tasarruf ve yatırım dengesi ve bütçe dengesinden meydana gelirken, dış ekonomik dengeyi cari açık dengesi oluşturmaktadır. İkiz açık kavramı dört farklı yaklaşımla açıklanmaktadır (Kouassi, Mougoue & Kymn, 2004): Birincisi, 'Geleneksel Keynesyen Yaklaşım' ikincisi, 'Ricardocu Denklik Hipotezi' yaklaşımlarıdır. Geleneksel Keynesyen yaklaşımda, artan bütçe açıkları kamunun bütçe finansmanı için borçlanma talebinin artmasına neden olmaktadır. Artan borçlanma talebi ise faiz oranlarının artmasına ve ülkeye yabancı sermaye girişinin özendirilmesinin önünü açmaktadır. Bu da artan döviz girişi sonucunda ulusal paranın değer kazanmasına sebep olmaktadır. Döviz kurundaki düşüş dış ticaret dengesini ithalatı artırmak suretiyle etkilemekte, dış ticaret açığının ve cari açığın artmasına yol açmaktadır (Feldstein, 1986: 2-3). Feldstein'a göre bütçe açıkları reel faiz oranının artmasına neden olarak sermaye girişlerinin artmasına yol açmaktadır. Keynesyen görüşe göre, bütçe açıklarında oluşan artışın cari işlemler açığını artıracağı ileri sürülmektedir (Saraç, 2019: 78, 79).

İkiz açık hipotezine göre, cari açık ve bütçe açığı arasında 4 farklı ilişki sözkonusudur (Kouassi, Mougoue & Kymn, 2004; Özdemir vd., 2014: 1): Geleneksel Keynesyen yaklaşıma göre, bütçe açığı ve cari işlemler açığı arasında pozitif bir ilişkinin var olduğu ve ilişkinin yönünün bütçe açığından cari açığa doğru olduğu (Alkswani, 2000: 4) ileri sürülürken, Barro (1974) tarafından ileri sürülen ikinci görüş olan Ricardocu denklik hipotezinde de, bütçe açığındaki artış reel faiz oranında bir değişmeye neden olmayacağından cari açığı etkileyemeyecektir dolayısıyla bu iki değişken arasında nedensellik ilişkisi olmadığı vurgulanmaktadır (Barro, 1974: 1095-1097). Üçüncü yaklaşıma göre, bütçe açıkları ve cari açık arasında çift yönlü bir ilişki bulunmaktadır.

'Ricardocu Denklik Yaklaşımı' olarak ifade edilen dördüncü yaklaşıma göre, cari açıklar bütçe açıklarına neden olmaktadır.

İkiz açıklar hipotezine göre, faiz oranlarında meydana gelen olası bir artış ülke parasının değer kazanmasına neden olur. Bu durum ihracatı ithalata göre daha pahalı hale getirerek, bütçe açığı ve cari açığın oluşmasına sebep olmaktadır (Dağ, 2018: 369). Szakolczai (2006)' da ikiz açık hipotezinde ifade edilen değişkenlere yurt içi tasarruf ve yatırım açığını dahil ederek 'üçüz açık' hipotezini (Berke vd., 2016: 67, 68) açıklamıştır. Sonuçta cari açık ve bütçe açığının birlikte meydana gelmesi ikiz açığı, cari işlemler dengesi açık verirken bütçe açığı ve yatırım- tasarruf açığı da meydana geliyorsa bu durum üçüz açık olarak ifade edilmektedir (İpek & Kızılgöl, 2016: 427). Üçüz açık durumunda gelişmekte olan ülkelerin bütçe açıklarında düşüş olmasına rağmen cari açıklarının artma eğilimini sürdürdüğü görülmektedir. Üçüz açıkların meydana gelmesi daha çok bu açıkların birbirleriyle etkileşimi ve açıkların finanse edilme yöntemiyle ilişkilidir (Akıncı vd., 2013: 4). Literatürde daha çok cari açık ve bütçe açığı ilişkisinin oluşumunun yurt içi tasarruflarla ilişkisi ve bu açıkların meydana getirdiği 'Crowding-Out (Dışlama) etkisi yönüyle incelenmiştir (Çoban & Balıkçıoğlu, 2016: 272).

Bu çalışmada gelişme yolunda bir ülke olan Türkiye'de üçüz açık hipotezi, tasarruf ve yatırımların da bir belirleyicisi olarak faiz oranları, bütçe açığı ve cari açık ilişkisi farklı hipotezlerle 1990-2019 yılları arasındaki yıllık veriler kullanılarak incelenmektedir. Türkiye için hangi hipotezin geçerli olduğu ekonometrik zaman serisi analiz bulguları değişkenler arasında nedensellik ilişkisi ve varılan sonuca yönelik mekanizmalar ve bulgularla tahmin edilmektedir.

2. İkiz Açık ve Üçüz Açık Hipotezinin Teorik Çerçevesi

Geleneksel Keynesyen 'ikiz açık hipotezi' ile izah edilen Mundell Flemming modelinde bütçe açıkları cari açıklara neden olmaktadır. Dolayısıyla bu ikiz açıklar durumunda bir ekonomide bütçe açıklarında meydana gelen artış yurt içi faiz oranlarını artırarak sermaye girişine ve reel döviz kurunun artmasına neden olmaktadır. (Gebremariam, 2018: 1). Tasarruf-yatırım dengesinin ilave edilmesiyle ortaya çıkan üçüz açık teorisi 'ikiz açık' teorisinin genişletilmiş versiyonudur (Szakolczai, 2006: 41). Genişletici maliye politikası uygulanması ile bütçe açığı ve cari açık meydana gelmektedir. Kamu borçlanmasında meydana gelen bir artış sonucu ulusal tasarruflar azalmakta, cari açık artarak üçüz açığa yol açmaktadır (Tülümce, 2013: 100, 101; Kamacı & Şahin-Kara, 2019: 145).

Ekonominin iç dengesi olarak izah edilen tasarruf yatırım dengesi ve bütçe dengesi ekonominin dış dengesini meydana getiren cari açığın birlikte meydana gelmesi üçüz açık hipoteziyle denklem 1'de açıklanmaktadır. (Szakolczai, 2006: 40, 41; Karanfil & Kılıç, 2015: 3):

$$(S-I) + (T-G) = (X-M) \quad (1)$$

(Tasarruf açığı) + (Bütçe açığı) = (Cari Açık)

Denklem 1'de (S-I) özel kesim tasarruf-yatırım dengesini, (T-G) kamu gelir ve gider dengesini, (X-M) ise, dış ekonomik denge düzeyini ifade etmektedir. Üç değişkenin de açık vermesiyle (tasarruf açığı, bütçe açığı ve cari açık) üçüz açık meydana gelmektedir. McTeer (2008)'in ifade ettiği gibi denklem 1'de, dengenin birinde oluşan değişim diğer dengeleri de etkilemektedir. Bütçe açıkları ulusal tasarrufların azalmasına ve cari işlemler dengesinin olumsuz yönde etkilenmesine neden olmaktadır. Böylece milli gelirde ve tasarruflarda düşüş bütçe açıklarına yol açmaktadır İktisat teorisinde bütçe açığının özel tasarrufları, yatırımları ve cari işlemler dengesini etkilediği bilinmektedir ancak Vyshnyak (2000)'de ifade ettiği gibi bütçe açığının tasarruflar, yatırımlar ve cari dengeye etkisi, açığın finanse edilme biçimiyle daha çok ilişkilidir. Yani üçüz açık hipotezinde oluşan açıkların finanse edilme yöntemi daha çok önem ifade etmektedir. Üçüz açık hipotezinin ortaya çıkışı, gelişmekte olan ülkelerin bütçe açıklarında görülen iyileşmelere rağmen cari açığın artış eğilimini sürdürmesi şeklinde ifade edilebilir (Karanfil & Kılıç, 2015: 3, 4).

İkiz açık ve üçüz açık hipotezlerinin teorik altyapısı denklem 2, 3, 4 ve 5'te ifade edilmektedir (Altunöz, 2018: 116-117):

$$\mathrm{Y} = \mathrm{C} + \mathrm{I} \text{ ve } \mathrm{Y} = \mathrm{C} + \mathrm{S} \tag{2}$$

Kapalı bir ekonomide genel ekonomik denge Denklem 1'de görüldüğü gibi, yurt içi tasarrufların, kamu ve özel kesim tasarruflarının toplamına eşit olduğu ve toplam tasarrufların da yatırımlara eşit olduğu ifade edilmektedir (Tülümce, 2013: 99). İki formülün birbirine eşitlenmesi halinde yatırım-tasarruf (I=S) eşitliği sağlanmaktadır. Kapalı ekonomiler için dış denge geçerli olmasa da açık ekonomilerde iç ve dış denge birlikte genel dengeyi sağlamaktadır (Altunöz, 2018: 117).

$$\mathrm{Y} = \mathrm{C} + \mathrm{I} + \mathrm{G} + (\mathrm{X} - \mathrm{M}) \tag{3}$$

Denklem 2'de, M ithalat değişkenini, X ihracat değişkenini ifade etmektedir.

$$\mathrm{Y} = \mathrm{C} + \mathrm{S} + \mathrm{T} + \mathrm{Tr} \tag{4}$$

Elde edilen ekonomik gelir, tüketilebilmekte, tasarruf edilebilmekte, devlete vergi olarak ödenebilmekte veya yurt dışına transfer edilebilmektedir. Denklem 3 ve 4'ün birbirine eşitlenmesiyle elde edilen denklem 5'te cari denge, dış denge denkleminin sol bölümünde yer alırken, denklemin sağ bölümünde ise iç ekonomik denge gösterilmektedir.

$$\mathrm{C} + \mathrm{S} + \mathrm{T} + \mathrm{Tr} = \mathrm{C} + \mathrm{I} + \mathrm{G} + \mathrm{X} - \mathrm{M} \text{ ve } \mathrm{X} - \mathrm{M} - \mathrm{Tr} = (\mathrm{S} - \mathrm{I}) + (\mathrm{T} - \mathrm{G}) \tag{5}$$

$$(\mathrm{S} - \mathrm{I}) + (\mathrm{T} - \mathrm{G}) = (\mathrm{X} - \mathrm{M}) \tag{6}$$

Denklem 5'te, (S-I) özel kesimin tasarruf-yatırım dengesini, (T-G) bütçe dengesini ve (X-M) dış (ticaret) dengeyi - cari işlemler dengesini ifade etmektedir. Üç dengenin açık vermesi durumunda ekonomi üçüz açıkla karşılaşılmaktadır (McTeer, 2008: 1-2).

Bütçe açığının cari açığı doğrudan veya dolaylı bir biçimde etkilediğine yönelik teorik yaklaşımların yanı sıra cari açığın bütçe açığını etkilediği yönünde yaklaşımlar da mevcuttur. Cari açığın büyüme oranında düşüşe yol açtığı ve bütçe açıklarında ise artışa neden olduğu ifade edilmektedir (Sever & Demir, 2007: 49). Literatürde 'ikiz açıklar hipotezi' olarak da tanımlanan bütçe açığı ve cari açık ilişkisi, 1980'li yıllardan sonra teorik çerçevede tartışma konusu olmuştur. İki değişken arasında nedensellik ilişkisi olup olmaması ve nedenselliğin yönü daha çok incelenmektedir.

Kamu borçlanmasındaki yaşanan artışların faiz oranlarını yükselttiği teorik yönden kabul edilse de ampirik çalışmaların bulguları bu teorik bilgiyi desteklememektedir. Özellikle bütçe açığı ve kısa dönem faiz oranı arasında güçlü bir ilişki bulunmamaktadır. Ancak bütçe açıklarının uzun dönem faiz oranlarını artırdığına yönelik bulgular mevcuttur. Keynesyen iktisat ekolüne sahip iktisatçılar, Keynesyen görüşe göre cari açıkların temel nedeninin bütçe açıkları olduğunu ifade edilmektedirler (Darrat, 1988: 880).

Enflasyon ve bütçe açığı ilişkisini ise iki yönlü gerçekleşmektedir. Faiz oranlarının artması kamu borç faiz yükününün artmasına neden olmakta ve vergi gelirlerindeki istikrarsızlıklar enflasyon dahilinde bütçe açıklarının artmasına sebep olmaktadır. Enflasyon artışının bütçe açığı üzerine etkisi ise, kamu gelirlerinin artan fiyatlar karşısındaki tepkisiyle belirlenmektedir.

Bütçe açıklarına bağlı olarak faiz oranlarında artış sermaye hareketliliği ve esnek döviz kuru sisteminin de etkisiyle yabancı sermaye girişini özendirerek döviz kuru artışlarının önüne geçilmekte ve ulusal paranın aşırı değerlenmektedir. Ulusal paranın yabancı paralar karşısında aşırı değer kazanması ise yurt içinde üretimi yapılan malların fiyatlarını yabancı malların fiyatlarına göre artırarak ihracatın düşmesine ve ithalatın artmasına sebep olmakta ve böylelikle net ihracat azalmakta ve cari açık giderek artmaktadır (Parasız, 2002: 59).

Kamu harcamalarında meydana gelen artış, özel kesimin kullanabileceği fonların azalmasına yol açmaktadır. Dolayısıyla kamu kesimi mevcut borçlanmayı yüksek faiz oranlarından yapmak durumunda kalmaktadır. Bu durum özel kesimin harcamalarını kısıtlayıcı bir etkiye sahip olmaktadır. Literatürde kamu borçlanması ve faiz oranları ilişkisi 'crowding-out/dışlama' etkisi olarak ifade edilmektedir.

3. Literatür İncelemesi

Bütçe açıkları, cari açık ve faiz oranı kapsamında literatür incelendiğinde kısmi çalışmaların yapıldığı görülmektedir. Literatür incelenirken önce bütçe açığı ve cari açık ilişkisini açıklayan ikiz açık hipotezi çalışmalarına yer verilmiştir. Bütçe açığı ve cari işlemler açığı ilişkisi daha çok Ricardocu denklik hipotezi ve Keynesyen geleneksel görüş çerçevesinde izah edilmektedir. Bütçe açığı daha çok tasarruflarla açıklanmaktadır. Diğer çalışmalarda ise bütçe açığı, cari açık ve faiz oranı ilişkisi üçüz açık hipotezi kapsamında ele alınmıştır.

Poterba ve Summers (1987), Ebrill ve Evans (1988) çalışmalarında bütçe açığı ve tasarruf açığı arasında herhangi bir ilişki olmadığı ve Ricardocu Denklik Hipotezi'nin geçersiz olduğu sonucuna ulaşmışlardır.

Tablo: 1
Bütçe Açıkları ile Cari Açıklar Arasındaki İlişki

Keynesyen Yaklaşım	Bütçe Açıkları → Cari Açıklar Yanısıra Bütçe Açığı ← Cari Açık Bütçe Açığı → Faiz Oranı Faiz oranı → Döviz Kuru Döviz Kuru → Cari Açık	Roubini (1988), Abell (1990), Nazma ve DaCosta (1990), Bachman (1992), Dibooğlu (1997), Vamvoukas (1999), Zengin (2000), Aqeel ve Nıshat (2000), Akbostancı ve Tunç (2002), Roubini ve Setser (2005), Sever ve Demir (2007), Chowdhury ve Saleh (2007), Bayrak ve Esen (2012)
Cari İşlemler Hedeflemesi (Cari Denge Hedeflemesi)	Bütçe Açıkları ← Cari Açıklar	Alkswani (2000), Baharumshah v.d. (2004), Aksu ve Başar (2005), Güriş ve Yılgör (2008), Chang ve Hsu (2009), Merza v.d. (2012), Uçal ve Bölükbaş (2013)
Çift Yönlü Nedensellik	Bütçe Açıkları ↔ Cari Açıklar	Darrat (1988), Islam (1998), Binhan (2002), Utkulu (2003), Yücel ve Ata (2003), Ay v.d. (2004), Yaldız (2005), Kim ve Kim (2006), Mukhtar v.d. (2007)
Ricardocu Eşitlik Yaklaşımı	Bütçe Açıkları ⇔ Cari Açıklar	Müller ve Rusek (1989), Enders ve Lee (1990), Bilgili (1998), Aksu ve Başar (2009), Kılavuz ve Dumrul (2012)

Kaynak: Özdemir vd., 2014: 2; Emirkadı, 2017: 83.

Bolat vd. (2014), 2002:1-2013:3 dönemini Avrupa Birliği ülkelerini ARDL yöntemiyle inceledikleri çalışmalarında Polonya, Portekiz, İspanya ve İsveç için üçüz açık hipotezinin geçerli olduğunu tahmin etmişlerdir.

Chowdhury ve Saleh (2007) çalışmalarında, 1970-2005 döneminde üçüz açık hipotezinin geçerliliğini Sri Lanka için (ARDL) sınır testiyle incelemişlerdir. Analiz bulguları sonucunda bütçe açığı, cari açık ve yatırım - tasarruf açığı arasında uzun dönemde bir ilişkinin var olduğunu test etmişlerdir.

Kim ve Roubini (2008), 1973-2004 dönemini VAR analiziyle G7 ülkeleri için inceledikleri çalışmalarında bütçe açığı ve cari açık arasında negatif bir ilişkinin olduğu yani ikiz açık hipotezinin geçerli olduğu sonucuna varmışlardır.

Şengönül (2008), 1994-2006 dönemi için ARDL sınır testiyle Türkiye'de üçüz açık hipotezinin geçerliliğini incelediği çalışmasında, analiz bulguları doğrultusunda değişkenler arasında uzun dönemli bir ilişkinin var olduğu sonucuna varılmıştır.

Sürekçi (2011), üçüz açık hipotezinin geçerliliğini Türkiye için ele aldığı çalışmasında, 1987:1-2007:3 dönemine ait çeyrek verileri kullanarak VAR analizlerini kullanmıştır. Analiz bulgularına göre kamu açıkları ve cari açık arasında bir ilişkinin var olduğu, ancak tasarruf-yatırım oranı ve cari açık arasında herhangi bir nedensellik ilişkisinin olmadığı sonucuna varılmıştır. Bu durumda yazar üçüz açık hipotezinin Türkiye'de geçerli olmadığını test etmiştir.

Akıncı ve Yılmaz (2012), 1975-2010 dönemini Türkiye için sınır testi kullanarak inceledikleri çalışmalarında cari açığın, tasarruf-yatırım açığı ve bütçe açığıyla belirlendiği sonucuna varılmıştır. Ayrıca incelenen dönemde üçüz açıkların Türkiye'de geçerli olduğu

yanı sıra tasarruf ve bütçe açığının kısa ve uzun dönemde cari açığa pozitif yönlü bir etkisi olduğu sonucuna varmışlardır.

Tülümce (2013), 1984-2010 döneminde üçüz açık sorununun varlığını Türkiye için Vektör Otoregresif (VAR) modeliyle incelediği çalışmasının analiz bulguları sonucunda cari açık ile tasarruf-yatırım eşitliği arasında bir ilişkinin varolduğu test edilmiş, ancak cari açık ile bütçe açığı arasında herhangi bir ilişki olmadığı sonucuna varmıştır. Dolayısıyla Türkiye'de ele alınan dönemde üçüz açık hipotezinin geçerliliği olmadığı sonucuna ulaşmışlardır.

Türkay (2013)'ün 1980-2012 dönemde Türkiye için cari açık, bütçe açığı ve yatırım-tasarruf açığı ilişkisini Engle-Granger eşbütünleşme ve DOLS (Dynamic Ordinary Least Square - Dinamik EKK) testleriyle incelemiştir. Bulgu sonucunda cari açık, bütçe açığı ve yatırım-tasarruf açığı arasında uzun dönemli bir eşbütünleşme ilişkisinin olduğu sonucuna ulaşmıştır.

Altun ve İnce (2014), 1975- 2010 dönemi için üçüz açık hipotezinin geçerliliğini Türkiye için ARDL sınır testi ve Toda Yamamoto nedensellik testiyle ele aldıkları çalışmada bütçe açığı, cari açık ve yatırım - tasarruf açığı arasında eşbütünleşme ilişkisi bulunmadığı sonucuna varmışlardır. Nedensellik analizi bulgularına göre ise, cari açıktan tasarruf - yatırım açığına ve cari açıktan bütçe açığına tek yönlü nedensellik ilişkisi bulunmuştur. Ayrıca tasarruf - yatırım açığından bütçe açığına tek yönlü nedensellik ilişkisinin var olduğunu tahmin etmişlerdir.

Tang (2014), üçüz açık hipotezinin geçerliliğini 1960:1-2013:1 dönemini ABD için ARDL sınır testiyle ele aldığı çalışmasında bütçe açığı, ticaret açığı ve tasarruf açığı arasında pozitif yönlü ve uzun dönemde eşbütünleşik bir ilişki olduğu sonucuna varmıştır.

Van Bon (2014), 1985-2012 dönemini GMM analiziyle Asya'nın 10 gelişmekte oaln ekonomisi için inceledikleri çalışmalarında cari açık ve bütçe açığı arasında ikiz açık hipotezinin geçerli olduğu sonucuna ulaşmıştır.

Özdemir vd. (2014) çalışmalarında, 2003-2011 dönemi için 17 geçiş ekonomisini inceledikleri çalışmalarında bütçe açığı ve cari açık arasında herhangi bir ilişkinin olmadığını ve üçüz açığın geçersiz olduğu ancak Ricardocu denklik hipotezinin geçerli olduğunu test etmişlerdir.

Samırkaş ve Samırkaş (2015), 1975-2004 dönemini Türkiye için üçüz açık hipotezinin geçerliliğini inceledikleri çalışmalarında, analiz bulguları sonucunda Türkiye'de üçüz açık hipotezinin geçersiz olduğu sonucuna varılmıştır. Cari işlemler açığının, yatırım-tasarruf açığı ve bütçe açığının belirleyicisi olduğu sonucuna ulaşmışlardır.

Karanfil ve Kılıç (2015), üçüz açık hipotezinin Türkiye için geçerliliğini Johansen eşbütünleşme ve Granger nedensellik analizleriyle 1980-2013 dönemi Türkiye için inceledikleri çalışmalarında, bütçe açığı, cari açık ve tasarruf - yatırım açığı arasında uzun

dönemli eşbütünleşme ilişkisi olduğu sonucuna ulaşılmıştır. Ayrıca cari açıktan tasarruf ve bütçe açığına tek yönlü, tasarruf açığından bütçe açığına çift yönlü nedensellik ilişkisinin var olduğunu tespit etmişlerdir.

Balan (2016), BRIC (Brezilya, Rusya, Hindistan, Çin) ve MINT (Meksika, Endonezya, Nijerya, Türkiye) ülkelerinde üçüz açık hipotezinin geçerli olp olmadığını Dumitreschu-Hurlin (2012) panel nedensellik testiyle inceledikleri çalışmasında analiz bulguları sonucunda BRIC ülkelerinde üçüz açık hipotezi geçerliyken, MINT ülkelerinde geçersiz olduğu sonucuna varmıştır.

Şen ve Kaya (2016), 1994-2012 dönemini 6 post-komünist (komünizm sonrası) ülkede ikiz ve üçüz açık hipotezlerinin geçerliliğini Bootstrap Panel Granger nedensellik testiyle ele aldıkları çalışmalarında, ikiz ve üçüz açık hipotezinin geçersiz olduğu sonucuna varmışlardır.

Dineri (2016), çalışmasında 1980-2014 dönemi için OECD ülkelerini ve OECD üyesi Türkiye'de üçüz açık hipotezinin geçerliliğini VAR analizi ve panel eşbütünleşme testleri ile analiz yapmışlardır. Türkiye ekonomisi için üçüz açık hipotezi geçerli olmadığı ve OECD ülkelerinde ise, uzun dönemde üçüz açık hipotezinin geçerli olduğu sonucuna varmıştır. Nedensellik analizi bulgularına göre, Türkiye için, cari işlemler açığından özel tasarruf-yatırım açığına ve cari açıktan bütçe açığına tek yönlü nedensellik ilişkisi bulunmuştur. OECD ülkelerinde de cari işlemeler açığı ve tasarruf ve yatırım açığı arasında çift yönlü nedensellik ilişkisinin var olduğu test edilmiştir.

İpek ve Kızılgöl (2016), 2004-2014 döneminde Türkiye için üçüz açık hipotezinin geçerliliğini ARDL sınır testi ve Toda Yamamoto nedensellik testiyle analizi yapılan çalışmalarında, değişkenler arasında uzun dönemli bir eşbütünleşme ilişkisinin var olduğunu ispatlamışlardır. Nedensellik analizi bulgularına göre, bütçe açığı ve cari açık, bütçe açığı ve tasarruf-yatırım açığı ve cari açık yatırım-tasarruf açığı arasında ise çift yönlü nedensellik ilişkisi olduğu bulgularına ulaşmışlardır.

Güder ve Kılıç (2016), 1980-2012 dönemi için ekonomik büyüme ve üçüz açık ilişkisini VAR (Vektör Otoregresif) analiziyle ele aldıkları çalışmalarında bütçe açığının büyümeyi kısa dönemde olumlu uzun dönemde olumsuz yönde etkilediğini tespit etmişlerdir. Ayrıca tasarruf - yatırım açığının da büyümeyi olumsuz yönde etkilediğini cari açığın ise, büyümeyi olumlu yönde etkilediğini ispatlamışlardır.

Shastri, Giri ve Mohapatra (2017) çalışmalarında, 1985-2015 dönemini 5 Güney Afrika ülkesi için üçüz açık hipotezinin geçerliliği Pedroni ve Westerlund panel eşbütünleşme testleri kullanılarak incelemişler, analiz bulguları sonucuna göre bütçe açığı, cari açığı ve yatırım-tasarruf açığı arasında uzun dönemde eşbütünleşme ilişkisi olduğu ortaya koymuşlardır.

Altunöz (2018), 2001:1-2017:3 dönemi için Türkiye'de ikiz açık ve üçüz açık hipotezlerinin geçerliliğini Hatemi-J eşbütünleşme ve Toda-Yamamoto nedensellik

analizleriyle inceledikleri çalışmalarının analiz bulguları sonucunda, kısa ve uzun dönemde değişkenler arasında eşbütünleşme ilişkisinin varolduğunu ve yatırım-tasarruf açığı ve bütçe açığı arasında ise çift yönlü, tasarruf yatırım açığı yanısıra cari açık ve bütçe açığı ile cari açık arasında çift yönlü nedensellik ilişkisinin olduğunu ispatlamıştır.

Kızılkaya ve Öztutuş (2018), çalışmalarında 1960-2016 dönemi için Türkiye'yi Johansen eşbütünleşme ve Granger nedensellik analizleriyle inceledikleri çalışmalarında Türkiye'de üçüz açık hipotezinin ekonomik istikrara etkisi incelendiğinde uzun dönemde Türkiye'de bütçe açığı ve yatırım - tasarruf açığının görüldüğünde cari açığın görüldüğü, uzun dönemde üçüz açık hipotezinin geçerli olduğu bulgularına ulaşmışlardır.

Saraç (2019), çalışmasında üçüz açık hipotezinin geçerliliği 2005-2017 dönemi için Türkiye'nin de yer aldığı 23 üst orta gelirli ülke grubu için Dumitreschu-Hurlin (2012) panel nedensellik analiziyle incelemiştir. Analiz bulguları sonucunda cari açık ve bütçe açığı arasında tek yönlü, bütçe ve tasarruf açığı arasında çift yönlü, tasarruf açığı ve cari açık arasında ise çift yönlü nedensellik ilişkisi olduğu sonucuna varmışlardır.

4. Veri ve Metodoloji

Bu çalışmada, Türkiye'nin 1990-2019 dönemi için yıllık verileri alınarak cari açık, bütçe açığı, tasarruf oranı ve faiz oranı değişkenleri arasındaki ilişki incelenerek "İkiz Açık" ve "Üçüz Açık" hipotezlerinin geçerliliği sınanmıştır. Çalışmada bütçe açığı (% GDP) değişkeni 'countryeconomy.com' veri tabanından elde edilmiştir. Cari açık değişkeni, cari açık/GDP %'lik oranı, Net Ulusal Tasarruf/GDP %'lik değişkeni ve Mevduat faiz oranı (%) değişkenleri ise, 'data.worldbank.org' veri tabanından elde edilmiştir. Çalışmada, ADF (1970) birim kök testi, Bayer-Hanck (2012) eşbütünleşme testi ve Hacker-Hatemi J. (2006) nedensellik testi kullanılmıştır. Ekonometrik analizlerde Eview 10.0, Stata 12.0 ve Gauss 10.0 programları kullanılmıştır.

4.1. Analiz Bulguları

Değişkenlerin durağanlıklarının incelenmesi adına Dickey ve Fuller (1981)'in geliştirdikleri sabitli ve sabitli-trendli modeller aşağıdaki denklemler aracılığıyla ele alınmaktadır (Güngör & Kurt, 2010: 202):

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum_{i=1}^{q} \beta_i \Delta Y_{t-i} + e_t \quad (7)$$

$$\Delta Y_t = \alpha_0 + \alpha_1 \mathrm{Trend} + \alpha_2 Y_{t-1} + \sum_{i=1}^{q} \beta_i \Delta Y_{t-i} + e_t \quad (8)$$

$$\Delta Y_t = \alpha_0 + \beta t + \rho Y_{t-1} + \sum_{i=1}^{k} \beta_i \Delta Y_{t-i} + \varepsilon_t \quad (9)$$

7 ve 8 no'lu denklemler için Y_t durağanlığı incelenen zaman serisini ifade ederken, Y_{t-1} serisinin bir gecikmeli değerini tanımlamaktadır. Δ, farkı alınan değişkenin fark parametresini ifade etmektedir. 8 no'lu trend denkleminde ise, α_i *ve* β_i değişkenlerin katsayılarını, q optimal gecikme uzunluğunu, e_t ise stokastik hata terimini ifade etmektedir. Denklem 7'de tanımlanan α_1 ve denklem 2'de tanımlanan α_2 katsayılarının tablo kritik

değerinden büyük olması durumunda serinin durağan olduğu göstermektedir. Ayrıca denklem 9'da ifade edilen ρ (prob.) değeri 0'a eşit veya 0'dan küçük olması durumuna göre serinin birim köklü veya birim kök içermediğine de karar verilebilmektedir.

$H_0: \rho = 0$, Seri durağan değildir. Seri birim köklüdür.

$H_1: \rho < 0$, Seri durağandır, seride birim kök içermemektedir. Hipotezler kullanılarak ADF testi sınanmaktadır.

Tablo: 1
ADF (1981) Birim Kök Testi

Değişkenler	ADF Birim Kök Testi Sonuçları	
	I(0)	I(1)
Bütçe Açığı	0.0002**	-
Cari Açık	0.0770*	-
Faiz Oranı	0.8128	0.0000**
Tasarruf Oranı	0.1850	0.0000**

****, **, * sırasıyla %1, %5 ve %10 anlamlılık düzeyinde anlamlılığı ifade etmektedir.*

Tablo 1'de görüldüğü üzere, bütçe açığı (%5) ve cari açık (%10) değişkenlerinin seviyede durağan oldukları görülürken, faiz oranı ve tasarruf oranı değişkenlerinin ise durağan olmadıkları görülmektedir. Faiz oranı ve tasarruf oranı serilerinin birinci derece farkları alınıp birim kök testi uygulandığında serilerin %5 anlamlılık düzeyinde durağan hale geldikleri görülmektedir.

Serilerin durağanlaşma dereceleri Dickey ve Fuller (ADF Birim kök testi, 1981) tespit edildikten sonrak seriler arasındaki uzun dönemli eşbütünleşme ilişkisi Bayer ve Hanck (2012) eşbütünleşme testiyle sınanmaktadır. Bayer ve Hanck (2012) testi literatürde yer alan mevcut eşbütünleşme testlerinin sonuçlarının çelişkili olmasından yola çıkılarak Engle ve Granger (1987), Johansen (1991), Boswijk (1994), Banerjee vd. (1998) eşbütünleşme testlerini birlikte ele alan yeni bir analiz yöntemi olarak literatürde yer almaktadır. Bayer ve Hanck (2012) testinde, Fisher (1932) formülü vasıtasıyla eşbütünleşme testlerinin olasılık değerlerinin birleştirebilebilmesi sözkonusudur (Govindaraju ve Tang, 2013: 315):

$$\text{EG - JOH} = -2[\ln(P_{EG}) + \ln(P_{JOH}) \quad (10)$$

$$\text{EG – JOH – BO – BDM} = -2\,[\ln(P_{EG}) + \ln(P_{JOH}) + \ln(P_{BO}) + \ln(P_{BDM})] \quad (11)$$

Denklem 10 ve 11'de, ifade edilen $P_{EG}, P_{JOH}, P_{BO}, P_{BDM}$, Engle ve Granger (1987), Johansen (1991), Boswijk (1994), Banerjee vd. (1998) eşbütünleşme testlerinin olasılık değerlerini sırasıyla temsil etmektedir. Elde edilen test istatistik değerlerinin Bayer ve Hanck (2012) kritik değerinden büyük olması halinde eşbütünleşme analizi ile ilişkisinin olmadığını belirtilen temel hipotez reddedilmektedir ve eşbütünleşme ilişkisi olduğunu ifade eden alternatif hipotez kabul edilmektedir (Alpler, 2017: 106, 107).

Tablo: 2
Bayer-Hanck (2012) Eşbütünleşme Testi Sonuçları

Model 1: Budget = f(Cad, Tasarruf, Interest)
Fisher Type Test Statistics, Bayer Hanck Test

	Engle-Granger	Johansen	Banerjee	Boswijk
p-values	0.9628	0.0000	0.2551	0.0025
Test Statistics	-1.4485	-	-2.8802	25.6235

EG-J: 55.3378 10% critical value: 8.363
EG-J-Ba-Bo: 70.0529 10% critical value: 16.097

Model 2: CAD = f(Budget, Tasarruf, Interest)

	Engle-Granger	Johansen	Banerjee	Boswijk
p-values	0.8973	0.0000	0.7727	0.0000
Test Statistics	-1.8742	-	-1.5699	132.5387

Fisher Type Test Statistics, Bayer Hanck Test
EG-J: 55.4772 10% ciritical value: 8.363
EG-J-Ba-Bo: 111.25654 10% ciritical value: 16.097

Model 3: Tasarruf = f(Budget, Cad, Tasarruf)
Fisher Type Test Statistics, Bayer Hanck Test

	Engle-Granger	Johansen	Banerjee	Boswijk
p-values	0.9911	0.0000	0.0000	0.0000
Test Statistics	-0.8821	-	-24.166	2.36e+04

EG-J: 55.2799 10% ciritical value: 8.363
EG-J-Ba-Bo: 165.804 10% ciritical value: 16.097

Model 4: Interest = f(Budget, Cad, Interest)
Fisher Type Test Statistics, Bayer Hanck Test

	Engle-Granger	Johansen	Banerjee	Boswijk
p-values	0.9849	0.0000	1.0000	0.0000
Test Statistics	-1.0987	-	39.8565	2231.06

EG-J: 55.2924 10% ciritical value: 8.363
EG-J-Ba-Bo: 110.545 10% ciritical value: 16.097

Tablo 2'den elde edilen bulgulara göre Engle-Granger (1987), Johansen (1991), Boswijk (1994) ve Banerjee vd. (1988) eşbütünleşme testlerinin tümünü dikkate alan Bayer-Hanck (2012) eşbütünleşme testi bulgularında, test istatistiğinin Bayer ve Hanck (2012) kritik değerden büyük olmasından dolayı eşbütünleşme ilişkisinin var olmadığını belirten temel hipotez reddedilmekte ve eşbütünleşme ilişkisinin olduğunu izah eden alternatif hipotez kabul edilmektedir. Dolayısıyla sırasıyla bütçe açığı, cari açık, tasarruf ve faiz oranı değişkenlerinden her bir değişkenin bağımlı değişken olarak alındığı dört farklı eşbütünleşme analizi modellerinde her bir model için serilerin uzun dönemde eşbütünleşik olduğu sonucuna ulaşılmıştır.

Hacker-Hatemi-J (2006) nedensellik testinde ARCH etkisinin görüldüğünde ve kalıntıların normal dağılım göstermediğinde Toda-Yamamoto (1995) nedensellik test istatisitiğinin x^2 dağılımına uyum göstermediğinde Efron (1979)'un geliştirdiği yeniden örneklemeye dayalı bootstrap simülasyonuyla oluşturulmakta ve daha güvenilir tablo kriitk

değerleri elde edilmektedir. Hatemi-J (2003), SIC ve Hannan-Quinn (HQ) bilgi kriterlerinin ortalamasına bağlı olarak Hatemi-J (HJC) bilgi kriteri elde edilmiştir (Pata, 2018: 104).

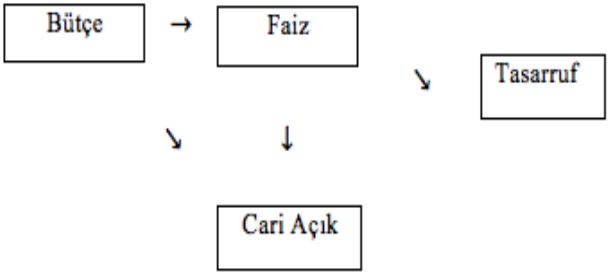
$$HJC = \ln(|\widehat{\Omega}|+j\ (\frac{n^2 lnT+2n^2 \ln\ (lnT)}{2T}),\ j=0.....,k \qquad (12)$$

Denklem 12'de, $|\widehat{\Omega}|$ j gecikme uzunluğuna bağlı tahmini yapılan VAR modeli için hata terimleri varyans-kovaryans matrisini, n VAR modelinde denklem sayısını, T ise gözlem sayısını temsil etmekte ve belirtilmektedir. Hacker-Hatemi-J testinde HJC uygun gecikme uzunluğunun belirlenmesinde önem ifade etmektedir (Pata, 2018: 104). Tablo 3'te Hacker-Hatemi-J (2006) nedensellik testi analiz bulguları ifade edilmiştir.

Table: 3
Hacker- Hatemi-J (2006) Causality Analysis for Turkey

Causality Direction	w-stat (MWald) stat.	Critical Value		
		%1 (***)	%5 (**)	%10 (*)
BUD → CAD	5.616*	12.209	7.449	5.553
CAD → BUD	1.816	12.399	7.234	5.479
BUD → INT	14.097**	19.287	11.536	8.610
INT → BUD	2.638	13.438	7.735	5.495
BUD → TAS	0.063	8.249	4.223	2.835
TAS → BUD	4.890	15.222	9.484	7.173
CAD → INT	0.009	8500	4.335	3.026
INT → CAD	3.417*	8.037	4.265	2.985
CAD → TAS	0.097	8.058	4.366	2.982
TAS → CAD	0.477	7.816	4.334	3.052
INT → TAS	10.897*	20.771	12.848	9.808
TAS → INT	4.914	20.865	12.856	10.813

*Not: Bootstrap kritik değerleri 10.000 döngüde elde edilir. Uygun gecikme uzunluğu AIC'ye (Akaike Information Criterion) göre belirlenmiştir. ***, **, * değişkenlerin sırasıyla %1, %5 ve %10 anlamlılık seviyelerinde durağan olduğunu göstermektedir.*



Tablo 3'te görüldüğü üzere Hacker ve Hatemi-J (2006) nedensellik analizi bulgularına göre, wald test istatistik değerleri kritik değerden büyük olduğundan dolayı bütçe açığından cari açığa, bütçe açığından faiz oranına, faiz oranından cari açığa ve faiz oranından tasarruf oranına tek yönlü nedensellik ilişkisinin var olduğu sonucuna ulaşılmıştır.

5. Sonuç

1980'li yıllarda küreselleşmenin etkisiyle dünya ekonomisinde Keynesyen politikalar yerini liberal politikalara bıraktığı yıllar olmuştur.

Sermayenin küreselleşmesi süreci olarak da tanımlanan bu süreçte dış finansman kaynaklarına yönelen ülkeleri cari açık sorunuyla karşı karşıya bırakmıştır. Ayrıca kamu harcamalarının finanse edilmesinde vergi gelirlerinin yetersiz olması bütçe açıklarının daha da artmasına neden olmuştur. Cari açık ve bütçe açığının birlikte artması Feldstein (1986) tarafından 'ikiz açık' kavramı olarak ifade edilmiştir. Szakolczai (2006)'da ikiz açık hipotezine 'yatırım-tasarruf dengesi' ekleyerek 'üçüz açık' hipotezi kavramını vurgulamıştır. Makro ekonomik dengenin sağlanması cari, tasarruf ve bütçe dengesinin sağlanmasıyla mümkün olmaktadır.

Çalışmada, 1990-2019 dönemi için Türkiye'de cari açık, bütçe açığı, tasarruf oranı ve faiz oranı ilişkisi incelen incelenmiş, 'İkiz Açık' ve 'Üçüz Açık' hipotezlerinin geçerliliği ADF (1970) birim kök testi, Bayer-Hanck (2012) eşbütünleşme testi ve Hacker-Hatemi J. (2006) nedensellik testleriyle analiz edilmiştir.

Hacker-Hatemi-J (2006) nedensellik testi bulgularına göre, bütçe açığından cari açığa tek yönlü nedensellik ilişkisinin olması Türkiye için incelenen 1990-2019 dönemi için 'İkiz Açık' hipotezinin geçerli olduğu ve Geleneksel Keynesyen yaklaşımda belirtilen görüşlerin analiz sonuçlarıyla tutarlı olduğu görüşmektedir. Keynesyen yaklaşıma göre, bütçe açıklarında meydana gelen artışların cari işlemler açığını artıracağı ileri sürülmektedir. Bütçe açığından faiz oranına doğru bir nedensellik ilişkisi olması da ikiz açık hipotezinin Türkiye için geçerliliğini desteklemektedir. Çünkü ikiz açık hipotezine göre, bütçe açığında ortaya çıkan artış faiz oranlarının artmasına sebep olmaktadır. Dolayısıyla faiz oranlarında meydana gelen artışla beraber ulusal parasının değer kazanmasını sağlamaktadır. İhracat ithalata göre pahalı bir hale gelmektedir. Bu durumda bütçe açığı ve cari açık ile birlikte görülmektedir. Keynesyen yaklaşıma göre, bütçe açığının finansmanı için borçlanma talebinin artması faiz oranlarının artmasına neden olmaktadır. Bütçe açıklarında meydana gelen artıştan kaynaklanana faiz oranlarındaki artış ikiz açık olarak adlandırılmaktadır. Faiz oranları artışı ülkeye yabancı sermaye girişinin olmasına neden olmaktadır. Ülkeye döviz girişi olması ulusal paranın yabancı paralar karşısında değer kazanmasına neden olmaktadır. Döviz kurunda meydana gelen düşüş dış ticarette ithalat artışı ve ihracat azalışı sonucu dengesizlik meydana getirmekte ve cari açığa neden olmaktadır. Yapılan analiz sonuçlarına göre Türkiye'de ikiz açık hipotezinin geçerliliği ifade edilmiş ve Türkiye'de üçüz açık hipotezinin geçerli olmadığı sonucuna ulaşılmıştır. Literatürde ikiz açık hipotezinin Türkiye'de geçerli olduğu yönündeki çalışmalar olan Sever ve Demir (2007), Erdinç (2008), Yapraklı (2010), Altıntaş ve Taban (2010), Mangır (2012), Bayrak ve Esen (2012), Azgün (2012)'deki çalışma sonuçları yapılan analiz sonuçlarıyla örtüştüğü görülmektedir. Yine Hacker-Hatemi-J (2006) nedensellik analizi bulgularına göre, üçüz açık hipotezinin geçerli olabilmesi için net tasarruf oranı - cari açık ve net tasarruf oranı - bütçe açığı arasında nedensellik ilişkisi olması gerekmektedir. İncelenen dönem için Türkiye'de net tasarruf

oranı - cari açık ve net tasarruf oranı - bütçe açığı arasında nedensellik ilişkisinin bulunmamasından dolayı üçüz açık hipotezinin Türkiye için geçerli olmadığı sonucuna ulaşılmıştır.

Klein (2006)'ın da ifade ettiği üzere ikiz açıkların uzun süre ülke ekonomilerinde etkisini sürdürmesi ekonomik istikrarsızlıklara yol açmaktadır. Dolayısıyla cari açık ve bütçe açığının her ikisinin para ve maliye politikalarının eşanlı olarak kullanımıyla çözülmesi tek başına mümkün olmamaktadır. Bütçe açığı ve cari açıkla ilişkili işsizlik, enflasyon, döviz kuru vb. gibi makroekonomik değişkenleri de kapsayan para ve maliye politikalarının eşanlı kullanımı yanı sıra bu politikalarla uyum gösteren iktisat politikalarının da uygulanması gerekmektedir.

Kaynaklar

Akıncı, M. & Ö. Yılmaz (2013), "Türkiye Ekonomisinde Üçüz Açık Hipotezinin Geçerliliği: Sınır Testi Yaklaşımı", *İMKB Dergisi*, 13(50), 2013, 1-28.

Akıncı, M. vd. (2016), "Dördüz Açıklar: Ütopya Mı Yoksa Gerçek Mi? Paradoks Ekonomi", *Sosyoloji ve Politika Dergisi*, 12(1), 22-47.

Alkswani, A.M. (2000), "Twin Deficit Phenomenon in Petroleum Economy: Evidence From Saudi Arabia", *Seventh Annual Conference*, Economic Research Forum, Amman.

Alper, F.Ö. (2017), "Türkiye'deki Enflasyon ve Nominal Faiz Oranı İlişkisinin Analizi: Bayer-Hanck Eşbütünleşme Testi", *3nd International Congress on Political, Economic and Social Studies (ICPESS)*, 09-11 Nov. 2017.

Altun, N. & N. Ince (2014), "Türkiye'de Üçüz Açıklara Ampirik Bir Yaklaşım: 1975-2010", *Sakarya İktisat Dergisi*, 3(2), 40-61.

Altunöz, U. (2014), "İkiz açık hipotezinin geçerliliğinin sınır yöntemiyle sınanması: Türkiye örneği", *Adıyaman Üniversitesi Sosyal Bilimler Dergisi*, 7(17), 426-446.

Azgün, S. (2012), "Twin De cit Hypothesis: Evidence From The Turkish Economy", *Doğuş University Journal*, 13(2), 189-196.

Balan, F. (2016), "BRIC ve MINT ekonomilerinde üçüz açık hipotezinin ampirik analizi", *Journal of Life Economics*, 3(1), 57-70.

Banerjee, A. vd. (1998), "Error-correction Mechanism Tests for Cointegration in a Single-equation Framework", *Journal of Time Series Analysis*, 19(3), 267-283.

Barro, R.J. (1974), "Are government bonds net wealth?", *Journal of Political Economy*, 82(6), 1095-1117.

Bayer, C. & C. Hanck (2013), "Combining Non-Cointegration Tests", *Journal of Time Series Analysis*, 34(1), 83-95.

Bayrak, M. & Ö. Esen (2012), "Bütçe açıklarının cari işlemler dengesi üzerine etkileri: İkiz açıklar hipotezinin Türkiye açısından değerlendirilmesi", *Ekonomik Yaklaşım Dergisi*, 23(82), 23-49.

Berke, B. vd. (2015), "Üçüz Açık ve Büyüme İlişkisi: Türkiye Örneği", *Eskişehir Osmangazi Üniversitesi İİBF Dergisi*, 2(1), 47-63.

Bolat, S. vd. (2014), "Does triple de cits have (UN) stable causality for the EU members? Evidence from bootstrap-corrected causality tests", *Procedia Economics and Finance*, 16, 603-612.

Boswijk, H.P. (1994), "Testing for an Unstable Root in Conditional and Structural Error Correction Models", *Journal of Econometrics*, 63(1), 37-60.

Chowdhury, K. & S.S. Ali (2007), "Testing the Keynesian proposition of twin de cits in the presence of trade liberalisation: Evidence from Sri Lanka", *Wollongong Economics Working Paper*, No: 07-09, 1-33.

Çoban, H. & E. Balıkçıoğlu (2016), "Triple deficit or twin divergence: A dynamic panel analysis", *The International Journal of Economic and Social Research*, 12(1), 271-280.

Dağ, M. (2018), *Türkiye'de Bütçe Açıkları ve Cari Açık Arasındaki İlişkinin Analizi: 1960-2016 Dönemi*, Modern Dönemde Eğitim, İktisat ve Güzel Sanatlar, Publisher: Berikan Yayınevi.

Darrat, D. (1988), "Have Large Budget Deficits Caused Rising Trade Deficits?", *Southern Economic Journal*, 54, 879-887.

Dickey, D.A. & W.A. Fuller (1981), "The Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root", *Econometrica*, 49(4), 1057-1072.

Dineri, E. & I. Taş (2016), "İkiz Açık Hipotezi: Türkiye'de Teorik ve Ampirik İnceleme", *Akademik Sosyal Araştırmalar Dergisi*, 4(32), 372-390.

Doménech, R. vd. (1997), *The Effects of Budget Deficits on National Saving in the OECD*, <http://iei.uv.es/~rdomenec/saving.pdf>, 05.05.2013.

Dooley, M. vd. (1987), "International Capital Mobility: What Do Saving- Investment Correlations Tell Us?", *IMF Staff Papers*, 34(3), 503- 530.

Ebrill, L.P. & O. Evans (1988), "Ricardian Equivalence and National Saving in the United States", *International Monetary Fund Working Paper*, No:88/96.

Efron, B. (1979), "Bootstrap Methods: Another Look at the Jackknife", *The Annals of Statistics*, 7(1), 1-26.

Eisner, R. (1994), "National saving and budget deficits", *The Review of Economics and Statistics*, 7(1), 181-186.

Emirkadı, Ö. (2017), "Türkiye Ekonomisinde İkiz Açıklar: Kuramsal Yaklaşımlar ve Ampirik Literatür Üzerine Değerlendirmeler", *Adnan Menderes Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 4(3), 81-99.

Engle, R.F. & C.W Granger (1987), "Co-integration and Error Correction: Representation, Estimation, and Testing", *Econometrica: Journal of the Econometric Society*, 251-276.

Feldstein, M. (1986), "The Budget Deficit and The Dollar", *NBER Working Paper* No: 1898.

Fischer, S. & W. Easterly (1990), "The Economics of the Government Budget Constraint", *The World Bank Research Observer*, 5(2), 127-142.

Gebremariam, T.K. (2018), "The Effect of Budget Deficit on Current Account Deficit in Ethiopia: Investigating the Twin Deficits Hypothesis", *International Journal of Economics &Management Sciences*, 7(4), 1-6.

Govindaraju, V.C. & C.F. Tang (2013), "The Dynamic Links between CO_2 Emissions, Economic Growth & Coal Consumption in China and India", *Applied Energy*, 104, 310-318.

Güder, F. & C. Kılıç (2016), "Üçüz Açık Sorunu ve Üçüz Açık Bileşenlerinin Ekonomik Büyüme Üzerine Etkisi: Türkiye Örneği", *Girişimcilik ve Kalkınma Dergisi*, 11(2), 46-77.

Güngör, B. & S. Kurt (2010), "Dışa Açıklık ve Kalkınma İlişkisi (1968-2003): Türkiye Örneği", *Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 21(2), 197-210.

Hacker, R.S. & A. Hatemi-J (2006), "Tests for Causality between Integrated Variables Using Asymptotic and Bootstrap Distributions: Theory and Application", *Applied Economics*, 38(13), 1489-1500.

Ipek, E. & Ö.A. Kızılgöl (2016), "Türkiye Ekonomisinde Üçüz Açik/Triple Deficit in Turkish Economy", *Ege Akademik Bakış*, 16(3), 425.

Johansen, S. (1988), "Statistical Analysis of Cointegration Vectors", *Journal of Economic Dynamics and Control*, 12(2-3), 231-254.

Kamacı, A. & S. Şahin-Kara (2019), "Üçüz Açıklar Hipotezi: 1974-2015 Yılları Arası Türkiye Örneği", *Uluslararası Afro-Avrasya Araştırmaları Dergisi*, 4(8), 143-154.

Karanfil, M. & C. Kılıç (2015), "Türkiye Ekonomisinde Üçüz Açık Hipotezinin Geçerliliği: Zaman Serisi Analizi", *Uluslararası Yönetim İktisat ve İşletme Dergisi*, 11(24), 1-20.

Kızılkaya, O. & F. Öztutuş (2018), "Türkiye'de Üçüz Açık Hipotezinin Geçerliliği: Nedensellik Analizi", *Elektronik Sosyal Bilimler Dergisi*, 17(68), 1476-1488.

Kim, S. & N. Roubini (2008), "Twin deficit or Twin Divergence? Fiscal Policy, Current Account, and Real Exchange Rate in the U.S.", *Journal of International Economics*, 74(2), 362-383.

Klein, L.R. (2006), "Issues Posed by Chronic US Deficit", *Journal of Policy Modeling*, 28(6), 673-677.

Kouassi, M. vd. (2004), "Causality Tests of the Relationship between the Twin Deficits", *Empirical Economics*, 29(3), 503-525.

McTeer, B. (2008), *Our Triple Deficits, National Center for Policy Analysis*, <http://www.ncpa.org/pub/ba613>, 01.03.2017.

Mixon, F.G. & J.B. Wilkinson (1999), "Maintaining The Status Quo: Federal Government Budget Deficits And Defensive Rent Seeking", *Journal of Economic Studies*, 26, 5-14.

Özdemir, D. vd. (2014), "Geçiş ekonomilerinde üçüz açık hipotezinin geçerliliği", *International Conference on Eurasian Economies*, 2014.

Papadogonas, T. & Y. Stournaras (2006), "Twin Deficits and Financial Integration in EU Member-States", *Journal of Policy Modeling*, 28(5), 595-602.

Parasız, İ. (2002), *Enflasyon, Kriz Ayarlamalar Dünyada ve Türkiye'de Kalkınma Makro Ekonomisi Sorunları*, Bursa: Ezgi Kitabevi.

Pata, U.K. (2018), "Türkiye'de Enflasyon, Tasarruf ve Ekonomik Büyüme Arasındaki İlişkilerin Simetrik ve Asimetrik Nedensellik Testleri ile Analizi", *Maliye Dergisi*, 174, 92-111.

Poterba, J.M. & L.H. Summers (1987), "Finite Lifetimes and the Effects of Budget Deficits on National Saving", *Journal of Monetary Economics*, 20(2), 369-391.

Pradhan, G. & K.P. Upadhyaya (2001), "The Impact of Budget Deficits on National Saving in the USA", *Applied Economics*, 33(13), 1745-1750.

Samırkaş, M.C. & M. Samırkaş (2015), "Türkiye'de Üçüz Açık Hipotezinin Geçerliliği Üzerine Ampirik Bir Çalışma", *Aksaray Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 7(3), 23-32.

Saraç, S. (2019), "Üçüz Açık Hipotezinin Geçerliliğine İlişkin Panel Veri Analizi", *Uluslararası Yönetim İktisat ve İşletme Dergisi*, 15(1), 77-93.

Sever, E. & M. Demir (2007), "Türkiye'de Bütçe Açığı ile Cari Açık Arasındaki İlişkilerin VAR Analizi ile İncelenmesi", *Eskişehir Osmangazi Üniversitesi İİBF Dergisi*, 2(1), 47-63.

Sürekçi, D. (2011), "Türkiye'de üçüz açıklar olgusunun analizi: Dinamik bir yaklaşım", *Yönetim ve Ekonomi*, 18(1), 51-59.

Szakolczai, G. (2006), "The Triple Deficit of Hungary", *Hungarian Statistical Review*, 10, 40-62.

Şen, H. & A. Kaya (2016), "Are the twin or triple de cits hypotheses applicable to post-communist countries?", Bank of Finland, BOFIT, *Discussion Paper*, <http://www.suomenpankki./boten/tutkimus/tutkimusjulkaisut/dp/Documents/2016/dp0316.pdf>, 08.11.2018.

Şengönül, A. (2008), "Different Twin Deficits in Different Time Intervals: Evidence from Turkey", *Asian-African Journal of Economics and Econometrics*, 8(2), 139-152.

Tang, T.C. (2014), "Fiscal Deficit, Trade Deficit and Financial Account Deficit: Triple Deficit Hypothesis with the U.S. Experience". *Monash University Discussion Paper*, 6(14), 1-13.

Toda, H.Y. & Y. Yamamoto (1995), "Statistical Inference in Vector Autoregressions with Possibly Integrated Processes", *Journal of Econometrics*, 66(1), 225-250.

Tülümce, Y.S. (2013), "Türkiye'de Üçüz Açığın Ampirik Analizi (1984- 2010)", *Maliye Dergisi*, 165, 97-114.

Türkay, H. (2013). "Türkiye'de cari açık, bütçe açığı ve yatırım tasarruf açığı ilişkisi", *C.Ü. İktisadi ve İdari Bilimler Dergisi*, 14(2), 253-269.

Van Bon, N. (2014), "Current Account and Fiscal Deficits Evidence of Twin Divergence from Selected Developing Economies of Asia", *Southeast Asian Journal of Economics*, 2(2), 33-48.

Vyshnyak O. (2000), *Twin Deficits Hypothesis: The Case of Ukraine*, <https://kse.ua/wp-content/uploads/2019/02/Vyshnyak-1.pdf>, 11.09.2020.

Sosyoekonomi

2021, Vol. 29(50), 317-336

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.15
Date Submitted: 14.09.2020
Date Revised: 10.08.2021
Date Accepted: 22.09.2021

Türkiye'de Tarım, Sanayi ve Hizmet Sektörleri Arasındaki Nedensellik İlişkisinin Analizi

Nilcan MERT *(https://orcid.org/0000-0002-4065-4768), Ardahan University, Turkey; nilcanmert@ardahan.edu.tr*

Zehra ABDİOĞLU *(https://orcid.org/0000-0002-1653-2840), Karadeniz Technical University, Turkey; maras@ktu.edu.tr*

Analysis of the Causality Relationship between Agriculture, Industry and Service Sectors in Turkey

Abstract

This study aims to investigate the causal relationship between agriculture, industry, and service sectors for Turkey. For this purpose, the panel causality analysis developed by Dumitrescu and Hurlin (2012) was performed for Turkey's general and seven geographical regions, using panel data covering 81 provinces from 2004 to 2017. Within the framework of this analysis, the key sectors that drive economic growth were examined for seven regions. According to the findings obtained from the panel causality test, the agriculture sector is fed by industry and service sectors, and the key sectors those direct general economic growth are different by region.

Keywords : Economic Growth, Sectoral Growth, Dumitrescu and Hurlin Causality Analysis.

JEL Classification Codes : O41, R11, C23.

Öz

Bu çalışmada Türkiye için tarım, sanayi ve hizmet sektörleri arasındaki nedensellik ilişkisinin araştırılması amaçlanmıştır. Bu amaç doğrultusunda 2004-2017 dönemi ile 81 ili kapsayan panel verileri kullanılarak Dumitrescu ve Hurlin (2012) tarafından geliştirilen panel nedensellik analizi hem Türkiye geneli hem de yedi coğrafik bölge için gerçekleştirilmiştir. Analizler çerçevesinde bölgelere göre ekonomik büyümeye yön veren kilit sektörler belirlenmeye çalışılmıştır. Panel nedensellik testinden edinilen bulgulara göre tarım sektörü sanayi ve hizmet sektörlerinden beslenmektedir ve genel ekonomik büyümeye yön veren öncü sektörler bölgelere göre farklılık arz etmektedir.

Anahtar Sözcükler : Ekonomik Büyüme, Sektörel Büyüme, Dumitrescu ve Hurlin Nedensellik Analizi.

1. Giriş

Ekonomik büyümede sektörel bağlantıların önemi Hirschman (1958) tarafından dengesiz büyüme teorisi kapsamında savunulmuştur. Teori ekonominin tüm sektörlerine eş zamanlı olarak yatırım yapmak yerine ekonominin stratejik sektörlerine yatırım yapma gerekliliği üzerinde durmaktadır. Teoriye göre sektörler arasındaki bağlantıların etkisiyle ekonominin diğer sektörleri otomatik olarak kendilerini geliştirecektir. Hirschman (1958), ekonominin farklı sektörleri arasındaki bağlantıları ileri (forward) ve geri (backward) doğru bağlantılar olarak tanımlamaktadır. Ayrıca Thirlwall (2006) da sektörler arasındaki ileri ve geri doğru bağlantı mekanizmasını açıklamıştır. Thirlwall (2006)'a göre bir sektörün çıktısı bir başka sektörün girdisi olarak kullanılıyorsa bu durum ileri doğru aktarım mekanizması yaratır. Bir sektörün çıktısının üretimi başka bir sektörden girdi satın almayı gerektiriyorsa ilgili sektörler arasında geri doğru bir bağlantı oluşturur. (Kularatne & Sivarajasingham, 2014: 27).

Ekonominin temel sektörlerinden biri olan tarım sektörü sanayileşme altyapısının oluşturulmasında elzem olan girdileri sağlamaktadır. Lewis (1954), Hirschman (1958), Fei ve Ranis (1961), Kuznets (1973) ve Chenery (1979), ekonomik kalkınmanın tarımsal faaliyetlerden endüstriyel aktivitelere doğru yapısal bir dönüşüm olduğunu ortaya koymuşlardır. Tarım sektörü, fiyat istikrarının temin edilmesinde çok önemli bir faktör olan yeterli gıda arzının sunulmasına imkân tanımaktadır. Tarımsal ihracat, önemli endüstriyel ara veya yatırım mallarını ithal etmek amacıyla kullanılabilen önemli bir döviz kaynağı niteliğindedir. Tarım sektörü tarım dışındaki sektörlere sermaye ve emek girdisi sağlamaktadır. Pazar odaklı bir ekonomi söz konusu olduğunda, kademeli olarak girişimcilik ve pazarlama yetenekleri birikimi yoluyla sanayileşme süreçlerini kolaylaştırmaktadır. Böylece daha hızlı bir tarım sektörü büyümesi sanayi sektöründe daha hızlı büyümeye neden olmaktadır. Özetle tarım sektörü, emek, sermaye ve hammadde kaynağı sağlayarak ve sanayi ürünlerine talep yaratarak sanayileşmeyi desteklemektedir. Aynı zamanda, tarım ve sanayi arasındaki ilişki karşılıklı bağımlılık ve tamamlayıcılık ilişkisini temsil etmektedir. Şöyle ki, tarım sektöründe sanayi sektörüne girdi sağlanırken aynı zamanda tarım sektörü verimliliğini artırmak için modern tarımsal girdileri, ileri teknolojileri ve tüketim mallarını da sanayi sektöründen temin etmektedir (Hwa, 1989: 107). Bu pozitif ilişki kaynak kullanımında daha fazla üretkenliğe ve sürdürülebilir ekonomik büyümeye yol açmaktadır. Diğer taraftan karşılaştırmalı üstünlük yasası tarımsal üretkenlik ve sanayileşme arasında negatif bir ilişkiye işaret etmektedir. Bu görüşe göre, imalat sektörü emek için tarım sektörü ile rekabet etmek zorundadır. Tarım sektöründeki düşük verimlilik, imalat sanayinin yararlanabileceği bol miktarda ucuz işgücü arzını ifade eder (Subramaniam & Reed, 2009: 6).

Fuchs (1968), Blades vd. (1974), Gemmell (1982) ve Bhagwati (1984) hizmet sektörünün hizmet dışı sektörler ile olan bağlantısını ele alarak hizmet sektörünün tarım sektörüne dağıtım ve perakendecilik gibi aracılık hizmetleri sağlayabildiğini vurgulamışlardır. Dağıtım ve perakendecilik gibi aracılık hizmetlerinin hem tarıma hem de sanayiye katkısı zaman içinde ivme kazanmıştır.

İmalat ve hizmet sektörlerinin iç içe geçtiği konusunda genel bir kanı söz konudur. İmalat sanayinin üretim süreçlerinde çeşitli hizmetleri önemli girdiler olarak kullandığı ve aynı zamanda sektörel çıktılarıyla birlikte bir dizi hizmet faaliyetini de yürütülmekte olduğu su götürmez bir gerçektir. Diğer taraftan, hizmet sektörü daha verimli aktivitelerde bulunmak amacıyla imalat sanayi çıktılarına ihtiyaç duymaktadır. Araştırmalar telekomünikasyon ve yazılım geliştirme gibi araştırma yoğun ve yüksek teknolojili hizmet endüstrilerinin imalat sanayinin girdilerinin önemli bir bölümünü oluşturduğunu ve aynı zamanda imalat sektöründeki pozitif ve önemli verimlilik etkilerinin de kaynağı olduğunu göstermiştir (Foster vd., 2012: 12).

"Nihai kullanım" hizmetleri tarım ve sanayi ürünlerine olan talebin yakın ikamesi olabilir ve hizmet sektörü çoğu zaman doğrudan işgücü için tarımla rekabet etmektedir (Gemmell vd., 2000: 356). Yüksek teknolojili sanayi ürünleri hizmet sektörüne daha fazla ihtiyaç duymaktadır ve özellikle taşımacılık, telekomünikasyon ve finansal hizmet sektörlerinin büyümesinin sanayi sektörünün gelişimi üzerinde önemli pozitif etkileri bulunmaktadır (Nordas & Kim, 2013).

Kaldor, 1967'deki öncü çalışması ile sanayi sektörünün ekonomik büyümenin motoru olduğunu kanıtlamıştır. Ancak yeni teknolojik gelişmeler ve diğer faktörler nedeniyle hizmetler sektörünün gelişmekte olan ülkelerde bile büyümenin motoru olarak sanayinin yerini alabileceğini öne süren alternatif görüşlerin mevcut olduğuna literatürde rastlanmaktadır (Dasgupta & Singh, 2005). Hizmetler sektörü genel ekonomik büyümeye istikrarlı bir destek sağlamaktadır. Sınır ötesi ticaret ve doğrudan yabancı yatırımlarda önemli ve artan bir paya sahiptir. Hizmetler sektörünün yükselen trendinin, bilgiye dayalı ve beceri odaklı faaliyetler alanındaki ilerleme ile giderek artan bir öneme sahip olması beklenmektedir (Ahmed & Ahsan, 2011: 1).

Ekonominin temel sektörleri arasındaki güçlü bağlantılar ve karşılıklı ilişkiler göz önüne alındığında sektörel gelişmeler ve sektörler arasındaki etkileşimlerin gerek sektörel bazda büyüme ve gerekse de genel ekonomik büyüme üzerinde önemli bir etkisinin olması beklenmektedir. Sektörler arasındaki geriye ve ileriye doğru bağlantılar konusunda bilgi sahibi olmak sektörler arası olası geri bildirim mekanizmaları hakkında daha iyi bir bakış açısı geliştirmeye olanak sağlayacaktır. Diğer sektörler ile önemli düzeyde geriye ve ileriye doğru bağlantı mekanizmasına sahip olan bir sektöre yatırımların yoğunlaştırılması kuşkusuz önem arz etmektedir. İlgili sektörün gelişimi üretim ve istihdam seviyeleri üzerinde önemli bir etkiye sahip olacaktır. Ekonominin kilit sektörü olarak değerlendirilen adı geçen sektördeki gelişme diğer sektörlerde daha fazla ekonomik faaliyeti teşvik ederek genel ekonomik büyüme üzerinde daha büyük bir çarpan etkisi yaratacaktır. Bu nedenle, sürdürülebilir bir ekonomik büyüme modelini yakalamak ve uzun vadeli stratejiler geliştirmek amacıyla sektörler arasındaki ilişkinin doğru bir şekilde yorumlanması elzemdir. Bu amaçla çalışmada Türkiye için 81 il ve 2004-2017 dönemini kapsayan panel veri analizi kullanılarak genel ekonomik büyüme ile tarım, sanayi ve hizmet sektörlerindeki büyüme arasındaki nedensellik ilişkisinin araştırılması amaçlanmıştır. Dumitrescu ve Hurlin

hetorojen panel nedensellik testi kullanılarak hem Türkiye geneli hem de yedi coğrafik bölge bazında sektörler arası nedensellik ilişkisi araştırılmıştır.

Sektörler arası ilişkileri konu alan ampirik literatürde çalışmaların önemli bir bölümünün çok sayıda ülkenin girdi-çıktı tablolarını temel aldığı gözlenmiştir (Sastry vd., 2003, Ersungur & Kızıltan, 2008; Atan, 2011; Ersungur vd., 2011; Günçavdı vd., 2013; Yıldız & Akduğan, 2014; Altan vd., 2015; Pehlivanoğlu & İnce, 2020 vb.). İlgili çalışmalar özellikle tarım, hayvancılık, madencilik, gıda, enerji, inşaat, hizmet, ulaşım vb. sektörler arasındaki ileri ve geri doğru bağlantılar üzerinde durarak kilit sektörün belirlenmesine odaklanmıştır. Yüksek çarpan etkilerine sahip sektörlerin saptanması karar alıcılara yatırım tercihleri noktasında önemli bilgiler sağlamaktadır.

Girdi-çıktı tablolarına dayalı çalışmaların yanı sıra zaman serilerini kullanarak eş bütünleşme ve nedensellik yaklaşımları bazında sektörler arası dinamikler üzerinde duran çalışmaların da önemli sayıda olduğu dikkatleri çekmektedir (Yamak & Sivri, 1997; Kanwar, 2000; Yao, 2000; Yamak, 2000; Katırcıoğlu, 2002; Wells & Thirlwall, 2004; Terzi & Oltulular, 2004; Rashid, 2004; Blunch & Verner, 2006; Arısoy, 2008; Subramaniam & Reed, 2009; Yamak vd., 2016; Kolcu & Yamak, 2017; Yetiz & Özden, 2017; Kalmaz & Giritli, 2018 vb). Adı geçen çalışmalarda tarım, sanayi, hizmet vb. sektörler arasındaki hem uzun hem de kısa dönemli etkileşimlere dayalı olarak ekonomide öncü olan kilit sektörler tespit edilmiştir. Bunun yanı sıra genel ekonomik büyümeyi besleyen ya da genel ekonomik büyümeden beslenen sektörler de ilgili çalışmalar kapsamında ortaya konulmuştur.

Literatürde ekonominin genel sektörleri arasındaki ilişkiyi araştıran girdi-çıktı analizlerine ve zaman serisi yaklaşımlarına dayalı çalışmaların yanı sıra, çok sayıda gözlemle çalışmaya olanak sağlayan panel veri analizleri kapsamında sektörler arasındaki dinamik ilişkiyi araştıran çalışmaların nispeten sınırlı sayıda olduğunu söylemek mümkündür. Literatürdeki ilgili boşluğu doldurmak amacıyla bu çalışmada Türkiye için tarım, sanayi ve hizmet sektörleri arasındaki dinamik ilişki 81 il bazında 2004-2017 dönemine ilişkin panel veriler kullanılarak analiz edilmiştir. Çalışmada öncelikle kullanılan veri seti ve yöntem tanıtılmış daha sonra edinilen bulgular açıklanmıştır. Son olarak genel değerlendirmeye yer verilmiştir.

2. Veri Seti ve Ekonometrik Yöntem

Çalışmada 81 ile ilişkin 2004-2017 dönemine ait genel GSYİH ile tarım, sanayi ve hizmetler sektörlerine ilişkin GSYİH serileri kullanılmıştır. Türkiye İstatistik Kurumu Bölgesel İstatistikler veri tabanından çekilen veri seti tüketici fiyatları endeksi (TÜFE, 2009=100) ile reel hale dönüştürülmüştür. Reel serilerin logaritmik dönüşümleri yapılarak logaritmik farkları alınmıştır. Bu şekilde sektörlere ait büyüme serileri ile analizler gerçekleştirilmiştir.

Tablo: 1
Değişken Tanımları

Değişken	Açıklama	Tanım
Dlrgsyih	Reel gayri safi yurtiçi hâsıla büyüme serisi	lrgsyih-lrgsyih(-1)
Dlrtarim	Tarım sektörü reel gayri safi yurtiçi hâsıla büyüme serisi	lrtarim-lrtarim(-1)
Dlrsanayi	Sanayi sektörü reel gayri safi yurtiçi hâsıla büyüme serisi	lrsanayi-lrsanayi(-1)
Dlrhizmet	Hizmetler sektörü reel gayri safi yurtiçi hâsıla büyüme serisi	lrhizmet-lrhizmet(-1)
l, serilerin logaritmik dönüşümünün yapıldığını; D, serilerin birinci devresel farkının alındığını göstermektedir.		

Tablo 2'de değişkenlere ilişkin tanımlayıcı istatistikler sunulmuştur. 2004-2017 dönemi için 81 il bazında ortalama genel ekonomik büyüme yaklaşık 0,04 oranında gerçekleşirken sanayi sektörü 0,06, tarım sektörü 0,01 ve hizmet sektörü 0,04 ortalama büyüme sergilemiştir. En yüksek standart sapma değerine sahip sektörün tarım sektörü olduğu dikkatleri çekmektedir. Jarque-Bera test istatistikleri büyüme serilerinin normal dağılıma sahip olmadıklarını göstermektedir.

Tablo: 2
Tanımlayıcı İstatistikler

	Dlrgsyih	Dlrtarım	Dlrsanayi	Dlrhizmet
Ortalama	0,045713	0,014672	0,069537	0,047192
Medyan	0,045094	0,009941	0,073077	0,047578
Maksimum	0,228979	1,077461	0,416453	0,174081
Minimum	-0,118337	-0,800882	-0,342901	-0,075854
Std. Sapma	0,049161	0,151658	0,098181	0,034461
Eğiklik	0,040402	0,685130	-0,503778	-0,356328
Basıklık	4,047705	8,896657	4,787097	4,041635
Jarque-Bera	48,44740	1607,939	184,6648	69,88769
Olasılık	0,000000	0,000000	0,000000	0,000000

Sektörel büyüme serileri arasındaki nedensellik analizine geçmeden çalışmada öncelikle paneli oluşturan birimler arasında yatay kesit bağımlılık olup olmadığı araştırılmıştır. Yatay kesit bağımlılık için Breusch ve Pagan (1980)'ın Lagrange Çarpanı testi (LM), Pesaran (2004)'ın yatay kesit bağımlılık testi (CD) ve Pesaran (2004)'ın ölçeklendirilmiş Lagrange Çarpanı testi (LM_S) kullanılmıştır.

Yatay kesit bağımlılık testi için Breusch ve Pagan (1980) tarafından geliştirilen LM test istatistiğini hesaplamak amacıyla aşağıdaki (1) numaralı denklem tahmin edilmektedir.

$$y_{it} = \alpha_i + \beta_i' x_{it} + u_{it} \;\; i = 1, 2, \dots, N; \; t = 1, 2, \dots, T \tag{1}$$

(1) numaralı denklemde i, yatay kesit boyutu; t, zaman boyutunu; x_{it}, kx1 boyutundaki açıklayıcı değişkenler vektörünü; α_i ve β_i, sırasıyla bireysel sabitleri ve eğim katsayılarını göstermektedir. LM testinde yatay kesit bağımlılık olmadığını ifade eden sıfır hipotezi (H_0*:Cov(u_{it},u_{jt})=0 tüm t'ler ve i≠j için*) yatay kesit bağımlılığı temsil eden alternatif hipoteze (H_1*: Cov(u_{it},u_{jt})≠0 en azından bir çift i≠j için)* karşı test edilmektedir. LM test istatistiği (2) numaralı eşitlikte verilmiştir.

$$LM = \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} T_{ij}\, \hat{\rho}_{ij}^2 \;\rightarrow \chi^2_{\frac{N(N-1)}{2}} \tag{2}$$

$\hat{\rho}_{ij}$ her bir i için denklem (1)'in sıradan en küçük kareler yaklaşımıyla tahmini sonucu elde edilen hata terimlerine ilişkin korelasyon katsayısıdır. Breusch-Pagan testi panelin birim boyutunun nispeten küçük, zaman boyutunun ise büyük olması durumlarında uygun bir yaklaşımdır. LM test istatistiği büyük N durumunda uygun bir yaklaşım değildir. Pesaran (2004) bu eksikliği gidermek amacıyla LM istatistiğinin standardize versiyonunu geliştirmiştir. İlgili test istatistiği (3) numaralı eşitlikte gösterilmiştir.

$$LM_S = \sqrt{\frac{1}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} (T_{ij}\, \hat{\rho}_{ij}^2 - 1) \;\rightarrow N(0,1) \tag{3}$$

Pesaran (2004), LM ve LM_S istatistiklerindeki boyut bozulmasını (size distortion) düzeltmek için korelasyon katsayılarının ($\hat{\rho}_{ij}$) ortalamasına dayalı alternatif bir test istatistiği geliştirmiştir. CD test istatistiği (4) numaralı eşitlikte sunulmuştur.

$$CD = \sqrt{\frac{2}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} T_{ij}\hat{\rho}_{ij} \;\rightarrow N(0,1) \tag{4}$$

Yatay kesit bağımlılık durumunda panel veriler için birim kök analizinde ikinci nesil panel birim kök testlerinin kullanımı önem arz etmektedir. Pesaran (2007), yatay kesit genelleştirilmiş Dickey-Fuller (CADF) regresyonu üzerinden standart birim kök istatistiğine dayanan bir birim kök testi önermiştir. Standart ADF denklemine yatay kesit ortalamalara ilişkin gecikmeli değerler ve yatay kesit ortalamalarının birinci farkları eklenerek CADF denklemi tahmin edilmektedir. Pesaran (2007)'ın yaklaşımı bireysel yatay kesit ortalamalarla genişletilmiş ADF istatistiklerinin ($CADF_i$) basit aritmetik ortalamalarına dayanmaktadır. Bireysel CADF istatistikleri CIPS (yatay kesit genişletilmiş Im, Pesaran ve Shin) istatistiğinin elde edilmesinde kullanılmaktadır. CIPS istatistiğine (5) numaralı eşitlikte yer verilmiştir.

$$CIPS = N^{-1} \sum_{i=1}^{N} CADF_i \tag{5}$$

Yatay kesit bağımlılığın yanı sıra panel veri analizlerinde bir diğer önemli konu eğim katsayılarının homojenliğidir. Eğim katsayılarının homojenlik testinde Pesaran ve Yamagata (2008) tarafından önerilen Δ ve Δ_{adj} testlerinden yararlanılmıştır. Pesaran ve Yamagata (2008)'ın Δ testi, Swamy (1970)'in eğim katsayısı homojenlik testinin standardize bir versiyonudur. Swamy (1970)'in test istatistiği aşağıdaki gibidir:

$$\tilde{S} = \sum_{i=1}^{N} \left(\hat{\beta}_i - \tilde{\beta}_{WFE}\right)' \frac{x_i' M_\tau x_i}{\tilde{\sigma}_i^2} \left(\hat{\beta}_i - \tilde{\beta}_{WFE}\right) \tag{6}$$

(6) numaralı eşitlikte $\hat{\beta}_i$ havuzlanmış en küçük kareler tahmincisini; $\tilde{\beta}_{WFE}$, ağırlıklı sabit etkiler havuzlanmış tahmincisini; M_τ, birim matrisi ve $\tilde{\sigma}_i^2$, σ_i^2'nin tahmincisini ifade etmektedir. Δ istatistiği aşağıdaki (7) numaralı eşitlikte gösterilmiştir.

$$\tilde{\Delta} = \sqrt{N}\left(\frac{N^{-1}\tilde{S} - k}{\sqrt{2k}}\right) \;\rightarrow (N,T) \rightarrow \infty \tag{7}$$

Pesaran ve Yamagata (2008), Δ test istatistiğine ortalama ve varyans yanlılık düzeltmesi uygulayarak testin küçük örneklem durumunda da geçerliliğini sağlamışlardır. (8) numaralı eşitlikte $\widetilde{\Delta}_{adj}$ test istatistiği verilmiştir.

$$\widetilde{\Delta}_{adj} = \sqrt{N}\left(\frac{N^{-1}\tilde{S} - E(\tilde{z}_{it})}{\sqrt{var(\tilde{z}_{it})}}\right) \tag{8}$$

Gerek yatay kesit bağımlılık ve gerekse de homojenlik testlerine ilişkin bulgular göz önüne alınarak çalışmada genel ekonomik büyüme ve sektörel büyüme arasındaki ilişkiyi analiz etmek amacıyla Dumitrescu ve Hurlin (2012) tarafından önerilen heterojen panel nedensellik testi kullanılmıştır. Dumitrescu ve Hurlin (2012), heterojen panel veri modelleri için çok basit bir Granger (1969) nedensellik testi önermişlerdir. Önerdikleri test istatistiği bireysel Wald istatistiklerinin ortalamasına dayanmaktadır. Monte Carlo deneyleri standardize panel istatistiklerinin yatay kesit bağımlılığın varlığı durumunda bile çok iyi küçük örnek özelliklerine sahip olduğunu kanıtlamıştır.

X ve Y durağan iki seriyi göstermek üzere doğrusal model aşağıdaki gibi yazılır:

$$Y_{i,t} = \alpha_i + \sum_{k=1}^{K} \gamma_i^{(k)} Y_{i,t-k} + \sum_{k=1}^{K} \beta_i^{(k)} X_{i,t-k} + \varepsilon_{i,t} \tag{9}$$

(9) numaralı denklemde $i = 1, 2, \dots, N$ ve $t = 1, 2, \dots, T$ olmak üzere $\beta_i = (\beta_i^{(1)}, \dots, \beta_i^{(K)})'$. Dumitrescu ve Hurlin yaklaşımında sıfır hipotezi (Homogeneous Non Causality, HNC) aşağıdaki gibi herhangi bir yatay kesit için nedensellik yoktur şeklinde tanımlanmaktadır.

$$H_0\colon\ \beta_i = 0,\ \forall_i = 1, \dots, N$$

Buna karşın alternatif hipotez ise N_1+1'den N'e kadar olan yatay kesit birimler için X'den Y'ye doğru bir nedensellik ilişkisi olduğunu ancak 1. birimden N_1. birime kadar herhangi bir nedensellik olmadığını ifade etmektedir. Diğer bir ifadeyle alternatif hipotez nedensellik ilişkisinin bazı birimler için söz konusu olduğunu (heterojen) göstermektedir.

$$H_1\colon \qquad \beta_i = 0,\ \forall_i = 1, \dots, N_1$$

$$\beta_i \neq 0,\ \ \forall_i = N_1 + 1, N_1 + 2, \dots, N$$

Dumitrescu ve Hurlin (2012), $W_{N,T}^{Hnc}$ ortalama test istatistiğini (10) numaralı eşitlikteki gibi tanımlamışlardır.

$$W_{N,T}^{Hnc} = \frac{1}{N} W_{i,T} \tag{10}$$

(10) numaralı eşitlikte $W_{i,T}$, bireysel $H_0\colon \beta_i = 0$ testine karşılık gelen i. kesit birimi için bireysel Wald istatistiklerini temsil etmektedir. Dumitrescu ve Hurlin (2012), sıfır hipotezi altında ortalama test istatistiğinin ($W_{N,T}^{Hnc}$) asimtotik dağılımını ilk olarak T'nin ve

sonra N'in sonsuza yakınsaması durumlarında ele almışlardır. Bu durumda standardize istatistik (11) numaralı eşitlikteki gibi tanımlanmıştır.

$$Z_{N,T}^{Hnc} = \sqrt{\frac{N}{2K}}(W_{N,T}^{Hnc} - K) \xrightarrow[T,N\to\infty]{d} N\ (0,1) \tag{11}$$

Büyük N ve T için standartlaştırılmış istatistik $Z_{N,T}^{Hnc}$, belirli bir anlamlılık düzeyinde, karşılık gelen normal kritik değerin üstündeyse sıfır hipotezi (HNC) reddedilmektedir. Aynı zamanda T>5+2K olan sabit bir T boyutu için standardize Z istatistiği standart normal dağılım izler.

$$\tilde{Z}_N^{Hnc} = \sqrt{\frac{N}{2K}\frac{(T-2K-5)}{(T-K-3)}}\left[\frac{(T-2K-3)}{(T-2K-1)}W_{N,T}^{Hnc} - K\right] \xrightarrow[N\to\infty]{d} N\ (0,1) \tag{12}$$

Eğer (12) numaralı eşitlikteki standartlaştırılmış istatistik $\tilde{Z}_N^{Hnc}$, belirli bir anlamlılık düzeyinde, karşılık gelen normal kritik değerin üstündeyse, sıfır hipotezi (HNC) reddedilir. Dumitrescu ve Hurlin (2012), panel veriler arasındaki yatay kesit bağımlılığın bir testin küçük örneklem özellikleri üzerindeki negatif etkilerini dikkate almak amacıyla nedensellik analizinde asimptotik kritik değerler yerine bootstrap kritik değerlerini kullanmışlardır.

3. Analiz Bulguları

Sektörel büyüme serileri arasındaki nedensellik analizi için uygun yaklaşımı belirlemek amacıyla öncelikle yatay kesit bağımlılık ve homojenlik testleri yapılmıştır. Tablo 3'te yatay kesit bağımlılık testlerine ilişkin bulgulara yer verilmiştir. Tablodan gözleneceği üzere kullanılan tüm yaklaşımlar %1 anlamlılık düzeyinde yatay kesit bağımlılığa işaret etmektedir. Bu bulgu Türkiye'nin illerinden birinde bir şok meydana geldiğinde iller arasındaki ekonomik ve sosyal entegrasyon dolayısıyla bu şokun diğer illere yayılabileceğini doğrulamaktadır.

Tablo: 3
Yatay Kesit Bağımlılık Testi

	Dlrgsyih	Dlrtarim	Dlrsanayi	Dlrhizmet
LM (Breusch ve Pagan, 1980)	15622,20***	7817,48***	22085,14***	20476,82***
LM_S (Pesaran, 2004)	152,81***	55,85***	233,09***	213,11***
CD (Pesaran, 2004)	115,14***	67,49***	144,85***	138,35***
***; p<0.01				

Sektörel büyüme serileri arasındaki karşılıklı dinamik bağımlılık ilişkisinin Dumitrescu ve Hurlin nedensellik yaklaşımı çerçevesinde araştırılması amacıyla değişkenlerin birim kök analizleri gerçekleştirilmiştir. İller arasındaki güçlü yatay kesit bağımlılık nedeniyle birim kök analizleri ikinci nesil birim kök testlerinden Pesaran (2007)'ın CADF yaklaşımı kullanılarak yapılmıştır. Tablo 4'te Pesaran (2007)'ın ikinci nesil birim kök analizine ilişkin bulgulara yer verilmiştir. Sabitli ve sabitli-trendli model sonuçları tüm büyüme serilerinin seviyelerinde durağan olduklarını göstermektedir.

Tablo: 4
Pesaran (2007) CADF Birim Kök Analizi

	Sabit [Z-tbar]	Sabit+trend [Z-tbar]
Dlrgsyih	-15,13***	-9,936***
Dlrtarim	-18,99***	-13,413***
Dlrsanayi	-11,055***	-8,632***
Dlrhizmet	-13,579***	-10,145***
Optimal gecikme uzunlukları Akaike bilgi kriterine göre 0 olarak belirlenmiştir. *** ; prob<0,01.		

Tablo 5'te Pesaran ve Yamagata (2008)'nın eğim homojenlik testine ilişkin bulgular sunulmuştur. $\tilde{\Delta}$ ve $\tilde{\Delta}_{adj}$ istatistiklerine bakıldığında %1 anlamlılık düzeyinde eğim homojenliğini ifade eden sıfır hipotezinin reddedildiği gözlenmektedir. Elde edilen bu bulgular nedensellik yaklaşımı olarak hem yatay kesit bağımlılığı hem de heterojenliği dikkate alan Dumitrescu ve Hurlin panel nedensellik yaklaşımının uygun olduğu yönünde bilgi sağlamaktadır.

Tablo: 5
Homojenlik Testi

	$\tilde{\Delta}$ (Pesaran ve Yamagata, 2008)	$\tilde{\Delta}_{adj}$ (Pesaran ve Yamagata, 2008)
Dlrgsyih	17,958***	22,893***
Dlrtarim	11,898***	15,168***
Dlrsanayi	15,396***	19,627***
Dlrhizmet	15,396***	19,626***
***; p<0,01		

Çalışmada 2004-2017 dönemi için 81 ilden oluşan panel veri seti kullanılarak gerek genel ekonomik büyüme ile sektörel büyüme arasındaki nedenselliği ve gerekse de sektörler arasındaki dinamik bağımlılığı araştırmak amacıyla Dumitrescu ve Hurlin nedensellik analizi gerçekleştirilmiştir. Bölgesel farklılıkları açığa çıkarmak amacıyla ilgili analizler hem Türkiye geneli hem de yedi coğrafik bölge kapsamında yapılmıştır. Tablolarda öncelikle genel ekonomik büyüme ile tarım, sanayi ve hizmet sektörleri arasındaki nedensellik bulgularına yer verilmiş ardından sektörler arasındaki nedensellik analizlerine dair sonuçlar raporlanmıştır. Türkiye geneline ilişkin sektörel nedensellik bulguları Tablo 6'da sunulmuştur.

Tablo: 6
Türkiye Geneli İçin Dumitrescu ve Hurlin Nedensellik Analizi

Nedenselliğin Yönü	Test istatistiği (Z-bar)
Dlrgsyih→Dlrhizmet	11,2233* (1) [0,0740]
Dlrhizmet→ Dlrgsyih	4,4895 (1) [0,2340]
Dlrgsyih→Dlrsanayi	6,2820 (1) [0,1940]
Dlrsanayi→ Dlrgsyih	11,2918* (1) [0,0580]
Dlrgsyih→Dlrtarim	13,3923* (2) [0,0800]
Dlrtarim→ Dlrgsyih	7,7957* (1) [0,0720]

Dlrtarim→Dlrsanayi	1,5263 (1) [0,5000]
Dlrsanayi→ Dlrtarim	16,5935* (2) [0,0520]
Dlrhizmet→Dlrsanayi	0,9292 (1) [0,8340]
Dlrsanayi→ Dlrhizmet	4,1054 (1) [0,2660]
Dlrhizmet→Dlrtarim	15,1555** (1) [0,0360]
Dlrtarim→ Dlrhizmet	8,0740* (1) [0,0700]
Parantez içindeki değerler Akaike Bilgi Kriterine (AIC) göre belirlenmiş optimal gecikme uzunluklarını göstermektedir. Bootstrap sayısı 500 olarak kullanılmıştır. Köşeli parantez içinde olasılık değerlerine yer verilmiştir. ***, prob<0,01; **, prob<0,05 ve *,prob<0,10	

Tablo 6 incelendiğinde genel ekonomik büyümeden hizmetler sektörüne ve sanayi sektörü büyümesinden genel ekonomik büyümeye doğru tek yönlü bir nedensellik ilişkisinin söz konusu olduğu gözlenmektedir. Ayrıca tarım sektöründeki büyüme ile genel ekonomik büyüme arasında çift yönlü nedensellik ilişkisinin varlığı dikkatleri çekmektedir. Bu bulgular kapsamında genel ekonomik büyümeye ivme kazandıran sektörlerin sanayi ve tarım sektörleri olduğu, hizmetler sektörünün ise genel ekonomik büyümeden beslendiği söylenebilir. Sektörler arasındaki ilişki bazında sanayi sektöründeki büyümeden tarım sektöründeki büyümeye doğru tek yönlü ve hizmetler sektöründeki büyüme ile tarım sektöründeki büyüme arasında ise çift yönlü bir nedensellik ilişkisi olduğu, sanayi ve hizmet sektörleri arasında herhangi bir nedensellik ilişkisi bulunmadığı yönünde bulgulara ulaşılmıştır. Tarım ve hizmet sektörleri arasındaki karşılıklı ilişki iki sektör arasındaki ileri ve geri doğru aktarım mekanizmasının varlığı için bir kanıt olarak değerlendirilebilir.

Çalışmada yedi coğrafik bölgeye ilişkin sektörel nedensellik ilişkileri de araştırılarak bölgesel farklılıkların ortaya konulması amaçlanmıştır. Öncelikle Marmara Bölgesi için nedensellik analizi bulgularına Tablo 7'de yer verilmiştir. Buna göre Marmara Bölgesi için yalnızca hizmet sektöründeki büyümeden tarım sektöründeki büyümeye doğru tek yönlü anlamlı bir nedensellik ilişkisi tespit edilmiştir. Bunun dışında sektörler arasında anlamlı bir ileri veya geri doğru bir aktarım mekanizmasına rastlanılmamıştır.

Tablo: 7
Marmara Bölgesi İçin Dumitrescu ve Hurlin Nedensellik Analizi

Nedenselliğin Yönü	Test istatistiği (Z-bar)
Dlrgsyih→Dlrhizmet	1,7257 (1) [0,2780]
Dlrhizmet→ Dlrgsyih	-0,0085 (1) [0,9960]
Dlrgsyih→Dlrsanayi	1,1185 (2) [0,6340]
Dlrsanayi→ Dlrgsyih	1,9555 (2) [0,4460]
Dlrgsyih→Dlrtarim	4,6991 (2) [0,1240]
Dlrtarim→ Dlrgsyih	-1,3170 (1) [0,3300]
Dlrtarim→Dlrsanayi	0,1762 (2) [0,9420]
Dlrsanayi→ Dlrtarim	4,7408 (2) [0,1180]

Dlrhizmet→Dlrsanayi	1,4380 (2) [0,5800]
Dlrsanayi→ Dlrhizmet	1,1760 (2) [0,6320]
Dlrhizmet→Dlrtarim	6,1815* (2) [0,0680]
Dlrtarim→ Dlrhizmet	-0,5560 (1) [0,6780]
Parantez içindeki değerler Akaike Bilgi Kriterine (AIC) göre belirlenmiş optimal gecikme uzunluklarını göstermektedir. Bootstrap sayısı 500 olarak kullanılmıştır. Köşeli parantez içinde olasılık değerlerine yer verilmiştir. ***, prob<0,01; **, prob<0,05 ve *,prob<0,10	

Ege Bölgesine ilişkin bulgular Tablo 8'de sunulmuştur. Bulgular Ege Bölgesi için hizmetler sektöründeki gelişmenin genel ekonomik büyümeyi beslediğini, genel ekonomik büyümenin ise tarım sektörünün gelişmesine katkıda bulunduğunu göstermiştir. Sektörler arasındaki ilişki incelendiğinde hem sanayi hem de hizmetler sektöründen tarım sektörüne doğru tek yönlü bir nedensellik ilişkisi olduğu dikkatleri çekmektedir. İlgili nedensellik bulguları değerlendirildiğinde Ege Bölgesi için özellikle hizmetler sektöründeki gelişmenin tarım sektöründeki gelişmeyi %1 anlamlılık düzeyinde önemli ölçüde etkilediği dikkatleri çekmektedir. Diğer bir ifadeyle hizmetler sektörünün tarım sektörü ile güçlü ileri dönük ilişkisi söz konusudur.

Tablo: 8
Ege Bölgesi İçin Dumitrescu ve Hurlin Nedensellik Analizi

Nedenselliğin Yönü	Test istatistiği (Z-bar)
Dlrgsyih→Dlrhizmet	1,4283 (1) [0,3540]
Dlrhizmet→ Dlrgsyih	8,0428 * (2) [0,0860]
Dlrgsyih→Dlrsanayi	-0,6211 (1) [0,7320]
Dlrsanayi→ Dlrgsyih	-0,0660 (1) [0,9840]
Dlrgsyih→Dlrtarim	6,6490* (2) [0,0500]
Dlrtarim→ Dlrgsyih	2,0982 (2) [0,3040]
Dlrtarim→Dlrsanayi	1,6303 (2) [0,4200]
Dlrsanayi→ Dlrtarim	5,5650* (2) [0,0860]
Dlrhizmet→Dlrsanayi	0,7645 (1) [0,7040]
Dlrsanayi→ Dlrhizmet	1,4773 (1) [0,3640]
Dlrhizmet→Dlrtarim	13,1343*** (2) [0,008]
Dlrtarim→ Dlrhizmet	1,0827 (2) [0,5280]
Parantez içindeki değerler Akaike Bilgi Kriterine (AIC) göre belirlenmiş optimal gecikme uzunluklarını göstermektedir. Bootstrap sayısı 500 olarak kullanılmıştır. Köşeli parantez içinde olasılık değerlerine yer verilmiştir. ***, prob<0,01; **, prob<0,05 ve *,prob<0,10	

İç Anadolu bölgesi için Dumitrescu ve Hurlin nedensellik analizi sonuçları Tablo 9'da verilmiştir. Tabloya göre sanayi sektöründeki gelişme genel ekonomik büyümeyi %5 anlamlılık düzeyinde açıklamaktadır. Bunun yanı sıra tarım sektörü büyümesi ile genel ekonomik büyüme arasında çift yönlü anlamlı bir nedensellik ilişkisi mevcuttur. Sektörler arasındaki ilişki bazında bulgular değerlendirildiğinde ise %5 anlamlılık düzeyinde sanayi sektöründeki gelişmenin tarım sektöründeki gelişmeye ivme kazandırdığını ifade edebiliriz.

Bu durumu sanayi sektöründen tarım sektörüne doğru ileri doğru güçlü bir bağlantı mekanizmasının varlığı ile açıklayabiliriz. Buna karşın sanayi sektörünün tarım sektörüyle geri doğru bağlantısının zayıf olduğunu değerlendirebiliriz. Ayrıca İç Anadolu Bölgesi için ekonominin öncü sektörlerinin tarım ve sanayi olduğu vurgulanabilir.

Tablo: 9
İç Anadolu Bölgesi İçin Dumitrescu ve Hurlin Nedensellik Analizi

Nedenselliğin Yönü	Test istatistiği (Z-bar)
Dlrgsyih→Dlrhizmet	1,9298 (1) [0,2120]
Dlrhizmet→ Dlrgsyih	2,6494 (1) [0,2080]
Dlrgsyih→Dlrsanayi	0,5704 (1) [0,8000)
Dlrsanayi→ Dlrgsyih	8,6909** (1) [0,0180]
Dlrgsyih→Dlrtarim	7,4502** (1) [0,0360]
Dlrtarim→ Dlrgsyih	6,6076* (2) [0,068]
Dlrtarim→Dlrsanayi	1,4967 (2) [0,4580]
Dlrsanayi→ Dlrtarim	8,1926** (1) [0,0300]
Dlrhizmet→Dlrsanayi	0,1400 (1) [0,9540]
Dlrsanayi→ Dlrhizmet	1,2816 (1) [0,4920]
Dlrhizmet→Dlrtarim	5,0400 (2) [0,1280]
Dlrtarim→ Dlrhizmet	0,1465 (1) [0,9320]
Parantez içindeki değerler Akaike Bilgi Kriterine (AIC) göre belirlenmiş optimal gecikme uzunluklarını göstermektedir. Bootstrap sayısı 500 olarak kullanılmıştır. Köşeli parantez içinde olasılık değerlerine yer verilmiştir. ***, prob<0,01; **, prob<0,05 ve *,prob<0,10	

Tablo 10'da sunulan Karadeniz Bölgesine ait nedensellik analizi sonuçlarına göre genel ekonomik büyümeden hizmetler sektörüne doğru tek yönlü nedensellik ilişkisi söz konusudur. Genel ekonomik büyüme ile sanayi sektörü büyümesinin karşılıklı nedensellik ilişkisine sahip olduğu tablodan gözlenmektedir. Sektörler arasındaki ilişkiye bakıldığında sadece tarım sektöründeki gelişmenin hizmetler sektöründeki gelişme üzerinde anlamlı bir etkisinin söz konusu olduğu dikkatleri çekmektedir.

Tablo: 10
Karadeniz Bölgesi İçin Dumitrescu ve Hurlin Nedensellik Analizi

Nedenselliğin Yönü	Test istatistiği (Z-bar)
Dlrgsyih→Dlrhizmet	6,9341** (1) [0,0380]
Dlrhizmet→ Dlrgsyih	2,3950 (1) [0,2380]
Dlrgsyih→Dlrsanayi	12,5787** (2) [0,0420]
Dlrsanayi→ Dlrgsyih	10,2403* (2) [0,0700]
Dlrgsyih→Dlrtarim	5,5340 (2) [0,1560]
Dlrtarim→ Dlrgsyih	3,5361 (1) [0,1260]

Dlrtarim→Dlrsanayi	1,8516 (1) [0,2760]
Dlrsanayi→ Dlrtarim	4,9715 (2) [0,1780]
Dlrhizmet→Dlrsanayi	1,1665 (1) [0,6320]
Dlrsanayi→ Dlrhizmet	3,1226 (1) [0,1660]
Dlrhizmet→Dlrtarim	5,6300 (2) [0,1480]
Dlrtarim→ Dlrhizmet	4,5102* (1) [0,0740]
Parantez içindeki değerler Akaike Bilgi Kriterine (AIC) göre belirlenmiş optimal gecikme uzunluklarını göstermektedir. Bootstrap sayısı 500 olarak kullanılmıştır. Köşeli parantez içinde olasılık değerlerine yer verilmiştir. ***, prob<0,01; **, prob<0,05 ve *,prob<0,10	

Tablo 11'de Akdeniz Bölgesine ait nedensellik analizi sonuçları raporlanmıştır. Tablodan genel ekonomik büyümeden hizmetler ve tarım sektörüne doğru %5 düzeyinde anlamlı bir nedensellik ilişkisinin söz konusu olduğu gözlenmektedir. Sektörler arasındaki ilişki incelendiğinde ise sanayi sektöründen tarım sektörüne doğru tek yönlü; hizmetler sektörü ile tarım sektörü arasında ise çift yönlü olmak üzere anlamlı ve güçlü bir nedensellik ilişkisi bulunduğu dikkat çekici bir bulgu olarak karşımıza çıkmaktadır. Akdeniz Bölgesi için tarım ve hizmet sektörleri arasındaki karşılıklı ilişkiyi ilgili sektörler arasında Hirshman (1958)'ın ifade ettiği ileri ve geri bağlantı mekanizmasının işlediği şeklinde yorumlayabiliriz. İlgili sektörlerin birbirlerinin girdi ve çıktılarına ihtiyaç duydukları ve bu kapsamda da gerekli iletişimi gerçekleştirdiği ifade edilebilir. Akdeniz Bölgesinde hem sanayi hem de hizmetler sektörü büyüme oranı tarım sektörü büyüme oranının nedeni olarak belirlenmiştir. Bu sonuç özellikle imalat sanayindeki daha yüksek verimli üretim teknolojilerinin tarım sektörüne yayılma eğilimini ve bu şekilde sektörel verimlilik seviyelerinin yakınsama eğilimine gireceğini savunan Neoklasik argümanı doğrular niteliktedir. Ayrıca Akdeniz Bölgesi için ekonomik büyümeye ivme kazandıran sektörlerin hizmetler ve tarım sektörleri olduğu çalışmadan elde edilen bir diğer çıkarımdır. Akdeniz Bölgesinin turizm potansiyeli göz önüne alındığında ilgili bulgu şaşırtıcı değildir.

Tablo: 11
Akdeniz Bölgesi İçin Dumitrescu ve Hurlin Nedensellik Analizi

Nedenselliğin Yönü	Test istatistiği (Z-bar)
Dlrgsyih→Dlrhizmet	5,5760** (1) [0,0420]
Dlrhizmet→ Dlrgsyih	1,3558 (1) (0,2920]
Dlrgsyih→Dlrsanayi	1,3210 (1) [0,440]
Dlrsanayi→ Dlrgsyih	2,0277 (1) [0,1860]
Dlrgsyih→Dlrtarim	6,4676** (1) [0,0240]
Dlrtarim→ Dlrgsyih	0,6000 (1) [0,6780]
Dlrtarim→Dlrsanayi	0,3231 (1) [0,8180]
Dlrsanayi→ Dlrtarim	11,5906**(1) [0,0160]
Dlrhizmet→Dlrsanayi	0,6344 (2) [0,7300]
Dlrsanayi→ Dlrhizmet	3,4912 (1) [0,1080]

Dlrhizmet→Dlrtarim	4,2629**(1) [0,0400]
Dlrtarim→ Dlrhizmet	9,5323 ***(1) [0,000]
Parantez içindeki değerler Akaike Bilgi Kriterine (AIC) göre belirlenmiş optimal gecikme uzunluklarını göstermektedir. Bootstrap sayısı 500 olarak kullanılmıştır. Köşeli parantez içinde olasılık değerlerine yer verilmiştir. ***, prob<0,01; **, prob<0,05 ve *,prob<0,10	

Doğu Anadolu Bölgesine ilişkin Dumitrescu ve Hurlin nedensellik analizi sonuçları Tablo 12'de sunulmuştur. Genel ekonomik büyüme ile sanayi ve özellikle tarım sektörü arasında çift yönlü anlamlı nedensellik ilişkisinin söz konusu olduğu gözlenmektedir. Ayrıca genel ekonomik büyümenin hizmetler sektörünü beslediği de elde edilen diğer bir bulgu olarak karşımıza çıkmaktadır. Sektörler arasındaki ilişki üzerine odaklanıldığında sanayi sektöründen tarım sektörüne doğru tek yönlü %1 anlamlılık düzeyinde bir nedensellik ilişkisi olduğu ve söz konusu bu ilişkinin sanayi sektöründen tarım sektörüne doğru ileri bağlantı mekanizmasını doğrular nitelikte bulgular sunduğu ifade edilebilir. Doğu Anadolu Bölgesi için son olarak hizmetler ve tarım sektörleri arasında çift yönlü bir nedensellik ilişkisi tespit edilmiştir. İlgili bulgu hizmet ve tarım sektörleri arasında ileri ve geri bağlantı ilişkisinin varlığını kanıtlamaktadır. Ayrıca sanayi ve hizmetler sektörlerinden tarım sektörüne doğru belirlenen nedensellik ilişkisi Neoklasik argümanı doğrulayarak sanayi ve hizmetler sektöründeki yüksek verimliliğe sahip üretim tekniklerinin tarım sektörüne yayılma eğilimini ve böylece sektörel verimlilik seviyelerinin yakınsaklığını teşvik ettiğini ortaya koymuştur. Gerek genel ekonomik büyüme ve gerekse de diğer sektörlerle olan nedensellik ilişkileri göz önüne alındığında Doğu Anadolu Bölgesinde öncü sektörün tarım sektörü olduğu vurgulanabilir.

Tablo: 12
Doğu Anadolu Bölgesi İçin Dumitrescu ve Hurlin Nedensellik Analizi

Nedenselliğin Yönü	Test istatistiği (Z-bar)
Dlrgsyih→Dlrhizmet	6,1922** (1) [0,0380]
Dlrhizmet→ Dlrgsyih	4,2258 (2) [0,1900]
Dlrgsyih→Dlrsanayi	6,6524 **(1) [0,0340]
Dlrsanayi→ Dlrgsyih	7,3671** (1) [0,0440]
Dlrgsyih→Dlrtarim	11,8451*** (1) [0,0100]
Dlrtarim→ Dlrgsyih	7,5765** (1) [0,0180]
Dlrtarim→Dlrsanayi	1,9830 (1) [0,2200]
Dlrsanayi→ Dlrtarim	19,6671***(1) [0,0020]
Dlrhizmet→Dlrsanayi	1,3669 (1) [0,4060]
Dlrsanayi→ Dlrhizmet	0,6327 (1) [0,7180]
Dlrhizmet→Dlrtarim	5,5796* (2) [0,0920]
Dlrtarim→ Dlrhizmet	4,5821* (1) [0,0700]
Parantez içindeki değerler Akaike Bilgi Kriterine (AIC) göre belirlenmiş optimal gecikme uzunluklarını göstermektedir. Bootstrap sayısı 500 olarak kullanılmıştır. Köşeli parantez içinde olasılık değerlerine yer verilmiştir. ***, prob<0,01; **, prob<0,05 ve *,prob<0,10	

Son olarak Güney Doğu Anadolu Bölgesi için nedensellik bulgularına Tablo 13'te yer verilmiştir. Bölge için edinilen bulguların Doğu Anadolu Bölgesi ile benzerlik taşıdığı tablodan görülmektedir. Sonuçlara göre genel ekonomik büyümeden hizmetler sektörüne doğru ve sanayi sektöründen genel ekonomik büyümeye doğru tek yönlü bir nedensellik ilişkisi söz konusu iken genel ekonomik büyüme ile tarım sektörü arasında çift yönlü anlamlı nedensellik ilişkisi mevcuttur. İlgili bulgular çerçevesinde Güney Doğu Anadolu Bölgesi için de ekonomik büyümeyi besleyen öncü sektörün tarım sektörü olduğu yönünde çıkarımda bulunulabilir. Güney Doğu Anadolu Bölgesi için sektörler arasındaki dinamik ilişki mercek altına alındığında sanayi sektöründen tarım sektörüne doğru tek yönlü, hizmetler sektörü ile tarım sektörü arasında ise çift yönlü olmak üzere anlamlı bir nedensellik ilişkisi olduğu görülmüştür. Bu kapsamda bölge için tarım ve hizmetler sektörü arasında karşılıklı ileri ve geri bağlantı mekanizmasının işlediği ifade edilebilir.

Tablo: 13
Güney Doğu Anadolu Bölgesi İçin Dumitrescu ve Hurlin Nedensellik Analizi

Nedenselliğin Yönü	Test istatistiği (Z-bar)
Dlrgsyih→Dlrhizmet	8,3117* (2) [0,0560]
Dlrhizmet→ Dlrgsyih	1,0843 (1) [0,5000]
Dlrgsyih→Dlrsanayi	2,5034 (1) [0,2060]
Dlrsanayi→ Dlrgsyih	5,4114** (1) [0,0360]
Dlrgsyih→Dlrtarim	6,1781** (1) [0,0220]
Dlrtarim→ Dlrgsyih	6,70399** (1) [0,0140]
Dlrtarim→Dlrsanayi	3,3213 (1) [0,1220]
Dlrsanayi→ Dlrtarim	6,5210* (2) [0,0780]
Dlrhizmet→Dlrsanayi	-0,7636 (1) [0,6320]
Dlrsanayi→ Dlrhizmet	0,2284 (1) [0,8800]
Dlrhizmet→Dlrtarim	5,5359* (1) [0,0580]
Dlrtarim→ Dlrhizmet	9,9421** (2) [0,0260]
Parantez içindeki değerler Akaike Bilgi Kriterine (AIC) göre belirlenmiş optimal gecikme uzunluklarını göstermektedir. Bootstrap sayısı 500 olarak kullanılmıştır. Köşeli parantez içinde olasılık değerlerine yer verilmiştir. ***, prob<0,01; **, prob<0,05 ve *,prob<0,10	

4. Sonuç

Bu çalışmada Türkiye ekonomisi için gerek tarım, sanayi ve hizmet sektörlerinde yaratılan ekonomik büyüme ile genel ekonomik büyüme arasındaki nedensellik ilişkisinin gerekse de sektörler arasındaki ileri ve geri doğru bağlanım mekanizmalarının 2004-2017 dönemi itibariyle 81 il düzeyinde araştırılması amaçlanmıştır. Sektörler arasındaki nedensellik ilişkilerinin belirlenmesinde Dumitrescu ve Hurlin panel nedensellik yaklaşımından yararlanılmıştır. Edinilen sonuçlara göre, Türkiye'de iller bazında tarım sektöründeki gelişme ile genel ekonomik büyüme arasında güçlü bir geri besleme ilişkisi bulunmaktadır. Ayrıca sanayi sektöründen genel ekonomik büyümeye ve genel ekonomik

büyümeden hizmetler sektörüne doğru tek yönlü bir nedensellik ilişkisi tespit edilmiştir. Bulgular sanayi sektörü üretimindeki büyümeden tarımsal üretime doğru tek yönlü, tarım ve hizmetler sektörü arasında ise karşılıklı nedensellik ilişkisi olduğunu kanıtlamıştır. Türkiye geneli bulguları tarım ve hizmetler sektörleri arasında ileri ve geri bağlanım mekanizmasının çalıştığını, sanayi sektöründen tarım sektörüne doğru sadece ileri bağlanım mekanizmasının geçerli olduğunu ortaya koymuştur. Bunun yanı sıra sanayi ve hizmetler sektörlerinden tarım sektörüne doğru belirlenen nedensellik ilişkisi Neoklasik argümanı doğrulayarak sanayi ve hizmetler sektöründeki yüksek verimliliğe sahip üretim teknolojilerinin tarım sektöründe kullanım eğilimini ortaya koymuştur.

Çalışmada ayrıca genel ekonomik büyüme ile sektörel büyüme arasındaki ilişki yedi alt bölge düzeyinde araştırılmıştır. Bölgesel düzeyde yapılan analiz sonuçlarına göre, Marmara Bölgesi'nde sektörlere ait büyüme ile genel ekonomik büyüme arasında karşılıklı bir ilişkiye rastlanamamış ancak hizmetler sektöründen tarım sektörüne doğru tek yönlü bir nedensellik ilişkisi olduğu görülmüştür. Ege Bölgesinde hizmetler sektöründeki büyümenin genel ekonomik büyümeyi beslediği; sanayi ve hizmetler sektörüne ait büyümenin ise tarım sektörünü etkilediği kanıtlanmıştır. İç Anadolu Bölgesi'nde beklenildiği üzere tarım sektörü ile genel ekonomik büyüme arasında karşılıklı bir ilişki olduğu, sanayi sektöründeki gelişmeden genel ekonomik büyümeye ve tarım sektörü büyümesine doğru tek yönlü bir nedenselliğin olduğu tespit edilmiştir. Karadeniz Bölgesi için yapılan analiz bulgularına bakıldığında, sanayi sektöründeki büyüme ile genel ekonomik büyüme arasında güçlü bir geri besleme ilişkisi olduğu, genel ekonomik büyüme ve tarım sektöründeki büyümenin ise hizmetler sektörünü beslediği görülmüştür. Akdeniz Bölgesi'ne gelindiğinde genel ekonomik büyümenin hizmetler ve tarım sektörlerini tek yönlü beslediği, hizmetler sektörü ile tarım sektörü arasında karşılıklı bir ilişki olduğu ve sanayi sektöründen tarım ve hizmetler sektörlerine doğru tek yönlü nedensellik ilişkisi olduğu yönünde bulgulara ulaşılmıştır. Doğu Anadolu Bölgesi'nde genel ekonomik büyüme ile hem tarım hem de sanayi sektöründeki büyüme arasında çift yönlü bir nedensellik ilişkisi olduğu, hizmetler sektörü ve tarım sektörü arasında çift yönlü bir nedensellik ilişkisinin bulunduğu ve sanayi sektöründen tarım sektörüne doğru tek yönlü bir nedensellik ilişkisinin söz konusu olduğu görülmüştür. Son olarak Güney Doğu Anadolu Bölgesi özelinde ise nispeten Doğu Anadolu Bölgesine benzer bulgulara ulaşılmıştır.

Dimutrescu-Hurlin panel nedensellik yaklaşımı çerçevesinde Türkiye geneli için edinilen bulgular ele alınan dönem itibariyle özellikle sanayi ve tarım sektörlerinin genel ekonomik büyümeyi doğrudan uyaran sektörler olduğunu, hizmetler sektörünün ise tarım sektörü üzerinden dolaylı olarak genel ekonomik büyümeyi uyardığını göstermiştir. Ancak ilgili bulguların bölgesel analizlerde farklılaştığı gözlenmiştir. Şöyle ki Ege Bölgesi için hizmetler sektörünün, İç Anadolu Bölgesi için sanayi ve tarım sektörlerinin, Akdeniz Bölgesi için tarım ve hizmetler sektörlerinin, Doğu ve Güneydoğu Anadolu Bölgeleri için tarım sektörünün ön plana çıktığı belirlenmiştir. Ege ve Akdeniz Bölgeleri için hizmetler sektörünün kilit sektör olarak belirlenmiş olması kuşkusuz ilgili bölgelerdeki turizm potansiyeli ile açıklanabilir. Doğu ve Güneydoğu Anadolu Bölgeleri için tarım sektörünün kilit sektör olarak ön plana çıkması ilgili bölgelerde ekonomik faaliyetler arasında tarımsal

faaliyetlerin diğer aktivitelerden daha baskın olmasına bağlanabilir. Benzer şekilde İç Anadolu Bölgesi için sanayi ve tarım sektörlerinin kilit sektör olarak belirlenmiş olması bölgedeki sanayi tesislerinin varlığı ve tarımsal alanların mevcudiyeti ile açıklanabilir.

Sektörler arasındaki ilişki bazında bölgeler itibariyle ortaya çıkan en dikkat çekici bulgu çoğu bölgede tarım ve hizmet sektörlerinin geri besleme ilişkisine sahip olmasıdır. Ayrıca gerek hizmetler sektörü ve gerekse de sanayi sektöründen tarım sektörüne ileri doğru bir bağlanım mekanizması belirlenmiştir. İlgili bulgu tarım sektöründe yüksek verimliğe sahip ileri teknoloji ürünlerine olan ihtiyacı ortaya koymuştur. Özellikle Doğu ve Güneydoğu Anadolu Bölgelerinde sanayi ve hizmetler sektöründen beslenen tarım sektörü bölgenin ekonomik büyümesini uyaran temel sektör olarak karşımıza çıkmaktadır.

Çalışmada edinilen bulgular özetle genel ekonomik büyümeye yön veren öncü sektörlerin bölgelere göre farklılık arz ettiğini, bazı sektörlerin doğrudan olmaktan ziyade diğer sektörler üzerinden dolaylı olarak genel ekonomik büyümeyi uyardığını ve genel anlamda sektörler arasında ileri ve geri bağlanım mekanizmasının çalıştığını ortaya koymuştur. Bu çerçevede Türkiye ekonomisi için sürdürülebilir bir ekonomik büyümeye ulaşmak amacıyla kilit olarak belirlenen sektörlerin geliştirilmesine yönelik uygun politikaların tasarlanması ve bölgesel farklılıkları göz önüne alarak kilit sektörlere ait ekonomik faaliyetlerin teşvik edilmesi son derece önem arz etmektedir.

Ekonominin genel sektörleri kapsamında gerçekleştirilen bu analizin ikinci düzey alt sektörler kapsamında yeniden ele alınması ve özellikle daha uzun bir zaman dilimi kapsamında uzun dönem analizlere uygun veri seti ile çalışılması kuşkusuz daha detaylı bulgulara ulaşmaya olanak sağlayacaktır.

Kaynaklar

Ahmed, A. & H. Ahsan (2011), "Contribution of Services Sector in the Economy of Pakistan", *PIDE-Working Papers*, 79, Pakistan Institute of Development Economics, Islamabad.

Altan, Ş. & M. Atan & S. Tokpınar (2015), "Sektörel Etkinlik Ölçümü: Girdi Çıktı Tablosu ve Veri Zarflama Analizi ile Bir Uygulama", *İşletme Araştırmaları Dergisi*, 7(2), 214-234.

Arısoy, İ. (2008), "Türkiye'de Sanayi Sektörü-İktisadi Büyüme İlişkisinin Kaldor Hipotezi Çerçevesinde Test Edilmesi", *Discussion Paper*, 2008/1, Türkiye Ekonomisi.

Atan, S. (2011), "Türkiye'deki Sektörel Bağlantı Yapısının Girdi Çıktı Yaklaşımı ile İncelenmesi: Yurtiçi Üretim ve İthal Ara Girdi Ayrıştırması", *Ekonomik Yaklaşım*, 22(80), 59-78.

Bhagwati, J.N. (1984), "Splintering and Disembodiment of Services and Developing Nation", *World Economy*, 7, 133-143.

Blades, D. & D.D. Johnson & W. Marczewski (1974), *Service Activities in Developing Countries*, OECD, Paris.

Blunch, N.H. & D. Verner (2006), "Shared Sectoral Growth Versus the Dual Economy Model: Evidence from Cote d'lvoire, Ghana, and Zimbabwe", *African Development Review*, 18(3), 283-308.

Breusch, T. & A. Pagan (1980), "The Lagrange Multiplier Test and Its Application to Model Specifications in Econometrics", *Review of Economic Studies*, 47 (1), 239-253.

Chenery, H.B. (1979), *Structural Change and Development Policy*, Oxford University Press, New York.

Dasgupta, S. & A. Singh (2005), "Will Services be the New Engine of Indian Economic Growth?", *Development and Change*, 36(6), 1035-58.

Dumitrescu, E. & C. Hurlin (2012), "Testing for Granger Non-Causality in Heterogeneous Panels", *Economic Modelling*, 29(4), 1450-1460.

Ersungur, Ş.M. & A. Kızıltan (2008), "Türkiye Ekonomisinde Sektörler arası Yapısal Bağınlaşma-Girdi Çıktı Yöntemiyle Bir Uygulama", *Atatürk Üniversitesi İktisadi İdari Bilimler Dergisi*, 22(2), 17-31.

Ersungur, Ş.M. & E.D. Ekinci & A. Takım (2011), "Türkiye Ekonomisinde İthalata Bağımlılıktaki Değişme: Girdi-Çıktı Yaklaşımıyla Bir Uygulama", *Atatürk Üniversitesi İİBF Dergisi*, Ekonometri ve İstatistik Sempozyumu Özel Sayısı, 25, 1-11.

Fei, J.C.H. & G. Ranis (1961), "A Theory of Economic Development", *American Economic Review*, 51, 533-565.

Foster McGregor, N. & J. Pöschl & R. Stehrer (2012), "Manufacturing Productivity: Effects of Service Sector Innovations and Institutions", *Working Paper*, 89, The Vienna Institute for International Economic Studies.

Fuchs, V. (1968), "The Service Economy", *National Bureau of Economic Research*, New York.

Gemmell, N. & T.A. Lloyd & M. Mathew (2000), "Agricultural Growth and Inter-Sectoral Linkages in a Developing Economy", *Journal of Agricultural Economics*, 51, 353-370.

Gemmell, N. (1982), "Economic Development and Structural Change, The Role of Service Sector", *Journal of Development Studies*, 19, 37-66.

Granger, C.W.J. (1969), "Investigating Causal Relations by Econometric Models and Cross-spectral Methods", *Econometrica*, 37(3), 424-438.

Günçavdı, Ö. & S. Küçükçiftçi & A. Bayar (2013), "Economic Development and Structural Change: The Role of the Agriculture Sector in Turkey", *Middle East Development Journal*, 5(2), 1-29.

Hirschman, A.O. (1958), *Strategy of Economic Development*, New Haven, Conn: Yale University Press.

Hwa, E.C. (1989), "The Contribution of Agriculture to Economic Growth: Some Empirical Evidence", içinde: J. Williamson & V.R. Panchamurchi (eds.), *The Balance between Industry and Agriculture in Economic Development*, Volume 2, Sector Proportion, New York: The World Bank.

Kaldor, N. (1967), *Strategic Factors in Economic Development*, New York State School of Industrial and Labor Relations, Cornell University, Ithaca.

Kalmaz, D. & N. Giritli (2018), "KKTC'de Ekonomik Büyüme ve Sektörel Gelişimin Büyümeye Etkileri", *Gazi Akademik Bakış Dergisi*, 11, 199-220.

Kanwar, S. (2000), "Does the Dog Wag the Tail or the Tail the Dog? Cointegration of Indian Agriculture with Non-agriculture", *Journal of Policy Modeling*, 22 (5), 533-556.

Katırcıoğlu, S. (2002), "Co-Integration and Causality between GDP, Agriculture, Industry and Services Growth in North Cyprus: Evidence from Time Series Data, 1977-2002", *Review of Social, Economic & Business Studies*, 5(6), 173-187.

Kolcu, F. & N. Yamak (2017), "Türkiye'de Kısa ve Uzun Dönem Sektörel Dinamikler", *Kafkas Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 8(15), 81-99.

Kularatne, T. & S. Sivarajasingham (2014), "Inter-Sectoral Dynamic Growth Linkages: Empirical Evidence form Sri Lanka", *Journal of Management*, 10 (1), 25-33.

Kuznets, S. (1973), "Modern Economic Growth: Findings and Reflections", *The American Economic Review*, 63(3), 247-258.

Lewis, W.A. (1954), "Economic Development with Unlimited Supplies of Labor", *Manchester School*, 22, 139-191.

Nordas, H.K. & Y. Kim (2013), "The Role of Services for Competitiveness in Manufacturing", *OECD Trade Policy Papers*, 148.

Pehlivanoğlu, F. & M. İnce (2020), "Girdi-Çıktı Analizi Yaklaşımıyla Türkiye Ekonomisinde Sektörlerarası Bağınlaşmanın Uzun Dönemli Analizi", *Sosyoekonomi*, 28(44), 169-190.

Pesaran, M.H. & T. Yamagata (2008), "Testing Slope Homogeneity in Large Panels", *Journal of Econometrics*, 142, 50-93.

Pesaran, M.H. (2004), "General Diagnostic Tests for Cross Section Dependence in Panels", C*ESifo Working Paper*, 1233, 255-60.

Pesaran, M.H. (2007), "A Simple Panel Unit Root Test in the Presence of Cross Section Dependence", *Journal of Applied Econometrics*, (22), 365-312.

Rashid, A. (2004), "Sectoral Linkages; Identifying the Key Growth Stimulating Sector of the Pakistan Economy", *Working Paper*, 27210, Munich Personal RePEc Archive.

Sastry, D. vd. (2003), "Sectoral Linkages and Growth Prospects: Reflections on the Indian Economy", *Economic and Political Weekly*, 38(24), 2390-2397.

Subramaniam, V. & M. Reed (2009), "Agricultural Inter Sectoral Linkages and its Contribution to Economics Growth in the Transition Countries", *International Association of Agricultural Economists Conference*, Beijing, China, August 16-22.

Swamy, P.A.V.B. (1970), "Efficient Inference in A Random Coefficient Regression Model", *Econometrica*, 38(2), 311-323.

Terzi, H. & S. Oltulular (2004), "Türkiye'de Sanayileşme ve Ekonomik Büyüme Arasındaki Nedensel İlişki", *Doğuş Üniversitesi Dergisi*, 5(2), 219-226.

Thirlwall, A.P. (2006), *Growth and Development with Special Reference to Developing Economies*, 8th Edition: Palgrave Macmillan.

Wells, H. & A.P. Thirlwall (2004), "Testing Kaldor's Growth Laws across the Countries of Africa", *African Development Review*, 15(2-3), 89-105.

Yamak, N. (2000), "Cointegration, Causality and Kaldor's hypothesis: Evidence from Turkey, 1946-1995", *Gazi Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 2(1), 75-80.

Yamak, R. & U. Sivri (1997), "Ekonomik Büyüme ve Kaldor Yasası: Türkiye Örneği, 1979-1994", *İktisat, İşletme ve Finans Dergisi*, 12(139), 9-21.

Yamak, R. vd. (2016), "A Re-examination of Kaldor's Engine of Economic Growth Hypothesis for the Turkish Economy", *Acta Universitatis Danubius Œconomica*), 12(4), 347-357.

Yao, S. (2000), "How Important is Agriculture in China's Economic Growth?", *Oxford Development Studies*, 28(1), 33-49.

Yetiz, F. & C. Özden (2017), "Analysis of Causal Relationship among GDP, Agricultural, Industrial and Services Sector Growth in Turkey", *Ömer Halis Demir Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 10(3), 75-84.

Yıldız, N. & U. Akduğan (2014), "Girdi-Çıktı Tabloları ile Sektörler Arası İlişkilerin Analizi: Seçilmiş Ülke Örnekleri", *Akademik Bakış Dergisi*, 44.

Sosyoekonomi

2021, Vol. 29(50), 337-359

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.16
Date Submitted: 29.01.2021
Date Revised: 09.10.2021
Date Accepted: 11.10.2021

Finansal Kuznets Eğrisi Hipotezi: Yapısal Kırılmalı Eş-bütünleşme Testleri ile Türk Ekonomisine İlişkin Ampirik Bir Analiz

Cüneyt DUMRUL *(https://orcid.org/0000-0002-6787-2001), Erciyes University, Turkey; cdumrul@erciyes.edu.tr*

Salih Çağrı İLKAY *(https://orcid.org/0000-0002-1996-7487), Erciyes University, Turkey; scilkay@erciyes.edu.tr*

Yasemin DUMRUL *(https://orcid.org/0000-0001-5961-2931), Kayseri University, Turkey; ydumrul@kayseri.edu.tr*

The Financial Kuznets Curve Hypothesis: An Empirical Analysis of the Turkish Economy with Structural Breaks Co-integration Tests

Abstract

Reducing income inequality is vital for sustainable development. Financial development can be an essential policy tool for reducing income inequality. In this study, the effects of financial development on income inequality in the Turkish economy are investigated in the context of the Financial Kuznets Curve Hypothesis. In the empirical part of the study, the series related to the financial development measures developed by the IMF and the series calculated with the University of Texas Inequality Project (UTIP) Data Set for income inequality is used. As a result of econometric analyzes made by considering structural breaks, the existence of a long-term co-integration relationship could not be determined. These findings show that the Financial Kuznets Curve hypothesis is not valid in Turkey in the period under consideration.

Keywords : Financial Kuznets Curve, Financial Development, Income Inequality.

JEL Classification Codes : G20, D31, O15.

Öz

Sürdürülebilir kalkınma için gelir eşitsizliğinin azaltılması önem arz etmektedir. Gelir eşitsizliği azaltılması için finansal gelişme önemli bir politika aracı olarak kullanılabilir. Bu çalışmada Türk ekonomisinde finansal gelişmenin gelir adaletsizliği üzerindeki etkileri Finansal Kuznets Eğrisi Hipotezi bağlamında araştırılmaktadır. Çalışmanın ampirik bölümünde IMF tarafından geliştirilen finansal gelişme ölçütlerine ilişkin seriler ve gelir adaletsizliği için Texas Üniversitesi Eşitsizlik Projesi (UTIP) Veri Seti ile hesaplanan seriler kullanılmıştır. Yapısal kırılmalar dikkate alınarak yapılan ekonometrik analizler sonucunda, uzun dönemli bir eş-bütünleşme ilişkisi tespit edilememiştir. Bu bulgular ele alınan dönemde Türkiye'de Finansal Kuznets Eğrisi hipotezinin geçerli olmadığını göstermektedir.

Anahtar Sözcükler : Finansal Kuznets Eğrisi, Finansal Gelişme, Gelir Eşitsizliği.

1. Giriş

Ekonominin işleyişi insan psikolojisi ve doğası ile yakından ilişkilidir. Doğada ve toplumsal hayatta birçok ilişki doğrusal olmayan bir eğilim göstermektedir. Ekonomideki birçok ilişkiyi göstermede ve anlamada eğrisel ilişkiler (karesel, kübik, sigmoid vs.) sıklıkla kullanılmaktadır. Bunlardan günümüz literatüründe en yaygın kullanılanlarından biri de ters-U biçiminde olan ve genellikle Kuznets eğrisi olarak nitelendirilen ilişkidir. Kuznets eğrisi, birçok iktisadi ilişkiyi tanımlamada kullanılmaktadır. Bunlardan en çok kullanılanları kişi başına gelir ile çevre kirliliği, kişi başına gelir ile gelir eşitsizliği, ticari serbestleşme ile gelir eşitsizliği ilişkileri sayılabilir. Böyle bir fonksiyonel form esasında değişkenler arasındaki ilişkide bir eşik değerin olduğunu da gösterir.

1980'li yıllardan itibaren dünya ekonomisi daha fazla finansallaşmaya başlamıştır. Ekonomilerin finansallaşmasının çeşitli kanallar ile sermayenin tabana yayılmasında etkili olacağı ve bu surette bir piyasa başarısızlığı olan gelir dağılımının iyileşeceği iddia edilmektedir. Ancak 2008 yılında yaşanan küresel finansal kriz, finansal ürünleri ayrım gözetmeksizin alt sosyoekonomik katmanlara genişletmenin hem yoksulluğu hem de gelir eşitsizliğini azalttığı yönündeki görüşü zayıflatmıştır. En önemlisi, böylesi bir durum Büyük Buhran'dan günümüze dek yaşanan en büyük krize katkıda bulunmuş ve son dönemde yoksullukla mücadele kapsamında gerçekleştirilen ilerlemeleri tehlikeye atmıştır. Bu sebeple, finansal gelişme-gelir eşitsizliği ilişkisine daha fazla ışık tutmak, yoksulluğu azaltma sürecine katkı sağlayacak politikaların uygulanması açısından oldukça önemlidir (Nikoloski, 2013).

Kalkınma teorilerinde özellikle kapitalist paternde gelişen bir ekonomide, kalkınmanın başlangıç aşamalarında gelir dağılımının bozulacağı iddia edilmektedir. Yapılan birçok çalışmada bu durumun bir realite olduğu görülmektedir. Gelir adaletsizliği, toplumsal huzuru ve ardından refahı bozabilecek bir unsur olarak düşünülebilir. Bu durumun giderilmesi ise, sürecin fonksiyonel ve ampirik olarak doğru bir şekilde tespiti ile mümkündür. Böylece uygun politikalar geliştirilerek toplumsal amaç fonksiyonu maksimize hale getirilebilir.

Bu çalışmanın amacı, yapısal kırılmaların varlığı altında finansal Kuznets eğrisi hipotezinin Türk ekonomisi için geçerliliğini test etmektir. Bir ekonomide savaşlar, doğal afetler, kamu politikaları, iktisadi krizler, arz şokları gibi sebeplerle ortaya çıkan yapısal değişimler iktisadi zaman serilerinde ve bu seriler arasındaki ilişkilerde aşağı veya yukarı doğru ani kırılmalara yol açmakta ve bu durum serilerin yapısal özelliklerinde değişmelere neden olabilmektedir. Böylesi bir durumda kırılmaları dikkate almayan birim kök testleri serilerin durağanlık özellikleri konusunda yanlış bilgi verebilmektedir. Başka bir ifadeyle, seri durağan olsa bile yapısal kırılmalar dikkate alınmadığında serinin birim köklü olduğu sonucuna ulaşılabilmektedir. Belirtilen sebeple bu çalışmada Türk ekonomisi için finansal gelişmenin gelir adaleti üzerindeki etkisini ele alan diğer çalışmalardan farklı olarak yapısal kırılmalı birim kök ve eş-bütünleşme testleri kullanılmıştır. Çalışmanın sorunsalı ise, finansal gelişmenin gelir dağılımındaki eşitsizliği gidermesidir. Belirtilen amaç ve sorunsal

doğrultusunda ilk olarak finansal Kuznets eğrisi teorik olarak açıklanacaktır. Konuyla ilgili teorik ve ampirik literatür sunulduktan sonra değişkenlerdeki ve değişkenler arasındaki ilişkilerdeki yapısal kırılmaları dikkate alan ekonometrik tekniklerle finansal Kuznets eğrisinin geçerliliği araştırılacaktır.

2. Finansal Kuznets Eğrisine İlişkin Teorik Literatür

Kuznets (1955)'e göre kırsal alanlar kentlere göre daha düşük gelire sahip olmaları ile birlikte daha adil bir gelir dağılımına sahiptir. Endüstrileşmenin başlaması ile kentleşme de gerçekleşmekte ve gelir kırsal alana göre adaletsiz bir şekilde artmaya başlamaktadır. Ancak bu durum belli bir düzeye kadar sürmekte ve belirtilen ilişkiler belli bir eşikten sonra tersine dönmektedir. Bunun birçok sebebi olmakla beraber, finansal sistemin gelişimi de önemli bir etkendir. Nitekim finansal gelişmeyle birlikte iş fikirlerini hayata geçirme ve eğitim sağlama olanakları kolaylaşmaktadır. Bu iki olanak gelir adaletini sağlamada önemi-etkili faktörler haline gelmektedir.

Finansal gelişme ve gelir adaleti konusundaki ters-U şeklindeki ilişkiye dair başat çalışmalar Greenwood ve Jovanovic (1990), Banerjee ve Newman (1993), Galor ve Zeira (1993), Greenwood ve Smith (1997), Smith (2003), Deidda (2006) ve Townsend ve Ueda (2006) olarak sıralanabilir. Bu çalışmalara göre, ekonomik kalkınma ve buna bağlı olarak gelişen finansal piyasalar başlangıçta gelir adaletsizliğini artıracaktır. Her ne kadar finansal sistemin gelişmesi bir piyasa başarısızlığı olan asimetrik bilgilenmeyi azaltsa da finansal gelişmenin başlangıç aşamalarında bu piyasalarda genellikle daha zengin kişiler işlem yapabildiği için gelir adaleti daha fazla bozulacaktır. Belli bir süre sonra ise, ekonomide kalkınmanın gerçekleşmesi, geniş halk kesimlerinin gelirinin artması ve finansal sisteminin tam anlamıyla gelişmesiyle gelir adaletinde bir iyileşme yaşanacaktır.

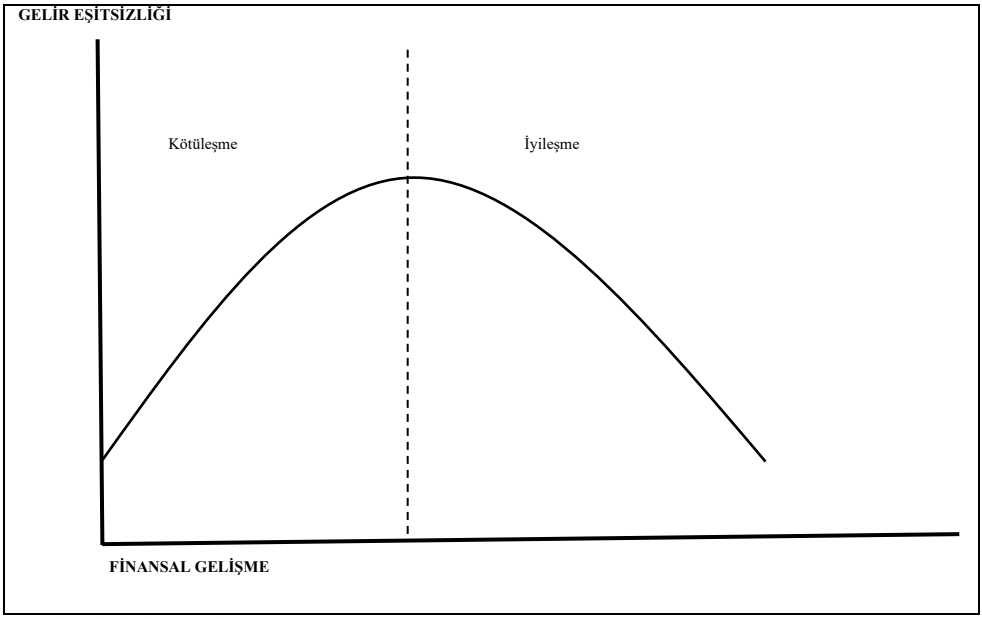
Galor ve Zeira (1993) ve Galor ve Moav (2004)'e göre finansal gelişme-gelir adaleti ilişkisi yüksek gelirli ve düşük gelirli ülkeler açısından farklılaşmaktadır. Bu çalışmalarda kredi kısıtlamalarının uygulanması durumunda, göreceli zengin ülkelerde finansal gelişmenin iktisadi büyümeyi artırdığı iddia edilmektedir. Fakir ülkelerde ise, finansal gelişme gerçekleştikçe gelir adaletsizliği de artmaktadır. Sermaye birikiminin yetersiz olduğu bu ülkelerde finansal gelişmenin başlangıç aşamalarında gelir dağılımı sermaye sahipleri lehine gelişirken ve gelir adaletsizliği artarken; sermayenin bollaşması ve tabana yayılması ile gelir adaleti düzelecektir (Oechslin, 2009; Kim & Lin, 2011).

İktisadî kalkınmanın başlangıç aşamalarında finansal gelişmenin gelir adaletini bozmasının bir nedeni de finansal krizlerdir. Özellikle GOÜ'lerde finansal gelişmenin başlangıç aşamalarında yapısal dönüşüm finansal krizlerle gerçekleşebilmektedir. Belirtilen duruma ilişkin çalışmalardan Agnello ve Sousa (2012)'de bankacılık krizlerinden önce gelir dağılımının giderek bozulduğu ve krizden sonra gelir dağılımının tekrar düzeldiği iddia edilmiştir. Krizden sonra gelir dağılımının düzelmesinin nedeni, bankacılık sisteminin kredi tahsisini daha iyi gerçekleştirmesidir. Ancak Jauch ve Watzka (2016)'ya göre 2008 küresel krizinden sonra banka zararlarının kamusallaştırılması tartışmaya ayrı bir boyut

kazandırmaktadır. Zira batan bir bankanın zararlarının devlet bütçesinden karşılanması, birçok şekilde gelir adaletini bozacak bir durumdur.

Yukarıda belirtilen ilişkiler Grafik 1'deki gibi betimlenebilir. Grafikten görüleceği üzere finansal gelişmenin belli bir aşamasına kadar gelir adaletsizliği artmaktadır. Ancak finansal gelişme belli bir düzeye ulaştıktan sonra gelir adaletsizliğine ilişkin parametrelerde azalma yaşanmaktadır.

Grafik: 1
Finansal Kuznets Eğrisi



Kaynak: Nikoloski (2013).

Kuznets (1955)'de ileri sürülen ve Grafik 1'de gösterilen bu ilişki Bradford (2005) ve Baiardi (2016, 2018)'i takiben aşağıdaki denklemlerle de ifade edilebilir.

$$y = a + bx + cx^2 \quad b > 0, c < 0 \tag{1}$$

$y: gelir\ eşitsizliği$

$x: reel\ kişi\ başına\ gelir$

(1) numaralı denklem itibariyle dönüm noktası aşağıdaki gibi betimlenebilir:

$$x^{\star} = \frac{-b}{2c} \tag{2}$$

(1) numaralı denklemi zaman göre türevini alıp (2) numaralı denklemle birleştirdiğimizde ise (3) numaralı denklemi elde edebiliriz.

$$\frac{\partial y}{\partial t} = (b + 2cx)\frac{\partial x}{\partial t} \tag{3}$$
$$= \propto (x^{\star} - x)g$$

Burada $\alpha \equiv 2c < 0$ ve $g \equiv \frac{\partial x}{\partial t}$ her bir ülke için kişi başına gelirin büyüme hızını vermektedir. Gelir adaletsizliğindeki anlık değişim, kişi başına gelir büyümesine (g) ve kişi başına gelir ile kişi başına gelirin dönüm noktası arasındaki farka $(x^{\star} - x)$ bağlıdır. Ayrıca $g > 0$ olduğunda, $x < x^{\star}$ eşitsizlik artmakta ve $x > x^{\star}$ olduğunda eşitsizlik azalmaktadır. Kişi başına gelirin dönüm noktasını finansal gelişme seviyesi (f) ile ilişkilendirmek için aşağıdaki eşitlikten yararlanabiliriz:

$$x^{\star} = \lambda_0 + \lambda_1 f \tag{4}$$

(4) ve (3) numaralı denklemleri bir arada düşünürsek, (5) numaralı denklem elde edilebilir:

$$\frac{\partial y}{\partial t} = \beta_0[x - (\lambda_0 + \lambda_1 f)]g \tag{5}$$

(5) numaralı denklemde yer alan (λ_0) ve (λ_1) parametreleri itibariyle ve $\lambda_1 < 0$ olduğunda, daha gelişmiş bir finansal sisteme sahip bir ülkenin finansal sistemi daha az gelişmiş bir ülkeye göre daha düşük bir gelir seviyesinde dönüm noktasına ulaşacağını göstermektedir. Bu iyileşmenin temel sebebi, daha gelişmiş bir finansal sistemin teknolojik yenilikler ile beşerî ve fiziki sermeye birikimini teşvik etmesi ve kaynakların daha etkin tahsisi ile gelir artışına ve adaletinin sağlanmasına vesile olmasıdır (Baiardi, 2018: 44). Ayrıca finansal sistem geliştikçe düşük gelirli insanların ve girişimcilerin dışsal fon elde etme imkânı artacaktır. Böylece finansal sistem sermayenin etkin tahsisini gerçekleştirecektir (Kim ve Lin, 2011: 310). Tahsis etkinliğinin daha iyi sağlanması ise, bölüşümde etkinliği daha iyi hale getirecektir.

3. Türkiye'de Gelir Adaleti

Türkiye'de kişi başına gelir düzeyi gelişmiş ülkelere göre düşük düzeydedir. 2018 yılı itibariyle Dünya Bankası verilerine göre Türkiye'de satın alma gücü paritesi ile düzeltilmiş kişi başına GSYİH 25.287 ABD dolarıdır. Aynı yıl dünya ortalaması 15.893, OECD ortalaması 40.492 ve gelişmekte olan ülkeler ortalaması 10.676 dolardır (UN, 2020).

Milli gelirin artmasının yanında önemli olan başka bir unsur da gelirin adil paylaşımıdır. Türkiye'de gelir adaletine ilişkin istatistiklerin ve çalışmaların çok yeterli olmadığı söylenebilir. Gelir dağılımı ile ilgili ilk istatistik, 1933 yılında Ticaret Bakanlığı Konjonktür Dairesi tarafından sunulmuştur. Daha sonraki istatistikler ise, düzensiz ve uzun yıllara dağılmış bir şekilde yapılmıştır. Özellikle TÜİK'in 1987'den itibaren elde ettiği

istatistiklere göre GINI katsayısının giderek düştüğü görülmektedir. Fonksiyonel gelir dağılımı itibariyle, 1994 yılından itibaren ücret gelirlerinin milli gelir içindeki payı sürekli artmış ve bu durum gelir adaletinin düzeldiğine ilişkin önemli bir gösterge olmuştur (Çalışkan 2010, 105-106; 111-112). Özetle ve kısıtlı veriler itibariyle Türkiye'de gelir adaletinin giderek iyileştiği iddia edilebilir (Taş & Özcan, 2012: 7). Fonksiyonel gelir dağılımı açısından Türkiye'de aktif işgücünün önemli bir kısmı (%45,7) alt gelir grubunda yer almaktadır. Her ne kadar alt gelir grubundan üst gelir grubuna doğru bir hareket olsa da bu hareket çok yeterli değildir (Aydın, 2012: 147).

Türkiye'deki gelir dağılımı ve yoksulluk ile ilgili ampirik çalışmaların da kısıtlı olduğu söylenebilir. Bunlardan Güneş (2007)'nin temel bulgusu, fonksiyonel gelirin bileşenlerinin birbiri ile eş-bütünleşik olduğu ve bu yüzden birbirlerinden çok farklı tutulamayacağıdır. Ayrıca Türkiye'de fonksiyonel gelirin dağılımında inceleme dönemi için çok fazla bir değişikliğin olmadığı bulgusuna da ulaşılmıştır (Güneş, 2007: 23). Topuz ve Sekmen (2020)'ye göre Türkiye'de GINI katsayısı 0,39 olarak hesaplanmıştır. Ayrıca Türkiye'de bölgeler açısından da gelir adaleti konusunda farklılıklar söz konusudur. Dikkat çekici bir şekilde sanayileşmiş ve gelir düzeyi daha yüksek batı bölgelerinde gelir adaletsizliğin de yüksek olduğu iddia edilmektedir. Tahsin (2019)'da Türkiye'de gelir adaletsizliğini giderilmesinde üst %10 gelir düzeyinin belirleyici olduğu sonucuna ulaşılmıştır. Çobanoğlu ve Yılmaz (2019)'da da benzer şekilde üst gelir grubunun gelirden oldukça yüksek bir pay aldığını ve gelir adaletinin tesisinde bu grubun önemli olduğu sonucuna ulaşılmıştır. Bu çalışmanın konusuna benzer şekilde Akalın vd. (2018)'de 1984-2011 tarihleri için gelir dağılımı ile ekonomik büyüme ilişkisi araştırılmıştır. Çalışmanın uygulama sonuçlarına göre, Türkiye'de GINI katsayısı ile ekonomik büyüme arasında Kuznets eğrisinin gösterdiği ilişki söz konusudur.

4. Finansal Kuznets Eğrisine İlişkin Ampirik Literatür

Finansal Kuznets eğrisinde finansal gelişme ve gelir adaleti arasındaki ilişki ele alındığı için ilk olarak finansal gelişmenin tanımlanması gerekmektedir. En basit anlamda finansal gelişme bir ekonomide finansal araçların ve aracıların niteliğinin ve niceliğinin artması ile ifade edilmektedir. Daha geniş bir tanımla finansal gelişme, finansal yenilikler ile piyasa yapı ve kurumlarındaki genişleme ve derinleşmeyle birlikte, finansal sistemin fonları daha etkin yatırım alanlarına tahsis edecek kurumlara sahip olmasını ve bu kurumların sayısının artmasını içermektedir. Finansal gelişme ile birlikte finansal araçlar, yatırım ve tüketim faaliyetlerinde yaygın olarak kullanılır (Günal, 2001: 47; Kar & Taş 2004: 170; Mishkin, 2007: 262; Dumrul, 2010). Finansal gelişmenin ölçülmesinde hangi değişken veya değişkenlerin kullanılacağı konusunda literatürde bir fikir birliği yoktur. Uygulamalı literatürde birçok değişken finansal gelişmeyi temsil etmek üzere kullanılmaktadır. Uygulamalı literatürde finansal gelişmeye ilişkin yaygın olarak kullanılan değişkenler Tablo 1'de sunulmuştur.

Tablo: 1
Uluslararası Uygulamalı Literatürde Kullanılan Finansal Gelişmeye İlişkin Ölçütler

Banka likit rezervlerinin banka varlıklarına oranı	Özel sektöre verilen kredilerin GSYİH içindeki payı
Banka likit yükümlülüklerinin GSYİH'ye oranı	Özel sektöre verilen kredilerin hacmi
Banka mevduat yükümlülüklerinin GSMH'ye oranı	Özel sektöre verilen yurt içi kredilerin toplam yurt içi kredilere oranı
Banka mevduat yükümlülüklerinin GSYİH'ye oranı	Özel sektöre verilen yurt içi kredilerin toplam yurt içi kredilere oranı (bankalara verilen krediler hariç)
Bankacılık kesiminin toplam varlıklarının GSYİH'ye oranı	Para benzerlerinin GSYİH'ye oranı
Bankacılık sistemindeki mevduatların özel sektöre verilen kredilere oranı	Özel girişimcilere verilen kredilerin, merkezi ve yerel kamu kurumlarına verilen kredilerle özel girişimcilere verilen kredilerin toplamına oranı
Brüt yurt içi tasarrufların geniş tanımlı para arzına olan oranındaki değişme	Mevduat bankalarının toplam mevduat yükümlülükleri/GSYİH (birinci gecikme)
Finansal araçların toplam değeri/GSYİH	Mevduat bankalarının yurt içi varlıkları ile merkez bankası ve mevduat bankalarının yurt içi varlıklarının toplamı
Finans sisteminde istihdam edilen işgücünün toplam işgücü içerisindeki payı	Reel faiz oranları
Finans sisteminin GSYİH içerisinde payı	Reel kredilerin iki yıl öncesine göre büyüme hızı
Finans sisteminin toplam varlıklarının GSYİH'ye oranı	Sermayeleşme oranı
Geniş tabanlı para arzının gelire oranı	Ticarî bankaların yurt içi varlıklarının diğer bankaların ve merkez bankasının varlıklarına oranı
Likit yükümlülüklerin GSYİH içindeki payı	Ticarî bankaların mevduat hacmi
M1	Tasarruf hacmi
M1/GSMH	Toplam finansal araçların değeri/GSMH
M2	Toplam krediler
M2/brüt uluslararası rezervler	Toplam özel krediler
M2/GSMH	Toplam yurt içi krediler
M2/GSYİH	Toplam krediler/mevduat
M2Y/GSYİH	Toplam mevduatlar
M3/GSYİH	Yurt içi banka kredilerinin nominal GSYİH'ye oranı
Hisse senetleri piyasasında işlem gören firma sayısı	Yurt içi krediler/GSMH
Hisse senetleri piyasası ticaret hacmi	Yurt içi krediler/GSYİH
Mevduat bankalarının özel sektöre verdiği kredilerin gelire oranı	Yurt içi yatırımlar/GSYİH

Kaynak: Dumrul, C. (2010).

Finansal gelişmeye ilişkin bu kadar farklı değişkenin kullanılması, nedensellik ilişkilerinin yönünü ve gücünü belirlemede muğlaklığa sebep olmaktadır. Nitekim finansal gelişme ile ilgili literatürde nedensellik ilişkilerinin yönü ile ilgili birbiriyle çelişen birçok çalışma mevcuttur. Bu çelişkileri gidermek için, çeşitli indeksleme yöntemleri kullanılmaktadır. Belirtilen tekniklerden özellikle temel bileşenler analizi finansal gelişme ve ekonomik büyüme arasındaki ilişkileri değerlendirirken kullanılan bir indeksleme yöntemi olup birçok çalışmada kullanılmıştır. Söz konusu muğlaklığı giderebilmek için son dönemde ise, IMF birçok ülkeyi kapsayacak şekilde finansal gelişme indeksleri sunmaktadır. IMF'nin sunmuş olduğu finansal gelişme indeksleri finansal kurumları ve finansal piyasaları ayrı ayrı değerlendirme imkânı vermektedir. Finansal kurumlar ve finansal piyasalar ise, derinlik, ulaşılabilirlik ve etkinlik açısından ayrı ayrı değerlendirilebilmektedir. Bu ayrım Čihák vd. (2012)'de yapılmıştır. Finansal gelişme ise, bu üçünün bir bileşimi olarak düşünülebilir. Belirtilen indeksler de temel bileşenler analizi ile elde edilmektedir (IMF, 2021; Svirydzenka, 2016: 5-19). Tablo 2'de ise finansal gelişme ve gelir adaleti arasındaki ilişkiye dair uygulamalı literatüre yer verilmiştir.

Tablo: 2
Finansal Gelişme ve Gelir Adaleti Arasındaki İlişkiye Dair Ampirik Literatür

Yazar(lar)	Yöntem ve Değişkenler	Ülke ve Veri Aralığı	Bulgu ve Sonuçlar
Chiu ve Lee (2019)	Yumuşak geçişli regresyon modeli - GINI katsayısı, - Özel sektöre verilen yurtiçi krediler, - Yurtiçi firmalara ait para kapitalizasyonu, - Risk endeksi, - Kişi başına GSYİH, - Dışa açıklık oranı, - Tüketici fiyat endeksi, - Küreselleşme oranı.	59 ülke 1985-2015	İstikrarlı bir ekonomik çevrede finansal gelişmenin gelir dağılımını daha adil bir hale getirdiği, buna karşın finansal ve politik riskin bulunduğu durumda finansal gelişmenin gelir dağılımını olumsuz bir şekilde etkilediği tespit edilmiştir.
Altıntaş ve Çalışır (2018)	ARDL sınır testi yaklaşımı - GINI katsayısı, - Özel sektöre verilen kredilerin GSYİH içindeki payı, - Sermaye piyasa değerinin GSYİH içindeki payı.	Türkiye 1993-2016	Türkiye'de bankacılık sistemindeki gelişmenin, sermaye piyasasına oranla daha az olmakla birlikte gelir dağılımındaki eşitsizliği azalttığı sonucuna ulaşılmıştır.
Azam ve Raza (2018)	Panel eş-bütünleşme analizi, sabit etkiler modeli - GINI katsayısı, - Reel büyüme oranı, - Tüketici fiyat endeksi, - Özel sektöre verilen toplam kredi miktarı, - Para arzı, - Finansal gelişim endeksi.	ASEAN üyesi 5 ülke 1989-2013	Finansal gelişmenin gelir dağılımındaki adaletsizliği azalttığı tespit edilmiştir. Ampirik bulgular, finansal Kuznets eğrisinin varlığını doğrulamıştır.
Baiardi ve Morana (2018)	Panel EKK ve Panel GMM - GINI katsayısı, - Kişi başına reel GSYİH, - Özel sektöre verilen kredilerin GSYİH'ye oranı, - Likit yükümlülüklerin GSYİH'ye oranı, - Yaş bağımlılık oranı, - Hükümet harcamalarının GSYİH'ye oranı, - Dışa açıklık oranı, - Şehirleşme oranı.	AB üyesi 19 ülke 1985-2013	Finansal derinleşmenin daha adil bir gelir dağılımı sağladığı tespit edilmiştir. Ayrıca dönem içinde gerçekleşen finansal krizlerin gelir dağılımını olumsuz bir şekilde etkilediği belirlenmiştir.
Şahin (2018)	Panel veri analizleri - GINI katsayısı, - Reel kişi başına GSYİH, - Özel sektöre verilen kredilerin GSYİH'ye oranı.	15 Gelişmiş Ülke 1995-2014	Panel eş-bütünleşme testi sonuçlarına göre finansal gelişme, ticari açıklık, ekonomik büyüme ve gelir eşitsizliği arasında uzun dönemli ilişki olduğu; nedensellik testlerine göre finansal gelişmeden gelir eşitsizliğine doğru tek yönlü nedensellik ilişkisi olduğu ve ekonomik büyüme, ticari açıklık ile gelir eşitsizliği arasında herhangi bir nedensellik ilişkisi olmadığı bulgusuna ulaşılmıştır.
Destek, Okumuş ve Manga (2017)	ARDL sınır testi, Granger nedensellik testi - GINI katsayısı, - Özel sektör tarafından sağlanan kredilerin GSYİH'ye oranı, - Kamu harcamalarının GSYİH'ye oranı, - Tüketici fiyat endeksi.	Türkiye 1977-2013	Kamu harcamaları ile enflasyon oranındaki artışın gelir dağılımını bozduğu, finansal gelişmenin ise gelir dağılımındaki adaletsizliği azalttığı tespit edilmiştir. Analiz sonuçları finansal Kuznets eğrisi hipotezini desteklemiştir.
Hepsağ (2017)	Dinamik En Küçük Kareler yöntemi ve ARDL Eş-bütünleşme analizleri - GINI katsayısı, - Özel sektör kredilerinin GSYİH'ye oranı, - Kişi başına reel büyüme oranı.	ABD (1961-2014) Almanya (1971-2015) İngiltere (1961-2015) İtalya (1967-2015) Kanada (1965-2008)	DOLS sonuçlarına göre ABD, İtalya ve Kanada için Finansal Kuznets Eğrisi hipotezi geçerli iken Almanya ve İngiltere için geçerli olmadığı belirlenmiştir. ARDL sonuçlarına göre Almanya ve İtalya ekonomileri için Finansal Kuznets Eğrisi geçerlidir.

Baiardi ve Morana (2016)	Panel veri analizleri - GINI katsayısı, - Kişi başına reel GSYİH, - M3/GSYİH, - Kontrol değişkenleri (bağımlı nüfus oranı, kamu harcamalarının GSYİH'ye oranı, faiz oranları, ticari dışa açıklık).	19 Euro bölgesi ülke 1985-2013	Finansal Kuznets eğrisini doğrulayan bulgulara ulaşılmıştır.
Argun (2016)	Panel veri Analizi - GINI endeksi, - Kişi başına GSYİH, - Yurtiçi özel sektör kredilerinin GSYİH'ye oranı, - Enflasyon, - İhracatın ithalatı karşılama oranı.	Gelişmekte olan 10 ülke 1989-2013	Analiz bulgularında, finansal sektör kredileri ile GINI katsayısı arasında anlamlı ve pozitif yönde bir ilişki bulunmuştur. Başka bir deyişle, Kuznets'in ters-U eğrisi hipotezini destekleyici sonuçlar elde edilmiştir.
Jauch ve Watzka (2016)	Panel veri yaklaşımı - Özel sektör kredilerinin GSYİH'ye oranı, - GINI Katsayısı, - Kişi başına GSYİH, - Enflasyon, - Kamu harcamaları, - Finans sistemine erişim, - Etnik-dilsel ayrışım.	138 gelişmiş ve gelişmekte olan ülke 1960-2008	Finansal Kuznets Eğrisine ilişkin hipotezin geçerli olmadığı ve hatta finansal gelişme ile gelir dağılımı eşitsizliği arasında ters-U değil de U şeklinde bir ilişkinin olduğu bulgusuna ulaşılmıştır.
Çetin ve Şeker (2016)	ARDL sınır testi yaklaşımı - GINI katsayısı, - Yurt içi kredilerin GSMH'ye oranı, - Dolar bazında kişi başına reel GSMH, - TÜFE, - İthalat ve ihracat toplamının GSYİH'ye oranı	Türkiye 1963-2006	Finansal gelişme ile gelir eşitsizliği arasında negative bir ilişki tespit edilmiştir. Başka bir deyişle, finansal gelişme gelir eşitsizliğini azalttığı sonucuna ulaşılmıştır.
Sehrawat ve Giri (2016a)	Panel veri analizleri - Kişi başına hanehalkı tüketim harcamaları, - Özel sektör kredilerinin GSYİH'ye oranı, - Tarımsal katma değerin endüstriyel katma değere oranı, - Kişi başına GSYİH, - Ticari dışa açıklık ve enflasyon (kontrol değişkenleri).	11 Güney Asya ülkesi 1990-2013	Ele alınan ülkelerde finansal gelişmenin ve iktisadi büyümenin gelir eşitsizliğini azalttığı; ancak köy-kent gelir dengesizliğini bozduğu sonucuna ulaşılmıştır.
Sehrawat ve Giri (2016b)	Panel veri analizleri - Özel sektör kredilerinin GSYİH'ye oranı, - Para arzının GSYİH'ye oranı, - GINI katsayısı, - Köy-kent gelir eşitsizliği, - Ticari dışa açıklık ve Enflasyon.	6 SAARC ülkesi 1990-2013	Ele alınan ülkeler için köy-kent gelir adaletsizliğini finansal gelişme artırırken, ticari dışa açıklık azaltmaktadır.
Altunöz (2015)	Sınır testi yaklaşımı - GINI Endeksi, - Cari fiyatlarla kişi başı gayri safi yurtiçi hasıla, - Özel sektör kredisi / GSYİH, - İhracatın ithalatı karşılama oranı.	Türkiye 1991-2014	Uygulama sonuçlarına göre kişi başına GSYİH, özel sektör tarafından kullanılan krediler ve ticaret değişkenlerinin gelir adaletsizliğinin giderilmesinde olumlu bir etkiye sahip olduğu sonucuna ulaşılmıştır.
Shahbaz vd. (2015)	ARDL sınır testi, Granger nedensellik testi - GINI katsayısı, - Reel GSYİH büyüme oranı, - Kişi başına reel özel sektör kredileri, - Tüketici fiyat endeksi, - KOF küreselleşme endeksi.	İran 1965-2011	Finansal gelişmenin gelir dağılımındaki eşitsizliği azalttığı, ekonomik büyümenin ise artırdığı tespit edilmiştir. Diğer taraftan enflasyon ve küreselleşme gibi unsurların gelir dağılımını düzelttiği belirlenmiştir.

Zhan ve Chen (2015)	Yapısal VAR - Kırsal nüfusun gelirinin şehir nüfusun gelirine oranı, - Finansal etkinlik oranı, - Karşılıklı sermaye ilişkisi, - Mali harcamalar, - Kentleşme.	Çin 1978-2013	Finansal Kuznets eğrisini doğrulayan ampirik bulgular elde edilmiştir. Buna göre finansal gelişmenin başlangıç aşamalarında gelir adaleti bozulmakta, ikinci ve üçüncü aşamada ise düzelmektedir.
Kanberoğlu ve Arvas (2014)	ARDL sınır testi yaklaşımı - GINI katsayısı, - Yurtiçi özel sektör kredilerinin GSYİH'ye oranı, - Kişi başına GSYİH, - Enflasyon oranı, - Dışa açıklık oranı.	Türkiye 1980-2012	Finansal gelişmenin, ekonomik kalkınmanın önemli bir unsuru olduğu, bununla birlikte etkin bir finansal sistemin daha adil bir gelir dağılımı sağladığı tespit edilmiştir.
Nikoloski (2013)	Dinamik çok değişkenli panel veri analizi - GINI katsayısı, - Kişi başına GSYİH, - Özel sektöre verilen kredilerin GSYİH'ye oranı, - Tüketici fiyat endeksi, - Özgürlük evi endeksi, - Hükümet harcamalarının GSYİH'ye oranı, - Kurumsal gelişim göstergeleri.	76 ülke 1962-2006	Finansal gelişme arttıkça gelir dağılımının daha adil bir şekilde gerçekleştiği tespit edilmiştir. Ampirik bulgular finansal Kuznets eğrisi hipotezini desteklemiştir.
Hoi ve Hoi (2012)	Regresyon analizleri - GINI katsayısı, - Kişi başına GSYİH, - Eğitim seviyesi, - Ticari açıklık, - Fakirlik oranı.	Vietnam 2002-2008	Finansal gelişmenin gelir eşitsizliğini azaltmada olumlu etkiye sahip olduğu görülmüştür. Finansal gelişme ve gelir eşitsizliği arasında Greenwood-Jovanovic hipotezinde iddia edildiği gibi ters-U şeklinde bir ilişkinin olmadığı görülmüştür.
Tan ve Law (2012)	Dinamik Panel Genelleştirilmiş Momentler Yöntemi - Finansal derinleşme, - Reel GSYİH, - Yozlaşma indeksi, - Enflasyon oranı	35 gelişmekte olan ülke	Finans-gelir adaleti konusundaki ilişkinin ters-U şeklinde olmadığı, aksine U şeklinde olduğu bulgusuna ulaşılmıştır.
Kim ve Lin (2011)	Eşik Değerli Otoregresif (TAR) regresyon modeli - GINI katsayısı, - Finansal gelişme göstergeleri, - Kişi başına GSYİH büyümesi, - Eğitim düzeyi, - Enflasyon oranı, - Kamu harcamalarının GSYİH'ye oranı, - Ticari açıklık.	53 ülke 1960-2005	Çalışmanın bulgularına göre finansal derinleşmenin faydaları finansal gelişmenin belli bir eşiğe ulaşması ile mümkündür. Bu kritik seviyenin altında finansal gelişme gelir adaletini kötüleştirmektedir. Sonuç olarak çalışmada finansal gelişme ile gelir adaleti arasındaki ters-U şeklindeki ilişkinin geçerli olduğu sonucuna ulaşılmıştır.
Shahbaz ve Islam (2011)	ARDL sınır testi yaklaşımı, hata düzeltme modeli - GINI katsayısı, - Yurtiçi özel sektör kredilerinin GSYİH'ye oranı, - Enflasyon oranı, - Hükümet harcamalarının GSYİH'ye oranı, - Dışa açıklık oranı	Pakistan 1971-2005	Ekonomik büyümenin, devlet büyüklüğünün, dışa açıklığın ve finansal istikrarsızlığın gelir eşitsizliğini artırdığı, enflasyon oranındaki artış ile imalat sektöründeki gelişmenin ise gelir eşitsizliğini azalttığı tespit edilmiştir. Ampirik bulgular neticesinde finansal Kuznets eğrisi hipotezi reddedilmiştir.
Rehman vd. (2008)	Klasik en küçük kareler - GINI katsayısı, - Kişi başına gelir büyümesi, - Enflasyon oranı, - İşsizlik oranı, - Yetişkinlerde okuryazarlık oranı, - Nüfus artış hızı, - Dışa açıklık oranı.	Farklı gelir düzeylerinde 51 ülke 1975-2002	Finansal gelişme ile gelir dağılımı eşitsizliği arasında ters-U şeklinde bir ilişkiye dair zayıf kanıtlar tespit edilmiştir.

Beck vd. (2007)	EKK ve Dinamik Panel araç değişkenler regresyonu - GINI katsayısı ve bunun büyümesi, - Özel krediler, - Nüfusun en fakir çeyreğinin gelir büyümesi, - Ücretli nüfusun büyüme hızı, - Kişi başına GSYİH büyüme oranı, - Okullaşma oranı, - Ticari açıklık, - Enflasyon, - Bağımlı nüfus oranı.	Finlandiya, Fransa, Türkiye Arjantin, Brezilya, Şili, Tayland, Venezüella ve ABD 1960-1985	Finansal gelişmenin zengin ile fakirler arasında orantısız bir şekilde fakirliğin azaltılmasına katkıda bulunduğu sonucuna ulaşılmıştır.
Clarke vd. (2006)	EKK ve İki aşamalı EKK - GINI katsayısı, - Özel krediler, - Banka varlıkları, - Başlangıç kişi başına GSYİH, - Enflasyon oranı.	83 Ülke 1960-1995	Finansal gelişme uzun dönemde GINI katsayısının seviyesinde düşüşe yol açmaktadır. Ancak finansal gelişmenin başlangıç aşamalarında gelir adaletsizliğinin artacağına dair güçlü bulgulara ulaşılamamıştır.

Not: Tablo tarafımızca oluşturulmuştur. Çalışmaların sıralamasında yıl esas alınmıştır.

Tablo 2'den de görüleceği üzere, ampirik literatürde genellikle finansal gelişmenin gelir adaletsizliğini azaltabileceğine yönelik bulgulara ulaşılmaktadır. Ancak az sayıda çalışmada bu bulguların tersi sonuçlara ulaşılmıştır. Clarke vd. (2006), Beck vd. (2007), Jalil vd. Feridun (2011), Agnello ve Sousa (2012), Nikoloski (2013), Satti vd. (2015) finansal gelişmenin gelir adaletsizliğine yol açabileceğine ilişkin çalışmalara örnek verilebilir. Ampirik literatürdeki bu çelişme seçilen değişkenler ile alakalı olabileceği gibi tahmin edilmeye çalışılan modelin matematiksel formunun doğrusal olmasıyla da ilişkilendirilebilir.

5. Veri ve Metodoloji

Daha önce de belirtildiği üzere literatürde finansal gelişme ile ilgili birçok değişken kullanılmakta ve bu durum analiz sonuçlarının muğlaklaşmasına yol açmaktadır. Belirtilen durumu önlemek için bu çalışmada IMF tarafından geliştirilen finansal gelişme ölçütleri kullanılacaktır. Bu verilerin niteliği Tablo 3'te sunulmuştur. Analiz edilen veriler yıllık frekansta olup 1980-2017 dönemini kapsamaktadır.

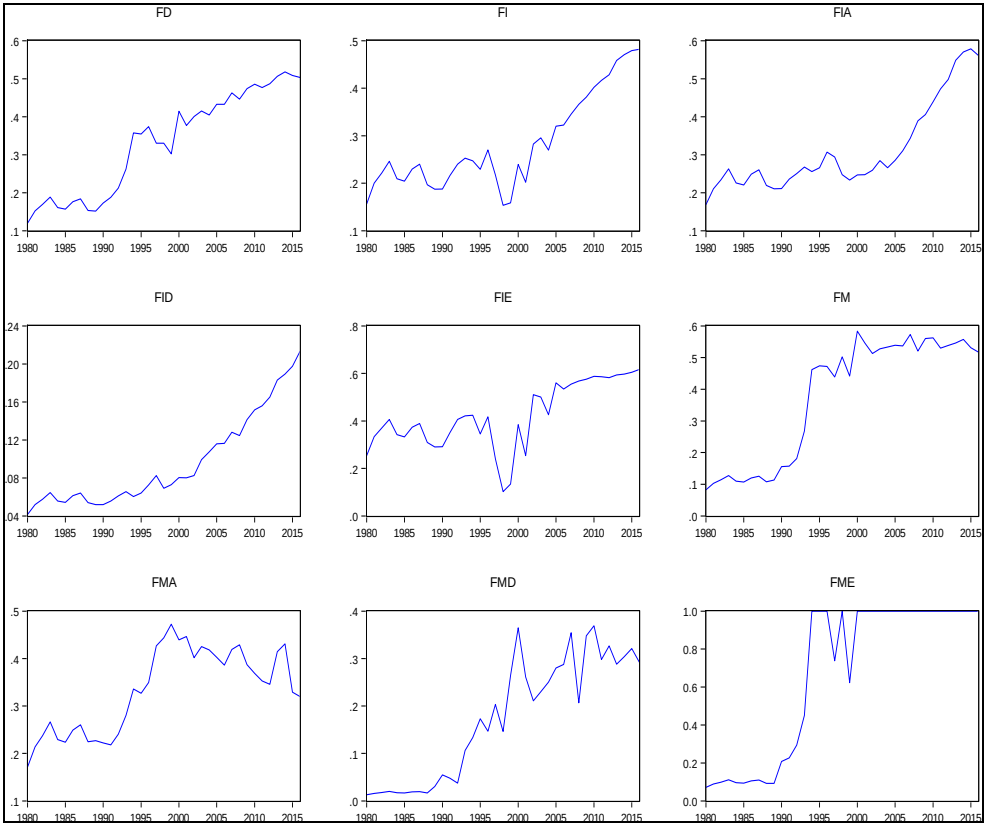
Tablo: 3
Finansal Gelişme Ölçütleri

FD			Finansal Gelişme
	FI		Finansal Kurumların Gelişmişliği
		FIA	Finansal Kurumların Erişilebilirliği
		FID	Finansal Kurumların Derinliği
		FIE	Finansal Kurumların Etkinliği
	FM		Finansal Piyasaların Gelişmişliği
		FMA	Finansal Piyasaların Erişilebilirliği
		FMD	Finansal Piyasaların Derinliği
		FME	Finansal Piyasaların Etkinliği

Kaynak: IMF (2019); Svirydzenka (2016).

Tablo 3'ten de anlaşılacağı üzere finansal gelişmenin iki unsuru olduğu kabul edilmektedir. Bunlardan ilki finansal kurumların gelişmişliği ve diğeri de finansal piyasaların gelişmişliğidir. Bu verilerin yıllar itibariyle seyri Grafik 2'de sunulmuştur. Grafiklerden görüleceği üzere, kriz dönemlerinde bir düşüş eğilimi görülse de genel olarak Türk finans sisteminin yıllar itibariyle derinlik, etkinlik, erişilebilirlik ve gelişmişlik açısından sürekli pozitif bir ilerleme gösterdiği söylenebilir.

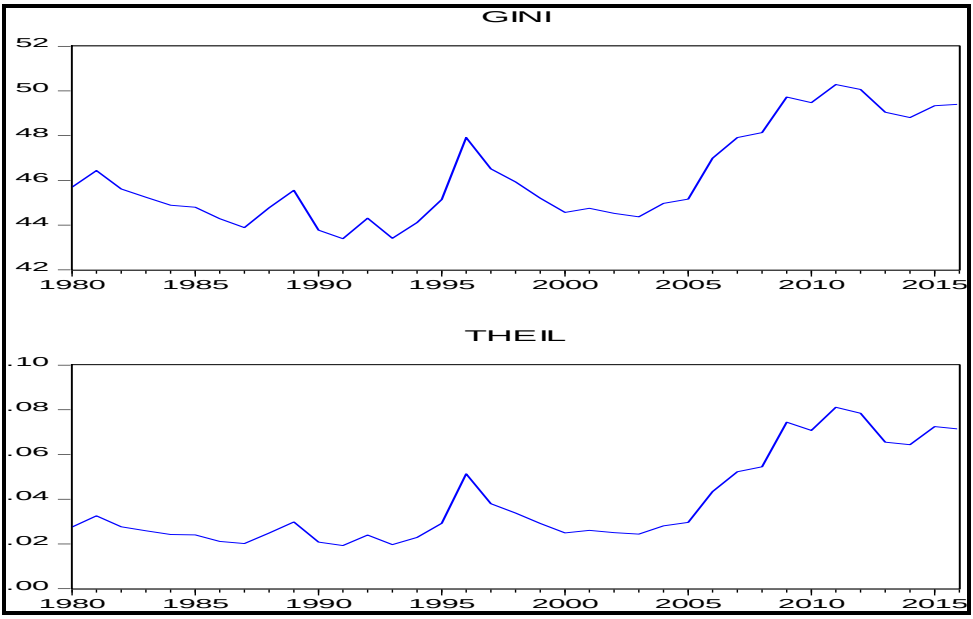
Grafik: 2
Finansal Gelişmeye İlişkin Verilerin Grafikleri



Türkiye için GINI katsayısı ile ilgili istatistikler genel olarak yetersizdir. Bu durum aslında neredeyse tüm GOÜ'lerde görülen bir sorundur. Bu nedenle gelir adaletine yönelik alternatif ölçümleri kullanan çalışmalar söz konusudur. Bunlardan en yaygın kullanılanları Yüzdelik Gruplar Katsayısı, McLoone İndeksi, Göreli Varyans (Değişkenlik Katsayısının Karesi), Logaritmik Sapmaların Ortalaması, Theil indeksi ve Texas Üniversitesi Eşitsizlik Projesi (UTIP) Veri Seti olarak sıralanabilir (Elveren 2013, 36-38). Texas Üniversitesi Eşitsizlik Projesi Veri Seti'nin Türkiye'ye ilişkin verileri iki ayrı kategoride değerlendirilebilir. Birincisi EHII olarak adlandırılan Tahmin Edilen Hanehalkı Gelir Eşitsizliği Veri Seti (Estimated Household Income Inequality Data Set) ve diğeri de UTIP-UNIDO olarak adlandırılan endüstriyel ücret eşitsizliğine ilişkin veri setidir. Her iki veri seti de 1963-2015 yılları arasını kapsamaktadır (Texas Üniversitesi, 2020). Gelir adaletsizliğine

ilişkin bu iki değişkenin seyri Grafik 3'te sunulmuştur[1]. Grafiklerden de görüleceği üzere, Türk ekonomisinde hem GINI hem de THEIL ölçütü itibariyle gelir adaletsizliğinin yüksek ve giderek bozulduğu söylenebilir.

Grafik: 3
Gelir Adaletine İlişkin Verilerin Grafikleri



Çalışmanın ekonometrik test stratejisi iki aşamalı olacaktır. Birinci aşamada geleneksel ve yapısal kırılmalı birim kök testleri uygulanacaktır. Bu çalışmada yapısal kırılmaları dikkate almayan Geliştirilmiş Dickey-Fuller (ADF,1981), Philips-Perron (PP,1988) ve Ng ve Perron (Ng-Perron, 2001) birim kök testleri ve yapısal kırılmaları dikkate alan Zivot ve Andrews (ZA, 1992), Lee ve Strazicich (LS, 2003, 2013) ve Narayan ve Popp (NP, 2010) birim kök testleri uygulanacaktır. Bu testlerin birbirlerine göre çeşitli avantajları bulunmaktadır. ADF testinde, otokorelasyon sorununu önlemek amacıyla değişkenin gecikmeli değerleri analize dâhil edilmektedir (Enders, 1995: 225). P-P testi hata terimlerinin değişen varyanslı olması halinde bile geçerli olmakta ve heterojen dağılıma sahip seriler için de güçlü bir test olarak nitelendirilmektedir (Phillips & Perron, 1988: 335-338). P-P testi, serilerde hareketli ortalama olması, köklerin -1'e yaklaşması ve hata teriminin hacminde boyut dağılımı çarpıklığı olması halinde etkinliğini kaybetmektedir. Ng-Peron testi, P-P testinin belirtilen eksikliğini gidermek için geliştirilmiştir. Bu testte boyut

[1] *Her iki verinin 2001 yılı için değeri mevcut olmadığı için bu yıla ilişkin veri 2001 öncesi ve sonrası üç yılın ortalaması alınarak hesaplanmıştır.*

dağılım çarpıklığını düzeltmek için MZ_α MZ_t, MSB ve MP_t olmak üzere 4 test istatistiği hesaplanmaktadır. ZA testinde tek bir yapısal kırılmanın belirlendiği bir test olup model A (düzeyde kırılma), model B (trendde kırılma) ve model C (hem düzeyde hem de trendde kırılma) yardımıyla ADF birim kök testi yapılarak durağan dışılığın kırılmalardan kaynaklanıp kaynaklanmadığı sorgulanmaktadır. Çift kırılmalı LS (2003) ve tek kırılmalı LS (2013) testleri ADF tipi bir test yaklaşımı yerine LM tipi bir test stratejisine dayanmakta ve bu testlerde kırılma tarihi içsel olarak belirlenmektedir.NP (2010), ADF tipi çift kırılmalı bir birim kök testidir ve mevcut yapısal kırılmalı birim kök testleri içinde nispeten daha iyi güç ve boyut özelliklerine sahiptir. LS (2003, 2013) ve NP (2010) testlerinde, düzeyde kırılmayı (model A) ve eğimde kırılmayı (model C) dikkate alan iki test stratejisi bulunmaktadır (Mert & Çağlar, 2019: 137-139).

İkinci aşamada ise, birim kök testlerinin sonuçları itibariyle değişkenler arasındaki uzun dönemli ilişkiler, yapısal kırılmaları dikkate alan eş-bütünleşme yöntemleri kullanılarak analiz edilecektir. Bu çalışmada yapısal kırılmalı eş-bütünleşme testleri olarak Gregory ve Hansen (GH, 1996) ve Hatemi- J (HJ, 2008) testleri uygulanacaktır. GH (1996), standart Engle-Granger (1987) eş-bütünleşme testine yapısal kırılmayı temsil eden kukla değişken eklenmesine dayanmaktadır. Kırılmanın içsel olarak belirlendiği bu test düzeyde (C), trendde (C/T) ve rejimde (C/S) tek kırılmaya izin verecek şekilde üç farklı modelden oluşmaktadır. Bu modeller sırasıyla aşağıda sunulmuştur.

$$y_{1t} = \mu_1 + \mu_2 \varphi_{t\tau} + \alpha^T y_{2t} + e_t \qquad t = 1,...,n \tag{6}$$

$$y_{1t} = \mu_1 + \mu_2 \varphi_{t\tau} + \beta t + \alpha^T y_{2t} + e_t \qquad t = 1,...,n \tag{7}$$

$$y_{1t} = \mu_1 + \mu_2 \varphi_{t\tau} + \alpha_1^T y_{2t} + \alpha_2^T y_{2t} + e_t \qquad t = 1,...,n \tag{8}$$

Denklemlerde yer alan μ_1 ve μ_2 sırasıyla kırılma öncesindeki ve kırılma sonrasındaki sabit terimleri gösterirken, α_1^T ve α_2^T ise sırasıyla kırılma öncesindeki ve kırılma sonrasındaki eş-bütünleşme ilişkisine ait eğim katsayılarını ifade etmektedir (Gregory & Hansen, 1996: 102-103). GH (1996) testinde sıfır hipotezi yapısal kırılmalı eş-bütünleşme ilişkisinin olmadığını; alternatif hipotez ise yapısal kırılmalı eş-bütünleşme ilişkisinin olduğunu ifade etmektedir. Test istatistiklerine ilişkin kritik değerler GH (1996)'da yer almaktadır. HJ (2008) ise, GH (1996)'de sunulan test istatistiklerinin bilinmeyen bir zamanda bir rejim değişikliğine izin verecek şekilde genişletilmiş halidir. Başka bir ifadeyle HJ (2008), yalnızca rejim (C/S) değişikliğinin etkisini hem eğimde hem de sabitte dikkate alan iki kırılmalı bir testtir. C/S modeli eşitlik (9)'de gösterilmiştir (Hatemi-J, 2008: 499).

$$y_t = \alpha_0 + \alpha_1 D_{1t} + \alpha_2 D_{2t} + \beta_0^{'} x_t + \beta_1^{'} D_{1t} x_t + \beta_2^{'} D_{2t} x_t + u_t \tag{9}$$

Eşitlik (9)'da yer alan D_{1t} ve D_{2t} kukla değişkenlerdir ve eşitlik (10)'daki gibi tanımlanmaktadır.

$$D_{1t} = \begin{cases} 0, t \le [n\tau_1] \\ 1, t > [n\tau_1] \end{cases} \quad \text{ve} \quad D_{2t} = \begin{cases} 0, t \le [n\tau_2] \\ 1, t > [n\tau_2] \end{cases} \tag{10}$$

Eşitlik (10)'daki bilinmeyen parametreler $\tau_1 \in (0,1)$ ve $\tau_2 \in (0,1)$ rejim değişiminin kırılma noktasını göstermektedir. Sıfır hipotezi eş-bütünleşmenin olmadığını, alternatif hipotez ise, eş-bütünleşmenin olduğunu ifade etmektedir (Hatemi-J, 2008: 499).

6. Uygulama Sonuçları, Bulgu ve Yorumlar

Bu kısımda öncelikle verilerin tanısal istatistikleri sunulacaktır. Tablo 4'ten görüleceği üzere özellikle GINI katsayısının ortalamada 0,46 gibi yüksek bir değer alması ve 0,50'ye kadar ulaşması Türkiye'de gelir adaletsizliğinin yüksek olduğunu göstermektedir.

Tablo: 4
Verilerin Tanısal İstatistik Değerleri

Değişkenler	**FD**	**GINI**
Ortalama	0.33	0.46
Medyan	0.35	0.45
Maksimum	0.51	0.50
Minimum	0.11	0.43
Standart sapma	0.13	0.02
Yayıklık	-0.17	0.63
Basıklık	1.47	1.99
Jarque-Bera	3.75	3.99
Olasılık	0.15	0.13

Çalışmada ilk olarak kırılmaları dikkate almayan Geliştirilmiş Dickey-Fuller, Philips-Perron ve Ng-Perron birim kök testleri yapılmıştır. Tablo 5 ve 6'da bulguları sunulan bu testlere göre hem finansal gelişme ölçütü hem de GINI katsayısı birinci farkında durağanlaşmaktadır. Bu durum her iki değişkenin ortalamasının ve varyansının zaman içerisinde değiştiğini göstermektedir. Ayrıca serilerin fark durağan olması, bu değişkenlere yönelik uygulanacak politikaların etkisinin uzun sürmeyeceğini, başka bir deyişle ilgili değişkenlerin kısa hafıza sürecine sahip olduğunu göstermektedir.

Tablo: 5
Geliştirilmiş Dickey-Fuller ve Philips-Perron Birim Kök Test Bulguları

GDF Testleri			**PP Testleri**	
Değişkenler	**Sabitli**	**Sabitli ve Trendli**	**Sabitli**	**Sabitli ve Trendli**
FD	-1.01(0)	-2.61(0)	-0.93(6)	-2.60(2)
$GINI$	-0.84(0)	-2.11(0)	-0.91(1)	-2.11(0)
$\Delta(FD)$	-7.08(0) *	-6.98(0)*	-7.33(3)*	-7.21(5)*
$\Delta(GINI)$	-5.57(0)*	-5.69(0)*	-5.57(0)*	-5.69(1)*

Notlar: Tüm seriler sabitli-trendli model çerçevesinde ele alınmıştır. Bir yıldız (*), %1 anlamlılık seviyesinde yokluk hipotezinin reddedildiğini göstermektedir. Kritik değerler MacKinnon (1991)'den elde edilmiştir. Parantez içindeki rakamlar GDF testi için gecikme uzunluklarını; PP testi için bant genişliğini (Bandwidth) göstermektedir.(Δ)*, simgesi fark operatörünü göstermektedir.*

Tablo: 6
Ng-Perron Birim Kök Test Bulguları

Değişkenler	Gecikme	MZ_α	MZ_t	MSB	MP_t
FD	0	-10.76	-2.26	0.21	8.73
$GINI$	0	-5.65	-1.65	0.29	16.04
$\Delta(FD)$	0	-16.83***	-2.89**	0.172***	5.43***
$\Delta(GINI)$	0	-17.27***	-2.93**	0.17***	5.27**
Kritik Değerler	%1	-23.80	-3.42	0.14	4.03
	%5	-17.30	-2.91	0.16	5.48
	%10	-14.20	-2.62	0.18	6.67

Notlar: Tüm seriler sabitli-trendli model çerçevesinde ele alınmıştır. Kritik değerler Ng ve Perron (2001)'den elde edilmiştir. Regresyon tahminlerinde kullanılan oto-regresif gecikmeler Scwarz bilgi kriterine göre belirlenmiştir. (Δ), simgesi fark operatörünü göstermektedir. (*), (**) ve (***) sırasıyla %1, %5 ve %10 anlamlılık seviyesinde yokluk hipotezinin reddedildiğini, yani serinin durağan olduğunu göstermektedir.

Tablo 7'de ise yapısal kırılmaları dikkate alan Zivot ve Andrews (1992), Lee ve Strazicich (2003, 2013), Narayan ve Popp (2010) birim kök testlerinin bulguları sunulmaktadır. Öncelikle finansal gelişmeye ilişkin kırılmaların genellikle 1994 Krizine denk geldiği görülmektedir. Gerçekten de 1994 krizinden sonra Türk finansal sisteminde finansal gelişmeyi daha sağlam temellerde tesis etmeye yönelik birçok düzenleme yapılmıştır. Belirtilen durum finansal gelişmenin yapısal bir değişimle ilerlemesi anlamına gelmektedir. GINI katsayısına ilişkin kırılmalar da genellikle 1994 krizi ile 2005 yılına işaret etmektedir. 1994 Krizinin gelir dağılımını değiştirmesi beklenen bir sonuçtur. 2005 yılı ise Türkiye'de tek parti iktidarının ekonomiye etkisinden kaynaklanabilir. Yapısal kırılmaları dikkate alan birim kök testlerinde yüksek hata paylarında yokluk hipotezi reddedebilmektedir. Özellikle güncel bir test olması itibariyle Narayan ve Popp (2010) testinde yokluk hipotezinin reddedilemediğini, yani kırılmalarla birlikte serilerin durağan olmadığı görülmektedir.

Tablo: 7
Yapısal Kırılmalı Birim Kök Test Bulguları

Değişkenler		ZA (1992)		LS (2003)		LS (2013)		NP (2010)	
		Mod. A	Mod. C	Mod. A	Mod. C	Mod. A	Mod. C	Mod. A	Mod. C
FD	T_{B1}	1994	1993	1983	1986	1993	1992	1993	1993
	T_{B2}			1993	1992			1999	1999
	Test İ.	-4.71*	-5.42*	-3.80**	-6.59**	-3.36***	-5.26*	-2.40	-2.73
$GINI$	T_{B1}	2006	2006	2005	1988	2008	2006	1995	1995
	T_{B2}			2008	2007			2005	2005
	Test İ.	-3.89*	-3.22*	-3.01	-4.09	-2.71	-3.82	-4.55	-3.15

Not: Model A serilere ilişkin regresyon modelindeki sabitte kırılmayı; Model C ise hem sabitte hem de trendde kırılmayı dikkate alan tahminlerdir. ZA (1992), Zivot ve Andrews (1992) test sonuçlarını; LS (2003), Lee ve Strazicich (2003) test sonuçlarını; LS (2013), Lee ve Strazicich (2013) test sonuçlarını; NP (2010), Narayan ve Popp (2010) test sonuçlarını göstermektedir. (*), (**) ve (***) sırasıyla %1, %5 ve %10 anlamlılık seviyesinde yokluk hipotezinin reddedildiğini, başka bir deyişle, serilerdeki kırılmanın dikkate alınması durumunda durağanlığın gerçekleşmediğini göstermektedir. Test istatistikleri adı geçen çalışmalardan elde edilmiştir.

Birim kök testlerinin ardından finansal gelişme ile gelir adaleti arasındaki ilişkinin doğrusal olup olmadığını, başka bir deyişle söz konusu ilişki de zaman içerisinde bir kırılma olup olmadığı değerlendirilecektir. Bu amaçla Gregory ve Hansen (1996) ve Hatemi- J

(2008) yapısal kırılmalı eş-bütünleşme analizleri uygulanmış ve bulgular Tablo 8'de sunulmuştur.

Tablo: 8
Yapısal Kırılmalı Eş-bütünleşme Test Sonuçları

Test	Model	ADF_{τ}^{*}	TB	Z_{t}^{*}	TB	$Z_{\propto}^{*}$	TB
GH (1996)	**A**	-3.97	2008	-3.85	2007	-21.19	2007
	C	-3.97	2008	-3.85	2007	-21.19	2007
HJ (2008)	**A**	-4.80	1993 2000	-4.67	1994 2000	-27.74	1994 2000
	C	-4.80	1993 1999	-4.68	1993 2000	-28.62	1993 2000

Not: Model A serilere ilişkin regresyon modelindeki sabitte kırılmayı; Model C ise hem sabitte hem de trendde kırılmayı dikkate alan tahminlerdir. GH (1996), Gregory ve Hansen (1996) test sonuçlarını; HJ (2008), Hatemi- J (2008) test sonuçlarını göstermektedir.

Tablo 8'den de görüleceği üzere tespit edilen kırılma tarihleri 1994, 2001 ve 2008 krizlerinde yoğunlaşmaktadır. Aynı zamanda hem GH (1996) hem de HJ (2008) testlerine göre hiçbir anlamlılık seviyesinde eş-bütünleşme ilişkisi tespit edilememiştir. Bu durum Finansal Kuznets Eğrisi Hipotezindeki kırılmanın gerçekleşmediğini de ima etmektedir.

7. Sonuç

II. Dünya Savaşı sonrası temel ekonomik amaç olarak ekonomik büyüme ağırlık kazanmıştır. Savaş sonrasında 1960'lı yılların sonlarına kadar büyümenin altın yılları yaşanmış ve gelir adaleti de dahil birçok sorun gündem dışı kalabilmiştir. Ancak 1960'lı yılların sonundan itibaren ideolojik gelişmeler, 1970'li yıllardaki Petrol Krizleri ve 1980 sonrası finansal piyasalardaki gelişmeler, dalgalanmalar ve krizler, ekonomik amaçların ve amaçlar arası ilişkilerin sorgulanmasına sebep olmuştur. Özellikle 2000'li yıllardan itibaren finansal ekonominin reel ekonomiyi neredeyse geçmesi, makroekonomik değişkenleri daha fazla ölçüde etkiler olmuştur. Belirtilenler itibariyle çalışmamızda finansal gelişme ile gelir adaleti arasındaki ilişki, Kuznets eğrisinin teorik çerçevesinde ele alınmıştır.

Çalışmanın uygulama kısmında finansal gelişme ölçütü olarak IMF tarafından geliştirilen seriler kullanılmıştır. İlgili serinin grafikleri itibariyle Türk ekonomisinde dalgalı bir seyir gösterse de genellikle artış eğilimi görülmektedir. Gelir adaletini göstermesi açısından Texas Üniversitesi Eşitsizlik Projesi Veri Setinden elde edilen GINI ve THEIL değerleri kullanılmıştır. Her iki değişken itibariyle Türkiye'de gelir adaletinin giderek bozulduğu söylenebilir. Ekonometrik analizlerin ilk aşaması olan birim kök testleri genellikle her iki değişkenin de seviyesinde durağan olmadığını göstermiştir. Bu durum politika etkinliği açısından önem arz etmekte ve uygulanan politikaların etkisinin uzun sürmeyeceğini göstermektedir. Başka bir deyişle, her iki seri de kısa hafıza özelliğine sahiptir.

Ekonometrik testlerin ikinci aşamasında yapısal kırılmaların dikkate alındığı Gregory ve Hansen (1996) ve Hatemi-J (2008) eş-bütünleşme analizleri uygulanmıştır. Her iki test de yapısal kırılmaların varlığı altında eş-bütünleşmenin olmadığını göstermiştir. Başka bir

deyişle, yapılan analizler itibariyle Türk ekonomisi için finansal Kuznets eğrisinde öngörülen ters-U şeklindeki ilişki geçerli değildir. Nitekim kırılma olması varsayımı altında eş-bütünleşmenin geçerli olmaması, bu duruma işarettir. Sözkonusu durum aynı zamanda Türk ekonomisinde finansal gelişmenin gelir adaletsizliğini giderecek boyutta gerçekleşmediğinin de delili olmaktadır. Çalışma sonucunda elde edilen bu bulgular, Hepsağ (2017) ve Shahbaz ve Islam (2011) ile uyumludur.

Kaynaklar

Acar, İ. (2015), "Türkiye'de Gelir Dağılımı", *Hak İş Uluslararası Emek ve Toplum Dergisi*, 4(8), 42-59.

Akalın, G. vd. (2018), "Türkiye'de Gelir Dağılımı ve Ekonomik Büyüme Arasındaki İlişki: ARDL Sınır Testi Yaklaşımı", *Kastamonu Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 20(4), 59-76.

Altınöz, U. (2015), "Kuznet Eğrisi Bağlamında Türkiye'de Finansal Gelişme ve Gelir Eşitsizliği İlişkisinin Analizi", *International Conference on Eurasian Economies*, 871-875.

Altıntaş, N. & M. Çalışır (2018), "Finansal Gelişmenin Bankacılık ve Sermaye Piyasası Bağlamında Gelir", *Trakya Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 7(1), 81-97.

Altunbaş, Y. & J. Thornton (2019), "The impact of financial development on income inequality: A quantile regression approach", *Economics Letters*, 175, 51-56.

Argun, A.İ. (2017), "Finansal Gelişme ve Gelir Eşitsizliği", *Sosyal Bilimler Dergisi*, (1), 61-74.

Asteriou, D. & S.G. Hall (2007), *Applied Econometrics: A Modern Approach Using EViews And Microfit*, New York: Palgrave Macmillan.

Aydın, K. (2012), "Türkiye'de Kişisel Gelir Dağılımının Sosyo Ekonomik ve Demografik Belirleyicileri", *Çalışma ve Toplum*, (32), 147-166.

Azam, M. & S.A. Raza (2018), "Financial Sector Development and Income Inequality in ASEAN-5 Countries: Does Financial Kuznets Curve Exists?", *Global Business and Economics Review*, 20(1), 88-114.

Baiardi, D. & C. Morana (2016), "The Financial Kuznets Curve: Evidence for the Euro Area", *Journal of Empirical Finance*, 39, 265-269.

Baiardi, D. & C. Morana (2018), "Financial Development and Income Distribution Inequality in the Euro Area", *Economic Modelling*, 70, 40-55.

Banerjee, A.V. & A.F. Newman (1993), "Occupational Choice and the Process of Development", *Journal of Political Economy*, 101(2), 274-298.

Beck, T. et al. (2007), "Finance, Inequality and the Poor", *Journal of Economic Growth*, 12(1), 27-49.

Bradford, D.F. et al. (2005), "The Environmental Kuznets Curve: Exploring a Fresh Specification", *Contributions to Economic Analysis & Policy*, 4(1), 1-28.

Çalışkan, Ş. (2010), "Türkiye'de Gelir Eşitsizliği ve yoksulluk", *Sosyal Siyaset Konferansları Dergisi*, (59), 89-132.

Çetin, M. & F. Şeker (2016), "Finansal Gelişmenin Gelir Eşitsizliği Üzerindeki Etkisi: Türkiye Ekonomisi için Ampirik Bir Kanıt", *International Anatolia Academic Online Journal Social Sciences Journal*, 3(2), 52-63.

Chiu, Y.B. & C.C. Lee (2019), "Financial Development, Income Inequality, and Country Risk", *Journal of International Money and Finance*, 93, 1-18.

Cihak, M. et al. (2012), *Benchmarking Financial Systems Around the World* (No. WPS6175).

Clarke, G.R.G. et al. (2006), "Finance and Income Inequality: What Do the Data Tell Us?", *Southern Economic Journal*, 72(3), 596.

Çobanoğlu, F. & İ.H. Yılmaz (2019), "Türkiye'de Hanehalkı Sorumlusunun Yıllık Toplam Gelirindeki Eşitsizliğin Ölçülmesi", *Tarım Ekonomisi Araştırmaları Dergisi*, 5(1), 25-43.

Deidda, L.G. (2006), "Interaction Between Economic and Financial Development", *Journal of Monetary Economics*, 53(2), 233-248.

Destek, M.A. vd. (2017), "Türkiye'de Finansal Gelişim ve Gelir Dağılımı İlişkisi: Finansal Kuznets Eğrisi", *Doğuş Üniversitesi Dergisi*, 18(2), 153-165.

Dickey, D.A. & W.A. Fuller (1979), "Distribution of the Estimators for Autoregressive Time Series With a Unit Root", *Journal of the American Statistical Association*, 74(366), 431.

Dickey, D.A. & W.A. Fuller (1981), "Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root", *Econometrica*, 49(4), 1072.

Dickey, D.A. & S.G. Pantula (1987), "Determining the Order of Differencing in Autoregressive Processes", *Journal of Business & Economic Statistics*, 5(4), 461.

Dumrul, C. (2010), "Finansal Sistemin Gelişimi ve Ekonomik Büyüme: Teori ve Türkiye Uygulaması", *Yayınlanmamış Doktora Tezi*, Erciyes Üniversitesi S.B.E.

Elveren, A.Y. (2013), "Gelir Dağılımı Çalışmaları İçin Bir Alternatif : Texas Üniversitesi Eşitsizlik Projesi Veri Setleri", *Anadolu Üniversitesi Sosyal Bilimler Dergisi*, 13(2), 35-42.

Enders, W. (1995), *Applied Econometric Time Series*, New York: Wiley.

Galor, O. & O. Moav (2004), "From Physical to Human Capital Accumulation: Inequality and the Process of Development", *Review of Economic Studies*, 71(4), 1001-1026.

Galor, O. & J. Zeira (1993), "Income Distribution and Macroeconomics", *Review of Economic Studies*, 60(1), 35-42.

Greenwood, J. & B. Jovanovic (1990), "Financial Development, Growth, and the Distribution of Income", *Journal of Political Economy*, 98(5), 1076-1107.

Greenwood, J. & B.D. Smith (1997), "Financial Markets in Development, and the Development of Financial Markets" *Journal of Economic Dynamics and Control*, 21(1), 145-181.

Gregory, A.W. & B.E. Hansen (1996), "Residual-Based Tests for Cointegration in Models With Regime Shifts", *Journal of Econometrics*, 70(1), 99-126.

Günal, M. (2001), *Merkez Bankasının Değişen Rolü ve Para Politikası Uygulamaları*, İstanbul: İMKB Yayınları.

Gunes, S. (2007), "Functional Income Distribution in Turkey: A Cointegration and VECM Analysis", *Journal of Economic and Social Research*, 9(2), 23-36.

Hatemi-J, A. (2008), "Tests for Cointegration with Two Unknown Regime Shifts with an Application to Financial Market Integration", *Empir Econ*, 35, 497-505.

Hepsağ, A. (2017), "Finansal Kuznets Eğrisi Hipotezi: G-7 Ülkeleri Örneği", *SGD-Sosyal Güvenlik Dergisi*, 7(2), 135-156.

Hoi, C.M. & L.Q. Hoi (2012), "Financial Development and Income Inequality in Vietnam: An Empirical Analysis", *Journal of Economics and Development*, 5(2), 5-25.

IMF (2021), *Financial Development Index Database*, <https://data.imf.org/?sk=f8032e80-b36c-43b1-ac26-493c5b1cd33b>, 27.01.2021.

Jalil, A. & M. Feridun (2011), "Long-run Relationship Between Income Inequality and Financial Development in China" *Journal of the Asia Pacific Economy*, 16(2), 202-214.

Jauch, S. & S. Watzka (2016), "Financial Development and Income Inequality: A Panel Data Approach" *Empirical Economics*, 51(1), 291-314.

Johnston, J. & J. Dinardo (1997), *Econometric Methods* (4. Baskı), New York: McGraw-Hill.

Kanberoğlu, Z. & M. Arvas (2014), "Finansal Kalkınma ve Gelir Eşitsizliği: Türkiye Örneği, 1980-2012", *Sosyoekonomi*, 21(21), 106-122.

Kar, M. vd. (2009), *Financial Development and Poverty Reduction in Turkey*, Department of Economics, Adana, Çukurova University. Turkey.

Kar, M. & S. Taş (2004), "İktisadi Kalkınmada Para ve Sermayenin Yeri", içinde: S. Taban & M. Kar (eds.), *Kalkınma Ekonomisi: Seçme Konular*, Bursa: Ekin Kitabevi, 159-195.

Katircioğlu, S.T. & N. Taşpinar (2017), "Testing the Moderating Role of Financial Development in an Environmental Kuznets Curve: Empirical Evidence from Turkey", *Renewable and Sustainable Energy Reviews*, 68, 572-586.

Kim, D.H. & S.C. Lin (2011), "Nonlinearity in the Financial Development-Income Inequality Nexus", *Journal of Comparative Economics*, 39(3), 310-325.

Kuznets, S. (1955), "Economic Growth and Income Inequality", *The American Economic Review*, 45(1), 1-28.

Lee, J. & M.C. Strazicich (2001), "Break Point Estimation and Spurious Rejections with Endogenous Unit Root Tests", *Oxford Bulletin of Economics and Statistics*, 63(5), 535-558.

Lee, J. & M.C. Strazicich (2003), "Minimum Lagrange Multiplier Unit Root Test with Two Structural Breaks", *The Review of Economics and Statistics*, 85(4), 1082-1089.

Lee, J. Et al. (2013), "Minimum LM Unit Root Test with One Structural Break", *Economics Bulletin*, 33(4), 2483-2492.

Mackinnon, J.G. (2010), *Critical Values for Cointegration Tests* (No. 1227), Kingston (Ontario).

Mert, M. & A.E. Çağlar (2019), *Eviews ve Gauss Uygulamalı Zaman Serileri Analizi*, Ankara: Detay Yayıncılık.

Mishkin, F.S. (2007), "Is Financial Globalization Beneficial?", *Journal of Money, Credit and Banking*, 39(3), 259-294.

Narayan, P.K. & S. Popp (2010), "A New Unit Root Test with Two Structural Breaks in Level and Slope at Unknown Time", *Journal of Applied Statistics*, 37(9), 1425-1438.

Nikoloski, Z. (2013), "Financial Sector Development and Inequality: Is There a Financial Kuznets Curve?", *Journal of International Development*, 25(7), 897-911.

Oechslin, M. (2009), "Creditor Protection and the Dynamics of the Distribution in oligarchic Societies", *Journal of Economic Growth*, 14(4), 313-344.

Oyvat, C. (2011), "Globalization, Wage Shares and Income Distribution in Turkey", *Cambridge Journal of Regions, Economy and Society*, 4(1), 123-138.

Öz, S. (2019), "Gelir Dağılımında Gini Katsayısı ve P80/P20 Oranı Arasındaki İlişkiler: 2000-2016 Dönemi Türkiye Örneği", *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi*, 18(35), 587-605.

Palma, J. (2018), *Does the Broad Spectrum of Inequality Across the World in the Current Era of Neo-liberal Globalization Reflect a Wide Diversity of Fundamentals, or Just a Multiplicity of Political Settlements and Market Failures?*, <https://www.semanticscholar.org/paper/Does-the-broad-spectrum-of-inequality-across-the-in-Palma/8a63846f1ba49616cb11fea247b65b8a1d8e8844>, 26.01.2021.

Phillips, P.C.B. & P. Perron (1988), "Testing for a Unit Root in Time Series Regressions", *Biometrika*, 75, 335-346.

Rehman, H.U. et al. (2008), "Income Distribution, Growth and Financial Development: A Cross Countries Analysis", *Pakistan Economic and Social Review*, 46(1), 1-16.

Sahay, R. et al. (2015), "Rethinking Financial Deepening: Stability and Growth in Emerging Markets", *Staff Discussion Notes* (No. 2015/8), 26.01.2021.

Şahin, D. (2018), "Gelişmiş Ülkelerde Finansal Gelişme ve Gelir Eşitsizliği İlişkisi", *Iğdır Üniversitesi Sosyal Bilimler Dergisi*, (15), 299-322.

Satti, S.L. et al. (2015), *Exploring the Linkages between Financial Development and Income Inequality: Does Financial Kuznets Curve Exist in Kazakhstan?*, No. 2015-002, Lahore, Pakistan.

Sehrawat, M. & A.K. Giri (2016a), "Financial development, poverty and rural-urban income inequality: evidence from south asian countries", *Quality and Quantity*, 50(2), 577-590.

Sehrawat, M. & A.K. Giri (2016b), "Panel Data Analysis of Financial Development, Economic Growth and Rural-urban Income Inequality Evidence from SAARC Countries", *International Journal of Social Economics*, 43(10), 998-1015.

Şerbetçi, G. (2014), "Türkiye'de Uygulanan Finansal Politikaların Gelir Dağılımı Üzerindeki Etkisi", *KSÜ İktisadi ve İdari Bilimler Dergisi*, 4(1), 93-116.

Shahbaz, M. et al. (2015), "Financial Development and Income Inequality: Is There Any Financial Kuznets Curve in Iran?", *Social Indicators Research*, 124(2), 357-382.

Smith, B.D. (2003), "Taking Intermediation Seriously", *Journal of Money, Credit and Banking*, 35(6), 1319-1357.

Tahsin, E. (2019), "An Investigation of the Palma Ratio for Turkey Both on National and Regional Level", *Sosyoekonomi*, 27(41), 151-182.

Tan, H.B. & S.H. Law (2012), "Nonlinear Dynamics of the Finance-inequality Nexus in Developing Countries", *The Journal of Economic Inequality*, 10(4), 551-563.

Taş, H.Y. & S. Özcan (2012), "Türkiye'de ve Dünya'da Yoksulluk Üzerine Bir Araştırma", *International Conference on Eurasian Economies*, 423-430.

Theil, H. (1972), *Statistical Decompostion Analysis: With Applications in the Social and Administrative Sciences*, Amsterdam: North-Holland Publishing.

Topuz, S.G. & T. Sekmen (2020), "Türkiye'de Gelir Eşitsizliği ve Seçilmiş Hanehalkı Gelir Bileşenlerinin Lorenz ve Yoğunlaşma Eğrileri İle Analiz Edilmesi", *Current Research in Social Sciences*, 6(2), 103-124.

Townsend, R.M. & K. Ueda (2006), "Financial Deepening, Inequality, and Growth: A Model-Based Quantitative Evaluation", *The Review of Economic Studies*, 73(1), 251-293.

UN (2020), *Human Development Data Center*, <http://hdr.undp.org/en/data>, 27.01.2021.

UTEXAS (2021), *University of Texas Inequality Project*, <https://utip.lbj.utexas.edu/>, 27.01.2021.

Zhang, Q. & R. Chen (2015), "Financial Development and Income Inequality in China: An Application of SVAR Approach", *Procedia Computer Science*, 55, 774-781.

Zhang, R. & S. Ben Naceur (2019), "Financial Development, Inequality, and Poverty: Some International Evidence", *International Review of Economics and Finance*, 61, 1-16.

Zivot, E. & D.W.K. Andrews (1992), "Further Evidence on the Great Crash, the Oil-Price Shock, and the Unit-Root Hypothesis", *Journal of Business & Economic Statistics*, 10(3), 251-270.

Sosyoekonomi

2021, Vol. 29(50), 361-386

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.17
Date Submitted: 28.02.2021
Date Revised: 03.09.2021
Date Accepted: 08.09.2021

Piyasa Güven Endeksi ile Finansal Yatırım Araçları Arasındaki İlişki: BRICS ve MIST Ülkeleri Üzerine Bir Araştırma

Ferhat Şirin SÖKMEN *(https://orcid.org/0000-0002-9563-3526), Şırnak University, Turkey; sokmenferhat@sirnak.edu.tr*

Serdar YAMAN *(https://orcid.org/0000-0002-8316-0805), Şırnak University, Turkey; serdaryaman@sirnak.edu.tr*

Mert Baran TUNÇEL *(https://orcid.org/0000-0001-8554-8080), Şırnak University, Turkey; mbtuncel@sirnak.edu.tr*

The Relation Between Business Confidence Index and Financial Investment Instruments: An Investigation on BRICS and MIST Countries

Abstract

The relationships between the business confidence index and financial investment instruments were scrutinized for BRICS and MIST countries via panel data analyses in this study. January 2010-May 2021 period data of BRICS and MIST countries were utilized within the scope of the study. The long-term cointegration relationships between business confidence index and financial investment instruments were analysed by Westerlund (2007) Panel ECM and Westerlund and Edgerton (2007) Panel LM tests, while Hatemi (2011) asymmetric causality test analysed the causality relationships. According to the panel data analysis results, the effects of investor confidence and expectations on financial investment instruments vary by country.

Keywords : Business Confidence Index, Financial Investment Instruments, Panel Cointegration, Panel Asymmetric Causality.

JEL Classification Codes : C1, C4, E44.

Öz

Bu çalışmada, piyasa güven endeksi ile finansal yatırım araçları arasındaki ilişkiler BRICS ve MIST ülkeleri için panel veri analizleri ile araştırılmıştır. Çalışmada BRICS ve MIST ülkelerine ait Ocak 2010-Mayıs 2021 dönemi verileri kullanılmıştır. Piyasa güven endeksi ile finansal yatırım araçları arasındaki uzun dönem eşbütünleşme ilişkisi Westerlund (2007) Panel ECM ve Westerlund ve Edgerton (2007) Panel LM testleriyle, nedensellik ilişkisi ise Hatemi (2011) asimetrik nedensellik testiyle analiz edilmiştir. Panel veri analizi sonuçlarına göre, yatırımcı güven ve beklentilerinin finansal yatırım araçlarına olan etkilerinin ülkelere göre farklılık gösterdiği tespit edilmiştir.

Anahtar Sözcükler : Piyasa Güven Endeksi, Finansal Yatırım Araçları, Panel Eşbütünleşme, Panel Asimetrik Nedensellik.

1. Giriş

Piyasa güven endeksi, sanayi sektöründeki çıktı büyümesini izlemek ve ekonomik faaliyetlerdeki dönüm noktasını takip etmek amacıyla kullanılan bir endekstir (OECD, 2021). Bu tür endeksler hem kamu hem de özel sektörün karar vericilerinin, performanslarını kontrol etmelerine ve politikalarını belirlemelerine yardımcı olmak için kullanılmaktadır (Oral vd., 205: 24). Bunun nedeni; piyasa güven endeksinin, ekonomik faaliyetlerin etkinliğini ve bir bütün olarak ülke ekonomisinin kalkınma hedeflerini karaktarize etmesidir. Bu yönüyle de makroekonomik yapı açısından önem arz etmektedir (Los & Ocheretin, 2019: 238). Makroekonomik açıdan, güven faktörü, istikrar ortamını yaratarak ekonomik büyümeye katkı sağlarken, mikro düzeyde ise işletmelerin katma değerlerine pozitif etki etmektedir (Kara vd., 2009: 280).

Finansal yatırım araçları ise; yatırım finansmanı ile ilgili kısıtlamaları minimize ederek, yatırımların artmasını sağlamaktadır. Diğer taraftan finansal yatırım araçlarının optimal kullanımı ile birlikte gerçekleşen finansal sistemlerdeki iyileşme, artan üretim talebine yanıt olarak, şirketlerin daha fazla yatırım yapmasına imkân tanımaktadır (Alhaj vd., 2020: 158). Ancak günümüzde yatırımcılar, rasyonellikten uzaklaşmakta ve duygularına göre karar vermektedir. Güven endeksi bu anlamda, rasyonel davranan yatırımcının yerini duygularına göre finansal işlem yapan ve tepkileri net olarak ölçülmeyen yatırımcıya bırakması nedeniyle, yatırımcıların duyarlılığını en iyi yansıtan ölçüt olarak kabul edilmektedir (Beşiktaşlı & Cihangir, 2020: 55).

Bu çalışmada; piyasa güven endeksi ile finansal yatırım araçları (döviz kurları, devlet tahvilleri ve altın) ilişkisi BRICS (Brezilya, Rusya, Hindistan, Çin ve Güney Afrika) ve MIST (Meksika, Endonezya, Güney Kore ve Türkiye) ülkeleri için ampirik olarak analiz edilmiştir. Çalışmanın ilk iki bölümünde giriş ve literatür yer alırken, üçüncü bölümde kapsam ve veri seti yer almaktadır. Dördüncü bölümde ise analizde kullanılan testlere ilişkin metodoloji ve ampirik analizler sonucunda ulaşılan bulgulara yer verilmiştir. Çalışmanın son bölümünü ise; analizler sonucunda elde edilen bulgulara ilişkin değerlendirmelerin yapıldığı sonuç kısmı oluşturmaktadır.

2. Literatür Taraması

Asgary & Gu (2005), tüketici güven endeksi ile hisse senedi fiyatları arasındaki ilişkiyi ele aldıkları çalışmalarında ABD, İngiltere, Fransa ve Almanya seçili ülkeler olarak incelenmiştir. 1986-2001 yılları arası dikkate alınarak elde edilen sonuçlara göre, ABD, İngiltere ve Fransa için hisse senedi fiyatları ile tüketici güveni arasında ilişki olduğu ortaya konulmuştur.

Bandopadhyaya & Jones (2006), çalışmalarında 2003-2004 dönemini ele alarak ABD'de güven endeksinin borsa endeksi üzerindeki etkisini incelemişlerdir. Elde edilen analiz sonuçlarına göre, güven endeksinin borsa endeksi üzerinde etkili olduğu tespit edilmiştir.

Ferreira vd. (2007), çalışmalarında ekonomi güven endeksi ile Avrupa hisse senedi getiri endeksi, Eurostoxx-500 ve FTSE 100 arasındaki ilişkiyi ele almışlardır. 1993-2002 dönemini inceleyen yazarlar güven endeksini açıklamada söz konusu değişkenlerin yetersiz kaldığını tespit etmişlerdir.

Korkmaz & Çevik (2009), çalışmalarında 1987-2008 dönemi için güven endeksi ile İMKB100 endeks getirisi arasındaki nedensellik ilişkisini incelemişlerdir. Elde edilen analiz sonuçlarına göre, değişkenler arasında çift yönlü etkileşim olduğu tespit edilmiştir.

Hsu vd. (2011), araştırmalarında 1999-2007 yılları arasını inceleyerek tüketici güven endeksleri ile hisse senedi endeksleri arasındaki ilişkiyi tespit etmeye çalışmışlardır. 21 ülkenin ele alındığı çalışmada elde edilen sonuçlara göre, değişkenler arasında eşbütünleşme ilişkisinin olmadığı ancak hisse senedi getirilerinden tüketici güvenine doğru nedensellik olduğu ortaya konmuştur.

Kale & Akkaya (2016), çalışmalarında tüketici ve reel sektör güven endeksleri ile BIST100, Mali, Sınai, Hizmetler ve Teknoloji endeksleri arasındaki ilişkiyi 2004-2015 dönemi için incelemişlerdir. Elde edilen bulgulara göre, hisse senedi getirilerinden tüketici güven endeksine doğru pozitif yönde nedensellik olduğu tespit edilmiştir.

Eyüboğlu & Eyüboğlu (2017), çalışmalarında hisse senedi endeksleri ile ekonomi güven endeksi arasındaki ilişkiyi incelemişlerdir. Ocak 2012-Ekim 2016 dönemi için elde edilen analiz sonuçlarına göre, ekonomi güven endeksinden, BIST Ulusal-100, BIST Sınai ve BIST Hizmetler endekslerine doğru nedensellik ilişkisi olduğu tespit edilmiştir.

Güngör (2019), araştırmasında ekonomi güven endeksi ile finansal yatırım araçları arasındaki ilişkiyi incelemiştir. Elde edilen bulgulara göre, Amerikan dolarından elde edilen reel getiri ile ekonomik güven arasında tek yönlü nedensellik ve altından elde edilen reel getiri ile de ekonomik güven arasında tek yönlü nedensellik olduğu tespit edilmiştir.

Evci (2019), araştırmasında ekonomik güven endeksi ile yatırım araçları arasındaki nedensellik ilişkisini incelemiştir. Ocak 2007-Haziran 2019 dönemlerine ilişkin aylık veriler kullanarak elde edilen analiz sonuçlarına göre, BİST100 endeksinin ekonomik güven endeksinin nedeni olmadığı ancak ekonomik güven endeksinin ise BİST100 endeksinin nedeni olduğu tespit edilmiştir. İlaveten USD/TL kuru ile ekonomik güven endeksi arasında tek yönlü nedensellik ilişkisinin olduğu görülürken, ekonomik güven endeksi ile altın fiyatları arasında ise herhangi bir nedensellik ilişkisinin olmadığı tespit edilmiştir.

Barışık & Dursun (2020), çalışmalarında Türkiye için dolar kuru ve altın fiyatları ile ekonomik güven endeksi arasındaki ilişkiyi ele almışlardır. Çalışma 2007-2019 dönemini kapsamaktadır. Çalışmadan elde edilen bulgulara göre, altın değişkeninden ekonomik güven endeksine ve dolar kuruna doğru kısa dönemli nedensellik; ekonomik güven endeksinden altına ve dolara doğru kısa dönemli nedensellik ilişkisi olduğu belirtilmiştir. Ayrıca değişkenler arasında uzun dönemli ilişkilerin olduğu da tespit edilmiştir.

3. Kapsam ve Veri Seti

Çalışmada BRICS (Brezilya, Rusya, Hindistan, Çin ve Güney Afrika) ve MIST (Meksika, Endonezya, Güney Kore ve Türkiye) ülkelerinde finansal yatırım araçları getirileri ile yatırımcı güven ve beklentileri arasındaki eşbütünleşme ve nedensellik ilişkisi Ocak 2010-Mayıs 2020 dönemi için araştırılmıştır. Çalışma kapsamında finansal yatırım araçları olarak ülkelerdeki temel borsa endeksleri (INDEX), döviz kurları (yerli para birimlerinin ABD doları karşısındaki değeri-CUR), devlet tahvilleri (10 yıllık devlet tahvili faizi-BOND) ve altın (ons altının yerli para birimi cinsinden değeri-GOLD) ele alınmıştır. Çalışmada yatırımcıların ekonomiye ilişkin güven ve beklentileri ise piyasa güven endeksi (business confidence index-BCI) ile temsil edilmiştir. BCI, özellikle sanayi sektörlerindeki üretim, sipariş ve stoklar ile ilgili gelişmeleri dikkate alan anketler sonucunda elde edilen yatırımcı beklentilerini ifade etmektedir. Bu nedenle çalışmanın ilerleyen kısımlarında piyasa güven endeksi ve yatırımcı beklentileri ifadeleri birbirlerinin yerine kullanılmıştır. BCI yatırımcıların ekonomik büyüme ve faaliyetler ile ilgili beklentilerini yansıtmakta olup, 100'den pozitif yönlü uzaklaşan değerler ilgili dönemlerde yatırımcıların ekonomide yakın gelecekteki iş performansına güvenlerinin artığını ifade ederken, 100'den negatif yönlü uzaklaşan değerler ise bu durumun tersini ifade etmektedir (data.oecd.org). Çalışma kapsamında oluşturulan veri setinde yer alan değişkenlere ilişkin bilgiler Tablo 1'de verilmiştir.

Tablo: 1
Örneklem ve Değişkenlere İlişkin Bilgiler

Ülkeler	Ülke Kodu	Yatırımcı Beklentisi	Temel Borsa Endeksi (INDEX)	Döviz Kuru (CUR)	Tahvil (BOND)	Ons Altın (GOLD)
Brezilya	BRA	BCI	Bovespa (BVSP)	USD/BRL	10 Yıllık Devlet Tahvili Faizi	XAU/BRL
Rusya	RUS		MOEX Russia (IMOEX)	USD/RUB		XAU/RUB
Hindistan	IND		Nifty 50 (NSEI)	USD/INR		XAU/INR
Çin	CHN		Shanghai Composite (SSEC)	USD/CNY		XAU/CNY
Güney Afrika	ZAF		South Africa Top 40 (SA40 - JTOPI)	USD/ZAR		XAU/ZAR
Meksika	MEX		S&P/BMV IPC (MXX)	USD/MXN		XAU/MXN
Endonezya	IDN		IDX Composite (JKSE)	USD/IDR		XAU/IDR
Güney Kore	KOR		KOSPI (KS11)	USD/KRW		XAU/KRW
Türkiye	TUR		BIST 100 (XU100)	USD/TRY		XAU/TRY

BRICS ve MIST ülkelerine ilişkin yatırımcı beklentilerini temsil eden BCI değişkenine ilişkin veriler OECD'nin (Organisation for Economic Co-operation and Development) veri tabanı olan data.oecd.org adresinden, finansal yatırım araçlarını temsil eden INDEX, CUR, BOND ve GOLD değişkenlerine ilişkin veriler ise investing.com web adresinden elde edilmiştir. Çalışma dönemi belirlenirken tüm ülkelerde BCI ve finansal yatırım araçlarına ilişkin verilere eksiksiz olarak ulaşılabilen tarihler dikkate alınmış ve bu bağlamda çalışma dönemi Ocak 2010-Mayıs 2020 olarak belirlenmiştir.

Çalışma kapsamında oluşturulan veri seti toplamda 9 birimlik (BRICS ve MIST ülkeleri) yatay kesit boyutuna, 125 dönemlik (Ocak 2010-Mayıs 2020) zaman boyutuna ve her seri için toplamda 1125 gözlem değerine sahip bir panel veri setidir. Çalışmada ilk olarak tüm değişkenlere ilişkin seriler $R_t=ln(P_t/P_{t-1})$ formülü yardımıyla getiri serisine dönüştürülerek analizlere hazır hale getirilmiştir. Ardından yatırımcı beklentilerindeki

değişimler ile finansal yatırım araçları getirileri arasındaki ilişkiler panel eş bütünleşme ve panel asimetrik nedensellik analizleri ile incelenmiştir.

4. Metodoloji ve Bulgular

Çalışma kapsamında, yatırımcı beklentileri ile finansal yatırım araçları arasındaki ilişkiler modellenirken beş adımlık bir metodolojik süreç izlenmiştir. Birinci adımda, veri setindeki ülkeler arasındaki yatay kesit bağımlılığı (cross-section dependence-CD) Breusch & Pagan (1980) *LM*, Pesaran (2004) CD_{LM} ve Pesaran, Ullah & Yagamata (2008) LM_{adj} testleriyle hem değişken hem de panel bazında kontrol edilmiştir. İkinci adımda, serilere ilişkin eğim katsayılarının homojenlik/heterojenlik durumları Pesaran & Yagamata (2008) delta ($\tilde{\Delta}$) ve düzeltilmiş delta ($\tilde{\Delta}_{adj}$) testleriyle hem değişken bazında hem de panel bazında incelenmiştir. Üçüncü adımda, serilerin durağanlık durumları, Bai & Ng (2004) Panel Analysis of Nonstationarity in Idiosyncratic and Common Components (PANIC), Pesaran (2007) Cross-sectionally Augmented Dickey Fuller (CADF) ve Cross-sectionally Augmented IPS (CIPS) ve Hadri & Kurozumi (2012) HK testleri ile incelenmiştir. Dördüncü adımda yatırımcı beklentileri ile finansal yatırım araçları arasındaki uzun dönem eşbütünleşme ilişkisi Westerlund (2007) Panel Error Correction Model (ECM) ve Westerlund & Edgerton (2007) Panel Lagrange Multiplier (LM) testleri ile incelenmiştir. Son olarak beşinci adımda, seriler arasındaki asimetrik nedensellik ilişkisi Hatemi (2011) asimetrik nedensellik testi ile incelenmiştir. Ekonometrik analizlere geçilmeden önce serilere ilişkin tanımlayıcı istatistikler ve seriler arasındaki korelasyon Tablo 2 yardımıyla incelenmiştir.

Tablo: 2
Tanımlayıcı İstatistikler ve Spearman Korelasyon Analizi

Tanımlayıcı İstatistikler					
	BCI	**INDEX**	**CUR**	**BOND**	**GOLD**
Ortalama	-0,000337	0,003247	0,005427	-0,003072	0,009070
Medyan	-0,000258	0,006369	0,001254	-0,005685	0,005515
Maksimum	0,021690	0,187058	0,210128	0,283668	0,203236
Minimum	-0,043499	-0,355309	-0,130417	-0,210530	-0,129691
Standart Sapma	0,003763	0,051515	0,029871	0,054639	0,050762
Çarpıklık	-2,896328	-0,633939	1,108458	0,531134	0,374767
Basıklık	37,43935	6,511162	8,864022	5,638566	3,398399
J-B İstatistik	57169,85	653,2392	1842,257	379,2395	33,77457
J-B Olasılık	0,001***	0,001***	0,001***	0,001***	0,001***
Gözlem	1125	1125	1125	1125	1125
Spearman Korelasyon Analizi					
	BCI	**INDEX**	**CUR**	**BOND**	**GOLD**
BCI	1,000000				

INDEX	0,157810	1,000000			
	(0,001)	------			
CUR	-0,241749	-0,299200	1,000000		
	(0,001)	(0,001)	------		
BOND	-0,021313	-0,280383	0,303159	1,000000	
	(0,4751)	(0,001)	(0,001)	------	
GOLD	-0,161741	-0,042237	0,461525	-0,045366	1,000000
	(0,001)	(0,1569)	(0,001)	(0,1283)	------
Not: Analizlerde p değeri %5 anlamlılık düzeyine göre değerlendirilmiştir.					

Tablo 2'de yer alan tanımlayıcı istatistikler incelendiğinde BCI ve BOND serilerine ilişkin ortalama değerlerin negatif olduğu, buna karşın INDEX, CUR ve GOLD serilerine ilişkin ortalama değerlerin ise pozitif olduğu görülmektedir. Söz konusu değerler BRICS ve MIST ülkelerinde ilgili dönemde yatırımcı beklentilerinin ve 10 yıllık devlet tahvili faiz getirilerinin negatif ortalama değere sahip olduğu, ülkelerdeki temel borsa endeksi getirileri, döviz kuru getirileri ve ons altın getirilerinin ise pozitif ortalama değere sahip olduğunu göstermektedir. Serilere ilişkin standart sapma değerleri incelendiğinde, BOND serisinin en yüksek standart sapma değerine, BCI serisinin ise en düşük standart sapma değerine sahip olduğu görülmektedir. Standart sapma değerleri, ilgili dönemde ülkelerdeki piyasa güven endekslerinde düşük düzeyde değişimlerin yaşandığı, buna karşın özellikle 10 yıllık devlet tahvili faiz getirileri ve borsa endeksleri getirilerinde ise nispeten yüksek düzeyde değişimler gözlendiğini ortaya koymaktadır. Serilere ilişkin çarpıklık değerleri incelendiğinde, BCI ve INDEX serilerinin sola çarpık, CUR, BOND ve GOLD serilerinin ise sağa çarpık olduğu; basıklık değerleri incelendiğinde ise, tüm serilerin pozitif basıklık değerlerine sahip olduğu ve dolayısıyla sivri dağılıma sahip olduğu görülmektedir. Jargue-Bera (J-B) olasılık değerinin tüm seriler için 0.05'ten düşük olduğu ve serilerin normal dağılıma uyum sağlamadığı görülmektedir. Serilere ilişkin çarpıklık ve basıklık değerlerinin 0'a eşit olmaması ve ortalama ve medyan değerlerinin çakışık olmaması da serilerin normal dağılıma uyum sağlamadıklarını göstererek J-B test istatistiğini desteklemektedir (Çil Yavuz, 2015: 34-37). Bu anlamda serilerin klasik finans serileri şeklinde hareket ettikleri söylenebilir.

Tablo 2'de yer alan Spearman Korelasyon analizi sonuçlarına göre, BCI serisi ile INDEX, CUR ve GOLD serileri arasında %5 anlamlılık düzeyinde istatistiksel olarak anlamlı ilişkilerin bulunduğu tespit edilmiştir. Bu durum özellikle INDEX, CUR ve GOLD serileri ile BCI serileri arasında uzun dönemli eşbütünleşme ve nedensellik ilişkilerinin de bulunabileceğine işaret etmektedir.

4.1. Yatay Kesit Bağımlılığı

Yüksek düzeyde küreselleşme ve uluslararası ticaret ve finansal entegrasyon nedeniyle bir ülkeyi etkileyen bir şok, benzer niteliklere sahip diğer ülkeleri de etkileyebilmektedir (Menyah vd., 2014: 389). Söz konusu durum yatay kesit bağımlılığı olarak adlandırılmaktadır. Veri setinde yer alan bir serideki birimler arasında gözlemlenen yatay kesit bağımlılığı, seriye ilişkin analiz sonuçlarını önemli ölçüde etkileyebilmektedir (De Hoyos & Safaridis, 2016: 482-483). Serilerde yatay kesit bağımlılığının bulunup bulunmamasına göre uygulanacak birim kök testleri, eşbütünleşme testleri ve nedensellik testleri değişiklik gösterebilmektedir. Bu durum panel veri analizlerinde tahminleme yapmadan önce yatay kesit bağımlılığının test edilmesini gerekli kılmaktadır. Yatay kesit bağımlılığının test edilmesi için birçok test bulunmakla birlikte bu çalışmada, literatürde sıklıkla kullanılan ve çalışmanın veri setinin niteliklerine uygun olan testler olan Breusch & Pagan (1980) *LM*, Pesaran (2004) CD_{LM} ve Pesaran, Ullah & Yagamata (2008) LM_{adj} testleri ile yatay kesit bağımlılığı test edilmiştir. *LM* test istatistiği denklem (1) ile hesaplanmaktadır (Breusch & Pagan, 1980: 247).

$$LM = T\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}^{2} \tag{1}$$

Denklem (1)'de *T* zaman boyutunu, *N* yatay kesit boyutunu, $\hat{\rho}$ ise bireysel en küçük kareler tahmininden elde edilen hata terimlerinin ikili korelasyon katsayısını ifade etmektedir. *LM* testi *N*'in nispeten küçük *T*'nin ise büyük olduğu (T>N), diğer bir ifadeyle N sabit ve T→∞ olan paneller için uygundur (Ozcan vd., 2017: 84).

LM testine alternatif olarak Pesaran tarafından 2004 yılında geliştirilen CD_{LM} testi ise, hem N→∞ hem de T→∞ olması durumunda uygun bir yatay kesit bağımlılığı testidir. CD_{LM} test istatistiği denklem (2) ile hesaplanmaktadır (Pesaran, 2004: 5).

$$CD_{LM} = \sqrt{\left(\frac{1}{N(N-1)}\right)}\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}(T\hat{\rho}_{ij}^{2} - 1) \tag{2}$$

T'nin büyük ve N'in küçük (T>N) olduğu durumlarda kullanılan bir diğer alternatif test ise Pesaran vd., (2008) tarafından geliştirilen LM_{adj} testidir. LM_{adj} testi, *LM* istatistiğinin ortalamasını ve varyansını kullanarak *LM* testinin değiştirilmiş bir versiyonu olan ve CD_{LM} testindeki korelasyon toplamlarının 0 (sıfır) olma olasılığını ortadan kaldıran bir yatay kesit bağımlılığı testidir (Menyah vd., 2014: 390). LM_{adj} test istatistiği denklem (3) ile hesaplanmaktadır (Pesaran vd., 2008: 108).

$$LM_{adj} = \sqrt{\left(\frac{2}{N(N-1)}\right)}\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}\frac{(T-k)\rho_{ij}^{2}-\mu_{Tij}}{\sqrt{v_{Tij}^{2}}} \tag{3}$$

Denklem (3)'te *k* açıklayıcı değişken sayısını, μ_{Tij} ve v_{Tij}^{2} ise sırasıyla $(T-k)\rho_{ij}^{2}$'ya ilişkin ortalamayı ve varyansı ifade etmektedir. *LM*, CD_{LM} ve LM_{adj} testleri T>N varsayımını dikkate alan testler oldukları için çalışmada yatay kesit bağımlılığı incelemesinde kullanılmışlardır. Her üç test de seride yatay kesit bağımlılığının olmadığı, temel hipotez ile test edilmektedir. Serilere ve modellere ilişkin *LM*, CD_{LM} ve LM_{adj} test sonuçları Tablo 3'te yer almaktadır. Tablo 3'te yer alan Model 1 INDEX serisinin bağımlı, BCI serisinin bağımsız değişken; Model 2 CUR serisinin bağımlı, BCI serisinin bağımsız değişken; Model 3 BOND serisinin bağımlı, BCI serisinin bağımsız değişken ve Model 4 ise GOLD serisinin bağımlı, BCI serisinin bağımsız değişken olduğu ekonometrik modelleri ifade etmektedir.

Tablo 3'te verilen *LM* ve CD_{LM} test sonuçları incelendiğinde, tüm seriler için hem sabit hem de sabit ve trendli modelde %1 anlamlılık düzeyinde ($p<0.01$) H_0 hipotezi reddedilmektedir. Dolayısıyla her iki test sonucuna göre de serilerde yatay kesit bağımlılığı tespit edilmiştir. LM_{adj} test sonucuna göre de BCI serisi sabit modelde %10 ve sabit ve trendli modelde %5 anlamlılık düzeyinde; INDEX, CUR ve GOLD serileri hem sabit hem de sabit ve trendli modellerde %1 anlamlılık düzeyinde anlamlı olduğu, BOND serisi ise, hem sabit hem de sabit ve trendli modelde %10 anlamlılık düzeyinde anlamlı olmadığı belirlenmiştir. Yatay kesit test sonuçlarının BCI, INDEX, CUR ve GOLD serileri için genel anlamda tutarlı sonuçlar verdiği, BOND serisi özelinde ise LM_{adj} test sonuçları ile *LM* ve CD_{LM} test sonuçlarının çeliştiği gözlemlenmiştir. BOND serisine ilişkin *LM* ve CD_{LM} test sonuçlarının

serinin yatay kesit bağımlılığı içerdiğine yönelik bulgular suması nedeniyle serinin yatay kesit bağımlılığı içerdiğine kanaat getirilmiştir.

Tablo: 3
Yatay Kesit Bağımlılığı Testleri Sonuçları

CD Test	*Sabit Model*						*Sabit ve Trendli Model*					
	LM		*CD_{LM}*		*LM_{adj}*		*LM*		*CD_{LM}*		*LM_{adj}*	
Değişkenler	**İstat.**	**p**	**İstat.**	**p**	**İstat.**	**p**	**İstat.**	**p**	**İstat.**	**p**	**İstat.**	**p**
BCI	172,042	0,001***	16,033	0,001***	1,437	0,075*	170,466	0,001***	15,847	0,001***	2,108	0,018**
INDEX	123,204	0,001***	10,277	0,001***	4,701	0,001***	122,243	0,001***	10,164	0,001***	4,863	0,001***
CUR	93,860	0,001***	6,819	0,001***	5,834	0,001***	94,575	0,001***	6,903	0,001***	6,600	0,001***
BOND	144,416	0,001***	12,777	0,001***	1,131	0,129	144,009	0,001***	12,729	0,001***	0,586	0,279
GOLD	171,499	0,001***	15,969	0,001***	10,814	0,001***	172,974	0,001***	16,143	0,001***	9,215	0,001***

CD Test	*LM*		*CD_{LM}*		*LM_{adj}*	
Modeller	**İstatistik**	**p**	**İstatistik**	**p**	**İstatistik**	**p**
MODEL 1	61,228	0,001***	4,440	0,001***	4,515	0,001***
MODEL 2	47,115	0,013**	2,554	0,005***	2,566	0,005***
MODEL 3	75,954	0,001***	6,408	0,001***	6,485	0,001***
MODEL 4	69,846	0,001***	5,592	0,001***	5,647	0,001***

H_0: Yatay kesit bağımlılığı yoktur
Not: ***, ** ve * işaretleri sırasıyla %1, %5 ve %10 anlamlılık düzeyini ifade etmektedir.

Panel bazında yatay kesit bağımlılığı analizleri sonucunda, modellere ait *LM*, CD_{LM} ve LM_{adj} olasılık değerlerinin %1 ve %5 anlamlılık düzeylerinde anlamlı olduğu ve tüm modeller için panel bazında yatay kesit bağımlılığının olmadığını ifade eden H_0 hipotezinin reddedildiği, dolayısıyla modellerde panel bazında yatay kesit bağımlılığının var olduğu tespit edilmiştir.

4.2. Homojenite/Heterojenite

Serilere ilişkin uygun birim kök testleri ve tahmin edilecek modellere ilişkin uygun eşbütünleşme ve nedensellik testleri seçiminde dikkate alınan diğer bir unsur da serilerde ve modellerde eğim katsayılarının homojenlik/heterojenlik durumlarıdır. Çalışmada serilerde ve modellerde eğim katsayılarının homojenlik/heterojenlik durumları Pesaran & Yagamata (2008) tarafından geliştirilen $\tilde{\Delta}$ ve $\tilde{\Delta}_{adj}$ testleriyle incelenmiştir. $\tilde{\Delta}$ ve $\tilde{\Delta}_{adj}$ test istatistikleri denklem (4) ve (5) ile hesaplanmaktadır (Pesaran & Yagamata, 2008: 57).

$$\tilde{\Delta} = \sqrt{N}\left(\frac{N^{-1}\tilde{S}-k}{\sqrt{2K}}\right) \tag{4}$$

$$\tilde{\Delta}_{adj} = \sqrt{N}\left(\frac{N^{-1}\tilde{S}-E(\tilde{Z}_{it})}{\sqrt{Var(\tilde{z}_{it})}}\right) \tag{5}$$

Denklem (4) ve (5)'te $\tilde{S}$ düzeltilmiş Swamy istatistiğini, $\tilde{Z}_{it}$ sınırlı ortalama varyansa sahip rastgele bağımsız değişkenleri, $E(\tilde{Z}_{it})$ *k'*yı, $Var(\tilde{z}_{it})$ ise *2k(T-K-1)/T+1'*i ifade etmektedir (Demir & Görür, 2020: 20). Her iki test istatistiği de eğim katsayılarının homojenliğini temel hipotez ile test etmektedir. Serilere ve modellere ilişkin $\tilde{\Delta}$ ve $\tilde{\Delta}_{adj}$ testleri sonuçları Tablo 4'te yer almaktadır.

Tablo 4'te yer alan homojenite testleri sonuçları incelendiğinde, BCI ve CUR serileri, Model 2 ve Model 4 olasılık değerlerine göre ($p<0.01$) H_0 hipotezleri reddedilerek her iki

teste göre de %1 anlamlılık düzeyinde BCI ve CUR serileri ve Model 2 ve Model 4 için eğim katsayılarının heterojen olduğu söylenebilir. INDEX, BOND ve GOLD serileri, Model 1 ve Model 3 olasılık değerlerine göre (p>0.01) ise H_0 hipotezleri kabul edilerek her iki teste göre de %1 anlamlılık düzeyinde INDEX, BOND ve GOLD serileri, Model 1 ve Model 3 eğim katsayılarının homojen olduğu söylenebilir.

Tablo: 4
Homojenite Testleri Sonuçları

Değişkenler	$\hat{\Delta}$		$\hat{\Delta}_{adj}$	
	İstatistik	p	İstatistik	p
BCI	5,421	0,001***	5,487	0,001***
INDEX	0,885	0,188	0,895	0,185
CUR	3,792	0,001***	3,838	0,001***
BOND	0,375	0,354	0,379	0,352
GOLD	-0,062	0,525	-0,063	0,525
MODEL 1	0,276	0,391	0,279	0,390
MODEL 2	7,952	0,001***	8,049	0,001***
MODEL 3	-0,347	0,636	-0,352	0,637
MODEL 4	3,494	0,001***	3,537	0,001***
H_0: Eğim katsayıları homojendir.				
Not: *** işareti %1 anlamlılık düzeyini ifade etmektedir.				

4.3. Panel Birim Kök Analizi

Panel veri analizlerinde tahminleme yapılmadan önce gerçekleştirilmesi gereken ön testlerden biri de birim kök testleridir. Bir serinin durağan olması (birim kök içermemesi) en genel anlamda, ilgili seriye ait ortalama, varyans ve kovaryansın hangi düzeyde ölçülürse ölçülsün sabit kalması ve seriye ait iki değer arasındaki farkın sadece iki zaman değeri arasındaki farka bağlı olması şeklinde ifade edilebilir (Gujarati, 2004: 798). Durağan olmayan serilerde (birim kök içeren serilerde) ise, uzun dönemde ortalama sabit bir değer bulunmamakta, zaman sonsuza gittikçe varyans da sonsuza gitmektedir. Panel veri analizinde birim kök sınaması yapılırken yatay kesit bağımlılığını dikkate almayan (birinci nesil) birim kök testleri ve yatay kesit bağımlılığını dikkate alan (ikinci nesil) birim kök testleri kullanılabilmektedir. Bu çalışmada veri setini oluşturan serilerin yatay kesit bağımlılığı içermesi nedeniyle serilerde durağanlık ikinci nesil birim kök testlerinden olan Bai & Ng (2004) PANIC, Pesaran (2007) CADF ve CIPS ve Hadri & Kurozumi (2012) HK testleri ile incelenmiştir.

PANIC testi, birinci nesil birim kök testlerinden olan Maddala & Wu (1999) Fisher ADF ve Choi (2001) Fisher PP testlerinin yatay bağımlılığını dikkate alacak şekilde tasarlanması ve N→∞ için geliştirilmesi şekilde oluşturulmuştur (Bai & Ng, 2004: 1140). PANIC testi sonucunda Maddala & Wu (1999) Fisher ADF test istatistiğine dayanan $P_{\hat{e}}^{\tau}$ ve Choi (2001) Fisher PP test istatistiğine dayanan $P_{\hat{e}}^{c}$ test istatistikleri elde edilmektedir. Bu bağlamda PANIC birim kök testinin genel gösterimi denklem (6) ve denklem (7) de verilmiştir (Bai & Ng, 2004: 1140).

$$P_{\hat{e}}^{c} = \frac{-2\sum_{i=1}^{N} logp_{\hat{e}}^{c}(i) - 2N}{\sqrt{4N}} \xrightarrow{d} N(0,1) \tag{6}$$

$$P_{\hat{e}}^{\tau} = \frac{-2\sum_{i=1}^{N} logp_{\hat{e}}^{\tau}(i) - 2N}{\sqrt{4N}} \xrightarrow{d} N(0,1) \tag{7}$$

CADF testinde, birimlere ilişkin serilerin birinci farkları ve gecikmeli düzeyleri kullanılarak yatay kesit ortalaması ile ADF regresyon modeli genişletilmekte ve böylece birimler arasındaki bağımlılık yok edilmektedir. Teste ilişkin regresyon modeli denklem (8)'deki gibidir.

$$\Delta y_{it} = a_i + b_i y_{i,t-1} + c_i \bar{y}_{t-1} + d_i \Delta \bar{y}_t + e_{it} \tag{8}$$

Denklem (8)'de, *t* zamanı, e_{it} birimlere özgü hatayı, a_i, b_i ve c_i sabit etki katsayılarını, $\bar{y}_t$ tüm gözlemlerin *t* zamandaki ortalamasını, y_i ise belirli bir yoğunluk fonksiyonuna sahip başlangıç değerlerini göstermektedir (Demir & Görür, 2020: 23). CADF değeri her bir birim için ayrı ayrı hesaplandığından CADF test istatistiği birim bazında durağanlık sınaması için kullanılmaktadır. CIPS test istatistiği ise denklem (9)'da gösterildiği gibi CADF istatistik değerlerinin aritmetik ortalaması alınarak hesaplanmakta ve panel bazında durağanlık sınaması için kullanılmaktadır.

$$CIPS = \frac{1}{N}\sum_{i=1}^{N} CADF_i \tag{9}$$

Hesaplanan CADF ve CIPS değerleri Pesaran (2007) çalışmasında yer alan tablo değerleri ile karşılaştırılarak serilerin durağanlıkları üzerine karar verilmektedir. Hesaplanan test istatistiğinin belirli bir anlamlılık düzeyi için verilen kritik değerden düşük olması ilgili anlamlılık düzeyinde serinin durağan olduğuna işaret etmektedir (Pesaran, 2007: 274-281).

Çalışmada serilerin durağanlıklarını sınamak için kullanılan diğer bir birim kök testi ise Hadri & Kurozumi (2012) testidir. Bu test Pesaran (2007) CADF ve CIPS testinden ilham alınarak KPSS tekniğiyle geliştirilmiş bir birim kök testidir. Test sonucunda Z_A^{SPC} ve Z_A^{LA} olmak üzere iki ayrı test istatistiği elde edilir. Z_A^{SPC} test istatistiği Sul, Phillips & Choi (2005) testine benzer şekilde AR(p), Z_A^{LA} test istatistiği ise Choi (1993) ve Toda & Yamamoto (1995) testindeki gibi AR(p+1) süreçlerini dikkate almaktadır. Söz konusu test istatistikleri CADF test istatistiğinin zayıf kalması durumunda bir sağlam nitelinde olup sahte birim kökün ortaya çıkmasını engellemektedir (Yücesan & Yağış, 2020: 700). Hadri & Kurozumi (2012) için oluşturulan eşitlik, denklem (10)'daki gibidir.

$$y_{it} = Z_t'\delta_i + f_t\gamma_i + \varepsilon_{it} \; \varepsilon_{it} = \phi_{i1}\varepsilon_{it-1} + \cdots + \phi_{ip}\varepsilon_{it-p} + \nu_{it} \tag{10}$$

Denklem (10)'da Z_t'deterministiktir ve bağımlı değişkendeki değişimleri açıklayabilmektedir. Z_A^{SPC} ve Z_A^{LA} test istatistikleri denklem (11) ve denklem (12)'deki gibi hesaplanmaktadır.

$$Z_A^{SPC} = \frac{1}{\hat{\sigma}_{SPC}^2 T^2}\sum_{t=1}^{T}(S_{it}^{w})^2 \tag{11}$$

$$Z_A^{LA} = \frac{1}{\hat{\sigma}_{LA}^2 T^2}\sum_{t=1}^{T}(S_{it}^{w})^2 \tag{12}$$

Çalışma kapsamında kullanılan birim kök testlerinden PANIC ve CADF ve CIPS testleri serilerin durağan olmadıklarını ifade eden temel hipotezi sınarken, HK testi ise serilerin durağan olduğunu ifade eden temel hipotezi sınamaktadır. PANIC, CADF ile CIPS ve HK testlerine ilişkin sonuçlar sırasıyla Tablo 5, Tablo 6 ve Tablo 7'de verilmiştir.

Tablo: 5
Bai & Ng (2004) PANIC Birim Kök Testi

Değişkenler	Sabit Model				Sabit ve Trendli Model			
	$P_{\hat{e}}^{c}$		$P_{\hat{e}}^{\tau}$		$P_{\hat{e}}^{c}$		$P_{\hat{e}}^{\tau}$	
	İstatistik	p	İstatistik	p	İstatistik	p	İstatistik	p
BCI	-1,8920	0,9708	6,6483	0,9928	-2,1018	0,9822	5,3892	0,9981
INDEX	-1,4676	0,9289	9,1947	0,9551	-1,0127	0,8444	11,9241	0,8511
CUR	-2,6188	0,9956	2,2874	1,0000	-1,7191	0,9572	7,6856	0,9830
BOND	-0,7697	0,7793	13,3818	0,7684	-1,2118	0,8872	10,7289	0,9055
GOLD	-2,5722	0,9949	2,5670	1,0000	-1,2754	0,8989	10,3477	0,9200
Değişkenler	**Sabit Model**				**Sabit ve Trendli Model**			
	$P_{\hat{e}}^{c}$		$P_{\hat{e}}^{\tau}$		$P_{\hat{e}}^{c}$		$P_{\hat{e}}^{\tau}$	
	İstatistik	p	İstatistik	p	İstatistik	Olasılık	İstatistik	p
D(BCI)	6,8503	0,001***	59,1018	0,001***	5,6913	0,001***	52,1476	0,001***
D(INDEX)	9,0000	0,001***	72,0000	0,001***	9,0000	0,001***	72,0000	0,001***
D(CUR)	9,0000	0,001***	72,0000	0,001***	9,0000	0,001***	72,0000	0,001***
D(BOND)	9,0000	0,001***	72,0000	0,001***	9,0000	0,001***	72,0000	0,001***
D(GOLD)	9,0000	0,001***	72,0000	0,001***	9,0000	0,001***	72,0000	0,001***
H_0: Seri durağan değildir								
Not: *** %1 anlamlılık düzeyini ve D ise serinin birinci farkını ifade etmektedir.								

Tablo 5'e göre, düzeyde tüm serilere ilişkin hem sabit hem de sabit ve trendli modellerde $P_{\hat{e}}^{c}$ ve $P_{\hat{e}}^{\tau}$ olasılık değerlerinin %10, %5 ve %1 anlamlılık düzeylerinde (sırasıyla p>0.1, p>0.05 ve p>0.01) anlamlı olmadığı tespit edilmiş, dolayısıyla tüm seriler için serinin durağan olmadığını ifade eden H_0 hipotezi reddedilememiştir. Birinci farklarında ise serilere ilişkin hem sabit hem de sabit ve trendli modellerde $P_{\hat{e}}^{c}$ ve $P_{\hat{e}}^{\tau}$ olasılık değerlerinin %1 anlamlılık düzeyinde (p<0.01) anlamlı olduğu tespit edilmiş, dolayısıyla tüm seriler için serinin durağan olmadığını ifade eden H_0 hipotezi reddedilmiştir.

Tablo 6'da yer alan CIPS test sonuçları, düzeyde sabitli modelde BCI serisine ilişkin test istatistik değerinin %5 anlamlılık düzeyinde anlamlı olduğu tespit edilmiş ve sabitli modelde BCI serisinin durağan olmadığını ifade eden H_0 hipotezi reddedilmiştir. Düzeyde BCI serisine ilişkin sabitli ve trendli model test istatistik değerinin ve INDEX, CUR, BOND ve GOLD serilerine ilişkin ise hem sabitli hem trendli model test istatistik değerlerinin tüm anlamlılık düzeylerinde anlamsız olduğu tespit edilmiş ve serilerin durağan olmadıklarını ifade eden H_0 hipotezi reddedilememiştir. Tüm serilerin birinci farklarına ilişkin CIPS istatistikleri ise %1 anlamlılık düzeyinde anlamlı olarak elde edilmiş ve serilerin durağan olmadıklarını ifade eden H_0 hipotezi reddedilmiştir. Sonuçlar doğrultusunda panel bazında serilerin düzeyde durağan olmadığı, birinci farklarında ise durağan olduğu tespit edilmiştir. CADF test istatistikleri incelendiğinde, düzeyde serilere ilişkin istatistik değerlerinin sabitli ve sabitli ve trendli modellerde farklı ülkelerde farklı anlamlılık düzeylerinde farklı sonuçlar verdiği gözlemlenmiştir. Sonuçlar, serilerin ülkelerin büyük çoğunluğunda düzeyde durağan olmadıklarını işaret etmektedir. Serilerin birinci farklarına ilişkin CADF test istatistik değerleri ise Brezilya için BCI ve GOLD serilerinde, Türkiye için ise BCI serisinde hem sabitli hem de sabitli ve trendli modelde durağanlığın olmadığına işaret ederken, diğer

serilerde tüm ülkelerde hem sabitli hem de sabitli ve trendli modellerde serilerin durağan olduklarına işaret etmektedir.

Tablo: 6
Pesaran (2007) CADF ve CIPS Birim Kök Testi

Ülkeler	Sabit Model					Sabit ve Trendli Model				
	BCI	INDEX	CUR	BOND	GOLD	BCI	INDEX	CUR	BOND	GOLD
BRA	-0,554	-1,242	1,095	-0,972	1,919	-0,562	-0,806	0,604	-1,968	0,558
RUS	-2,364	-2,106	-3,235*	-2,575	-0,223	-3,241	-2,076	-3,256	-2,600	-2,593
IND	-2,892	-2,361	-2,115	-0,878	-1,210	-2,820	-2,653	-2,730	-2,481	-2,047
CHN	-3,790**	-2,743	-1,783	-2,295	-2,269	-4,751***	-2,774	-1,424	-2,947	-2,880
ZAF	-0,396	-1,140	-2,130	-1,316	0,653	-1,078	-2,009	-2,142	-2,220	-1,144
MEX	-3,382**	-1,585	-1,491	-1,951	0,138	-2,880	-1,128	-1,522	-2,586	-2,573
IDN	-3,055*	-1,971	-2,389	-2,792	-0,167	-2,700	-1,961	-2,385	-2,797	-3,283
KOR	-2,428	-2,863	-2,518	-1,675	-0,415	-2,525	-2,855	-2,508	-2,013	-3,272
TUR	-3,631**	-2,763	-0,163	-0,537	-3,262**	-3,608*	-2,958	-1,584	-1,591	0,583
CIPS	-2,499**	-2,086	-1,636	-1,666	0,188	-2,685	-2,136	-1,883	-2,356	-1,850
Ülkeler	Sabit Model					Sabit ve Trendli Model				
	D(BCI)	D(INDEX)	D(CUR)	D(BOND)	D(GOLD)	D(BCI)	D(INDEX)	D(CUR)	D(BOND)	D(GOLD)
BRA	-2,049	-7,353***	-3,747**	-7,294***	-1,490	-2,372	-7,925***	-4,101**	-7,327***	-1,904
RUS	-5,367***	-6,846***	-7,948***	-7,860***	-6,003***	-5,311***	-6,998***	-7,877***	-7,937***	-6,007***
IND	-3,510**	-9,130***	-7,982***	-7,476***	-7,789***	-3,477*	-9,122***	-7,955***	-7,572***	-7,754***
CHN	-6,552***	-7,776***	-5,939***	-6,257***	-9,147***	-6,619***	-7,755***	-6,210***	-6,259***	-9,112***
ZAF	-4,410***	-6,305***	-5,312***	-7,902***	-4,085***	-4,843***	-6,523***	-5,339***	-7,948***	-4,172**
MEX	-3,627**	-7,983***	-6,331***	-7,407***	-5,599***	-3,641*	-8,442***	-6,401***	-7,396***	-5,706***
IDN	-3,963***	-6,870***	-7,009***	-8,360***	-8,886***	-4,015**	-7,242***	-7,030***	-8,481***	-8,873***
KOR	-4,188***	-8,975***	-9,143***	-7,808***	-8,890***	-4,259**	-9,081***	-9,166***	-7,836***	-8,877***
TUR	-2,358	-7,304***	-9,256***	-8,157***	-3,117*	-2,324	-7,273***	-9,716***	-8,166***	-4,102**
CIPS	-4,003***	-7,616***	-6,959***	-7,613***	-6,112***	-4,096***	-7,818***	-7,088***	-7,658***	-6,279***
Kritik Değerler	Düzey	CADF		CIPS		Düzey	CADF		CIPS	
	%1	-3,88		-2,53		%1	-4,35		-3,03	
	%5	-3,24		-2,32		%5	-3,72		-2,83	
	%10	-2,92		-2,21		%10	-3,41		-2,72	
H₀: Seri durağan değildir										
Not: ***, ** ve * sırasıyla %1, %5 ve %10 anlamlılık düzeyini ve D ise serinin birinci farkını ifade etmektedir.										

Tablo 7'de yer Hadri & Kurozumi (2012) HK testi sonucunda, düzeyde BCI serisine ilişkin hem sabitli hem de sabitli ve trendli modellerde hem Z_A^{SPC} hem de Z_A^{LA} test istatistiklerinin serinin durağan olmadığını işaret ettiği, INDEX serisine ilişkin sabitli modelde hem Z_A^{SPC} hem de Z_A^{LA} test istatistiklerinin, sabitli ve trendli modelde ise Z_A^{LA} test istatistiğinin serinin durağan olmadığını işaret ettiği, CUR serisine ilişkin sabitli modelde Z_A^{LA} test istatistiğinin, sabitli ve trendli modelde ise hem Z_A^{SPC} hem de Z_A^{LA} test istatistiklerinin serinin durağan olmadığını işaret ettiği, BOND serisine ilişkin sabitli modelde hem Z_A^{SPC} hem de Z_A^{LA} test istatistiklerinin, sabitli ve trendli modelde ise Z_A^{LA} test istatistiğinin serinin durağan olmadığını işaret ettiği, GOLD serisine ilişkin sabitli modelde hem Z_A^{SPC} hem de Z_A^{LA} test istatistiklerinin serinin durağan olmadığına işaret ettiği tespit edilmiştir. Serilere ilişkin birinci fark sonuçları incelendiğinde; neredeyse tüm serilerde ve modellerde serilerin durağanlaştığı görülmektedir.

PANIC testi, CADF ve CIPS testleri ve HK testine ilişkin sonuçlar, genel anlamda birbirlerini desteklemekte ve veri setindeki serilerin düzeyde durağan olmadıkları ve birinci farklarında durağanlaştıklarını işaret etmektedirler. Bu durum seriler arasındaki uzun dönemli ilişkilerin eşbütünleşme analizleri ile incelenebilmesine imkân tanımaktadır.

Tablo: 7
Hadri & Kurozumi (2012) HK Birim Kök Testi

Değişkenler	Sabit Model				Sabit ve Trendli Model			
	Z_A^{SPC}		Z_A^{LA}		Z_A^{SPC}		Z_A^{LA}	
	İstatistik	p	İstatistik	p	İstatistik	p	İstatistik	p
BCI	37,8875	0,001***	263,4820	0,001***	47,8235	0,001***	563,4767	0,001***
INDEX	2,0646	0,0195**	7,7295	0,001***	1,6369	0,508	6,5182	0,001***
CUR	0,3485	0,3637	18,6039	0,001***	2,0539	0,0200**	23,9510	0,001***
BOND	13,3639	0,001***	5,1418	0,001***	1,8419	0,0327**	1,9829	0,237
GOLD	57,3023	0,001***	65,9065	0,001***	0,1639	0,4349	0,8975	0,1847
Değişkenler	**Sabit Model**				**Sabit ve Trendli Model**			
	Z_A^{SPC}		Z_A^{LA}		Z_A^{SPC}		Z_A^{LA}	
	İstatistik	p	İstatistik	p	İstatistik	p	İstatistik	Olasılık
D(BCI)	-0,9282	0,8234	1,7376	0,0411**	0,3740	0,3542	3,1697	0,001***
D(INDEX)	2,3658	0,0090***	2,3078	0,0105**	-1,5184	0,9355	-1,5445	0,9388
D(CUR)	0,2256	0,4108	0,0319	0,4873	-0,7975	0,7874	-0,9170	0,8204
D(BOND)	-0,6749	0,7501	-0,6975	0,7573	-1,2443	0,8933	-1,2592	0,8960
D(GOLD)	0,5226	0,3006	0,5667	0,2855	0,5332	0,2970	0,4933	0,3109
H_0: Seri durağandır								
Not: *** ve ** işaretleri sırasıyla %1 ve %5 anlamlılık düzeyini ifade etmektedir. D işareti serinin birinci farkını ifade etmektedir.								

4.4. Panel Eşbütünleşme Analizi

Düzeyde durağan olmayan seriler arasındaki ilişkiler incelenirken sahte regresyon problemi ile karşılaşılmaması için serilerin birinci farkları alınarak modelleme gerçekleştirilmektedir. Fakat bu durum seriler arasındaki uzun dönemli ilişkilerin incelenmesi için önemli olan bazı bilgilerin kaybedilmesine neden olmaktadır. Bu nedenle düzeyde durağan olmayan ve aynı dereceden birim kök içeren seriler arasındaki uzun dönemli ilişkiler eşbütünleşme analizleri ile incelenebilmektedir (Demir & Görür, 2020:24). Çalışmada yatırımcı beklentileri ile finansal yatırım araçları serileri arasındaki uzun dönemli eşbütünleşme ilişkisi Westerlund (2007) Panel ECM ve Westerlund & Edgerton (2007) Panel LM testleri ile incelenmiştir.

Westerlund (2007) hata düzeltme modeli temelli dört panel eşbütünleşme testi (G_τ, G_α, P_τ, P_α) önermektedir. Her dört test de her birimin kendi hata düzeltmesine sahip olup olmadığına karar verilmesi yoluyla eşbütünleşmenin varlığı sınanma temeline dayanmaktadır. G_τ ve G_α istatistikleri birim bazında eşbütünleşmenin varlığını sınarken, P_τ ve P_α panel bazında eşbütünleşmenin varlığını sınamaktadır. Westerlund (2007) denklem (13)'te yer alan regresyon modelinden yola çıkarak denklem (14) ve (15)'te yer alan grup istatistiklerinin ve denklem (16) ve (17)'de yer alan panel istatistiklerinin hesaplanabileceğini ifade etmektedir (Westerlund, 2007: 715-718).

$$\Delta y_{it} = \delta_i' d_t + \alpha_i y_{it-1} + \lambda_i' \chi_{it-1} + \sum_{j=0}^{p_i} \gamma_{ij} \Delta \chi_{it-j} + e_{it} \tag{13}$$

Denklem (13)'te yer alan $d_t = (1, t)'$ deterministik bişleşenleri, δ_i'=$(\delta_{1i}, \delta_{2i})'$ parametrelerinin ilişki vektörünü, α_i hata düzeltme parametresini ifade etmektedir (Demir & Görür, 2020: 25). Eğim katsayıları heterojen olan seriler arasındaki eşbütünleşme ilişkisinin incelenmesi için geliştirilen G_τ ve G_α istatistikleri, denklem (14) ve (15)'te verilmişken,

$$G_\tau = \frac{1}{N}\sum_{i=1}^{N}\frac{\hat{\alpha}_i}{SE(\hat{\alpha}_i)} \tag{14}$$

$$G_\alpha = \frac{1}{N}\sum_{i=1}^{N}\frac{T\hat{\alpha}_i}{\hat{\alpha}_i(1)} \tag{15}$$

eğim katsayıları heterojen olan seriler arasındaki eşbütünleşme ilişkisinin incelenmesi için geliştirilen P_τ ve P_α istatistikleri, denklem (16) ve (17)'de verilmiştir.

$$P_\tau = \frac{\hat{\alpha}}{SE(\hat{\alpha})} \tag{16}$$

$$P_\alpha = T\hat{\alpha} \tag{17}$$

Westerlund & Edgerton (2007) Panel LM testi McCoskey & Kao (1988) tarafından geliştirmiş olan LM testine dayanmakta olup, bootstrap metodu sayesinde yatay kesit bağımlılığının olması durumunda panel bazında uzun dönemli eşbütünleşme ilişkisine dair tutarlı sonuçlar verebilmektedir (Westerlund & Edgerton, 2007: 186-188). Panel LM test istatistiği denklem (18)'deki regresyon modelinden yola çıkılarak elde edilmektedir.

$$y_{it} = \alpha_i + \chi'_{it}\beta_{it} + z_{it} \tag{18}$$

Denklem (18)'de z_{it} hata terimini ifade etmekte olup,

$$z_{it} = u_{it} + v_{it}\ ,\ v_{it} = \sum_{j=1}^{t}\eta_{ij} \tag{19}$$

denklemi ile ifade edilmektedir. Burada η_{ij} varyansı σ_i^2olan ve ortalaması sıfır olan hata terimidir. Denklem (18)'den yola çıkarak Panel LM test istatistiği denklem (20) ile hesaplanmaktadır.

$$LM_N^+ = \frac{1}{NT^2}\sum_{i=1}^{N}\sum_{t=1}^{T}\acute{\omega}_i^{-2}\,S_{it}^2 \tag{20}$$

Denklem (20)'de $\acute{\omega}_i^{-2}\ u_{it}$'nin uzun dönem varyansını, S_{it}^2 ise z_{it} hata teriminin kısmi toplamını ifade etmektedir.

Çalışma kapsamında kullanılan eşbütünleşme testlerinden Westerlund (2007) Panel ECM testi seriler arasında uzun dönemli eşbütünleşme ilişkisinin olmadığını ifade eden temel hipotezi sınarken, Westerlund & Edgerton (2007) Panel LM testi ise seriler arasında uzun dönemli eşbütünleşme ilişkisinin var olduğunu ifade eden temel hipotezi sınamaktadır. Westerlund (2007) Panel ECM eşbütünleşme testi sonuçları Tablo 8'de, Westerlund & Edgerton Panel LM Bootstrap eşbütünleşme testi sonuçları ise Tablo 9'da yer almaktadır.

Tablo 8'de yer alan Panel ECM eşbütünleşme analizi sonuçları değerlendirilirken modellerin homojen/heterojen yapıları dikkate alınmaktadır. Bu bağlamda $\tilde{\Delta}$ ve $\tilde{\Delta}_{adj}$ testleri sonucunda heterojen yapıya sahip olduğu tespit edilen Model 2 ve Model 4 için G_τ ve G_α istatistikleri, homojen yapıya sahip olduğu tespit edilen Model 1 ve Model 3 için ise P_τ ve P_α istatistikleri dikkate alınmıştır. Panel ECM eşbütünleşme analizi sonucunda, Model 1 ve

Model 3'e ilişkin P_τ ve P_α olasılık değerlerinin ve Model 2'ye ilişkin G_τ ve G_α olasılık değerlerinin hem sabit modelde hem de sabit ve trendli modellerde %1 anlamlılık düzeyinde (p<0.01) anlamlı olduğu tespit edilmiş ve Model 1, Model 2 ve Model 3 için seriler arasında uzun dönem eşbütünleşme ilişkisinin olmadığını ifade eden H_0 hipotezi reddedilmiştir. Model 4'e ilişkin sonuçlar incelendiğinde ise sabit modelde hem G_τ hem de G_α olasılık değerlerinin %1 anlamlılık düzeyinde (p<0.01) anlamlı olduğu, sabit ve trendli modelde G_τ olasılık değerinin %5 (p<0.05) anlamlılık düzeyinde, G_α olasılık değerinin ise %10 anlamlılık düzeyinde (p<0.10) anlamlı olduğu ve seriler arasında uzun dönem eşbütünleşme ilişkisinin olduğu tespit edilmiştir. Panel ECM eşbütünleşme analizi sonuçlarına göre, BRICS ve MIST ülkelerinde yatırımcı beklentisi ile borsa endeksi getirisi, döviz kuru getirisi ve tahvil faizi getirisi arasında güçlü bir eşbütünleşme ilişkisinin olduğu tespit edilirken, yatırımcı beklentisi ile altın getirileri arasındaki eşbütünleşme ilişkisinin nispeten daha güçsüz kaldığı söylenebilir.

Tablo: 8
Westerlund (2007) Panel ECM Eşbütünleşme Testi

Model	**Sabit Model**				**Sabit ve Trendli Model**			
	G_τ		G_α		G_τ		G_α	
	İstatistik	**p**	**İstatistik**	**p**	**İstatistik**	**p**	**İstatistik**	**p**
Model 2	-6,305	0,001***	-40,719	0,001***	-5,556	0,001***	-32,462	0,001***
Model 4	-5,749	0,002***	-41,631	0,005***	-4,542	0,014**	-31,850	0,092*
Model	**Sabit Model**				**Sabit ve Trendli Model**			
	P_τ		P_α		P_τ		P_α	
	İstatistik	**p**	**İstatistik**	**p**	**İstatistik**	**p**	**İstatistik**	**p**
Model 1	-7,848	0,001***	-7,848	0,001***	-7,313	0,001***	-7,313	0,001***
Model 3	-6,054	0,001***	-6,054	0,001***	-4,684	0,001***	-4,684	0,005***
H_0: Eşbütünleşme yoktur								
Not: ***, ** ve * işaretleri sırasıyla %1, %5 ve %10 anlamlılık düzeyini ifade etmektedir.								

Tablo 9'da yer alan Panle LM Bootstrap testi sonucunda, Model 1, Model 2 ve Model 3'e ilişkin olasılık değerlerinin hem sabit hem de sabit ve trendli modellerde %10 anlamlılık düzeyinde (p>0.10) anlamsız olduğu tespit edilmiş ve ilgili seriler arasında uzun dönem eşbütünleşme ilişkisinin olduğunu ifade eden H_0 hipotezi reddedilememiştir. Model 4'e ilişkin olasılık değerlerinin ise sabit modelde %10 anlamlılık düzeyinde (p<0.10) ve sabit ve trendli modelde %1 anlamlılık düzeyinde (p<0.01) anlamlı olduğu tespit edilmiş ve seriler arasında uzun dönem eşbütünleşme ilişkisi olduğunu ifade eden H_0 hipotezi reddedilmiştir.

Tablo: 9
Westerlund & Edgerton (2007) Panel LM Bootstrap Eşbütünleşme Testi

	Sabit		**Sabit ve Trendli**	
	İstatistik	**p**	**İstatistik**	**p**
Model 1	0,367	0,198	-2,266	0,840
Model 2	0,577	0,226	0,295	0,100
Model 3	0,212	0,407	0,742	0,119
Model 4	0,620	0,065*	5,166	0,001***
H_0: Eşbütünleşme vardır				
Not: *** ve * işaretleri sırasıyla %1 ve %10 anlamlılık düzeyini ifade etmektedir.				

Panel ECM ve Panel LM Bootstrap analizlerine ilişkin sonuçlarının genel anlamda birbirlerini desteklediği ve her iki analiz sonucunda da BRICS ve MIST ülkelerinde

yatırımcı beklentisi ile borsa endeksi getirisi, döviz kuru getirisi ve tahvil faizi getirisi arasında eşbütünleşme ilişkisinin varlığına dair önemli istatistiki kanıtlar elde edildiği söylenebilir. Analizler sonucunda yatırımcı beklentisi ile altın getirileri arasındaki eşbütünleşme ilişkisinin varlığına dair kanıtların ise yetersiz kaldığını söylemek mümkündür.

4.5. Panel Asimetrik Nedensellik Analizi

Çalışmada piyasa güven endeksinde (yatırımcı beklentilerinde) meydana gelen değişimlerin borsa endeks getirileri, döviz kuru getirileri, devlet tahvili faiz getirileri ve ons altın getirilerindeki değişimlerin nedeni olup olmadığı ve bu getirilerdeki değişimlerin piyasa güven endeksindeki değişimlerin nedeni olup olmadığı Hatemi (2011) panel asimetrik nedensellik testi ile incelenmiştir. Hatemi (2011) panel asimetrik nedensellik testi geleneksel nedensellik terslerinden farklı olarak seriler arasındaki pozitif şoklardan pozitif şoklara, pozitif şoklardan negatif şoklara, negatif şoklardan pozitif şoklara ve negatif şoklardan negatif şoklara olan nedenselliği incelemeye imkân tanımaktadır.

Hatemi (2011) panel asimetrik nedensellik testi, Granger & Yoon (2002)'un öne sürdüğü asimetrik nedensellik analizinin geliştirilmiş bir versiyonu olup, pozitif ve negatif şokların etkileşimlerini ortaya çıkarmaktadır (Zortuk & Yıldız, 2018: 133). Serilerin bütünleşik olduğu varsayıldığında denklem (21) ve (22)'deki gibi ifade edilebilir (Hatemi, 2011: 4).

$$x_{i1,t} = x_{i1,t-1} + e_{i1,t} = x_{i1,0} + \sum_{j=1}^{t} e_{i1,j} \tag{21}$$

$$x_{i2,t} = x_{i2,t-1} + e_{i2,t} = x_{i2,0} + \sum_{j=1}^{t} e_{i2,j} \tag{22}$$

Denklem (21) ve (22)'de i birimleri, e_i ise beyaz gürültü hata terimini ifade etmektedir. Pozitif ve negatif şoklar ise sırasıyla denklem (23) ve denklem (24)'teki gibi gösterilebilir.

$$e_{i1,t}^{+} = max(e_{i1,t}, 0)\ ,\ e_{i2,t}^{+} = max(e_{i2,t}, 0) \tag{23}$$

$$e_{i1,t}^{-} = min(e_{i1,t}, 0)\ ,\ e_{i2,t}^{-} = min(e_{i2,t}, 0) \tag{24}$$

Denklem (21), (22), (23) ve (24) doğrultusunda her bir serinin birikimli pozitif ve negatif şokları denklem (25), (26), (27) ve (28)'deki gibi ifade edilebilir.

$$x_{i1,t}^{+} = x_{i1,0}^{+} + e_{i1,t}^{+} = x_{i1,0} + \sum_{j=1}^{t} e_{i1,j}^{+} \tag{25}$$

$$x_{i2,t}^{+} = x_{i2,0}^{+} + e_{i2,t}^{+} = x_{i2,0} + \sum_{j=1}^{t} e_{i2,j}^{+} \tag{26}$$

$$x_{i1,t}^{-} = x_{i1,0}^{-} + e_{i1,t}^{-} = x_{i1,0} + \sum_{j=1}^{t} e_{i1,j}^{-} \tag{27}$$

$$x_{i2,t}^{-} = x_{i2,0}^{-} + e_{i2,t}^{-} = x_{i2,0} + \sum_{j=1}^{t} e_{i2,j}^{-} \tag{28}$$

Serilere ilişkin pozitif ve negatif şoklar elde edildikten sonra şoklar arasındaki nedensellik ilişkisi k gecikmeli VAR-SUR (vektor autoregressive seemingly unrelated regression) modeli kullanılarak test edilmektedir. İki seri arasında pozitif şoklardan pozitif şoklara $(x_{i1,t}^{+}, x_{i2,t}^{+})$ olan nedensellik, k gecikmeli bir VAR-SUR modeli için denklem (29)'daki gibi hesaplanmaktadır (Hatemi, 2011: 5).

$$\begin{bmatrix} x_{i1,t}^{+} \\ x_{i2,t}^{+} \end{bmatrix} = \begin{bmatrix} \beta_{i0} \\ \gamma_{i0} \end{bmatrix} + \begin{bmatrix} \sum_{r=1}^{k} \beta_{i1,r} & \sum_{r=1}^{k} \beta_{i2,r} \\ \sum_{r=1}^{k} \gamma_{i1,r} & \sum_{r=1}^{k} \gamma_{i2,r} \end{bmatrix} \text{x} \begin{bmatrix} x_{i1,t-r}^{+} \\ x_{i2,t-r}^{+} \end{bmatrix} + \begin{bmatrix} \varepsilon_{i1}^{+} \\ \varepsilon_{i2}^{+} \end{bmatrix} \tag{29}$$

Denklem (29) sonucunda elde edilen Wald test istatistiği üzerinden "x_2'deki pozitif şoklar x_1'deki pozitif şokların Granger nedeni değildir" şeklindeki temel hipotez test edilmektedir. Denklem (29) benzer şekilde pozitif şoklardan negatif şoklara $(x_{i1,t}^{-}, x_{i2,t}^{+})$, negatif şoklardan negatif şoklara $(x_{i1,t}^{-}, x_{i2,t}^{-})$ ve negatif şoklardan pozitif şoklara $(x_{i1,t}^{+}, x_{i2,t}^{-})$ olan nedensellik ilişkilerini ortaya koyacak şekilde düzenlenebilir (Hatemi, 2011: 5). Hatemi (2011) asimetrik nedensellik testi, bir serideki pozitif veya negatif şokların diğer serideki pozitif veya negatif şokların nedeni olmadığını ifade eden temel hipotezi sınamaktadır. Hatemi (2011) asimetrik nedensellik testine ilişkin panel bazında sonuçlar Tablo 10'da birim (ülke) bazında sonuçlar ise Ek 1, Ek 2, Ek 3 ve Ek 4'te yer almaktadır. Panel ve ülke bazında tespit edilen asimetrik nedenselliğin yönleri ise Tablo 11'de özetlenmiştir.

Tablo: 10
Hatemi (2011) Panel Asimetrik Nedensellik Sonuçları

	BCI⁺→INDEX⁺	**BCI⁺→INDEX⁻**	**BCI⁻→INDEX⁻**	**BCI⁻→INDEX⁺**
İstatistik	36,440	22,831	44,113	38,669
Olasılık	0,006***	0,197	0,001***	0,003***
	INDEX⁺→BCI⁺	**INDEX⁺→BCI⁻**	**INDEX⁻→BCI⁻**	**INDEX⁻→BCI⁺**
İstatistik	36,650	36,306	17,815	19,804
Olasılık	0,006***	0,006***	0,468	0,344
	BCI⁺→CUR⁺	**BCI⁺→CUR⁻**	**BCI⁻→CUR⁻**	**BCI⁻→CUR⁺**
İstatistik	24,397	13,908	15,935	33,137
Olasılık	0,142	0,735	0,597	0,016**
	CUR⁺→BCI⁺	**CUR⁺→BCI⁻**	**CUR⁻→BCI⁻**	**CUR⁻→BCI⁺**
İstatistik	79,449	46,629	26,889	24,655
Olasılık	0,000***	0,000***	0,081*	0,135
	BCI⁺→BOND⁺	**BCI⁺→BOND⁻**	**BCI⁻→BOND⁻**	**BCI⁻→BOND⁺**
İstatistik	20,016	29,746	15,080	33,223
Olasılık	0,332	0,040**	0,656	0,016**
	BOND⁺→BCI⁺	**BOND⁺→BCI⁻**	**BOND⁻→BCI⁻**	**BOND⁻→BCI⁺**
İstatistik	22,286	33,162	27,907	19,085
Olasılık	0,220	0,016**	0,063*	0,387
	BCI⁺→GOLD⁺	**BCI⁺→GOLD⁻**	**BCI⁻→GOLD⁻**	**BCI⁻→GOLD⁺**
İstatistik	31,568	38,385	21,386	56,655
Olasılık	0,025**	0,003***	0,260	0,000***
	GOLD⁺→BCI⁺	**GOLD⁺→BCI⁻**	**GOLD⁻→BCI⁻**	**GOLD⁻→BCI⁺**
İstatistik	31,233	21,998	31,765	20,915
Olasılık	0,027**	0,232	0,023**	0,284
Hipotezler	**X⁺ → Y⁺**	**H_0:** X'deki pozitif şoklar Y'deki pozitif şokların nedeni değildir		
	X⁺ → Y⁻	**H_0:** X'deki pozitif şoklar Y'deki negatif şokların nedeni değildir		
	X⁻ → Y⁻	**H_0:** X'deki negatif şoklar Y'deki negatif şokların nedeni değildir		
	X⁻ → Y⁺	**H_0:** X'deki negatif şoklar Y'deki pozitif şokların nedeni değildir		
Not: ***, ** ve * işaretleri sırasıyla %1, %5 ve %10 anlamlılık düzeyini ifade etmektedir.				

BRICS ve MIST ülkelerinde yatırımcı beklentisi ile yatırım araçları arasında panel bazında asimetrik nedensellik ilişkisine dair elde edilen bazı önemli bulgular aşağıdaki gibi özetlenebilir.

- BCI ve INDEX serileri için incelendiğinde, panel bazında BCI ile INDEX arasında pozitif şoklardan pozitif şoklara karşılıklı bir nedensellik ilişkisinin bulunduğu ve BCI'deki negatif şokların INDEX'teki negatif şokların nedeni olduğu tespit edilmiştir. Bu sonuçlar, yatırımcıların ekonomiye ilişkin kısa dönemdeki pozitif beklentilerindeki artışın pay piyasalarında olumlu bir hava yarattığı ve pay getirilerinde artışa neden olduğunu, negatif beklentilerdeki artışın ise pay getirilerinde düşüşe neden olduğunu, benzer şekilde pay piyasalarındaki yükselişlerin de yatırımcıların ekonomiye ilişkin kısa dönemli beklentilerini pozitif yönde etkilediği anlamına gelmektedir.
- BCI ve CUR serileri arasındaki asimetrik nedensellik ilişkisine yönelik sonuçlar incelendiğinde, panel bazında CUR'daki pozitif şokların BCI'deki negatif şokların nedeni olduğu, BCI'daki negatif şokların ise CUR'daki pozitif şokların nedeni olduğu tespit edilmiştir. Bu sonuçlar, döviz kurundaki yükselişlerin yatırımcıların ekonomiye dair kısa dönemli beklentilerinde negatif bir etki yarattığı ve söz konusu olumsuz beklentilerin döviz kurundaki artışın devam edeceğine dair beklentileri artırdığı ve yatırımcıların döviz yatırımlarına yöneldiği ve dolayısıyla oluşan talep nedeniyle döviz kurunda yükselişe neden olduğunu işaret etmektedir.
- BCI ile BOND serileri arasındaki asimetrik nedensellik ilişkisine yönelik sonuçlar incelendiğinde, panel bazında BCI ve BOND arasında pozitif şoklardan negatif şoklara karşılıklı bir nedensellik ilişkisinin bulunduğu ve BCI'deki negatif şokların BOND'daki pozitif şokların nedeni olduğu tespit edilmiştir. Bu sonuçlar, yatırımcıların ekonomiye dair beklentilerindeki pozitif/negatif değişimlerin devlet tahvili gibi teorik olarak risksiz olduğu kabul edilen bir yatırım aracına ilişkin getirilerde negatif/pozitif bir etki yarattığı şeklinde yorumlanabilir. Diğer bir ifadeyle, ekonomiye ilişkin olumlu beklentilere sahip olan yatırımcılar risksiz bir yatırım aracına yatırım yaparak düşük getiriyi kabul etmek yerine riskli yatırım araçlarına yatırım yaparak yüksek getiri elde etmeyi hedeflemektedirler. Ekonomiye ilişkin olumsuz beklentilerin yükseldiği dönemlerde ise yatırımcılar riskten kaçınmak adına tahvil yatırımlarına ağırlık vermekte ve bu durum oluşan talep nedeniyle tahvil faizlerinde yükselişe neden olmaktadır.
- BCI ile GOLD serileri arasındaki asimetrik nedensellik ilişkisine yönelik sonuçlar incelendiğinde, panel bazında BCI'daki pozitif şokların GOLD'daki negatif şokların nedeni olduğu ve BCI'daki negatif şokların GOLD'daki pozitif şokların nedeni olduğu tespit edilmiştir. Bu sonuçlar, yatırımcıların ekonomiye dair beklentilerindeki pozitif/negatif değişimlerin yatırımcılar için güvenli liman olarak bilinen altına ilişkin getirilerde negatif/pozitif bir etki yarattığı şeklinde yorumlanabilir. Diğer bir ifadeyle, ekonomiye ilişkin olumlu beklentilere sahip olan yatırımcılar düşük riskli bir yatırım aracı olarak düşünülebilecek olan altına yatırım yapmak yerine riskli yatırım araçlarına yönelmektedirler. Ekonomiye

ilişkin olumsuz beklentilerin yükseldiği dönemlerde ise yatırımcılar riskten kaçınmak adına yatırımlarını güvenli liman olarak ifade edilen altına yönlendirmekte ve bu durum oluşan talep nedeniyle altın fiyatlarında ve getirilerinde yükselişe neden olmaktadır.

Ülke bazında yatırımcı beklentisi ile yatırım araçları arasındaki asimetrik nedensellik ilişkisine dair elde edilen bazı önemli bulgular aşağıdaki gibi özetlenebilir.

- Ülke bazında asimetrik nedensellik analizleri sonucunda, Brezilya ve Endonezya'da yatırımcı güveni ve beklentisindeki pozitif şokların pay piyasasındaki pozitif şokların nedeni olduğu tespit edilirken, Rusya ve Hindistan'da ise pay piyasasındaki pozitif şokların yatırımcı güveni ve beklentisindeki pozitif şokların nedeni olduğu tespit edilmiştir. Rusya, Hindistan ve Güney Kore'de yatırımcı beklentisindeki negatif şokların pay piyasasındaki negatif şokların nedeni olduğu tespit edilirken, Brezilya'da yatırımcı beklentisi ve pay piyasası arasında negatif şoklardan negatif şoklara çift yönlü bir nedensellik ilişkisinin bulunduğu tespit edilmiştir. Benzer şekilde Meksika'da yatırımcı beklentisi ve pay piyasası arasında negatif şoklardan pozitif şoklara çift yönlü bir nedensellik ilişkisinin bulunduğu tespit edilmiştir. Endonezya'da ise pay piyasasındaki pozitif şokların yatırımcı beklentisindeki negatif şokların nedeni olduğu tespit edilmiştir. Türkiye'de pay piyasası ve yatırımcı güven ve beklentileri arasında herhangi bir asimetrik nedensellik ilişkisine rastlanmamıştır.

Tablo: 11
Panel ve Ülke Bazında Asimetrik Nedenselliğin Yönü

Panel	$X^+ \rightarrow Y^+$	$X^+ \rightarrow Y^-$	$X^- \rightarrow Y^-$	$X^- \rightarrow Y^+$		**BRA**	$X^+ \rightarrow Y^+$	$X^+ \rightarrow Y^-$	$X^- \rightarrow Y^-$	$X^- \rightarrow Y^+$	
INDEX	↔	→	←	←	**BCI**	**INDEX**	←	↔	↔	←	**BCI**
CUR	→	→	→	←	**BCI**	**CUR**		→		←	**BCI**
BOND		↔	→	←	**BCI**	**BOND**	→				**BCI**
GOLD	↔	←	→	←	**BCI**	**GOLD**				←	**BCI**
RUS	$X^+ \rightarrow Y^+$	$X^+ \rightarrow Y^-$	$X^- \rightarrow Y^-$	$X^- \rightarrow Y^+$		**IND**	$X^+ \rightarrow Y^+$	$X^+ \rightarrow Y^-$	$X^- \rightarrow Y^-$	$X^- \rightarrow Y^+$	
INDEX	→	←	←		**BCI**	**INDEX**	→		←	←	**BCI**
CUR	→				**BCI**	**CUR**	→	→	→	←	**BCI**
BOND					**BCI**	**BOND**		↔	→		**BCI**
GOLD					**BCI**	**GOLD**					**BCI**
CHN	$X^+ \rightarrow Y^+$	$X^+ \rightarrow Y^-$	$X^- \rightarrow Y^-$	$X^- \rightarrow Y^+$		**ZAF**	$X^+ \rightarrow Y^+$	$X^+ \rightarrow Y^-$	$X^- \rightarrow Y^-$	$X^- \rightarrow Y^+$	
INDEX					**BCI**	**INDEX**					**BCI**
CUR	↔			→	**BCI**	**CUR**	→				**BCI**
BOND		←		→	**BCI**	**BOND**					**BCI**
GOLD	←	←	↔		**BCI**	**GOLD**	↔			←	**BCI**
MEX	$X^+ \rightarrow Y^+$	$X^+ \rightarrow Y^-$	$X^- \rightarrow Y^-$	$X^- \rightarrow Y^+$		**IDN**	$X^+ \rightarrow Y^+$	$X^+ \rightarrow Y^-$	$X^- \rightarrow Y^-$	$X^- \rightarrow Y^+$	
INDEX				↔	**BCI**	**INDEX**	←	→			**BCI**
CUR	←			←	**BCI**	**CUR**	←	→		→	**BCI**
BOND					**BCI**	**BOND**	←	→	←	←	**BCI**
GOLD					**BCI**	**GOLD**		←		↔	**BCI**
KOR	$X^+ \rightarrow Y^+$	$X^+ \rightarrow Y^-$	$X^- \rightarrow Y^-$	$X^- \rightarrow Y^+$		**TUR**	$X^+ \rightarrow Y^+$	$X^+ \rightarrow Y^-$	$X^- \rightarrow Y^-$	$X^- \rightarrow Y^+$	
INDEX			←		**BCI**	**INDEX**					**BCI**
CUR	→				**BCI**	**CUR**					**BCI**
BOND					**BCI**	**BOND**		↔			**BCI**
GOLD	→		←	↔	**BCI**	**GOLD**				←	**BCI**

Not 1: X bağımsız değişkeni, Y ise bağımlı değişkeni ifade etmektedir.
Not 2: + işareti ilgili değişkendeki pozitif şokları, - işareti ilgili değişkendeki negatif şokları ifade etmektedir.
Not 3: → işareti ilgili satırda bulunan değişkenden BCI değişkenine doğru olan nedensellik ilişkisini, ← işareti BCI değişkeninden ilgili satırda bulunan değişkene doğru olan nedensellik ilişkisini, ↔ işareti ise BCI değişkeni ile ilgili satırda bulunan değişken arasındaki çift yönlü nedensellik ilişkisini ifade etmektedir.

- Analizler sonucunda, Brezilya, Hindistan ve Endonezya'da döviz kurlarındaki pozitif şoklardan yatırımcı güveni ve beklentisindeki negatif şoklara doğru tek yönlü bir nedensellik ilişkisi tespit edilmiştir. Bu bulguları destekleyecek şekilde, Brezilya ve Hindistan'da yatırımcı beklentisindeki negatif şoklardan döviz kurundaki pozitif şoklara ve Endonezya'da döviz kurundaki negatif şoklardan yatırımcı beklentisindeki pozitif şoklara tek yönlü nedensellik ilişkilerinin olduğu tespit edilmiştir. Rusya, Çin, Güney Afrika ve Güney Kore'de ise döviz kurundaki pozitif şokların yatırımcı beklentisindeki pozitif şokların nedeni olduğu tespit edilmiştir. Söz konusu nedensellik ilişkisi Çin için çift yönlü olarak elde edilmiştir. Meksika'da ise yatırımcı beklentisindeki negatif şoklardan döviz kurundaki pozitif şoklara doğru tek yönlü bir nedensellik ilişkisi tespit edilmiştir. Türkiye'de döviz kuru ve yatırımcı güven ve beklentileri arasında herhangi bir asimetrik nedensellik ilişkisine rastlanmamıştır.
- Tahvil faizleri ile yatırımcı beklentileri arasındaki nedensellik analizleri sonucunda, Hindistan ve Türkiye'de yatırımcı beklentileri ile tahvil faizleri arasında pozitif şoklardan negatif şoklara doğru karşılıklı bir nedensellik ilişkisinin bulunduğu tespit edilmiştir. Çin'de yatırımcı beklentilerindeki pozitif şokların tahvil faizlerindeki negatif şokların nedeni olduğu, tahvil faizlerindeki negatif şokların ise yatırımcı beklentilerindeki pozitif şokların nedeni olduğu tespit edilmiştir. Benzer şekilde Endonezya'da tahvil faizlerindeki pozitif şokların yatırımcı beklentilerindeki negatif şokların nedeni olduğu ve yatırımcı beklentilerindeki negatif şokların tahvil faizlerindeki pozitif şokların nedeni olduğu tespit edilmiştir. Brezilya'da ise diğer ülkelerin aksine yatırımcı beklentilerindeki pozitif şoklardan tahvil faizlerindeki pozitif şoklara doğru bir nedensellik ilişkisi tespit edilmiştir. Rusya, Güney Afrika, Meksika ve Güney Kore'de ise tahvil faizleri ile yatırımcı güven ve beklentileri arasında herhangi bir asimetrik nedensellik ilişkisine rastlanmamıştır.
- Altın ile yatırımcı beklentileri arasındaki nedensellik analizleri sonucunda, Brezilya ve Türkiye'de yatırımcı beklentilerindeki negatif şoklardan altındaki pozitif şoklara doğru tek yönlü bir nedensellik ilişkisi tespit edilirken, söz konusu ilişki Endonezya'da çift yönlü olarak tespit edilmiştir. Ayrıca Endonezya'da yatırımcı beklentilerindeki pozitif şokların altındaki negatif şokların nedeni olduğu tespit edilmiştir. Çin'de yatırımcı beklentilerindeki pozitif şoklardan altındaki pozitif şoklara doğru ve Güney Kore'de altındaki pozitif şoklardan yatırımcı beklentilerindeki şoklara doğru tek yönlü bir nedensellik ilişkisi tespit edilirken, Güney Afrika'da bu ilişki çift yönlü olarak elde edilmiştir. Ayrıca, Güney Kore'de yatırımcı beklentilerindeki negatif şoklardan altındaki negatif şoklara doğru tek yönlü bir nedensellik ilişkisi tespit edilirken, Çin'de söz konusu ilişkinin çift yönlü olduğu tespit edilmiştir. Rusya, Hindistan ve Meksika'da ise altın ile yatırımcı güven ve beklentileri arasında herhangi bir asimetrik nedensellik ilişkisine rastlanmamıştır.

5. Sonuç

Yatırımcıların piyasaya ve iş dünyasına karşı güvenleri ve gelecekle ilgili beklentileri, finansal piyasalarda işlem gören yatırım araçlarının fiyat ve getirilerini yakından ilgilendirmektedir. Yatırımcıların ekonomiye dair güven ve beklenti düzeyleri, tasarrufların risk düzeyi farklı finansal yatırım araçlarına yatırım yapılarak değerlendirilmesi noktasındaki kararları üzerinde etkili olabilmektedir. Etkin piyasa hipotezi ve beklenen fayda teorisi, yatırımcıların yatırım kararları noktasında rasyonel hareket ettiğini ve yatırım politikalarının beklenen getiriyi maksimize edecek şekilde belirlendiğini ileri sürmektedir. Fakat ilgili konuda gerçekleştirilen birçok çalışma, piyasaların etkin olmadığı ve yatırımcıların piyasaya gelen bilgiler karşısında aşırı veya yetersiz tepki verdiklerini ortaya koymuştur. Davranışsal finans modelleri ile açıklanan ve yatırımcı psikolojisi ile ilişkilendirilen söz konusu rasyonel olmayan yatırımcı davranışları, kişiden kişiye değişebildiği gibi farklı ülkelerde de farklı şekilde karşımıza çıkabilmektedir.

Bu çalışmada yatırımcıların ekonomi ve iş dünyasına ilişkin güven ve beklentileri ile finansal yatırım araçları getirileri arasındaki uzun dönem eşbütünleşme ilişkisi ve asimetrik nedensellik ilişkisi incelenmiştir. Çalışmada yatırımcı güven ve beklentileri ile finansal yatırım araçları arasındaki ilişkilerin tahmininde kullanılacak yönteme karar vermek amacıyla; her bir seri ve model için yatay kesit bağımlılığı ve homojenite durumu ve her bir seri için durağanlık durumu çeşitli testler kullanılarak kontrol edilmiştir. Yatay kesit bağımlılığı ve homojenite test sonuçlarının serilere ve modellere göre farklılık gösterdiği tespit edilirken durağanlık testleri sonucunda tüm serilerin düzeyde birim kök içerdikleri ve birinci farklarında durağanlaştıkları tespit edilmiştir.

Eşbütünleşme analizleri sonucunda, BRICS ve MIST ülkelerinde yatırımcı beklentileri ile borsa endeksi getirisi, döviz kuru getirisi ve tahvil faizi getirisi arasında uzun dönem eşbütünleşme ilişkisinin varlığına dair önemli istatistiki bulgular elde edilirken yatırımcı beklentileri ile altın getirileri arasındaki uzun dönem eşbütünleşme ilişkisinin varlığına dair bulguların ise yetersiz kaldığı tespit edilmiştir. Yatırımcı beklentileri ile yatırım araçları arasında panel bazında gerçekleştirilen asimetrik nedensellik analizi sonucunda; BRICS ve MIST ülkelerinde ekonomiye ilişkin pozitif beklentilerdeki artışın pay piyasalarında olumlu bir hava yarattığı ve pay getirilerinde artışa neden olduğu, negatif beklentilerdeki artışın ise pay getirilerinde düşüşe neden olduğu; döviz kurundaki yükselişlerin yatırımcı beklentilerinde negatif bir etki yarattığı, yatırımcıların döviz kurlarında yükseliş beklentisi ile döviz yatırımlarına yöneldiği ve dolayısıyla oluşan talep nedeniyle döviz kurunda yükselişe neden olduğu; yatırımcı beklentilerinin arttığı dönemlerde teorik olarak risksiz olduğu kabul edilen devlet tahvilinin faiz getirisinin azaldığı, yatırımcı beklentilerinin azaldığı dönemlerde ise tahvil faiz getirilerinin arttığı, diğer bir ifadeyle yatırımcıların sahip oldukları olumlu beklentiler nedeniyle risksiz bir yatırım aracına yatırım yapmak yerine riskli yatırım araçlarına yöneldiği ve yüksek getiri elde etmeyi hedeflediği; benzer şekilde yatırımcı beklentilerinin azaldığı dönemlerde güvenli liman olarak bilinen altına ilişkin getirilerin azaldığı, yatırımcı beklentilerinin arttığı dönemlerde ise yatırımcıların altın yerine riskli yatırımlara yöneldiği ve bu durum karşısında

altın getirilerinin azaldığına ilişkin önemli istatistiki bulgular elde edilmiştir. Ülke bazında elde edilen asimetrik nedensellik analizleri sonucunda, gerek finansal yatırım araçlarındaki değişimlerin yatırımcı beklentileri üzerine olan etkileri, gerekse yatırımcı beklentilerinin finansal yatırım araçları getirileri üzerine olan etkileri noktasında ülkeler arasında ciddi farklılıklar gözlemlenmiştir. Elde edilen bu sonuçlar, farklı ülkelerdeki yatırımcıların farklı risk algısı ve yatırım perspektifine sahip olmaları ve piyasaların etkin olmaması ile açıklanabilir. Ayrıca çalışma bulguları, risk algısının ülkelere göre farklılaşmasının ülkeler arasındaki ekonomik, kültürel, coğrafik ve demografik farklılıklardan da kaynaklanabileceğini işaret etmektedir. Çalışma sonucunda piyasa güven endeksi ve finansal yatırım araçları arasındaki ilişkilere ilişkin elde edilen bulgular genel anlamda Asgary & Gu (2005), Bandopadhyaya & Jones (2006), Korkmaz & Çevik (2009), Hsu vd. (2011), Kale & Akkaya (2016), Eyüboğlu & Eyüboğlu (2017), Güngör (2019), Evci (2019) ve Barışık & Dursun (2020) çalışmalarıyla benzerlik göstermektedir.

Çalışmada elde edilen bulguların yatırımcılar başta olmak üzere, yatırım danışmanlık firmaları, politika yapıcılar, araştırmacılar ve akademisyenler gibi farklı kesimlerden ilgililere yatırım analizleri ve yatırımcı beklentilerinin daha iyi anlaşılması noktasında fayda sağlayacağı düşünülmektedir. Gelecek çalışmalarda, ülkelerdeki ekonomik, kültürel, coğrafik ve demografik farklılıkların yatırımcı risk algısı üzerine olan etkilerinin araştırılması literatüre katkı sağlayacaktır.

Kaynaklar

Alhaj, A.A. & A.M. Awn (2020), "Financial Instruments and Their Impact on the Growth of Investment-A Study on the Libyan Market", *European Journal of Economic and Financial Research*, 4(3), 158-173.

Asgary, N. & A.Y. Gu (2005), "The Stock Market and Consumer Confidence: An International Comparison", *Journal of Accounting and Finance Research*, 13(3), 205-213.

Bai, J. & S. Ng (2004), "A PANIC Attack on Unit Roots and Cointegration", *Econometrica*, 72(4), 1127-1177.

Bandopadhyaya, A. & A.L. Jones (2006), "Measuring Investor Sentiment in Equity Market", *Journal of Asset Management*, 7, 208-215.

Barışık, S. & E. Dursun (2009), "Türkiye'de Ekonomik Güven Endeksi ile Altın Fiyatları ve Döviz Kuru Arasındaki İlişkinin Analizi", *Journal of Institute of Economic Development and Social Researches*, 6(23), 370-384.

Beşiktaşlı, D.K. & Ç.K. Cihangir (2020), "Tüketici Güven Endeksinin Finansal Piyasalara ve Makroekonomik Yapıya Etkisi", *Finans Ekonomi ve Sosyal Araştırmalar Dergisi*, 5(1), 54-67.

Breusch, T.S. & A.R. Pagan (1980), "The Lagrange Multiplier Test and Its Applications to Model Specification in Econometrics", *Review of Economic Studies*, 47(1), 239-253.

Choi, I. (1993), "Asymptotic Normality of the Least-Squares Estimates for Higher Order Autoregressive Integrated Processes with Some Applications", *Econometric Theory*, 9, 263-282.

Choi, I. (2001), "Unit Root Tests for Panel Data", *Journal of International Money and Finance*, 20, 249-272.

Çil-Yavuz, N. (2015), *Finansal Ekonometri*, (2. Baskı), İstanbul: Der Yayınevi.

De Hoyos, E.R. & V. Sarafidis (2006), "The Testing for Cross-Sectional Dependence in Panel Data Model", *The Stata Journal*, 6(4), 482-496.

Demir, Y. & Ç. Görür (2020), "OECD Ülkelerine Ait Çeşitli Enerji Tüketimleri ve Ekonomik Büyüme Arasındaki İlişkinin Panel Eşbütünleşme Analizi ile İncelenmesi", *Journal of Econometrics and Statistics*, 32, 15-33.

Evci, S. (2019), "Ekonomik Güven Endeksi ile Yatırım Araçları Arasındaki Nedensellik İlişkisi: Toda-Yamamoto Yaklaşımı", *İşletme Araştırmaları Dergisi*, 11(4), 2893-2901.

Eyüboğlu, K. & S. Eyüboğlu (2017), "Ekonomik Güven Endeksi ile Hisse Senedi Fiyatları Arasındaki İlişkinin İncelenmesi: Türkiye Örneği", *Gazi Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 19(2), 603-614.

Ferreira, E.M. et al. (2007), "Economic Sentiment and Yield Spreads in Europe", *European Financial Management*, 14(2), 206-221.

Gujarati, D.N. (2004), *Basic Econometrics*, (4th Edition), New York: The McGraw-Hill Companies.

Güngör, S. (2019), "Ekonomik Güven Endeksi ve Finansal Yatırım Araçları Getirileri Arasındaki Nedensellik İlişkisi: 2007-2017 Döneminde ABD Doları ve Altın Getirileri Örneği", *Yönetim ve Ekonomi Araştırmaları Dergisi*, 17(1), 22-39.

Hadri, K. & E. Kurozumi (2012), "A Simple Panel Stationarity Test in the Presence of Serial Correlation and a Common Factor", *Economic Letters*, 115, 31-34.

Hatemi-J, A. (2011), "Asymmetric Panel Causality Tests with an Application to the Impact of Fiscal Policy on Economic Performance in Scandinavia", *Working Paper*, Munich Personal RePEc Archive-MPRA, Working Paper No: 55527.

Hsu, C.C. et al. (2011), "Consumer Confidence and Stock Markets: The Panel Causality Evidence", *International Journal of Economics and Finance*, 3(6), 91-98.

Kale, S. & M. Akkaya (2016), "The Relation Between Confidence Climate and Stock Returns: The Case of Turkey", *Procedia Economics and Finance*, 38, 150-162.

Kara, F.Z. vd. (2009), "Yatırımcı İlişkileri Yönetiminde Güven ve Ekonomiye Etkisi", *Afyon Kocatepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 11(1), 279-307.

Korkmaz, T. & E.İ. Çevik (2009), "Reel Kesim Güven Endeksi ile İMKB 100 Endeksi Arasındaki Dinamik Nedensellik İlişkisi", *İstanbul Üniversitesi İşletme Fakültesi Dergisi*, 38(1), 24-37.

Los, V. & D. Ocheretin (2019), "Prediction of Business Confidence Index Based on a System of Economic Indicators", in: *Proceedings of the Selected Papers of the 8th International Conference on Monitoring, Modeling & Management of Emergent Economy*, Odessa, Ukraine, 237-248.

Madalla, G.S. & S. Wu (1999), "A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test", *Oxford Bulletin of Economics and Statistics*, Special Issue, 631-652.

McCoskey, S. & C. Kao (1998), "A Residual-Based Test of the Null of Cointegration in Panel Data", *Econometric Reviews*, 17, 57-84.

Menyah, K. et al. (2014), "Financial Development, Trade Openness and Economic Growth in African Countries: New Insights From a Panel Causality Approach", *Economic Modeling*, 37, 386-394.

OECD (N/A), *Business Confidence Index*, <https://data.oecd.org/leadind/business-confidence-index-bci.htm>, 05.02.2021.

Oral, E. et al. (2005), "Building up a Real Sector Business Confidence Index for Turkey", *Central Bank Review*, 5(1), 23-54.

Ozcan, C.C. et al. (2017), "Economic Freedom, Economic Growth and International Tourism for Post-Communist (Transition) Countries: A Panel Causality Analysis", *Theoretical and Applied Economics*, 2(611) 75-98.

Pesaran, M.H et al. (2008), "A Bias Adjusted LM Test of Error Cross Section Independence", *Econometrics Journal*, 11, 105-127.

Pesaran, M.H. & T. Yamagata (2008), "Testing Slope Homogeneity in Large Panels", *Journal of Econometrics*, 142, 50-93.

Pesaran, M.H. (2004), "General Diagnostic Tests for Cross Section Dependence in Panels", *Cambridge Working Papers in Economics*, 435, 1-39.

Pesaran, M.H. (2007), "A Simple Panel Unit Root Test in the Presence of Cross-Section Dependence", *Journal of Applied Econometrics*, 22, 265-312.

Sul, D. et al. (2005), "Prewhitening Bias in HAC Estimation", *Oxford Bulletin of Economics and Statistics*, 67, 517-546.

Toda, H.Y. & T. Yamamoto (1995), "Statistical Inference in Vector Autoregressions with Possibly Integrated Processes", *Journal of Econometrics*, 66, 225-250.

Westerlund, J. & D.L. Edgerton (2007), "A Panel Bootstrap Cointegration Test", *Ecomonic Letters*, 97, 185-190.

Westerlund, J. (2007), "Testing for Error Correction in Panel Data", *Oxfor Bulletin of Economics and Statistics*, 69(6), 709-748.

Yücesan, M. & O. Yağış (2020), "Ekonomik Özgürlüğe Etki Eden Faktörler: Yükselen Piyasa Ekonomileri İçin Panel Veri Analizi", *Çankırı Karatekin Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 10(2), 691-711.

Ekler

Ek: 1
BCI ve INDEX Değişkenleri Arasındaki Asimetrik Nedensellik İlişkisi

	$BCI^+ \rightarrow INDEX^+$		$BCI^+ \rightarrow INDEX^-$		$BCI^- \rightarrow INDEX^-$		$BCI^- \rightarrow INDEX^+$	
	MWALD	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**
Panel	36,440	0,006***	22,831	0,197	44,113	0,001***	38,669	0,003***
BRA	16,436	0,001***	14,291	0,074*	11,336	0,079*	17,416	0,026**
RUS	4,362	0,886	21,649	0,027**	25,486	0,004***	16,605	0,120
IND	3,579	0,612	8,231	0,767	26,060	0,011**	23,263	0,026**
CHN	0,464	0,927	2,778	0,427	2,354	0,502	2,098	0,552
ZAF	0,625	0,891	6,653	0,880	10,612	0,389	16,394	0,174
MEX	4,823	0,185	6,467	0,167	0,087	0,957	11,344	0,023**
IDN	34,685	0,001***	13,393	0,341	7,092	0,131	12,354	0,418
KOR	1,575	0,455	8,400	0,753	24,864	0,010**	17,773	0,123
TUR	2,886	0,557	1,643	0,440	2,385	0,303	1,628	0,443
	$INDEX^+ \rightarrow BCI^+$		$INDEX^+ \rightarrow BCI^-$		$INDEX^- \rightarrow BCI^-$		$INDEX^- \rightarrow BCI^+$	
	MWALD	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**
Panel	36,650	0,006***	36,306	0,006***	17,815	0,468	19,804	0,344
BRA	4,245	0,236	21,465	0,000***	11,256	0,081*	3,092	0,378
RUS	25,319	0,003***	1,279	0,258	12,844	0,133	0,008	0,929
IND	10,976	0,052*	3,208	0,361	14,718	0,257	1,019	0,797
CHN	3,467	0,325	4,621	0,202	1,763	0,623	4,487	0,213
ZAF	2,436	0,487	2,173	0,537	5,678	0,842	1,110	0,775
MEX	7,260	0,064	3,880	0,868	0,919	0,631	13,560	0,094*
IDN	5,372	0,944	16,364	0,060*	7,606	0,107	6,866	0,651
KOR	3,527	0,171	2,708	0,439	5,773	0,888	5,256	0,154
TUR	5,891	0,207	1,526	0,676	0,233	0,890	5,931	0,115
Not: ***, ** ve * işaretleri sırasıyla %1, %5 ve %10 anlamlılık düzeyini ifade etmektedir.								

Ek: 2
BCI ve CUR Değişkenleri Arasındaki Asimetrik Nedensellik İlişkisi

	$BCI^+ \rightarrow CUR^+$		$BCI^+ \rightarrow CUR^-$		$BCI^- \rightarrow CUR^-$		$BCI^- \rightarrow CUR^+$	
	MWALD	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**
Panel	24,397	0,142	13,908	0,735	15,935	0,597	33,137	0,016**
BRA	0,215	0,898	5,128	0,163	0,309	0,857	7,378	0,061*
RUS	0,554	0,457	0,007	0,932	12,528	0,129	3,085	0,079
IND	2,622	0,454	15,480	0,216	11,374	0,123	20,358	0,061*
CHN	11,870	0,018**	1,831	0,608	0,678	0,878	2,084	0,555
ZAF	11,341	0,500	10,428	0,578	6,486	0,773	18,176	0,110
MEX	4,668	0,097*	0,756	0,685	0,259	0,879	5,145	0,076*
IDN	11,141	0,049**	10,423	0,579	11,981	0,286	15,326	0,224
KOR	0,972	0,808	1,949	0,999	12,918	0,375	13,898	0,239
TUR	0,509	0,775	1,578	0,209	0,717	0,397	0,025	0,875
	$CUR^+ \rightarrow BCI^+$		$CUR^+ \rightarrow BCI^-$		$CUR^- \rightarrow BCI^-$		$CUR^- \rightarrow BCI^+$	
	MWALD	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**
Panel	79,449	0,000***	46,629	0,000***	26,889	0,081*	24,655	0,135
BRA	2,080	0,353	6,473	0,039**	3,335	0,189	0,651	0,722
RUS	5,984	0,014**	0,000	0,989	12,801	0,119	0,282	0,596
IND	13,790	0,003***	44,148	0,000***	15,123	0,034**	9,212	0,685
CHN	19,052	0,001***	13,610	0,192	5,075	0,166	22,068	0,015**
ZAF	57,831	0,000***	7,131	0,713	5,279	0,872	12,335	0,263
MEX	0,533	0,766	2,399	0,494	5,045	0,080*	1,364	0,714
IDN	2,717	0,744	21,107	0,007***	10,902	0,365	14,635	0,067*
KOR	9,347	0,025**	0,358	0,836	8,777	0,722	2,590	0,274
TUR	1,161	0,560	3,317	0,345	0,259	0,611	3,690	0,297
Not: ***, ** ve * işaretleri sırasıyla %1, %5 ve %10 anlamlılık düzeyini ifade etmektedir.								

Ek: 3
BCI ve BOND Değişkenleri Arasındaki Asimetrik Nedensellik İlişkisi

	$BCI^+ \rightarrow BOND^+$		$BCI^+ \rightarrow BOND^-$		$BCI^- \rightarrow BOND^-$		$BCI^- \rightarrow BOND^+$	
	MWALD	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**
Panel	20,016	0,332	29,746	0,040**	15,080	0,656	33,223	0,016**
BRA	2,484	0,478	1,832	0,400	1,298	0,523	0,267	0,875
RUS	0,021	0,884	0,706	0,703	3,107	0,375	1,531	0,465
IND	1,483	0,476	19,752	0,006***	3,572	0,828	10,323	0,171
CHN	7,711	0,103	7,873	0,049**	1,748	0,782	3,766	0,288
ZAF	7,075	0,529	7,237	0,703	4,312	0,932	8,240	0,605
MEX	3,513	0,173	2,626	0,269	0,545	0,909	0,004	0,998
IDN	8,467	0,037**	12,084	0,439	21,866	0,039**	42,348	0,000***
KOR	0,719	0,698	7,274	0,776	3,301	0,192	7,271	0,777
TUR	0,173	0,917	3,425	0,064*	0,835	0,659	1,485	0,223
	$BOND^+ \rightarrow BCI^+$		$BOND^+ \rightarrow BCI^-$		$BOND^- \rightarrow BCI^-$		$BOND^- \rightarrow BCI^+$	
	MWALD	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**
Panel	22,286	0,220	33,162	0,016**	27,907	0,063*	19,085	0,387
BRA	16,117	0,001***	1,048	0,592	0,744	0,689	4,140	0,126
RUS	0,315	0,575	0,859	0,354	6,019	0,111	1,633	0,201
IND	1,324	0,516	17,609	0,091*	20,785	0,004***	16,011	0,141
CHN	1,315	0,859	2,291	0,682	3,318	0,506	9,797	0,044**
ZAF	5,944	0,654	6,046	0,109	3,894	0,952	0,212	0,976
MEX	0,327	0,849	4,792	0,188	1,905	0,592	1,742	0,628
IDN	2,563	0,464	25,514	0,013**	16,146	0,185	6,501	0,889
KOR	1,876	0,392	0,268	0,875	3,190	0,203	0,318	0,853
TUR	1,286	0,526	23,839	0,021**	2,693	0,260	4,045	0,983
Not: ***, ** ve * işaretleri sırasıyla %1, %5 ve %10 anlamlılık düzeyini ifade etmektedir.								

Ek: 4
BCI ve GOLD Değişkenleri Arasındaki Asimetrik Nedensellik İlişkisi

	$BCI^+ \rightarrow GOLD^+$		$BCI^+ \rightarrow GOLD^-$		$BCI^- \rightarrow GOLD^-$		$BCI^- \rightarrow GOLD^+$	
	MWALD	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**
Panel	31,568	0,025**	38,385	0,003***	21,386	0,260	56,655	0,000
BRA	2,440	0,295	16,701	0,161	1,671	0,434	38,998	0,000
RUS	1,714	0,634	0,755	0,686	0,511	0,744	1,038	0,595
IND	6,899	0,228	11,286	0,505	10,839	0,543	13,052	0,365
CHN	10,658	0,014**	16,782	0,001***	19,656	0,074*	4,274	0,233
ZAF	28,200	0,005***	12,928	0,298	9,837	0,630	23,775	0,014
MEX	1,545	0,672	2,002	0,572	0,063	0,969	0,880	0,830
IDN	5,239	0,155	15,849	0,007***	3,375	0,497	18,527	0,002
KOR	9,104	0,694	9,672	0,560	20,616	0,038**	17,439	0,096
TUR	1,700	0,637	5,286	0,152	3,824	0,148	8,518	0,036
	$GOLD^+ \rightarrow BCI^+$		$GOLD^+ \rightarrow BCI^-$		$GOLD^- \rightarrow BCI^-$		$GOLD^- \rightarrow BCI^+$	
	MWALD	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**	**MWALD**	**Olasılık**
Panel	31,233	0,027**	21,998	0,232	31,765	0,023**	20,915	0,284
BRA	3,243	0,198	2,446	0,294	0,447	0,800	0,188	0,910
RUS	2,913	0,405	1,118	0,572	2,677	0,262	1,845	0,398
IND	4,259	0,513	18,176	0,110	16,703	0,161	11,771	0,464
CHN	2,880	0,411	0,645	0,724	37,827	0,000***	1,554	0,460
ZAF	18,595	0,099*	15,893	0,145	8,004	0,785	7,765	0,734
MEX	0,621	0,892	3,454	0,178	3,861	0,145	0,46	0,800
IDN	4,091	0,252	4,071	0,254	2,330	0,675	8,499	0,037**
KOR	31,031	0,001***	2,293	0,318	12,436	0,332	5,727	0,057*
TUR	3,484	0,323	1,034	0,569	0,221	0,896	2,393	0,302
Not: ***, ** ve * işaretleri sırasıyla %1, %5 ve %10 anlamlılık düzeyini ifade etmektedir.								

Sosyoekonomi

2021, Vol. 29(50), 387-412

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.18
Date Submitted: 01.03.2021
Date Revised: 31.07.2021
Date Accepted: 06.08.2021

Yatırımcı Duyarlılığının BIST Pay Piyasasına Etkisi[1]

Duygu ALTUNTAŞ *(https://orcid.org/0000-0001-9524-5788), Nevşehir Hacı Bektaş Veli University, Turkey; altuntasduyguu@gmail.com*

Ersan ERSOY *(https://orcid.org/0000-0003-4079-2834), Nevşehir Hacı Bektaş Veli University, Turkey; eersoy1@yahoo.com*

The Effect of Investor Sentiment on the BIST Stock Index[2]

Abstract

This study investigates the relationship between the CBRT Consumer Confidence Index, Bloomberg HT Consumer Confidence Index, and the VIX Index, which represent investor sentiment, and the BIST 100 Index. This study covers the period January 2007-August 2020, and monthly data are used. Cointegration tests results' show a cointegration relationship between the BIST 100 Index and the Bloomberg HT Consumer Confidence Index and VIX Index. However, a cointegration between BIST 100 Index and CBRT Consumer Confidence Index has not been determined. According to the causality analysis, there is one-way causality from the BIST 100 Index to consumer confidence indices and one-way causality from the VIX Index to the BIST 100 Index.

Keywords : Investor Sentiment, Behavioural Finance, Consumer Confidence Index, VIX Index.

JEL Classification Codes : G11, G40, G41.

Öz

Bu çalışmanın amacı, yatırımcı duyarlılığını temsilen kullanılan TCMB Tüketici Güven Endeksi, Bloomberg HT Tüketici Güven Endeksi ve VIX Endeksi ile BIST 100 Endeksi arasındaki ilişkinin araştırılmasıdır. Çalışma Ocak 2007-Ağustos 2020 dönemini kapsamaktadır ve aylık veriler kullanılmıştır. BIST 100 Endeksi ile Bloomberg HT Tüketici Güven Endeksi ve VIX Endeksi arasında eşbütünleşme ilişkisi tespit edilmiştir. BIST 100 Endeksi ile TCMB Tüketici Güven Endeksi arasında ise eşbütünleşme ilişkisi bulunamamıştır. Yapılan nedensellik analizlerine göre, BIST 100 Endeksinden her iki tüketici güven endeksine doğru tek yönlü nedensellik, VIX Endeksinden ise BIST 100 Endeksine doğru yine tek yönlü nedensellik ilişkisi bulunmaktadır.

Anahtar Sözcükler : Yatırımcı Duyarlılığı, Davranışsal Finans, Tüketici Güven Endeksi, VIX Endeksi.

---

[1] *Bu çalışma, Nevşehir Hacı Bektaş Veli Üniversitesi Sosyal Bilimler Enstitüsü Bankacılık ve Finans Anabilim Dalı'nda kabul edilen "Yatırımcı Duyarlılığının BIST Pay Piyasasına Etkisi" adlı yüksek lisans tezinden türetilmiştir.*

[2] *This study is derived from the master's thesis entitled "The Effect of Investor Sentiment on BIST Equity Market", Department of Banking and Finance, Institute of Social Sciences, Nevşehir Hacı Bektaş Veli University.*

1. Giriş

Beklenen fayda teorisine dayalı olan etkin piyasalar hipotezinde, yatırımcıların rasyonel oldukları, mevcut tüm bilgilerin fiyatlara yansıdığı ve hiçbir yatırımcının piyasanın üzerinde bir getiri elde edemeyeceği ileri sürülmektedir (Fama, 1970). Ancak piyasalarda görülen çeşitli anomaliler etkin piyasalar hipotezinin geçerliliğinin tartışılmasına yol açmıştır. Davranışsal finans teorisinde ise yatırımcıların çeşitli psikolojik faktörlerin etkisi altında yatırım kararı verdikleri ve dolayısıyla her zaman rasyonel davranmadıkları, finansal varlıkların fiyatlanmasında psikolojik faktörlerin de etkili olduğu ifade edilmektedir. Davranışsal finans teorisine göre, zihinsel muhasebe ve aşırı güven gibi çeşitli bilişsel eğilimler ile pişmanlıktan kaçınma ve sürü psikolojisi gibi çeşitli duygusal eğilimler karar verme süreçlerinde etkili olabilmekte, bu nedenle de piyasalarda irrasyonel yatırımcı davranışlarının ortaya çıkması, finansal varlıklarda aşırı veya düşük değerlemelere yol açabilmektedir.

Finans alanına ilişkin davranışsal yaklaşımda Allais (1953) ve Ellsberg (1961) gibi öncülerin yol gösterdiği kabul edilse de Kahneman ve Tversky'nin (1979) çalışmasıyla birlikte karar alma sürecinin iktisat ve finans alanlarında uygulanabilirliği anlaşılmış ve geleneksel finansın temel dayanağı olan beklenen fayda teorisinin yerini beklenti teorisi almıştır (Müldür, 2018: 39). Kahneman ve Tversky'nin (1979) öncü çalışmasıyla birlikte, finansal varlıkların fiyatlamasında psikolojik faktörlerin etkisini temel alarak yatırımcı davranışlarını açıklamaya çalışan geniş bir literatür oluşmuştur.

Davranışsal finans teorisinin iki temel dayanağı vardır. Birincisi, sınırlı arbitrajdır. Gerçek piyasa koşullarında arbitraj riskli ve bu nedenle sınırlıdır. Arbitrajın sınırlı olması, fiyatların piyasaya gelen bilgilere neden yeterince tepki vermeyebildiğini ve yeni bilgi girişi olmamasına rağmen, talepte bilgiye dayalı olmayan değişimlere bağlı olarak fiyatlarda neden değişim yaşanabildiğini açıklamaya yardımcı olmaktadır. İkincisi ise yatırımcı duyarlılığıdır (Shleifer, 2004: 13, 24). Yatırımcı duyarlılığı, genel olarak, gelecekteki nakit akışları ve yatırımların riskine ilişkin olarak eldeki bilgiler ile desteklenmemesine rağmen oluşan inanışlar şeklinde tanımlanabilir (Baker & Wurgler, 2007: 129). Yatırımcı duyarlılığı, yatırımcıların gerçek dünyada yatırım kararı verirken hangi inanç ve değerlerle hareket ettiklerini ve daha genel olarak da menkul kıymet taleplerinin nasıl oluştuğunu açıklamaya yardımcı olmaktadır. Sınırlı arbitraj ve yatırımcı duyarlılığı, menkul kıymetlerin fiyat ve getiri davranışlarını öngörmeye yardımcı olur (Shleifer, 2004: 24).

Yapılan ampirik çalışmalar, yatırımcı duyarlılığının pay senetlerinin fiyatı üzerinde etkili olduğunu göstermektedir. Fakat söylenti tacirlerinin varlığı ve yatırımcıların iyimser ya da kötümser bakış açısı nedeniyle yatırımcı duyarlılığı piyasalarda doğrudan ölçülememektedir. Bu nedenle yatırımcı duyarlılığını temsilen çeşitli göstergeler kullanılmaktadır (Kaya, 2018: 93). Bu göstergeler, diğer bir ifadeyle temsilciler direkt veya dolaylı olmak üzere iki gruba ayrılmaktadır. Tüketici güven endeksleri gibi göstergeler direkt temsilciler olarak, volatilite primi ve kapalı uçlu yatırım fonu iskontosu gibi faktörler ise dolaylı temsilciler olarak kullanılmaktadır. Ayrıca Baker ve Wurgler (2006, 2007) gibi

bazı çalışmalarda ise kapalı uçlu yatırım fonu iskontosu, pay senetlerinin ortalama işlem görme oranı, ilk halka arz sayısı, temettü primi gibi çeşitli dolaylı temsilciler kullanılarak yatırımcı duyarlılığı endeksi hesaplanmaktadır (Cagli, Ergün & Durukan, 2020: 214).

Yatırım kararlarını etkileyen faktörlerden biri de tüketicilerin gelecekle ilgili beklentileridir ve gelecekle ilgili beklentileri tespit etmenin yollarından biri de belirli aralıklarla ölçülen güven endeksleridir (Korkmaz & Çevik, 2009: 25). Teorik literatürde, pay piyasaları ve reel ekonomi arasında üç temel nedensel bağlantıdan söz edilmektedir. Birincisi tüketim (geleneksel servet etkisi), ikincisi yatırım (Tobin's Q teorisi) ve üçüncüsü kredi piyasasındaki aksaklıklar ve bunun harcamalar üzerindeki etkisiyle ilgilidir. Son yıllarda tartışılan başka bir nedensel bağlantı ise pay piyasaları ile tüketici güveni arasındaki ilişkidir. Pay piyasalarında yaşanan yükselişler, tüketicilerin gelecekle ilgili daha iyimser olmalarını sağlayabilir ve bu nedenle tüketicilerin harcama eğiliminde artışı teşvik edebilir. Pay piyasasında yaşanacak düşüşler ise tersine bir etki yaratabilir. Prensipte, daha yüksek hisse senedi fiyatları, tüketici güveni kanalıyla tüketimi iki şekilde artırabilir. Birincisi, daha yüksek hisse senedi fiyatı, daha yüksek servet ve dolayısıyla daha fazla iyimserlik anlamına gelir. Geleneksel servet etkisi olarak ifade edilen bu durum, bireysel hisse senedi yatırımcısının az olduğu ülkelerde daha düşük düzeyde önemlidir. İkincisi ise yüksek hisse senedi fiyatlarının ekonomik birimler tarafından gelecekte ekonomik koşulların daha olumlu olacağına dair bir işaret olarak yorumlanabilmesidir. Hisse senedi fiyatlarının öncü gösterge olma özelliği, hisse senedi fiyatlarının, borsada doğrudan bir payları olup olmadığına bakılmaksızın tüm tüketicilerin davranışlarını etkileyebileceği bir kanal sağlar. (Jansen & Nahuis, 2003: 90).

Tüketici güvenindeki artışın pay piyasalarına etkisi açısından bakıldığında ise ekonomiye ilişkin tüketici güvenini yükselmesi, gelecekte ekonomik koşulların daha iyi olacağı şeklinde yorumlanabilmektedir. Bu durum, gelecekteki tüketim harcamalarının ve dolayısıyla firmaların satışlarının ve karlarının artacağı, sonuç olarak da firmaların pay senetlerinin değerinin yükseleceği şeklinde bir beklenti yaratabilmektedir. Tüketicilerinin ekonomin geleceğine ilişkin güvenlerinin artması, pay senetlerine ilişkin olumlu beklentilerin oluşmasına yol açarak pay senetlerine olan talebi artırıp, pay senedi fiyatlarının yükselmesine neden olabileceği söylenebilir.

Yatırımcı duyarlılığını temsilen kullanılan göstergelerden biri de VIX Endeksidir. VIX Endeksindeki yükseliş, geleceğe ilişkin belirsizliklerin ve dolayısıyla riskin artması şeklinde yorumlanır. Gerek bireysel gerekse kurumsal yatırımcılar tarafından takip edilen bu endeks, küresel risk iştahının bir göstergesi olarak da kabul edilmektedir. Küreselleşme ve piyasalar arasındaki entegrasyonun yüksek olması nedeniyle yatırımcılar sadece kendi ülkelerinin makroekonomik göstergelerine, CDS primlerine vb. değil aynı zamanda özellikle gelişmiş piyasaların endekslerine, FED kararlarına ve VIX Endeksi gibi göstergelere de bakmaktadır. VIX Endeksi piyasalarda işlem yapanlar tarafından volatiliteyi takip etmekte kullanılan en önemli göstergelerden biridir. Yatırımcıların, piyasaların gelecekte beklenen volatilitesini yatırım kararlarında bir girdi olarak kullanması, doğal

olarak bu endeksin yatırım kararlarında ve yatırımcı davranışlarında etkili olabileceği anlamına gelmektedir.

Bu çalışmanın amacı, yatırımcı duyarlılığını temsilen kullanılan TCMB Tüketici Güven Endeksi, Bloomberg HT Tüketici Güven Endeksi ve VIX Endeksi ile Borsa İstanbul 100 Endeksi arasındaki eşbütünleşme ve nedensellik ilişkisini araştırmaktır. Literatür incelendiğinde, BIST üzerine yapılan önceki çalışmalarda özellikle yatırımcı duyarlılığı kapsamında TCMB Tüketici Güven Endeksinin sıklıkla kullanıldığı, Bloomberg HT Tüketici Güven Endeksini kullanan çok az sayıda çalışma olduğu görülmektedir. VIX Endeksi ile BIST 100 fiyat endeksi arasındaki hem eşbütünleşme hem de nedensellik ilişkisini yatırımcı duyarlılığı kapsamında araştıran bir çalışmaya ise rastlanılmamıştır. Bu çalışmanın gerek bu yönüyle gerekse aylık veriler üzerinden güncel ve geniş bir örneklemin kullanılması nedeniyle literatüre katkı sağlayacağı düşünülmektedir. Ayrıca davranışsal finans teorisi kapsamında tartışıldığı ve çok sayıda ampirik kanıt ile de desteklendiği üzere, finansal varlık fiyatları çeşitli psikolojik faktörlerden etkilenmektedir. Bu nedenle yatırımcı duyarlılığı değişkenlerinin, BIST 100 Endeksi üzerindeki etkisinin bilinmesinin, yatırımcılar, firmalar ve politika yapıcılar açısından faydalı bilgiler sunacağı düşünülmektedir.

Bu çalışma beş bölümden oluşmaktadır. Giriş bölümünü takip eden ikinci bölümde literatür taramasına, üçüncü bölümde yöntem ve veriler ile ilgili bilgilere yer verilmiştir. Dördüncü bölümde çalışmadan elde edilen bulgular, beşinci bölümde ise elde edilen sonuçlar tartışılmıştır.

2. Literatür

Literatür incelendiğinde, kapalı uçlu yatırım fonu iskontosu ve oluşturulan yatırımcı duyarlığı endeksi gibi farklı göstergelerin yatırımcı duyarlılığını temsilen kullanıldığı ve bu göstergeler ile pay senetlerinin fiyat ve getirileri arasındaki ilişkinin araştırıldığı görülmektedir (De Long, Shelifer, Summers & Waldmann, 1990; Lee, Shleifer & Thaler, 1991; Neal & Wheatley, 1998; Elton, Gruber & Busse, 1998; Fisher & Statman, 2000; Baker & Stein, 2004; Baker & Wurgler, 2006, 2007).

Otoo (1999), Haziran 1980- Haziran 1999 döneminde aylık veriler kullanarak Willshire 500 Fiyat Endeksi ile Michigan Tüketici Güven Endeksi arasındaki ilişkiyi incelemiştir. Yapılan nedensellik testinde, pay senedi fiyat hareketlerinin tüketici güven endeksindeki değişimi etkilediği tespit edilmiştir. Christ ve Bremmer (2003) 1978-2003 döneminde Dow Jones, S&P 500 ve NASDAQ endeksleri ile tüketici güven endeksi arasındaki kısa ve uzun dönemli ilişkiyi araştırmıştır. Çalışmada, pay senedi endeksleri ile Michigan Tüketici Güven Endeksi arasında uzun dönemli bir eşbütünleşme ilişkisi bulunamamıştır. Yapılan Granger nedensellik testinde, pay senedi fiyatlarının tüketici güven endeksini etkilediği sonucuna ulaşılmıştır.

Jansen ve Nahuis'in (2003) 1986-2001 dönemini ve 11 Avrupa Birliği ülkesini kapsayan çalışmasında, pay senedi fiyat endeksi ile tüketici güven endeksi arasında eşbütünleşme ilişkisi bulunamamıştır. Ancak genellikle pay senedi endeksinden tüketici güven endeksine doğru nedensellik olduğuna dair kanıtlara ulaşılmıştır. Brown ve Cliff (2004) ABD'de yatırımcı duyarlılığı göstergeleri ile pay senedi getirilerinin birlikte hareket ettiğine dair güçlü kanıtlara ulaşırken, kısa vadede yatırımcı duyarlılığı göstergelerinin pay senedi getirilerini öngörmede kullanılabileceğine dair çok zayıf kanıtlara ulaşmıştır. Wang, Keswani ve Taylor (2006), 1990-2001 döneminde ABD'de pay senedi getirisinden yatırımcı duyarlılığı göstergelerine doğru bir nedensellik ilişkisi olduğunu tespit etmiştir. Bremmer (2008) tarafından yapılan çalışmada; Dow Jones, S&P 500 and NASDAQ, NASDAQ 100, S&P 100, Russell 1000, 2000 ve 3000, Wilshire 5000 endeksleri ile Michigan Tüketici Güven Endeksi arasında uzun dönemli bir eşbütünleşme ilişkisi bulunamamıştır. Ancak yapılan Granger nedensellik analizleri sonucunda, pay senedi endekslerinden tüketici güven endeksine doğru tek yönlü nedensellik ilişkisinin var olduğu tespit edilmiştir.

Schmeling (2009) 18 sanayileşmiş ülkeyi kapsayan çalışmasında, tüketici güven endeksi ile yatırımcı duyarlılığı arasında çift yönlü nedensellik ilişkisi bulmuştur. Hsu, Lin ve Wu'nun (2011) 1999-2007 döneminde 21 ülkeyi kapsayan çalışmasında, tüketici güven endeksi ile pay piyasası endeksi arasındaki ilişki panel eşbütünleşme ve nedensellik testleri ile araştırılmıştır. Değişkenler arasında eşbütünleşme ilişkisi bulunamazken, çift yönlü nedensellik ilişkisi tespit edilmiştir. Spyrou (2012), ABD'de 1965-2007 döneminde, oluşturulan portföy getirilerinin yatırımcı duyarlılığındaki değişimin Granger nedeni olduğunu tespit etmiştir. Yang ve Hasuike (2017), Çin'de yatırımcı duyarlılık endeksi ile pay senedi getirisi arasında çift yönlü nedensellik ilişkisi bulmuştur.

Türkiye üzerine yapılan çalışmalar incelendiğinde; Kandır (2006) 2002-2005 dönemini kapsayan ve regresyon analizi yaptığı çalışmasında, CNBC-E tüketici güven endeksindeki değişimin İMKB mali sektör pay senetlerinin getirilerini tahmin etmede önemli bir faktör olduğu sonucuna ulaşmıştır. Canbaş ve Kandır (2007) yatırımcı duyarlılığının İMKB sektör endeks getirileri (sınai, mali ve hizmetler) üzerine etkisini 1997-2006 dönemi için regresyon analizi ile araştırmış ve yatırımcı duyarlılığının pay senedi getirilerini sistematik bir şekilde etkilediğini tespit etmiştir. Kaya (2018), çalışmasında yatırımcı duyarlılığı endeksi hesaplamış ve regresyon analizi sonucunda yatırımcı duyarlılığının BIST 100 endeks getirisini pozitif yönde etkilediği sonucuna ulaşmıştır. Cagli, Ergün ve Durukan (2020), 1997-2018 döneminde kapalı uçlu yatırım fonu iskontosu, ilk halka arzlar, yatırım fonu ortalama nakit akışı, BIST işlem hacminin piyasa değerine oranı ve duyarlılık endeksi ile BIST 100 Getiri Endeksi arasındaki nedensellik ilişkisini araştırmıştır.

Olgaç ve Temizel (2008), 2004-2007 döneminde TCMB Tüketici Güven Endeksi ile İMKB-30 Endeksinin eşbütünleşik olduğunu ve İMKB 30 Endeksinin tüketici güven endeksini etkileyen bir konuma sahip olduğunu tespit etmiştir. Korkmaz ve Çevik (2009), 1987-2009 döneminde İMKB 100 endeks getirisi ile reel kesim güven endeksi arasındaki ilişkiyi ortalama ve varyansta nedensellik testi ile araştırmıştır. Elde edilen sonuçlara göre,

İMKB 100 endeks getirisi ile reel kesim güven endeksi arasında geribildirim etkisi vardır ve eş zamanlı olarak birbirlerini etkilemektedir.

Topuz (2011) tarafından yapılan çalışmada, 2004-2009 döneminde İMKB-100 Endeksinden tüketici güven endeksine doğru tek yönlü nedensellik ilişkisi tespit edilmiştir. Kale ve Akkaya (2016) tarafından yapılan ve 2004-2015 dönemini kapsayan çalışmada, endeks getirisinden tüketici güven endeksine doğru tek yönlü nedensellik, reel kesim güven endeksi ile endeks getirisi arasında ise çift yönlü nedensellik ilişkisi bulunmuştur. Tekin ve Cengiz (2018), 2004-2017 döneminde BIST 100 ile tüketici güven endeksinin uzun dönemde birlikte hareket ettiğini ve BIST 100 Endeksindeki artış veya azalışların tüketici güvenindeki artış veya azalışların Granger nedeni olduğunu tespit etmiştir. Cagli (2019) tarafından yapılan çalışmada, 2004-2019 döneminde BIST 100 Getiri Endeksindeki değişimden tüketici güven endeksindeki değişime doğru tek yönlü nedensellik ilişkisi tespit edilmiştir.

Baştürk'ün (2019) çalışmasında, 2004-2019 döneminde tüketici güven endeksi ile BIST 100 endeksi arasında uzun dönemli bir ilişki bulunamamış ancak BIST 100 Endeksinden tüketici güven endeksine doğru tek yönlü bir nedensellik ilişkisinin olduğu görülmüştür. Eyüpoğlu ve Eyüpoğlu (2018), 2006-2016 döneminde TCMB Tüketici Güven Endeksi ile Borsa İstanbul sektör endeksleri arasındaki ilişkiyi incelemiştir. Çalışmanın sonucunda, değişkenler arasında eşbütünleşme ilişkisinin var olduğu ve pay senedi endekslerinin tüketici güvenin nedeni olduğu görülmüştür.

Görmüş ve Güneş'in (2010) 2002-2008 dönemini kapsayan çalışmasında, değişkenler arasında uzun dönemde eşbütünleşme ilişkisinin olmadığı ancak kısa dönemde pay senedi fiyatından CNBC-e tüketici güven endeksine doğru tek yönlü nedensellik ilişkisinin olduğu tespit edilmiştir. Canöz (2018), 2004-2017 döneminde BIST 100 Endeksi ile tüketici güven endeksleri arasındaki nedensellik ilişkisini araştırmış ve BIST 100 Endeksinden TCMB Tüketici Güven Endeksi ve Bloomberg HT Tüketici Güven Endeksine doğru tek yönlü nedensellik ilişkisi bulmuştur. Koy ve Akkaya (2017), tüketici güven endeksinde (Bloomberg, TUİK ve Reel Kesim Tüketici Güven Endeksleri) meydana gelen şokların BIST 100 Getiri Endeksi üzerindeki etkisinin, BIST 100 Getiri Endeksindeki şokların tüketici güven endeksi üzerindeki etkisi kadar güçlü olmadığını tespit etmiştir.

VIX Endeksi üzerine yapılan çalışmalar incelendiğinde, VIX Endeksi ile BIST 100 Fiyat Endeksi arasındaki eşbütünleşme ve nedensellik ilişkisini yatırımcı duyarlılığı kapsamında araştıran bir çalışmaya rastlanılmamıştır. Köse ve Akkaya'nın (2016), 2007-2016 dönemini kapsayan çalışmasında, Michigan Üniversitesi Güven Endeksi, Almanya Tüketici Güven Endeksi, Almanya İş İklimi Endeksi ve VIX Endeksi ile BIST 100 Getiri Endeksi arasındaki ilişki incelenmiş ve anlamlı bir nedensellik ilişkisi bulunamamıştır. Sarı (2019), tüketici güven endeksi ve VIX Endeksinin BIST 100 endeks getirisini tahmin etme kabiliyetine sahip olduğunu gösteren sonuçlara ulaşmıştır. Şit, Hacıevliyagil ve Büyükoğlu (2019), 2010-2018 döneminde günlük veriler üzerinden BIST 100 Endeksi ile VIX Endeksi arasındaki uzun dönemli eşbütünleşme ilişkisini araştırmıştır. Değişkenlerin uzun dönemde

eşbütünleşik oldukları ve kısa dönemde oluşan sapmaların sonraki dönemde düzelerek uzun dönem dengesine yaklaşıldığı belirlenmiştir. Yatırımcı duyarlılığı kapsamında araştırılmasa da Hacıhasanoğlu ve Soytaş (2009), Kaya (2015), Kaya ve Coşkun (2015), Öner, İçellioğlu ve Öner (2018), Başarır (2018), Sakarya ve Akkuş (2018), Akdağ (2019), Kuzu (2019), Sarıtaş ve Nazlıoğu (2019) tarafından yapılan çalışmalarda günlük veriler üzerinden BIST 100 Endeksi ile VIX Endeksi arasındaki ilişki incelenmiştir.

3. Araştırma Yöntemi ve Veriler

Bu çalışma Ocak 2007-Ağustos 2020 dönemini kapsamaktadır. Çalışmada aylık veriler kullanılmıştır. Literatürde yatırımcı duyarlılığını temsilen tüketici güven endekslerinin (Kandır, 2006; Olgaç & Temizel, 2008; Kale & Akkaya, 2015; Canöz, 2018; Sarı, 2019) ve VIX Endeksinin (Lee & Song, 2003; Giot, 2005; Köse & Akkaya, 2016; Smales, 2017) sıklıkla kullanıldığı görülmektedir. Bu çalışmada yatırımcı duyarlılığını temsilen TCMB Tüketici Güven Endeksi, Bloomberg HT Tüketici Güven Endeksi ve VIX Endeksi kullanılmıştır. Yatırımcı duyarlılığını temsilen kullanılan bu değişkenler ile BIST 100 Endeksi arasındaki ilişki araştırılmıştır.

BIST 100 Endeksi ve TCMB Tüketici Güven Endeksi verileri TCMB'nin elektronik veri dağıtım sisteminden alınmıştır. VIX Endeksi verileri <www.investing.com> adresinden, Bloomberg HT Tüketici Güven Endeksi verileri, Bloomberg HT'nin resmi internet sitesindeki (www.bloomberght.com) Bloomberg HT Tüketici Güven Endeksi veri sayfasından alınmıştır.

Çalışmada öncelikle serilerin durağanlığı araştırılmıştır. Seriler arasındaki eşbütünleşme ilişkisini incelemek için birim kök testinden çıkan sonuçlara göre Johansen eşbütünleşme testi veya ARDL sınır testi uygulanmıştır. Nedensellik ilişkini araştırmak için de VAR modeli üzerinden Granger nedensellik testi ve Toda-Yamamoto nedensellik testi kullanılmıştır.

Tüketici Güven Endeksi, Türkiye İstatistik Kurumu ve Türkiye Cumhuriyet Merkez Bankası işbirliği çerçevesinde 2004 yılından itibaren aylık tüketici eğilim anketi sonuçlarına göre hesaplanarak yayımlanmaktadır. Tüketici güveni ve soru bazında endeksler aylık tüketici eğilim anketi sonuçları kullanılarak hesaplanmaktadır. Anket yardımıyla, tüketicilerin, kişisel mali durumlarına ve genel ekonomiye ilişkin mevcut durum ile gelecek dönem beklentilerinin ve eğilimlerinin değerlendirilmesine, harcama ve tasarruflarına ilişkin eğilimlerinin saptanması olanağı elde edilmektedir. Tüketici güven endeksi, anket sonuçlarından faydalanılarak hesaplanmaktadır. Endeks tüketicilerin çeşitli konulardaki değerlendirme ve beklentileri sonucunda edindikleri genel izlenimi yansıtan öncü bir gösterge niteliğindedir ve tüketicilerin ekonomik faaliyetlere ilişkin güven durumunu göstermektedir (TUİK, 2020).

Bloomberg HT Tüketici Güven Endeksi eşit ağırlıklı beş sorudan yola çıkılarak hesaplanan bir endekstir. İlk iki soru tüketicinin daha çok kişisel durumunu ve beklentilerini

yansıtmaktadır. Üçüncü ve dördüncü soru, tüketicilerin Türkiye ekonomisine ilişkin beklentilerini anlamaya yöneliktir. Beşinci soru ise tüketicilerin mevcut harcama eğilimini ölçmeyi hedeflemektedir. Olası tüketim eğilimini ölçmeye çalışan endeks, Türkiye ekonomisini yakından takip edenler için öncü bir ekonomik gösterge niteliğindedir. Endeks başta finansal piyasalarda çalışanlar olmak üzere, yönetici veya karar vericilerin güçlü konjonktür tahmini yapabilmelerine yardımcı olmaktadır (Bloomberg HT, 2019).

S&P 500 Endeks opsiyonlarının fiyatlarına dayalı olarak hesaplanan VIX Endeksi, pay piyasasının gelecekte beklenen 30 günlük volatilitesini yansıtır. Eğer beklenen piyasa volatilitesi artarsa (azalırsa), yatırımcılar pay senetlerinden daha yüksek (düşük) getiri oranı talep ederler, bu nedenle de pay senedi fiyatları düşer (yükselir) (Whaley, 2009). Dolayısıyla VIX Endeksi ile menkul kıymet borsaları negatif yönlü bir ilişkiye sahiptir. VIX Endeksinin yükselmesi, geleceğe yönelik belirsizliklerin ve dolayısıyla riskin artması anlamına gelir.

4. Ampirik Bulgular

Çalışmanın bu bölümünde, BIST 100 Endeksi ile yatırımcı duyarlılığını temsilen kullanılan Tüketici Güven Endeksi, Bloomberg HT Tüketici Güven Endeksi ve VIX Endeksi arasındaki eşbütünleşme ve nedensellik ilişkisini araştırmak için yapılan analizlerden elde edilen bulgular raporlanmıştır. Ancak eşbütünleşme ve nedensellik analizlerine geçmeden önce ilk olarak serilerin durağan olup olmadıkları araştırılmıştır. Çünkü serilerin durağan olmaması durumunda sahte regresyon problemi ortaya çıkabilmektedir. Çalışmada Augmented Dickey-Fuller (ADF) ve Phillips-Perron birim kök testi kullanılmıştır. Birim kök testleri hem sabitli model hem de sabitli ve trendli model kullanılarak logaritması alınan seriler üzerinden tahmin edilmiş ve sonuçlar Tablo 1'de sunulmuştur.

Tablo: 1
Birim Kök Testi Sonuçları

ADF Birim Kök Testi	**Düzey**		**Birinci Dereceden Fark**	
	Sabitli	**Sabitli ve Trendli**	**Sabitli**	**Sabitli ve Trendli**
BIST 100 Endeksi	-1,4395	-2,8768	-12,8441***	-12,8044***
TCMB Tüketici Güven Endeksi	-2,3388	-2,4736	-11,7227***	-11,6897***
Bloomberg HT Tük. Güven End.	-2,9318**	-3,5473**		
VIX Endeksi	-3,9674***	-4,2931***		
P-P Birim Kök Testi	**Düzey**		**Birinci Dereceden Fark**	
	Sabitli	**Sabitli ve Trendli**	**Sabitli**	**Sabitli ve Trendli**
BIST 100 Endeksi	-1,436498	-2,997184	-12,84367***	-12,80430***
TCMB Tüketici Güven Endeksi	-2,357108	-2,506178	-11,72617***	-11,68758***
Bloomberg HT Tük. Güven End.	-3,332723**	-3,989853**		
VIX Endeksi	-3,789186***	-4,197617***		
***, **, * simgeleri %1, %5 ve %10 düzeylerinde serilerde birim kökün varlığını ifade eden boş hipotezin reddedildiğini göstermektedir.				

Birim kök testinde boş hipotez, serilerde birim kökün var olduğunu yani serilerin durağan olmadığını ifade etmektedir. Tablo 1'de yer alan sonuçlara göre, BIST 100 Endeksi ve TCMB Tüketici Güven Endeksi serileri için boş hipotez reddedilememektedir. Dolayısıyla BIST 100 Endeksi ve TCMB Tüketici Güven Endeksi serileri düzey değerleri itibariyle durağan değildir. Ancak bu serilerin birinci farkları alındığında, boş hipotezlerin %1 anlamlılık seviyesinde reddedildiği ve durağan oldukları görülmektedir. Bloomberg HT Tüketici Güven Endeksi ve VIX Endeksi serileri için yapılan birim kök testi sonuçlarına

göre, serilerin düzey değerleri itibariyle durağan olmadığını ifade eden boş hipotezler %5 anlamlılık seviyesinde reddedilmektedir. Bu nedenle Bloomberg HT Tüketici Güven Endeksi ve VIX Endeksi serilerinin düzey değerleri itibariyle durağan oldukları kabul edilmiştir.

4.1. BIST 100 Endeksi ile TCMB Tüketici Güven Endeksi Arasındaki İlişkinin Analizi

BIST 100 Endeksi ile TCMB Tüketici Güven Endeksi serileri aynı dereceden durağan oldukları için eşbütünleşme analizinde Johansen ve Juselius (1990) eşbütünleşme testi kullanılmıştır. Değişkenler arasında eşbütünleşme ilişkisi çıkmaması sebebiyle nedenselliği araştırmak VAR modeli oluşturulmuş ve VAR modeli üzerinden Granger nedensellik testi yapılmıştır.

Eşbütünleşme testini yapabilmek için öncelikle oluşturulacak model için optimal gecikme düzeyinin belirlenmesi gerekmektedir. Optimal gecikme düzeyini belirlemek için VAR (Vector Auto Regreesive Model) kullanılmış ve sonuçlar Ek 1'de sunulmuştur.

FPE ve AIC kriterleri optimal gecikme düzeyinin 2 olduğuna işaret ederken, SC ve HQ kriterleri optimal gecikme düzeyinin 1 olduğuna işaret etmektedir. Ancak hem 1 gecikme ile hem de 2 gecikme ile oluşturulan modellerde otokorelasyon ve değişen varyans problemleri tespit edilmiştir. Bu nedenle otokorelasyon ve değişen varyans problemlerinin olmadığı farklı gecikme düzeyleri araştırılmıştır. 7. gecikme düzeyinde otokorelasyon ve değişen varyans sorununun ortadan kalktığı tespit edilmiştir. Yapılan otokorelasyon LM testi sonuçları Tablo 2'de, değişen varyans test sonuçları ise Tablo 3'te yer almaktadır.

Tablo: 2
Serisel Korelasyon LM Testi Sonuçları

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	6,467790	4	0,1668	1,629972	(4, 278.0)	0,1668
2	2,817635	4	0,5888	0,705440	(4, 278.0)	0,5888
3	2,869982	4	0,5798	0,718614	(4, 278.0)	0,5798
4	6,533416	4	0,1627	1,646705	(4, 278.0)	0,1627
5	0,711956	4	0,9498	0,177578	(4, 278.0)	0,9498
6	3,961560	4	0,4112	0,993880	(4, 278.0)	0,4112
7	3,853881	4	0,4261	0,966678	(4, 278.0)	0,4261
8	1,752013	4	0,7812	0,437807	(4, 278.0)	0,7813
9	7,712279	4	0,1027	1,947958	(4, 278.0)	0,1027
10	7,426168	4	0,1150	1,874727	(4, 278.0)	0,1150
11	7,026666	4	0,1345	1,772598	(4, 278.0)	0,1345
12	7,324866	4	0,1197	1,848816	(4, 278.0)	0,1197

Otokorelasyon LM testinde olasılık değerlerinin 0,05'ten büyük olması 7. gecikme düzeyinde tahmin edilen VAR modelinde otokorelasyon probleminin olmadığına işaret etmektedir. White değişen varyans testinde, test istatistiği Ki-kare = 100,0080 (p = 0.1122) çıkmıştır. p olasılık değerinin 0,05'ten büyük olması, değişen varyans sorununun olmadığını göstermektedir.

Tablo: 3
White Değişen Varyans Test Sonuçları

Ki-kare	Serbestlik Derecesi	*p* - değeri.
100,0080	84	0,1122

BIST 100 Endeksi ile TCMB Tüketici Güven Endeksi arasındaki eşbütünleşme ilişkisini araştırmak için yapılan test sonuçları Tablo 4'te sunulmuştur. Hem iz testi hem de maksimum özdeğer test sonuçlarına göre, seriler arasında eşbütünleşme vektörünün bulunmadığını ifade eden boş hipotezler %5 anlamlılık düzeyinde reddedilememektedir. Bu durum BIST 100 Endeksi ile TCMB Tüketici Güven Endeksi arasında eşbütünleşme ilişkisinin olmadığını göstermektedir.

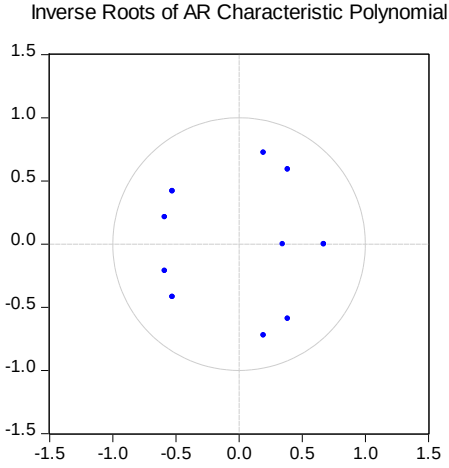
Tablo: 4
Eşbütünleşme Testi Sonuçları

İz Testi				
Hipotezler	**Özdeğer**	**İz İstatistiği**	**%5 Kritik Değer**	**Olasılık****
H_0: r = 0	0,039414	6,869274	15,49471	0,5929
H_1: r ≥ 1	0,003815	0,596212	3,841466	0,4400
Maksimum Özdeğer Testi				
Hipotezler	**Öz Değer**	**Maksimum Özdeğer İstatistiği**	**%5 Kritik Değer**	**Olasılık****
H_0: r = 0	0,039414	6,273062	14,26460	0,5784
H_1: r ≥ 1	0,003815	0,596212	3,841466	0,4400
**MacKinnon-Haug-Michelis (1999) p-değerleri				

BIST 100 Endeksi ile TCMB Tüketici Güven Endeksi arasında eşbütünleşme ilişkisi çıkmadığı için değişkenler arasındaki nedensellik ilişkisi VAR modeli üzerinden araştırılmıştır. VAR modelini oluşturmak için öncelikle uygun gecikme düzeyinin belirlenmesi gerekmektedir. Belirlenen gecikme uzunluğunda tahmin edilen VAR modelinin istikrar koşulunu taşıması ve değişen varyans ve otokorelasyon problemlerinin olmaması gerekmektedir. VAR modeli üzerinden belirlenen optimal gecikme düzeyine ilişkin sonuçlar Ek 2'de yer almaktadır. Optimal gecikme uzunluğunun LR, FPE ve AIC bilgi kriterleri 3, SC ve HQ bilgi kriterleri ise 0 olduğuna işaret etmektedir. Ancak söz konusu gecikmelerle tahmin edilen VAR modellerinde otokorelasyon ve değişen varyans problemlerinin olduğu görülmüştür. Bu nedenle farklı gecikmelerde VAR modelleri tahmin edilmiş ve otokorelasyon ve değişen varyans probleminin olmadığı, ayrıca modelin istikrar koşulunu sağladığı en uygun gecikme düzeyinin 5 olduğu tespit edilmiştir.

Grafik 1'de, 5 gecikme düzeyinde tahmin edilen VAR modelinde, otoregresif karakteristik polinomunun ters köklerinin birim çemberin içinde yer aldığı görülmektedir. Dolayısıyla tahmin edilen modelin istikrar koşulunu sağladığı söylenebilir.

Grafik: 1
AR Karakteristik Polinomunun Ters Kökleri



Tahmin edilen VAR modeli için yapılan otokorelasyon LM testinin sonuçları Tablo 5'te, değişen varyans test sonuçları ise Tablo 6'da görülmektedir. Otokorelasyon LM testinde olasılık değerlerinin 0,05'ten büyük olması 5 gecikmede otokorelasyon probleminin olmadığına işaret etmektedir. White değişen varyans testinin test istatistiği Ki-kare = 67.63458 (p = 0.2328) çıkmıştır. p olasılık değerinin 0,05'ten büyük olması nedeniyle değişen varyans sorununun olmadığına karar verilmiştir.

Tablo: 5
Serisel Korelasyon LM Testi Sonuçları

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	4,367870	4	0,3585	1,096454	(4, 288.0)	0,3585
2	4,659126	4	0,3241	1,170158	(4, 288.0)	0,3241
3	2,495056	4	0,6455	0,624297	(4, 288.0)	0,6455
4	6,206645	4	0,1842	1,563016	(4, 288.0)	0,1842
5	2,396631	4	0,6632	0,599567	(4, 288.0)	0,6632
6	3,141631	4	0,5344	0,786960	(4, 288.0)	0,5344
7	4,722715	4	0,3169	1,186260	(4, 288.0)	0,3170
8	2,953610	4	0,5656	0,739621	(4, 288.0)	0,5656
9	5,933364	4	0,2042	1,493487	(4, 288.0)	0,2042
10	7,649056	4	0,1053	1,931090	(4, 288.0)	0,1053
11	5,459554	4	0,2433	1,373095	(4, 288.0)	0,2433
12	5,810142	4	0,2138	1,462158	(4, 288.0)	0,2138

Tablo: 6
White Değişen Varyans Test Sonuçları

Ki-kare	Serbestlik Derecesi	*p* - değeri.
67,63458	60	0,2328

Değişkenler arasındaki nedensellik ilişkisi araştırmak için seçilen gecikme uzunluğu ile tahmin edilen VAR modeli üzerinden Granger nedensellik testi yapılmış ve sonuçlar

Tablo 7'de sunulmuştur. VAR Granger nedensellik test sonuçlarına göre, TCMB Tüketici Güven Endeksi, BIST 100 Endeksinin Granger nedeni değildir boş hipotezi reddedilememektedir. Dolayısıyla TCMB Tüketici Güven Endeksinden BIST 100 Endeksine doğru bir nedensellik bulunmamaktadır. BIST 100 Endeksi, TCMB Tüketici Güven Endeksinin Granger nedeni değildir boş hipotezi ise %1 anlamlılık seviyesinde reddedilmektedir. Boş hipotezin reddedilmesi, BIST 100 Endeksinden TCMB Tüketici Güven Endeksine doğru bir nedenselliğin olduğu anlamına gelmektedir.

Tablo: 7
VAR Granger Nedensellik/Blok Dışsallık Test Sonuçları

H_0: TCMB Tüketici Güven Endeksi, BIST 100 Endeksinin Granger nedeni değildir
Ki-Kare: 1,610903 df(5) Prob: [0,8999]
H_0: BIST 100 Endeksi, TCMB Tüketici Güven Endeksinin Granger nedeni değildir
Ki-Kare: 21,29626*** df(5) Prob: [0,0007]
*** simgesi %1 önem düzeyinde anlamlı olduğunu göstermektedir.

4.2. BIST 100 Endeksi ile Bloomberg HT Tüketici Güven Endeksi Arasındaki İlişkinin Analizi

Birim kök testinden elde edilen sonuçlara göre, BIST 100 Endeksi serisi düzeyde durağan, Bloomberg HT Tüketici Güven Endeksi serisi ise birinci farkında durağandır. Pesaran vd. (2001) tarafından geliştirilen ARDL sınır testi, serilerin farklı derecelerden durağan olması halinde eşbütünleşme ilişkisini araştırmak amacıyla sıklıkla kullanılan bir yöntemdir. Bu çalışmada da serilerin farklı derecelerden durağan olması nedeniyle değişkenler arasındaki eşbütünleşme ilişkisi ARDL sınır testi ile araştırılmış ve sonuçlar Tablo 8'de raporlanmıştır.

Tahmin edilen ARDL modelinde, otokorelasyon ve değişen varyans sorununun bulunmaması, hata teriminin normal dağılıma sahip olması, model kurma hatasının olmaması ve modelin kararlılık koşulunu sağlaması gerekmektedir. Otokorelasyon sorununun olup olmadığını tespit etmek için Breusch-Godfrey LM Testi, değişen varyans probleminin olup olmadığını belirlemek için Breusch-Pagan-Godfrey testi, hata teriminin normal dağılıma sahip olup olmadığını belirlemek için Jarque-Bera normallik testi ve model kurma hatasının olup olmadığını belirlemek için de Ramsey reset testi yapılmış ve bu testlerin sonuçları da Tablo 8'de gösterilmiştir. Tahmin edilen modelin kararlılığını tespit etmek için yapılan CUSUM ve CUSUMQ kare test sonuçları ise Grafik 2'de sunulmuştur.

Tanısal testler dikkate alınarak ARDL modelinde bağımlı ve bağımsız değişkenlerin uygun gecikme uzunluğu belirlenmiş ve ARDL modeli (2,0) şeklinde tahmin edilmiştir. Bağımlı ve bağımsız değişkenlerin trende sahip olması nedeniyle model sabitli ve trendli olarak tahmin edilmiştir. Gecikme uzunluğunu belirlemek için Akaike bilgi kriteri kullanılmıştır. Değişen varyans problemi söz konusu olduğu için, model dirençli standart hatalar (white) ile tahmin edilmiştir.

Tablo 8'de görüldüğü üzere hesaplanan test istatistiği (F istatistiği = 12.10202) üst kritik değerlerden daha büyüktür ve değişkenler arasında %1 anlamlılık düzeyinde

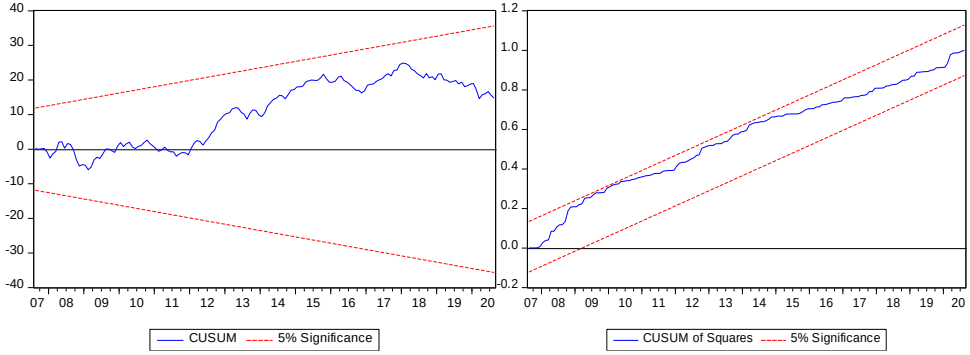
eşbütünleşme ilişkisi vardır. Başka bir ifadeyle BIST 100 Endeksi ile Bloomberg HT Tüketici Güven Endeksi arasında uzun dönemde istatistiksel olarak anlamlı bir ilişki bulunmaktadır. Uzun dönem katsayıların olasılık değerlerine bakıldığında, katsayı değerinin %1 seviyesinde anlamlı olduğu görülmektedir. Hata düzeltme modeli sonuçlarına bakıldığında, hata düzeltme katsayısının [CointEq(-1)] negatif, birden küçük ve istatistiksel olarak %1 düzeyinde anlamlı olduğu görülmektedir. Bu durum, hata düzeltme mekanizmasının çalıştığını ve kısa dönemde dengeden sapmaların 5,9 ay sonra (1 / 0.169510 = 5,9) düzelerek uzun dönem dengesine ulaştığı anlamına gelmektedir.

Tablo: 8
ARDL Sınır Testi Sonuçları

Conditional Error Correction Regression				
Değişkenler	**Katsayı**	**Standart Hata**	**t-istatistiği**	**Olasılık**
C	0,262443	0,223759	1,172882	0,2426
@Trend	0,001471	0,000330	4,457951	0,0000
lnBIST 100 Endeksi (-1)	-0,169510	0,038168	-4,441130	0,0000
lnBloomberg HT Tük. Güven End.	0,163772	0,042102	3,889930	0,0001
D(lnBIST 100 Endeksi (-1))	-0,059438	0,080052	-0,742493	0,4589
Levels Equation **Case 5: Unrestricted Constant and Unrestricted Trend**				
Değişkenler	**Katsayı**	**Standart Hata**	**t-istatistiği**	**Olasılık**
lnBloomberg HT Tük. Güven End.	0,966151***	0,291595	3,313331	0,0011
F-Bounds Test				
Test İstatistiği	**Değer**	**Anlamlılık**	**I(0)**	**I(1)**
F-İstatistiği	12,10202***	10%	5,725	6,45
		5%	6,82	7,67
		1%	9,17	10,24
Hata Düzeltme Modeli				
Değişkenler	**Katsayı**	**Standart Hata**	**t-istatistiği**	**Olasılık**
C	0,262443***	0,052989	4,952787	0,0000
@Trend	0,001471***	0,000324	4,536730	0,0000
D(lnBIST 100 Endeksi (-1))	-0,059438	0,074643	-0,796302	0,4271
CointEq(-1)	-0,169510***	0,034346	-4,935404	0,0000
R^2 = 0,133873 Düzeltilmiş R^2 = 0,117427 F İstatistiği = 8,140400 (0,000045)				
Breusch-Godfrey LM Testi	1,537661 (0,1170)			
Jarque-Bera Normallik Testi	4,451615 (0,107980)			
Ramsey Reset Testi	4,203672 (0,0420)			
*** simgesi %1 düzeyinde anlamlılığı göstermektedir.				

Tahmin edilen ARDL (2, 0) modelinin kararlılığını test etmek için CUSUM ve CUSUMQ kare testleri yapılmış ve Grafik 2 'de gösterilmiştir. Grafik incelendiğinde hem CUSUM hem de CUSUMQ kare istatistikleri %5 anlamlılık düzeyinde kritik sınırlar içerisinde kalmaktadır. Dolayısıyla parametre tahminleri %95 güven sınırlarını ifade eden kesikli çizgilerin arasında kaldığı için parametre tahmininin istikrar koşulunu sağladığı söylenebilir.

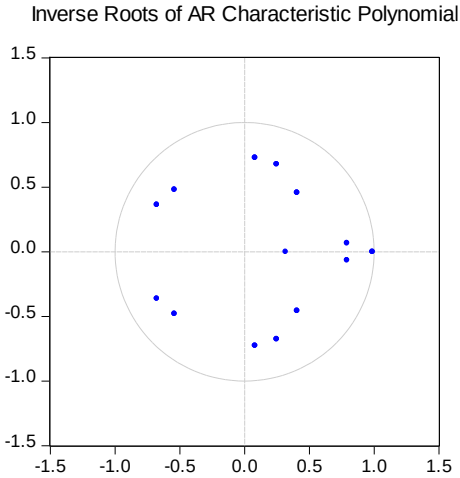
Grafik: 2
CUSUM ve CUSUMQ Kare Grafikleri



BIST 100 Endeksi serisinin düzeyde durağan olması, Bloomberg HT Tüketici Güven Endeksi serisinin ise birinci farkta durağan olması nedeniyle bu değişkenler arasındaki nedensellik ilişkisi Toda-Yamamoto (1995) nedensellik testi ile araştırılmıştır. Toda-Yamamoto nedensellik testi yapılırken ilk olarak k + dmax gecikme düzeyi üzerinden VAR modeli oluşturulmuştur. Daha sonra oluşturulan VAR modelindeki k gecikmeli değerlere Wald istatistiği uygulanarak nedensellik ilişkisi araştırılmıştır. BIST 100 Endeksi serisinin I(0), Bloomberg HT Tüketici Güven Endeksi serisinin ise I(1) olması nedeniyle maksimum bütünleşme derecesi (d_{max}) 1 olarak belirlenmiştir. Maksimum bütünleşme derecesi belirlendikten sonra VAR modelinin istikrar koşulunu sağladığı ve otokorelasyon probleminin olmadığı optimal gecikme düzeyi belirlenmiştir.

Optimal gecikme düzeyini belirlemek için öncelikle VAR modeli üzerinden tahmin edilen ve Ek 3'te sonuçları verilen bilgi kriterleri kullanılmıştır. Optimal gecikme uzunluğu FPE, AIC ve HQ bilgi kriterine göre 3, SC bilgi kriterine göre 2, LR test istatistiğine göre 6'dır. Söz konusu gecikmelerde VAR modelleri tahmin edilmiş fakat otokorelasyon probleminin olduğu tespit edilmiştir. Bu nedenle farklı gecikmelerde VAR modeli yeniden tahmin edilmiş ve otokorelasyon probleminin olmadığı, ayrıca modelin istikrar koşulunu sağladığı en uygun gecikme düzeyinin 7 olduğu tespit edilmiştir. Grafik 3'te görüldüğü üzere, tahmin edilen VAR modelinde AR karakteristik polinomunun ters kökleri birim çemberin içinde yer almaktadır. Bu durum tahmin edilen modelin istikrar koşulunu sağladığına işaret etmektedir.

Grafik: 3
AR Karakteristik Polinomunun Ters Kökleri



Otokorelasyon LM testi sonuçları Tablo 9'da yer almaktadır. Tablo 9 incelendiğinde, otokorelasyon LM testinde tüm gecikmelerde olasılık değerlerinin 0,05'ten büyük olduğu görülmektedir. Dolayısıyla tahmin edilen modelde otokorelasyon problemi bulunmamaktadır.

Tablo: 9
Serisel Korelasyon LM Testi Sonuçları

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	3,405983	4	0,4923	0,853644	(4, 278.0)	0,4923
2	1,569796	4	0,8142	0,392145	(4, 278.0)	0,8142
3	4,407627	4	0,3536	1,106676	(4, 278.0)	0,3536
4	5,605385	4	0,2306	1,410445	(4, 278.0)	0,2306
5	3,824611	4	0,4303	0,959286	(4, 278.0)	0,4303
6	6,657816	4	0,1551	1,678435	(4, 278.0)	0,1551
7	2,618252	4	0,6236	0,655287	(4, 278.0)	0,6236
8	0,958700	4	0,9160	0,239227	(4, 278.0)	0,9160
9	7,255112	4	0,1230	1,830980	(4, 278.0)	0,1230
10	5,764221	4	0,2175	1,450826	(4, 278.0)	0,2175
11	2,721398	4	0,6055	0,681228	(4, 278.0)	0,6055
12	8,640156	4	0,0708	2,185970	(4, 278.0)	0,0708

BIST 100 Endeksi ile Bloomberg HT Tüketici Güven Endeksi arasındaki nedensellik ilişkisini belirlemek için yapılan Toda-Yamamoto nedensellik testi sonuçları Tablo 10'da sunulmuştur. Wald istatistiğine ait olasılık değerlerine bakıldığında, olasılık değerinin 0,05'ten büyük olması nedeniyle "Bloomberg HT Tüketici Güven Endeksinden BIST 100 Endeksine doğru bir nedensellik yoktur" şeklinde ifade edilen H_0 hipotezi reddedilememektedir. Dolayısıyla Bloomberg HT Tüketici Güven Endeksinden BIST 100 Endeksine doğru bir nedensellik bulunmamaktadır. BIST 100 Endeksinden, Bloomberg HT Tüketici Güven Endeksine doğru bir nedenselliğin olup olmadığı belirlemek için yapılan

Toda-Yamamoto nedensellik testinin sonuçları incelendiğinde, Wald istatistiğine ait olasılık değeri 0,05'ten küçük olduğu için H_0 hipotezi reddedilmektedir. H_0 hipotezinin reddedilmesi, BIST 100 Endeksinden Bloomberg HT Tüketici Güven Endeksine doğru bir nedenselliğin olduğunu ortaya koymaktadır. Özetle, değişkenler arasında tek yönlü; BIST 100 Endeksinden Bloomberg HT Tüketici Güven Endeksine doğru, bir nedensellik ilişkisi bulunmaktadır.

Tablo: 10
Toda-Yamamoto Nedensellik Testi Sonuçları

H_0: Bloomberg HT Tüketici Güven Endeksinden BIST 100 Endeksine doğru bir nedensellik yoktur
Ki-Kare: 1,384920 Olasılık Değeri: [0,9668]
H_0: BIST 100 Endeksinden, Bloomberg HT Tüketici Güven Endeksine doğru bir nedensellik yoktur
Ki-Kare: 41,75412*** Olasılık Değeri: [0,0000]
*** simgesi %1 önem düzeyinde anlamlı olduğunu göstermektedir.

Jansen ve Nahuis (2003) pay senedi fiyatlarının, iki nedenden dolayı güven kanalı aracılığıyla tüketimi etkileyebileceğini belirtmiştir. Birincisi, geleneksel servet etkisidir ve daha yüksek pay senedi fiyatlarının, daha yüksek servet ve dolayısıyla daha fazla iyimserlik anlamına gelmesidir. İkincisi ise, daha yüksek pay senedi fiyatlarının ekonomik birimler tarafından gelecekteki olumlu ekonomik koşulların bir işareti/öncü bir göstergesi olarak yorumlanabilmesidir. Pay senedi fiyatlarının öncü gösterge olma özelliği, pay senedi fiyatlarının; pay senedi yatırımlarına sahip olup olmadığına bakılmaksızın, tüm tüketicilerin davranışlarını etkileyebilecek bir kanal oluşturmasıdır. Nedensellik analizlerinden elde edilen sonuçların (BIST 100 Endeksinden hem TCMB Tüketici Güven Endeksine hem de Bloomberg HT Tüketici Güven Endeksine doğru tek yönlü nedensellik ilişkisinin bulunmasının), söz konusu yaklaşımla tutarlı olduğu söylenebilir.

4.3. BIST 100 Endeksi ile VIX Endeksi Arasındaki İlişkinin Analizi

Yapılan birim kök testlerinde, BIST 100 Endeksi serisi düzeyde durağan, VIX Endeksi serisi ise birinci farkta durağan çıkmıştı. Söz konusu serilerin farklı derecelerden durağan olması nedeniyle eşbütünleşme ilişkisi Pesaran vd. (2001) tarafından geliştirilen ARDL sınır testi ile analiz edilmiştir. Değişkenler arasındaki eşbütünleşme ilişkisini incelemek için yapılan ARDL eşbütünleşme analizi sonuçları Tablo 11'de yer almaktadır. Tahmin edilen ARDL modelinde, otokorelasyon sorununun olup olmadığını tespit etmek için Breusch-Godfrey LM Testi, değişen varyans probleminin olup olmadığını belirlemek için Breusch-Pagan-Godfrey testi, hata teriminin normal dağılıma sahip olup olmadığını belirlemek için Jarque-Bera normallik testi ve model kurma hatasının olup olmadığını belirlemek için de Ramsey reset testi yapılmış ve test sonuçları da Tablo 11'de sunulmuştur. Ayrıca tahmin edilen modelin kararlılığını tespit etmek için de CUSUM ve CUSUMQ kare testi yapılmış ve sonuçlar Grafik 4'te gösterilmiştir.

Bağımlı ve bağımsız değişkenlerin uygun gecikme uzunluğu diagnostik testler dikkate alınarak belirlenmiş ve ARDL modeli (7,0) şeklinde tahmin edilmiştir. Bağımlı ve bağımsız değişkenlerin trende sahip olması nedeniyle model sabitli ve trendli olarak tahmin edilmiştir. Gecikme uzunluğunu belirlemek için Akaike bilgi kriteri kullanılmıştır.

Otokorelasyon ve değişen varyans problemleri nedeniyle ARDL (7,0) modeli dirençli standart hatalar ile (HAC (Newey-West)) tahmin edilmiştir.

Tablo: 11
ARDL Sınır Testi Sonuçları

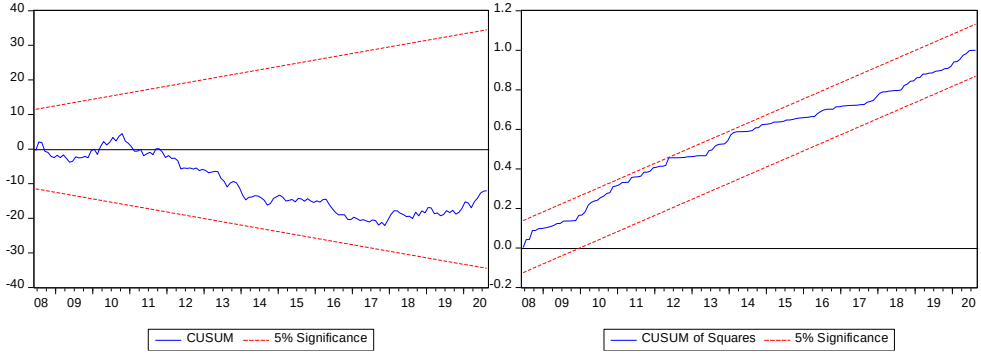
Conditional Error Correction Regression				
	Katsayı	**Standart Hata**	**t-istatistiği**	**Olasılık**
C	1,470832	0,271079	5,425847	0,0000
@Trend	0,001181	0,000296	3,989503	0,0001
lnBIST 100 Endeksi (-1)	-0,205772	0,041345	-4,976905	0,0000
lnVIX Endeksi	-0,075853	0,017986	-4,217316	0,0000
D(lnBIST 100 Endeksi (-1))	0,063641	0,075645	0,841302	0,4015
D(lnBIST 100 Endeksi (-2))	0,103130	0,075497	1,366012	0,1740
D(lnBIST 100 Endeksi (-3))	0,003318	0,076063	0,043622	0,9653
D(lnBIST 100 Endeksi (-4))	0,069472	0,075531	0,919785	0,3592
D(lnBIST 100 Endeksi (-5))	0,233428	0,076324	3,058396	0,0026
D(lnBIST 100 Endeksi (-6))	-0,014359	0,079178	-0,181347	0,8563
Levels Equation **Case 5: Unrestricted Constant and Unrestricted Trend**				
Değişkenler	**Katsayı**	**Standart Hata**	**t-istatistiği**	**Olasılık**
lnVIX Endeksi	-0,368629***	0,115418	-3,193861	0,0017
F-Bounds Test				
Test İstatistiği	**Değer**	**Anlamlılık**	**I(0)**	**I(1)**
F-İstatistiği	16,10951***	10%	5,725	6,45
		5%	6,82	7,67
		1%	9,17	10,24
Hata Düzeltme Modeli				
Değişkenler	**Katsayı**	**Standart Hata**	**t-istatistiği**	**Olasılık**
C	1,470832***	0,258395	5,692188	0,0000
@Trend	0,001181***	0,000235	5,034303	0,0000
D(lnBIST 100 Endeksi (-1))	0,063641	0,074480	0,854462	0,3942
D(lnBIST 100 Endeksi (-2))	0,103130	0,073979	1,394050	0,1654
D(lnBIST 100 Endeksi (-3))	0,003318	0,074452	0,044566	0,9645
D(lnBIST 100 Endeksi (-4))	0,069472	0,073809	0,941251	0,3481
D(lnBIST 100 Endeksi (-5))	0,233428***	0,074257	3,143505	0,0020
D(lnBIST 100 Endeksi (-6))	-0,014359	0,077074	-0,186297	0,8525
CointEq(-1)	-0,205772***	0,036129	-5,695454	0,0000
R^2 = 0,216609 Düzeltilmiş R^2 = 0,174263 F İstatistiği = 5,115271 (0,000012)				
Breusch-Godfrey LM Testi	1,865307 (0,0440)			
Jarque-Bera Normallik Testi	1,685027 (0,430627)			
Ramsey Reset Test	3,070989 (0,0818)			
*** simgesi %1 düzeyinde anlamlılığı göstermektedir				

Tablo 11'de görüldüğü üzere, hesaplanan F test istatistiği (16.10951) üst kritik değerlerden büyüktür ve değişkenler arasında %1 anlamlılık düzeyinde eşbütünleşme ilişkisi bulunmaktadır. Başka bir ifadeyle BIST 100 Endeksi ile VIX Endeksi arasında uzun dönemde istatistiksel olarak anlamlı bir ilişki bulunmaktadır. Uzun dönem katsayılarına bakıldığında, uzun dönem katsayısının olasılık değerlerinin %1 seviyesinde anlamlı olduğu görülmektedir. Tabloda yer alan hata düzeltme modeli sonuçları incelendiğinde, hata düzeltme katsayısının [CointEq(-1)] negatif, birden küçük ve istatistiksel olarak %1 düzeyinde anlamlı olduğu görülmektedir. Bu bulgudan hareketle, hata düzeltme mekanizmasının çalıştığını ve kısa dönemde dengeden sapmaların 4,9 ay sonra (1 / 0.205772 = 4,9) düzelerek uzun dönem dengesine ulaştığı söylenebilir.

Grafik 4'te, tahmin edilen ARDL modelinin kararlılığını test etmek için yapılan CUSUM ve CUSUMQ kare testlerinin sonuçları yer almaktadır. Grafik incelendiğinde hem CUSUM hem de CUSUMQ kare istatistiklerinin %5 anlamlılık düzeyinde kritik sınırlar

içerisinde kaldığı görülmektedir. Parametre tahminleri %95 güven sınırlarını ifade eden kesikli çizgilerin arasında kaldığı için parametre tahmininin istikrar koşulunu sağladığı söylenebilir.

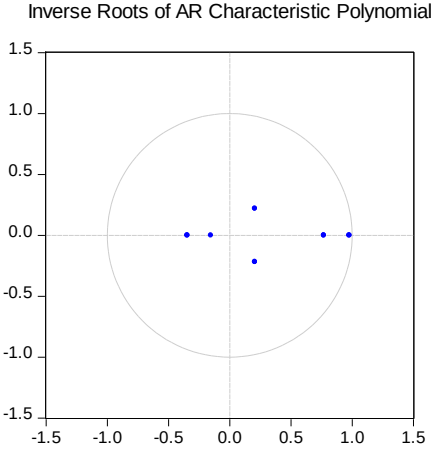
Grafik: 4
CUSUM ve CUSUMQ Kare Grafikleri



BIST 100 Endeksi serisinin düzeyde durağan olması, VIX Endeksi serisinin ise birinci farkta durağan olması nedeniyle bu değişkenler arasındaki nedensellik ilişkisi Toda-Yamamoto (1995) nedensellik testi ile araştırılmıştır. BIST 100 Endeksi serisi I(0), VIX Endeksi serisi ise I(1) olduğu için maksimum bütünleşme derecesi (d_{max}) 1 olarak belirlenmiştir. Maksimum bütünleşme derecesi belirlendikten sonra VAR modeli için optimal gecikme sayısı belirlenmiştir. Optimal gecikme sayısını belirlemek için VAR modeli ile tahmin edilen bilgi kriterlerinden faydalanılmış ve sonuçlar Ek 4'te sunulmuştur. Optimal gecikme uzunluğunun LR test istatistiği, FPE, AIC ve HQ bilgi kriterileri 2, SC bilgi kriteri ise 1 olduğuna işaret etmektedir. Öncelikle 1 gecikme uzunluğunda VAR modeli tahmin edilmiştir. Ancak tahmin edilen modelde otokorelasyon problemi görülmüştür. Daha sonra gecikme düzeyi 2 alınarak VAR modeli tahmin edilmiş ve tahmin edilen modelde otokorelasyon probleminin olmadığı, ayrıca modelin istikrar koşulunu sağladığı görülmüştür. Bu nedenle en uygun gecikme düzeyinin 2 olduğuna karar verilmiştir. (k + d_{max}) dereceden VAR (3) modeli tahmin edilmiş ve k gecikmeli değerlere Wald istatistiği yapılarak değişkenler arasındaki nedensellik ilişkisi incelenmiştir.

Grafik 5 incelediğinde, AR karakteristik polinomunun ters köklerinin birim çemberin içinde yer aldığı görülmektedir. Dolayısıyla, tahmin edilen VAR modelinin istikrar koşulunu sağladığı söylenebilir.

Grafik: 5
AR Karakteristik Polinomunun Ters Kökleri



Tablo 12'de otokorelasyon LM testi sonuçları yer almaktadır. Tablo incelendiğinde, otokorelasyon LM testinde tüm gecikmelerde olasılık değerlerinin 0,05'ten büyük olduğu görülmektedir. Dolayısıyla tahmin edilen modelde otokorelasyon probleminin bulunmadığı söylenebilir.

Tablo: 12
Serisel Korelasyon LM Testi Sonuçları

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	1,098632	4	0,8945	0,274248	(4, 302.0)	0,8945
2	0,415596	4	0,9812	0,103627	(4, 302.0)	0,9812
3	0,949493	4	0,9174	0,236961	(4, 302.0)	0,9174
4	0,906055	4	0,9237	0,226104	(4, 302.0)	0,9237
5	4,989937	4	0,2883	1,253662	(4, 302.0)	0,2883
6	1,647305	4	0,8003	0,411585	(4, 302.0)	0,8003
7	2,818728	4	0,5886	0,705633	(4, 302.0)	0,5886
8	6,450936	4	0,1679	1,624645	(4, 302.0)	0,1679
9	6,244442	4	0,1816	1,572102	(4, 302.0)	0,1816
10	3,067348	4	0,5466	0,768188	(4, 302.0)	0,5466
11	1.188234	4	0.8800	0.296659	(4, 302.0)	0.8800
12	9.037637	4	0.0602	2.285874	(4, 302.0)	0.0602

Değişkenler arasındaki nedensellik ilişkisini araştırmak için gerçekleştirilen Toda-Yamamoto nedensellik testine ilişkin sonuçlar Tablo 13'te yer almaktadır. Wald istatistiğine ait olasılık değerleri incelendiğinde, "VIX Endeksinden BIST 100 Endeksine doğru bir nedensellik yoktur" şeklinde ifade edilen H_0 hipotezi, olasılık değerinin 0,05'ten küçük olması nedeniyle reddedilmektedir. "BIST 100 Endeksinden VIX Endeksine doğru bir nedensellik yoktur" şeklinde ifade edilen H_0 hipotezi ise olasılık değerinin 0,05'ten büyük olması nedeniyle reddedilememektedir. Sonuç olarak Toda-Yamamoto nedensellik testinden elde edilen bulgular, değişkenler arasında tek yönlü bir nedensellik ilişkisinin var

olduğunu, ilişkinin yönünün ise VIX Endeksinden BIST 100 Endeksine doğru olduğunu göstermektedir.

Tablo: 13
Toda-Yamamoto Nedensellik Testi Sonuçları

H_0: VIX Endeksinden BIST 100 Endeksine doğru bir nedensellik yoktur
Ki-Kare: 34,50605*** Olasılık Değeri: [0,0000]
H_0: BIST 100 Endeksinden, VIX Endeksine doğru bir nedensellik yoktur
Ki-Kare: 2,130758 Olasılık Değeri: [0,3446]
*** simgesi %1 önem düzeyinde anlamlı olduğunu göstermektedir.

5. Sonuç

Davranışsal finans teorisinde, etkin piyasalar teorisinin tersine yatırım kararlarında çeşitli psikolojik faktörlerin etkisinin olduğu, dolayısıyla da söz konusu psikolojik faktörlerin menkul kıymetlerin fiyatlarını etkileyeceği ileri sürülmektedir. Bu çalışmada, Ocak 2007-Ağustos 2020 döneminde BIST 100 Endeksi ile yatırımcı duyarlılığını temsil ettiği kabul edilen göstergelerden tüketici güven endeksleri ve VIX Endeksi arasındaki ilişki incelenmiştir.

Yapılan analizler sonucunda, BIST 100 Endeksi ile TCMB Tüketici Güven Endeksi arasında eşbütünleşme ilişkisi bulunamamıştır. VAR modeli üzerinden yapılan Granger nedensellik testi sonucunda, BIST 100 Endeksinden TCMB Tüketici Güven Endeksine doğru tek yönlü nedensellik ilişkisi tespit edilmiştir. Bu sonuç; Topuz (2011), Kale ve Akkaya (2016), Canöz (2018), Tekin ve Cengiz (2018), Eyüboğlu ve Eyüboğlu (2018), Cagli (2019) ve Baştürk'ün (2019) çalışmasından elde edilen bulgularla uyumludur.

BIST 100 Endeksi ile Bloomberg HT Tüketici Güven Endeksi ve VIX Endeksi arasındaki eşbütünleşme ilişkisini araştırmak için ARDL Sınır Testi kullanılmış ve yapılan eşbütünleşme testlerinde değişkenler arasında eşbütünleşme ilişkisinin olduğu görülmüştür. Ayrıca kısa dönemde hata düzeltme mekanizmasının çalıştığı ve kısa dönemde dengeden sapmaların bir süre sonra düzelerek uzun dönem dengesine ulaştığı tespit edilmiştir. Söz konusu değişkenler arasındaki nedensellik ilişkisini incelemek için Toda-Yamamoto Nedensellik Testi kullanılmıştır. BIST 100 Endeksinden Bloomberg HT Tüketici Güven Endeksine doğru tek yönlü nedensellik ilişkisinin olduğu görülmüştür. Elde edilen bu bulgu, Görmüş ve Güneş (2010) ve Canöz'ün (2018) çalışmalarından elde edilen sonuçlar ile uyumludur. Ayrıca tüketici güven endekslerine ilişkin yapılan nedensellik analizlerinden elde edilen bulgular, Otoo (1999), Christ ve Bremmer (2003), Jansen ve Nahuis'in (2003), Wang, Keswani ve Taylor (2006) ve Bremmer (2008) gibi literatürde yer alan çalışmaların büyük bir kısmında elde edilen sonuçlarla tutarlıdır.

BIST 100 Endeksi ile VIX Endeksi için yapılan nedensellik analizinde ise VIX Endeksinden BIST 100 Endeksine doğru tek yönlü nedensellik ilişkisi bulunmuştur. Bu sonuç, Köse ve Akkaya'nın (2016) 2007-2016 dönemini kapsayan ve BIST 100 Getiri Endeksi ile VIX Endeksi arasında nedensellik ilişkisi bulamadıkları çalışmanın sonuçlarıyla çelişmektedir. Bu durum, araştırmalarda kullanılan veri, yöntem ve araştırma döneminin

farklı olmasından kaynaklanabilir. VIX Endeksi ile BIST 100 endeksi arasında teorik beklentilerle uyumlu olarak negatif bir ilişki bulunmuştur. VIX Endeksindeki yükseliş, BIST 100 Endeksini üzerinde düşüş yönünde bir etki yaratmaktadır.

Yatırımcı duyarlılığını temsilen kullanılan TCMB Tüketici Güven Endeksi ve Bloomberg HT Tüketici Güven Endeksi Türkiye için hesaplanan ulusal düzeyde tüketici güven endeksleridir. BIST 100 Endeksinden her iki tüketici güven endeksine doğru tek yönlü nedensellik ilişkisinin çıkmasının, tüketici güveninde ortaya çıkan değişimlerin yatırımcılar tarafından önceden fiyatlandırılmasından kaynaklanabileceği söylenebilir. Yatırımcı duyarlılığını temsilen kullanılan VIX Endeksi ise uluslararası düzeyde tüm finansal piyasalarda takip edilen bir göstergedir. VIX Endeksi ile BIST 100 Endeksi için yapılan analizlerden elde edilen bulgular, VIX Endeksinin bir yatırımcı duyarlılığı göstergesi olarak Türkiye'de yatırımcı davranışlarını etkileyen bir faktör olduğunu göstermektedir. Ayrıca, yatırımcıların, VIX Endeksini BIST 100 Endeksinde meydana gelecek değişimlerin öncü bir göstergesi olarak takip edip, bu endekste bir değişim olduğunda Borsa İstanbul pay piyasasındaki pozisyonlarını gözden geçirmeleri faydalarına olabilecektir. Politika yapıcıların bu endeksi dikkate almasının, alacakları kararların piyasalara daha sağlıklı bir şekilde yansımasını sağlamak adına faydalı olabileceği de söylenebilir.

Davranışsal finans teorisinde, yatırımcıların yatırım kararı verirken çeşitli psikolojik faktörlerden etkilendikleri ve her zaman rasyonel kararlar vermedikleri ileri sürülmektedir. Literatür incelendiğinde, davranışsal finans teorisini haklı çıkarak çok sayıda ampirik kanıt bulunmaktadır. Bu çalışmada da davranışsal finans teorisini destekleyici nitelikte bazı kanıtlara ulaşılmıştır. Finansal piyasalarda işlem yapan yatırımcıların yatırım kararlarda, özellikle pay senetleri borsada işlem gören şirketlerin sahip ve yöneticilerinin alacakları finansal kararlarda ve finansal karar alanlarına ilişkin oluşturacakları politikaların belirlenmesinde ve politika yapıcıların alacakları kararlarda piyasaları etkileyen psikolojik faktörlerin neler olduğunun ve bu faktörlerdeki değişime piyasaların nasıl tepki verdiğinin bilinmesi önem arz etmektedir. Bu nedenle, çalışmadan elde edilen bulgular çerçevesinde VIX Endeksindeki değişimin yatırımcılar, şirketlerin yöneticileri ile hissedarlar ve politika yapıcılar tarafından takip edilmesinin önemli olduğu söylenebilir.

Kaynaklar

Akdağ, S. (2019), "VIX Korku Endeksinin Finansal Göstergeler Üzerindeki Etkisi: Türkiye Örneği", *Hitit Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 12(1), 235-256.

Baker, M. & J. Wurgler (2007), "Investor Sentiment in the Stock Market", *Journal of Economic Perspectives*, 21(2), 129-151.

Baker, M. & J.C. Stein (2004), "Market Liquidity as a Sentiment Indicator", *Journal of Financial Markets*, 7(3), 271-299.

Başarır, Ç. (2018), "Korku Endeksi (VIX) ile BİST 100 Arasındaki İlişki: Frekans Alanı Nedensellik Analizi", *Dokuz Eylül Üniversitesi İşletme Fakültesi Dergisi*, 19(2), 177-191.

Baştürk, M.F. (2019), "Tüketici Güven Endeksi ile Hisse Senedi Piyasası Arasındaki İlişki: Türkiye Örneği", *Maliye Dergisi*, 177, 145-159

Bloomberg HT (2019), *Bloomberg HT Tüketici Güven Endeksi Hesaplama Methodu*, <https://www.bloomberght.com/bloomberg-ht-guven-endeksi-hesaplama-methodu-2224483>, 20.11.2020.

Bremmer, D. (2008), "Consumer Confidence and Stock Prices", Paper presented at the *72nd Annual Meeting of the Midwest Economics Association*, Hyatt Regency, Chicago, Illinois.

Brown G.W. & M.T. Cliff (2004), "Investor Sentiment and the Near-Term Stock Market", *Journal of Empirical Finance*, 11, 1-27.

Cagli, E.C. (2019), "The Causality Between Consumer Confidence Index and Stock Returns: Evidence from Recursive Evolving Granger Causality Test", *Applied Economics and Finance*, 14(Special Issue), 164-172.

Cagli, E.C. et al. (2020), "The Causal Linkages between Investor Sentiment and Excess Returns on Borsa Istanbul", *Borsa İstanbul Review*, 20(3), 214-223.

Canbaş, S. & S.Y. Kandır (2007), "Yatırımcı Duyarlılığının İMKB Sektör Getirileri Üzerindeki Etkisi", *Dokuz Eylül Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 22(2), 219-248.

Canöz, İ. (2018), "Borsa İstanbul 100 Endeksi ile Tüketici Güven Endeksleri Arasındaki Nedensellik İlişkisi: Türkiye Örneği", *Fiscaoeconomia*, 2(1), 136-153.

Christ, K.P. & D.S. Bremmer (2003), "The Relationship between Consumer Sentiment and Stock Prices", Paper presented at the *78th Annual Conference of the Western Economics Association International*, 15 July 2003, Denver-ABD.

De Long J.B. et al. (1990), "Noise Trader Risk in Financial Markets", *Journal of Political Economy*, 98(4), 703-738.

Elton, E.J. et al. (1998), "Do Investor Care about Sentiment?", *The Journal of Business*, 71(4), 477-500.

Eyüboğlu, S. & K. Eyüboğlu (2018), "Tüketici Güven Endeksi ile Borsa İstanbul Sektör Endeksleri Arasındaki İlişkinin Araştırılması", *DEÜ İİBF Dergisi*, 33(1), 235-259.

Fama E.F. (1970), "Efficient Capital Markets: A Review of Theory and Empirical Work", *Journal of Finance*, 25(2), 413-416.

Fisher, K.L. & M. Statman (2000), "Investor Sentiment and Stock Returns", *Financial Analyst Journal*, 56(2), 16-23.

Giot, P. (2005), "Relationships Between Implied Volatility Indexes and Stock Index Returns", *The Journal of Portfolio Management*, 31(3), 92-100.

Görmüş, Ş. & S. Güneş (2010), "Consumer Confidence, Stock Prices and Exchange Rates: The Case of Turkey", *Applied Econometrics and International Development*, 10(2), 103-114.

Hacıhasanoğlu, E. & U. Soytaş (2009), "Global Risk Algısının Gelişmekte Olan Piyasalara Etkisi: Türkiye Örneği", *Ekonomik ve Sosyal Araştırmalar Dergisi*, 5(5), 39-50.

Hsu, C.-C. et al. (2011), "Consumer Confidence and Stock Markets: The Panel Causality Evidence", *International Journal of Economics and Finance*, 3(6), 91-98.

Jansen, W. J. & N.J. Nahuis (2003), "The Stock Market and Consumer Confidence: European Evidence", *Economics Letters*, 79(1), 89-98.

Johansen, S. & K. Juselius (1990), "Maximum Likelihood Estimation and Inference on Cointegration-with Application to the Demand for Money", *Oxford Bulletin of Economics and Statistics*, *52*(2), 169-210.

Kahneman, D. & A. Tvertsky (1979), "Prospect Theory: An Analysis of Decision under Risk", *Econometrica*, 47(2), 263-292.

Kale, S. & M. Akkaya (2016), "The Relation between Confidence Climate and Stock Returns: The Case of Turkey", *Procedia Economics and Finance*, 38, 150-162.

Kandır, S.Y. (2006), "Tüketici Güveni ve Hisse Senedi Getirileri İlişkisi: İMKB Mali Sektör Hisse Senetleri Üzerine Bir Uygulama", *Çukurova Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 15(2), 217-230.

Kaya, A. & A. Çoşkun (2015), "VIX Endeksi Menkul Kıymet Piyasalarının Bir Nedeni midir? Borsa İstanbul Örneği", *Cumhuriyet Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 16(1), 175-186.

Kaya, E. (2015), "Borsa İstanbul (BIST) 100 Endeksi ile Zımni Volatilite (VIX) Endeksi Arasındaki Eş-Bütünleşme ve Granger Nedensellik", *KMÜ Sosyal ve Ekonomik Araştırmalar Dergisi*, 17(28), 1-6.

Kaya, E. (2018), "Yatırımcı Duyarlılığı ve Hisse Senedi Getirileri", *Finans & Politik ve Ekonomik Yorumlar Dergisi*, 645, 91-112.

Korkmaz, T. & E.İ. Çevik (2009), "Reel Kesim Güven Endeksi ile İMKB 100 Endeksi Arasındaki Dinamik Nedensellik İlişkisi", *İstanbul Üniversitesi İşletme Fakültesi Dergisi*, 38(1), 24-37.

Koy A. & M. Akkaya (2017), "The Role of Consumer Confidence as a Leading Indicator on Stock Returns: A Markov Switching Approach", *Annals of "Dunarea de Jos" University of Galati: Fascicle I. Economics and Applied Informatics*, 23(1), 36-47.

Köse, A.K. & M. Akkaya (2016), "Beklenti ve Güven Anketlerinin Finansal Piyasalara Etkisi: BIST 100 Üzerine Bir Uygulama", *Bankacılar Dergisi*, 99, 3-15.

Kuzu, S. (2019), "Volatilite Endeksi (VIX) ile BIST 100 Arasındaki Johansen Eş-Bütünleşme ve Frekans Alanı Nedensellik Analizi", *Turkish Studies*, 14(1), 479-493.

Lee, C.M.C. et al. (1991), "Investor Sentiment and the Closed-End Fund Puzzle", *Journal of Finance*, 46(1), 75-109.

Lee, Y.W. & Z. Song (2003), "When Do Value Stocks Outperform Growth Stocks? Investor Sentiment and Equity Style Rotation Strategies", *SSRN Working Paper*.

Müldür, G.T. (2018), "Geleneksel ve Davranışsal Finans: Tarihsel ve Kavramsal Çerçeve", *Adana Alparslan Türkeş Bilim ve Teknoloji Üniversitesi Sosyal Bilimler Dergisi*, 2(1), 37-45.

Neal, R. & S.M. Wheatley (1998), "Do measures of Investor Sentiment Predict Returns?", *The Journal of Financial and Quantitative Analysis*, 33(4), 523-547.

Olgaç, S. & F. Temizel (2008), "Yatırımcı Duyarlılığı Hisse Senedi Getirileri İlişkisi: Türkiye Örneği", *TİSK Akademi*, 3(6), 224-239.

Otoo, M.W. (1999), "Consumer Sentiment and the Stock Market", Board of Governors of the Federal Reserve System (U.S.) *Finance and Economics Discussion Series*, No. 1999-60.

Öner, H. vd. (2018), "Volatilite Endeksi (VIX) ile Gelişmekte Olan Ülke Hisse Senedi Piyasası Endeksleri Arasındaki Engel-Granger Eş-Bütünleşme ve Granger Nedensellik Analizi", *Finansal Araştırmalar ve Çalışmalar Dergisi*, 10(18), 110-124.

Pesaran, M.H. et al. (2001), "Bound Testing Approaches to the Analysis of Level Relationships", *Journal of Applied Econometrics*, 16(3), 289-326.

Sakarya, Ş. & H.T. Akkuş (2018), "BİST-100 ve BİST Sektör Endeksleri ile VIX Endeksi Arasındaki İlişkinin Analizi", *Balıkesir Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 21(40), 351-373.

Sarı, S.S. (2019), "Borsa İstanbul Hisse Senedi Getirilerinin Yatırımcı Duyarlılığı Aracılığıyla Tahmin Edilmesi", *Doktora Tezi*, Erzincan Binali Yıldırım Üniversitesi, Sosyal Bilimler Enstitüsü.

Sarıtaş, H. & E.H. Nazlıoğlu (2019), "Korku Endeksi, Hisse Senedi Piyasası ve Döviz Kuru İlişkisi: Türkiye İçin Ampirik Bir Analiz", *Ömer Halisdemir Üniversitesi İİBF Dergisi*, 12(4), 542-551.

Schmeling, M. (2009), "Investor Sentiment and Stock Returns: Some International Evidence", *Journal of Empirical Finance*, 16(3), 394-408.

Shleifer, A. (2004), *Inefficient Markets -An Introduction to Behavioral Finance*, New York: Oxford University Press.

Smales, L.A. (2017), "The Importance of Fear: Investor Sentiment and Stock Market Return", *Applied Economics*, 49(34), 3395-3421.

Spyrou, S. (2012), "Sentiment Changes, Stock Returns and Volatility: Evidence from NYSE, AMEX and NASDAQ Stocks", *Applied Financial Economics*, 22(19), 1631-1646.

Şit, A. vd. (2019), "VIX Endeksi ve Borsa Etkileşimi: BIST 100'de Bir Uygulama", içinde: J.S. Oran & M.U. Polat (ed.), *23. Uluslararası Finans Sempozyumu Bildiriler Kitabı*, İstanbul: Marmara Üniversitesi Yayınevi, 766-773.

Tekin, B. & S. Cengiz (2018), "Pay Senedi Piyasası ile Tüketici Güven Endeksi Arasındaki Nedensellik ve Eşbütünleşme İlişkileri: Borsa İstanbul'da Bir Uygulama", *Journal of Social and Humanities Sciences Research*, 5(29), 3837-3847.

Topuz, Y.V. (2011), "Tüketici Güveni ve Hisse Senedi Fiyatları Arasındaki Nedensellik İlişkisi: Türkiye Örneği", *Ekonomik ve Sosyal Araştırmalar Dergisi*, 7(1), 53-65.

TUİK (2020), *Tüketici Güven Endeksinde Yapılan Ana Revizyona İlişkin Metodolojik Doküman*, <https://www.tuik.gov.tr/indir/revizyon/tge_metod_tr.pdf>, 20.11.2020.

Wang, Y.-H. et al. (2006), "The Relationship between Sentiment, returns and Volatility", *International Journal of Forecasting*, 22, 109-123.

Whaley, R.E. (2009), "Understanding the VIX", *Journal of Portfolio Management*, 35(3), 98-105.

Yang, Y. & T. Hasuike (2017), "Construction of Investor Sentiment Index in the Chinese Stock Market", Paper presented at the *6th IIAI International Congress on Advanced Applied Informatics*, 9-13 July 2017, Hamamatsu, Japan.

Ekler

Ek: 1
Gecikme Düzeyinin Seçimi

Lag	LogL	LR	FPE	AIC	SC	HQ
0	135.1812	NA	0.000594	-1.752385	-1.712597	-1.736222
1	507.9445	730.8122	4.64e-06	-6.604533	-6.485169*	-6.556043*
2	514.0733	11.85446	4.51e-06*	-6.632544*	-6.433604	-6.551728
3	516.5441	4.713980	4.61e-06	-6.612423	-6.333907	-6.499280
4	521.4241	9.182117	4.55e-06	-6.624002	-6.265910	-6.478533
5	521.9383	0.954031	4.77e-06	-6.578136	-6.140469	-6.400341
6	527.2914	9.790426	4.69e-06	-6.595939	-6.078697	-6.385817
7	528.3930	1.985760	4.87e-06	-6.557802	-5.960984	-6.315354
8	531.0194	4.665384	4.96e-06	-6.539729	-5.863335	-6.264954
9	532.4552	2.512600	5.14e-06	-6.505989	-5.750019	-6.198888
10	534.9180	4.245104	5.25e-06	-6.485763	-5.650217	-6.146335
11	540.8395	10.05102*	5.12e-06	-6.511046	-5.595925	-6.139292
12	544.9611	6.887341	5.12e-06	-6.512646	-5.517948	-6.108565

LR: Ardışık modifiye edilmiş LR test istatistiği, FPE: Son kestirim hatası, AIC: Akaike bilgi kriteri, SC: Schwarz bilgi kriteri, HQ: Hannan-Quinn bilgi kriteri

Ek: 2
Gecikme Düzeyinin Seçimi

Lag	LogL	LR	FPE	AIC	SC	HQ
0	506.2145	NA	4.31e-06	-6.678338	-6.638374*	-6.662103*
1	511.9383	11.22007	4.21e-06	-6.701169	-6.581278	-6.652463
2	514.8931	5.713971	4.27e-06	-6.687326	-6.487506	-6.606149
3	520.6526	10.98499*	4.18e-06*	-6.710631*	-6.430883	-6.596983
4	521.0670	0.779403	4.38e-06	-6.663139	-6.303463	-6.517020
5	524.9427	7.186724	4.39e-06	-6.661493	-6.221889	-6.482903
6	526.5559	2.948542	4.53e-06	-6.629879	-6.110347	-6.418818
7	529.0669	4.523263	4.62e-06	-6.610158	-6.010699	-6.366626
8	530.9869	3.407603	4.75e-06	-6.582608	-5.903220	-6.306605
9	532.8188	3.202847	4.90e-06	-6.553892	-5.794576	-6.245418
10	537.9297	8.800214	4.83e-06	-6.568606	-5.729362	-6.227661
11	540.8729	4.989708	4.90e-06	-6.554607	-5.635436	-6.181192
12	541.7545	1.471400	5.12e-06	-6.513305	-5.514206	-6.107419

LR: Ardışık modifiye edilmiş LR test istatistiği, FPE: Son kestirim hatası, AIC: Akaike bilgi kriteri, SC: Schwarz bilgi kriteri, HQ: Hannan-Quinn bilgi kriteri

Ek: 3
Gecikme Düzeyinin Seçimi

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-18.36898	NA	0.004482	0.268013	0.307801	0.284176
1	316.1216	655.7776	5.79e-05	-4.080548	-3.961184	-4.032058
2	335.8604	38.17893	4.71e-05	-4.287637	-4.088697*	-4.206821
3	343.5915	14.75014	4.48e-05*	-4.336730*	-4.058215	-4.223588*
4	345.4503	3.497449	4.61e-05	-4.308556	-3.950465	-4.163087
5	346.4969	1.941735	4.80e-05	-4.269696	-3.832029	-4.091900
6	352.1364	10.31436*	4.70e-05	-4.291268	-3.774026	-4.081146
7	353.3519	2.191112	4.87e-05	-4.254630	-3.657812	-4.012182
8	355.0575	3.029622	5.03e-05	-4.224440	-3.548046	-3.949665
9	356.8617	3.157437	5.18e-05	-4.195549	-3.439579	-3.888448
10	359.5044	4.555226	5.28e-05	-4.177690	-3.342144	-3.838262
11	363.9384	7.525982	5.25e-05	-4.183399	-3.268278	-3.811645
12	366.4797	4.246728	5.36e-05	-4.164207	-3.169509	-3.760126

LR: Ardışık modifiye edilmiş LR test istatistiği, FPE: Son kestirim hatası, AIC: Akaike bilgi kriteri, SC: Schwarz bilgi kriteri, HQ: Hannan-Quinn bilgi kriteri

Ek: 4
Gecikme Düzeyinin Seçimi

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-96.37486	NA	0.012508	1.294406	1.334194	1.310569
1	200.0784	581.2043	0.000267	-2.553663	-2.434299*	-2.505173
2	207.4734	14.30368*	0.000255*	-2.598335*	-2.399395	-2.517519*
3	209.4388	3.749702	0.000262	-2.571563	-2.293048	-2.458421
4	209.7291	0.546242	0.000275	-2.522752	-2.164660	-2.377283
5	210.6143	1.642157	0.000287	-2.481766	-2.044100	-2.303971
6	214.1261	6.422978	0.000289	-2.475343	-1.958101	-2.265221
7	215.8031	3.023060	0.000298	-2.444778	-1.847959	-2.202330
8	218.5559	4.889713	0.000303	-2.428366	-1.751972	-2.153592
9	221.0865	4.428620	0.000309	-2.409033	-1.653063	-2.101931
10	224.3993	5.710186	0.000312	-2.399990	-1.564444	-2.060563
11	226.0962	2.880316	0.000322	-2.369687	-1.454565	-1.997933
12	226.4868	0.652707	0.000338	-2.322195	-1.327497	-1.918114

LR: Ardışık modifiye edilmiş LR test istatistiği, FPE: Son kestirim hatası, AIC: Akaike bilgi kriteri, SC: Schwarz bilgi kriteri, HQ: Hannan-Quinn bilgi kriteri

Sosyoekonomi

2021, Vol. 29(50), 413-432

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.19
Date Submitted: 26.12.2020
Date Revised: 14.07.2021
Date Accepted: 01.08.2021

Makina Öğrenmesi Yöntemleri ile Türk Mevduat Bankalarının Müşteri Tahminine Yönelik Bir Uygulama

Filiz YETİZ *(https://orcid.org/0000-0001-5480-9268), Akdeniz University, Turkey; filizyetiz@akdeniz.edu.tr*

Mustafa TERZİOĞLU *(https://orcid.org/0000-0002-4614-7185), Akdeniz University, Turkey; mterzioglu@akdeniz.edu.tr*

Mehmet KAYAKUŞ *(https://orcid.org/0000-0003-0394-5862), Akdeniz University, Turkey; mehmetkayakus@akdeniz.edu.tr*

An Analysis of Turkish Deposit Banks' Customer Forecasting with Machine Learning Methods

Abstract

Banks have expanded their marketing activities to uphold their existing customers and gain new customers to accentuate their market share in the sector. This study aims to emphasize the importance of customer forecasting and investigate the factors that are effective in determining the number of customer forecasting. Machine learning, artificial neural networks, and support vector machines methods are used. The variables commonly used in the literature, such as number of branches, number of employees, total deposits, total loans, were selected to determine customer estimates by considering the monthly data of deposit banks in the Turkish banking sector for the period 2011-2020. As a result of the analysis, the number of customers estimates of deposit banks in Turkey was successfully obtained. In light of these estimates, it is thought that banks can facilitate the creation of targets for identifying target customers they aim to provide services to in the future.

Keywords : Banking, Customer Relations, Customer Satisfaction, Customer Loyalty, Artificial Neural Networks, Support Vector Machines.

JEL Classification Codes : G20, G21, G29.

Öz

Bankalar, sektördeki pazar paylarını artırmak için pazarlama faaliyetlerini mevcut müşteriyi koruma ve yeni müşteri kazanma konusunda genişletmişlerdir. Çalışmanın amacı, müşteri sayısı tahmininin önemini vurgulamak ve müşteri sayısı tahmini belirlemede etkili olan etmenleri araştırmaktır. Çalışmada makine öğrenmesi yöntemlerinden yapay sinir ağları ve destek vektör makineleri kullanılmıştır. Çalışmada, Türk Bankacılık sektöründeki mevduat bankaların 2011-2020 dönemi aylık verileri kullanılarak şube sayısı, çalışan sayısı, toplam mevduat, toplam krediler gibi literatürde kullanılan değişkenler müşteri tahminini tespit etmede seçilmiştir. Analiz sonucunda, Türkiye'deki mevduat bankalarının müşteri sayısı tahminleri başarılı bir şekilde elde edilmiştir. Bu çalışmanın bankaların hizmet sunmayı hedeflediği hedef müşterileri belirleme aşamasında bankalara yol göstereceği düşünülmektedir.

Anahtar Sözcükler : Bankacılık, Müşteri ilişkileri, Müşteri Memnuniyeti, Müşteri Sadakati, Yapay Sinir Ağları, Destek Vektör Makineleri.

1. Giriş

Bankalar, hizmet sektörü içerisinde yer alan ve ekonomik büyümenin lokomotifini oluşturan önemli finansal kurumlardan biridir. Bankaların hizmet sunduğu müşteriler ise bankaların faaliyetlerine kârlı bir şekilde devam edebilmelerini sağlayan en değerli kaynağıdır. Bu bağlamda bankalar mevcut müşterileri ile çalışmalarına devam etmek ve yeni müşteriler kazanmak için farklı pazarlama stratejileri üzerinde çalışmaktadır. Bankalar açısından öncelik mevcut müşterilerin kendisine sunulan bankacılık hizmetinden memnun kalması böylece banka ile çalışmalarına devam etmesidir. Ayrıca bankalar mevcut müşterilerinin kullandıkları ürün yelpazesini genişleterek çalışmakta, müşterinin daha önceden kullanmadığı ürün ve hizmetlerin kullanması için ise azami çaba göstermektedir. Bankalar, mevcut müşterilerinin finansman ihtiyaçlarını zamanında belirlemek, finansman ihtiyaçlarına uygun kredi ve mevduat ürünlerini özel fiyatlamalarla kullandırmak, yeni ürün ve hizmetleri konusunda bilgi vermek ve müşterinin banka ile olan çalışmalarında devamlılığı sağlamak için her geçen gün yeni uygulamalar geliştirmektedir. Ancak hangi müşteriler ile çalışılacağı, hangi müşteriler ile çalışmaların artırılacağı ve hangi müşteriler ile çalışmaların azaltılacağı konusunda bankaların aktif ve pasif müşterilerine ait bilgilere ihtiyaç vardır. Bu çerçevede bankaların mevcut müşterilerini koruması hatta yeni müşterilere kolaylıkla ulaşabilmesi açısından çalışmaya devam edeceği müşteri bilgisine banka içi veya banka dışı kaynakları kullanarak hızlı bir şekilde ulaşması gerekmektedir.

Bankacılık sektöründe temel sorun müşteri sadakatini kaybetmemektir. Bu açıdan bankalar farklı yöntemler kullanmaktadır. En çok kullanılan yöntemler, tüm müşterilerine sürekli olarak belli zaman aralıklarıyla yeniliklerden ve kurum içerisinde gerçekleşen gelişmelerden haberdar tutmak için gerçekleştirilen müşteri ziyaretleridir. Müşteri ziyaretleri bankaların müşteri ilişkilerini yönettiği önemli bir pazarlama tekniğidir. Fakat bu iş ciddi bir çaba ve maliyet ortaya çıkarmaktadır. Bu maliyetin en aza indirilebilmesi için doğru müşteri kümesinin bulunması ve o yönde çaba sarf edilmesidir (Balcioglu & Sezen, 2019).

Günümüz rekabet koşullarında bankalar, kârlılıklarını arttırmak ve devam ettirmek için yeni ürün ve yöntemleri pazarlamak için müşteri memnuniyetine özen göstermekte, müşterilerinin banka ile çalışmasını devam ettirmek için özen göstermektedirler. Bankalarda kobi kredilerinin değerlendirmesi (Yazıcı, 2007), kredi risk yönetimi tahmini (Pacelli & Azzollini, 2011), mevduat bankalarının kârlılığının tahmini (Sönmez, Zontul & Bülbül, 2015), bankacılık alanında müşteri kaybının öngörülmesi (Bilal-Zorić, 2016), banka müşterilerinin bankadan ayrılma olasılığının tahmini (Balcioglu & Sezen, 2019) gibi bankacılık konularında literatürde yapay sinir ağları yöntemi kullanılmıştır. Literatürdeki bankacılık konularından farklı olarak bu çalışmada bankacılık sektöründe hizmet sunulan müşterinin önemli olduğu düşüncesi ile müşteri sayısının tahmini amaçlanmıştır. Ayrıca geleneksel yöntemlere göre (çoklu doğrusal regresyon vb.) gerçeğe yakın sonuçlar veren ve öngörü başarısı yüksek olan tahmin yöntemi olarak yapay sinir ağları ve destek vektör makinaları yöntemi kullanılmıştır.

Ayrıca çalışmada banka müşteri sayısının tahmin edilmesi ile bankaların müşteri sadakati, müşteri memnuniyetini artırmak amaçlı gelecek politika hedeflerinin oluşturması konusunda destek olacağı düşünülmektedir. Bu çalışmayı literatürdeki diğer çalışmalardan farklılaştıran unsurlar ise, hem bankaların mevcut müşteri sayılarını düzenli takip edebilmeleri açısından bankalara önemli bilgiler vermesi hem de son zamanlarda bankacılık literatüründe kullanılan yapay sinir ağları ve destek vektör regresyonu yöntemlerinin kullanılmasıdır.

Bu amaçla çalışmada, Türk Bankacılık sektöründeki mevduat bankalarının 2011-2020 dönemi aylık verileri aralığında, banka şube sayısı, çalışan sayısı, mevduat, krediler değişkeni müşteri tahminini etkileyen etmenler olarak çıkış değişkenleri olarak seçilmiştir. Bankalarda müşteri tahmini analizinde kullanılan değişkenlerinden biri banka şube sayısı ile şubelerde çalışan personel sayısıdır. Bankaların yeni müşteri kazandığı, müşterileriyle iletişimi güçlendirerek onları kalıcı kıldığı kanal olması ve çoğu müşterinin ilk erişim noktası olarak şube bankacılığını hâlâ tercih ediliyor olması nedenleriyle şubelerin varlığı sektör açısından önemlidir. Bankalar, şube sayılarını arttırmayı ve şubelerde daha çok pazarlamaya yönelik hizmet vermeyi tercih etmektedir (Başar, Kabak & Topçu, 2015: 3). Türk bankacılık sektöründeki Mart 2021 itibariyle mevduat bankalarındaki banka şube sayısı 9.858 adet, çalışan sayısı 180.889 kişiye ulaşmıştır (TBB, 2021). Şube sayısı ve çalışan sayısı bankalarda ihtiyaca uygun şekilde artırıldığı zaman müşteri memnuniyeti artmakta ve müşteri sadakati sağlanmaktadır Buna bağlı olarak mevcut müşterilerin bankacılık hizmetlerine daha hızlı cevap verilebilmekte dolayısıyla müşterilerin banka ile çalışmaları devamlılık göstermektedir. Analizde kullanılan değişkenlerden diğerleri ise kredi ve mevduat değişkenleridir. Johnston 1997 yılında yaptığı çalışmada müşteri sadakatinde ve potansiyel müşterilerin bankayı tercih etmesinde temel unsurların bankaların sunduğu en önemli iki ürün olan mevduat ve kredi olduğunu belirtmiştir. Mevduat ve kredi ürünlerinin çeşitliliği hizmet kalitesini ve müşteri memnuniyetini artırmaktadır. Bu nedenle müşteriler bankaları ile çalışmalarını uzun süre devam ettirmektedirler (Johnston, 1997). Bu amaçla söz konusu bağımsız değişkenler bankalar ile çalışması devam eden mevcut müşterilerin sağlıklı bir şekilde öngörülebilmesi açısından tercih edilmiş ve çalışmamızda yer verilmiştir.

Yapılan analiz sonucunda, Türkiye'deki mevduat bankalarının müşteri tahminleri başarılı bir şekilde elde edilmiş ve bu tahminler ışığında bankaların gelecekte hizmet sunmayı amaçladığı yeni müşterileri belirleme hedeflerinin oluşturması aşamasında bankalara kolaylık sağlayabileceği düşünülmektedir. Ayrıca müşteri tahmin sonuçları, bankaların aktif müşterileri ile çalışmaya devam edip etmemeleri konusunda ve bu müşterilere yönelik hangi tür yeni finansal ürün ve hizmetleri oluşturması gerektiği konusunda stratejiler oluşturmalarına yardımcı olabilecektir. Müşteri tahmini analizi sonuçları belirli dönemlerde bankalar tarafından tekrarlandığında söz konusu bankayla çalışma sayısı artan veya azalan müşterilerin sayısı takip edilebilecektir. Çalışmamızdaki müşteri sayısını doğru bir şekilde tahminleme bu açıdan da önem arz etmektedir.

Çalışmada değişkenlerin seçimi ve zaman periyodunu kapsayan iki sınırlılık vardır. Birincisi, Türk Mevduat Bankacılık Sektörü değerlendirmesi için 2011-2020 aylık dönemi verileri kullanılmıştır. İkinci sınırlılık ise değişkenlerin seçimi ve ülke ile ilgilidir. Çalışmada kullanılan değişkenler Türkiye ile sınırlıdır ve araştırmada incelenen banka sayısı 26 adettir. Türk Bankacılık sektöründeki mevduat bankalarının müşteri tahminin ölçütü olarak; banka şube sayısı, çalışan sayısı, mevduat, krediler değişkeni müşteri tahminini etkileyen bankacılık sektörünün iç dinamikleri değişken olarak seçilmiştir.

Çalışmanın birinci bölümü olan giriş kısmında müşterinin değeri ile bankalar açısından önemi açıklanmış, ikinci bölümde literatür incelemesine yer verilmiştir. Çalışmanın üçüncü bölümünde analizde kullanılan veri seti ve yöntem hakkında detaylı bilgiler verilmiştir. Dördüncü bölümde araştırmanın analiz sonuçları ve bulgulara, son bölümde ise çalışmayla ilgili tartışma ve genel değerlendirmeler ele alınmıştır.

2. Kavramsal Çerçeve ve Literatür Özeti

Müşteri kavramı, işletmelerin sunduğu mal ve hizmetleri satın alan tüketiciler şeklinde ifade edilebilir. Tüketiciler bir mal veya hizmeti aldıklarında o ürünün müşterisi olmaktadırlar (Altuğ & Özhan, 2018).

Yeni müşteri kazanmanın maliyeti mevcut müşteri ile çalışmanın maliyetinden altı kat daha fazla olduğu öngörülmektedir (Demir & Kırdar, 2007). Bu durum bankaları mevcut müşterilerinin bankacılık faaliyetleri memnuniyetlerini sürekli iyileştirmeye zorlamaktadır. Müşteri memnuniyetinin devamlılığının sağlanması bankacılık sektörü açısından oldukça önemlidir. Çünkü bankayla çalışmasını sürdüren mevcut müşteri bankanın kârlılığını sağlamada ve bankacılık hedeflerine kolay ulaşılmasında temel faktördür (Özdemir, 2012).

Bankacılığın en önemli sermayesi bireylerin bankacılık kurumuna, banka çalışanlarına güvenmesidir. Bankalar mevcut müşterileriyle aktif çalışmaya devam etmek için farklı, yeni müşterileri kazanmak için ise daha farklı yöntemler denemektedir. Ayrıca bankalar mevcut müşterilerin kullandıkları ürün sayılarını arttırmaya çalışmakta, mevcut müşterilerin sunulan diğer hizmetleri de kullanmaları için çaba göstermektedir. Bu bağlamda mevcut müşterilerin sık sık ziyaret etmek, müşteri ihtiyaçlarını belirlemek, her yeni ürün ve hizmet hakkında bilgilendirme yapmak bankaların müşteri ilişkilerini yönetmek aşamasında kullandığı temel ilkelerdendir (Gürbüz, 2016).

Literatürde, bankanın aktif müşterilerinin tahminlenmesi konusu ile ilgili çalışmalardan ziyade daha çok müşteri memnuniyeti, müşteri sadakati kapsamındaki çalışmaların ağırlıklı olduğu söylenebilir.

Araslı vd. (2009) çalışmalarında banka müşterilerinin beklentilerinin yeterince karşılanmadığı, empati boyutunda büyük farklılıklar olduğunu ve güven boyutunun müşteri memnuniyetinde önemli bir etkiye sahip olduğu sonucuna ulaşmışlardır (Arasli, Katircioglu & Mehtap-Smadi, 2005).

Gençtürk vd. (2011) çalışmalarında bireysel bankacılıkta müşterilerin memnuniyetini etkileyen faktörleri incelemişlerdir. Çalışma sonucunda hizmet kalitesinin müşteri memnuniyeti için önemli bir faktör olduğu tespit edilmiştir (Gençtürk, Kalkan, & Oktar 2011).

Bülbül (2017) araştırmasına Türk bankacılık sektöründe faaliyet gösteren katılım bankalarını mevduat bankaları ile karşılaştırmıştır. Hizmet çeşitliliği, faizle daha fazla kazanç sağlama olanaklarından ve mevduat bankalarının, katılım bankalarına kıyasla müşteri memnuniyeti açısından daha ileride olduğunu ortaya koymuştur (Bülbül, 2019).

Aydın ve Tavukçu (2019), Türkiye Katılım Bankacılığı sektöründeki müşteri memnuniyeti, müşteri sadakati ve müşteri tavsiye etme üzerine bir inceleme yapmışlardır. İletişim, güven, yetkinlik ve çatışma yönetimlerinin, müşteri memnuniyeti, müşteri sadakati ve müşterilerin tavsiye etme eğilimine olumlu katkı sağladığı tespit edilmiştir (Aydın & Tavukçu, 2019).

Bankaların mevcut müşterileriyle çalışmaya devam edip etmediğini gösteren müşteri tahmin sonuçları bankaların müşteri kaybına uğrayıp uğramadığı konusunda da bilgi vermektedir. Aktif çalışılan müşteri sayısındaki sürekli azalma banka açısından müşteri kayıplarına neden olabilecektir.

Müşteri kayıplarının yarattığı bir takım olumsuz sonuçlar söz konusudur. Müşteri kayıpları işletmenin karlılığını ve pazar payını olumsuz etkilemekte (Colgate & Hedge, 2001; Frederick & Sasser, 1990; Keaveney, 1995) müşteriler için yapılan ve boşa giden iç yatırım maliyetlerine (Colgate, Stewart & Kinsella, 1996) ve işletmenin yeni müşteri kazanımı sağlamak için üstlendiği maliyetlere de (Fornell & Wernerfelt, 1987) neden olabilmektedir.

Müşteri kaybını tahmin etmeye yönelik literatür incelemesi yapıldığında ise müşteri kaybının tahmin edilmesi amacıyla çalışmaların bir kısmının makine öğrenmesi yöntemleri üzerine yoğunlaştıkları tespit edilmiştir. Bu yöntemlerin arasında Destek Vektör Makinaları (Farquad, Ravi & Raju, 2014; Gordini & Veglio, 2017; Moeyersoms & Martens, 2015) Yapay Sinir Ağları (Tsai & Lu, 2009; Xie & Li, 2008; Zhao, Li, Li, Liu & Ren, 2005) yer almaktadır.

Bankacılık işlemleri üzerine öğrenen makine yöntemleri kullanılarak yapılan literatür çalışmalarını incelediğimizde ise bu alanda sınırlı sayıda çalışmanın olduğu görülmektedir.

Pacelli ve Azzollini (2011), çalışmalarında kredi risk yönetimi tahminine yönelik yapay sinir ağları yöntemi ile incelenmiştir (Pacelli & Azzollini, 2011).

Nazari ve Alidadi (2013), İran bankalarındaki iyi müşteriler ile kötü müşterileri sınıflandırma kriterlerini belirlemeyi amaçlamıştır. Çalışmada yapay sinir ağları kullanılarak banka müşterilerinin kredi risk oranı ölçülmüştür (Nazari & Alidadi, 2013).

Altunöz (2013), bankaların başarısızlıklarını yapay sinir ağları modeli ile test etmiştir. Çalışma sonucunda yapay sinir ağları bu alandaki yüksek öngörü başarısıyla ön plana çıkmıştır (Altunöz, 2013).

Sayıcı (2018) bankalarda ihtiyaç kredilerinin skorlamasını yapay sinir ağları yöntemini kullanılarak incelemiştir. Sonuçlar, ihtiyaç kredilerinin ülkemizde hızla yaygınlaştığını ve bireysel krediler içerisinde ise payının arttığını göstermiştir (Sayıcı, 2018).

Balcıoğlu ve Sezen (2019), yapay sinir ağları yöntemini kullanarak banka müşterilerinin, bankadan ayrılma olasılığının tahmin etmişlerdir. Çalışmalarının sonucu olarak, daha küçük bir grubu ayrılma potansiyeli olan müşteri olarak belirlemişlerdir (Balcioglu & Sezen, 2019).

Literatürde hizmet kalitesi ile müşteri memnuniyeti arasındaki ilişkiyi araştıran çalışmalarda kullanılan analiz yöntemlerinden en sık rastlanan ölçüm yönteminin çoklu doğrusal regresyon analizinin olduğu çalışmalardır (Anton, 1996; Landrigan, 1999). Ancak yapay sinir ağları yöntemi, çoklu doğrusal regresyon analizine bir alternatif olarak da kullanılmaya başlanmış ve daha iyi sonuçlar verdiği gözlemlenmiştir (Uysal & Roubi, 1999; Nguyen & Cripps, 2001). Sonuç olarak literatürde yapılan çalışmalarda müşteri memnuniyetini değerlendirmeye yönelik kullanılan farklı yöntemlerin yanı sıra bankacılık işlemlerinde kredi skorlama, kredi riski tahmininde ve banka finansal başarısızlıklarını tahmin etmeye yönelik öğrenen makine yöntemlerinin kullanıldığı çalışmaların olduğu ancak mevduat bankalarına ait müşteri tahminine yönelik öğrenen makine yöntemlerini kullanan çalışmaların ise yetersiz olduğu dikkat çekicidir. Bu araştırma ile mevduat bankalarının müşteri tahminin yapay sinir ağları ve destek vektör regresyonu analizleriyle değerlendirilerek diğer yöntemlerden farklı olarak nasıl başarılı bir performans gösterdiği tespit edilecektir.

3. Araştırma Yöntemi ve Veriler

3.1. Veri Seti

Çalışmada, Bankacılık Düzenleme ve Denetleme Kurumu tarafından paylaşılan Haziran 2010 ve Ekim 2020 arasındaki aylık dönemleri kapsayan 2500 adet veri kullanılmıştır. Türkiye'deki faaliyet gösteren ve Bankacılık Düzenleme ve Denetleme Kurumu tarafından kategorize edilen mevduat bankaları araştırmaya konu edilmiştir. Bu kategoriler; kamu mevduat bankaları, yerli özel mevduat bankaları ve yabancı özel mevduat bankalarıdır. Çalışmanın modeli kurulurken değişkenler için bankacılık sektörünün iç dinamikleri alınması karar verilmiştir. Bu nedenle, modelin giriş birimleri araştırmaya konulan bankaların personel sayısı, şube sayısı, bilançolarındaki toplam mevduatları ve kredileridir. Bankaların iç dinamiklerinin giriş birimi olarak seçilmesinin nedeni literatür kısmında da belirtildiği gibi bankaların kendi müşteri politikalarının performansını müşteri tahmininde önemli bir etken olarak düşünülmesidir. Bu bakımdan bir bankanın en büyük iki faaliyet konusu olan mevduat toplamak ve kredi vermek unsurları ve bu faaliyeti

gerçekleştirecek olan şube ve personel sayıları giriş birimi olarak seçilmiştir. Çıkış birimi olarak bu bankaların mudi sayısı belirlenmiştir. Öğrenen makine yöntemlerinin uygulaması ve analizleri için Knime programı tercih edilmiştir.

Çalışmada öğrenen makine öğrenmesi yöntemlerinin performansının iyileştirmek ve doğruluk oranını arttırmak için normalizasyon yöntemi kullanılmıştır. Normalizasyon yöntemi olarak min-max, z-score, medyan ve sigmoid aktivasyon fonksiyonu gibi yöntemler bulunmaktadır. Bu çalışmada min-max normalleştirme yöntemi kullanılarak orijinal veriler 0-1 aralığında doğrusal dönüşüm ile normalizasyon işlemi gerçekleştirilmiştir. Denklem 1'de min-max normalleştirme formülü verilmiştir.

$$x' = \frac{x_i - x_{min}}{x_{max} - x_{min}} \tag{1}$$

x' normalize edilmiş veriyi, xi girdi değerini, x_{min} girdi seti içerisinde yer alan en küçük sayıyı, x_{max} girdi seti içerisinde yer alan en büyük sayıyı göstermektedir.

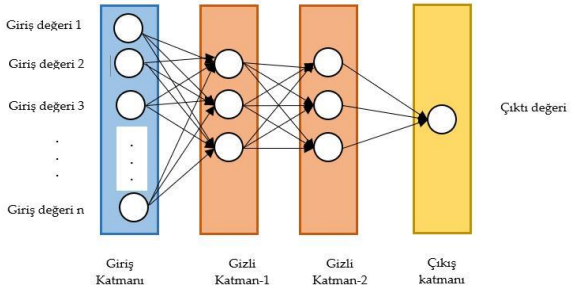
3.2. Tahmin Yöntemleri

3.2.1. Yapay Sinir Ağları

Yapay sinir ağları (YSA), insan beyninin nöro-fizyolojik yapısını matematiksel olarak modelleyerek işlemlerini taklit etmek için geliştirilmiş bilgisayar sistemleridir (Zhang, 2001). YSA "öğrenme" yeteneğine sahiptir; yani, performansını iyileştirmek için denetimli veya denetimsiz öğrenme yoluyla eğitilebilmektedir (Chang & Chao, 2006). Yapay sinir ağları, mimarilerine (katman sayısı), topolojilerine (bağlantı modeli, ileri besleme veya tekrarlayan vb.) ve öğrenme çeşidine göre kategorize edilmektedir. Uygulamaların çoğu, ileri beslemeli ağ yapısını ve hata geri yayılımı öğrenimini kullanmaktadır.

İleri beslemeli ağ genellikle giriş, gizli ve çıkış katmanları olarak tanımlanan üç katmandan oluşan hiyerarşik bir yapıdan oluşmaktadır. Giriş katmanındaki her düğüm, ağırlıklı bağlantılar kullanılarak gizli katmandaki tüm düğümlere bağlanır. Ağ bağlantıları üzerindeki ağırlıklar, veri uydurma modelinin parametrelerini belirlemektedir. Giriş katmanındaki düğüm sayısı modellenecek sistemdeki girdi sayısına eşittir. Gizli katmanlardaki düğüm sayıları ve büyüklükleri istenen tahmin doğruluğu ve YSA modelinin performansı gibi konulara göre belirlenen ayarlanabilen parametrelerdir (Patel et al., 2007). Çıkış katmanı ise giriş değerlerine ve seçilen parametrelere göre hesaplanmış bilgi üretmektedir. Veriler ağa giriş katmanı üzerinden girmekte, gizli katmandan geçerek ilerlemekte ve çıktı katmanından çıkmaktadır. Her gizli katman ve çıktı katmanı düğümü, üstündeki düğümlerden (giriş katmanı veya gizli katman) veri toplar ve bir etkinleştirme işlevi uygular. Etkinleştirme işlevleri birkaç şekilde olabilir. Aktivasyon fonksiyonunun türü, ağ içindeki nöronun durumu ile belirtilir. Çoğu durumda, giriş katmanı nöronlarının bir aktivasyon işlevi yoktur, çünkü onların rolü girdileri gizli katmana aktarmaktır (Khashei, Hamadani & Bijari, 2012). Şekil 1'de Yapay sinir ağı modeli görülmektedir.

Şekil: 1
YSA Modeli



Geri yayılım öğrenme algoritması ileri besleme ve geri yayılma ağırlık eğitimi olmak üzere iki prosedürden oluşmaktadır. Girdi verisi seti, çıktının bir tahminini vermek için ağ üzerinden yayılır. Tahmindeki hata bilgisine göre ağırlıklar sistematik olarak güncellemek için kullanılır (Hancke & Malan, 1998). Ağ, eğitim verisi çıktıları ile ağın tahmin edilen çıktıları arasındaki hata yeterince küçük olana kadar ağırlıkları değiştirerek eğitilmektedir (Mesroghli, Jorjani & Chelgani, 2009).

Bir yapay sinir ağı modelinde giriş hücrelerindeki bilgiler ara katman hücrelerine aktarılırken ilgili ağırlıklar ile çarpılmakta ve ağırlıklı toplam fonksiyonuna göre her ara katman hücresinin NET girdisi hesaplanmaktadır:

$$NET_p = \sum_i w_{ip} x_i \tag{2}$$

Burada NET_p ara katmanın p. hücresine olan girdi; w_{ip} giriş katmanının i. hücresini, ara katmanın p. hücresine bağlayan ağırlık; x_i giriş katmanındaki i. hücresinin çıkışını temsil etmektedir. Bulunan NET girdi, bir aktivasyon fonksiyonundan geçirilerek, ara katman hücrelerinin çıkışı bulunmaktadır.

$$F_p = f(NET_p) \tag{3}$$

Burada F_p ara katmanın p. hücresinin aktivasyon fonksiyonunu göstermektedir. Kullanılacak aktivasyon fonksiyonun türevlenebilir olması şarttır.

Bu aşamadan sonra hedef değer ile çıkış hücresinde bulunan değeri kullanarak hata hesaplaması yapılmaktadır. Hata hesaplaması:

$$\varepsilon_p = (T_p) - (F_p) \tag{4}$$

ε_p yapılan hata; T_p hedeflenen çıkış değeri; F_p p. Hücrenin hesaplanan değerini göstermektedir.

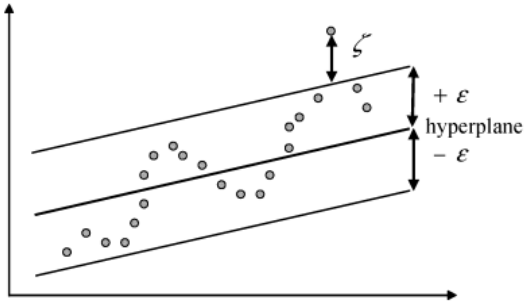
3.2.2. Destek Vektör Regresyonunu

Destek vektör regresyonu (SVR), Vapnik tarafından önerilen evrensel bir öğrenme algoritmasıdır (Cortes & Vapnik, 1995; Vapnik, 2013). SVR, az miktarda örnekle öğrenme problemlerini çözmeyi sağlayan istatistiksel bir öğrenme teorisine dayanmaktadır (Tan, Zhang, Xia, Fang & Chen, 2015). Ek olarak, SVR'nin doğrusal olmayan sorunları ele alma konusunda güçlü bir yeteneği vardır ve çok çeşitli alanlarda başarıyla kullanılmaktadır (Azamathulla, Ghani, Chang, Hasan & Zakaria, 2010; Lu, Lee & Chiu, 2009; Rao & Gopalakrishna, 2009).

Destek vektör regresyonu, Vapnik'in ε-duyarsız kayıp fonksiyonunun ortaya çıkmasıyla doğrusal olan ve olmayan sistemleri tahmin etmek ve çözmek için güçlü bir yaklaşım olarak kullanılmaya başlanmıştır (Lijuan & Guohua, 2016).

Doğrusal olmayan destek vektör regresyonu Şekil 2'de gösterilmiştir.

Şekil: 2
Doğrusal Olmayan Destek Vektör Regresyonu



Kaynak: Wu, Ho & Lee, 2004.

ℓ'nin toplam eğitim örneklerinin sayısını gösterdiği Denklem 5'teki gibi bir veri seti olduğunu düşüldüğünde:

$$D = \{(x^1, y^1), \dots, (x^\ell, y^\ell)\}, x \in R^n, y \in R \tag{5}$$

Destek vektör regresyonu için doğrusal fonksiyon:

$$f(x) = w \cdot \phi((x) + b \tag{6}$$

Burada w ve b sırasıyla ağırlık vektörü ve bias'tır. $\phi(x)$ çekirdek fonksiyonu göstermektedir.

Amacımız ω ve b'nin değerini bulmak ve böylece *x* değerlerinin regresyon riskini en aza indirgeyerek belirlemektir. Regresyon riskini indirgeyerek tahmin etmede hata oranı minimize edilecektir. Böylece daha yüksek doğruluk oranı ile tahmin başarısı sağlanacak; modelin güvenilirliği ve performansı artması sağlanacaktır. Regresyon riskinin minimize edilmesiyle şu şekilde çözülebilir:

$$R_{reg}(f) = C\sum_{i=0}^{\ell}\Gamma(f(\chi_i) - y_i) + \frac{1}{2}\|w\|^2 \tag{7}$$

Burada Γ(.) bir maliyet (cost) fonksiyonudur, C sabittir (constant) ve ω vektörü veri noktaları cinsinden şöyle yazılabilir:

$$w = \sum_{i=1}^{\ell}(\alpha_i - \alpha_i^*)\Phi(x_i) \tag{8}$$

Burada α Lagrange çarpanlarını göstermektedir. Optimizasyon yaparken, Lagrange çarpanı metodu bir fonksiyonun maksimum ve minimum noktalarını bulmak için kullanılan bir yöntemdir. ℓ toplam eğitim örneklerinin sayısını, ϕ(x) çekirdek fonksiyonu göstermektedir.

Bir SVR için, uygun bir çekirdek seçmek, öğrenme sürecinin başarısı için zorunludur. Bir SVR'nin karmaşıklığı ile ayrılamayan noktaların sayısı arasındaki ödünleşimi kontrol eden düzenlileştirme parametresi de önemlidir. SVR çekirdekleri arasında doğrusal çekirdek, polinom çekirdeği, dizin çekirdeği, çift sinir ağı çekirdeği ve radyal temel işlevi (RBF) çekirdekleri bulunmaktadır. Bu çekirdeklerde, RBF çekirdeği en popüler çekirdek işlevidir ve genel olarak daha iyi kararlılığa sahiptir (Hsu & Lin, 2002).

Radyal temel işlev (RBF) çekirdeği:

$$K(x_i, x_j) = \exp\left(-\gamma\left|(x_i \cdot x_j\right|^2\right) \tag{9}$$

Burada <x, y> iç çarpımı göstermektedir. Aşırı tahmin söz konusu olduğunda, üstel ifade yaklaşık olarak doğrusallaşır ve yüksek boyutlu doğrusal olmayan yapısını kaybetmeye başlar. Öte yandan, eğer gerçek değerden daha düşük tahmin gerçekleşiyorsa, fonksiyon düzgünleştirmeyecek ve karar sınırı ise eğitim verisindeki gürültü değerlere karşı son derece duyarlı olacaktır (Güldoğan, 2017).

Burada, bir regresyon fonksiyonu bulunmaya çalışılmaktadır. Bu fonksiyon "ϵ-duyarsız" kayıp fonksiyonu kullanılarak elde edilmektedir. ε-duyarsız kayıp fonksiyon en yaygın kullanılan maliyet fonksiyonudur. Fonksiyon:

$$\Gamma(f(\chi_i) - \gamma) = \begin{cases} |f(x) - \gamma| - \varepsilon, \; for |f(x) - \gamma| \geq \varepsilon \\ 0, diğer \end{cases} \tag{10}$$

İkinci dereceden optimizasyon problemini çözerek regresyon riski ve e-duyarsız kayıp fonksiyonu en aza indirilebilmektedir. Optimizasyon nesnesi için:

$$min: \frac{1}{2}\sum_{i,j=1}^{\ell}(\alpha_i^* - \alpha_i)(\alpha_j^* - \alpha_j)k(x_i, x_j) - \sum_{i=1}^{\ell}\alpha_i^*(y_i - \varepsilon) - \alpha_i(y_i + \varepsilon) \quad (11)$$

Lagrange çarpanları α_i ve α_i^*, tahminleri hedef değer olan y_i'ye doğru iten kuvvetler olarak hareket eden yukarıdaki ikinci dereceden problemin çözümlerini temsil etmektedir. Lagrange çarpanlarının sadece sıfır olmayan değerleri regresyon hattını tahmin etmede yararlıdır ve destek vektörleri olarak bilinmektedir. C sabiti, tahmin hatalarına verilen cezaları belirlemektedir. w'nin değeri Lagrange çarpanlarına göre çözülmektedir. b değişkeni için, Lagrange çarpanlarının ve kısıtlamalarının ürününün 0'a eşit olması gerektiği anlamına gelen Karush-Kuhn-Tucker (KKT) koşulları uygulanarak hesaplanabilir.

$$\alpha_i(\varepsilon + \xi_i - y_i + (w, x_i) + b) = 0$$
$$\alpha_i^*(\varepsilon + \xi_i^* + y_i - (w, x_i) - b) = 0 \quad 12$$

$$(C - \alpha_i)\xi_i = 0$$
$$(C - \alpha_i^*)\xi_i^* = 0 \quad 13$$

ξ_i ve ξ_i^*, ε tüpü dışındaki hataları ölçmek için kullanılan değişkenlerdir. α_i^{α} Ɛ (0,C) için α_i, α_i^*=0 ve ξ_i^*=0 olduğunda b hesaplaması şu şekilde yapılmaktadır:

$$b = y_i - (w, x_i) - \varepsilon \; for \; \alpha_i \in (0, C)$$
$$b = y_i - (w, x_i) + \varepsilon \; for \; \alpha_i^* \in (0, C) \quad 14$$

Buralarda çekirdek fonksiyonları olan düzenleme parametresi C ve çağ değeri ε değerlerini deneyerek ideal değeri bulmak gerekmektedir.

3.3. Modellerin Değerlendirilmesi

Yapay sinir ağları, destek vektör makineleri ve çoklu doğrusal regresyon modellerinin başarılarının karşılaştırılmasında düzeltilmiş belirleme katsayısı (R2), ortalama mutlak hata (MAE), ortalama kare hata (MSE), hata kareler ortalamasının karekökü (RMSE) ve ortalama mutlak yüzde hata (MAPE) kriterleri kullanılmıştır.

Bu kriterlere ait denklemler aşağıda verilmiştir.

$$R^2 = 1 - \frac{\sum(y_i - y_i^*)^2}{\sum(y_i - y_{ort})^2} \quad (15)$$

$$MAE = \frac{\sum_{i=1}^{n}|y_i - y_i^*|}{n} \quad (16)$$

$$MSE = \frac{1}{n}\sum_{i=1}^{n}(y_i - x_i)^2 \quad (17)$$

$$RMSE = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(y_i - x_i)^2} \quad (18)$$

$$MAPE = \frac{\sum_{i=1}^{n} \left| \frac{y_i - y_i^*}{y_i} \right|}{n} \cdot 100 \tag{19}$$

Burada i veri sayısını, y gerçek değeri, y_{ort} ortalama gerçek değeri ve x tahmin değerini göstermektedir.

Modellerin değerlendirilmesinde kullanılan parametrelerin açıklamaları, değer aralıkları ve istenen değer bilgileri aşağıda verilmiştir (Veri bilimci, 2021):

Verilerin doğrusal bir eğriye ne kadar iyi uyduğunu gösteren R2 değerinin 1 olması, test verilerinin doğrusal bir eğri sağlandığını göstermektedir. Bağımsız değişkeninin toplam varyasyonun yüzde kaçı ile açıklanabildiğini göstermektedir. R2 değerinin istenen değerlere yani 1'e yaklaşması doğrusal bir eğri sağlamaya yakın olduğu görülmektedir.

RMSE, tahmin edilen değerler ile gerçek değerler arasındaki uzaklığın bulunmasında kullanılan ve hatanın büyüklüğünü gösteren bir büyüklüktür. Bir başka ifade ile RMSE tahmin hatalarının standart sapmasıdır. Hata, regresyon hattının veri noktalarından ne kadar uzakta olduğunun bir ölçüsüdür; RMSE ise bu kalıntıların ne kadar yayıldığının bir ölçüsüdür. RMSE değeri 0'dan ∞'a kadar değişebilir. RMSE değerinin sıfır olması modelin hiç hata yapmadığı anlamına gelmektedir. Bu yüzden RMSE değerinin sıfır değerine yakın olması istenmektedir.

MSE değeri bir regresyon eğrisinin bir dizi noktaya ne kadar yakın olduğunu göstermek için kullanılmaktadır. MSE, tahmin modelinin performansını ölçer, her zaman pozitif değerlidir. Sıfırı yakın tahmin modellerinin daha başarılı söylenebilir.

MAE iki sürekli değişken arasındaki farkı gösteren bir büyüklüktür. Bir başka deyişle gerçek değer ile veriye en iyi uyan çizgi arasındaki ortalama dikey mesafeyi göstermektedir. MAE, hataların ortalama büyüklüğünü ölçen doğrusal bir skordur. MAE 0'dan ∞'a kadar değişebilen değerler almaktadır. Negatif olan değerler yani daha MAE değerinin düşük olması tahmin modelinin başarılı olduğunu göstermektedir.

MAPE, regresyon modellerinin doğruluğunu ölçmekte kullanılan bir büyüklüktür. Gerçek değerler arasında sıfır içerenler varsa, sıfır ile bölünme olacağı için MAPE hesaplanamaz. Çok düşük tahmin değerleri için yüzde hatası %100'ü geçemez, ancak çok yüksek tahmin değerleri olduğunda yüzde hatasının üst sınırı yoktur. MAPE değeri %10'un altında olan modeller "çok iyi", % 10 < MAPE < % 20 arasında olan modelleri "iyi", % 20 < MAPE < % 50 arasında olan modelleri "kabul edilebilir" ve %50< MAPE 'nin üzerinde olan modeller ise "yanlış ve hatalı" olarak ifade edilmektedir.

4. Ampirik Bulgular

Çalışmada mevduat bankalarına ait toplam 2500 adet veri (bağımlı değişken olarak müşteri sayısı; bağımsız değişkenler ise banka şube sayısı, çalışan sayısı, toplam mevduat, toplam krediler) kullanılmıştır. Yapay zekâ tekniklerinin uygulaması ve analizleri için

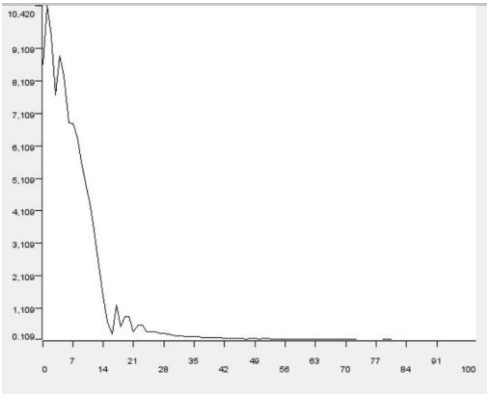
Knime programı tercih edilmiştir. Yapay sinir ağları modelinde verilerin %70'i eğitim, %30'u test amaçlı olmak üzere rastgele seçilerek tasarlanan ağa aktarılmaktadır. Yapay sinir ağları ile yapılan testler sonucunda elde edilen istatistiksel sonuçlar Tablo 1'de görülmektedir.

Tablo: 1
YSA Yönteminin İstatiksel Analiz Sonuçları

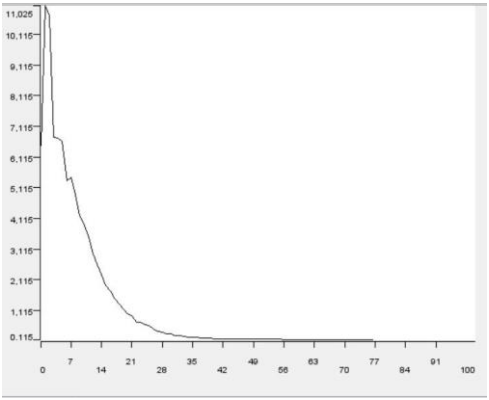
Banka Türleri	R2	MSE	RMSE	MAE	MAPE
Kamu mevduat Bankaları	0,990	0,01	0,010	0,007	0,020
Yerli Özel Mevduat Bankaları	0,983	0	0,005	0,004	0,019
Yabancı Özel Mevduat Bankaları	0,993	0	0,022	0,007	0,057
Tüm Mevduat Bankaları	0,993	0	0,006	0,003	0,038

Çalışmada oluşan hata eğrileri Şekil 3'te görülmektedir.

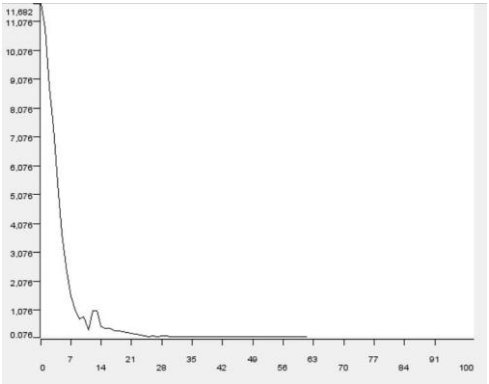
Şekil: 3
Hata Eğri Grafikleri



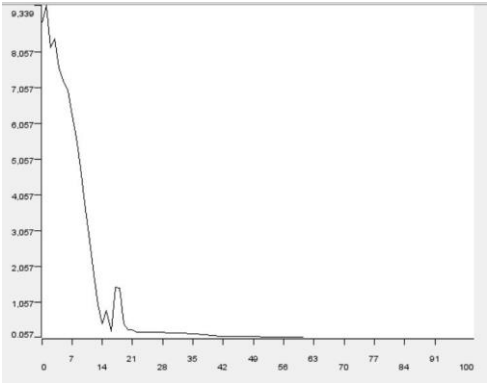
Kamu Mevduat



Yerli Özel Mevduat



Yabancı Özel Mevduat



Toplam Mevduat

Verilerin doğrusal bir eğriye ne kadar iyi uyduğunu gösteren R2 değerinin 1 olması, test verilerinin doğrusal bir eğri sağlandığını göstermektedir. Çalışmada MSE değerleri sıfır olduğu için ideal değerlerde olduğu görülmüştür. RMSE değeri sıfır ile sonsuz arasında değer alabilmektedir; değerinin sıfıra yakın olması istenmektedir. Çalışmada 0,005-0,022 aralığında olup istenen değere oldukça yakın olduğu görülmüştür. Çalışmada MAE 0,003 ile 0,007 aralığında; MAPE 0,019 ile 0,057 aralığında değerler almaktadır. MAE ve MAPE değerleri ideal modelde sıfır olması istenmektedir. Bu değerlerin sıfır veya sıfır yakın olması ideal kabul edilmektedir. Çalışma hem MAE hem de MAPE değeri için istenen değerlere çok yakındır.

Çalışmada SVR yöntemi olarak doğrusal olmayan regresyon yöntemi kullanılmıştır. SVR yönteminde çekirdek fonksiyonlardan polinom, hiperbolik fonksiyon ve çapsal tabanlı fonksiyon (Radial Basis Function- RBF) teknikleri kullanılarak testler yapılmış olup; başarılı sonucu verdiği için çekirdek fonksiyonu olarak çapsal tabanlı fonksiyon (RBF) tercih edilmiştir. Örtüşen ceza (Overlapping penalty), giriş verilerinin ayrılabilir olmaması durumunda kullanılan faydalı bir parametredir. Yanlış tahmin edilen her noktaya ne kadar ceza verileceğini belirlemekte böylelikle doğruluk oranının arttırılmasını sağlamaktadır. Bu çalışmada örtüşen ceza değerleri test edilmiş ve en iyi değeri 10'da verdiği görülmüştür.

Tablo 2'de Radial basis function (RBF) çekirdek fonksiyonu için SVR yöntemine göre performansları görülmektedir.

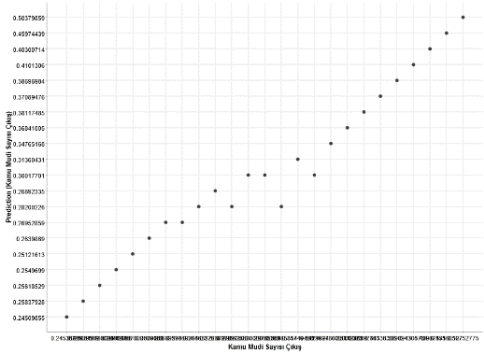
Tablo: 2
Farklı SVR Modelleri İçin Test Sonuçları

Banka Türleri	R2	MSE	RMSE	MAE	MAPE
Kamu Mevduat Bankaları	0,985	0,001	0,027	0,023	0,010
Yerli Özel Mevduat Bankaları	0,989	0,001	0,034	0,027	0,020
Yabancı Özel Mevduat Bankaları	0,900	0,001	0,028	0,019	0,010
Tüm Mevduat Bankaları	0,906	0,001	0,024	0,018	0,204

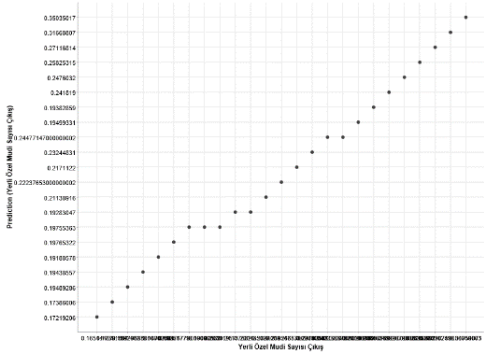
SVR yöntemine göre mevduat bankalarının müşteri tahmininde R2 değeri en düşük 0,900; en düşük 0,989 olmuştur. Çalışmada MSE değerleri 0,001 olduğu için ideal değerdedir. RMSE değerinin sıfıra yakın olması istenmekte; bu çalışmada 0,024-0,034 aralığında olup istenen değere çok yakın olduğu görülmektedir. MAE ve MAPE için ise en küçük değere sahip değerler ideal kabul edilmektedir. Çalışmada MAE 0,018 ile 0,027 aralığında; MAPE 0,010 ile 0,204 aralığında değerler almaktadır ve istenen değerlere çok yakın değerler olduğu görülmektedir.

Sonuçlara göre SVR yönteminin doğrusal bir eğri sağlanmaya çok yakın olduğu görülmektedir. Şekil 4'te SVR için serpilme diyagramı eğrisi görülmektedir.

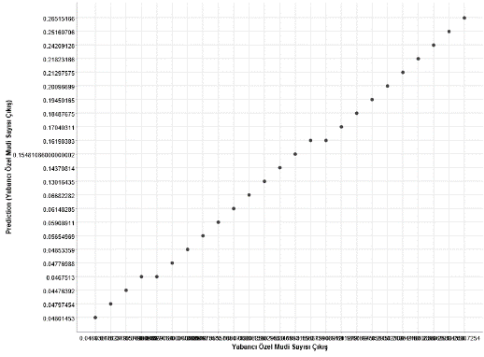
Şekil: 4
SVR Serpilme Diyagramı Eğrisi



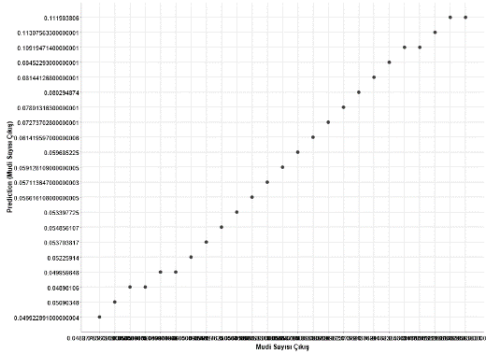
Kamu Mevduat



Yerli Özel Mevduat



Yabancı Özel Mevduat



Toplam Mevduat

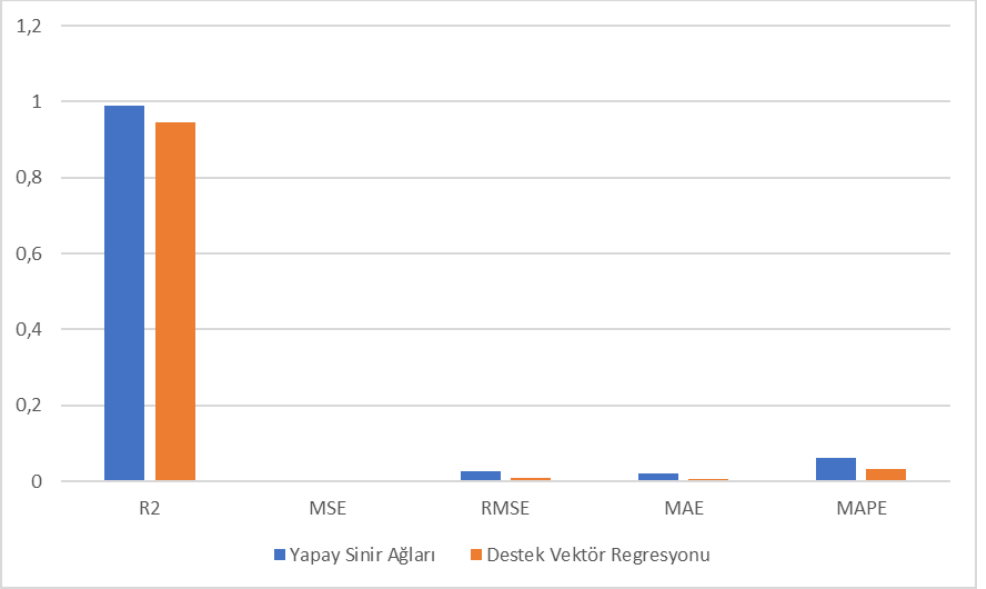
İki farklı analiz tekniğine göre yapılan testlerin ortalama istatistiksel sonuçlar Tablo 3'te gösterilmiştir.

Tablo: 3
İki Farklı Yapay Zekâ Tekniğine Göre Ortalama İstatiksel Sonuçlar

Test Yöntemi	R2	MSE	RMSE	MAE	MAPE
Yapay Sinir Ağları	0,989	0,002	0,010	0,005	0,033
Destek Vektör Regresyonu	0,945	0,001	0,028	0,021	0,061

Her iki yönteme göre istatistiksel ortalama değerler birbirine oldukça yakın ve başarılı değerler aldığı görülmektedir. Tablo 3'teki test sonuçlarının grafiksel gösterimi Şekil 5'te görülmektedir.

Şekil: 5
Ortalama Test Sonuçlarının Grafiksel Gösterimi



İki farklı makine öğrenmesi tekniğine göre yapılan analiz sonuçları karşılaştırıldığında iki makine öğrenmesi yönteminin de ideal değerlere yakın olmakla birlikte YSA yönteminin daha başarılı sonuçları olduğu görülmüştür.

5. Sonuç ve Tartışma

Küreselleşen finansal sistemin yoğun rekabeti içinde bankaların hem potansiyel müşterileri portföylerine kazandırmaları hem mevcut müşterilerini portföylerinde tutabilmeleri hem de mevcut müşterilerinde yeni finansal ürünlerle derinleşme sağlayabilmeleri her geçen gün biraz daha zorlaşmaktadır. Müşterilerin son yıllarda dijital kanallar aracılığıyla bankacılıkta birçok bilgiye daha hızlı bir şekilde ulaşabilmesi, birçok bankanın sunduğu çeşitli ürünler arasında seçimler yapmaya çalışması sonucunda bankaların hizmetleriyle ilgili müşterilerin beklentileri her geçen gün artmaktadır. Bu amaçla bankalar rakip bankalardan daha iyi iş yapmak, müşteri isteklerini anlamak ve ihtiyaçlara hemen cevap vermek için çabalamaktadır.

Elde edilen analiz sonuçları, kamu, özel ve yabancı mevduat bankalarıyla çalışmalarını devam ettiren müşterilerin doğru tahmin edilmesinde bankalara ön bilgiler sunabileceği ve bu analiz sonuçları kapsamında bankaların müşteri kazanımı hedeflerini belirlemede banka üst yönetimi için yol gösterici olabileceğini göstermektedir. Müşteri tahmini raporları bankaların hizmet odaklı pazarlama stratejilerinden ziyade müşteri odaklı

stratejiler ile hizmet sunmaları açısından önemlidir. Çünkü günümüzde bankalar müşteri ilişkileri yönetiminde müşteri memnuniyetini ön plana koymaktadır.

Çalışmada kullanılan yapay sinir ağları (YSA) ve destek vektör makineleri (DVM) yöntemleri müşteri sayılarının tahmininde oldukça başarılı sonuçlar vermiştir. En iyi uyumu veren modelin belirlenmesinde belirleme katsayısı (R2) ve hata varyansını ifade eden kriterler (MSE, RMSE, MAE ve MAPE) dikkate alınmıştır Çalışmada elde edilen R2 değerleri yapay sinir ağları için 0,983 ile 0,993 arasında, destek vektör regresyonu kullanıldığında ise 0,900 ile 0,989 arasındadır. Bu değerler literatürdeki farklı konulardaki tahmin başarı değerleri ile karşılaştırıldığında oldukça yüksektir. Araştırma konusu olan çalışmalarda ulaşılan performans değerlerine göre yapay sinir ağları modelinin destek vektör regresyonu analizinden daha etkin bir performans sergilediği görülmektedir. Yapay sinir ağlarının destek vektör regresyonu analizine göre daha yüksek bir öngörüye sahip olduğu ve daha az hataya sahip sonuçlar verdiği görülmektedir.

Çalışmada oluşturulan model ve seçilen analiz teknikleri ile her banka kendi özelinde müşteri sayılarını başarılı bir şekilde tahmin edebilecektir. Bu bağlamda söz konusu bankalar yıl içinde veya belirli dönemler itibariyle kazandığı mevcut müşterileri ya da kaybettiği müşteri sayılarını ön görebilecek böylece karşılaştırma yapabilme olanaklarına sahip olacaklardır. Ayrıca tahmin sonuçları ile bankalar açısından müşteri sayılarındaki artış müşteri ihtiyaçlarına uygun ürün ve hizmetleri sunabildiklerini, müşteri sayısındaki azalma ise bankaların sürekli çalışmayı hedeflediği müşteriler için yeni ürünler geliştirmeleri gerektiği, ürün geliştirme aşamalarında müşteri ihtiyaçlarına öncelik vermeleri, bankaların geliştirecekleri yenilik stratejileri ve müşteri ilişkilerini geliştirme yönünde yeni politikaların oluşturması konusunda yol gösterici olacaktır.

Bir diğer önemli sonuç ise, bankacılık sektöründe kredibilitesi yüksek yeni müşterilerin kazanılması hem maliyetli hem de zaman alması bakımından zorlayıcıdır. Bu durum bankaların müşteri tatminini arttıracak ve onların bankalarına olan bağlılıklarını artırmaya yönelik yeni stratejiler geliştirmeleri yönünde hedefler oluşturmalarını sağlayacaktır. Türkiye'de faaliyet gösteren kamu, özel ve yabancı bankaların müşterilerinin başarılı bir şekilde tahmin edilmesi ile giderek artan müşterinin önemi ortaya konulmuştur. Yapılan tahmin sonuçları paralelinde bankaların mevcut müşterileri hakkında kısa sürede doğru bilgiye sahip olmaları rekabet ortamında bankalara pek çok avantaj sağlayabilecektir. Müşteri tahmin sonuçları ile bankalar mevcut müşterilerinin yeterliliği veya yetersizliği konusunda bilgi sahibi olabilecekler ve bu kapsamda yeni müşteri hedeflerini ihtiyaca yönelik olarak kolayca belirleyebileceklerdir. Ayrıca müşteri tahmin bilgileriyle müşteri sayılarını artırmaya yönelik planlama ve yenilikler kapsamında banka yönetiminin alacağı kararların hız kazanmasında etkili olabileceği öngörülmektedir. Bu doğrultuda bankalar müşteri sayılarını artırmak için müşteri memnuniyeti, müşteri ilişkilerinin sürekli iyileştirilmesi ve müşteri sadakatine yönelik stratejik politikalara ve hedeflere yönelmelidir. Bunu sağlayan bankalar sektörde rakiplerinden daha üstün bir şekilde faaliyetlerine devam edebilecektir.

Kaynaklar

Altuğ, N. & Ş. Özhan (2018), *Pazarlamada Güncel Gelişmeler*, Nobel.

Altunöz, U. (2013), "Bankaların Finansal Başarısızlıklarının Yapay Sinir Ağları Modeli Çerçevesinde Tahmin Edilebilirliği", *DEÜ İİBF Dergisi*, 28(2), 189-217.

Arasli, H. et al. (2005), "A comparison of service quality in the banking industry", *International Journal of Bank Marketing*, 23(7), 508-526.

Aydın, S. & A. Tavukçu (2019), "İlişkisel pazarlama uygulamalarının müşteri sadakati, müşteri memnuniyeti ve müşterilerin tavsiye etme eğilimi üzerine etkisi: Türk katılım bankacılığı sektöründe bir araştırma", *Proceedings of the International Congress on Business and Marketing*, İstanbul, Türkiye.

Azamathulla, H.M. et al. (2010), "Machine learning approach to predict sediment load-a case study", *CLEAN-Soil, Air, Water*, 38(10), 969-976.

Balcioglu, Y. & B. Sezen (2019), "Yapay Sinir Ağları ile Banka Müşterilerinin Bankadan Ayrılma Olasılığının Tahmini", *Business and Organization Research*, Izmir.

Başar, A. vd. (2015), "Banka Şubeleri İçin Uygun Yer Seçiminin Belirlenmesine Yönelik Tabu Arama Yaklaşımı: Bir Türk Bankası Uygulaması", *Endüstri Mühendisliği Dergisi*, 26(3), 2-22.

Bilal-Zorić, A. (2016), "Predicting customer churn in banking industry using neural networks", *Interdisciplinary Description of Complex Systems: INDECS*, 14(2), 116-124.

Bülbül, S. (2019), "Türk bankacılık sektöründe müşteri memnuniyetinin katılım ve mevduat bankalarında karşılaştırmalı olarak değerlendirilmesi", *Yüksek Lisans Tezi*, Gebze Teknik Üniversitesi, Gebze.

Chang, T.-C. & R.-J. Chao (2006), "Application of back-propagation networks in debris flow prediction", *Engineering Geology*, 85(3-4), 270-280.

Colgate, M. & R. Hedge (2001), "An investigation into the switching process in retail banking services", *International Journal of Bank Marketing*, 19(5), 201-212.

Colgate, M. et al. (1996), "Customer defection: a study of the student market in Ireland", *International Journal of Bank Marketing*, 14(3), 23-29.

Cortes, C. & V. Vapnik (1995), "Support-vector networks", *Machine Learning*, 20(3), 273-297.

Demir, F.O. & Y. Kırdar (2007), "Müşteri ilişkileri yönetimi: CRM. Review of Social", *Economic & Business Studies*, 8, 293-308.

Farquad, M.A.H. et al. (2014), "Churn prediction using comprehensible support vector machine: An analytical CRM application", *Applied Soft Computing*, 19, 31-40.

Fornell, C. & B. Wernerfelt (1987), "Defensive marketing strategy by customer complaint management: a theoretical analysis", *Journal of Marketing Research*, 24(4), 337-346.

Frederick, F.R. & W.E. Sasser (1990), "Zero defections: quality comes to services", *Harvard Business Review*, 68(5), 105.

Gençtürk, M. vd. (2011), "Bireysel Bankacılıkta Müşteri Memnuniyetini Etkileyen Faktörler: Burdur ve Isparta İllerinde Bir Uygulama", *SDÜ İİBF Dergisi*, 16(2), 59-77.

Gordini, N. & V. Veglio (2017), "Customers churn prediction and marketing retention strategies. An application of support vector machines based on the AUC parameter-selection technique in B2B e-commerce industry", *Industrial Marketing Management*, 62, 100-107.

Güldoğan, E. (2017), "Çeşitli çekirdek fonksiyonlari ile oluşturulan destek vektör makinesi modellerinin performanslarinin incelenmesi: Bir klinik uygulama", İnönü Üniversitesi ve Mersin Üniversitesi Biyoistatistik ve Tıp Bilişimi Anabilim Dalı, *Doktora Tezi*.

Gürbüz, F. (2016), "Bankacılık Sektöründe Müşteri Değerlendirme Kriterleri Seçiminde Örnek Bir Karar Verme Süreci", *Nevşehir Bilim ve Teknoloji Dergisi*, 5(2), 167-184.

Hancke, G.P. & R. Malan (1998), "A modal analysis technique for the on-line particle size measurement of pneumatically conveyed pulverized coal", *IEEE Transactions on Instrumentation and Measurement*, 47(1), 114-122.

Hsu, C.-W. & C.-J. Lin (2002), "A comparison of methods for multiclass support vector machines", *IEEE transactions on Neural Networks*, 13(2), 415-425.

Johnston, R. (1997), "Identifying the critical determinants of service quality in retail banking: importance and effect", *International Journal of Bank Marketing*, 15(4), 111-116.

Keaveney, S.M. (1995), "Customer switching behavior in service industries: An exploratory study", *Journal of Marketing*, 59(2), 71-82.

Khashei, M. et al. (2012), "A novel hybrid classification model of artificial neural networks and multiple linear regression models", *Expert Systems with Applications*, 39(3), 2606-2620.

Lijuan, W. & C. Guohua (2016), "Seasonal SVR with FOA algorithm for single-step and multi-step ahead forecasting in monthly inbound tourist flow", *Knowledge-Based Systems*, 110, 157-166.

Lu, C.-J. et al. (2009), "Financial time series forecasting using independent component analysis and support vector regression", *Decision Support Systems*, 47(2), 115-125.

Mesroghli, S. et al. (2009), "Estimation of gross calorific value based on coal analysis using regression and artificial neural networks", *International Journal of Coal Geology*, 79(1-2), 49-54.

Moeyersoms, J. & D. Martens (2015), "Including high-cardinality attributes in predictive models: A case study in churn prediction in the energy sector", *Decision Support Systems*, 72, 72-81.

Nazari, M. & M. Alidadi (2013), "Measuring credit risk of bank customers using artificial neural network", *Journal of Management Research*, 5(2), 17.

Özdemir, İ. (2012), "Bankacılıkta halkla ilişkiler ve müşteri ilişkileri", *Bankacılık ve Sigortacılık Araştırmaları Dergisi*, 1(3), 4-15.

Pacelli, V. & M. Azzollini (2011), "An artificial neural network approach for credit risk management", *Journal of Intelligent Learning Systems and Applications*, 3(02), 103.

Patel, S.U. et al. (2007), "Estimation of gross calorific value of coals using artificial neural networks", *Fuel*, 86(3), 334-344.

Rao, B.V. & S. Gopalakrishna (2009), "Hardgrove grindability index prediction using support vector regression", *International Journal of Mineral Processing*, 91(1-2), 55-59.

Sayıcı, S.C. (2018), "İhtiyaç kredilerinde yapay sinir ağları uygulaması", *Doktora Tezi*, Kadir Has Üniversitesi, İstanbul.

Sönmez, F. vd. (2015), "Mevduat bankalarının karlılığının yapay sinir ağları ile tahmini: Bir yazılım modeli tasarımı", *BDDK Bankacılık ve Finansal Piyasalar Dergisi*, 9(1), 9-46.

Tan, P. et al. (2015), "Estimation of higher heating value of coal based on proximate analysis using support vector regression", *Fuel Processing Technology*, 138, 298-304.

TBB (2021), *Bankacılık Sisteminde Banka, Çalışan ve Şube Sayıları Mart 2021*, <https://www.tbb.org.tr/Content/Upload/istatistikiraporlar/ekler/1575/Banka_Calisan_ve_Sube_Sayilari-Mart_2021.pdf>, 20.04.2021.

Tsai, C.-F. & Y.-H. Lu (2009), "Customer churn prediction by hybrid neural networks", *Expert Systems with Applications*, 36(10), 12547-12553.

Vapnik, V. (2013), "The nature of statistical learning theory", *Springer Science & Business Media*.

Veri Bilimci (2021), *Makine Öğrenmesi MSE, RMSE, MAE, MAPE ve Diğer Metrikler*, <https://veribilimcisi.com/2017/07/14/mse-rmse-mae-mape-metrikleri-nedir>, 11.07.2021

Wu, C.-H. et al. (2004), "Travel-time prediction with support vector regression", *IEEE Transactions on Intelligent Transportation Systems*, 5(4), 276-281.

Xie, Y. & X Li (2008), "Churn prediction with linear discriminant boosting algorithm", *2008 International Conference on Machine Learning and Cybernetics*.

Yazıcı, M. (2007), "Bankalarda kobi kredilerini değerlendirmeye ilişkin bir yaklaşım: Yapay sinir ağları", *Doktora Tezi*, Kadir Has Üniversitesi İstanbul.

Zhang, G.P. (2001), "An investigation of neural networks for linear time-series forecasting", *Computers & Operations Research*, 28(12), 1183-1202.

Zhao, Y. et al. (2005), "Customer churn prediction using improved one-class support vector machine", *International Conference on Advanced Data Mining and Applications*.

Sosyoekonomi

2021, Vol. 29(50), 433-463

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.20
Date Submitted: 12.04.2021
Date Revised: 01.10.2021
Date Accepted: 04.10.2021

Âdem-i Merkeziyetçilik-Merkeziyetçilik Tartışmaları Bağlamında Osmanlı Devleti ve Fransa'da Savaşlar, Mali Baskılar, Kurumsal Değişim

Perihan Hazel KAYA *(https://orcid.org/0000-0002-9878-4194), Selcuk University, Turkey; perihaner@selcuk.edu.tr*

Wars, Fiscal Pressures, Institutional Change in the Ottoman Empire and France in the Context of Decentralization and Centralization Debates

Abstract

Income sources of countries have significant effects on their institutional structures. To what extent could countries that were more dependent on local taxpayers for their income sources in the early modern period develop their institutional structures? In this study, an answer to this question is sought by comparing the evolution of the Ottoman Empire and French financial institutions, which collected a significant part of their income with the tax farming system (iltizam) between the sixteenth and nineteenth centuries in the context of decentralization-centralization. Wars, the centralization of finance, and thus the emergence of central states are interrelated processes. While some types of taxation became centralized after the French Revolution in France, some remained decentralized. The Ottoman Empire took important steps to centralize the financial structure with the Tanzimat reform.

Keywords : Decentralization, France, Tax Farming System, Centralization, Ottoman Empire.

JEL Classification Codes : B10, E02, E32, E62.

Öz

Ülkelerin gelir kaynakları, kurumsal yapıları üzerinde önemli etkilere sahiptir. Erken modern dönemde gelir kaynakları içinde yerel vergi mükelleflerine daha bağımlı olan ülkeler kurumsal yapılarını ne ölçüde geliştirebilmiştir? Bu çalışmada bu soruya, gelirlerinin önemli bir kısmını iltizam sistemi ile toplamış olan Osmanlı Devleti ve Fransız mali kurumlarının âdem-i merkeziyetçilik-merkeziyetçilik bağlamında XVI.-XIX. yüzyıllar arasındaki evrimine ilişkin karşılaştırmalar yapılarak cevap aranmaktadır. Savaşlar, maliyenin merkezileşmesi ve bu yolla merkezi devletlerin ortaya çıkışı birbiriyle ilişkili süreçlerdir. Fransa'da Fransız Devriminden sonra vergilendirmenin bazı türleri merkezileşirken bazı türleri âdem-i merkeziyetçi yapıda kalmış buna karşılık Osmanlı Devleti'nde Tanzimat reformu ile birlikte mali yapının merkezileşmesi adına önemli adımlar atılmıştır.

Anahtar Sözcükler : Âdem-i Merkeziyetçilik, Fransa, İltizam Sistemi, Merkeziyetçilik, Osmanlı Devleti.

1. Giriş

Ülkelerin idaresinin teşkilat ve faaliyet bakımından yürütülmesinde merkeziyetçilik[1] ve âdem-i merkeziyetçilik[2] olmak üzere iki sistem bulunmaktadır. Merkeziyetçilikte bütün yetkiler merkezden alınırken, âdem-i merkeziyetçilikte hükümet merkezince atanan memurlar yanında, merkezi hiyerarşiye dahil olmayan merciler vardır. Merkezi bir hükümet bürokrasisinin kurulması vergilerin toplanması adına modern bir ekonominin temel özelliklerinden biri olarak kabul edilir. Diğer bir özellik ise ekonomik büyümeyi artırıcı iyi ve gelişmiş kurumların varlığıdır. Günümüz ülkelerinin çoğu ne yazık ki bu tarz nitelikteki kurumlara sahip değildir. Burada tarihin rolü çok büyüktür[3]. İltizam sistemi XVI. yüzyıldan itibaren Avrupa'daki en temel vergi toplama yöntemiydi. Erken Modern Dönemde, Fransa, İngiltere, Prusya, Osmanlı Devleti ve Güneydoğu Asya'da uygulanan beş ayrı iltizam modeli bulunmakta idi. İngiltere, Fransa ve Prusya'da uygulanan iltizam modelinin üç belirgin türü olmakla beraber en sıra dışı vergi toplama yöntemi Prusya'da uygulanmaktaydı. İngiltere, dolaylı vergileri toplarken hem iltizam sistemini hem de merkezi vergi dairesini kullanırken Fransa dolaylı vergileri toplarken çoğunlukla iltizam sistemini kullanmıştı. Diğer yandan Fransa ve Prusya iltizam sistemini yaygın biçimde uygularken İngiltere XVII. yüzyılın sonlarında iltizamı terk edip, ücretli memurlardan oluşan vergi toplama bürokrasisi yaratmıştı (Buluş, 2010: 89-90). Öte yandan Osmanlı Devleti ve Fransa büyük ölçüde iltizam sistemine güvenmeye devam eden ülkeler olarak karşımıza çıkıyordu. Osmanlı Devleti ve Fransa'da uygulanan iltizam sistemlerinin ortak noktalarından biri de her iki ülkede de dolaylı vergilerin yanı sıra doğrudan vergileri toplamak için de kullanılmış olmasıydı[4]. Çağdaş özelleştirme kavramına benzer şekilde iltizam, Ortadoğu tarihinde çok az anlaşılan bir olguydu. Genellikle devlet gücünün kötüye kullanılması ve modern öncesi İslam devletlerinin çöküşünün kurumsal nedenleri üzerine tartışmalarla bağlantılı bir kavramdı. Modern dünyada vergilerin toplanması temel bir hükümet işlevi gibi görünebilir. Öyleyse temel bir soru ortaya çıkıyor: Vergi gelirini maksimize etmenin merkezi önemi göz önüne alındığında, neden Fransız kraliyeti özelleştirilmiş bir vergi tahsilat sistemi kullanmıştı? Diğer bir deyişle, dolaylı vergilerin toplanması için Fransız monarşisi, neden devlet tarafından yönetilen maaşlı görevliler seçmedi de vergi toplama hakkını sabit bir ücret karşılığında bir şirkete kiralamıştı? On sekizinci yüzyılın başında dolaylı vergilerin tahsiline yönelik böyle bir kira sözleşmesinin kabul edilmesi, Kral'ın temsilcilerini kontrol ve takip etmede karşılaştığı zorluklardan ve vergi gelirlerindeki eksikliklere karşı riskleri göze alamamasından kaynaklanmaktaydı. Bu çalışmada bu soruya erken modern dönemde yoğun bir şekilde iltizam sistemini uygulayan Osmanlı Devleti ve Fransa'nın özellikle savaşlardan

---

[1] *Centralisation, merkezcilik, merkezden yönetim.*

[2] *Decentralisation, self-goverment, yerinden yönetim.*

[3] *Literatürde tarihsel kurumlar ve günümüz performansları arasındaki ilişkiyi ele alan birçok çalışma bulunmaktadır. Örneğin, bkz. Acemoğlu, Johnson & Robinson, 2002; Acemoğlu & Robinson, 2014; Kuran, 2012; Rodrik, Subramanian & Trebbi, 2004.*

[4] *İngiltere'de iltizam sistemi doğrudan vergilendirmede kullanılmamıştır. Bkz. Kiser & Kane, 2001.*

dolayı yaşanan benzer mali krizlere ve iletişim ve ulaşım teknolojisindeki yetersizliklere verdikleri farklı tepkileri karşılaştırılarak cevap aranmaktadır.

XVII. yüzyılda savaş harcamalarının ve kaybedilen savaşların yol açtığı nakit ihtiyacı bu ülkeleri daha kısa sürede daha fazla gelir elde yoluna sevk etmişti. Bunun için de daha önce iltizam sistemi aracılığıyla vergi tahsildarlarına verdikleri mülkiyet haklarını ihlal etmeye başlamışlar, iltizamlarını ellerinden alarak başkalarına daha yüksek bedellerle kiraya vermişlerdi. Tüm bu yaşananlar her iki ülkede de kurumsal başarısızlığa yol açtı. Bu süreçte Fransa'da, XIV. Louis döneminde monarşinin vergi toplama faaliyetlerinin önemli bir bölümünü, küçük bir varlıklı finansör grubun yönetimi altında birleştiren *General Farms Şirketi*[5] (Ferme Générale) ortaya çıktı ve krala karşı büyük kısıtlamalar getirmeyi başardı. Osmanlı Devleti'nde ise yaşanan mali krizler sonucu Fransa'daki *General Farms* Şirketine benzer bir koalisyon ortaya çıkmadı ve belirsiz mülkiyet hakları mali sistemde padişah ve vergi tahsildarlarının XVII. ve XVIII. yüzyılın çoğu döneminde anlaşmalara uymamalarından dolayı[6] bir çöküşe yol açtı. Fransa'da, vergi tahsildarlarının sermayeyi bir araya getirme kabiliyeti, krallığa karşı inandırıcı bir tehdit oluşturacak kadar büyük bir ölçekte örgütlenmelerine izin verirken Osmanlı Devleti'nde vergi tahsildarları böyle bir örgütlenme içerisine giremedi bu nedenle de Osmanlı Devleti'nde kurumlar Fransa'dakinin aksine farklı bir yöne evrildi. Bunun en önemli nedenlerinden biri başarılı ve güvenilir kamu sektörü kurumlarının oluşmasında özel sektör kuruluşlarının önemli rol oynamasıydı. Erken modern Fransa ve Osmanlı Devleti tarihi incelendiğinde görülebileceği üzere, gerekli özel sektör kurumları yerinde olmadığı sürece kamu sektörü reformlarının başarılı olma olasılığı düşüktü (Balla & Johnson, 2009: 810-811). XVII. yüzyılda Fransa'da *General Farms* gibi özel statüdeki bir şirket altında kişiler sermayelerini bir araya getirerek düşük maliyetlerle birleştirebilirken Osmanlı Devleti'nde İslami kaidelere dayanan inanç ve miras hukuku ve para vakıfların işleyiş yapısı kişilerin özel işletmelerde sermaye biriktirmesini yüksek maliyetlerle engelledi. Bu faktörler sonucu Osmanlı Devleti'nde vergi tahsildarları birleşerek bir kredi kaynağı oluşturamadı ve padişahın mali faaliyetlerine kısıtlamalar getiremedi.

Vergilendirme XVIII. yüzyılın sonlarında Fransa'da önemli bir sorundu. Adaletsiz ve aşırı vergilendirme Fransız Devrimi'nin kışkırtılmasına yardımcı oldu. Aşırıydı çünkü

---

[5] *General Farms şirketi, Fransız Devrimi'nden önceki eski/antik rejimin (ancien regime) bir ürünüydü. Şirket sonunda kendisini yok edecek Devrimin de temellerini atmıştır. Aslen Kraliyet borçlanmasını kolaylaştırmak için yaratılan Şirket, XVIII. yüzyılın sonunda mali reform üzerinde ciddi bir kısıtlama getirdi. General Farms Şirketi'nin XVIII. yüzyıldaki tarihi, 1789 Devrimi'nden önceki mali krizin kökenini açıklamaya yardımcı olmaktadır. General Farms Şirketi hakkında detaylı bilgi için bkz. Johnson, 2006.*

[6] *Çalışmanın ilerleyen bölümlerinde daha ayrıntılı açıklanacağı üzere iltizam sisteminde sözleşme süresi üç yıl olarak belirtilmişse de özellikle savaş dönemlerinde devletin daha fazla gelir elde etmek amacıyla sözleşme süresi bitmeden ilk ihaleden daha yüksek tutar teklif eden yeni mültezimlere verdiği görülmektedir. Bu durum verginin toplandığı reâyâyı olumsuz yönde etkilemiştir. Mültezimin planlamış olduğu süre ile gerçekleşen süre arasında bir farklılık olması hem vergi gelirlerinde düşüşe hem de vergi kaynağının dolayısıyla reâyânın güçsüzleşmesine neden olmuştur. Mukataanın aşırı ölçüde sömürülmesine yol açan bu belirsizlik karşısında mültezim, her an iltizamı elinden alınabilir düşüncesiyle en kısa zamanda yatırımının karşılığını vergi kaynağından çıkartmaya çalışmıştır. Bkz. Çizakça, 1999a.*

Fransa, esas olarak savaş kışkırtıcılığı, büyüyen bürokrasisi ve yüksek harcamaları nedeniyle Avrupa'nın en çok vergi veren devletlerinden biri haline gelmişti. Verimsizdi çünkü birçok vergi, yolsuzluğu ve vergiden kaçınmayı teşvik eden bir sistem olan "iltizamcılar" olarak adlandırılan bir özel yükleniciler ağı tarafından toplanıyordu. Şaşırtıcı olmayan bir şekilde, antik rejimin dengesiz vergi rejimine ilişkin şikayetler Fransız Devrimi'nin önemli bir nedeni haline geldi. Bununla birlikte XVIII. yüzyılın sonunda Fransız kurumlarının esnekliği devrime güç kazandırdı. Osmanlı Devleti'nde ise, birbirini izleyen hükümetler, bir yüzyıldan fazla bir süre boyunca, az ya da çok kademeli reformlar gerçekleştirebildiler. Burada cevabı aranan son soru ise Fransız Devrimi ile vergi idaresinin merkezileşmesi arasında ilişki olup olmadığı ve Osmanlı Devleti'nde böyle bir devrim yaşanmazken mali anlamda merkezileşme çabalarının Tanzimat Fermanının ortaya çıkmasındaki etkinliğinin ne olduğudur? Tüm bu soruları cevaplamak için bu çalışmada Osmanlı Devleti ve Fransa'da vergi idaresinin tarihsel evriminin ayrıntılı bir değerlendirmesi tarihsel süreç içerisinde karşılaştırılmalı olarak yapılmaktadır. Bu doğrultuda ilk olarak her iki ülkede de en temel vergi toplama yöntemi olan iltizam sistemi ayrıntılı olarak ele alınmış ve savaşların iltizam sisteminde yol açtığı değişiklikler değerlendirilmiştir. Sonrasında Osmanlı Devleti ve Fransa'nın belirsiz mülkiyet haklarına verdikleri tepkilerin kurumsal değişimlerine etkisi âdem-i merkeziyetçi-merkeziyetçi yapı bağlamında değerlendirilerek çalışma sonlandırılmıştır.

2. Osmanlı Devleti ve Fransız Vergi Sisteminin Kökenleri

Osmanlı Devleti'nde vergiler şer'î ve örfî olarak iki başlık altında toplanırken, devletin halktan aldığı vergiler; Rüsum-ı Şer'îye (zekât, cizye, öşür vb.), Rüsum-ı Örfiye (çift, ispenç, arus, cürm-ü cinayet vb.) ve Avârız-ı Divaniye (Avârız akçesi, Nüzûl bedeli, Sürsat, İmdâd-î Seferiye, İmdâd-î Hazeriyye vb.) olmak üzere üç bölüme ayrılmaktaydı (Kaya, 2017:178-179). Vergi olarak zekât, genellikle beş başlık altında toplanmıştı. Bunlar; altın ve gümüşten, tarımsal ürünlerden öşür[7] olarak, hayvanlardan ağnam vergisi[8] olarak, madenlerden devlet hissesi olarak ve mal ticaretinden gümrük resmi olarak alınmaktaydı (Akgündüz, 1990:154). Devletin en önemli gelir kaynaklarından birisini Rüsum-u Şer'iye içerisinde yer alan cizye vergisi oluşturmaktaydı. İslam hukukuna göre, devletin Müslüman olmayan vatandaşını yakından ilgilendiren bir vergi olarak cizye başlangıçta Müslümanlığı kabul etmeyenlerden devlet tarafından can, mal ve ırzın korunması için alınırken sonradan Müslüman olmayanlardan askerlik görevlerini yerine getirmemeleri karşılığında alınan bir tür dereceli baş vergisi haline gelmişti (İnalcık, 1993: 45-46).

---

[7] *Onda bir anlamına gelen öşür reâyânın, tımarlı sipahiye ödediği bir vergi türüydü. Özellikle hububat ürünleri üzerine konan öşür vergisi Müslüman tebaa tarafından üretilen tarımsal ürünler üzerinden belli oranlarda alınırdı. Fakat zirai ürünlerden hatta bu ürünler dışında örneğin baldan da öşür vergisi alındığı görülmüştü. Genel olarak 10'da bir alınsa da bu oran toprağın sulanma, verimlilik, mahalli örf ve adetlere göre 5/1, 6/1, 8/1 oranlarında da alınırdı. Bkz. Kazıcı, 2003.*

[8] *Osmanlı resmî kayıtlarında resm-i ganem, âdet-i ağnâm şekillerinde de geçen bu verginin miktarı Fâtih kanununa göre üç koyundan bir akçe iken daha sonra iki koyundan bir akçe olarak tespit edilmişti. Ancak bu miktar bölgelerin özelliklerine göre değişebilmekteydi. Bkz. Emecen, 1988.*

Osmanlı Devleti'nde örfi vergiler, din ayırımı yapılmaksızın herkesten yerel ve olağanüstü harcamaları karşılamak için alınan ve geleneklere göre konmuş düzensiz vergilerdi. Fakat daha sonraları bu vergiler devletin içinde bulunduğu şartlardan dolayı sürekli uygulanan vergiler haline gelmişlerdi. En temel Rüsum-ı Örfiye vergileri arasında, kullanılan toprağın miktarına göre nakit olarak toplanan diğer bir deyişle toprak kirası olan *çift resmi*; çift resminden farklı olmayan ancak gayrimüslim tebaadan alınan *ispence*; evlenen kız ya da kadınlar için erkeklerinden alınan *arus*; tımar topraklarında yaşayanlardan işledikleri suça karşılık alınan *cürm-ü cinayet* yer almaktaydı (Pamuk, 2010: 45). Osmanlı Devleti, XVII. yüzyılın başlarından itibaren savaş masraflarını hafifletmek için olağanüstü durum vergisi almaya başlamıştı. Avârız akçesi, nüzûl ve sürsat bedeli diye adlandırılan Avârız-ı Divâniyye[9] türündeki bu vergiler, önce belirli savaş yıllarında istenirken, XVII. yüzyıldan itibaren giderek sürekli hale gelen Avusturya, İran, Venedik, Lehistan savaşları ve kapıkulu askerlerinin artan masrafları ve mevacip ödemelerinden dolayı kalıcı vergiye dönüşmüştü. Ayrıca, savaş döneminde savaşa katılan valilerin ihtiyaçlarını karşılamak için imdâd-î seferiye ve malikâne uygulaması sonucu gelirleri azalan valilerin sefer olmadığı barış dönemlerindeki giderlerini karşılamak için imdâd-î hazeriyye vergisi alınmaya başlanmıştı. (Kaya, 2017: 235).

Osmanlı Devleti'nde devlete ait vergi gelirleri, belirli vergi toplama usulleriyle vergilerin merkezi hazineye taşınması şeklinde doğrudan ve hasılatı doğrudan merkezi hazineye ait olmayan fakat mîrî bir vazife karşılığında askeri zümrelere bırakılmış vergilerin yine ilgili zümreler tarafından toplanması şeklinde dolaylı olmak üzere iki şekilde toplanmaktaydı. Doğrudan tahsilatla merkezi hazineye bağlı ve merkezi bütçe gelirlerinin esasını oluşturan havass-ı hümayun gelirleri elde edilirken dolaylı tahsilat ile devletin merkezi gelirleri içinde yer almayan tımar gelirleri elde edilirdi (Özvar, 2003: 2). Devletin tarımdan elde edeceği gelirin büyük bir kısmı tımar kesimi içerisinde belli gider alanlarına ayrılmaktaydı. Buna göre devlet, kendisi araya girmeden, tarımdan alacağı vergiyi, doğrudan doğruya büyük bir kısmı asker olan tımar sahiplerine bırakıyordu (Tabakoğlu, 2014: 65). Toprağın mülkiyeti padişaha aitken tımar sahibi olan sipahi, reâyâdan toprak rantı karşılığında vergi toplamakta ve karşılığında orduya belirli sayıda teçhizatlı savaşçı sağlamaktaydı. XVI. yüzyılda Osmanlı Devleti gelirlerinin üçte ikisi ila dörtte üçü tımar sisteminden geliyordu (Barkan, 1980: 806). XVII. yüzyılda vergi gelirlerini tımar düzeni çerçevesinde dolaylı olarak kullanmak yerine doğrudan merkezi hazinede toplama çabalarının sonucu olarak vergilendirme görevinin özel teşebbüs gibi hareket eden kişilere belirli şartlarda devredilmesine olanak sağlayan iltizam sistemi yaygınlaşmıştı. İltizam

---

[9] *Osmanlı Devleti merkez maliyesinin önemli bir vergi kalemi olan avârız-ı divaniye vergilerinin aynî, nakdî ya da hizmet şeklinde olmak üzere farklı türleri söz konusuydu. Kısaca avârız olarak bilinen bu vergiler Müslüman ve gayrimüslim fark etmeksizin tüm tebâdan alınırdı. Yol, köprü ve su yollarının bakım ve onarımından, saray mutfağı için tavuk ve soğan tedarikine, ordunun ihtiyacı olan harp malzemesini ve arpa, saman gibi ihtiyaç maddelerini tedarik etmeye, askerin geçeceği yollar boyunca tesis edilen menzillere belirlenen çeşit ve miktarda zahire satmaya, hisar yapmaya ve avârız akçesi ya da avârız bedeli akçe ile seferin masraflarına katılmak avârız vergilerinin başlıcalarındandı. Devletin içinde bulunduğu konjonktürel yapıdan dolayı avârız miktarı yıldan yıla hatta aynı yıl içerisinde bile değişiklik gösterebilmekte bu nedenle de avârız miktarı kanunnamelerde belirtilmeyip her yıl fermanlarla belirlenirdi. Bkz. Kaya, 2017.*

sistemi; devletin, genellikle belirli bir mekanla sınırlı mukataa[10] birimlerini vergilendirmeyi rekabete açık, müzayede ile tespit edilen ve bir bölümü peşin ödenmesi istenen belirli bir yıllık bedel karşılığında (bir ila üç yıl), sınırlı bir süre (tahvil) için kârı ve zararı kendine ait olmak üzere kabul edecek mültezimlere güvenilir bir kefaletle devretmesiydi. Mültezim sivil sektörden, reâyâ, yabancı ya da askerî zümre mensubu olabilirdi. İltizamda hazinenin ihtiyacına ve mültezimlerin rekabet gücüne göre değişmekle birlikte her zaman için bir peşin ödeme söz konusuydu (Genç, 2000: 154-155). İltizam sistemi, maaşlı devlet personeli yerine özel şahıslar tarafından yürütülen her türlü vergi tahsilatını ifade etmekteydi.

Fransız mali sistemi, XVI. yüzyılda Osmanlı Devleti'nin mali sistemi ile pek çok benzerliği paylaşıyordu[11]. O da karmaşıktı ve nispeten âdem-i merkeziyetçiydi. Fransa'da mali sistem; hakkında hiçbir şey bilinmeyen, hiç kimseye karşı sorumlu olmayan, karmaşık, bölgeden bölgeye değişen[12] vergi oranlarına sahip ve nadiren kararnamelerde belirtilen ilkelere göre tahsilatın yapıldığı bir sistemdi. Fransa'da vergilendirmenin kökeni XIV. yüzyıla dayanmakta ve dolaylı vergilerin özelleştirilmiş toplanması (iltizam) ile merkezi olmayan (âdem-i merkeziyetçi), yerel olarak kontrol edilen dolaysız vergilerin bir karışımı şeklindeydi (Markoff, 1996: 237). Dolaysız vergiler, kraliyet görevli memurları tarafından bireylerden alınan bir vergiydi. Özellikle memurlarda rüşvet alma yaygın olduğundan dolaysız vergiler için kesin bir vergi oranı yoktu. Dolaylı vergiler ise iltizam sistemi aracılığıyla *fermiers-généraux* adı verilen yolsuzlukları ve açgözlülükleri ile bilinen "iltizamcılar" tarafından toplanıyordu. İltizam sistemi kapsamında, iltizamcı, sabit miktarın üzerinde toplanan herhangi bir vergi gelirine ilişkin kalan gelir karşılığında krallığa sabit bir ödeme yapmayı kabul etmişti. Osmanlı Devleti ile benzer şekilde Fransa'da da özel aracılarla vergilerin toplanması yaygındı. Dolayısıyla âdem-i merkeziyetçi yapı çerçevesinde vergiler doğrudan bireylerden toplanmak yerine iltizamcılardan toplu olarak alınıyordu. XVI. yüzyıl Osmanlısı'nda olduğu gibi aynı dönemde Fransa'da iltizam sisteminde tek bir şahıs olarak veya ortaklık halinde faaliyet gösteren bir kesim vardı. XVI. yüzyılın sonunda, iltizamlar kraliyet gelirlerinin yaklaşık üçte birini oluşturuyordu (Balla & Johnson, 2009: 814).

Fransa'daki en eski eyalet vergisi, XV. yüzyılda ortaya çıkan, gelir ve servet üzerinden alınan ve ordunun ihtiyaçlarının karşılanması için tahsis edilen *taille* idi. *Taille*, yılda yaklaşık 20 milyon livre getiren, kraliyet hükümetinin en kazançlı vergisiydi. Fransa'nın bölgesine bağlı olarak, çeşitli gelir ve servet (özellikle arazi) ölçülerine uygulanmaktaydı. Ancak bu, keyfi olarak yapılırdı ve miktar yıldan yıla önemli ölçüde

---

[10] *Mukataa, iltizamın konusu olan vergi birimidir. Mukataa, bir yandan tek bir vergi türünü belli bir bölge veya bölgeler itibariyle kapsamına alabilirken diğer yandan da çeşitli vergi türlerini belli bir bölge veya bölgeler itibariyle kapsamına alabilmekteydi. Bkz. Genç, 2006: 129.*

[11] *Osmanlı Devleti'nin merkezi hazine gelirleri, Fransa ve İspanya dışındaki tüm Avrupa devletlerinden daha fazlaydı. Bu durum XVI. yüzyılda Avrupa Devletleri karşısında askeri anlamda güçlü olmasıyla yakından ilişkiliydi. Bkz. Pamuk, 2014.*

[12] *Örneğin, kişi başına ortalama dolaysız vergilendirme Brittany'nin bazı kısımları ile Guyenne'in bazı kısımları arasında %400'e varan oranda farklılık göstermekteydi. Ayrıca gabelle vergisi bölgeden bölgeye tuz fiyatının 10 katına kadar değişebiliyordu. Bkz. Peter, 1988.*

değişebiliyordu. *Taille*, ilk olarak XV. yüzyılda Yüz Yıl Savaşları'nın masraflarını karşılamak için toplandı. XVI. yüzyılda, II. Henri döneminde posta servisi, savaş, yol ve köprü tamiri için kullanılmak üzere alınan *crue*, *the grande crue* ve *taillon* adlarında *taille*'yi tamamlayıcı vergiler yürürlüğe konulmuştu. Fransız Devrimi zamanında dolaysız vergi gelirlerinin yaklaşık %45'ini bu vergi temsil ediyordu (Bloch, 1940: 267-268). *Taille* vergisi, Osmanlı Devleti'nde XVII. yüzyılda giderek daha düzenli bir vergi haline gelen avârız vergisine benzemekteydi (Pamuk, 2014: 7). Diğer dolaysız vergiler *capitation* (baş vergisi) ve *vingtième* idi. *Capitation* kişi başı, her yetişkin vatandaşa tahakkuk ettirilen bir "kelle vergisi" veya "baş vergisi" idi. İlk olarak 1695 yılında savaş döneminde yürürlüğe kondu. Bir livre ile 2.000 livre arasında değişen tutarlarda alınan bu vergiden din adamları muaftı (Kwass, 2000). XVI. yüzyılda ortaya çıkan *aide royale* vergisi, özellikle içecekler üzerinden alınan bir tüketim vergisi olmakla birlikte tüketim metalarının satışı ve nakliyesi üzerinden de alınmaktaydı. Gümrük vergisi olarak ithalat ve ihracat üzerinden alınan *Traites* ile birleştiğinde *aides* Bordeaux'da şarap fiyatını on kat yükseltmekteydi. Aslında bu bir satış vergisiydi ve antik rejimin laneti haline gelen dolaylı vergilendirme sistemi içerisinde yer alıyordu (Brissaud, 1915: 455-456). *Gabelle* ise tuz üzerinden alınan ve Fransa için önemli olan bir vergiydi. Kral Fransa'nın bazı bölgelerinde tuz üretim tekelini elinde bulunduruyor, tuz satışını denetimi altında tutuyordu. 1780'lerde *gabelle*, yılda 55 milyondan fazla livre gelir sağlayarak hükümetin vergi gelirlerinin %10'undan fazlasını oluşturuyordu. Dolaylı vergiler, ortalama olarak, 1662 ile 1773 arasındaki vergi gelirlerinin neredeyse yarısını meydana getirirken esasen %28'i alkollü içecekler (*aides* lerden biri), *gabelle* (tuz) ve *tabac* (tütün) vergilerinden oluşuyordu (Chanel, 2015: 68-69).

Fransa'nın vergilendirmeyle ilgili sorunları XIV. Louis (1643-1715) dönemine kadar uzanmaktaydı. Fransa'da *taille* ismindeki dolaysız vergiden soylular, kilise mensupları, bazı resmi kişiler ve bazı kentler muaf olduğu için yükün orta ve fakir sınıfın sırtına yüklü olması ile *aide* ve *gabelle* ile tütün tekelinin mültezimler elinde olması vergi sisteminin en önemli sorunlarıydı (Buluş, 2010: 97). Dolaylı vergilerin tek bir kişiye belirli miktar karşılığında verilmesi, iltizam bedelinin çok altında gelir elde edilmesine neden olmuştu. Osmanlı Devleti'nde olduğu gibi dolaylı vergilerin iltizama verilmesinde ihale yöntemi getirilmişti. İhale yöntemiyle iltizamlardan elde edilen dolaylı vergi miktarı artırılmıştı. 1681'de Maliye Bakanı Colbert, vergi tahsilatını "iltizamcı" sayısını azaltarak düzene sokma girişimi olarak *General Farms*'ı kurdu ve iltizamların hepsinin buraya devrini gerçekleştirdi. Böylelikle kendisinden önce görev yapan Fouquet (1650-1653) iltizam yöntemiyle 36,9 milyon livre elde etmişken, Colbert 65,8 milyon livre elde etmişti (Sargent, 2004: 18-23). *General Farms*'ın %10'u halktan, üçte biri yargı soylularından ve kalanı da diğer soylulardan oluşuyordu (Bossenga, 2003: 69-70). Bu iltizamcılar o kadar çok kâr elde ediyorlardı ki kentlerin en zenginleri finansörler ve vergi tahsildarları olmuştu (Hazan, 2015: 25).

Aşağıda açıklanacağı gibi, XVII. yüzyıl boyunca hem Osmanlı Devleti'nde hem de Fransa'da iltizam sisteminin önemi arttı. Fransa'da iltizam sistemi ile XVII. yüzyılın başında gelirlerin yaklaşık üçte biri toplanırken XVIII. yüzyılın başında gelirlerin yarısına yakınını toplandı. Benzer şekilde, Osmanlı Devleti'nde de XVIII. yüzyılın başında iltizam, devlet gelirlerinin yaklaşık yüzde 30 ila 50'sini oluşturuyordu (Salzmann, 2004: 105). Bununla

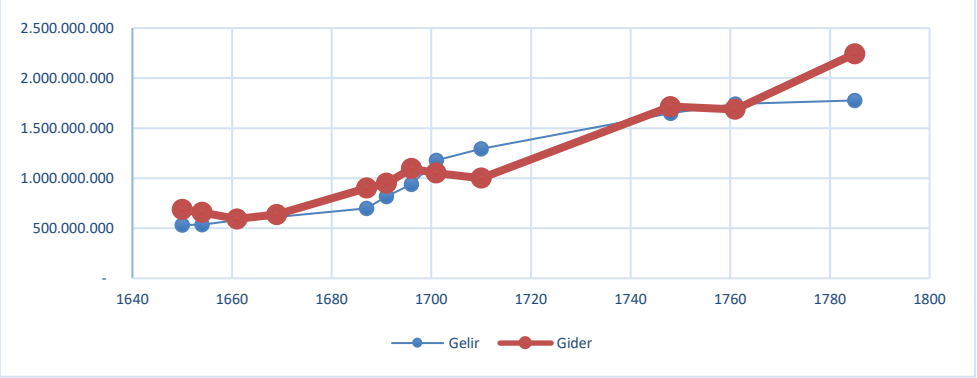
birlikte, iltizam sisteminin her ülkede nasıl geliştiği konusunda da önemli farklılıklar vardı. Fransa'da, iltizam sistemi, *General Farms* Şirketi olarak bilinen, yarı özel, tek bir organizasyonda birleştirildi. Şirket, XVIII. yüzyılda Fransız mali sisteminin en etkili paydaşlarından biri haline geldi ve bu konumunu büyük bir başarıyla korudu. İlerleyen kısımlarda daha detaylı ele alınacağı üzere tımardan başlayıp sırasıyla iltizam ve malikâne usullerinin uygulanması, dönemin ihtiyaçları gereği XVII. ve XVIII. yüzyıllarda Osmanlı Devleti'nin daha fazla âdem-i merkeziyetçiliğe doğru ilerlediği ve devletin vergi tahsildarı durumundan kontrolörü durumuna geçmesi olarak düşünülebilir (Katırancı, 2015: 1). Osmanlı Devleti ile karşılaştırıldığında XVIII. yüzyıl Fransa'sında mülkiyet haklarının mali sözleşmeler üzerindeki göreceli güvenliğini nasıl açıklayabiliriz? Daha spesifik olarak, Osmanlı Devleti'nde *General Farms* gibi bir koalisyon ortaya çıkmamışken Fransız mali sistemi içinden dayanıklı ve güçlü bir siyasi koalisyonun ortaya çıkmasına ne sebep oldu?

3. Savaşların İltizam Sistemine Etkileri

XVI. yüzyıldan sonra Avrupa ve Orta Doğu'daki iltizam sistemi biçimleri benzer yasal temellere sahip olsa da uygulamalar dünya çapındaki yeni eğilimlerle, yani artan savaş maliyetleri ve genişleyen küresel ticaretle değişikliğe uğramıştı. Osmanlı Devleti'nin XVIII. yüzyıl öncesi tarihine bakıldığında devletin kurumlarının, yapısının kısacası genel sistematiğinin savaşlar üzerine biçimlenmiş olduğu ve ekonominin kendini yeniden üretmesinde bu savaşların çok önemli rol ve işleve sahip olduğu görülmekteydi. Osmanlı klasik düzeni içerisinde savaşlar bir bunalım öğesi değil tam tersine bir kazanç kaynağı idi. O halde burada şu soruyu sorabiliriz: Yılları savaşlarla geçmiş ve bu savaşları yıllarca bir kazanç kaynağı olarak görmüş Osmanlı Devleti'nde bu savaşlar artık nasıl da kaçınılmaz bir mali bunalım öğesi olmaya başlamıştı? Başka bir deyişle XVIII. yüzyılla birlikte nasıl bir değişim ve dönüşüm süreci yaşanmıştı ki, savaşlara göre biçimlenmiş eski Osmanlı düzeni sarsılarak mali bunalımlar yaşanmaya başlanmıştı (Cezar, 1986: 27-28).

XVII. yüzyıla kadar tımar sistemi, bir tür vergi-maaş sistemi olarak eyalet askerini finanse ederken XVII. yüzyılla birlikte Alman ve Avusturyalıların yeni bir ordu düzeni içinde ateşli silah kullanan piyade askerlerine karşı Osmanlı Devleti sipahilerinin etkisiz kalması tımar sisteminin mecburen değişim sürecine girmesine neden oldu. Osmanlı Devleti, ateşli silah kullanabilen gençleri paralı asker olarak istihdam etmeye başladı. Bu süreç, merkezi ve ücretli ordunun gittikçe daha önem kazanması anlamına geliyordu. Diğer yandan bu durum devlet maliyesi açısından ciddi sonuçlar doğuracaktı. XVII. yüzyılda devlet maliyesi açısından en az bu süreç kadar ciddi sonuçlar doğuracak başka bir gelişme ise, uzun süren savaşlar ve bu savaşların finansmanıydı (Özvar, 2003: 10-13). 1645'te başlayan ve 1669 yılında biten Girit Savaşı ile Osmanlı Devleti'nde uzun ve masraflı savaşlar dönemi başlamış oldu. Devamında Avusturya Savaşı, 1672-1676 Lehistan Savaşı, 1678-81 Rusya Savaşı, 1683 yılında yeniden Avusturya ile savaşa girmesi ve peş peşe kaybettiği savaşlar ve 1699 yılında imzaladığı Karlofça Antlaşması Osmanlı maliyesini kronik bütçe açıklarına sürüklemişti (Cezar, 1986: 32). Savaş ve yarattığı finansal ihtiyaçlar, erken modern kamu maliyesindeki kurumsal değişimin arkasındaki itici güçtü.

Grafik: 1
Osmanlı'da 1600-1785 Dönemi Bütçe Gelir ve Giderleri (Akçe)



Kaynak: Tabakoğlu, 1985a:15-16; Genç, 2009: 223.

Bu dönem savaşlarının Osmanlı Devleti'ne getirmiş olduğu yükün bütçeye etkisi literatürde bu konuyla alakalı yapılan çalışmalardan da görülebilir[13]. Grafikten de anlaşılacağı üzere mali bunalım süreci XVII. yüzyıldan itibaren etkisini artırarak devam etmiş ve genellikle savaş dönemlerinde bütçe açık vermişti. İlk zamanlar düşük seviyelerde seyreden bütçe açıkları, sonrasında büyüyerek kronik hale gelmişti.

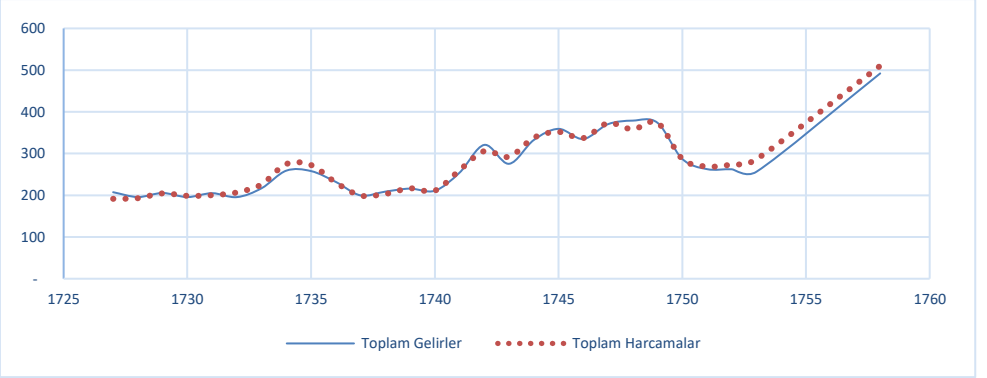
Vergi gelirlerinin büyük bir kısmı askeri amaçla harcandığından Osmanlı Devleti'nin maliyesi savaş dönemlerinde ağır baskı altına girdi. Bu mali baskı dönemleri, Osmanlıların mali kurumlarını değiştirdiği ya da vergi tahsilatında, iç borçlanma ya da yeni gelir kaynakları için tamamen yeni kurumlar benimsediği kilit dönemlerdi (Pamuk, 2014: 7-8). XVII. yüzyılda tımar sisteminin bozulması, uzun süren ve genellikle kaybedilen savaşlar ve içeride yaşanan iç karışıklıklar nedeniyle devlet savaş masraflarını karşılayamaz duruma gelmiş ve Osmanlı devlet hazinesinde paraya olan ihtiyaç gittikçe artmıştı. 1695 yılından itibaren, özellikle maliyenin artan nakit ihtiyacının karşılanması için iltizam ile işletilen mukataalar malikâne haline getirilmeye başlanmıştı. Diğer yandan da savaş harcamalarını karşılamak üzere olağanüstü vergiler konulmuştu. XVIII. yüzyılda "imdâd-î seferiye" ve "imdâd-î hazeriyye" adında yeni vergiler konularak, vali ve sancakbeylerinin çeşitli yükümlülüklerinden kaynaklanan giderlerine karşılık olmak üzere kendilerine tahsis olunmuştu. Diğer bir deyişle, imdâdiyeler vali ve sancakbeylerin iltizam sistemindeki değişiklikler nedeniyle giderek yoksun kaldıkları eski has gelirlerinin bir tamamlayıcısı biçimindeydi (Kaya, 2017: 218-219).

Fransa'da XIV. Louis'nin son otuz yılında gerçekleşen savaşlar Colbert'in devletin gelirlerini artırmaya yönelik çabalarını boşa çıkarmıştı. 1715'te XIV. Louis ölmüş, İspanya Savaşı bitmiş geride büyük miktarda borç kalmıştı. Fransa'da, harcamalar savaştan hemen

[13] *Bu bütçeler için bkz. Barkan, 1955; Tabakoğlu, 1985b; Sahillioğlu, 1969.*

önce veya savaş esnasında artmanın yanı sıra harcamaların büyüklüğü birbirini izleyen her krizle daha fazla artmıştı.

Grafik: 2
Fransa'da 1725-1760 Dönemi Bütçe Gelir ve Giderleri (Milyon Livre)[14]



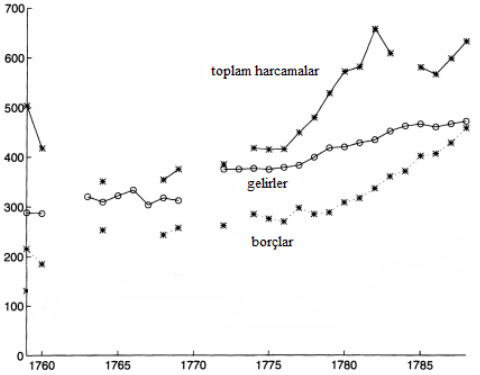
Kaynak: Riley, 1987: 224-225.

Savaş zamanı harcamaları Polonya Veraset Savaşında (1733-35, mali 1734-35) 259 milyon livreden Avusturya Veraset Savaşında (1740-48, mali 1741-49) 379 milyon livreye yükseldi. Yedi Yıl Savaşları'nda ise (1756-63, mali 1756-62) en az 506 milyon ile zirveye ulaştı (Riley, 1987: 228). 1733-1736 yılları arasında kral tahvile benzeyen rentes viageres'leri çıkararak kiliseden, pays d'etat'lardan ve receveurs des finances'den borçlanmıştı. Askeri harcamalar bütçenin en büyük harcama kalemini oluşturuyordu. Avusturya Savaşı ile birlikte capitation vergisine ek olarak 1749'da toprak sahiplerinin net geliri üzerinden %5 oranında alınan *vingtième* adında vergi getirildi. İkinci vingtieme, 1756 yılında yürürlüğe kondu ve Yedi Yıl Savaşları boyunca uygulanmasına devam edildi. Kral, Yedi Yıl Savaşı'nın maliyeti karşılamak için yüzde on faiz oranı ile borç almak zorunda kalmış ve zamanla borçlar bütçenin beşte ikisinin oluşturur duruma gelmişti (White, 2001: 16).

---

[14] *Grafikte yer alan bütçe gelirleri; taille ve capitation (baş vergisi) vergi gelirleri, General Farm ve diğer çiftliklerinden gelen gelirleri, monarşi tarafından düzenli olarak alınan diğer vergileri ve kraliyet alanları tarafından sağlanan bazı vergi dışı gelir kaynaklarını içermekteydi. Bunlara daha sonra, Polonya Veraset Savaşı ve Avusturya Veraset Savaşı sırasında gelirin onda biri olan dixieme vergisi ve 1750'de yirmide biri olan vingtieme vergisi eklendi. Yedi Yıl Savaşları sırasında iki vingtieme vergisi daha tanıtıldı. Gelir üzerindeki tüm harçlar, olağanüstü gelirler ve olağanüstü işler altında rapor edilirdi. Böylece vergiler iki kategoriye ayrılabilirdi. Birincisi, olağan gelirleri sağlayan dolaysız ve dolaylı vergiler, kralın her yıl vergi alma hakkı vardı. İkincisi, savaşla özdeşleştirilen özel harçlar, ancak 1750 yılı vingtieme örneğinde olduğu gibi sadece savaş değil sonrasında barış döneminde de alınmaya devam etti. Dixieme ve vingtieme 1740'tan sonra o kadar düzenli bir şekilde alınıyordu ki, bazı yetkililer bunun olağan bir vergi haline geldiğini savundular. Bu dönemde hem olağan hem de olağanüstü gelirler arttı. Bkz. Riley, 1987.*

Grafik: 3
Fransa'da 1760-1788 Dönemi Bütçe Gelir ve Giderleri (Milyon Livre)



Kaynak: Sargent &Velde, 1995: 481.

1726'dan 1789'a kadar savaş harcamaları üç kat artmış, gelirler de buna yaklaşık bir oranda artsa da savaşlar için yapılan harcamalar borçların ağırlığı nedeniyle gelirleri bastırmıştı. 1788 yılında borçları ödemek için toplam yıllık 120-130 milyon livre gerekmişti. Parlement'eye 1763, 1772 ve 1781 yıllarında barış dönemleri için vingtieme vergisi yürürlüğe koyması için baskı yapılmıştı (Norberg, 1994: 268-270). Colbert'ın iltizam sistemini merkezileştirmesi pek işe yaramamış, iltizam alt sözleşmelerle farklı vergi tahsildarlarına verilmişti. Savaş dönemi dolaylı vergiler yürürlüğe girmiş, bu vergiler genel iltizama değil, parçalı halde iltizama verilmişti. Bu durum vergilerin %10 artırılmasına neden olmuştu (Velde, 2006: 8-10). Necker yönetimi harcamaların karşılanmasına yönelik olarak borçlanma yoluna gitmişti. Bunu yapmanın en basit yolu, iltizamcının, kira bedelinin ödemelerini vadesi gelmeden önce krala iletmesiydi. Bu tür erken ödemelere gelecekteki vergi makbuzları için tahmin deniyordu. Kral yaklaşık 2.000.000 livre'lik gelecekteki ödemeler beklentisiyle en az 1.668.212 livre borç aldı. Böylece kral, makbuzlarının yarısını *aides* toplanmadan önce tahsil ediyordu (Balla & Johnson, 2009: 818). Kralın General Farms'a 68,4 milyon livre borcu bulunmaktaydı (Bossenga, 2003: 69-70).

Özellikle savaş dönemlerinde savaş harcamalarını karşılamak için olağan vergilerin yanında olağanüstü vergilerin alınması bunların oranlarının artırılması mali anlamda her iki ülkeyi de bir krize sürüklemiş, mülkiyet hakları üzerinde artan belirsizlikler yaratmıştı. Giderek artan harcamalar ve sabit gelirlerle karşı karşıya kalan Osmanlı Devleti ve Fransız yönetimi bir yandan mali sözleşmelerde daha fazla borçlanmaya giderken diğer yandan mülkiyet hakları[15] üzerindeki artan belirsizliğin kurumsal gelişime etkisi her iki ülkede çok farklıydı (Potter, 2003: 132-134).

[15] *Fransa'da mali kurumların mülkiyet hakları uzun vadede artırılırken, Osmanlı Devleti'nde böyle bir durum gerçekleşmedi. Savaş harcamalarındaki artışlar her ülkede aynı etkiyi yaratmadı. Bkz. Potter, 2003.*

Osmanlı Devleti'nde merkezi ordunun önem kazanması, seferlerin uzun sürmesi ve buna bağlı olarak nakit ihtiyacının artması karşılığında Osmanlı Devleti maliyesinin aldığı en önemli tedbirlerden biri iltizam sisteminden malikâne sistemine geçerek tımar alanlarında mukataalaşma eğiliminin artmasıydı. İltizam sistemindeki bu gelişmeye paralel başka bir uygulama ise *peşin* uygulamasının gittikçe yaygınlık kazanmasıydı. İltizam uygulamasında mültezimlerin yüklenecekleri mukataalar için hazineye ödedikleri bir tür teminat ya da kefalet bedeli olan peşin, aslında erken dönemlerde vardı. Ancak bu süreçte yaygınlaşarak peşin, hazinenin nakit ihtiyacını bir tür iç borçlanma yoluyla karşılamanın önemli bir aracı haline gelmişti (Özvar, 2003: 17). Bu uygulama Fransa'da Kral'ın gelecekteki gelirlerini önceden borçlanmasına benzer bir uygulama olarak karşımıza çıkmaktadır.

Sonuç olarak, XVII. ve XVIII. yüzyıllarda iltizam sistemi vergi toplamanın birincil yöntemi haline gelerek merkezi hazinenin en önemli gelir kaynağı olmuştu. Ancak Fransa'da olduğu gibi Osmanlı Devleti'nde de iltizam sözleşmelerinde belirsizlikler söz konusuydu. Mukataalar tahvil süreleri dolmadan defalarca hazineye gelir sağlamak amacıyla başka mültezimlere verilmişti. XVII. yüzyılda 206 iltizam sözleşmesinin %10'u bir yıldan kısa süre içinde iptal edilmişti. 1618 yılında Selanik Tuz Fabrikası için bir yıl içinde dört farklı iltizam sözleşmesi yapılmıştı (Çizakça, 1999b: 224). Diğer taraftan yüklenilen bir mukataa için süresi içinde başka bir mültezim tarafından daha yüksek bir teklif verilirse mevcut mültezim ya aradaki farkı ödeyerek yüklenmeye devam edecekti ya da sözleşmesi fes edilecek ve yeni mültezimle yeni bir iltizam sözleşmesi yapılacaktı (İnalcık, 2000). Tüm bunlar, iltizam sözleşmeleri üzerindeki mülkiyet haklarının belirsizliğini artırdı.

4. Belirsiz Mülkiyet Hakları ve Kurumsal Değişim

Osmanlı Devleti'nde de mültezimler hukuken padişaha karşı sorumluydu ve hesapları düzenli olarak kontrol ediliyordu. Fransa'da olduğu gibi, bazı vergileri toplamak için neden tımar sözleşmelerinin kullanıldığı ve diğer durumlarda neden iltizam sözleşmelerinin tercih edildiği, vergi gelirlerini ölçmenin ve izlemenin işlem maliyetleri ile açıklanabilmekteydi. Esas itibariyle merkeze bağlı bürokrasi ile yine merkezin emrinde bulunan sipahilerin yüklendikleri bu faaliyetleri, devletin yüzlerce kilometre uzakta bulunan yerlerinden toplanacak ayni vergileri, doğrudan doğruya toplamak imkânsız olduğu için, vergilerin nakden alınması veya nakde çevrilerek merkezi bir hazineye aktarılması ve oradan bu faaliyet zümrelerine maaş şeklinde ödenmesi gerekliliği ortaya çıktı. Bu nedenle daha önce de bahsedildiği gibi tımar sisteminden iltizam sistemine geçiş yapılmıştı (Genç, 2009: 102).

XVII. yüzyılın ilk yarısında hem Fransa hem de Osmanlı Devleti'nde âdem-i merkeziyetçi vergi sistemleri vergi tahsildarlarının kralın sözleşmelere müdahalesine karşı direniş göstermelerine yardımcı oldu. Ancak Fransa ve Osmanlı Devleti'nin giderek belirsizleşen mülkiyet haklarına uzun vadeli tepkileri çok farklıydı. Fransa'da, 1661'den sonra krallığa karşı bir iltizamcılar koalisyonu ortaya çıktı. Bu koalisyon, iltizamcıların kralı tehdit etmesine olanak sağlayan mevcut kurumların sermaye havuzlamasına elverişli olması nedeniyle ortaya çıktı. Osmanlı Devleti'nde mevcut kurumlar sermayeyi bir araya getirmeye

yatkın değildi, bu da mali ajanların padişahı sınırlandırmak için yeterince büyük sayıda örgütlenmesini engelliyordu. Neden Fransa'da XVII. yüzyılın ikinci yarısında bir mali ajanlar koalisyonu ortaya çıktı ama Osmanlı Devleti'nde böyle bir koalisyon olmadı? İlk olarak, Fransız iltizamcılar daha homojen bir grup olarak yola çıkmışlardı. XVII. yüzyılın Fransa'sında, daha az iltizamcı, daha az iltizam vardı ve çiftçiler benzer sosyal ağlara mensuptu (Balla & Johnson, 2009: 826-827). Osmanlı Devleti'nde ise bunun tersine, XVIII. yüzyıl boyunca, İstanbul'daki 1000 ila 2000 merkezli kişi ile şehirlerde bulunan yaklaşık 5000 ila 10.000 kişi ve sayısız müteahhit, finansör, muhasebeci ve yönetici devlet gelirlerinin önemli bir bölümünü kontrol ediyordu (Pamuk, 2014: 10). Homojenlik, en azından başlangıçta *General Farms* Şirketi'nin kurulmasını kolaylaştırdı. Osmanlı Devleti coğrafi olarak çok büyük olduğu için iltizamları Fransa'da olduğu gibi konsolide etmek mümkün olmayabilirdi. Ancak tek başına coğrafya, Osmanlı Devleti'nde neden her biri padişahı sınırlayabilen birden fazla mültezim koalisyonunun ortaya çıkmadığını açıklamıyordu. Çiftçiler, örneğin bir Mısır konsolide çiftliği veya Avrupa toprakları üzerinde büyük bir çiftlik oluşturarak bölgesel hatlar boyunca örgütlenebilirlerdi (Balla & Johnson, 2009: 828). Bir başka olasılık da XVII. yüzyılda Osmanlı Devleti'nde mültezimlerin bir sınıf olarak birleşmenin toplu eylem maliyetlerini aşacak kadar homojen olmamasıydı. Fransa'da, özellikle 1661 sonrası dönemde, iltizamcıların çoğunun akraba ya da arkadaş olduğuna dair çok sayıda kanıt vardı. XVIII. yüzyılda, Fransız iltizamcılarının büyük çoğunluğu üst burjuvaziden geldi, Paris'te yaşadı, aynı kitapları okudu, aynı operalara ve aynı kiliselere gitti (Johnson, 2006: 2-4).

Aksine, Osmanlı mültezimleri devletin çeşitli etnik ve dini yapısını yansıtıyordu: İltizam sistemi içerisinde XVI. yüzyıldan XVIII. yüzyılın başlarına dek mültezimlerin dini kimlikleri açısından bakıldığında Müslüman mültezimlerin daima sayı olarak daha fazla olduğu görülmekteydi. Kendi içinde, gayrimüslimlerin (Hıristiyanlar ve Yahudiler) sayısı XVI. yüzyılın başından XVII. yüzyılın başına kadar artsa da bu tarihten itibaren azalma söz konusuydu (Özvar, 2003: 18). 1611 ile 1630 arasındaki sözleşmelere konu olan 96 mültezimin %60'ı Müslüman, %27'si Yahudi ve %13'ü Hıristiyan idi (Çizakça, 1999b: 136). XVIII. yüzyıl Osmanlı iltizamcıları, Fransız meslektaşlarının homojen geçmişlerini paylaşmıyorlardı. XVII. yüzyılın başlarından itibaren Müslüman mültezimler arasında askeri zümre mensuplarının nispi oranının ciddi şekilde artış kaydettiği görülmüştü. XVIII. yüzyılda ise bu homojenlik yerini heterojen bir grup olarak askeri zümre, din adamları ve bürokratlara bırakmıştı (Özvar, 2003: 18). Bununla birlikte, İslam hukuku altında hükümdarla uğraşmak, önemli miktarlarda sermayenin bir araya getirilmesinde potansiyel olarak ciddi engeller oluşturuyordu.

Diğer bir neden de Fransızların Osmanlılara göre tüzel kişiliğe sahip, devredilebilir hisselerle yeni bir organizasyon oluşturmayı nispeten kolaylaştıran kurumlara sahip olmasıydı. Bu tür kurumlar, *General Farms* Şirketi'nin, kralla olan meselelerinde krala karşı örneğin kredileri keserek cezalandırmak için yeterli sermaye biriktirmesine izin verdi. On çiftçiden oluşan bir konseyin bir krediyi kesmeye karar vermesi, binlerce yatırımcının karar vermesinden daha kolaydı. 1590 ile 1653 arasında, Fransız iltizam çiftlikleri birleştirilmeden önce, Fransız iltizam sözleşmelerinde yaklaşık 303 farklı imza bulunabilirdi. Bu çiftçilerden

81'i birden fazla sözleşme imzaladı. 1600 ve 1652 yılları arasında -*General Farms* Şirketi'nin kurulmasından önce- en büyük iki iltizam, tüm iltizam sisteminden krala giden toplam gelirin yaklaşık %52'sini oluşturuyordu (Balla & Johnson, 2009: 827).

Tablo: 1
General Farms Şirketi Kira Sözleşmeleri

Kefil	Yıl	Yıllık Kira Fiyatı (Livre)	İltizamcı Sayısı
Carlier	1726	80,000,000	40
Desboves	1732	84,000,000	40
Forceville	1738	91,830,000	40
La Rue	1744	92,000,000 (barış dönemi)	40
	1748	91,153,000 (savaş dönemi)	
Girandin	1750	104,265,000	40
Henriet	1756	110,000,000	60
Prevost	1762	124,000,000 (barış dönemi)	60
	1764	118,000,000 (savaş dönemi)	
Alaterre	1768	132,000,000	60
David	1774	152,000,000	40
Salzard	1780	122,900,000	40
Mager	1786	144,000,000	42

Kaynak: White, 2001: 6.

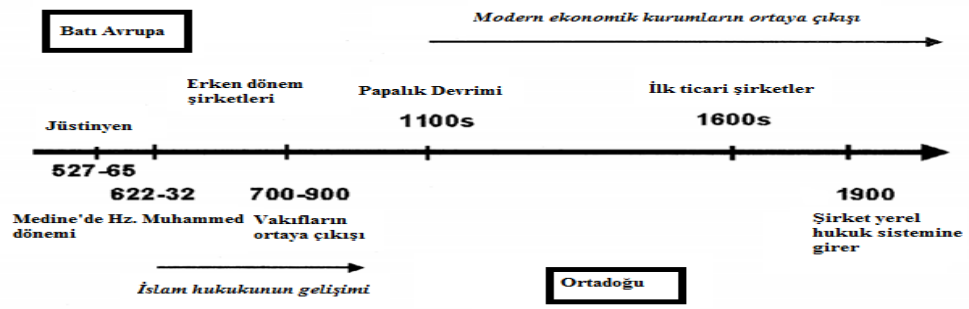
XVIII. yüzyılda kira sözleşmeleri, *gabelle, tobacco* (1747'den sonra), *traites* (iç ve dış gümrükler), *aides, domaines* vergi gelirlerini kapsıyordu. En çok gelir *aides*'lerden gelirken en az geliri *traites* ler getiriyordu. Vergi oranları 1705 ile karşılaştırıldığında 1781'de %50 daha yüksekti (Matthews, 1958: 70). *General Farms* Şirketi kurulduktan sonra 1681-1708 dönemi için iltizamcıların sayısı azalarak 88'e indi. 1726-1786 döneminde ise tablodan da görülebileceği üzere daha da azaldı, 1726'da 40 iltizamcı bulunuyorken bu sayı 1760'larda 60'a çıktı, 1786'ya gelindiğinde 42'ye düştü. Kira fiyatları ise 1726'da 80 milyon livreden 1786 yılında 144 milyon livreye yükselmişti. Bununla birlikte iltizamların yıllık kira fiyatları barış dönemlerinde savaş dönemlerine göre çok daha fazla idi. Örneğin, 1744 yılında 92 milyon livre iken, 1748 yılında Avusturya Veraset Savaşları döneminde yıllık kira fiyatları önceki dönemlere göre çok daha azdı (White, 2001: 6).

Matthews'e göre iltizam sistemi çok maliyetliydi. *General Farms* Şirketi'nin 1726 yılından sonra neredeyse hiç kayıp riski yoktu. Hükümetle yaptığı sözleşmelerden çok daha fazlasını toplayarak kâr elde ediyordu. 1774-1780 dönemde 40 iltizamcının her biri yıllık 24.000 livre maaş, harcamaları için 4.200 livre, 133.000 livre sermayesine faiz, 156.000 livre kâr payı elde ediyordu. Bu durumda burada şu soruyu sorabiliriz: O zaman neden devlet böyle maliyetli bir sisteme devam etti? Çünkü şirket özerk ve hala kraliyet mali yapısının vazgeçilmez bir parçası idi. Para olarak dolaşıma sokulan banknotlar yayarak halktan borçlandı (1762'de 60.000.000 livre), hükümet tarafından öngörülen makbuzlara karşılık gelen çekleri ödedi, ödenen devlet fonlarını topladı ve hükümete 1768-80 döneminde 92.000.000 livre kadar uzun vadeli borç verdi (Matthews, 1958: 191).

Neden Osmanlı Devleti'nde "doğal" kişiliğin aksine "yasal" bir kavram ortaya çıkmadı? Osmanlı Devleti'ndeki siyasi otorite Fransa'ya göre meşruiyet açısından dini otoritelere daha fazla bağımlıydı. Ekonomik yasalar, müftü ve kadı gibi dini liderlerin öğretilerine dayandığı için, bu yasaları değiştirmenin maliyeti İslam ülkelerinde çok daha

yüksekti (Balla & Johnson, 2009: 831). Osmanlı Devleti'nde kurumsal kurumların yokluğunun ikinci bir nedeni ise vakıfların varlığı ve ikame gücüydü. Vakıf deyim olarak, bir kimsenin mülkünü sosyal veya dinî bir amaca sınırsız olarak tahsis etmesidir. XVIII. yüzyılda vakıf kurucularının %80-90'ını askeri zümre mensupları, %10-20 kadarını ise reâya oluşturmaktaydı. Vakıf sistemi ülkedeki sağlık, eğitim, diyanet, sosyal yardım ve bayındırlık yatırımlarını yürüten kurum olarak mali sistemin önemli bir parçasıydı (Kaya, 2017: 72). Yine de vakıf, tüzel kişiliğe sahip olmadığı, devredilebilir hisselerden yoksun olduğu, belirli bir amaca hizmet ettiği ve bu amaçtan sapmaması gerektiği için normal bir şirketten çok farklıydı. Geleneksel bir vakfa yatırılan sermaye, gerçek anlamda, işletmenin kuruluşunda ortaya konan amaca bağlıydı[16].

Şekil: 1
Ortadoğu ve Batı Avrupa'da Örgütsel Farklılık



Kaynak: Kuran, 2005: 803.

Müslümanlar, İslam'ın ilk dönemlerinden beri sermaye ihtiyaçlarını mudârebe, müfâvaza, müşareke (inan ortaklığı) ve kredi ortaklığı (vücûh) diye bilinen iş ortaklıkları başta olmak üzere karz-ı hasen, para vakıfları vb. gibi bir takım faizsiz yollarla başarılı bir şekilde karşılamışlardı. Başta mudârabe olmak üzere Müslümanların geliştirdikleri ve para vakıflarında, gemicilik ve gemi yapımında ve daha çok da devlete finansman sağlayan girişimcilerin kurduğu iş ortaklığı türleri hem istihdamın artırılmasında hem de sermaye ihtiyacının karşılanmasında önemli bir rol üstlenmişti. Osmanlı Devleti'nin yanı sıra Ortaçağ

---

[16] *Klasik İslam hukuku, vakıf gibi önemli bir istisna dışında, bireylerin bütünlüğünden oluşan hiçbir ekonomik varlığı tanımaz. Ancak vakıf bile bir şirketin sahip olduğu birçok özgürlükten yoksundu. Sermayenin bir vakıf altında bu "hareketsizleştirilmesinin" kurumsal değişimi nasıl etkilediğinin çarpıcı bir örneği olarak Orta Doğu'da vakıf finansmanlı medreseler olarak kurulan kolejler ile Batı'da eşzamanlı olarak kurulan üniversiteler arasındaki zıtlıklar verilebilirdi. Avrupa'da erken dönemde kurulan Paris (1180) ve Oxford (1240) üniversiteleri vakıf benzeri vakıf araçları altında oluşturulmuş ancak birleşme yoluyla hızla kendi kendini yöneten ve kendini yenileyen kuruluşlar haline geldiler. Buna karşılık vakıflar aracılığıyla finanse edilen medreseler kurucularının direktifleriyle kısıtlanmaya devam ettiler. Bu nedenle, zamanla, medreselerde müfredat üniversitelere göre daha az değişti ve Orta Doğu'nun entelektüel bir durgunluğa dönüşmesine neden oldu. İslami yönetim altında birkaç parlak yüzyıldan sonra Ortadoğu'nun entelektüel öneme sahip olmamasına birçok faktör katkıda bulunsa da temel neden vakıfların örgütsel sınırlamalarında yatmaktadır. Bkz. Kuran, 2005.*

Avrupa'sında da yine bu amaçlarla çeşitli iş ortaklıkları gelişmişti (Çizakça, 1999b:115-118).

Ticari canlanmanın Ortaçağ Avrupa'sındaki şirketleşme hareketine verdiği teşvik göz önüne alındığında, tüccarların yasal dönüşüme katkıda bulunması şaşırtıcı değildi. XVI. yüzyılın sonlarına kadar ticari işletmeler şirket olarak örgütlenmeye başlamadı. Bununla birlikte, ticari şirket ile ilişkilendirilen organizasyonel özellikler ve işleyişi için gerekli olan uygulamalar, önceki üç yüzyıl içinde çoktan ortaya çıkmıştı (Kuran, 2005: 802-811). Ortaçağda özellikle 12. ve 13. yüzyıllarda yaygınlaşan iş ortaklıklarının en önemlisi c*ommenda*[17] idi. İngiltere, Kanada, Amerika Birleşik Devletleri ve Japonya gibi bazı ekonomilerde küçük ve orta ölçekli girişimcilerin işsizlikle mücadele ve finansman ihtiyacını karşılama çerçevesinde gündeme gelen riske dayalı ve faizsiz Venture Capital Sisteminin kaynağı olarak da değerlendirilen commenda iş ortaklık türünün, İslamî mudârebe ortaklığı ile bir benzerliğe sahip olduğuna yönelik yaygın bir görüş vardı[18] (Kumaş, 2006: 370-371). Şekilden de görülebileceği üzere Batı Avrupa kurumları aynı amaçları gerçekleştirmek için kullanmaya başladığı zamanlarda vakıf, İslam'ın sosyal hizmetler sağlamak için ana örgütsel biçimi haline geldi. Örgütsel boşluk, Batı'nın kurumsal örgüt biçimini kâr odaklı üretime, finansa ve ticarete uygulamaya başlamasıyla XVI. yüzyılın sonunda daha da genişledi. XIX. yüzyıl Fransa'sında ortaklıklar en yaygın örgütsel biçim olmaya devam etti, ancak istihdam veya sermaye ile ölçülen işletme ne kadar büyükse, kurumsal özelliklere sahip olma olasılığı da o kadar yüksek oluyordu (Kuran, 2005: 802-811). Osmanlı Devleti'nde para vakıflarının[19] ortaya çıkışıyla toplum yeni bir finansman yöntemiyle tanışmıştı. Bir nevi kredi müessesesi[20] olan para vakıfları, ailesinin ihtiyacını karşılamakta zorlanan kişilerin, küçük ve orta ölçekte faaliyet gösteren esnaf ve girişimcinin finansman talebini karşılamaktaydı (Döndüren, 2008). İş ortaklıkları ve para vakıfları arasındaki ilişkiye baktığımız zaman vakıflar binlerce kişinin değil tek bir kişinin tasarruflarına sahip olduğu için girişimcilere kullandırabilecekleri sermaye görece küçüktü. Çoğu zaman borç alan kişiler bu parayla var olan işlerini büyütmek ya da yeni işler kurmak yerine İstanbul'daki sarraflara daha yüksek faizle borç veriyorlardı. Bu nedenle başlangıçta ümit verici ve özgün bir Osmanlı sermaye kurumu olarak ortaya çıkan para vakıflarının,

---

[17] *İlk kez X. veya XI. yüzyıllarda İtalya'da ortaya çıkan commenda Ortaçağda Akdeniz ticaretinin gelişmesinde önemli bir rol oynamıştı. Özellikle sermayenin toplanması, denizaşırı ticari faaliyetler ve işletmeci ile yatırımcının bir araya getirilmesi gibi sorunların aşılmasında başvurulan en önemli ortaklık türüydü. Bkz. Udovitch, 1962.*

[18] *X. yüzyıldan itibaren mudarebe ortaklık yöntemi commenda adı ile Avrupa'ya geçmiş, Avrupa ticaret hukukunda diğer ortaklık çeşitlerine de öncülük etmiş ve XX. Yüzyıla gelindiğinde emek-sermaye ortaklığının en önemli halkası olarak risk sermayesi ile tamamlanmıştı. Bkz. Döndüren, 2008.*

[19] *Para vakıfları, Allah adına insanlığa hizmet etmek amacını güden ve kuruluş sermayesi paradan oluşan vakıf fonlarıydı. XVI. yüzyılın sonlarında para vakıfları bütün Anadolu'da ve devletin Avrupa'daki eyaletlerinde yaygınlaşmıştı. Dini amaçlarla belirli miktarda nakit parayı dağıtmak isteyen varlıklı kişiler tarafından kurulan para vakıflarında vakfın sermayesi ilk olarak borç almak isteyenlere aktarılıyor, onlar da belirli bir süreden sonra vakfa anapara ile birlikten "fazladan" bir parayı geri ödüyorlardı. Bu "fazla" sonrasında sosyal ve dini amaçlar için kullanılıyordu. Bkz. Çizakça, 1999b.*

[20] *Para vakıflarının bir kredi kurumu olup adeta bir banka gibi çalıştığı ancak yapısal olarak bankadan farklı olduğu yönündeki geniş bir değerlendirme için bkz. Çizakça, 1999b.*

aslında sermaye dağıtım kurumu oldukları görüldü. Vakıflardan krediyi alanların çoğu küçük tüketici, esnaf ya da girişimciydi ve vakıfların yarattıkları fonlar önemli girişimleri finanse etmekte kullanılmıyordu. Acaba talep yönünden neden bir sermaye birikimi oluşmadı ya da girişimci neden çok sayıda vakıftan kredi alma yolunu seçmedi? Para vakıfları borç alan kişiden teminat olarak evini rehin göstermesini istiyordu. Para vakıflarının ödünç para karşılığında bu kadar büyük bir teminat istemeleri etkin sermaye birikim araçlarına dönüşememelerine neden olmuştu. Bir kişi aynı anda birden çok para vakfından kredi almak isterse rehin olarak birçok ev göstermek zorundaydı (Çizakça, 1999b: 115-118). Bu nedenle Osmanlı Devleti'nde böyle büyük bir sermayeyi bir araya getirerek bir şirket oluşturma o dönemlerde kolay değildi.

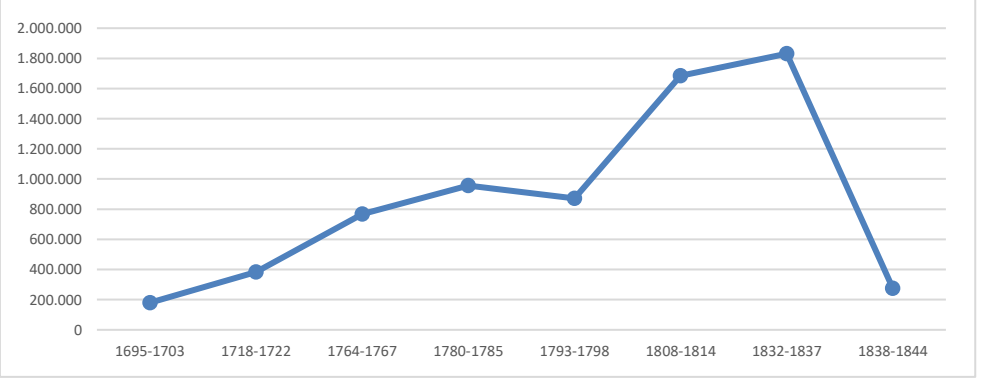
Tüm bu yaşananlar, XVII. yüzyılın son döneminde ve XVIII. yüzyıl boyunca Fransa'da sermaye sahiplerinin Kralın hareketlerini kısıtlayarak kralı, Osmanlı padişahlarının izlediği kademeli reformlardan ziyade temel kurumsal reform yapmaya yönlendirdi.

1690'larda Osmanlı Devleti mali sistemi, Fransa'nın *General Farms* Şirketi aracılığıyla iltizamların toplanmasında merkezileşme hamlesine karşılık daha fazla âdem-i merkeziyetçilik ve mali sözleşmelerde daha az güvenlik yönünde, Fransa'nın tersi yönde ilerledi. Bu doğrultuda Osmanlı Devleti'nde temel reformlar yerine kademeli reformlara devam edilmiş ve XVII. yüzyılın sonunda artan nakit ihtiyacına çözüm olarak iltizam sisteminden malikâne sistemine geçilmişti. İltizam sisteminin ardından, ortaya çıkan malikâne sistemi de yine aynı amaca hizmet etmiş ve bu defa belirli bir süre için verilen iltizamların içeriği değişerek kayd-ı hayat şartıyla verilmeye başlamıştı. Osmanlı Devleti mülk anlayışının değişmesinin ve özel mülkiyetin ortaya çıkmasının asıl nedeni olarak görülen malikâne sistemi ile idari, ekonomik ve toplumsal alanda değişimler yaşanmıştı. XVI ve XVII. yüzyılların nakit ihtiyacını karşılamanın yöntemi iltizam gibi görünse de XVIII. yüzyılda mukataaların malikâneye dönüştürülmesine izin verilmişti (Tabakoğlu, 1985a: 130). Malikâne sisteminde muaccele ve müeccele adı verilen iki farklı ödeme şekli ile mukataaların gelirleri satışa çıkarılmıştı. Muaccele; satış sırasında ödenen peşin miktar iken müeccele her yıl ödenecek taksitti. Yani; malikâne sistemi, devletin nakit ihtiyacını hem satışta hem de her yılbaşında taksit olarak almasını sağlayarak nakdi gelirleri artıracak açık artırma usulüyle satışı gerçekleştirilen bir sistem olarak ortaya çıkmıştı (Genç, 2009: 107). Osmanlı Devleti'nde mali sistem içinde *General Farms* Şirketi'ne benzeyen hiçbir kısıtlayıcı örgüt oluşmadı. Malikâne uygulamasının başladığı 1695 yılı ile 1697 yılı arasında toplamda 1113 malikâne satışı gerçekleşmiştir. Bu sayı içerisinde biri Yahudi dördü Hıristiyan olmak üzere 5 tane gayrimüslim malikâneci bulunmaktaydı. Ayrıca aynı dönemde malikâne sahiplerinin %19'u İstanbul'da yaşamakta ve bunların yatırdıkları muaccele bedelleri %42 idi (Özvar, 2003: 77-79).

Malikâne sisteminde devletin hem satış bedeli üzerinden para alması hem de sonrasında yıllık müeccelelerini alması merkezi hazinenin nakit sıkıntısına ilk zamanlarda

çare oluyordu. Bu kârlı sistem, ayrıca cebelü bedeliyesi[21] adı altında da bir takım ödemeler alarak, her yönüyle bir kâr ve nakit karşılama yöntemine dönüşmüştü. İran savaşları sırasında, 1738'de, ek bir mali kaynak sağlama amacıyla 1000 müeccelelerin her 1000 guruşundan 150 guruş alınmıştı (Tabakoğlu, 1985a: 134). Ayrıca, XVIII. yüzyılda alınan vergilerden biri de her padişahın tahta çıkması ile birlikte, müeccele miktarlarının %25'i kadar olan "cülûs resmî"[22] idi (Genç, 2009: 116). XVIII. yüzyılda mukataaların eyalet boyutunda verilmesi mâlikane sisteminin ne kadar yaygınlaştığının bir göstergesiydi. Öyle ki 1746 yılında Adana, Trablusşam eyaletleri, Rakka eyaleti, Kıbrıs ve Mora Muhassıllıkları ve Aydın muhassıllığı mâlikane olarak verilmişti (Tabakoğlu, 1985a: 135).

Grafik: 4
Yıllık Muaccele Gelirleri (Ortalama-Kuruş)



Kaynak: Genç, 2009: 117.

Fransa'daki iltizamcıların XVIII. yüzyıl boyunca mülkiyet haklarının güvenliğini artırma becerilerinin aksine, Osmanlı Devleti'nde malikâne sistemi kapsamındaki mali sözleşmeler güvenli olmaktan çok uzaktı[23]. Mukataaları iltizama alan malikâneciler genellikle İstanbul'da yaşıyordu ve mukataalarını gayri resmi olarak başkalarına iltizama veriyorlardı. Hatta bazı mukataalarda ikinci ve üçüncü elden iltizamlar bile vardı. Böylece

---

[21] *Silâh, zırh" anlamına gelen Moğolca cebe kelimesinden türetilen cebelü (cebeli) "zırhlı, teçhizatlı asker" demekti. Cebelü asker, tımar sahibinin (sipahi) geliriyle doğrudan bağlantılıydı ve sayıları bu gelirlere göre tespit edilmişti. Sipahiler gelirleri karşılığı cebelü çıkartmazlarsa, kendilerinden cebelü bedeliyesi adı altında vergi talep edilirdi. XVII ve XVIII. yüzyıllarda cebelü bedeliyesi uygulaması hazinenin paraya olan ihtiyacı sebebiyle yaygınlaştırılmıştı. Bununla birlikte yeni savaş tekniklerinin ortaya çıkması ve tımar sisteminin giderek bozulması sonucu bu askerî teşkilât zamanla önemini yitirmişti. Bkz. Emecen, 1993.*

[22] *Padişah değişikliklerinde askerlere ödenen bahşişlere "cülus" denilmekteydi.*

[23] *Malikâneciyi bu derece büyük bir risk almaya yönlendiren şey neydi? Çizakça'ya göre bu sorunun cevabı "mülkiyet hakları" kavramında gizli olabilirdi. Askeri bir sınıfın bir üyesi Osmanlı Devleti tarihinde ilk defa yaşamı boyunca özel mülkiyete benzer bir mülkiyete sahip olabiliyordu. Muacceleyi peşin olarak ödeyen ve yıllık ödemeleri de düzenli olarak yapan bir malikâneci kontrol ettiği vergi kaynağından tümüyle yararlanabiliyordu. Malikâneci risk alan bir girişimciydi; hayatının geri kalan kısmında devlete ödediği toplam miktarın üzerinde gelir elde edebiliyorsa kâr ediyor, aksi takdirde zarara giriyordu. Bkz. Çizakça, 1999b.*

iltizam sisteminde olduğu gibi bir malikâneci hiyerarşisi ortaya çıkmıştı (Batmaz, 1996: 42). Ne yazık ki malikâne sistemi XVIII. yüzyılda devletin olumlu beklentilerini karşılayamadı. Malikâneciler öldüğünde kontratlarının tekrar devlet denetimine dönmesi sağlanamadığı için bu sistem devlete ulaşan vergi gelirlerini artırmak yerine tersine azalttı (Pamuk, 2013: 138). Özellikle 1683 yılından sonra merkezi otoritenin zayıflaması sonucu ortaya çıkan iç güvensizlik ortamı ayânların[24] doğmasına neden olmuş ve XVIII. yüzyıl boyunca ayân ailelerin taşradaki gücü günden güne artmıştı. Bu aileler, idari ve askeri görevliler, hakimler, din bilginleri ve yerel tüccarlar arasından yükseldi. XVIII. yüzyılda, merkezi idare ayrıca ayânlara kamu düzenini koruma görevini vermiş ve onlardan gelirleriyle birlikte savaşlara katılmalarını istemişti (Pamuk, 2014: 9). 1768 Osmanlı-Rus Savaşı'nda devletin askere ve paraya olan ihtiyacından dolayı taşra idaresini ele geçiren ayânlardan yardım istemesi, ayânlar üzerindeki devlet kontrolünün zayıflamasına ve ayânların idari, iktisadi ve sosyal açıdan güçlerini artırmasına neden olmuştu (Özdeğer, 2000: 78). Öyle ki, Anadolu ve Rumeli'de her vilayet ya da sancakta yavaş yavaş ayânlar arasında büyüklerinden, küçüklerine doğu uyruklaşmanın geliştiği görülmüş, böylece Osmanlı Devleti hükümet düzeni yerel idaresi yönünden merkeziyetçiliğin düşmanı bir karakter kazanmıştı (Akdağ,1974: 53). XVIII. yüzyıl devletin ayânlarla uzlaşma eğilimlerine ve mücadelelerine ve kendini âdem-i merkeziyetçi eğilimden kurtarma çabalarına sahne olmuştu (Sofracı & Ergenoğlu, 2016: 389). Malikânecilerin sözleşmelerini düzenleyen kanunlara aldırış etmemesi ayânlıkla beraber daha da kötüleşince merkezi hükümet, müsâdere[25] usulünü kullanmış, iltizamlara el koymaya ve yerel güçleri uzaklaştırmaya başlamıştı.

Osmanlı Devleti'nde malikâne sistemindeki mültezimler XVII. yüzyılın sonundan itibaren, hiçbir zaman Fransız iltizamcılar ile aynı ölçekte sermaye bir araya getiremediler. İstanbul'dan gelen ortakların ve yatırımların sayısı 1768'de 711 iken 1789'da 963'e yükselmişti. İstanbul'dan malikâne sistemine katılan yatırımcıların toplam payı ise aynı tarihlerde %65'ten %87'ye çıkmıştı (Salzmann, 2004: 148-150). Taşra ve merkezi otorite arasında yaşanan bu iktidar mücadelesinde güçlü taraf İstanbul'un seçkinleri olmuştu. Çünkü halkı vergilendirirken aynı zamanda onları koruyabilecek olanlar kendilerine göre ancak İstanbul'un seçkinleri idi (Faroqhi, 1994: 691-692). 1787-88 yıllarında aktif varlıkları 100 bin kuruşun üstünde olan 14 aile vardı ve bu aileler İstanbul'da bulunan yatırımcılar içinde %2'yi oluştururken, yatırım hacminde %30'un üstünde paya sahiptiler. Tüm bunlardan hareketle İstanbul'dan gelen yatırımlar içerisinde de belirli bir zümrenin daha da öncelikli olduğunu söylemek yanlış olmazdı (Salzmann, 2004: 108). Fransa'da ise tam tersine 1788 yılında iltizam sistemi ile ilişkili sermayenin hemen hemen tamamını 16 kişi

---

[24] *Aslında XVI. ve XVII. yüzyıllarda ayân tabiriyle taşrada servet ve nüfuz sahibi kimseler kastedilmekteydi. Kapıkulları, yeniçeri serdarları, sipahiler, eminler, eski beylerbeyleri, sancakbeyleri, kadılar, mültezimler, müderrisler gibi zümreler ayânın kaynağını oluşturuyordu. Bkz. Tabakoğlu, 1985a.*

[25] *Müsâdere, devlet adamlarının hayatları boyunca elde ettikleri malların şahsa değil makama ait oldukları düşünülerek, vefatlarının ardından çocuklarına yetecek kadar mal bırakılıp geri kalan miktara el konulmasıydı. Osmanlı'nın Kuruluş döneminde pek başvurulmayan müsâdere usulüne Fatih Sultan Mehmed döneminde merkezi yönetimin gücünün tescillenmesi adına daha sık başvurulmuş, XVII. yüzyıla gelindiğinde de gelir sağlama amacıyla sık sık uygulanmıştır. XVIII. yüzyılın sonlarında artık sadece devlet adamlarının değil sıradan insanların mal varlıklarına da müsâdere uygulanmaya başlanmıştı. Bkz. Öğün, 2006.*

kontrol ediyordu. Büyüklü küçüklü Osmanlı yatırımcıları, sürekli olarak iltizamlar arasında çeşitlenmeyi seçti[26]. Böylelikle *General Farms* Şirketi, XVIII. yüzyılda krala karşı kısıtlamalar getirmek için yeterli sermayeyi bir araya getirirken, bu kritik kitleye bir Osmanlı iltizam çiftliği hiçbir zaman ulaşamadı (Balla & Johnson, 2009: 836).

XVIII. yüzyılın sonunda Fransa'da gerçekleştirilen temel kurumsal reformların aksine, Osmanlı padişahları kademeli reformlarla XIX. yüzyıla kadar devam ettiler. 1768-1774 Osmanlı-Rus Savaşı sonrası imzalanan Küçük Kaynarca Antlaşması'nın savaş tazminatını ödeyebilmek için birçok büyük iltizam tesisini devraldı ve bunları esham[27] sistemi ile işleterek devlete ek mali kaynak sağladı. Esham sistemi ile iç borçlanma süreci başlatılmış ve ilk olarak 1775 yılında İstanbul Tütün Gümrüğü mukataasına uygulanmıştı. Bu yöntemle devlet elindeki mukataaları çok sayıda paya bölmüş ve her paya düşen yıllık vergi gelirinin faiz denilen bir bölümünü ömür boyunca ve peşin olarak ödenen bir bedel karşılığında özel kişilere satmıştı (Öner, 2005: 164).

5. Vergi Yönetimi ve Merkezileşme Çabaları

XVIII. yüzyıl boyunca Fransız hükümeti *taille, capitation, dixieme-vingtieme* gibi dolaysız vergileri rüşvet alan kraliyet görevlileri; dolaylı vergileri ise altı yıllık sözleşmeler ile *General Farms* Şirketi aracılığıyla topladı. Yüzyıllar içerisinde iltizam sistemi yavaş gelişti ve Colbert, 1681 yılında büyük çiftlikleri geçici olarak birleştirmeyi başardı. Colbert'ın, XVII. yüzyılın sonlarında *General Farms* Şirketi ile konsolidasyon sürecini yeniden başlatması merkezileşmeye doğru bir dönüm noktasıydı. 1768 yılına gelindiğinde *General Farms* Şirketi toplam devlet gelirinin yaklaşık %45'ini topluyordu. Fransız yöneticiler, bir grup özel personelin devlet gelirinin böylesine büyük bir yüzdesini kontrol etmesine izin vermenin sonuçlarından korkmaya başladılar. Dahası, iltizamcılar devlet tarafından kullanılandan daha iyi bir muhasebe sistemi, katı bir hiyerarşi, ayrıntılı personel kayıtları gibi verimliliği artıran birçok yeni teknik geliştirdi (Matthews, 1958: 218).

Devrim, dolaylı vergilerin özelden kamusal tahsiline geçiş için gerekli bir koşul muydu? Bu yöndeki önemli reformlar Devrim'den neredeyse on yıl önce meydana geldiğinden, yanıt hayır gibi görünüyordu. 1777 yılından başlayarak 1780 yılına kadar dönemin Maliye Bakanı Jacques Necker, Fransız idari sisteminde önemli reformlar başlattı. Bu reformların en önemlileri; genel olarak yereldeki memurların gücünü azaltarak dolaysız vergilerin kontrolünü merkezileştirme ve bürokratikleştirme girişimi ve dolaylı vergilerin yaklaşık %40'ını *General Farms* Şirketinin kontrolünden alarak bunları kamu idaresine

---

[26] *Örneğin, İstanbul'daki Tütün Gümrük (Tobacco Customs) iltizamı 1707 ile 1737 arasında dört mültezime sahipti, ancak 1759'da 22 sahibi vardı ve en küçük pay 1/128 idi Bkz. Özvar, 2003.*

[27] *Esham "pay, hisse" anlamına gelen sehm kelimesinin çoğuludur. Osmanlı Devleti maliye teşkilatında ilk defa, 1775 yılında uygulamaya konularak 1860'lı yıllara kadar devam eden bir iç borçlanma sistemini ifade eder. Bu sistem şu şekilde işlemekteydi: Mukataa olarak bilinen vergi birimlerine ait yıllık nakdî gelirlerin, faiz denilen belirli bölümlerinin sehimler halinde parçalanarak özel şahıslara "muaccele" adı verilen bir peşin meblağ karşılığında kayd-ı hayat şartı ile satılmasıdır. Satışa sunulan, bir mukataaya ait yıllık nakdî gelirin tamamı değil sadece faiz denilen belirli bir bölümüdür. Bkz. Genç, 1995.*

devretmekti (Doyle, 1996: 65-70). Dolaysız vergileri toplayan rüşvet alan memurların reformları sürekli engellemeye çalışmasına rağmen dolaylı vergilendirmede iltizamcılar devletle olan sözleşmeleri birkaç yılda bir yenilendiği için reformların gerçekleştirmesine olanak sağlıyorlardı. 1777-1780 döneminde *aides* ler ve damga vergileri iltizamcıların kontrolünden çıkarıldı ve 1791 yılına kadar devlet kontrollü bir rejim hâkim oldu. Dolaylı vergiler zaten merkezileştirilmiş ve kısmen bürokratikleştirilmişti; üçüncü adım, onları özelden kamu eline geçirmekti. 48 iltizamcı bastırıldı ve onların topladığı gelirler merkezi hazineye aktarıldı. Reform hem rüşveti azalttı hem de merkezileşmeyi artırdı. Ancak Necker devrilince bir yıl içinde her şey tersine döndü. Dolaysız vergilerin rüşvet alan yöneticilerinin yerinden edilemeyecek kadar güçlü olduğu ortaya çıktı. Bu durumda, köklü güçlerini kırmak ve en yüksek düzeydeki doğrudan vergi idaresini nihai olarak merkezileştirmek ve bürokratikleştirmek için bir devrim gerekecekti (Kiser & Kane, 2001: 204-205).

Tablo: 2
Fransız Vergi İdaresi Tarihinde Önemli Olaylar

Yıllar	Olaylar
1600 öncesi	Merkeziyetçi Bir Yapı
1600	Âdem-i Merkeziyetçi Bir Vergi Sistemi
1681	*General Farms* Şirketinin Kurulması
1723	İltizam Sistemiyle Dolaylı Vergilerin Merkezileştirilmesi
1780-1800	İletişim / Ulaşım Alanında (Hızında) Yaşanan Önemli Gelişmeler
1780	*Aides* ve Damga Vergilerinin İltizam Sistemi ile Toplanmasının Sonlandırılması
1789	Fransız Devriminin Başlaması-İltizamın Sonu
1792-1799	Merkezi Yönetimin Kısmen Bürokratikleşmesi
1799-1800	Merkezileştirme: Valilerin Ortaya Çıkışı
1815-1830	Yeniden Monarşi-Restorasyon Devri
1830-1850	Yerel Yollar da Dahil Olmak Üzere Yol Yapımında Önemli Artış
1870	Merkezi Yönetimin Bürokratikleşmesi
1870-1898	Dolaylı Vergilerin Bürokratikleşmesi
1914	Doğrudan Vergilerin Bürokratikleşmesi ve Merkezileşmesi: Gelir Vergisi

Kaynak: Kiser & Kane, 2001: 190.

4 Ağustos 1789 gecesi, Ulusal Meclisin nesiller boyu Fransız yaşamını şekillendiren birçok gelenek ve kurumu kaldırdığı ve radikal kararların alındığı bir gece olarak bilinmektedir (Doyle, 1996). Çoğu bilim insanı Fransız Devrimi'ni, Fransız devletinin merkeziyetçilik ve bürokratikleşmesinde dönüm noktası olarak görür (Skocpol, 1979; Tilly, 1990; White, 2001). 1789'dan önce merkezi bürokratik yönetime doğru önemli hareketler vardı, ancak bunlar dolaylı vergiler alanıyla sınırlıydı. Dolaysız vergi idaresinin çoğu da dahil olmak üzere Fransız devletinin diğer kısımları, Devrimden sonraki yüzyılda âdem-i merkeziyetçi yapısına devam etti. Acaba Fransa'da vergi yönetiminin merkezileşmesi ile Fransız Devrimi arasında ilişki var mıydı? Devrim, ancak devletlerin izleme kapasitesi (yöneticilerin görevlilerin eylemleri hakkında bilgi toplama yeteneği), iltizam ve yerel eşraflar tarafından tahsilat gibi alternatiflerden merkezi örgütlenmeyi daha verimli hale getirecek kadar geliştirildiğinde bürokratikleşmeye ve merkezileşmeye yol açardı. İzleme kapasitesi, vergi türlerine ve yönetim düzeylerine göre değişiklik gösterdiğinden, eyaletler de farklı hızlarda bürokratikleşir ve devrimden farklı şekilde etkilenirdi. Bu, Fransa'daki devrimin neden dolaylı vergiler üzerinde dolaysız vergilere göre daha fazla etkiye sahip olduğunu açıklıyordu. Dolayısıyla devrim bürokratikleşme ve merkezileşme için ne gerekli ne de yeterli bir koşuldu, ancak reformun önündeki engelleri ortadan kaldırarak sürece

katkıda bulundu (Weber, 2012; Tilly, 1990)[28]. Bu çalışmanın odak noktası, bürokratikleşmenin diğer yönlerine değil, esas olarak merkezileşmesi üzerinedir.

Fransa'da tüketim ve alım-satım işlemlerinden alınan dolaylı vergiler, belli bazı vergiler için çok kısa dönemler hariç genel olarak XIII. yüzyıldan Fransız Devrimi'ne kadar iltizam sistemi ile toplanmaktaydı. Doğrudan vergiler ise XIII. yüzyılda ve yalnızca 1643-1661 arasında iltizama verilirken, bu dönemler dışında merkezi devlet idaresi tarafından belirlenmiş götürü verginin bir karışımı ile toplandı. 1681'den önce dolaylı vergiler âdem-i merkeziyetçi bir yapıda toplanıyordu. 1681'de *General Farms* Şirketi'nin kurulması ile iltizam sistemi merkezi hale getirildi ve hemen hemen tüm dolaylı vergiler bu şirket çatısı altında birleştirildi (Buluş, 2010: 89-90).

Tablo: 3
Osmanlı Devleti Vergi İdaresinde Yaşanan Önemli Olaylar*[29]

Yıllar	Olaylar
XVI. Yüzyıl Öncesi	Tımar Sistemi ve Merkeziyetçi Bir Yapı
XVI. Yüzyıl	İltizam Sistemi ve Nispeten Âdem-i Merkeziyetçi Bir Yapı
1600-1695	İltizam Sistemi ve Âdem-i Merkeziyetçi Bir Vergi Sistemi
1695	İltizam Sisteminden Malikâne Sistemine Geçiş
1700 Sonrası Dönem	Ayânlığın Ortaya Çıkışı ve Vergilerin Âdem-i Merkeziyetçi Bir Yapıda Tahsisi
1800-1839	III. Selim ve Sonrasında II. Mahmud ile Merkezileşmeye Yönelik Adımlar- Vergi Otoritesinin Merkezileştirilme Çabaları
1839	Tanzimat Fermanı- Merkezi Otoritenin Güçlendirilmesi
1840	Muhassıllık Teşkilatının Kurulması- Vergi Otoritesinin Merkezileştirilmesi
1842	Muhassıllık Teşkilatının Kaldırılması ve İltizam Sistemine Dönüş
1864	Vilayet Nizamnamesi ve Âdem-i Merkeziyetçiliğe Kayış
1878	I. Meşrutiyetin Bitişi ve Merkeziyetçiliğin Güçlenmesi

**Yazar tarafından oluşturulmuştur.*

1789 Devrimi Fransa için önemli bir dönüm noktasıydı. 1789'da Fransa'nın verimsiz, etkisiz, nefret edilen vergi sistemi monarşiyle birlikte yıkıldı, ancak tamamen ortadan kaldırılması için daha fazla zamana ihtiyaç vardı (Chanel, 2015: 79). Tablodan da görebileceği üzere 1780-1800 döneminde iletişim ve ulaşım alanında önemli gelişmeler yaşandı. Bu gelişmeler yavaş yavaş merkezileşmenin önündeki engelleri kaldırsa da merkezileşme farklı vergi türleri için farklı zamanlarda meydana gelmişti. Bu anlamda

---

[28] *Max Weber'in ufuk açıcı çalışmasından (2012) başlayarak, sosyologlar ve tarihçiler siyasi kurumların bürokratikleşmesinin nedenlerini tartıştılar. En yaygın argümanlardan biri, devrimin bürokratikleşmeyi kolaylaştırdığıdır. Vergi idaresi, bu ve diğer erken modern devletlerde sivil devlet aygıtının açık arayla en büyük parçası olduğundan, bürokrasinin oluşumunu incelemek için uygun bir yerdi. Bkz. Tilly, 1975; Weber, 2012.*

[29] *Osmanlı Devleti'ndeki hem merkeziyetçi hem de âdem-i merkeziyetçi uygulamaları eyaletler ve taşra yönetimi ile ilgili bazı nitelikler oluşturmaktaydı. Osmanlı devleti, idari bakımdan merkeziyetçi bir yapıya sahip olmakla birlikte, eyaletler arasında yönetim biçimleri bakımından bazı farklılıklar söz konusuydu. Bu farklılıkların en önemlisi, birçok Osmanlı eyaletinin has ve bazılarının ise salyane ile idare edilmesiydi. Coğrafi bakımdan has ile idare edilen eyaletler, daha çok imparatorluğun iç kesimlerinde ve Anadolu ile Rumeli topraklarında yer almaktaydı. Salyane ile idare edilenler Cezayir, Tunus gibi Osmanlının büyük askeri harekatlarının dışında kalan uç bölgelerdi. Salyane ile idare edilen eyaletlerde, has ile idare edilenlerdeki gibi tımar sistemi mevcut değildi. Osmanlı'da bir eyaletin başka bir eyalete, belki bir sancağın başka bir sancağa benzemez niteliği o dönemin özellikleri açısından gerekli sıkı bir merkeziyetçiliğin yanında âdem-i merkeziyetçi uygulamaların da var olabilmesini mümkün kılan önemli bir etkendi. Bunun ekonomik, askeri sosyal, kültürel, dini ve siyasi-idari birçok yönü bulunmaktaydı. Bkz. Ökmen & Yılmaz, 2015.*

Osmanlı Devleti ve Fransa'daki merkezileşmenin boyutları kendi tarihsel olayları bağlamında değerlendirilecektir.

Tarihte devletlerin önce merkeziyetçilikle idare olunduğu, sonra âdem-i merkeziyetçi bir yapıya büründüğü, ardından tekrar merkeziyetçi yapıya döndüğü görülmektedir. Osmanlı Devleti'nde âdem-i merkeziyetçi ve merkeziyetçi yapı hep iç içe olmuştu. Osmanlı Devleti'nin mali-idari sistemi merkeziyetçiliğe karşı değil aksine merkeziyetçiliğin içerisinde yer alıyordu. XVI. yüzyıla kadar taşra idaresinin temelini tımar sistemi oluşturuyordu. Beylerbeyiler ve sancakbeyleri bölgelerinin mülki ve askeri önderleriydiler. Sefere çıkıldığında tımarlı sipahilerle onların cebelüleri sancakbeylerinin emrinde toplanır ve hepsi beylerbeyinin emrinde sefere katılırlardı. Fakat tımar sistemi bozulunca cebelü yetiştirmek önemini kaybettiği gibi mahallelerinde bir denge unsuru ve merkezin temsilcisi olan tımarlı sipahiler de artık şehirlerde rızık peşinde koşmaya başlamıştı (Tabakoğlu, 1985a: 222). Mali bunalımın kendini hissettirdiği XVI. yüzyılın ikinci yarısında, kamu harcamalarının giderek artması sonucunda, Osmanlı Devleti'nin tarım ve toprak rejimi olan tımar sistemi de olumsuz etkilenmişti. Vergi gelirlerini tımar düzeni çerçevesinde dolaylı olarak kullanmak yerine dolaysız olarak merkezi hazinede toplama çabaları daha önce de bahsedildiği gibi iltizam sistemini doğurmuştu. İltizam sistemi ile birlikte vergilerin âdem-i merkeziyetçi bir yapıda toplanması söz konusu olmuştu. Ancak bu yapı merkeziyetçilikten kopuk değildi. Sonuçta iltizam sistemi içerisinde de olsa vergiler devlet adına toplanmaktaydı. İltizam sisteminde devlet her ne kadar vergilerin tahsilatını kişilere emanet etse de nispeten merkezi olmayan bu sistemi aşırı tahsilat, izinsiz kazanç, zimmete para geçirme ve zulüm gibi durumlardan korumak için mültezimlerin etrafını denetmenler ve muhafızlarla çevirmişti (Sofracı & Ergenoğlu, 2016: 387).

XVIII. yüzyıl boyunca girilen ve kaybedilen savaşlar Osmanlı Devleti'ni mali bunalıma sürüklemiş, devlet nakit ihtiyacını gidermek için iltizam sisteminden malikâne sistemine geçmişti. Bu süreçte ayânların ortaya çıkışı âdem-i merkeziyetçi yapının sürdürülmesine neden olmuştu. XVIII. yüzyılın sonlarında III. Selim ile başlayan (1789-1807) ve sonrasında II. Mahmud (1808-1839) ile devam eden yenileşme sürecinin temelini mali anlamda âdem-i merkeziyetçilikten merkeziyetçiliğe doğru dönüşüm sağlayarak merkezi devletin gücünü artırmak oluşturmaktaydı. Tanzimat döneminde (1839-1876) istenilen merkezileşme hareketinin iki önemli nedeni bulunmaktaydı. Bunlardan birincisi Fransa'da Fransız Devrimi ile halkın dolaylı vergilerin toplanmasında lanetledikleri iltizam sistemini kaldırarak halkın bir nebze de olsa rahatlamasının sağlanması gibi Tanzimat reformu ile de merkezileşme reformları ile halkın yerel toprak sahipleri tarafından yıpratılmasını durdurmaktı. İkincisi de yerelde toplanan gelirlerin doğrudan merkezi hazineye aktarılması yoluyla gelirlerin artırılması çabasıydı (Weiker, 1968: 464-465). Osmanlı Devleti mali ve siyasi merkezileşmesinde resmî kurumlar sınırlı bir rol oynadı. Osmanlı parlamentosu, 1876-77 arasındaki kısa bir dönem hariç, 1908 Jön Türk devriminin sonrasına kadar kurulmamıştı. Kurumsal değişikliklerin zamanlaması ve gelir rakamları, Osmanlı Devleti mali konsolidasyonunun öncelikle modern askeri tekniklerin ve idari organizasyon tarzlarının ve vergi toplama sürecinde aracıların büyük paylarının azalmasına

yardımcı olan demiryolları gibi diğer yeni teknolojilerin benimsenmesiyle sağlandığını göstermekteydi (Pamuk, 2014: 5).

Fransız Devrimi ile beraber vergi sisteminde önemli gelişmeler yaşanmıştı. Bunlardan ilki, vergi sisteminin büyük bir bölümünü kontrol eden iltizam sisteminin kaldırılmasıydı. Doğrudan vergi tahsilatı, Devrim'den sonra oldukça âdem-i merkeziyetçi idi. 1790 ve 1791 yılları arasında, *aides, traites, octrois, gabelle* ve t*abac* bir dizi başka vergi ve harçla birlikte kaldırıldı, ancak bazıları -özellikle *gabelle* ve o*ctroi*- kısa süre sonra eski durumuna getirildi ve sonra tekrar yürürlükten kaldırıldı. 1789 ile 1793 yılları arasında eski dolaysız vergiler, kısa istisnalar dışında, kaldırıldı ve nihayet, gerçek kademeli vergilendirme resmi olarak 18 Mart 1793'te kabul edildi (Chanel, 2015: 79-80). 1804'ten itibaren dolaylı vergi idaresi tek bir kurum altında merkezileşmeye başladı. Topluca *droits reunis* adı verilen alkollü içecekler, tuz, tütün, oyun kartları ve toplu taşıma üzerindeki vergiler bir araya getirildi, kabaca *General Farms* Şirketi altında devrim öncesi merkezileşme yeniden gerçekleştirildi. Diğer vergiler (gümrükler dahil) 1814, 1816 ve 1852'de bu yapıya dahil edildi. 1830'ların ortasında ve sonundaki Fransa'da, antik rejiminin yeniden yaşadığı görülebilirdi (Pinkney, 1986).

Devrimin ve XIX. yüzyıl boyunca Fransa'da yapılan çok sayıda hükümet değişikliğinin, devletin personelini patrimonyal bir aristokrasiden bürokratik bir meritokrasiye ne ölçüde değiştirdiğine dair devam eden tartışmalar vardı[30]. 1795-1799 döneminde uzmanlaşma, iş bölümü, hiyerarşi, arşivleme sürecinin kurumsallaşması gibi bürokratik gelişmeler yaşanmıştı. Merkezileşme ve bürokratikleşme en çok hesap kontrollerinde önemli ilerlemeler kaydedilmesini sağlamıştı. Ancak 1799 yılına gelindiğinde bürokratikleşme süreci tam anlamıyla başarılamamıştı (Kiser & Kane, 2001: 206-207). Hükümet, idare kurumları ve iktidardaki kişiler farklıydı, ancak devrim fırtınaları, her ne kadar 1790'larda ve ondan sonraki on yılda olayların yüzeyini çalkalamış olsalar da Fransızların temel yönlerini büyük ölçüde değiştirmemişti (Pinkney, 1986). Kamu hizmetlerine alımlarda düzenli bir sistem geliştirilememişti, miras, satın almalar gibi yöntemler kullanılmış, pratikte ise kayırmacılık yaygın olmuştu. Vergi tahsilatı sürecinin reforme edilmesinde ise devrim pek başarılı olamamıştı. Vergi tahsilatında reform, güç sahipleri ve makam sahipleri tarafından engellenmişti (Kiser & Kane, 2001: 206-207).

Merkezileşme başarısızlığının en önemli nedeni, en azından XIX. yüzyılın ortalarına kadar yeterli yerel yolların olmamasıydı. 1830'larda Fransa, 1780'lerde olduğu gibi, tarımsal, kırsal, merkeziyetten uzak, büyük ölçüde köylülerin yaşadığı ve toprak sahipleri aristokrasisinin hakimiyetindeydi. Ancak 1840'larda ufuk açıcı gelişmeler yaşandı. Yolların yapımında bir "devrim" yaşandı, ancak ilk olarak en büyük yolları etkiledi. 1851'de iletişim alanında gelişmeler yaşandı ve telgraf Paris'i Fransa'daki her departmana bağladı ve yeterli

---

[30] *XIX. yüzyılda Fransız yönetimi himaye ve liyakat karışımına dayanmaktaydı. Öncelikli olarak eski rejim çalışanlarının çoğunun konumlarını koruması nedeniyle, yönetim personeli devrimden sonra pek değişmemişti. 1830 yılında Fransa'daki personelin yaklaşık %45'inin kökeni asillere dayanmaktaydı. Ancak bu durum 1840'larda değişmeye başladı ve eğitim nitelikleri giderek daha önemli hale geldi. Bkz. Kiser & Kane, 2001.*

posta hizmeti de yüzyılın ortalarında gelişmeye başladı. Fransız devletinin izleme kapasitesi, nihayetinde dramatik bir şekilde gelişmeye başlamıştı (Pinkney, 1986: 50-60). XX. yüzyıla kadar devlet gücünün merkezileşmesine karşı direniş ve buna eşlik eden "mali engizisyon" korkusu, devletin gelir ihtiyaçlarını karşılamak için tüketim vergilerine güvenmesine yol açarak efektif bir gelir vergisi koyma dürtüsünü zayıflattı. Dolaysız vergi idaresi bu nedenle merkezileşememişti. Ancak 1914 yılında dolaysız vergi idaresinin merkezileşmesi adına önemli bir adım atılarak devletin ilk kez bireyleri doğrudan vergilendirebileceği gelir vergisi gelişti (Morgan & Prasad, 2009: 1350).

Dönem itibariyle Fransız Devrimi öncesinde hüküm süren, Avusturya ve Rusya ile yıkıcı savaşlar veren III. Selim ve ardından II. Mahmud alınan mağlubiyetler ve azalan gelirlerden sonra köklü değişikliklere gitmeye karar vermişlerdi. Bu doğrultuda 24 Ocak 1839 tarihinde ilan edilen Tanzimat fermanı ile taşra idaresinde önemli değişiklikler olmuştu. Tımar usulü ve mütesellimlik lağvedilerek, muhassıllık sistemi[31] ile vilayetlere memurlar gönderilmeye başlanmış ve vergileme ile ilgili tüm işlemler bu kişiler aracılığıyla gerçekleştirilmişti. Sonuç olarak "herkesin emlak ve arazi ve hayvanatına ve esnaf ve tüccar kısmının yıllık gelirlerine birer kıymet takdir olunmak suretiyle ve binde hesabıyla… an-cema'tin tevzi olunan temettü vergisi" uygulamaya konuldu (Sayın, 1999: 379). 1840 tarihinden itibaren eyaletlere merkeze bağlı muhassılların gönderilmesi ile vali ve sancakbeylerinin salâhiyetleri daraltılmış oluyordu. Muhassıllar, taşralardaki meclislerin de başkanı idi. Ancak iki sene sonra muhassıllık sisteminden istenilen başarıya ulaşılamadığı için kaldırıldı ve tekrar iltizam sistemine dönüş yapıldı. Taşra gelirlerinin toplama işi yeniden mültezimlere verildi ve vali ve sancakbeylerine eski salâhiyetleri tanındı (Ekinci, 2008: 29).

Tanzimat dönemi yönetiminin temel özelliğini merkeziyetçilik ve bürokratikleşme oluşturmakla birlikte uygulamada çeşitli sıkıntılara yol açmıştı (Eryılmaz, 1992: 12). Batılı ülkeler tarzında merkezi ve taşra örgütlenmesi anlayışına geçişin ilk örneğini oluşturan Tanzimat ile devlet sadece vergi toplama, asker besleme ve adalet dağıtma merkezli olmaktan çıkmış, eğitim, sağlık, bayındırlık ve ekonomi işlerini de yürütmeye başlamıştı (Acun, 1999: 158). Bu değişimlerin en önemli aracını da bürokrasi oluşturmuştu. Toplumu yönlendirme aracı olarak bürokrasi yeni kuralların uygulamaya konulmasını gerektirmişti (Ökmen, 2007: 8). Çünkü merkezi yönetimi güçlendirme girişimleri ile merkeziyetçilik artmış ancak, merkezi erk padişahta yoğunlaşmak yerine reformlara öncülük eden bürokratlarda yoğunlaşmıştı (Mardin, 1996: 126).

---

[31] *Muhassıl kelimesi Arapça kökenlidir ve "tahsil edici" anlamındadır. Tanzimat Fermanı sonrası 25 Ocak 1840 tarihinde çıkarılan bir nizamnâme ile geçmişten beri şikâyetlere sebep olan ve halkı ve devleti zarara uğratan iltizam sisteminin kaldırılmasına karar verilmiş, bu karar çerçevesinde muhassıllık sistemi getirilerek çeşitli isimlerle alınan vergilerin yerine herkesten geliri oranında tek bir verginin tahsil edilmesi esası benimsenmiştir. Böylece iltizam sisteminde halkla devlet arasında aracılık eden ve devletin gelirlerinin toplanmasında önemli rol oynayan mültezimlerin görevine son verilerek vergileri toplamakla vazifeli ve doğrudan merkeze bağlı olan muhassıl-ı emvâl adlı görevliler atanmıştır. Bkz. Özkaya & Akyıldız, 2006.*

6. Sonuç

Merkezi bir hükümet bürokrasisinin kurulması ve ülkede gelişmiş kurumların varlığı vergilerin toplanması adına modern bir ekonominin temel özelliklerinin oluşturmaktadır. Fransa'da *General Farms* gibi özel statüdeki bir şirket çatısı altında kişiler sermayelerini bir araya getirebilmişken Osmanlı Devleti'nde bu tarz gelişmiş kurumlarının yokluğu nedeniyle böyle bir koalisyon mümkün olamamıştı.

Fransız mali sistemi ile Osmanlı Devleti'nin mali sistemi pek çok açıdan benzerliklere sahipti. Her ikisi de yüzyıllar boyunca hem doğrudan hem de dolaylı vergi gelirlerinin önemli bir kısmını iltizam sistemi ile topladı. Her iki ülkede de çok çeşitli vergi türleri söz konusuydu ve bazı vergilerden soyluların, din adamlarının, seçkinlerin, bazı resmi kişilerin ve bazı bölgelerin muaf olması sonucu vergi yükünün çoğu orta ve fakir sınıfın sırtına yüklenmişti. Özellikle savaş dönemlerinde merkezi hazinelerinin ihtiyaçları doğrultusunda her iki ülke de olağan vergilerine ek olarak olağanüstü durum vergisi almaya başladı ve bu konulan yeni vergiler zamanla nakit ihtiyacının artmasından dolayı olağan hale dönüştürüldü. Her ikisinde de merkezi hükümet iltizam sistemi içerisinde halktan vergi gelirlerini toplarken yüksek işlem maliyetleri ile karşı karşıya kaldı. Hem padişahlar hem de krallar, bir taraftan vergi gelirleri karşılığında mülkiyet haklarını takas etmek zorunda kalırken diğer taraftan kendi çıkarları doğrultusunda bu mülkiyet haklarını değiştirdiler. Tüm bu yaşananlar hem Fransa'da hem de Osmanlı Devleti'nde mülkiyet hakları üzerindeki belirsizlikleri artırdı. Bununla birlikte, XVII. yüzyılda yaşanan mali krizler sonucu ülkelerde kurumların gelişimi farklı yönde ilerledi. Fransız ve Osmanlı mali sistemlerinde XVII. yüzyılın sonlarında başlayan kurumsal değişimin en önemli nedenleri savaşlar, savaşların maliyeti ve savaş teknolojisindeki gelişmelerdi. Her iki ülkede de bütçe açığının finansmanı, belirsiz mülkiyet haklarına yol açtı ve bu da vergi tahsildarlarını mülkiyet haklarını korumak için yeni kurumlar oluşturmaya sevk etti. Osmanlı Devleti'nde hazineye ek gelir sağlamak adına kademeli reformlar atılarak öncelikle iltizam sisteminden malikâne sistemine sonrasında esham sistemine geçilmişti. Malikâne sisteminde mukataaların sözleşmeleri dolmadan artan nakit ihtiyacını karşılamak adına başka mültezimlere verilmesi, malikâne sahiplerinin önemli bir kısmının İstanbul'da yaşayıp mukataaları gayri resmi olarak başkalarına iltizama vermeleri mülkiyet haklarındaki belirsizliği daha da artırmıştı.

Fransa, özel sektörden kamusal vergi toplamaya ve yerel olarak kontrol edilen yönetimden (âdem-i merkeziyetten) daha merkezi yönetime geçiş için çeşitli girişimlerde bulundu. Fransa'da iltizamcılar, varlıklarını mevcut mali sistemin sürdürülmesinde büyük bir payı olan *General Farms* şirketi altında birleştirdiler. Osmanlı Devleti'nde ise vakıf sistemi ülkede her alanda faaliyet göstererek mali sistemin önemli bir parçası olmuştu. Özellikle para vakıfları aracılığıyla hem istihdam artmakta hem de tüketici, esnaf ve girişimcinin sermaye ihtiyacı karşılanmaktaydı. Ancak para vakıfları tek bir kişinin tasarrufu ile kurulduğu için kişilere verdiği sermaye miktarı da görece azdı. Bununla beraber bir girişimci para vakıflarının teminat olarak ev gösterilmesini istemesinden dolayı aynı anda farklı para vakıflarından da kredi alamıyordu. Bu durum Osmanlı Devleti'nde girişimcilerin büyük ölçekte sermaye biriktirmelerini ve *General Farms* gibi bir iltizamcılar

koalisyonunun oluşmasını engelleyen bir unsur olarak karşımıza çıkmaktaydı. Osmanlı Devleti'nde vergi tahsildarları böyle bir birleşmeye gitmezken zaman içerisinde hem sayıları hem çıkarları arttı. Ne Fransızların *General Farms* şirketi ile merkezileşmeye yönelmesi ne de Osmanlı Devleti'nin iltizam ve devamında malikâne sistemi ile âdem-i merkeziyetçilik hamlesi mali krizlerin çözümünde yeterli düzeyde etkili oldu.

Fransa'da antik rejimin bütçe açığı krizi, vergi sisteminde reform yapılması çağrılarıyla karşılandı. Fransa'daki reformlar, iletişim, ulaşım ve kayıt tutmanın yetersiz gelişimi nedeniyle genellikle verimliliği artırmadı, bu nedenle kısa ömürlü oldu. Fransız kralları, XVIII. yüzyılda mevcut mali kurumlara Osmanlı Devleti meslektaşlarından daha güçlü bir şekilde bağlıydı. Nihayetinde, mevcut mali kurumlarla olan bağları, Fransa'da ancak yerleşik çıkarları silip süpüren kapsamlı reformları gerçekleştirmelerine neden oldu ve Fransız Devrimi yaşandı. Devrim ve merkezileşme arasındaki ilişki karmaşıktır. Devrimin Fransa'da merkezileşme üzerinde önemli etkileri oldu, ancak bu yönde bazı reformlar devrimden önce gerçekleşti ve vergi idaresinin bazı türleri bir yüzyıldan fazla bir süre merkezileşemedi. Buradan iki sonuç çıkarabiliriz; birincisi, devrim merkezileşme için ne gerekli ne de yeterli bir koşuldu; ikincisi ise merkezileşme farklı yönetim düzeylerinde ve devletin farklı bölümlerinde farklı şekillerde gerçekleşmekteydi. Fransız Devrimin belki de en önemli etkisi, eyaletlerde dolaylı vergilerin iltizam sistemi ile toplanmasının devrimle sona ermesiydi. Dolaysız vergilerin merkezileştirilmesi ise ancak devrimden bir yüzyıl sonra gerçekleştirilebilmiş ve bu süreçte dolaysız vergiler âdem-i merkeziyetçi bir yapıda toplanmaya devam etmişti.

Sonuç olarak şunu söyleyebiliriz ki, dolaylı vergilerin tahsiline yönelik *General Farms* Şirketi ile böyle bir kira sözleşmesinin kabul edilmesi, XVII. yüzyılın son dönemlerinde ve XVIII. yüzyıl boyunca Kral'ın temsilcilerini kontrol ve takip etmede karşılaştığı zorluklardan ve vergi gelirlerindeki eksikliklere karşı riskleri göze alamamasından kaynaklanmaktaydı. Ancak bu durum Fransa'da iltizamcıların *General Farms* Şirketi altında sermayelerini birleştirerek Krala karşı kısıtlamalar getirmeyi başarabilmelerine ve kurumsal yapılarını da bu doğrultuda değiştirmelerine olanak sağlamıştı. Osmanlı Devleti'nde ise iltizamcılar yüksek işlem maliyetlerini Fransa'dakiler gibi karşılayamayıp böyle bir birleşmeye gidemedi. Osmanlı Devleti'nde, Fransa'daki gibi bir devrim gerçekleşmemiş tam tersine Osmanlı padişahları, XIX. yüzyıla kadar maliye sisteminde kademeli reformlar gerçekleştirerek iltizam sisteminden malikâne sistemine ve esham uygulamalarına geçerek mali bunalımlarına çözüm aramıştı. Ancak XVIII. yüzyılın sonlarında yerelde ayânların güçlenmesi, vergi gelirlerinin azalması, halkın aşırı yıpratılması sonucu mali alanda yenileşmeye yönelik adımlar atılmış ve Tanzimat reformu ile iltizam sisteminin kaldırılıp vergi idaresinin merkezileştirilmesine karar verilmişti. Ancak taşrada kurulan Muhassıllık teşkilatları aracılığıyla vergi gelirlerinin toplanmasında bir artış sağlanamadığı için iki yıl sonra 1842 yılında yeniden iltizam sistemine bazı değişikliklerle geri dönülmüştü. Osmanlı Devleti'nde merkeziyetçi ve âdem-i merkeziyetçi yapı yüzyıllar içerisinde hep iç içe olmuştu.

Kaynaklar

Acemoğlu, D. & J.A. Robinson (2014), *Ulusların Düşüşü: Güç, Zenginlik ve Yoksulluğun Kökenleri*, çev. F.R. Velioğlu, İstanbul: Doğan Kitap.

Acemoğlu, D. et al. (2002), "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution", *The Quarterly Journal of Economics*, 117(4), 1231-1294.

Acun, F. (1999), "Osmanlı'dan Türkiye Cumhuriyeti'ne: Değişme ve Süreklilik", *H.Ü. Edebiyat Fakültesi Dergisi*, Osmanlı Devletinin Kuruluşunun 700. Yılı Özel Sayısı, 155-167.

Akdağ, M. (1974), "Osmanlı Tarihinde Ayânlık Düzeni Devri 1730-1839", *Tarih Araştırmaları Dergisi*, 8-12 (14-23), 51-61.

Akgündüz, A. (1990), *Osmanlı Kanunnameleri ve Hukuki Tahlilleri/ Osmanlı Hukukuna Giriş ve Fatih Devri Kanunnameleri*, Fey Vakfı Yayınları.

Balla, E. & N.D. Johnson (2009), "Fiscal Crisis and Institutional Change in the Ottoman Empire and France", *The Journal of Economic History*, 69(3), 809-45.

Barkan, Ö.L. (1955), "1070-71 (1660-61) Tarihli Osmanlı Bütçesi ve Bir Mukayese", *İ.Ü. İktisat Fakültesi Mecmuası*, 17(1-4), 304-347.

Barkan, Ö.L. (1955), "1079-80 (1669-70) Mali yılına Ait Bir Osmanlı Bütçesi ve Ekleri", *İ.Ü. İktisat Fakültesi Mecmuası*, 17(1-4), 1955, 225-303.

Barkan, Ö.L. (1980), *Tımar, Türkiye'de Toprak Meseleleri*, Toplu Eserler -1-, Cilt: 2, Gözlem Yayınları.

Batmaz, E. (1996), "İltizam Sisteminin XVIII. Yüzyıldaki Boyutları", *Tarih Araştırmaları Dergisi*, 18, 39-50.

Bloch, H. (1940), "The Evolution of French Taxation-An Historical Sketch",. *The Bulletin of the National Tax Association*, 25(9), 266-273.

Bossenga, G. (2003), *The Politics of Privileges: Old Regime and Revolution in Lille*, Cambridge: Cambridge University Press.

Brissaud, J. (1915), *A History of French Public Law*, Boston: Little Brown.

Buluş, A. (2010), "Vergi Toplamanın Özerkleştirilmesinin Vergi Toplamanın Etkinliğine Katkısı: İltizam Sistemi ile Bir Mukayese", *Kocaeli Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 19(1), 81-120.

Cezar, Y. (1986), *Osmanlı Maliyesinde Bunalım ve Değişim Dönemi*, İstanbul: Alan Yayıncılık.

Chanel, G. (2015), "Taxation as a Cause of the French Revolution: Setting the Record Straight", *Studia Historica Gedanensia*, VI. 65-81.

Çizakça, M. (1999a), "Osmanlı İmparatorluğu'nda İç Borçlanmanın Evrimi (XV. Yüzyıldan XIX. Yüzyıla)", içinde: *Osmanlı Ansiklopedisi*, C.3, Ankara: Yeni Türkiye Yayınları, 226-233.

Çizakça, M. (1999b), *İslam Dünyası ve Batı'da İş Ortaklıklarının Tarihi*, İstanbul: Tarih Vakfı Yurt Yayınları.

Doyle, W. (1996), *Venality: The Sale of Offices in Eighteenth-Century France*, Oxford: Clarendon Press.

Döndüren H. (2008), "Osmanlı Tarihinde Bazı Faizsiz Kredi Uygulamaları ve Modern Türkiye'de Faizsiz Bankacılık Tecrübesi", *U.Ü. İlâhiyat Fakültesi Dergisi*, 17(1), 1-24.

Ekinci, E.B. (2008), "Osmanlı İdaresinde Adem-i Merkeziyet ve İmtiyazlı Eyâletler", *Türk Hukuk Tarihi Araştırmaları*, 6, 7-84.

Emecen, F. (1988), "Ağnam Resmi", *TDV İslam Ansiklopedisi*, C.1, 478-479.

Emecen, F. (1993), "Cebelü", *TDV İslam Ansiklopedisi*, C.7, 188-189.

Eryılmaz, B. (1992), *Tanzimat ve Yönetimde Modernleşme*, İstanbul: İşaret Yayını.

Faroqhi, S. (1994), *Osmanlı'da Kentler ve Kentliler*, İstanbul: Tarih Vakfı Yurt Yayını.

Genç, M. (1995), "Esham", *TDV İslâm Ansiklopedisi*, C.11, 376-380

Genç, M. (2000), "İltizam", *TDV İslam Ansiklopedisi*, C.22, 154-158.

Genç, M. (2006), "Mukataa", *TDV İslam Ansiklopedisi*, C. 31, 129-132.

Genç, M. (2009), *Osmanlı İmparatorluğunda Devlet ve Ekonomi*, İstanbul: Ötüken Neşriyat.

Hazan, E. (2015), *Fransız Devriminin Kısa Tarihi*, İstanbul: Say Yayınları.

İnalcık, H. (1993), "Cizye", *TDV İslam Ansiklopedisi*, C. 8, 45-47.

İnalcık, H. (2000), *Osmanlı İmparatorluğu'nun Ekonomik ve Sosyal Tarihi*, Cilt 1: 1300-1600, (ed: H. İnalcık & D. Quatert), Çev. Halil Berktay, İstanbul: Eren Yayıncılık.

Johnson, N.D. (2006), "The Cost of Credibility: The Company of General Farms and Fiscal Stagnation in Eighteenth Century France", *Essays in Business and Economic History*, 24, 16-28.

Katırancı, Ü. (2015), *İltizam ve Malikane Sistemi*, <https://www.academia.edu/7925931/%C4%B0ltizam_ve_Malikane_Sistemi>, 12.12.2020.

Kaya, P.H. (2017), *18. Yüzyılda Konya'nın Mali Yapısı ve Merkez Maliyesi ile İlişkisi*, Ankara: Nobel Yayınevi.

Kazıcı, Z. (2003), *Osmanlı'da Vergi Sistemi*, Bilge Yayıncılık.

Kiser, E. & J. Kane (2001), "Revolution and State Structure: The Bureaucratization of Tax Administration in Early Modern England and France", American Journal of Sociology, 107(1), 183-223.

Kumaş, M.S. (2006), "Bir Finansman Yöntemi Olarak İş Ortaklığı Uygulaması (Mudârabe-Commenda Karşılaştırması)", *U.Ü. İlâhiyat Fakültesi Dergisi*, 15(1), 369-383.

Kuran, T. (2005), "The Absence of the Corporation in Islamic Law: Origins and Persistence", *The American Journal of Comparative Law*, 53(4), 785-834.

Kuran, T. (2012), *Yollar Ayrılırken Ortadoğu'nun Geri Kalma Sürecinde İslam Hukukunun Rolü*, (çev. N. Elhüseyni), İstanbul: Yapı Kredi Yayınları.

Kwass, M. (2000), *Privilege and the Politics of Taxation in Eighteenth-Century France: Liberté, Egalité, Fiscalité*, Cambridge: Cambridge University Press.

Mardin, Ş. (1996), *Yeni Osmanlı Düşüncesinin Doğuşu*, İstanbul: İletişim Yayınları.

Markoff, J. (1996), *The Abolition of Feudalism*, University Park: Pennsylvania State University Press.

Matthews, G. (1958), *The Royal General Farms in Eighteenth-Century France*, New York: Columbia University Press.

Morgan, K. & M. Prasad (2009), "The Origins of Tax Systems: A French-American Comparison", *American Journal of Sociology*, 114(5), 1350-1394.

Norberg, K. (1994), *Fiscal Crises, Liberty and Representative Government, 1450-1789*, Stanford: Stanford University Press. 226-252.

Öğün, T. (2006), "Müsâdere", *TDV İslam Ansiklopedisi*, C. 12, 67-68.

Ökmen, M. & A. Yılmaz (2015), "Klasik Dönemden Tanzimat'a Osmanlı Kenti ve Yerel Yönetimler", *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi*, 23, 91-112.

Ökmen, M. (2007), "Osmanlı'dan Cumhuriyet'e Türkiye'de Merkeziyetçilik- Âdem-i Merkeziyetçilik Pratiği Üzerine Notlar", *Akademik Araştırmalar Dergisi*, 9(10), 1-25.

Öner, E. (2005), *Osmanlı İmparatorluğu ve Cumhuriyet Döneminde Mali İdare*, Ankara: T.C. Maliye Bakanlığı Araştırma Planlama ve Koordinasyon Kurulu Başkanlığı Yayınları.

Özdeğer, M. (2000), "Osmanlı Devlet Teşkilâtında Âyanın Mali ve İdari Yönetime Müdahale Devri", *İ.Ü. İktisat Fakültesi Mecmuası*, 50(1-4), 69-132.

Özkaya, Y. & A. Akyıldız (2006), "Muhassıl", *TDV İslam Ansiklopedisi*, C. 31, 18-20.

Özvar, E. (2003), *Osmanlı Maliyesinde Malikane Uygulaması*, İstanbul: Kitabevi Yayınları.

Pamuk, Ş. (2010), *Osmanlı-Türkiye İktisadi Tarihi 1500-1914*; İstanbul: İletişim Yayınları.

Pamuk, Ş. (2013), *Osmanlı Ekonomisi ve Kurumları*, İstanbul: İş Bankası Yayınları.

Pamuk, Ş. (2014), "Fiscal Centralisation and the Rise of the Modern State in the Ottoman Empire", *The Medieval History Journal*, April, 1-27.

Peter, M.J. (1988), *The Peasantry in the French Revolution*, Cambridge: Cambridge University Press.

Pinkney, D. (1986), *Decisive Years in France, 1840-1847*, Princeton N.J.:Princeton University Press.

Potter, M.R. (2003), "War Finance and Absolutist State Development in Early Modern Europe: An Examination of French Venality in the Seventeeth Century", *Journal of Early Modern History*, 7(1), 120-147.

Riley, J.C. (1987), "French Finances 1727-1768", *The Journal of Modern History*, 59(2), 209-243.

Rodrik, D. et al. (2004), "Institutions Rule: the Primacy of Institutions over Geography and Integration in Economic Development", *Journal of Economic Growth*, 9(2), 131-165.

Sahillioğlu, H. (1969), "Savaş Yılı Buhranları", *İ.Ü. İktisat Fakültesi Mecmuası*, 27(1-2), 75-111.

Salzmann, A. (2004), *Tocqueville in The Ottoman Empire Rival Paths to the Modern State, The Ottoman Empire and, its Heritage, Politics, Society and Economy*, (eds. S. Faroqhi & H. Inalcık), Boston: Brill Leiden.

Sargent, A.J. (2004), *The Economic Policy of Colbert*, <http://socserv2.socsci.mcmaster.ca/econ/ugcm/3ll3/sargent/EconomicPolicyColbert.pdf >, 12.12.2020.

Sargent, T.J. & F.R. Velde (1995), "Macroeconomic Features of the French Revolution", *Journal of Political Economy*, 103(3), 474-518.

Sayın, A.V. (1999), *Tekâlif Kavaidi (Osmanlı Vergi Sistemi)*, (çev. F.H. Özkan), Ankara: T.C. Maliye Bakanlığı Araştırma, Planlama ve Koordinasyon Kurulu Başkanlığı Yayınları.

Skocpol, T. (1979), *States and Social Revolutions*, Cambridge: Cambridge University.

Sofracı, İ.E. & M. Ergenoğlu, (2016), "Devletin Mültezimlerle Uzlaşma Yöntemleri: XVIII. Yüzyıl Adana Sancağı Örneği", *M.K.Ü. Sosyal Bilimler Enstitüsü Dergisi*, 13(35), 384-401.

Tabakoğlu, A. (1985a), *Gerileme Dönemine Girerken Osmanlı Maliyesi*, İstanbul: Dergâh Yayınları.

Tabakoğlu, A. (1985b), "XVII ve XVIII. Yüzyıl Osmanlı Bütçeleri", *İ.Ü. İktisat Fakültesi Mecmuası*, 41(1-4), 389-414.

Tabakoğlu, A. (2014), *Türkiye İktisat Tarihi*, İstanbul: Dergâh Yayınları.

Tilly, C. (1975), *The Formation of National States in Western Europe*, Princeton, N.J: Princeton University.

Udovitch, A. (1962), "At The Origins of Western Commenda: Islam, Israel, Byzantine?", *Speculum*, 37(2), 198-207.

Velde, F.R. (2006), *French Public Finance Between 1683 and 1726*, <http://www.helsinki.fi/iehc2006/papers3/Velde.pdf>. 12.12.2020.

Weber, M. (2012), *Ekonomi ve Toplum*, 2 Cilt, Yarın Yayınları.

Weiker, W.F. (1968), "The Ottoman bureaucracy: Modernization and reform", *Administrative Science Quarterly*, 13(3), 251-270.

White, E.N. (2001), "France's slow transition from privatized to government-administered tax collection: Tax farming in the eighteenth century", *Working Paper*, No. 2001-16, Rutgers University, Department of Economics, New Brunswick, NJ.

Sosyoekonomi

2021, Vol. 29(50), 465-484

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.21
Date Submitted: 10.06.2020
Date Revised: 18.10.2021
Date Accepted: 20.10.2021

Kurumsal Kalite Faktörlerinin Finansal Gelişmişlik Üzerindeki Etkisi: İslam İşbirliği Teşkilatı Ülkeleri Örneği

Muhammed KASIM *(https://orcid.org/0000-0002-7833-1251), Süleyman Demirel University, Turkey; mohammad.monier1989@gmail.com*

Gökhan ÖZKUL *(https://orcid.org/0000-0001-7545-8292), Süleyman Demirel University, Turkey; gokhanozkul@sdu.edu.tr*

Dilek ÇETİN *(https://orcid.org/0000-0002-0854-8746), Süleyman Demirel University, Turkey; dilekcetin@sdu.edu.tr*

Effect of Institutional Quality Factors on Financial Development: The Case of Islamic Cooperation Organization Countries

Abstract

The main aim of this study is to analyse the impact of institutional factors on financial development in Islamic Cooperation Organization Countries. The ratio of domestic credit given to the private sector to GDP is used as a proxy for financial development; income level, broad money, foreign direct investment, trade openness, saving rate, inflation, unemployment rate, exchange rate, final government expenditure, and external debt are utilized as determinants of financial development; corruption index and four sub-levels of economic freedom is used as a proxy for the institutional quality level. According to the linear dynamic panel data estimation by using 1995-2018 panel data, it has been found that the reduction of corruption, the rule of law, regulations effectiveness, and open markets positively affected financial development; however, government size negatively influenced financial development.

Keywords : Financial Development, Institutional Quality Factors, Islamic Cooperation Organization, Panel Data Analysis, Linear Dynamic Panel Model.

JEL Classification Codes : C23, E44, G1, O16, O43.

Öz

Bu çalışmanın amacı, kurumsal kalite faktörlerinin finansal gelişmişlik üzerindeki etkisini İslam İşbirliği Teşkilatı ülkelerinde incelemektir. Finansal gelişmişliğin göstergesi olarak yurtiçindeki finansal sektör tarafından özel sektöre kullandırılan kredilerin GSYH'ye oranı; finansal gelişmişliğin belirleyicisi olarak gelir düzeyi, para arzı, yabancı sermaye net girişi, ticaret açıklığı, tasarruf oranı, enflasyon, işsizlik, döviz kuru, devlet harcamaları ve dış borç; kurumsal kalite düzeyinin göstergesi olarak yolsuzluk endeksi ve ekonomik özgürlük endeksinin dört alt unsuru kullanılmıştır. 1995-2018 yıllarına ait panel veri kullanılarak elde edilen doğrusal dinamik panel veri tahmin sonuçlarına göre; yolsuzluğun azalmasının ve hukukun üstünlüğü, mevzuat etkinliği, piyasaların açıklığının finansal gelişmişliği pozitif, devlet büyüklüğünün ise negatif etkilediği bulunmuştur.

Anahtar Sözcükler : Finansal Gelişmişlik, Kurumsal Kalite Faktörleri, İslam İşbirliği Teşkilatı, Panel Veri Analizi, Doğrusal Dinamik Model.

1. Giriş

Ekonomik büyüme teorisi çeşitli perspektiflerden gelişmekle birlikte, ortaya çıkan yaklaşımlardan biri de finansal gelişmenin ekonomik büyüme üzerindeki etkisidir. Son yıllarda yapılan birçok çalışma (Cojocaru vd., 2016; Kyophilavong vd., 2016; Okpara vd., 2018) finansal gelişmişliğin ekonomik büyümeyi yönlendiren en önemli unsurlardan biri olduğunu ortaya koymaktadır. Bu artan önem, finansal gelişmişlik ile ilgili yapılan çalışma sayısına da yansımıştır (King & Levine, 1993; Levine & Zervos, 1996; Levine vd., 2000). Yapılan bu çalışmalar ekonomik büyümenin artmasında, ekonomideki istikrarın sağlanmasında ve bireylerin refahının artmasında finansal gelişmişliğin (finansal piyasalar ve kurumlar gelişmişliği) önemli bir rol oynadığını ortaya koymaktadır. Bu nedenle finansal gelişmişlik; anlam, kapsam ve etkilerinin iyi anlaşılması gereken kavramlardan biridir.

Finansal gelişmişlik; genellikle finansal aracılık hizmetlerinin nicelik, nitelik ve verimliliğindeki gelişmeyi belirleyen bir süreç olarak tanımlanmaktadır. Bu süreç, birçok faaliyeti ve kurumların etkileşimini içermektedir (Abu-Bader & Abu-Qarn, 2008: 890). Dünya Ekonomik Forumu (World Economic Forum, 2012: 3); finansal gelişmişliği, etkin finansal aracılık ve piyasaların yanı sıra sermaye ve finansal hizmetlere derin ve geniş erişim sağlayan faktörler, politikalar ve kurumlar olarak tanımlamıştır. Bu tanım finansal gelişmişlik kavramının nicel ve nitel açıdan gelişmeleri kapsadığını anlatmaktadır. Hussain & Chakraborty (2012: 28) ise finansal gelişmişliği; bankacılık sektöründeki finansal hizmetlerin hacminde, finansal aracı kurumlarının sayısı ve sermaye piyasalarında gerçekleşen işlemlerin sayısında yükseliş göstermesi olarak tanımlamıştır. Bununla birlikte finansal gelişmişlik; yalnızca parasal büyüklükleri ve faiz oranlarını değil, aynı zamanda düzenleme ve denetleme, rekabet derecesi, finansal açıklık, kurumsal kapasite, piyasaları oluşturan finansal ürünlerin çeşitliliğini kapsayan ve ülkenin mali yapısını oluşturan çok yönlü bir kavramdır (Creane vd., 2007: 480).

Finansal gelişmişlik hem finansal genişlemeyi hem de finansal derinleşmeyi kapsamaktadır. Finansal genişleme, finansal hizmetlerin genişlemesi ve finansal kurumların büyümesi anlamına gelirken; finansal derinleşme ise, kişi başına düşen finansal hizmetlerin ve kurumların sayısındaki artışı ya da finansal varlıkların gelire oranındaki artışı ifade etmektedir. Finansal sektörün gelişmişliği, finansal piyasaları genişleterek ve çeşitlendirerek, kaynakların daha iyi tahsis edilmesine yol açmaktadır. Finansal gelişmişlik, yatırımcıların uygun ve çeşitli borç yapısını seçmelerine olanak sağlamaktadır (Ahmed & Ansari, 1998: 503-504). Ayrıca finansal gelişmişlik, daha derin hizmetler vererek tasarrufları artırmasıyla birlikte tasarrufları daha verimli alanlara aktarmaktadır (Ito & Kawai, 2018: 2). Erim ve Türk (2005: 23) finansal gelişmişliğin, finansal piyasaların gelişmişliğinden ibaret olduğunu belirtmişlerdir. Finansal piyasaların gelişmişliği ise, finansal piyasalardaki araçların çeşitlenmesi ile birlikte daha yaygın kullanılır hale gelmesi anlamına gelmektedir. Finansal derinleşme ise, finans sisteminde yaratılan fonların, reel kesime aktarılma oranından ibarettir.

Finansal gelişme çok boyutlu bir kavram olduğu için, finansal sektörün gelişmişliğini etkileyen birçok faktör söz konusudur. Literatür incelendiğinde bu faktörler makroekonomik faktörler, piyasaya ilişkin faktörler ve kurumsal kalite faktörleri olmak üzere üç başlık altında sınıflandırılabilir (Billmeier & Massa, 2007; Yartey, 2007; Mbulawa, 2015). Bununla birlikte bu faktörlerin finansal gelişmişlik üzerindeki etkisi ülkelerin sahip olduğu sosyal, siyasal ve ekonomik koşullardaki farklılıklardan dolayı ülkeden ülkeye değişiklik gösterebilmektedir. Bu bağlamda, bu çalışmada dünyanın en büyük örgütlerinden biri olan İslam İşbirliği Teşkilatı ülkelerinde kurumsal kalite faktörlerinin finansal gelişmişlik üzerindeki etkisi incelenmiştir. Kurumsal kalite faktörleri, finansal piyasaların işlevselliğini etkileyerek daha derin bir finansal sistemin oluşmasında oldukça önemlidir (Yartey, 2007; Yüce-Akıncı vd., 2014; Ali vd., 2020). İslam İşbirliği Teşkilatı ülkelerinde ve özellikle de Arap ülkelerinde kurumsal kalite aktivitelerinin çok fazla gelişmediği söylenebilir. Bu bağlamda çalışmanın amacı İslam İşbirliği Teşkilatı ülkelerinde finansal gelişmişliği tetikleyen veya engelleyen kurumsal kalite faktörlerini belirlemektir. Kurumsal kalite faktörlerinin etkisi sadece yöneticileri değil aynı zamanda yabancı yatırımcıları yakından ilgilendirmektedir. Çünkü kurumsal kalite faktörleri hukukun üstünlüğü, finansal özgürlük ve yatırım özgürlüğü gibi kavramları içerdiği için bir ülkede yatırım yapmanın kalitesini ve miktarını oldukça etkilemektedir.

Çalışmada İslam İşbirliği Teşkilatı üyesi olan 57[1] ülkeden 56[2]'sının 1995-2018 dönemine ilişkin verilerinden faydalanarak kurumsal kalite faktörlerinin finansal gelişmişlik üzerindeki etkisi panel veri analizi ile incelenmiştir. Bu bağlamda çalışmada ilk olarak kurumsal kalite faktörlerinin finansal gelişmişlik üzerindeki etkisini ele alan çalışmalar çerçevesinde literatür taraması ortaya konmuştur. Daha sonra araştırmanın amacı ve yönteminden bahsedilmiştir. Son olarak ise araştırmanın bulgularına değinilmiş ve çalışma sonuç bölümüyle sona ermiştir.

2. Literatür Taraması

Finansal gelişmişlik; tasarruf eğilimini artırmak ve bunları verimli alanlara yönlendirmek, yatırım faaliyetlerini finanse etmek, yabancı sermaye girişlerini teşvik etmek, sermaye tahsisini optimize etmek ve verimliliğini artırmak, teknolojik alanlarda ilerlemeler kaydetmek gibi işlevleri sayesinde ekonomik büyümeyi teşvik eden oldukça kapsamlı bir kavramdır (The World Bank, 2020). Bu nedenle finansal gelişmişliğin ölçülmesinde miktar ölçütleri, yapısal ölçütler, finansal fiyatlar, ürün çeşitleri ve işlem maliyetleri şeklinde farklı

---

[1] *Afganistan, Arnavutluk, Azerbaycan, Bahreyn, Bangladeş, Benin, Birleşik Arap Emirlikleri (BAE), Brunei Darüsselam, Burkina Faso, Cezayir, Cibuti, Çad, Endonezya, Fas, Fildişi Sahili, Filistin, Gabon, Gambiya, Gine, Gine Bissau, Guyana, Irak, İran, Kamerun, Katar, Kazakistan, Kırgızistan, Komorlar, Kuveyt, Libya, Lübnan, Maldivler, Malezya, Mali, Mısır, Moritanya, Mozambik, Nijer, Nijerya, Özbekistan, Pakistan, Senegal, Sierra Leone, Somali, Sudan, Surinam, Suriye (Üyeliği 14-15 Ağustos 2012 tarihlerinde Mekke'de düzenlenen 4. Olağanüstü İİT Zirvesi'nde askıya alınmıştır), Suudi Arabistan, Tacikistan, Togo, Tunus, Türkiye, Türkmenistan, Uganda, Umman, Ürdün, Yemen.*

[2] *İslam İşbirliği Teşkilatı ülkelerinden sadece Filistin, uygun veri bulunamamasından dolayı araştırmada yer almamaktadır.*

ölçütler kullanılmaktadır (Lynch, 1996: 7). Miktar ölçütleri, geleneksel finansal gelişme ve derinleşme ölçütleri olup parasal büyüklükler, kredi büyüklükleri ve sermaye piyasası büyüklükleri şeklinde üç farklı kullanımı söz konusudur (Öztürk vd., 2010: 99). Parasal büyüklükler, geniş tanımlı M2 para arzı büyüklüğünün GSYH'ye oranı ve dar tanımlı M1 para arzı büyüklüğünün GSYH'ye oranını kapsamaktadır (Lynch, 1996: 7). Kredi büyüklükleri, özel sektöre kullandırılan kredilerin GSYH'ye oranı, yurtiçindeki toplam kredi hacminin GSYH'ye oranı ve özel sektöre kullandırılan kredilerin yurtiçindeki toplam kredi hacmine oranı ölçütlerini kapsamaktadır (Öztürk vd., 2010: 99; Ağır, 2009: 95). Sermaye piyasası büyüklüklerini ise piyasa kapitalizasyonu, piyasa likiditesi ve piyasa devir hızı olarak üç kategoriye ayırmak mümkündür. Yapısal ölçütlere bakıldığında ise finansal sistemin yapısını analiz etmek ve farklı unsurların önemini belirlemek için tasarlandığı söylenebilir. Yapısal ölçütler, geniş tanımlı para arzının (M2), dar tanımlı para arzına (M1) oranıyla ifade edilmektedir. Finansal fiyatlar ölçütü ise faiz oranı ve faiz oranındaki esneklik derecesi ile ölçülmektedir (Lynch, 1996: 10-12). Ürün çeşitleri ölçütü finansal sistemdeki araçların çeşitlenmesiyle birlikte finansal sistemdeki risklerin daha yönetilebilir hale gelmesini ve finansal sistemin gelişmesini kapsamaktadır. Son olarak işlem maliyetleri ise finansal sistemin mevduat karşılığında verdiği faiz oranı ile kredilerden aldığı faiz oranı arasındaki fark ile tanımlanabilmektedir (Lynch, 1996: 16-20). Bu çalışmada finansal gelişmişliğin göstergesi olarak miktar ölçütlerinden yurtiçindeki finansal sektör tarafından özel sektöre kullandırılan kredilerin GSYH'ye oranı kullanılmıştır.

Finansal gelişmişliği etkileyen en önemli faktörlerden biri ülkenin sahip olduğu kurumsal kalite seviyesidir. Kurumsal kalite; hukuku, bireysel hakları ve yüksek nitelikli hükümet düzenlemelerini ve hizmetlerini içeren geniş bir kavramdır. Bu yüzden de literatürde kullanılan çeşitli kurumsal kalite göstergeleri bulunmaktadır. Genel olarak kurumsal kalite kavramı aşağıdaki yedi kategoriden oluşmaktadır (Bruinshoofd, 2016):

- **Oy ve hesap verebilirlik**: Bir ülke vatandaşının hükümetini seçme ve sorgulama derecesini ölçmektedir.
- **Siyasi istikrar ve şiddetin olmaması**: Genel olarak yabancı yatırımcılar, siyasi istikrara sahip olan ve şiddet uygulanmayan ülkelere yönelmektedir.
- **Hükümetin etkinliği**: Kamu hizmetlerinin kalitesini ve siyasi baskılardan etkilenmenin derecesini ölçmektedir. Böylece özel yatırımlar için uygun bir ortam oluşacaktır.
- **Düzenleyici kalite**: Hükümetin özel sektör gelişimine izin veren ve teşvik eden sağlam politikalar ve düzenlemeler oluşturma ve uygulama becerisini teşkil etmektedir.
- **Hukukun üstünlüğü**: Özellikle sözleşmelerin uygulanması, mülkiyet hakları, polis ve mahkemelerin niteliği gibi toplum kurallarının uygulanmasını içermektedir.
- **Yolsuzluk kontrolü**: Yolsuzluğun kontrolü ne kadar güçlüyse, ekonomik başarı bağlantılar ve rüşvetten ziyade çaba ve yetkinliğe bağlı olacaktır.

- **İş yapma kolaylığı**: Düzenleyici çevre ticari işlemleri kolaylaştırmanın boyutlarını belirleyen çok sayıda özelliği içermektedir.

Ekonomik büyüme, bir ülkenin kökeni ne olursa olsun, kısa vadeli yörüngesini belirlemek için kilit bir unsurdur. Bununla birlikte kurumsal gelişme, kısa vadeli kazanımların uzun vadede sürdürülebilir olup olmadığını belirlemektedir. Yüksek kurumsal kalite özellikleri piyasa ekonomisindeki bir sonraki ekonomik krizi engelleme gücüne sahip olmayabilir, ancak bir toplumun bu krizle başa çıkabilme, bu krizden kurtulabilme ve uzun vadeli ilerleme yolunda devam edebilme ihtimalini artırmaktadır (Bruinshoofd, 2016). Dolayısıyla kurumsal kalite faktörlerinin ekonomik büyüme üzerinde önemli etkiye sahip olması nedeni ile son yıllarda oldukça önem kazanmıştır. Bu artan önem ile birlikte hem kurumsal kalite faktörlerini hesaplayan kuruluşlar hem de bu faktörleri ve ekonomik büyümeye etkisini ele alan çalışmalar artmıştır.

North (1981), Jones (1987) ve Olson (1987)'un teorik olarak kurumsal kaliteyi ele alan öncül çalışmaları, sonraki ampirik çalışmalara yön vermiştir. Knack & Keefer (1995), Mauro (1995) ve Barro (1997)'nun ampirik düzeyde öncül çalışmaları kurumsal kalitenin yatırım ve sürdürülebilir ekonomik büyüme için önemli olduğunu ortaya koymuşlardır. Diğer açıdan Hall & Jones (1999), dünya çapındaki kurumsal kalite farklılıklarının sermaye birikimi ve verimlilik artışında büyük değişikliklere ve dolayısıyla gelir farklılıklarına neden olduğunu belirlemiştir (Nawaz vd., 2014). Rodrik vd. (2004) hukukun üstünlüğünün ekonomik büyümeyi olumlu etkilediğini ortaya koyarken, Acemoglu vd. (2006) kurumsal özel mülkiyet haklarının uzun vadeli ekonomik büyümenin, yatırımların ve finansal gelişmişliğin ana etkeni olduğunu ortaya koymuştur. Bir ekonomideki finansal sistemin derinliğini, kurumsal kalite düzeyi belirlemektedir. Kurumsal kalite faktörleri, finansal gelişme ve finansal derinlik arasındaki ilişkiye bakıldığında, özellikle yasal ve denetleyici kurumların piyasaların işlevselliği üzerindeki etkilerine yoğunlaşmaktadır (Raza vd., 2014; Yüce-Akıncı vd., 2014: 2).

Son yıllarda gelişmekte olan piyasalara yabancı sermaye girişlerindeki artış, kurumsal risk konusunu gündeme getirmiştir. Yabancı yatırımcılar gelişmekte olan piyasalara yatırım yapmaya karar verdiklerinde, üç farklı risk türü ile karşı karşıya kalırlar: Ekonomik risk, finansal risk ve kurumsal risk. Bu çalışmada kurumsal risk ve finansal gelişmişliğe odaklanılmaktadır. Düşük kurumsal risk, ekonomide kurumların kaliteli olduğunu göstermektedir.

Aşağıdaki Tablo 1'de kurumsal kalite faktörlerinin hem finansal sektör gelişmişliği hem de hisse senedi piyasası gelişmişliği üzerindeki etkisini ampirik düzeyde ele alan çalışmalar özet olarak sunulmuştur.

Tablo: 1
Literatür Özeti

Yazar	Ülke Grubu	Yöntem	Bağımlı Değişken	Bağımsız Değişken	Sonuç
Billmeier & Massa (2007)	Ortadoğu ülkeleri	Sabit etkiler tahmin yöntemi	Hisse senedi piyasası kapitalizasyonu	Ekonomik özgürlük endeksi	Ekonomik özgürlük endeksinin hisse senedi piyasası kapitalizasyonu üzerindeki etkisi pozitiftir.
Yartey (2007)	Afrika 13 ülke	Rassal etkiler tahmin yöntemi	Hisse senedi piyasası kapitalizasyonu	Hukukun üstünlüğü, demokrasi ve hesap verebilirlik, yolsuzluk kontrolü	Tüm kurumsal kalite faktörlerinin hisse senedi piyasası gelişmişliği üzerindeki etkisi pozitiftir.
Yartey (2008)	42 Gelişmekte olan ülke	Arellano-Bond GMM tahmin yöntemi	Hisse senedi piyasası kapitalizasyonu	Siyasi risk endeksi	Endeksteki yüksek değer hisse senedi gelişmişliğine yol açmaktadır.
Cherif & Gazdar (2010)	Ortadoğu & Kuzey Afrika 14 ülke	Sabit etkiler tahmin yöntemi	Hisse senedi piyasası kapitalizasyonu	Siyasi risk endeksi	Siyasi risk endeksinin hisse senedi piyasası gelişmişliği üzerindeki etkisi anlamsızdır.
Ayaydın & Baltacı (2013)	42 gelişmekte olan ülke	Panel regresyon	Hisse senedi piyasası kapitalizasyonu	Yolsuzluk	Yolsuzluğun hisse senedi piyasası üzerindeki etkisi negatiftir.
Ben Naceur vd. (2014)	Ortadoğu & Kuzey Afrika 12 ülke	Sabit etkiler tahmin yöntemi	Özel sektöre kullandırılan kredilerin GSYH'ye oranı, M3/GSYH	Hukukun üstünlüğü, bürokrasi kalitesi, demokrasi ve hesap verebilirlik, yolsuzluk kontrolü	Genel olarak kurumsal kalite faktörleri finansal gelişmişliği desteklemektedir.
Ayadi vd. (2015)	Güney ve Doğu Akdeniz ülkeleri	Rassal etkiler tahmin yöntemi	Özel sektöre kullandırılan kredilerin GSYH'ye oranı	Yasal ve demokrasi kalitesi endeksi	Yasal ve demokrasi kalitesi endeksi finansal gelişmişliği pozitif yönde etkilemektedir.
Mbulawa (2015)	Güney Afrika Kalkınma Topluluğu (SADC) 11 ülke	Arellano-Bond GMM tahmin yöntemi	Bankacılık sektörü kredileri	Yasal ve demokrasi kalitesi endeksi	Kurumsal kalite faktörlerinin finansal gelişmişlik üzerindeki etkisi pozitiftir
Khalfaoui (2015)	15 Gelişmiş 23 gelişmekte olan ülke	Rassal ve sabit etkiler tahmin yöntemi	Özel sektöre kullandırılan kredilerin GSYH'ye oranı	Yasal haklar endeksi	Kurumsal kalite faktörlerinin finansal gelişmişlik üzerindeki etkisi gelişmekte olan ülkelerde anlamsız, gelişmiş ülkelerde anlamlı ve etkisi pozitiftir.
Cherif & Dreger (2016)	Ortadoğu & Kuzey Afrika 12 ülke	Panel regresyon	Yurtiçi kredilerinin GSYH'ye oranı, hisse senedi piyasası kapitalizasyonu	Hukukun üstünlüğü, adli kurumların sağlamlığı	Kurumsal kalite faktörleri hem bankacılık sektörü hem de hisse senedi piyasasını pozitif etkilemektedir.
Bayar (2016)	8 Avrupa ülkesi	Panel regresyon	Hisse senedi piyasası kapitalizasyonu	Siyasi istikrar, şiddet yokluğu, mevzuat kalitesi, hukukun üstünlüğü, yolsuzluk kontrolü	Kurumsal kalite faktörlerinin hisse senedi piyasası gelişmişliği üzerindeki etkisi pozitiftir.
Khan vd. (2020)	Gelişmekte olan 15 ülke	İki aşamalı en küçük kareler 2SLS)	Hisse senedi piyasası kapitalizasyonu, hisse senedi piyasası devir hızı, hisse senedi likiditesi, özel sektöre kullandırılan kredilerin GSYH'ye oranı	Ekonomik özgürlük, siyasi istikrar, yolsuzluk kontrolü, devlet etkinliği, hukukun üstünlüğü	Genel olarak kurumsal kalite faktörleri finansal gelişmişliğini pozitif yönde etkilemektedir.
Ali vd. (2020)	İslam İşbirliği Teşkilatı 45 ülke	Arellano-Bond GMM tahmin yöntemi	Finansal derinliği, etkinliği ve erişimini temsil eden IMF tarafından oluşturulmuş bir indeks	Yolsuzluk kontrolü, devlet etkinliği, siyasi istikrar, şiddet yokluğu, düzenleyici kalitesi, hukukun üstünlüğü, oy ve hesap verebilirlik	Kurumsal kalite faktörlerinin artması finansal gelişmişliğe yol açar.
Nguyen & Thi Ha (2021)	ASEAN ülkeleri	Arellano ve Bover (1995), Blundell ve Bond (1998) GMM tahmin yöntemleri	Finansal Erişim	Oy ve hesap verebilirlik, siyasi istikrar, şiddet yokluğu, hükümetin etkinliği, düzenleme kalitesi, hukukun üstünlüğü ve yolsuzluk kontrolü faktörlerini temsil eden bir proxy	Kurumsal kalite faktörlerinin finansal erişim üzerindeki etkisi anlamlı ve pozitiftir.

Literatür incelendiğinde Ali vd. (2020) dışında İslam İşbirliği Teşkilatı ülkelerinde kurumsal kalite faktörlerinin finansal gelişmişlik üzerindeki etkisini inceleyen çalışmaya

rastlanmamıştır. Ali vd. (2020) 2000-2016 dönemini kapsayan çalışmalarında kurumsal kalite faktörleri olarak devlet etkinliği ve yolsuzluk kontrolünü kullanmışlardır.

Bu çalışmanın literatürdeki diğer çalışmalardan farkı ise hem daha kapsamlı bir dönemi (1995-2018) hem de kurumsal kalite faktörü olarak ekonomik özgürlük ve yolsuzluk kontrolü değişkenlerini birlikte kullanıyor olmasıdır. Ekonomik özgürlük endeksinin alt başlıklarının da (hukukun üstünlüğü, devlet büyüklüğü, mevzuat etkinliği ve piyasaların açıklığı) kurumsal kalite faktörü olarak incelenmesi çalışmanın literatüre en önemli katkısıdır.

3. Yöntem, Veri ve Hipotezler

Hem teorik hem de ampirik düzeyde yapılan birçok çalışma, finansal gelişmişliğin ekonomik büyüme ve bireylerin refahı üzerinde olumlu etkilere sahip olduğunu vurgulamaktadır. Bu bağlamda iyi ve gelişmiş bir finansal sektör, ekonomide diğer sektörlerin destekleyicisi durumundadır. Dolayısıyla finansal sektörün sorunsuz ve sağlıklı bir şekilde çalışması oldukça önemlidir. Bununla birlikte finansal sektörün gelişmişliğini olumlu veya olumsuz şekilde etkileyen çeşitli faktörler vardır. Bu bağlamda araştırmanın amacı İslam İşbirliği Teşkilatı ülkelerinde kurumsal kalite faktörlerinin finansal sektör gelişmişliğini hangi yönde ve ne ölçüde etkilediğini panel veri analizi yöntemini kullanarak incelemektir.

Gelişmekte olan ülkeler olarak sınıflandırılan İslam İşbirliği Teşkilatı ülkelerinde ve özellikle de Arap ülkelerinde yolsuzluk kontrolü ve ekonomik özgürlük gibi kurumsal kalite aktiviteleri etkin değildir. Dolayısıyla İslam İşbirliği Teşkilatı ülkelerinde kurumsal kalite faktörlerinin finansal sektör gelişmişliği üzerindeki etkisi merak uyandıran ve incelenmesi gereken bir konudur. Bu bağlamda bu çalışmada İslam İşbirliği Teşkilatı ülkelerinde finansal gelişmişlik için itici güç oluşturan veya engelleyen kurumsal kalite faktörleri belirlenmeye çalışılacaktır.

Araştırmada İslam İşbirliği Teşkilatı üyesi olan 57 ülkeden 56'sının 1995-2018 dönemine ilişkin verilerden faydalanılarak kurumsal kalite faktörlerinin ve makroekonomik faktörlerin finansal gelişmişlik üzerindeki etkisi panel veri analizi ile incelenmiştir. İslam İşbirliği Teşkilatı ülkelerinin büyük bir çoğunluğunda sermaye piyasalarına ilişkin yeterli veri bulunmamaktadır. Dolayısıyla finansal gelişmişliği etkileyen piyasaya ilişkin faktörler araştırmaya dahil edilmemiştir[3].

Araştırmada kullanılan panel veri analizi zaman serisi verileri ve yatay kesit serilerinin aynı anda kullanımına imkân sağlayan bir analiz türüdür. Panel veride, birden çok birim ve her bir birime karşılık gelen birden fazla gözlem bulunmaktadır. Genel olarak yatay kesit ve zaman serisi verilerinin boyutlarının küçük olmasından dolayı 1950'li yıllardan

[3] *Piyasaya ilişkin faktörlere yönelik veriler İslam İşbirliği Teşkilatı ülkelerinden sadece 18 ülke için bulunduğundan gözlem sayısı önemli derece düşmektedir. Dolayısıyla piyasaya ilişkin faktörlerin araştırmaya dahil edilmesi analizin güçlülüğü açısından uygun görülmemiştir.*

itibaren panel veri kullanımı yaygınlaşmaya başlamış, fakat ampirik düzeyde ilk çalışmalar ise 1990'lı yıllardan itibaren başlamıştır[4].

Panel veri analizi avantajlarından biri, modeli oluştururken değişkenler arasında etki farklıkları göstermesidir. Dolayısıyla panel veri analizinin genel denklemi aynı zamanda sabit etki denklemi aşağıdaki gibidir (Kennedy, 2006: 345):

$$Y_{it} = a_i + \beta X_{it} + \varepsilon_{it} \quad (1)$$

Y_{it}: i. birim ve t. dönem için bağımlı değişken

X_{it}: i. birim ve t. dönem için bağımsız değişkenler

a_i: sabit, β: bağımsız değişkenlerin katsayısı, ε_{it}: hata terimi

Diğer taraftan rassal etki tahmini için tahminci denklem aşağıdaki gibidir (Kennedy, 2006: 345):

$$Y_{it} = \mu + \beta X_{it} + (u_i + \varepsilon_{it}) \quad (2)$$

μ: rassal kesit katsayıları

$u_i + \varepsilon_{it}$: birleşik hata terimi

Bağımlı değişkenin gecikmeleriyle ilişkili olduğu modellerde, "doğrusal dinamik panel veri modeli (linear dynamic panel-data estimation)"[5] kullanılabilmektedir. Bu model, bağımlı değişkenin p gecikmesini ortak değişken (covariate) ve sabit ya da rassal gözlemlenmeyen (unobserved) panel etkileri içermektedir. Arellano-Bond (1991) veya Arellano-Bover/Blundell-Bond (1995, 1998) tahmin edicilerini kullanarak dinamik panel veri modelini tahmin etmekle birlikte bu iki modele göre daha avantajlıdır çünkü iki modele göre daha karmaşık bir yapıya sahip olan önceden belirlenmiş değişkenlere izin verebilmektedir. Standart GMM iki aşamalı tahminin varyansının eğimli (biased) olduğu bilinmektedir. Doğrusal dinamik panel veri modelinin bir diğer avantajı da Windmeijer (2005)'in geliştirdiği GMM tahmin edicileri için iki aşamalı güçlü (robust) tahmin edicileri kullanılabilmesidir[6]. Dinamik panel veri modeli aşağıdaki gibidir (Drukker, 2008; Wooldridge, 2001; Kennedy, 2006):

$$Y_{it} = \sum_{j=1}^{p} \alpha\, Y_{i,t-j} + \mu + \beta X_{it} + (u_i + \varepsilon_{it}) \quad (3)$$

Araştırmada öncelikle rassal veya sabit etkiler panel veri tahminci ile tahmin yapılmıştır ve bu ikisi arasından birini tercih etmek için Hausman testi yapılmıştır. Hausman testinin sonucuna göre sabit etkiler tahmincisinin daha uygun olduğu görülmüştür. Ayrıca değişen varyans ve otokorelasyon problemlerinin olup olmadığını belirlemek için modifiye edilmiş Wald ve Wooldridge testleri yapılmıştır. Buna göre otokorelasyon ve değişen

---

4 *Daha detaylı bilgi için bkz. Wooldridge, 2001; Arellano, 2003; Kennedy, 2006, Baltagi, 2013.*

5 *Daha detaylı bilgi için bkz. <https://www.stata.com/manuals13/xtxtdpd.pdf>.*

6 *Daha detaylı bilgi için bkz. Drukker, 2008.*

varyans sorunu bulunduğu görülmüştür. Değişen varyans ve otokorelasyon sorunlarını çözebilmek için ise doğrusal dinamik panel veri modeli kullanılmıştır.

Araştırmada kurumsal kalite faktörleri dışında kullanılan tüm veriler Dünya Bankası'ndan elde edilmiştir (The World Bank, 2020). Kurumsal kalite faktörlerinden yolsuzluk kontrolü verileri Uluslararası Şeffaflık Örgütü'nden (Transparency International, 2020), ekonomik özgürlük verileri ise Heritage Vakfı'ndan (The Heritage Foundation, 2020) alınmıştır.

Araştırmada kullanılan değişkenlere ilişkin özet istatistikleri Tablo 2'de gösterilmiştir. Değişkenlere ait korelasyon tablosu ise Ek 1'de yer almaktadır.

Tablo: 2
Özet İstatistiği

Değişken	Göz.	Ort.	Std dev.	Min.	Max.
FG (Finansal Gelişmişlik)	555	27,19	22,53	2,21	105,83
G.GD (Gecikmeli Gelir Düzeyi)	507	2,66	4,34	-22,31	32,99
G.PA (Gecikmeli Para Arzı)	507	45,91	38,58	7,21	258,82
YSG (Yabancı Sermaye Net Girişleri)	501	3,37	4,58	-15,23	32,32
TAC (Ticaret Açıklığı)	555	67,97	27,65	19,10	194,35
G.TO (Tasarruf Oranı)	555	16,52	17,29	-53,11	60,49
ENF (Enflasyon)	555	100,31	38,31	8,06	349,81
ISZ (İşsizlik Oranı)	555	7,74	4,83	0,27	23,72
DVZ (Döviz Kuru)	555	4,62	2,72	-1,34	10,33
DH (Devlet Harcamaları)	555	13,20	6,86	0,95	73,57
DBR (Dış Borç)	555	20,06	2,78	6,90	25,62
YK (Yolsuzluk Kontrolü)	555	28,28	8,45	4,00	47,00
EKO (Ekonomik Özgürlük)	555	55,36	8,85	15,60	77,70
EKO1 (Hukukun Üstünlüğü)	555	37,85	12,87	15,93	82,56
EKO2 (Devlet Büyüklüğü)	555	72,05	14,24	35,46	95,56
EKO3 (Mevzuat Etkinliği)	555	63,56	8,61	35,46	83,33
EKO4 (Piyasaların Açıklığı)	555	49,91	12,33	13,33	79,60

Kaynak: The World Bank, 2020; Transparency International, 2020; The Heritage Foundation, 2020.

Aşağıda çalışmada kullanılan değişkenlerin tanımlanması yapılmıştır:

FG: Finansal sektörün gelişmişliğini temsil etmektedir. Özel sektöre kullandırılan kredilerin GSYH'ye oranı ile hesaplanmıştır. Literatürde finansal gelişmişliğinin göstergesi olarak sıklıkla kullanılan bir orandır.
G.GD: Bu değişken gelir düzeyi yani kişi başına düşen GSYH'yi temsil etmektedir. Diğer değişkenler oran ile gösterildiği için bu değişkenin büyümesi hesaplanmış ve Garcia (1999) ve Yartey (2007)'in çalışmalarında olduğu gecikmeli değeri modele dahil edilmiştir.
G.PA: Para arzının gecikmeli değerini temsil etmektedir. Geniş tanımlı para arzının GSYH'ye oranı ile hesaplanmıştır. Literatürde çok sayıda çalışmada finansal sistemin gelişmişliğinin göstergesi olarak kullanılmıştır. Diğer çalışmalarda ise para arzı olarak kullanılmıştır. İncelenen ülkelerin finansal sistemi yeterince gelişmediği için araştırmada geniş tanımlı para arazı büyüklüğü tanımı olarak M3 tanımı kullanılmıştır. Yani bu ülkelerde para arzında herhangi bir genişleme olduğunda bu durum dolaşımdaki paranın artmasından ibaret olabilmektedir (Babayemi vd., 2013).

Para arzının artması faizleri düşürerek özel sektörün kredi talebini artıracağı için, para arzının finansal sektörün gelişmişliği üzerinde olumlu bir etkisi beklenmektedir.
YSG: Bu değişken yabancı sermaye net girişlerini temsil etmektedir. Bu değişken yabancı sermaye girişlerinin yabancı sermaye çıkışlarına oranı ile hesaplanmıştır. Literatürde gelişmekte olan ülkeler üzerinde yapılan çalışmalarda yabancı sermaye girişleri finansal sektörün gelişmişliğini tetikleyen önemli faktörlerden biridir.
TAC: Bu değişken ticaret açıklığını temsil etmektedir. Bu değişken ithalat ve ihracat toplamının GSYH'ye oranı ile hesaplanmıştır. Genel olarak bu değişkenin değeri artıkça finansal gelişmişlik artar.
G.TO: Bu değişken tasarruf oranının gecikmeli değerini temsil etmektedir. Tasarruf oranı yurtiçi tasarrufların GSYH'ye oranı ile hesaplanmıştır.
ENF: Enflasyonu temsil etmektedir. Bu değişken TÜFE'ye (2010 yılı sabit fiyatlarına) göre hesaplanmıştır. Enflasyon, genel olarak finansal sektörde belirsizliğe yol açacağı için, bu belirsizliğin finansal sektörün gelişmişliğini negatif yönde etkileyeceği beklenmektedir.
ISZ: Bu değişken işsizlik oranını temsil etmektedir. Genel olarak işsizlik oranı reel sektörü olumsuz etkiler, dolaylı olarak da finansal sektörü olumsuz etkiler.
DVZ: Bu değişken döviz kuru değerini temsil etmektedir. Bu değişken ülke para biriminin ABD dolarına karşı fiyatı ile hesaplanmıştır. Bu değişken ülkeler arasında büyük farklılık gösterdiği için logaritması alınarak kullanılmıştır.
***DH*:** Bu değişken devlet harcamalarını temsil etmektedir. Devlet harcamalarının GSYH'ye oranı ile hesaplanmıştır. Bu değişkenden beklenen işaret pozitiftir.
DBR: Bu değişken dış borcu temsil etmektedir. Diğer değişkenler oran olduğu için bu değişkeninin logaritması alınmıştır. Genellikle dış borç finansal sektöre fon sağlayacağı için olumlu bir etkisi beklenmektedir.
YK: Uluslararası Şeffaflık Örgütü tarafından hesaplanan yolsuzluk kontrolü endeksini temsil etmektedir. Bu endeks 1995 yılından beri hesaplanmaktadır. 1995-2011 yılları arasında yolsuzluk endeksi (0-10) arasında değer almıştır. 2012 yılından bu yana (0-100) arasında değer almaktadır. Bu sorunu çözmek için 1995-2011 yılları arasındaki veriler 10'la çarpılmıştır. Sıfır değeri yüksek yolsuzluk ve düşük şeffaflık için, 100 değeri ise düşük yolsuzluk ve yüksek şeffaflık için kullanılmıştır. Dolayısıyla bu değişkenin katsayısının artması finansal sektörün gelişmişliğinin iyileştiği anlamına gelmektedir.
EKO: Bu değişken ekonomik özgürlük endeksini temsil etmektedir. Ekonomik özgürlük endeksi 1995 yılından beri Heritage Vakfı (The Heritage Foundation) tarafından hesaplanmaktadır. Ekonomik özgürlük endeksi; hukukun üstünlüğü (mülkiyet hakları, hükümetin dürüstlüğü, yargı etkinliği), devlet büyüklüğü (devlet harcamaları, vergi yükü, mali sağlık), mevzuat etkinliği (iş özgürlüğü, işgücü özgürlüğü, para özgürlüğü) ve piyasaların açıklığı (ticaret özgürlüğü, yatırım özgürlüğü ve finansal özgürlük) şeklinde dört geniş kategoride sınıflandırılan 12 nicel ve nitel faktöre dayanarak hesaplanmaktadır. Bu anlamda ekonomik özgürlük endeksi değişkeni birçok kurumsal kalite faktörünü bir araya getiren bir değişkendir. Bu endeks 0-100 arasında bir değer almaktadır. 0 değeri kurumsal kalitenin düşük

olduğunu gösterirken, 100 değeri ise yüksek olduğunu göstermektedir. Ekonomik özgürlüklerin finansal gelişmişliği pozitif etkilemesi beklenmektedir. Diğer taraftan ekonomik özgürlük endeksinin hesaplanmasında kullanılan hukukun üstünlüğü (***EKO1***), devlet büyüklüğü (***EKO2***), mevzuat etkinliği (***EKO3***) ve piyasaların açıklığı (***EKO4***) unsurlarının etkisini görebilmek adına ekonomik özgürlük değişkeni ayrı olarak modele dahil edilmiştir.

Araştırmada kullanılan ekonometrik model Law ve Habibullah (2009), Johansson ve Kongstad (2013) ve Mbulawa (2015) çalışmalarında kullanılan modeller baz alınarak geliştirilmiştir. Bu üç modelin de ortak özelliği makroekonomik faktörleri ve kurumsal kalite faktörlerini aynı anda inceliyor olmasıdır. Dolayısıyla bu üç modelden yola çıkarak çalışmada kullanılan model aşağıdaki şekilde geliştirilmiştir:

$$FG = \beta_0 + \beta_1 MATRIX + \beta_3 YK + \beta_2 EKO + u \quad (4)$$

Modelde kullanılan "MATRIX" kontrol değişkenlerini temsil etmektedir. Diğer değişkenler ise ilgi değişkenler olan yolsuzluk kontrolü ve ekonomik özgürlük değişkenlerini temsil etmektedir. Aşağıda Tablo 3'te modelde kullanılan değişkenler ve bu değişkenlere ilişkin beklenen işaret gösterilmektedir.

Tablo: 3
Modeldeki Kullanılan Bağımsız Değişkenler

Kontrol Değişkenleri		İlgi Değişkenler	
Değişken	**Beklenen İşaret**	**Değişken**	**Beklenen İşaret**
G.GD	+	YK	+
G.PA	+	EKO	+
YSG	+	EKO1	+
TAC	+	EKO2	+
G.TO	+	EKO3	+
ENF	-	EKO4	+
ISZ	-		
DVZ	-		
DH	+		
DBR	+		

Modelin temel hipotezleri ilgi değişkenler üzerinden kurulmuştur. Yan hipotezleri ise kontrol değişkenleri üzerinden kurulmuştur. Modelde ilgi değişkenler üzerinden kurulan temel hipotezler şunlardır:

- H_1: Yolsuzluk kontrolü, finansal gelişmişliği etkilemektedir.
- H_2: Ekonomik özgürlük, finansal gelişmişliği etkilemektedir.
- H_3: Hukukun üstünlüğü, finansal gelişmişliği etkilemektedir.
- H_4: Devlet büyüklüğü, finansal gelişmişliği etkilemektedir.
- H_5: Mevzuat etkinliği, finansal gelişmişliği etkilemektedir.
- H_6: Piyasaların açıklığı, finansal gelişmişliği etkilemektedir.

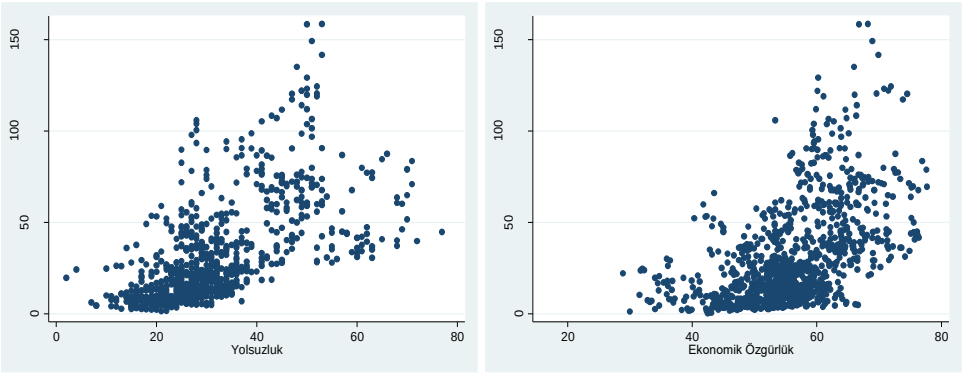
Modelin yan hipotezleri ise aşağıda gibidir:

- H_7: Gelir düzeyi, finansal gelişmişliği etkilemektedir.
- H_8: Para arzı, finansal gelişmişliği etkilemektedir.
- H_9: Yabancı sermaye net girişleri, finansal gelişmişliği etkilemektedir.
- H_{10}: Ticaret açıklığı, finansal gelişmişliği etkilemektedir.
- H_{11}: Tasarruf oranı, finansal gelişmişliği etkilemektedir.
- H_{12}: Enflasyon, finansal gelişmişliği etkilemektedir.
- H_{13}: İşsizlik oranı, finansal gelişmişliği etkilemektedir.
- H_{14}: Döviz kuru, finansal gelişmişliği etkilemektedir.
- H_{15}: Devlet harcamaları, finansal gelişmişliği etkilemektedir.
- H_{16}: Dış borç, finansal gelişmişliği etkilemektedir.

4. Araştırmanın Bulguları

Panel analizine geçmeden önce, betimsel analiz yapılarak ilgi değişkenler ile bağımlı değişken arasındaki ilişkiye bakılmıştır. Aşağıdaki Şekil 1'de yolsuzluk ve ekonomik özgürlük ile finansal gelişmişlik arasındaki ilişki gösterilmiştir. Dikey eksen bağımlı yatay ise bağımsız değişken değerleri göstermektedir. Şekilde görüldüğü üzere ilgi bağımsız değişkenler ile bağımlı değişken arsasında net bir şekilde pozitif bir ilişki gözle görülebilmektedir.

Şekil: 1
Finansal Gelişmişlik ile Yolsuzluk ve Ekonomik Özgürlük Arasındaki İlişki



Analize geçmeden önce sabit etkiler ve rassal etkiler tahmininden hangisinin kullanılmasının uygun olduğunu belirlemek için Hausman testi (58.46***) yapılmıştır. Hausman testinin sonuçlarına göre sabit etkiler modelinin daha uygun olduğu bulunmuş ve sabit etkiler[7] tahmincisi kullanılarak ilişkiye bakılmıştır. Ardından değişen varyans ve otokorelasyon problemleri olup olmadığını belirlemek için sırası ile Modifiye edilmiş Wald (3.8×10^{30}***) ve Wooldridge testleri (293.301***) yapılmıştır. Yapılan testlerin

[7] *Sabit etkiler tahminin sonuçları Ek 2'de sunulmuştur.*

sonuçlarına göre hem değişen varyans hem de otokorelasyon problemlerinin varlığına rastlanılmıştır. Bu problemlerinin ikisini birden çözmek için doğrusal dinamik panel veri modelinden faydalanılmıştır. Tablo 4'te bu modelinin sonuçları sunulmuştur.

Tablo: 4
Doğrusal Dinamik Panel Veri Tahmin Sonuçları

Değişkenler	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	FG	**FG**	**FG**	**FG**	**FG**	**FG**
G.GD	0,231***	0,228***	0,251***	0,257***	0,242***	0,247***
	(0,0455)	(0,0473)	(0,0456)	(0,0467)	(0,0475)	(0,0480)
G.PA	0,754***	0,791***	0,738***	0,688***	0,781***	0,731***
	(0,0270)	(0,0285)	(0,0272)	(0,0286)	(0,0288)	(0,0297)
YSG	0,0704	0,0678	0,0541	0,0579	0,0560	0,0683
	(0,0768)	(0,0789)	(0,0764)	(0,0782)	(0,0788)	(0,0795)
TAC	0,00980	0,00522	0,0172	0,0388**	0,0101	0,0269
	(0,0185)	(0,0187)	(0,0186)	(0,0191)	(0,0188)	(0,0190)
G.TO	0,0835***	0,0615**	0,0656**	0,0634**	0,0502*	0,0439
	(0,0271)	(0,0273)	(0,0274)	(0,0288)	(0,0277)	(0,0289)
ENF	-0,00574	-0,0191**	-0,0105	-0,0145	-0,0221**	-0,0261***
	(0,00917)	(0,00930)	(0,00922)	(0,00950)	(0,00937)	(0,00950)
ISZ	-0,419***	-0,270**	-0,374***	-0,183	-0,246*	-0,0885
	(0,129)	(0,135)	(0,128)	(0,134)	(0,135)	(0,139)
DVZ	3,137***	1,710	2,870***	4,175***	1,621	3,216***
	(1,088)	(1,052)	(1,084)	(1,123)	(1,050)	(1,074)
DH	0,142***	0,0828**	0,131***	0,0822**	0,0767**	0,0433
	(0,0380)	(0,0389)	(0,0379)	(0,0390)	(0,0388)	(0,0393)
DBR	0,479***	0,454***	0,415***	0,300**	0,419***	0,372***
	(0,145)	(0,138)	(0,145)	(0,148)	(0,138)	(0,140)
YK		0,388***			0,371***	0,265***
		(0,0506)			(0,0511)	(0,0536)
EKO			0,00940***		0,00635**	
			(0,00282)		(0,00291)	
EKO1				0,0714***		0,0646***
				(0,0144)		(0,0146)
EKO2				-0,0650***		-0,0607***
				(0,00952)		(0,00966)
EKO3				0,0382***		0,0394***
				(0,00753)		(0,00766)
EKO4				0,0871***		0,0656***
				(0,0106)		(0,0111)
Sabit Terim	-29,46***	-33,93***	-31,30***	-43,46***	-35,27***	-45,41***
	(5,366)	(5,165)	(5,358)	(5,627)	(5,185)	(5,360)
Wald Chi-2	1818***	1769***	1855***	1896***	1851***	1785***
Sargan[a]	1,000	1,000	1,000	1,000	1,000	1,000
A&B Otokorelasyon[b]	0,404	0,178	0,331	0,320	0,095	0,235
Gözlem Sayısı	455	455	455	455	455	455
Ülke Sayısı[c]	33	33	33	33	33	33

NOT: Analiz sonuçlarında ilk satır katsayı değerini, parantez içerisinde yer alan ikinci satır standart hata göstermektedir.
** %10 düzeyinde, ** %5 düzeyinde, *** %1 düzeyinde istatistiksel olarak anlamlı olduğunu göstermektedir.*
[a] H0: Kullanılan araçlar geçerlidir.
[b] H0: Otokorelasyon yoktur.
[c] Afganistan, Arnavutluk, Cezayir, Azerbaycan, Bangladeş, Benin, Burkina Faso, Kamerun, Fil Dişi Sahili, Mısır, Gabon, Gambiya, Gine, Gine-Bissau, Guyana, Endonezya, İran, Ürdün, Kazakistan, Kırgızistan, Mali, Moritanya, Fas, Nijer, Nijerya, Pakistan, Senegal, Sierra Leone, Tacikistan, Togo, Tunus, Türkiye ve Uganda.

Otokorelasyonun varlığını test etmek için Arellano ve Bond'un testi ve aşırı tanımlama kısıtlamalarını diğer bir ifade ile kullanılan araçların geçerliliğini test etmek için Sargan testi uygulanmıştır. Elde edilen sonuçlara göre otokorelasyon sorunu çözüldüğü ve modelde kullanılan araçların geçerliliğini göstermektedir. Model tahmin edilirken güçlü (robust) tahmin edici kullanıldığından dolayı değişen varyans problemi bulunmamaktadır.

Tablo 4'te yer alan çoklu doğrusal modelinden elde edilen sonuçlara göre, Wald testinin değerine bakıldığında oluşturulan modelin genel olarak anlamlı olduğu görülmektedir. İlgi değişkenlerinin ikisi de finansal gelişmişliği pozitif yönde etkilemektedir. Yolsuzluk kontrolünün etkisi ekonomik özgürlüğün etkisinden daha fazladır. Dolayısıyla H_1 (Yolsuzluk kontrolü, finansal gelişmişliği etkilemektedir) ve H_2 (Ekonomik özgürlük, finansal gelişmişliği etkilemektedir) hipotezleri kabul edilmiştir. Diğer yandan ekonomik özgürlük alt başlıklarından hukukun üstünlüğü, mevzuat etkinliği ve piyasaların açıklığı finansal gelişmişliğini pozitif yönde etkilerken devlet büyüklüğü negatif yönde etkilemektedir. Ekonomik özgürlükler içinde finansal piyasaları etkileyen en önemli unsur beklenildiği üzere piyasaların açıklığıdır. İslam İşbirliği Teşkilatına üye olan ülkeler gelişmekte olan ülke olarak kabul edilebilirler ve bu ülkelerde devlet büyüklüğünün artması dışlama etkisi yaratarak finansal sektörün özel sektöre kullandırdığı kredi miktarının GSYH içindeki payının azalmasına neden olmaktadır.

Modelde gelir düzeyi ve para arzı değişkenleri de literatürle uyumlu bir şekilde %1 anlamlılık düzeyinde finansal gelişmişliği olumlu yönde etkilemektedir. Dolayısıyla H_7 (Gelir düzeyi, finansal gelişmişliği etkilemektedir) ve H_8 (Para arzı, finansal gelişmişliği etkilemektedir) hipotezleri kabul edilmiştir. Tasarruf oranı %10 anlamlılık düzeyde finansal gelişmişliği pozitif yönde etkilemektedir. Yani H_{11} (Tasarruf oranı, finansal gelişmişliği etkilemektedir) hipotezi kabul edilmiştir. Enflasyon ve işsizlik değişkenleri sırası ile %5 ve %10 anlamlılık düzeyde finansal gelişmişliğini negatif yönde etkilemektedir. Dolayısıyla H_{12} (Enflasyon, finansal gelişmişliği etkilemektedir), H_{13} (İşsizlik oranı, finansal gelişmişliği etkilemektedir) hipotezleri kabul edilmiştir. Ayrıca devlet harcamaları ve dış borç değişkenleri %1 anlamlılık düzeyde finansal gelişmişliği pozitif yönde etkilemektedir. Böylece H_{15} (Devlet harcamaları, finansal gelişmişliği etkilemektedir) ve H_{16} (dış borç, finansal gelişmişliği etkilemektedir) hipotezleri kabul edilmiştir. Diğer yandan modelde ticaret açıklığı, döviz kuru ve yabancı sermaye net girişleri değişkenlerinin etkisi anlamsızdır. Dolayısıyla H_{10} (Ticaret açıklığı, finansal gelişmişliği etkilemektedir), H_9 (Yabancı sermaye net girişleri, finansal gelişmişliği etkilemektedir) ve H_{14} (Döviz kuru, finansal gelişmişliği etkilemektedir) hipotezleri reddedilmiştir. Bütün değişkenler literatürle uyumludur. Literatürden farklı şekilde ticaret açıklığı, döviz kuru ve yabancı sermaye net girişleri İslam İşbirliği Teşkilatı ülkelerinde finansal gelişmişliği açıklamada başarısız kalmışlardır. Aşağıdaki Tablo 5'te çalışmanın özet sonuçları gösterilmiştir:

Tablo: 5
Araştırma Bulguları Özeti

Değişken	Anlamlılık Düzeyi	Beklenen İşaret	Gerçekleşen İşaret	Hipotez Kabul/Ret
G.GD	***	+	+	Kabul
G.PA	***	+	+	Kabul
YSG	-	+	+	Ret
TAC	-	+	+	Ret
G.TO	*	+	+	Kabul
ENF	**	-	-	Kabul
ISZ	*	-	-	Kabul
DVZ	-	-	-	Ret
DH	**	+	+	Kabul
DBR	***	+	+	Kabul
YK	***	+	+	Kabul
EKO	**	+	+	Kabul
EKO1	***	+	+	Kabul
EKO2	***	+	-	Kabul
EKO3	***	+	+	Kabul
EKO4	***	+	+	Kabul

5. Sonuç

İslam İşbirliği Teşkilatı ülkeleri, genel olarak gelişmekte olan ülkelerden oluştuğu için yolsuzluk kontrolü ve ekonomik özgürlük gibi kurumsal kalite özellikleri düşük olan ülkelerdir. Kurumsal kalite özellikleri kısa vadeli kazanımların uzun vadede sürdürülebilir olup olmadığını belirlediği için finansal sistemin derinliğini artırmak suretiyle ekonomik büyüme ve gelişmeyi önemli derecede etkilemektedir. Dolayısıyla çalışmada İslam İşbirliği Teşkilatı ülkelerinde kurumsal kalite faktörlerinin finansal gelişmişlik üzerindeki etkisi, 1995-2018 dönemine ait yıllık veriler kullanarak panel veri analizi yöntemiyle incelenmiştir.

Çalışmada finansal gelişmişliğin göstergesi olarak yurtiçindeki finansal sektör tarafından özel sektöre kullandırılan kredi değerinin GSYH'ye oranı ile kullanılmıştır. Literatürden finansal gelişmişliğin belirleyicisi olarak gelir düzeyi, para arzı, yabancı sermaye net girişi, ticaret açıklığı, tasarruf oranı, enflasyon, işsizlik, döviz kuru, devlet harcamaları ve dış borç belirlenmiştir. Kurumsal kalite göstergesi olarak da yolsuzluk endeksi ve ekonomik özgürlüğün dört alt başlığı (hukukun üstünlüğü, mevzuat etkinliği, piyasaların açıklığı, devlet büyüklüğü) modele dahil edilmiştir.

Çoklu doğrusal dinamik modelinden elde edilen sonuçlara göre; ticaret açıklığı, yabancı sermaye girişleri ve döviz kuru değişkenleri hariç çalışmada kullanılan bütün değişkenlerin finansal gelişmişlik üzerindeki etkisi anlamlıdır. Ekonomik özgürlük, yolsuzluk kontrolü, para arzı, gelir düzeyi tasarruf oranı, devlet harcamaları ve dış borç değişkenlerinin finansal gelişmişlik üzerindeki etkisi pozitif iken, enflasyon ve işsizlik değişkenlerinin finansal gelişmişlik üzerindeki etkisi negatiftir. Değişkenlerin beklenen işaretleri literatürle uyumludur. Ayrıca İslam İşbirliği Teşkilatı ülkelerinde kurumsal kalite faktörlerinden yolsuzluk kontrolünün finansal gelişmişlik üzerindeki etkisi ekonomik özgürlüğün etkisine göre daha güçlüdür. Diğer yandan devlet büyüklüğü finansal gelişmişliğini olumsuz etkilemektedir. Gelişmekte olan bu ülkelerde devlet büyüklüğünün artması dışlama etkisi yaratarak finansal sektörün özel sektöre kullandırdığı kredi miktarının GSYH içindeki payının azalmasına neden olabilmektedir. Dış borç ve tasarruf oranı

değişkenlerinin katsayıları birbirleri ile karşılaştırıldığında dış borç değişkeninin katsayısı tasarruf oranının katsayısından büyük olduğu görülmektedir. Bu durum finansal sektörünün kaynaklarının çoğunun mevduattan değil dış borçtan oluştuğu şeklinde yorumlanabilir. Elde edilen sonuçlar genel olarak değerlendirildiğinde Ayaydın & Baltacı (2013), Bayar (2016) ve Khan vd. (2020) çalışmalarının sonuçları ile benzerlik gösterdiği söylenebilir.

Yolsuzluk kontrolü ve ekonomik özgürlük gibi kurumsal kalite faktörlerinin finansal sektörün gelişmişliği üzerinde önemli bir etkiye sahip olması sebebiyle, politika yapıcılar tarafından yolsuzluğa karşı önemli tedbirler alınmasının yanı sıra iş kurma ve yatırım işlemlerini kolaylaştıracak yeni düzenlemeler yapılmalıdır. Tüm bunlar ise yatırım yapmanın kalitesini artırmak suretiyle finansal piyasaların daha işlevsel bir özellik kazanmasını sağlayacak ve hem ekonomik büyümeyi hem de gelişmeyi destekleyecektir.

Kaynaklar

Abu-Bader, S. & A.S. Abu-Qarn (2008), "Financial Development and Economic Growth: The Egyptian Experience", *Journal of Policy Modeling*, 30(5), 887-898.

Acemoglu, D. et al. (2006), "Did Medicare Induce Pharmaceutical Innovation?", *American Economic Review*, 96(2), 103-107.

Ağır, H. (2009), "Türkiye'de Finansal Liberalizasyon ve Finansal Gelişme İlişkisinin Ekonometrik Analizi", *Doktora Tezi*, Adnan Menderes Üniversitesi Sosyal Bilimler Enstitüsü, Aydın.

Ahmed, S.M. & M.I. Ansari (1998), "Financial Sector Development and Economic Growth: The South-Asian Experience", *Journal of Asian Economics*, 9(3), 503-517.

Ali, M. et al. (2020), "Financial Inclusion, Institutional Quality and Financial Development: Empirical Evidence from OIC Countries", *The Singapore Economic Review*, doi:10.1142/s0217590820420084.

Arellano, M. & O. Bover (1995), "Another Look at the Instrumental Variable Estimation of Error-Components Models", *Journal of Econometrics*, 68(1), 29-51.

Arellano, M. & S. Bond (1991), "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations", *Review of Economic Studies*, 58(2), 277-297.

Arellano, M. (2003), *Panel Data Econometrics*, Oxford University Press: New York.

Ayadi, R. et al. (2015), "Determinants of Financial Development Across the Mediterranean", in: R. Ayadi et al. (eds.), *Economic and Social Development of the Southern and Eastern Mediterranean Countries*, Springer, Cham, 159-181.

Ayaydın, H. & N. Baltacı (2013), "Corruption, Banking Sector, and Stock Market Development: A Panel Data Analysis". *European Journal of Research on Education*, (Special Issue), 94-99.

Babayemi, A.W. et al. (2013), "Empirical Relationship between the Stock Markets and Macroeconomic Variables: Panel Cointegration Evidence from African Stock Markets", *International Journal of Engineering Science and Innovative Technology*, 2(4), 394-410.

Baltagi, H.B. (2013), *Econometric Analysis of Panel Data*, 5th edition, John Wiley& Sons: England.

Barro, R.J. (1997), *Determinants of Economic Growth: A Cross-Country Empirical Study*, Mass.: MIT Press, Cambridge.

Bayar, Y. (2016), "Institutional Determinants of Stock Market Development in European Union Transition Economies", *The Romanian Economic* Journal, (61), 211-226.

Ben Naceur, S. et al. (2014), "What Drives the Development of the MENA Financial Sector?", *Borsa Istanbul Review*, 14(4), 212-223.

Billmeier, M.A. & I. Massa (2007), "What Drives Stock Market Development in the Middle East and Central Asia: Institutions, Remittances, or Natural Resources?", *IMF Working Papers*, No. 7-157, International Monetary Fund.

Blundell, R. & S. Bond (1998), "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models", *Journal of Econometrics*, 87, 115-143.

Bruinshoofd, A. (2016), "Institutional Quality and Economic Performance", *RaboResearch - Economic Research*, <https://economics.rabobank.com/publications/2016/january/institutional-quality-and-economic-performance/>, 12.04.2020.

Cherif, M. & C. Dreger (2016), "Institutional Determinants of Financial Development in MENA Countries: Financial Development in MENA Countries", *Review of Development Economics*, 20(3), 670-680.

Cherif, M. & K. Gazdar (2010), "Institutional and Macroeconomic Determinants of Stock Market Development in Mena Region: New Results From a Panel Data Analysis", *The International Journal of Banking and Finance*, 7(1), 139-159.

Cojocaru, L. et al. (2016), "Financial System Development and Economic Growth in Transition Economies: New Empirical Evidence from the CEE and CIS Countries", *Emerging Markets Finance and Trade*, 52(1), 223-236.

Creane, S. et al. (2007), "Measuring Financial Development in the Middle East and North Africa: A New Database", *IMF Staff Papers*, 53(3), 479-511.

Drukker, D. (2008), "Econometric Analysis of Dynamic Panel-Data Models Using Stata", in: *Summer North American Stata Users Group Meeting*, Gleacher Center, University of Chicago, <https://www.stata.com/meeting/snasug08/drukker_xtdpd.pdf>, 20.02.2020.

Erim, N. & A. Türk (2005), "Finansal Gelişme ve İktisadi Büyüme", *Kocaeli Üniversitesi Sosyal Bilimler Dergisi*, (10), 21-45.

Garcia, V.F. & L. Liu (1999), "Macroeconomic Determinants of Stock Market Development", *Journal of Applied Economics*, 2(1), 29-59.

Hall, R.E. & C.I. Jones (1999), "Why Do Some Countries Produce So Much More Output Per Worker than Others?", *The Quarterly Journal of Economics*, 114(1), 83-116.

Hussain, F. & D.K. Chakraborty (2012), "Causality between Financial Development and Economic Growth: Evidence from an Indian State", *The Romanian Economic Journal*, XV(15), 27-48.

Ito, H. & M. Kawai (2018), "Quantity and Quality Measures of Financial Development: Implications for Macroeconomic Performance", *Public Policy Review*, 14(4), 1-32.

Johansson, D. & A.S. Kongstad (2013), "The Determinants of Stock Market Development: Implications of a Dynamic Panel Data Model", *MSc in Finance Thesis*, School of Economics and Management Lund University.

Jones, E.L. (1987), *The European Miracle: Environments, Economies, and Geopolitics in the History of Europe and Asia*, Cambridge University Press.

Kennedy, P. (2006), *Ekonometri Kılavuzu*, 5. Baskı. Ankara: Gazi Kitapevi.

Khalfaoui, H. (2015), "The Determinants of Financial Development: Empirical Evidence from Developed and Developing Countries", *Applied Economics and Finance*, 2(4), 1-9.

Khan, M.A. et al. (2020), "Impact of Institutional Quality on Financial Development: Cross-Country Evidence based on Emerging and Growth-Leading Economies", *Emerging Markets Finance and Trade*, 56(15), 3829-3845.

King, R.G. & R. Levine (1993), "Finance and Growth: Schumpeter Might Be Right", *The Quarterly Journal of Economics*, 108(3), 717-737.

Knack, S. & P. Keefer (1995), "Instutions and Economic Performance: Cross-Country Test Using Alternative Institutional Measures", *Economics and Politics*, 7(3), 207-227.

Kyophilavong, P. et al. (2016), "The Nexus between Financial Development and Economic Growth in Lao PDR", *Global Business Review*, 17(2), 303-17.

Law, S.H. & M.S. Habibullah (2009), "The Determinants of Financial Development: Institutions, Openness And Financial Liberalisation", *South African Journal of Economics*, 77(1), 45-58.

Levine, R. & S. Zervos (1996), "Stock Market Development and Long-Run Growth", *The World Bank Policy Research Department Finance and Private Sector Development Division*, 1-24.

Levine, R. et al. (2000), "Financial Intermediation and Growth: Causality and Causes", *Journal of Monetary Economics*, 46(1), 31-77.

Lynch, D. (1996), "Measuring Financial Sector Development: A Study of Selected Asia-Pacific Countries", *The Developing Economies*, 34(1), 1-27.

Mauro, P. (1995), "Corruption and Growth", *The Quarterly Journal of Economics*, 110(3), 681-712.

Mbulawa, S. (2015), "Determinants of Financial Development in Southern Africa Development Community (Sadc): Do Institutions Matter?" *European Journal of Accounting Auditing and Finance Research*, 3(6), 39-62.

Nawaz, S. et al. (2014), "The Impact of Institutional Quality on Economic Growth: Panel Evidence", *The Pakistan Development Review*, 53(1), 15-31.

Nguyen, Y.H.D. & D.T. Thi Ha (2021), "The Effect of Institutional Quality on Financial Inclusion in ASEAN Countries", *Journal of Asian Finance, Economics and Business*, 8(8), 421-431.

North, D.C. (1981), *Structure and Change in Economic History*, Norton.

Okpara, G.C. et al. (2018), "Econometrics Analysis of Financial Development and Economic Growth: Evidence from Nigeria", *Global Journal of Management and Business Research*, 18(2), 1-5.

Olson, M. (1982), *The Rise and Decline of Nations: Economic Growth, Stagflation, and Social Rigidities*, Yale University Press.

Öztürk, N. vd. (2010), "Gelişmekte Olan Piyasalarda Finansal Derinleşme ve Büyüme İlişkisi: Panel Veri Analizi", *ZKÜ Sosyal Bilimler Dergisi*, 6(12), 95-119.

Raza, S.H. et al. (2014), "Exploring the Determinants of Financial Development (Using Panel Data on Developed and Developing Countries)", *Journal of Finance and Economics*, 2(5), 166-172.

Rodrik, D. et al. (2004), "Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development", *Journal of Economic Growth*, 9(2), 131-165.

The Heritage Foundation (2020), *2020 Index of Economic Freedom*, <https://www.heritage.org/index/explore?view=by-region-country-year&u=637264682744903681>, 23.01.2020.

The World Bank (2020), "World Development Indicators DataBank", *World Development Indicators*, <https://databank.worldbank.org/source/world-development-indicators>, 22.01.2020.

Transparency International (2020), "Research - CPI - Overview", *Corruption Perceptions Index*, <https://www.transparency.org/research/cpi/cpi/0>, 25.01.2020.

Windmeijer, F. (2005), "A finite sample correction for the variance of linear efficient two-step GMM estimators", *Journal of Econometrics*, 126, 25-51.

Wooldridge, J.M. (2001), *Econometric Analysis of Cross Section and Panel Data*, The MIT Press: Cambridge.

World Economic Forum (2012), *The Financial Development Report 2012*, New York: World Economic Forum.

Yartey, C.A. (2007), "Well-Developed Financial Intermediary Sector Promotes Stock Market Development: Evidence from Africa", *Journal of Emerging Market Finance*, 6(3), 269-289.

Yartey, C.A. (2008), "The Determinants of Stock Market Development in Emerging Economies: Is South Africa Different?", *IMF Working Papers*, Working Paper. No. 08/3, 1-33.

Yüce-Akıncı, G. vd. (2014), "Finansal Gelişmişliğin Makroekonomik Belirleyicileri: Türkiye İçin Bir VAR Modeli", *Uluslararası Alanya İşletme Fakültesi Dergisi*, 6(1), 1-15.

Ek: 1
Korelasyon Testinin Sonuçları

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	1																
2	-0,05**	1															
3	0,76**	-0,08***	1														
4	-0,06*	-0,00	-0,04	1													
5	0,48***	0,00	0,34***	-0,02	1												
6	0,24***	0,01	0,06**	-0,01	0,18***	1											
7	0,16***	-0,04	0,14***	-0,07**	0,02	-0,04	1										
8	-0,03	0,02	0,13***	0,06*	0,05*	-0,00	-0,06**	1									
9	-0,38***	-0,00	-0,24***	0,02	-0,32***	-0,34***	0,15***	-0,10***	1								
10	0,23***	-0,09***	0,19***	-0,02	0,25***	-0,03	0,05*	0,04*	-0,24**	1							
11	0,49***	0,03	0,40***	-0,03	-0,02	0,24***	0,01	0,24***	-0,21***	0,03	1						
12	0,61***	-0,14***	0,35***	0,01	0,38***	0,39***	0,05	-0,13***	-0,52***	0,28***	0,24***	1					
13	0,38***	-0,05*	0,25***	-0,07**	0,14***	0,17***	0,28***	-0,14***	-0,07**	0,06***	0,26**	0,49**	1				
14	0,49***	-0,09***	0,29***	-0,04	0,24***	0,27***	0,11***	-0,11***	-0,31***	0,19***	0,31***	0,68**	0,81**	1			
15	0,21***	-0,03	0,10***	-0,07**	-0,02	0,12***	0,31***	-0,16***	0,08***	-0,08**	0,19**	0,23***	0,91***	0,65***	1		
16	0,36***	-0,04*	0,27***	-0,09***	0,16***	0,18***	0,40***	-0,11***	- 0,00	0,05***	0,22***	0,38***	0,92***	0,65***	0,80***	1	
17	0,34***	-0,02	0,24***	-0,05	0,14***	0,09**	0,14***	-0,11**	-*0,07***	0,09***	0,24***	0,48***	0,91***	0,71***	0,76**	*0,78***	1

1=FG, 2=G.GD, 3=G.PA, 4=YSG, 5=TAC, 6=G.TO, 7=ENF, 8=ISZ, 9=DVZ, 10=DH, 11=DBR, 12=YK, 13=EKO, 14=EKO1, 15=EKO2, 16=EKO3, 17=EKO4.

** %10 düzeyinde, ** %5 düzeyinde, *** %1 düzeyinde istatistiksel olarak anlamlı olduğunu göstermektedir.*

Ek: 2
Sabit Etkiler Tahmin Sonuçları

Değişkenler	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	FG	**FG**	**FG**	**FG**	**FG**	**FG**
G.GD	0,224**	0,184**	0,234**	0,215**	0,194**	0,192**
	(0,0923)	(0,0925)	(0,0923)	(0,0905)	(0,0928)	(0,0914)
G.PA	0,851***	0,821***	0,829***	0,781***	0,807***	0,770***
	(0,0541)	(0,0545)	(0,0554)	(0,0553)	(0,0556)	(0,0557)
YSG	0,0724	0,0631	0,0532	0,0614	0,0494	0,0619
	(0,169)	(0,168)	(0,169)	(0,166)	(0,168)	(0,166)
TAC	0,00579	0,0161	0,0158	0,0331	0,0228	0,0350
	(0,0330)	(0,0329)	(0,0334)	(0,0331)	(0,0333)	(0,0330)
G.TO	0,0555	0,0620	0,0414	0,0442	0,0511	0,0467
	(0,0528)	(0,0524)	(0,0533)	(0,0539)	(0,0530)	(0,0538)
ENF	-0,0131	-0,0244	-0,0202	-0,0270*	-0,0289*	-0,0324**
	(0,0154)	(0,0158)	(0,0160)	(0,0158)	(0,0162)	(0,0161)
ISZ	-0,417*	-0,284	-0,374	-0,234	-0,261	-0,171
	(0,230)	(0,232)	(0,231)	(0,229)	(0,233)	(0,231)
DVZ	1,197	1,308	1,211	3,082*	1,311	2,986*
	(1,614)	(1,599)	(1,610)	(1,613)	(1,598)	(1,611)
DH	0,0729	0,0583	0,0642	0,0271	0,0529	0,0219
	(0,0742)	(0,0737)	(0,0742)	(0,0729)	(0,0738)	(0,0728)
DBR	0,313	0,399**	0,303	0,241	0,386**	0,307
	(0,193)	(0,194)	(0,193)	(0,192)	(0,194)	(0,195)
YK		0,264***			0,245***	0,153
		(0,0899)			(0,0911)	(0,0928)
EKO			0,00995*		0,00739	
			(0,00587)		(0,00590)	
EKO1				0,0566**		0,0511*
				(0,0279)		(0,0281)
EKO2				-0,0548***		-0,0524***
				(0,0185)		(0,0185)
EKO3				0,0269*		0,0269*
				(0,0144)		(0,0143)
EKO4				0,0865***		0,0773***
				(0,0197)		(0,0205)
Hata Terimi	-19,18**	-28,30***	-23,45***	-36,84***	-30,84***	-40,36***
	(7,967)	(8,485)	(8,339)	(8,586)	(8,718)	(8,830)
Gözlem Sayısı	455	455	455	455	455	455
Birim İçi R^2	0,533	0,542	0,536	0,563	0,544	0,565
Birimler Arası R^2	0,679	0,716	0,693	0,607	0,723	0,636
F-Test	0,000	0,000	0,000	0,000	0,000	0,000
Ülke Sayısı	33	33	33	33	33	33

NOT: Analiz sonuçlarında ilk satır katsayı değerini, parantez içerisinde yer alan ikinci satır standart hata göstermektedir.

** %10 düzeyinde, ** %5 düzeyinde, *** %1 düzeyinde istatistiksel olarak anlamlı olduğunu göstermektedir.*

Sosyoekonomi

2021, Vol. 29(50), 485-501

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.22
Date Submitted: 26.03.2021
Date Revised: 19.10.2021
Date Accepted: 21.10.2021

Will Workers be Unemployed Because of Robots? A Meta-Analysis on Technology and Employment

İbrahim DAĞLI *(https://orcid.org/0000-0001-8199-821X), Süleyman Demirel University, Turkey; mribrahimdagli@gmail.com*

Çalışanlar Robotlar Yüzünden İşsiz mi Kalacak? Teknoloji ve İstihdam Üzerine Bir Meta-Analiz Çalışması

Abstract

The purpose of this paper is twofold. The first is to present an overall effect size of technology's impact on employment. The second is to provide an example of the usability of the meta-analysis method in economics. This study conducted with the meta-analysis method concluded that technology positively affects employment, and the overall effect size is medium (g=0.53). Contrary to the general prejudice that technology can cause unemployment, it has been concluded that technology affects employment positively. Unlike the other empirical studies, a more comprehensive and general result was obtained thanks to meta-analysis.

Keywords : Technological Unemployment, Meta-Analysis, Technology and Employment, Robots and Labour, Future of Work.

JEL Classification Codes : L0, O3, J2.

Öz

Bu çalışmanın amacı iki yönlüdür. Birincisi, teknolojinin istihdama etkilerine dair genel bir etki büyüklüğü sunmaktır. İkincisi, meta-analiz yönteminin iktisat biliminde kullanılabilirliğine dair bir örnek sunmaktır. Meta-analiz yöntemiyle yapılan bu çalışmada teknolojinin istihdam üzerinde pozitif bir etkisi olduğu ve genel etki büyüklüğünün orta düzeyde (g=0,53) olduğu sonucuna ulaşılmıştır. Teknolojinin işsizliğe neden olabileceğine dair genel önyargının aksine teknolojinin istihdamı olumlu yönde etkilediği sonucuna ulaşılmıştır. Bu çalışmada diğer ampirik çalışmalardan farklı olarak meta-analiz sayesinde daha kapsamlı ve genel bir sonuç elde edilmiştir.

Anahtar Sözcükler : Teknolojik İşsizlik, Meta-Analiz, Teknoloji ve İstihdam, Robotlar ve İşgücü, İşin Geleceği.

1. Introduction

Since the first industrial revolution, the fear that technology will adversely affect work life has been an ongoing debate. The possibility of machines replacing human labour was central to the discussion. Is technology an illness of the century as technological unemployment, as Keynes said in 1930, or does it contribute to human well-being? While the productivity-enhancing effect of technology is noticeable, the impact of technology on employment is still ambiguous. On the one hand, technology increases productivity lowers the cost of goods and services, and creates new industries related to the technology itself.

On the other hand, human labour is being replaced with the job-saving effect, and some workers are losing their current jobs. The skill needs of new sectors and the job descriptions of new professions will be different from today. But the crucial point is whether it will be possible to find a new job for all workers who lost their jobs due to technological innovations. In other words, will there be more newly created jobs than destroyed? If so, that means there will be no unemployment, at least due to technological advances.

It is seen that classical economists also included their views on the economic effects of technology in their famous works. Adam Smith stated the division of labour and specialization and their impact on productivity in his notable work "The Wealth of Nations" (Smith, 1776). Ricardo touched on the mechanization and changing skill requirements, and he claims those would decrease the need for labour over time (Ricardo, 1817). Karl Marx argued that capitalist powers would benefit from the increased efficiency in the manufacturing industries (Bimber, 1990). Keynes spoke of it as a new huge illness in 1930, as if Ricardo and Marx had never discussed it before (Campa, 2018: 34). The first significant action that broke out exactly 21 decades ago in Nottingham was the technology and employment debate milestone. Textile workers tore down the machines in England and started the Luddism movement.

Solow claimed that the technology is an exogenous factor and called the unexplained increased productivity effect "Solow Residual". Even though the idea that workers would lose their jobs was prevalent during the first mechanization years (Leontief, 1979), opposing views emerged after technology created new jobs. Schumpeter introduced the concept of creative destruction and said that technology transforms into new ones while destroying the old ones (Schumpeter, 1943: 81-86). Schumpeter accepted innovation as "a change in the production function" in the production process (Schumpeter, 1939: 84).

International Labor Organization [ILO] (2018) points to a technology-based job polarization around the world. New occupations emerging with new technologies have also transformed the nature and conditions of jobs by changing skill requirements and traditional business models. Technological changes have been dynamic processes that create and destroy jobs and transform how existing jobs are organized (ILO, 2016). The inequality in the distribution of employment due to rural-urban differences and technological transformations may become even more severe in the future (ILO, 2020: 13). ILO (2021)

expects a globally uneven economic recovery in 2021, but the projected employment growth seems insufficient to close the gaps opened up by the COVID-19 crisis.

The impact of technology on employment has been discussed in many empirical studies in the literature. However, unfortunately, a generally accepted result could not be reached in studies conducted, especially at the macro level. The employment-increasing effects of product innovation, R&D and patents, and the effects of process innovation on job-saving are evident in the literature. However, most of these studies are sector-level or firm-level research. Naturally, the results vary according to the sample group, and it is complicated to make a macro policy with these studies.

Using the meta-analysis method, this study used a new analysis with empirical studies published between 2010-2021 following the specified criteria. Meta-analysis is a quantitative method that allows combining the results of more than one study into a single result. This method reveals the overall effect between studies regardless of the results of the original studies. On the one hand, no study presenting a general effect on technology and employment relationship could be found in the literature. On the other hand, it has been observed that meta-analysis studies are mainly focused on medicine and educational sciences (Delgado et al., 2018: Kim et al., 2021), and the use of this method is limited in economics (Dagli & Karacadir, 2021: Yaman, 2020).

Dagli & Karacadir (2021) researched the relationship between high-technology export and economic growth using meta-analysis. Likewise, Yaman (2020) used a meta-analysis to analyse the relationship between R&D and economic growth. Using a meta-analysis gives an excellent opportunity to see the general effect in economic studies. For this reason, in this study, using the meta-analysis method, a general effect size on the relationship between technology and employment is presented. In this way, it is aimed to make a concrete contribution to the technology-unemployment debate that has been going on for more than a century from the perspective of the big picture. In the first part of the study, empirical studies available in the literature are included. In the next section, the meta-analysis process and its findings are shared.

2. Empirical Literature Review

After the 2000s, many bestseller books dealt with the effects of technology and the relationship between humans and technology. Authors of these books include professors and futurist scientists from renowned universities such as MIT. Some examples of well-known are:

"*The Rise of the Robots*", Martin Ford (2015); "*The Second Machine Age*", Eric Brynjolfsson & Andrew McAfee (2014); "*Digital is Destroying Everything*", Andrew Edwards (2015); "*Still Think Robots Can't Do Your Job*", Ricardo Campa (2018); "*Smarter Than Us: The Rise of Machine Intelligence*", Stuart Armstrong (2014); "*Technology vs. Humanity*", Gerd Leonhard (2016); "*The Inevitable*", Kevin Kelly (2016); "*The Fourth*

Industrial Revolution", Klaus Schwab (2016); "*The Age of Spiritual Machines*", Ray Kurzweil (1999).

The literature is divided into two levels as firm-level (micro) and country-level (macro) studies. Some of the micro-level studies are firm-level studies, and the other part consists of sector-level studies.

There are very few macro-level studies dealing with the effects of technological change on employment. In most macro-level studies, the relationship between technology and employment is non-significant or uncertain (Sinclair, 1981; Simonetti et al., 2000; Tancioni & Simonetti, 2002). Cang (2017) and Evangelista et al. (2014) found that technology and employment are unrelated. Sometimes the results depend on the country as Vivarelli (1995) found the employment effect negative for Italy and positive for the USA. According to Pini (1995), Simonetti et al. (2000), and Feldmann (2013), the effect of the technology was temporary, and it was minimal, according to Krousie (2018) and Aguilera & Barrera (2016).

When looking at the studies at the micro-level, it is seen that the results are more precise. Significantly, the results are more evident in micro studies conducted according to the type of innovation. The positive effect of product innovation was confirmed in many studies (Evangelista & Vezzani, 2011; Greenan & Guellec, 2000; Hall et al., 2008; Lachanmaier & Rottman, 2011; Meriküll, 2008; Smolny, 1998). However, the impact of process innovation on employment was negative in most studies (Dachs & Peters, 2014; Falk, 2015; Harrison et al., 2014; Kwon et al., 2015; Van Reenen, 1997).

It is also evident in sector-level studies that product innovation had a positive and process innovation harmed employment (Autor & Dorn, 2013; Aubert-Tarby et al., 2017; Bogliacino & Pianta, 2010; Cirillo et al., 2018; Huo & Feng, 2010; Peters, 2005; Piva & Vivarelli, 2018). Morrison Paul & Siegel (2001) found a negative impact of technology on employment in the manufacturing industry. Likewise, Acemoglu & Restrepo (2020) found the job-saving effect of innovation in local labour markets, and Evangelista & Savona (2002) confirmed the negative effect in the service industry.

In the studies related to the impact of automation, Frey & Osborne (2017) found that nearly half of the employment in the U.S. is at risk of automation. Arntz et al. (2016) found this risk 9% for OECD countries, and Chang & Huynh (2016) found 3/5 of jobs are at risk of automation in ASEAN countries. World Economic Forum (WEF, 2017) found the ratio of the risk of automation for Morocco and Turkey (50%), Bahrain and Saudi Arabia (46%), Egypt (49%), and Qatar (52%), UAE (47%) and Kuwait (41%). Acemoglu and Restrepo (2020) found that using an additional robot per thousand workers reduces the employment/ population ratio by about 0.2 percentage points (about 400 thousand jobs for the USA).

3. Methodology

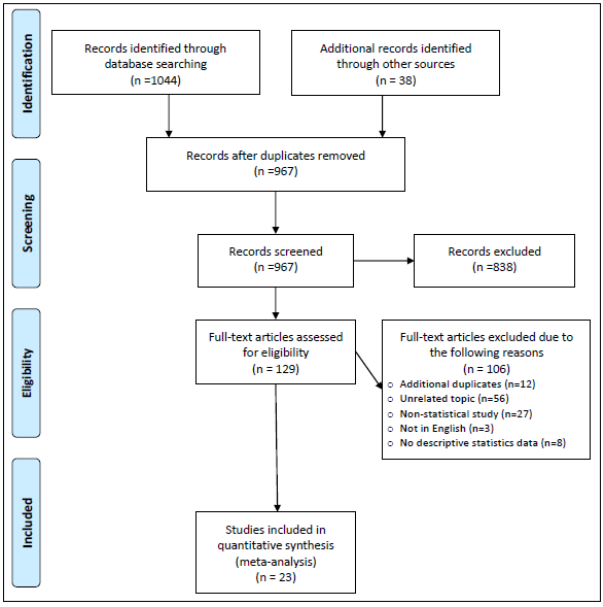
3.1. Data Selection and Collection Processes

Inclusion and exclusion criteria of the studies included in the meta-analysis are as follows:

- The study should be about the relationship between technology and employment,
- The study should be either an article paper or working paper,
- The study should be published formally from the year 2010-2021,
- The study should be in English,
- The study should include an empirical analysis,
- The statistical data of the study should include n, S, and $\bar{x}$ to calculate an effect size.

A preliminary literature review was made to identify the studies required for the meta-analysis. After a premise work, it was determined to search Google Scholar and Scopus database. The search keywords were selected as *"R&D OR patent OR technology AND employment"* and *"'impact of technology' OR 'effects of technology' AND employment"*. The studies meeting these criteria in *"abstract, title or keywords"* were selected for the analysis.

Figure: 1
Prisma Flow Diagram



758 studies from Google Scholar and 286 studies from Scopus were identified through database searching. From a forward search that mostly cited in the references of these works, additional 38 studies were identified through other sources. The search ended in March 2021 with 1,082 records (1044 from the database and 38 from other sources). At the first stage, 115 duplicating studies were removed. After using the selection criteria mentioned above, 23 studies satisfied all the criteria and were selected for the meta-analysis. Excluding reasons for some studies and the flow diagram of the searching, the procedure is shown in Figure 1.

3.2. Data Coding

For the reliability of the meta-analysis, it is critical to code the data correctly (Lipsey & Wilson, 2001). It is recommended to check the coding of the data at least by two different researchers studying in that field. For this reason, other than the author of this article, one more researcher studying Science and Technology Policies coded the data separately. Intercoder reliability can be assessed by standard indices such as Agreement Rate (A.R.), Cohen's Kappa, and Pearson Correlation. The agreement rate is the most straightforward and intuitive among these methods and the most commonly used one (Card, 2012: 76). According to the agreement rate method, the coding of the studies was entirely consistent with the author and independent researcher (AR=1).

Preliminary controls were made before moving on to the analysis section, which showed two possible outliers (value ≥4) for the analysis. After removing the outliers, there were 21 records for the final meta-analysis. Descriptive information and the relative weight of these 21 studies are given in Table 1.

Table: 1
Descriptive Information and Relative Weight of the Selected Studies

Study Name	Study Level	R.Weight
Aldieri et al., 2015	Firm-level	4.86
Aldieri et al., 2019	Sector-level	4.86
Aubert-Tarby et al., 2017	Sector-level	4.87
Barbieri et al., 2018	Firm-level	4.85
Bogliacino et al., 2011	Firm-level	4.84
Bogliacino et al., 2012	Sector-level	4.86
Bogliacino, 2014	Firm-level	4.85
Buerger et al., 2012	Sector-level	4.81
Feldmann, 2013	Macro-level	3.72
Haile et al., 2017	Firm-level	4.87
Horbach, 2010	Firm-level	4.85
Lachenmaier & Rottmann, 2011	Firm-level	4.87
Matuzeviciute et al., 2017	Macro-level	4.33
Meschi et al., 2011	Firm-level	4.87
Ni & Obashi, 2011	Firm-level	4.87
Paul & Lal, 2020	Sector-level	4.55
Pellegrino et al., 2018	Firm-level	4.84
Piva & Vivarelli, 2018	Firm-level	4.85
Torrecillas et al., 2017	Macro-level	4.84
Triguero et al., 2017	Firm-level	4.87
Van Roy et al., 2018	Firm-level	4.87

In this meta-analysis, the studies consist of three sub-groups according to their study level categorically. 14 firm-level, 6 sector-level, and 3 macro-level studies will be analysed through the categories, and results will be assessed separately.

4. Results

4.1. Common Effect Size

The main goal is to find a mean effect size of all studies chosen for the analysis. Card (2012) defines the focus on effect sizes as *"the whats of meta-analysis"*. There are many alternative indices to use as an effect size. Among these indices, Cohen's d, Hedges' g, and Glass's index are the most common indices of standardized mean difference (Grissom & Kim, 2005). These indices are defined by equations 1, 2, and 3.

$$\text{Hedge's } g = M^1 - M^2 / S_{pooled} \quad (1)$$

$$\text{Cohen's } d = M^1 - M^2 / Sd_{pooled} \quad (2)$$

$$\text{Glass's index } g\ \text{Glass} = M^1 - M^2 / S_1 \quad (3)$$

- M^1 and M^2 are the means of groups 1 and 2.
- S_{pooled} is the pooled estimate of the population standard deviation.
- Sd_{pooled} is the pooled sample standard deviation.
- S_1 is the estimate of the population standard deviation from group 1.

Even with large sample sizes, Hedge's g and Cohen's d will be virtually identical (Card, 2012: 91). Therefore, using Hedge's g or Cohen's in this meta-analysis will not give a far different result. Hedge's g was used in this meta-analysis. In an analysis with the same studies with Cohen's d effect size, the results seem identical. A primary effect size of the selected studies for fixed effect and random effect is in Table 2.

Table: 2
Effect Size for Random and Fixed Effect

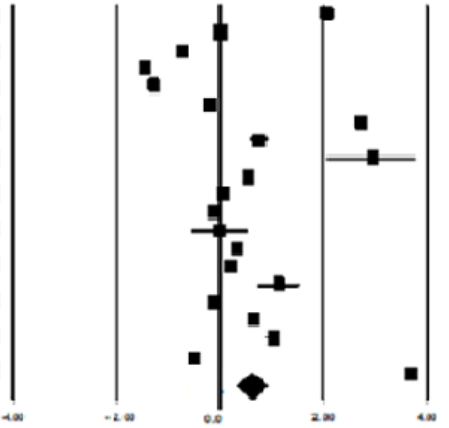
Model	Number Studies	Point Estimate	Std. Error	Variance	Lower Limit	Upper Limit
Fixed	21	0.232	0.002	0.000	0.227	0.237
Random	21	0.527	0.174	0.030	0.185	0.869

The mean effect size of the sample in the random-effects model was significant (greater than zero $p < .01$) and computed as 0.53 with a standard error of .17 and the 95% confidence interval ranges from .19 to .87. In the fixed-effects model, the effect size was statistically non-significant.

The most critical result gained by meta-analysis is the effect size which represents the power of all studies individually and the overall result for all included studies. Table 3 shows the effect sizes of all studies and a forest plot which is an indispensable part of a meta-analysis. All analyses were made through the Comprehensive Meta-Analysis (CMA Version 3) Software, and the computations on the tables are an output of this software.

Table: 3
Effect Sizes and Forest Plot for Random Effect Model

Study Name	Hedge's g	Lower Limit	Upper Limit	p-Value
Aldieri et al., 2015	2.05	1.97	2.13	0.00
Aldieri et al., 2019	-0.01	-0.09	0.09	0.98
Aubert-Tarby et al., 2017	-0.75	-0.77	-0.73	0.00
Barbieri et al., 2018	-1.48	-1.58	-1.37	0.00
Bogliacino et al., 2011	-1.28	-1.40	-1.17	0.00
Bogliacino et al., 2012	-0.20	-0.26	-0.14	0.00
Bogliacino, 2014	2.71	2.61	2.81	0.00
Buerger et al., 2012	0.76	0.59	0.94	0.00
Feldmann, 2013	2.93	2.06	3.79	0.00
Haile et al., 2017	0.54	0.50	0.59	0.00
Horbach, 2010	0.05	-0.04	0.14	0.30
Lachenmaier & Rottmann, 2011	-0.12	-0.15	-0.08	0.00
Matuzeviciute et al., 2017	-0.01	-0.56	0-53	0.96
Meschi et al., 2011	0.31	0.30	0.32	0.00
Ni & Obashi, 2011	0.21	0.20	0.21	0.00
Paul & Lal, 2020	1.13	0.72	1.54	0.00
Pellegrino et al., 2018	-0.11	-0.22	0.01	0.07
Piva & Vivarelli, 2018	0.64	0.53	0.75	0.00
Torrecillas et al., 2017	1.04	0.91	1.16	0.00
Triguero et al., 2017	-0.51	-0.55	-0.47	0.00
Van Roy et al., 2018	3.69	3.66	3.73	0.00
Random	0.53	0.19	0.87	0.00



The most common models used in meta-analyses are fixed effect and random effect models. Although using a random effect model in meta-analyses in social sciences is common, it is better to check some assumptions. The critical difference between fixed effect and random effect is that *"the single parameter of the fixed-effects model, the single population effect size (θ), is decomposed into two parameters (the central tendency and study deviation, μ, and ξi) in the random-effects model"* (Card, 2012: 233). According to Card (2012), *"The challenge of the random-effects model is to determine how much of the variability in each study's deviation from this mean is due to the distribution of population effect sizes"*.

To determine whether to use a fixed-effect or random-effect model, homogeneity (heterogeneity) is one of the significant factors. In the following section on heterogeneity tests, it is evident that the data is heterogeneous. The other one is the relative weight of the studies. In the random-effect model relative weight of the studies seems close to each other (see Table 1). But in a fixed-effect model, the studies seem very fluxional, and the relative weight of a few studies are far more than the others. Another factor in deciding the model in meta-analysis is the goal of your study. Results from fixed-effects models are limited to only the chosen studies in your meta-analysis, whereas the random-effect model allows more generalizable conclusions (Card, 2012: 250).

All the assumptions show us random effect model is the correct preference for this analysis. The p-value of the random effect model (p=.00) supports the significance of the analysis. The mean effect size was computed as 0.53 the 95% confidence interval ranges from .19 to .87. A common way of interpreting effect sizes is to consider them as *"small (= .2), medium (= .5), and large (= .8)"* (Lakens, 2013: 11). This value (0.53) is medium effect

size, and it represents a positive relationship between technology and employment. When we consider it presents the mean effect of all studies included in the meta-analysis, it is a valuable conclusion that suggests technology boosts employment. The common prejudice about technology is its job-saving effect, but this analysis claims that its job-creating effect is more dominant than the job-saving effect.

4.2. An ANOVA for Sub-group Analyses

In the meta-analysis, it is beneficial to use an ANOVA test to see the effect size and heterogeneity separately in sub-groups. For this purpose, the test was conducted on sub-groups to see a difference between the effect size and sub-group heterogeneity. The moderator was the level of the studies such as macro-level studies, firm-level studies, and sector-level studies. In the ANOVA, out of 21 studies included in the meta-analysis 13 of them were firm-level, 3 were macro-level, and 5 were sector-level studies.

Firm-level and macro-level studies seem significant (p= .02 and p= .03), but sector-level studies seem non-significant (p= .50) statistically. The overall effect of the studies was significant statistically, and the overall effect size of the 21 studies was 0.42, which is close to medium size. The sub-group effect size of firm-level studies in the ANOVA was computed as 0.52, the 95% confidence interval ranges from .09 to .94, and the z-value is 2.37. The effect size for the macro-level sub-group is 1.25, which is a large effect, and the 95% confidence interval ranges from .13 to 2.37. The effect size of sector-level studies was very small (.16) and non-significant (p= .50).

Table: 4
Effect Sizes for Sub-groups

Study Level	N	Effect Size	Standard Error	Lower Limit	Upper Limit	Z-Value	p-Value
Firm-Level	13	0.52	0.22	0.09	0.94	2.37	0.02
Macro-Level	3	1.25	0.57	0.13	2.37	2.19	0.03
Sector-Level	5	0.16	0.24	0.40	0.93	0.67	0.50
Overall	21	0.42	0.16	0.12	0.72	2.71	0.01

4.3. Homogeneity versus Heterogeneity

It is vital to see if the data is heterogeneous in a meta-analysis, and there are a few indices to check. Statistic Q is one of the common ways to control heterogeneity of the effect sizes. The equation for statistic Q is below Equation 3 (Card, 2012: 185).

$$Q = \sum(w_i\,(ES_i - \overline{ES}\,)^2\,) = \sum(w_i\,ES_i^2) - (\sum(w_i ES_i))^2 \,/\, \sum w_i \text{ dr= k-1} \quad (4)$$

- w_i is the weight of study i.
- $E.S._i$ is the effect size estimate from study i.
- $\overline{E.S.}$ is the mean effect size across studies.
- K is the number of studies.

Q statistic is distributed as χ2 with *df* = *k* - 1 under the null hypothesis of homogeneity. When I look up the chi-square distribution table, the Q value exceeds the 20

degrees of freedom and .05 confidence interval (*df*=20, $\chi 2(.05)$ =31.41). It proves that the effect sizes are heterogeneous (See Table 5).

Table: 5
Heterogeneity/ Homogeneity for Common Effect Size

Q-value	Df (Q)	P-value	I^2
64493.72	20	0.00	99.97

Another valuable index for heterogeneity is the I^2 index which shows the variability among the effect sizes. Huedo-Medina et al. (2006) interpret I^2 as*" ≈ 25% small, ≈ 50% medium, and ≈ 75% large*" amount of heterogeneity. I^2 (99.97) for this meta-analysis showed a large amount of heterogeneity. Also, the p-value (0.00) suggests heterogeneity for the data.

Table: 6
Heterogeneity/ Homogeneity for Sub-groups

Sub-group	Q-value	Df (Q)	P-value	I^2
Firm-level	52090.97	12	0.00	99.97
Macro-level	32.583	2	0.00	93.86
Sector-level	874.59	4	0.00	99.54

Heterogeneity tests for sub-group analyses also confirm effect sizes of all sub-groups are heterogeneous. The results are respectively, Q statistic (52090.97, 32.583, 874.59), p-value (0.00 for all sub-groups) and *I*2 index were (99.97, 93.86, 99.54).

4.4. Publication Bias

The reality and reliability of the effect sizes mostly hinge upon publication bias in meta-analyses. It refers to the possibility that studies finding negative results are less likely to be published. The presence of publication bias means that the studies included in the meta-analysis might not be representative of all studies on the topic. In other words, the available results likely show a stronger effect size than if all studies were considered (Card, 2012: 258).

Table: 7
Fail-safe N Test

Z-value for observed studies	78.47
P-value for observed studies	0.00
Alpha	0.05
Tails	2.00
Z for alpha	1.95
Number of observed studies	21
Number of missing studies that would bring p-value to >alpha	3643

In this meta-analysis, three different most common tests for publication bias were conducted. The first one was the *"fail-safe N"* test proposed by Rosenthal (1979). The number of missing studies that would bring a p-value greater than alpha was 3643 in the fail-safe N test at .05 confidence level (see Table7). 5n+10 formula (Fragkos et al., 2014) equals

110, and 3643 is much greater than this value. So, the fail-safe N test confirmed there was no publication bias.

Duval & Tweedie's (2000) *"trim and fill"* method shows that none of the studies was trimmed, and the observed values and adjusted values were identical (see Table 8). This test confirmed the result of the fail-safe N test, and in short, it suggested there was no publication bias.

Table: 8
Duval and Tweedie's Trim and Fill Test

		Fixed Effects			Random Effects			
	Studies Trimmed	Point Estimate	Lower Limit	Upper Limit	Point Estimate	Lower Limit	Upper Limit	Q Value
Observed values	-	0.232	0.227	0.237	0.529	0.187	0.870	64493.88
Adjusted values	0	0.232	0.227	0.237	0.529	0.187	0.870	64493.88

Egger et al. (1997) proposed a test to estimate the asymmetry of the funnel plot. In Egger's regression, if the p-value is less than 0.05, it implicates publication bias (Jin et al., 2014). Egger's regression test of the studies included in the meta-analysis gave p-value= 0.31(1-tailed) and p-value= 0.63. So, the test confirmed the previous publication bias test results and showed there was no publication bias.

Table: 9
Egger's Regression Intercept Test

Intercept	7.48
Standard error	15.29
95% lower limit (2-tailed)	-24.53
95% upper limit (2-tailed)	39.49
t-value	0.49
Df	19.00
P-value (1-tailed)	0.32
P-value (2-tailed)	0.63

5. Conclusion and Policy Remarks

The effects of technology on the economy and especially on employment have been discussed for many years. The increase in productivity provided by technology in production and the corresponding decrease in costs and prices is a generally accepted result. However, the situation is very different when it comes to the effects of technology on employment. An important part of the studies in the literature is micro econometric studies conducted at firm-level and sector-level. However, the number of macro studies that can show an overall effect on the economy is very few. Moreover, most macro studies, which are few, could not reach statistically significant findings. There are some explicit situations in micro econometric studies. For example, there is a consensus in the literature that product innovation positively affects employment, and that process innovation has a negative effect. Similarly, in most of the studies conducted at the micro-level, it is seen that R&D expenditures and patent numbers have a positive relationship with employment.

Technological innovations positively affect the economy with cost reductions resulting from productivity gains. The increase in welfare, called the increase in GDP, contributes to the country's general economy. However, machines or robots doing the work previously done by humans bring about changes in the traditional production approach. Today's skill requirements and qualifications sought in workers are different than in the past, and it would probably be far different in the next production revolution. However, reducing automation to the level of capturing human work by machines would be a somewhat biased and inadequate approach. That is to say; technological innovations provide the emergence of many new products and sectors with the spillover effect. Invention, design, maintenance, repair of machines, increasing product variety, and production increase with decreasing costs are just some of the advantages of technology. The critical point is whether a sufficient number of jobs in new production sectors and new lines of work are provided for workers replaced by machines. In other words, if the newly created jobs are on par with the disappeared jobs and the workers successfully provide the necessary orientation, there is no question of being unemployed due to technological progress.

In this paper, a new analysis has been made using econometric studies published between 2010 and 2021 on the technology-employment relationship. In this study, the meta-analysis method was used, and a more comprehensive overall effect size was obtained independently from the results of other studies. Hedge's g = 0.53, this effect size is medium level, indicating that technology positively affects employment. This situation shows that the jobs created by technology are more than the jobs it destroys. In the process Schumpeter refers to as creative destruction, innovations have opened the door to more efficient technologies and processes. According to the findings of this paper, employees who were dismissed during the automation process were able to find jobs for themselves in new jobs that emerged thanks to technology. However, this result is only limited to the empirical findings of this paper. Analysis in different sectors, regions, and firms could give any different effects of the technology.

The impact of technology on human labour cannot yet be measured clearly. However, the positive effects of technology in terms of job-saving and productivity increase should not be ignored. Although technology may cause temporary unemployment due to its job-saving effect, this effect on employment can be minimized with compensation mechanisms. In innovation policies, it should focus on productivity increase rather than labour-saving and compensate for the negative effects on the workforce with the increase in the welfare level created by technology.

References

Acemoglu, D. & P. Restrepo (2020), "Robots and Jobs: Evidence from U.S. Labor Markets", *Journal of Political Economy*, 128(6), 2188-2244.

Aguilera, A. & M.G.R. Barrera (2016), "Technological Unemployment: An Approximation to the Latin American Case", *AD-Minister*, 29, 59-78.

Aldieri, L. et al. (2015), "R&D spillovers and employment: a micro-econometric analysis", *MPRA Paper* No. 67269.

Aldieri, L. et al. (2019), "Spoils of Innovation? Employment Effects of R&D and Knowledge Spillovers in Finland", *Economics of Innovation and New Technology*, 1-15.

Armstrong, S. (2014), *Smarter Than Us: The Rise of Machine Intelligence*, Berkeley: Machine Intelligence Research Institute.

Arntz, M. et al. (2016), "The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis", *OECD Social, Employment and Migration Working Papers*, No. 189, OECD Publishing, Paris.

Aubert-Tarby, C. et al. (2017), "The Impact of Technological Change on Employment: The Case of Press Digitisation", *Technological Forecasting & Social Change*, 128, 36-45.

Autor, D.H. & D. Dorn (2013), "The Growth of Low-Skill Service Jobs and The Polarization of The Us Labor Market", *American Economic Review*, 103, 1553-97.

Barbieri, L. et al. (2018), "R&D, Embodied Technological Change, and Employment: Evidence from Italian Microdata", *Industrial and Corporate Change*, 28(1), 203-18.

Bimber, B. (1990), "Karl Marx and The Three Faces of Technological Determinism", *Social Studies of Science*, 20(2), 333-351.

Bogliacino, F. & M. Pianta (2010), "Innovation and Employment: A Reinvestigation Using Revised Pavitt Classes", *Research Policy*, 39, 799-809.

Bogliacino, F. et al. (2011) "R&D and Employment: Some Evidence from European Microdata", *IZA Discussion Paper* No. 5908.

Bogliacino, F. et al. (2012), "R&D and Employment: An Application of the LSDVC Estimator Using European Microdata", *Economics Letters*, 116, 56-59.

Bogliacino, F. (2014), "Innovation and employment: A firm level analysis with European R&D Scoreboard data", *Economia*, 15(2), 141-54.

Brynjolfsson, E. & A. McAfee (2014), *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*, New York: W.W. Norton.

Buerger, M. et al. (2012), "Regional Dynamics of Innovation: Investigating the Co-evolution of Patents, Research and Development (R&D), and Employment", *Regional Studies*, 46(5), 565-82.

Campa, R. (2018), *Still Think Robots Can't Do Your Job. Essays on Automation and Technological Unemployment*, Roma: D Editore.

Cang, Y. (2017), "A Deep Dive into Technological Unemployment: A State-Level Analysis on the Employment Effect of Technological Innovations", *Senior Thesis*, Claremont McKenna College.

Card, N.A. (2012), *Applied Meta-Analysis for Social Science Research*, New York, NY: Guilford Press.

Chang, J.H. & P. Huynh (2016), "ASEAN in transformation. The Future of jobs at risk in automation, International Labour Office (ILO), Bureau for Employers' Activities", *Working Paper* No 9.

Cirillo, V. et al. (2018), "Technology and Occupations in Business Cycles", *Sustainability*, 10(463), 1-25.

Dachs, B. & B. Peters (2014), "Innovation, Employment Growth, and Foreign Ownership of Firms", *Research Policy*, 43(1), 214-32.

Dağlı, İ. & V. Karaçadır (2021), "İleri Teknoloji İhracatı ve Ekonomik Büyüme İlişkisine Genel Bir Bakış: Bir Meta-Analiz Çalışması", *Kafkas Üniversitesi İİBF Dergisi*, 12(23), 160-180.

Delgado, P. et al. (2018), "Don't Throw Away Your Printed Books: A Meta-Analysis on The Effects of Reading Media on Reading Comprehension", *Educational Research Review*, 25, 23-38.

Duval, S. & R. Tweedie (2000), "Trim and Fill: A Simple Funnel-Plot-Based Method of Testing and Adjusting for Publication Bias in Meta-Analysis", *Biometrics*, 56(2), 455-63.

Edwards, A.V. (2015), *Digital is Destroying Everything: What the Tech Giants Won't Tell You about how Robots, Big Data, and Algorithms are Radically Remaking Your Future*, Rowman & Littlefield.

Egger, M. et al. (1997), "Bias in Meta-Analysis Detected by a Simple Graphical Test", *Bmj*, 315(7109), 629-34.

Evangelista, R. & A. Vezzani (2011), "The Impact of Technological and Organizational Innovations on Employment in European Firms", *Industrial and Corporate Change*, 21(4), 871-99.

Evangelista, R. & M. Savona (2002), "The Impact of Innovation on Employment in Services: Evidence from Italy", *International Review of Applied Economics*, 16, 309-18.

Evangelista, R. et al. (2014), "The Economic Impact of Digital Technologies in Europe", *Economics of Innovation and New Technology*, 23(8), 802-24.

Falk, M. (2015), "Employment Effects of Technological and Organizational Innovations: Evidence Based on Linked Firm-Level Data for Austria", *Jahrbücher Für Nationalökonomie Und Statistik*, 235(3), 268-285.

Feldmann, H. (2013), "Technological Unemployment in Industrial Countries", *Journal of Evolutionary Economics*, 23, 1099-1126.

Ford, M. (2015), *Rise of the Robots: Technology and the Threat of Mass Unemployment*, New York: Basic Books.

Fragkos, K.C. et al. (2014), "Publication Bias in Meta-Analysis: Confidence Intervals for Rosenthal's Fail-Safe Number", *International Scholarly Research Notices*, 2014, 825383.

Frey C.B. & M.A. Osborne (2017), "The Future of Employment: How Susceptible Are Jobs to Computerisation?", *Technological Forecasting and Social Change*, 114, 254-80.

Greenan, N. & D. Guellec (2000), "Technological Innovation and Employment Reallocation", *Labour*, 14(4), 547-90.

Grissom, R.J. & J.J. Kim, (2005), *Effect Sizes for Research: A Broad Practical Approach*, Mahwah, NJ: Erlbaum.

Haile, G. et al. (2017), "Imported Technology and Manufacturing Employment in Ethiopia", *Eurasian Business Review*, 7(1), 1-23.

Hall, B.H. et al. (2008), "Employment, Innovation, and Productivity: Evidence from Italian Microdata", *Industrial and Corporate Change*, 17(4), 813-39.

Harrison, R. et al. (2014), "Does Innovation Stimulate Employment? A Firm-Level Analysis Using Comparable Micro-Data from Four European Countries", *International Journal of Industrial Organization*, 35, 29-43.

Horbach, J. (2010), "The Impact of Innovation Activities on Employment in the Environmental Sector - Empirical Results for Germany at the Firm Level", *Jahrbücher Für Nationalökonomie Und Statistik*, 230(4), 403-19.

Huedo-Medina, T.B. et al. (2006), "Assessing Heterogeneity in Meta-Analysis: *Q* statistic or *I*2 index?", *Psychological Methods*, 11, 193-206.

Huo, J. & H. Feng (2010), "The Political Economy of Technological Innovation and Employment", *Comparative Political Studies*, 43(3), 329-52.

ILO (2016), *Technological Changes and Work in the Future: Making Technology Work for All*, The Future of Work the Centenary Initiative, International Labour Office, Issue Note Series 1.

ILO (2018), *The Impact of Technology on the Quality and Quantity of Jobs*, The Future of Work, International Labour Office, Issue Brief Series No 6. 241.

ILO (2020), *World Employment and Social Outlook: Trends 2020*, Geneva: International Labour Office.

ILO (2021), *World Employment and Social Outlook: Trends 2021*, Geneva: International Labour Office.

Jin, ZC. et al. (2014), "A Modified Regression Method to Test Publication Bias in Meta-Analyses with Binary Outcomes", *BMC Med Res Methodol*, 14, 132.

Kelly, K. (2016), *The Inevitable: Understanding the 12 Technological Forces that will Shape Our Future*, New York, New York: Viking.

Kim, Y.S.G. et al. (2021), "Writing Instruction Improves Students' Writing Skills Differentially Depending on Focal Instruction and Children: A Meta-Analysis for Primary Grade Students", *Educational Research Review*, 34, 100408.

Krousie, C. (2018), "Technological Unemployment in the United States: A State-Level Analysis", *Major Themes in Economics*, 20(6), 87-101.

Kurzweil, R. (2000), *The Age of Spiritual Machines: When Computers Exceed Human Intelligence*, Penguin.

Kwon, S.J. et al. (2015), "Innovation Activities and the Creation of New Employment: An Empirical Assessment of South Korea's Manufacturing Industry", *Social Science Information*, 54(3), 354-68.

Lachenmaier, S. & H. Rottmann (2011), "Effects of Innovation on Employment: A Dynamic Panel Analysis", *International Journal of Industrial Organization*, 29, 210-20.

Lakens, D. (2013), "Calculating and Reporting Effect Sizes to Facilitate Cumulative Science: A Practical Primer for T-Tests and ANOVAs", *Frontiers in Psychology*, 4, 863.

Leonhard, G. (2016), *Technology vs. Humanity: The Coming Clash between Man and Machine*, FutureScapes.

Leontief, W. (1979), "Is Technological Unemployment Inevitable?", *Challenge*, 22(4), 48-50.

Lipsey, M.W. & D.B. Wilson (2001), *Practical Meta-Analysis*, Applied Social Research Methods Series, Vol. 49, Thousand Oaks, CA: Sage publications.

Matuzeviciute, K. et al. (2017), "Do Technological Innovations Affect Unemployment? Some Empirical Evidence from European Countries", *Economies*, 5(48), 1-19.

Meriküll, J. (2008), "The Impact of Innovation on Employment: Firm- and Industry-level Evidence from Estonia", Eesti Pank Bank of Estonia, *Working Paper Series*, 1/2008.

Meschi, E. et al. (2011), "Trade, Technology and Skills: Evidence from Turkish Microdata", *Labour Economics*, 18, 60-70.

Morrison Paul, C.J. & D.S. Siegel (2001), "The Impacts of Technology, Trade and Outsourcing on Employment and Labor Composition", *Scandinavian Journal of Economics*, 103(2), 241-64.

Ni, B. & A. Obashi (2021), "Robotics Technology and Firm-Level Employment Adjustment in Japan", *Japan and the World Economy*, 57, 101054.

Paul, S. & K. Lal (2020), "Technology Intensity and Employment in the Indian Economy", *Arthaniti: Journal of Economic Theory and Practice*, 0976747919895326.

Pellegrino, G. et al. (2018), "R&D, Embodied Technological Change and Employment: Evidence from Spain", *GLO Discussion Paper*, No. 214.

Peters, B. (2005), "Employment Effects of Different Innovation Activities: Microeconometric Evidence", ZEW Centre for European Economic Research, *Discussion Paper* 04-073.

Pini, P. (1995), "Economic Growth, Technological Change and Employment: Empirical Evidence for a Cumulative Growth Model with External Causation for Nine OECD Countries: 1960-1990", *Structural Change and Economic Dynamics*, 6, 185-213.

Piva, M. & M. Vivarelli (2018), "Is Innovation Destroying Jobs? Firm-Level Evidence from the E.U.", *Sustainability*, 10(1279), 1-16.

Ricardo, D. (1817), *The Principles of Political Economy & Taxation*, Kitchener, Canada: Batoche Books.

Rosenthal, R. (1979), "The File Drawer Problem and Tolerance for Null Results", *Psychological Bulletin*, *86*, 638-41.

Schumpeter, J.A. (1939), *Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process*, (ed. Rendigs Fels), New York and London: McGraw-Hill.

Schumpeter, J.A. (1943), *Capitalism, Socialism and Democracy*, New York: Harper Collins.

Schwab, K. (2016), *The Fourth Industrial Revolution*, Currency.

Simonetti, R. et al. (2000), "Modelling the Employment Impact of Innovation", in: *The Employment Impact of Innovation: Evidence and Policy* (ed. Pianta & Vivarelli), Routledge, 26-46.

Sinclair, P.J.N. (1981), "When will Technical Progress Destroy Jobs?", *Oxford Economics Paper*, 31, 1-18.

Smith, A. (1776), *An Inquiry into The Nature and Causes of The Wealth of Nations*, (Edited with an Introduction, Notes, Marginal Summary and an Enlarged Index by Edwin Cannan), London: Methuen. 1904.

Smolny, W. (1998), "Innovations, Prices and Employment", *Journal of Industrial Economics*, 46(3), 359-380.

Tancioni, M. & R. Simonetti (2002), "A Macroeconometric Model for The Analysis of The Impact of Technological Change and Trade on Employment", *Journal of Interdisciplinary Economics*, 13, 185-221.

Torrecillas, C. et al. (2017), "The Dual Role of R&D Expenditures in European Union's Member States: Short- and Long-Term Prospects", *Innovation: The European Journal of Social Science Research*, 30(4), 433-54.

Triguero, Á. et al. (2017), "Environmental Innovation and Employment: Drivers and Synergies", *Sustainability*, 9(2057), 1-12.

Van Reenen, J. (1997), "Employment and Technological Innovation: Evidence from U.K. Manufacturing Firms", *Journal of Labor Economics*, 15(2), 255-84.

Van Roy, V. et al. (2018), "Technology and Employment: Mass Unemployment or Job Creation? Empirical Evidence from European Patenting Firms", *Research Policy*, 47, 1762-76.

Vivarelli, M. (1995), *The Economics of Technology and Employment: Theory and Empirical Evidence*, Cheltenham: Edward Elgar.

WEF (2017), *The Future of Jobs and Skills in the Middle East and North Africa*, World Economic Forum, May 2017.

Yaman, H. (2020), "Araştırma Geliştirme (Ar-Ge) Faaliyetleri ile Ekonomik Büyüme İlişkisinin Meta Analiz Yöntemiyle Değerlendirmesi", *Anemon Muş Alparslan Üniversitesi Sosyal Bilimler Dergisi*, 8(4), 1247-1254.

Sosyoekonomi

2021, Vol. 29(50), 503-520

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.23
Date Submitted: 08.05.2021
Date Revised: 20.10.2021
Date Accepted: 22.10.2021

Türkiye'de Para İkamesine Karşı Politika Faizi Etkin Olarak Kullanılıyor Mu? Fourier Alandan Kanıtlar

Tayfur BAYAT *(https://orcid.org/0000-0002-4427-0999), İnönü University, Turkey; tayfur.bayat@inonu.edu.tr*
Şebnem TAŞ *(https://orcid.org/0000-0002-7303-3407), Fırat University, Turkey; stas@firat.edu.tr*

Is Policy Interest Effectively Used in Turkey for Against Currency Substitution: Evidence from Fourier Area

Abstract

The phenomenon of currency substitution started in the Turkish economy during the transition to a free-market economy in the 1980s with the changing foreign exchange regime. In this context, the study, based on the January 2011-November 2020 period, Turkey's economy to prevent currency substitution, whether the weighted average funding rate is used effectively or not, is examined by traditional and Fourier causality tests. As a result of empirical analysis, it has been determined that currency substitution hysteria is experienced due to economic actors' deterioration in nominal exchange rate expectations. To rectify this situation, no interest rate hysteresis was experienced during the analysis period due to the inability to use the policy rate effectively. As the study's main question, both time and Fourier domain causality from average funding cost to money substitution could not be found.

Keywords : Currency Substitution, Policy Interest, Fourier Approximation, Causality.

JEL Classification Codes : C22, E43, E52, F31.

Öz

Para ikamesi olgusu Türkiye ekonomisinde, 1980'li yıllarda serbest piyasa ekonomisine geçiş ve kambiyo rejiminde yapılan değişiklik ile yer bulmaya başlamıştır. Bu kapsamda çalışmada, Türkiye ekonomisinde Ocak 2011-Kasım 2020 dönemi baz alınarak para ikamesinin engellenmesi amacıyla ağırlıklı ortalama fonlama faizinin etkin olarak kullanılıp kullanılmadığı geleneksel ve Fourier nedensellik testleri ile incelenmektedir. Ampirik analizler sonucunda ekonomik aktörlerin nominal döviz kuru beklentilerinde bozulma nedeniyle para ikamesi histerisinin yaşandığı tespit edilmiştir. Bu durumun düzeltilmesi amacıyla politika faizinin etkin olarak kullanılamaması nedeniyle analiz periyodunda faiz oranı histerisi yaşanmamıştır. Çalışmanın temel sorusu olarak ağırlıklı ortalama fonlama maliyetinden para ikamesine doğru hem zaman hem de Fourier alanda nedensellik bulunamamıştır.

Anahtar Sözcükler : Para İkamesi, Politika Faizi, Fourier Yaklaşım, Nedensellik Testleri.

1. Giriş

Küreselleşmenin en önemli etkilerinden biri olan finansal liberalizasyonla birlikte ülkeler arasındaki sınırlar kalkmış, bağlantılar güçlenmiş ve bu da ülkelerin ticari faaliyetlerinin artmasına neden olmuştur. Bu ticari faaliyetler, ülke para birimlerinin konvertibl olmasıyla beraber hızlanmıştır. Türkiye'nin özellikle 1980'li yıllardan sonra serbest piyasa ekonomisine geçişi ve 1989 yılında ülke para biriminin konvertibl hale gelmesiyle uluslararası pazara girişini kolaylaştırarak ticaret hacminin artmasına yol açmıştır. Sürecin işleyişine bağlı olarak finansal serbestleşme, avantajlarının yanında kırılgan bir yapının oluşmasına da neden olmuştur. Bu kapsamda Türkiye'de 1980 öncesi dönemde, ekonomik birimlerin döviz bulundurması ve kullanması yasak olduğundan para ikamesi sorunu da yaşanmamaktaydı. Ancak 24 Ocak 1980 kararları sonrasında kambiyo rejiminde yapılan değişiklikler ile beraber yabancı para birimleri ile ilgili bahsedilen kısıtlamalar ortadan kaldırılmış ve çeşitli güdüler nedeni ile talep edilir ve kullanılır hale gelmiştir (Balaylar & Duygulu, 2004: 33).

Yaşanan bu sürecin ardından para ikamesi olgusu ülke ekonomisinde önemli bir yer tutmaya başlamıştır. Küresel açıdan bakıldığında ise, özellikle 1997 yılında yaşanan Asya mali krizi ve ülkelerin finansal sistemlerinin zayıf olmasından kaynaklı olarak yaratmış olduğu domino etkisiyle birçok ülkenin olumsuz anlamda etkilenmesi, para ikamesi için önemli bir örneği oluşturmaktadır. Özellikle böyle dönemlerde ülkelerin yaşamış olduğu ekonomik sorunlardan dolayı bireylerin değer kaybeden ulusal paradan kaçışı ve daha güçlü olan yabancı para birimine geçişi söz konusu olabilmektedir. Bu kapsamda 1980'lerin ikinci yarısında birçok Avrupa ülkesinde finansal liberalizasyonla birlikte elde yabancı para tutma konusunda hızlı bir artış olduğu görülmektedir (Giovanni & Turtelboom, 1982). Türkiye'de ve gelişmekte olan ülkelerin birçoğunda yaşanan enflasyon sorunu, faiz oranları makroekonomik sorunlar, ulusal paranın değer kaybı vb. faktörlerden kaynaklı olarak para ikamesinin arttığı görülmektedir. Bu motivasyondan hareketle, bu çalışmada Türkiye'de para ikamesi ile faiz oranları arasındaki ilişki araştırılmaktadır. Kwiatowski vd. (1992, KPSS) tarafından geliştirilen doğrusal birim kök testi ile Becker vd. (2006) tarafından geliştirilen Fourier birim kök testi ile para ikamesi ve faiz oranı histerisinin varlığı test edilmektedir. Ayrıca para ikamesi ve faiz oranları arasındaki nedensellik ilişkisi Granger (1969), Toda ve Yamomoto (1995), Enders ve Jones (2016), Nazlioglu vd. (2016) tarafından geliştirilen geleneksel ve Fourier nedensellik testleri ile incelenmektedir.

Literatürde Türkiye özelinde yer alan çalışmalara bakıldığında, para ikamesi ve faiz oranları arasındaki ilişkinin genellikle geleneksel nedensellik testleri ile analiz edilmeye çalışıldığı, Fourier nedensellik testlerinin kullanılmadığı görülmektedir. Bu kapsamda çalışmamızda söz konusu değişkenler arasındaki ilişkinin tespiti amacıyla geleneksel nedensellik testlerinin yanı sıra Fourier nedensellik testlerinin de kullanılması, çalışmayı önemli kılmakta ve literatürdeki boşluğu gidermeye katkıda bulunmaktadır.

Çalışmanın devam eden kısmında ilk olarak değişkenlere ait teorik altyapı ve literatürde yer alan çalışmalar üzerinde durulacak, ardından ampirik analiz yöntemleri ile

elde edilen bulgular analiz edilecek ve en son bölümde sonuç ve politika önerilerine yer verilecektir.

2. Teorik Altyapı ve Literatür

Paranın değer saklama, işlem amaçlı ve hesap birimi olma fonksiyonlarından, değer saklama niteliğini yitirmesi sonucu değişim aracı olarak farklı para birimlerinin ulusal para yerine kullanımı literatürde para ikamesi olarak ifade edilmektedir (Cuddington, 1989). Yabancı paranın ulusal para yerine hesap birimi, değişim ve değer saklama aracı olarak kullanılması ise "dolarizasyon olarak ifade edilmektedir (Calvo & Végh, 1992). Yapılan çalışmaların birçoğunda dolaşımda olan yabancı para hakkında genellikle veri olmadığından dolayı bu çalışmada da kullanıldığı üzere para ikamesi göstergesi olarak döviz mevduatlarının M2 para arzına oranı olarak ifade edilen dolarizasyon oranı kullanılmaktadır (Savastano, 1992). Para ikamesi kavramının belirleyicileri ve para ikamesi konusunda geniş bir literatür mevcuttur. İlk çalışmalar Bretton Woods sisteminin terk edilmesiyle ulusal paraların yabancı para birimleri karşısındaki aşırı dalgalanmaların bir açıklaması olarak yapılmıştır (Civcir, 2005). Meksika ekonomisi üzerine yapılan çalışmada Ortiz (1983) para ikamesinin temel belirleyicilerinin devalüasyon beklentisi ve kur riskiyle ilgili faktörlerden kaynaklandığı sonucuna ulaşmıştır.

Devalüasyon konusunda bireylerin hareketlerinin para ikamesini artırıp artırmayacağı algılama biçimiyle ilgilidir. Devalüasyon sonucunda bireyler bunu servet artışı olarak algılar ise ulusal para talebi artacak yani para ikamesi azalacaktır. Diğer taraftan yapılan devalüasyon daha fazla bir devalüasyon beklentisi oluştururs a ulusal paradan kaçış yabancı paraya geçiş hızlanacak yani para ikamesi artacaktır. Ayrıca para ikamesinin yaygın olduğu bir ülkede faiz oranındaki (hem reel hem de nominal) değişiklikler, para talebinin istikrarsızlığı nedeniyle belirsiz olacaktır (Adom vd., 2009). Bir diğer bulguya göre açık ekonomilerde hükümet politikalarından kaynaklanan enflasyonist ortamda bireylerin enflasyon vergisinden kaçma arzularının da para ikamesini artırdığı ortaya konulmuştur (Canto & Nickelsburg, 1987). Enflasyonun yüksek olduğu ülkelerde ulusal para değer saklama işlevini yitirecek ve enflasyona bağlı olarak ulusal paralara olan talep istikrarsız bir görünüm sergileyecektir (McKinnon, 1982). Para ikamesinin, refahı artırdığı (Sturzenegger, 1997), fakat para ikamesinin refah artırıcı olması için enflasyon oranının oldukça yüksek olması gerektiğine (Özbilgin, 2012) yönelik bulgular mevcuttur. Bunun tam tersi durumda para ikamesinin özel tüketimi dolayısıyla refahı azalttığı (Ghobaee Arani vd., 2018) da ifade edilmektedir.

Para ikamesinin refah azaltıcı etkileri, vergi kaçakçılığının maliyetlerinde azalmaya yol açma, 'kayıt dışı' ekonomiye katılımı kolaylaştırma, finansal işlemleri gizleyerek, işletme hırsızlığının maliyetini düşürme, yolsuzluk ve rant arayışını kolaylaştırma şeklindedir (Feige, 2003). Makroekonomik dengeyi olumsuz yönde etkileyen bu faktörlerin yanında para ikamesi ise döviz kurunda beklenenden çok daha büyük dalgalanma ve istikrarsızlara neden olmakta (Girton & Roper, 1981) bu da ekonominin beklentilerden uzaklaşıp, kötüleşmesine yol açmaktadır. Para ikamesi ve faiz oranları arasındaki ilişki konusunda ise

teorik altyapı para ikamesinin nedenlerinden olan enflasyonun önüne geçebilmek adına faiz oranlarının artırılmasını öngörmektedir. Literatürde Taylor kuralı adı verilen bu kavram enflasyon oranından daha yüksek bir faiz oranının belirlenmesi gerektiğini savunmaktadır. Para ikamesinin yurt içi faiz oranlarını etkilediğine dair ilk çalışma gelişmekte olan ülkeleri inceleyen Edwards ve Khan (1985) tarafından yapılan çalışma olarak kabul edilmektedir. Düşük faiz ortamında enflasyondan korunmak için para ikamesinde artış söz konusu iken bunun tersi durumda yani enflasyon oranından daha yüksek bir faiz oranı sunulursa bireyler/yatırımcılar yabancı parayı tercih etmek yerine faiz oranlarında paralarını değerlendirmeyi tercih edebilir mi? sorusu önem kazanmaktadır.

Literatürde Türkiye üzerine yapılan bazı çalışmalar para ikamesi ile faiz oranı arasında negatif (Civcir, 2005), enflasyon ile arasında ise pozitif yönlü ilişki olduğu yönünde bulgular mevcuttur (Domac & Oskooee, 2002). Para ikamesinin belirleyicileri konusunda yapılan çalışmalar, ulusal paranın değer kaybı /döviz kuru (Selçuk, 1994; Viseth, 2002; Yasuda, 2009; Pepic vd., 2015; Aigheyisi, 2015) ve faiz oranı (Clements & Schwartz, 1993; Tkalec, 2013; Kumamoto, 2014; Manjani, 2015), siyasi şiddet (Fielding & Shortland, 2012), siyasi belirsizliklerin (Doguwa, 2014) para ikamesini etkilediğini ortaya koymuşlardır. Para ikamesine neden olan faktörlerin yanı sıra Türkiye üzerine yapılan çalışmada para ikamesinin de döviz kuru oynaklığını artırdığına yönelik bulgular mevcuttur (Akçay, vd., 1997). Bir diğer bulguya göre para ikamesine neden olan faktörler ağ dışsallıkları (Oomes, 2003) ve devalüasyon olduğu fakat ağ dışsallıklarının devalüasyondan daha fazla para ikamesi üzerinde etkisi olduğudur (Valev, 2010). Bunlarla birlikte para politikasının pozitif ve negatif şoklarının para ikamesi üzerinde etkili olduğu ancak pozitif para politikası şoklarının para ikamesi üzerinde daha baskın olduğu (Sökmen, 2021), Türkiye'de para ikamesinin ekonomik birimlerin spekülatif ticaretleri nedeni ile gerçekleşmediği, siyasi olayların ekonomik olaylara kıyasla para ikamesi üzerinde daha güçlü bir etkiye sahip olduğu (Mişu vd., 2020), hem uzun hem de kısa dönemde enflasyon, döviz kuru değer kaybı ve finansal derinleşmenin para ikamesi için önemli bir belirleyici olduğu (Tarawalie & Jalloh, 2020) ve hükümetlerin para ikamesinin yüksek olduğu durumlarda likidite zorluklarını hafifletmek için doğrudan yabancı yatırım girişlerini teşvik eden ortamı yaratması gerektiği ve bunun için de faiz oranlarının önemli bir araç olduğuna dair ampirik sonuçlar bulunmaktadır (Tomu vd., 2021).

Kısaca özetlemek gerekirse para ikamesinin nedenlerinin başında yüksek enflasyon (Bernholz, 1989; Drazen & Helpman, 1990; Imrohoroğlu, 1994; Babatope-Obasa & Aziakpono, 2004) paranın değerini koruma arzusu, ithal mal alımı için kullanımı veya ülkede kontrolden çıkan enflasyonla başa çıkmak resmi olarak tamamen ulusal paranın yabancı bir parayla değişimi şeklinde sayılabilir. Burada sorun şu ki yaşanan yüksek enflasyon ve ekonomik istikrarsızlıklardan kaynaklanan para ikamesi bir süre sonra kalıcı hale gelerek eski seviyelere dönmeyebilir. İşte bireylerin kendi tasarruf yöntemlerini bulduğu ve paralarının değerlerini koruma adına uyguladıkları para ikamesi davranışının kalıcı hale gelme olayına "para ikamesi histerisi" denir (Savastano, 1996). Para ikamesi histerisi konusunda çeşitli modeller geliştirilmiştir (Guidotti & Rodriguez, 1992; Uribe, 1997; Sturzenegger, 1997). Bu modeller satın alma gücü riski modeli ve ağ dışsallıkları

şeklindedir (Valev, 2010). Para ikamesi histerisi hakkındaki çalışmalar incelendiğinde histeri etkisinin varlığı (Samreth, 2011) ve bu etkinin giderilemeyeceği (Ghaderi, 2017) ifade edilmektedir. Bu görüşe karşıt bir görüş olarak para ikamesi histeri etkisinin sabit kur rejimine geçişle giderilebileceğine dair bulgular da mevcuttur (Shahin & Freiha, 2005).

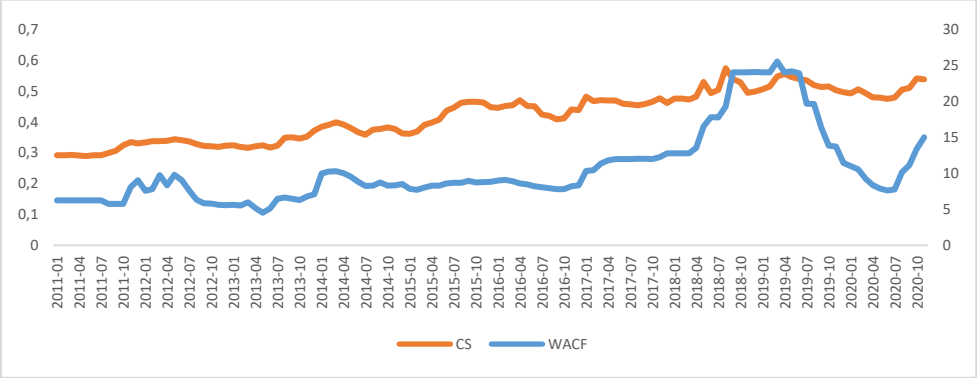
3. Kapsam ve Veri Seti ve Ampirik Sonuçlar

Bu çalışmada Ocak 2011-Kasım 2020 döneminde Türkiye'de para ikamesi ve faiz oranları arasındaki ilişki Türkiye Cumhuriyet Merkez Bankası ağırlıklı ortalama fonlama maliyeti (weighted average cost of the Central Bank of the Republic of Turkey, WACF) ile döviz tevdiat hesaplarının M2 para arzına oranı (CS) değişkenleri kullanılarak araştırılmaktadır. Türkiye Cumhuriyet Merkez Bankası'nın piyasalarda oluşan faizlere yön vermek amacıyla daha çok ağırlıklı ortalama fonlama maliyetini kullanması çalışmada bu değişkenin faiz oranı göstergesi olarak alınmasına neden olmuştur. T.C. Merkez Bankası ağırlıklı fonlama maliyetini gecelik borç verme faizinin ve haftalık repo faizinin ağırlıklı ortalamasını alarak oluşturmaktadır. Para ikamesi göstergesi olarak baz alınan döviz tevdiat hesapları/M2 oranında, döviz tevdiat hesapları, Türkiye'de yerleşik gerçek ve tüzel kişiler ile yurtdışında yerleşik gerçek ve tüzel kişilerin T.C. Merkez Bankası ve bankalar nezdinde tuttukları dövizlerden oluşmaktadır. Bu kapsamda döviz tevdiat hesaplarının M2 para arzına oranı ülkedeki para ikamesinin düzeyini net bir şekilde ortaya koymaktadır.

Çalışmanın ampirik bölümünde ilk olarak tanımlayıcı istatistikler ve daha sonra Kwiatowski vd. (1992, KPSS) tarafından geliştirilen doğrusal birim kök testi ile Becker vd. (2006) tarafından geliştirilen Fourier birim kök testi ile para ikamesi ve faiz oranı histerisinin varlığı incelenmektedir. Ardından Granger (1969), Toda ve Yamomoto (1995), Enders ve Jones (2016), Nazlioglu, vd. (2016) tarafından geliştirilen geleneksel ve Fourier nedensellik testleri ile para ikamesi ve faiz oranları arasındaki ilişki araştırılmaktadır.

Geleneksel birim kök testlerinde zaman serilerinin deterministik trendinde oluşan yapısal değişmelerinin göz önünde bulundurulmaması, serilerin birim kök test sonuçlarının farklı olmasına neden olabilmektedir. Bu durumun üstesinden gelebilmek amacıyla Kwitkowski vd. (1992)'ne ait KPSS birim kök testi, Becker vd. (2006) tarafından yapısal değişimler dikkate alınarak genişletilmiş ve yapısal değişimler Fourier fonksiyonu kullanılarak dikkate alınmıştır. Bu sayede geleneksel testlerde yapısal kırılmaların sayısı ve yapısının önceden bilinmesinin zor olması durumu Fourier fonksiyonların kullanımı ile aşılmakta ve güçlü sonuçlar elde edilebilmektedir. Söz konusu bu özellikleri nedeni ile çalışmamızın ampirik analiz kısmında, geleneksel testlerinin yanı sıra Fourier nedensellik testleri de kullanılmaktadır.

Grafik: 1
Faizlerin Ampirik Analiz Periyodu Boyunca Gelişimi



Grafikte sol eksen döviz tevdiat hesaplarının M2 para arzına oranını ve sağ eksen ise ağırlıklı ortalama fonlama maliyetini göstermektedir. Türkiye'nin 2011:1-2020:9 dönemine ait grafik değişkenler arasındaki ilişkiyi doğrusal ilişkiyi ifade etmektedir. Para ikamesinin Türkiye'de bazı dönemler dışında (2015:1, 2016:9,2018:9,2020:5) bir artış eğilimde olduğu yönündedir. Para ikamesinde azalmanın olduğu yılların neredeyse tamamında faiz oranların bir düşüş olduğu görülmektedir. Türkiye'de faizler ve para ikamesi arasındaki negatif ilişkiyi ifade eden ve Civcir (2005) çalışmasını destekleyen dönemin 2018:9-2019:5 arasında olduğu görülmektedir.

Tablo: 1
Tanımlayıcı İstatistikler

	WACF	CS	Aritmetik Ortalama	Max.	Min.	Std. Sapma	Varyasyon Katsayısı	Çarpıklık	Basıklık	Jarque-Bera (prob.)
WACF	1	-	10.59	25.5	4.52	5.16	0.48	1.55	4.57	60.12 (0.00)***
CS	0.762	1	0.41	0.57	0.28	0.07	0.17	-0.07	1.72	8.21 (0.016)**

*Not: ***, ** ve * değerleri sırasıyla %1. %5 ve %10 anlam seviyelerinde alternatif hipotezin kabul edildiğini göstermektedir.*

Ağırlıklı ortalama fonlama maliyeti ile döviz tevdiat hesaplarının M2 para arzına oranı arasında pozitif ve nispeten güçlü bir korelasyon bulunmaktadır. Ağırlıklı ortalama fonlama maliyeti en yüksek değerine Mart 2019 tarihinde, en düşük değerine ise Mayıs 2013 tarihinde ulaşmıştır. Para ikamesi oranı ise en yüksek değerine Ağustos 2018 ve en düşük değerine ise Mayıs 2011 tarihinde ulaşmıştır. Ağırlıklı ortalama fonlama maliyeti dolarizasyon rasyosundan daha öngörülemez bir yapıya sahiptir. Ağırlıklı ortalama fonlama maliyetinin dağılımı sağa çarpık ve dik olmasına rağmen döviz tevdiat hesaplarının M2 para arzına oranı sola çarpık ve basık bir dağılıma sahiptir. Her iki değişkende normal dağılıma sahip değildir.

Zaman serileri analizinde sahte regresyon problemi ile karşılaşmamak amacıyla serilerin durağan olup olmadıkları birim kök testleri ile sınanmalıdır. Bu bağlamda çalışmada geleneksel birim kök testi olan Kwiatowski vd. (1992)'nin geliştirdiği doğrusal KPSS birim kök testi ve Becker vd. (2006) tarafından geliştirilen Fourier KPSS birim kök testi kullanılmaktadır. Kwiatowski vd. (1992) doğrusal KPSS birim kök testinde, bir serinin deterministik bir eğilim etrafında durağan olduğu şeklindeki boş hipotezin testi önerilmektedir. Seri, deterministik eğilim, rastgele yürüyüş ve durağan hatanın toplamıdır ve test, rastgele yürüyüşün sıfır varyansa sahip olduğu hipotezinin LM testi olarak ifade edilir. İstatistiğin asimptotik dağılımı, boş ve serinin farkının durağan olduğu, alternatif hipotez altında elde edilir. Bu kapsamda test aşağıda yer alan lineer regresyon modelinden hareket eder.

$$y_t = r_1 + \beta_t + \varepsilon_t \; t = 1, \dots\dots, T \tag{1}$$

ve birbirini takip eden aşamaların ardından Kwiatowski vd. (1992)'ne ait test istatistiği 2 no'lu denklemdeki gibi gösterilir.

$$\mu = T^{-2} \sum_{t=1}^{T} \frac{S_t^2}{S^2\,(l)} \tag{2}$$

Ho ve H_1 hipotezleri aşağıdaki gibi gösterilmekte olup,

$$\begin{aligned} H_0 &: \vartheta_u^2 = 0 \\ H_1 &: \vartheta_u^2 > 0 \end{aligned} \tag{3}$$

$\vartheta_u^2 = 0$ hipotezinde ϑ_u^2'nin pozitif olduğu yani birim köke sahip olduğu hipotezine karşılık otonom parametrelerinin sabit olduğu öne sürülmektedir.

Geleneksel birim kök testlerinde zaman serilerinin deterministik trendinde oluşan yapısal değişmelerinin göz önünde bulundurulmaması, serilerin birim kök test sonuçlarının farklı olmasına neden olacaktır. Becker, vd., (2006)'ne göre yapısal kırılmayı içeren birim kök testlerinde, deterministik trendde meydana gelen değişmenin kukla değişkenle belirlenmesi sorun yaratmaktadır.

Bu bağlamda Kwitkowski vd. (1992), tarafından geliştirilen KPSS birim kök testi, Becker vd. (2006) tarafından yapısal değişimler dikkate alınarak genişletilmiştir. Söz konusu testte yapısal değişimler Fourier fonksiyonu kullanılarak dikkate alınmıştır. Bu sayede serideki değişimler etkin bir şekilde tahmin edilebilmektedir. Yapısal kırılmaların sayısı ve yapısının önceden bilinmesi durumunun zor olması durumu Fourier fonksiyonlarının kullanımı ile aşılmakta ve bu sayede güçlü sonuçlar elde edilebilmektedir (Fendoğlu ve Gökçe, 2019:24). Bu kapsamda Becker vd. (2006) tarafından geliştirilen Fourier birim kök test istatistiği aşağıdaki gibidir.

$$\tau_t(k) = \frac{1}{T^2} \frac{\sum_{t=1}^{T} \tilde{S}_t(k)^2}{\tilde{\sigma}^2} \tag{4}$$

$$\tilde{S}_t(k) = \sum_{j=1}^{t} \tilde{e}_j \tag{5}$$

$$\tilde{\sigma}^2 = \tilde{\gamma}_0 + 2\sum w_j\,\tilde{\gamma}_j \tag{6}$$

$\tilde{e}_j$ Fourier fonksiyonuna ait hata terimi, $\tilde{\gamma}_j$ kalıntıların j. Oto kovaryanslarıdır. Söz konusu fonksiyonun anlamlı olup olmadığı F test istatistiği ile sınanır. K frekansına sahip Fourier modeli için F test istatistiği aşağıdaki gibidir:

$$F_i = \frac{(KKT_0 - KKT_1(k))/2}{KKT_1(k)/(T-q)}, i = \pi, \tau. \tag{7}$$

$KKT_1(k)$ regresyon denklemine ait kalıntı kareleri toplamı, KKT_0 trigonometrik terimleri içermeyen modele ait kalıntı kareler toplamıdır. F testinin uygulanabilmesi için temel hipotezin kabul edilmiş olması gerekmektedir (Fendoğlu & Gökçe, 2019: 25).

Tablo: 2
Doğrusal ve Fourier KPSS Test Sonuçları

		Frekans (k)	Min KKT	FKPSS	F İstatistiği	KPSS
WACF	Sabitli Model	1	1542.86	0.096	60.49	0.702**
	Sabitli ve Trendli Model	3	1229.92	0.079	26.71	0.080
CS	Sabitli Model	1	0.237	0.517***	120.83	1.239***
	Sabitli ve Trendli Model	3	0.057	0.124**	21.39	0.106

*Notlar: FKPSS testinde %1, %5 ve %10 anlam seviyesinde kritik değerler sırasıyla k=1'de sabitli model için 0.131, 0.172 ve 0.269, sabitli ve trendli model için 0.047, 0.054 ve 0.071 ve k=3'te sabitli model için 0.339, 0.448, 0.718 ve sabitli ve trendli model için 0.114, 0.142 ve 0.210'dur. KPSS testinde %1, %5 ve %10 anlam seviyesinde kritik değerler sırasıyla sabitli model için 0.739, 0.463 ve 0.347, sabitli ve trendli model için 0.216, 0.146 ve 0.119'dur. ***, ** ve * değerleri sırasıyla %1. %5 ve %10 anlam seviyelerinde serilerin durağanlıklarını göstermektedir.*

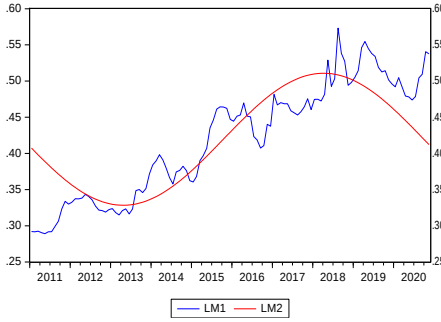
Hem Kwiatowski vd. (1992) tarafından geliştirilen birim kök testinde hem de Becker vd. (2006) tarafından geliştirilen Fourier KPSS testinde boş hipotez değişkenin birim kök taşımadığı ve histeri etkisinin geçerli olmadığı, alternatif hipotez ise değişkenin birim kök taşıdığı ve histeri etkisinin geçerli olduğu şeklindedir. Eğer F test istatistiği kritik değerden büyük ise alternatif hipotez kabul edilmektedir. Eğer F test istatistiği kritik değerden küçük ise sıfır hipotezi kabul edilmektedir. Tablo 2'de yer alan sonuçlara göre hem ağırlıklı ortalama fonlama maliyeti hem de para ikamesi oranı doğrusal KPSS testinde sabitli modelde birim kök taşımakta ve histeri etkisi geçerli olmaktadır. Ancak sabit terimli ve trendli modelde ise tam tersi birim kök taşımamakta ve histeri etkisi geçerli olmaktadır.

Fourier KPSS birim kök testinde ise ağırlıklı ortalama fonlama maliyeti hem sabitli hem de sabit terimli ve trendli modelde birim kök taşımamakta ve histeri etkisi yaşamamaktadır. Ancak para ikamesi oranı ise hem sabitli hem de sabit terimli ve trendli modelde birim kök taşımakta ve histeri etkisi yaşamaktadır. Birim kök testlerinden elde edilen bu sonuçlara ampirik analiz periyodu ekonomik aktörlerin nominal döviz kuru beklentilerinde bozulma yaşadığı için ve döviz tevdiat hesaplarının M2 para arzına oranı belirli bir eşik değerin üstünde olduğundan dolarizasyon azalmamaktadır. Öte yandan para politikasının önemli araçlarından biri olan politika faizinin belirli bir bant aralığında pozitif reel faiz vermesi nedeniyle faiz histerisi yaşanmamaktadır.

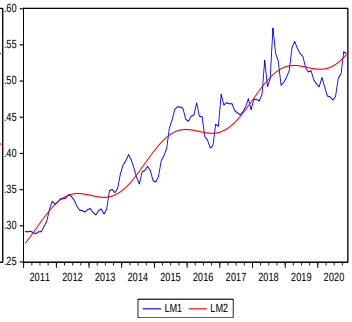
Ekonomik birimlerin makroekonomik istikrarsızlıklardan korunma amaçlı olarak ulusal para birimi yerine yabancı para birimini tercih etmeleri şeklindeki tepkileri olarak tanımlanan para ikamesinin, ekonomik istikrarsızlıkların giderilmesine rağmen eski seviyesine dönmemesi para ikamesi histerisi olgusunu ortaya çıkarmaktadır. Hem Kwiatowski vd. (1992) tarafından geliştirilen birim kök testinin hem de Becker vd. (2006) tarafından geliştirilen Fourier KPSS testinin sonuçları bir arada değerlendirildiğinde ele alınan dönem itibari ile Türkiye'de para ikamesi histerisinin geçerli olduğu anlaşılmaktadır. Yani özellikle yüksek enflasyon nedeniyle ulusal paranın satın alma gücünün düşerek değer kaybettiği ve faiz oranlarındaki belirsizliklerin yoğun olduğu dönemler gibi istikrasız ortamlarda para ikamesinin arttığı ancak daha sonraki dönemlerde enflasyondaki düşüşe ve yerli varlıklarının getirisindeki artışa rağmen para ikamesi seviyesinin düşmediği ve para ikamesinin sürdüğü görülmektedir.

Literatürde elde edilen bu sonuçları destekleyen çalışmalara bakıldığında bu durumun farklı nedenleri olabileceği görülmektedir. Guidotti ve Rodriguez (1992) Latin Amerika ülkelerinde para ikamesini ele aldıkları çalışmalarında ekonomik birimlerin para ikamesine geçiş süreçlerinde para birimini değiştirmeleri nedeni ile sabit bir maliyetle karşılaştıklarını ve bu maliyetin bir enflasyon bandı oluşturduğunu ileri sürmüşlerdir. Bu bandın varlığının ise para ikamesi histerisini gösterdiği ve özellikle Bolivya ve Meksika örneklerinde görüldüğü üzere enflasyondaki geçici değişikliklerin ekonominin para ikamesi derecesinde kalıcı etkilere ve dolayısıyla para ikamesi histerisinin oluşmasına neden olduğunun altını çizmişlerdir. Freitas (2003) farklı enflasyon deneyimleri ve para ikamesi seviyesine sahip olan Bolivya, Türkiye (yüksek enflasyon deneyimli) ve Endonezya (düşük enflasyon deneyimli) ülkelerinde para ikamesinin farklı dönüşüm kalıpları sergileyip sergilemediğini incelemiştir. Ele alınan bu üç ülkedeki dolarizasyon (para ikamesi) histerezisinin varlığına dair kanıtlar sunarak, bu olgunun yüksek düzeyde dolarize olmuş ekonomilerle veya uzun süre yüksek enflasyon oranları yaşayan ekonomilerle sınırlı olduğu görüşüne karşıt bir görüş sunmuştur. Buna göre yerli ve yabancı para birimleri, ödeme aracı olarak mükemmel ikameler ise, döviz talebi, istikrarın sağlamasının ardından azalmayacaktır. Havrylyshyn ve Beddies (2003) ise, Eski Sovyetler Birliği ülkelerindeki para ikamesi olgusunu ele aldıkları çalışmalarında bu ülkelerde para ikamesi düzeyinin çok yüksek düzeyde olduğunun ve bu durumun histeri etkisinin varlığından kaynaklandığının altını çizmişlerdir. Bu bağlamda yüksek para ikamesinin ve para ikamesi histerisinin varlığının yalnızca ataletsel güven eksikliğinden kaynaklanmadığı, özellikle finans piyasalarında portföy çeşitlendirmesi için çok az sayıda alternatif araçtan biri olarak dövizin hem nakit hem de mevduat biçiminde kullanıldığını belirtilmektedir.

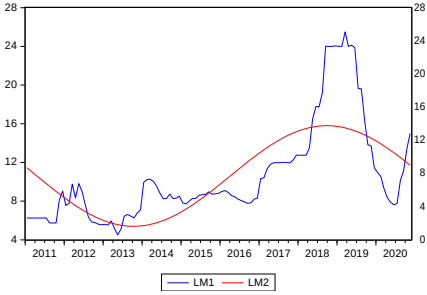
Grafik: 2
CS için Sabitli Model



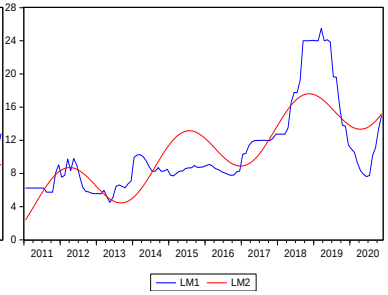
Grafik: 3
CS için Sabitli ve Trendli Model



Grafik: 4
WACF için Sabitli Model



Grafik: 5
WACF için Sabitli Model



Yukarda yer alan grafiklerde LM1 değişkenlerin ham veri halini ve LM2 ise Fourier fonksiyonları ifade etmektedir. Hem para ikamesi oranının hem de politika faizinin sabit terimli ve trend değişkenli modelde deterministik değişkenlerin etkisi ile Fourier fonksiyonlarının yukarı yönlü trendine devam edeceğini göstermektedir. Sabit terimli ve sabit terim-trend değişkenli modellerdeki Fourier fonksiyonlar karşılaştırıldığında sabit terimli modellerdeki Fourier fonksiyonları dalga boylarının daha uzun ve yatay bir bant içerisinde hareket ettiği görülmektedir. Sabit terimli ve trend değişkenli modelde dalga boylarının kısalması para ikamesi ve politika faizini belirleyen dışsal faktörlerin etkisinin daha fazla olduğunu işaret etmektedir.

Çalışmada değişkenler arasındaki ilişkinin varlığının ve yönünün tespit edilebilmesi amacıyla hem geleneksel hem de Fourier nedensellik testlerine başvurulmaktadır. Bu kapsamda ilk olarak bir değişkenin, başka bir değişken üzerindeki etkisinin tahmin edilmesine olanak sağlayan ve literatüre ilk nedensellik testi olarak geçen Granger (1969) nedensellik testine göre, iki değişken arasında dört yönlü nedensellik ilişkisi bulunabilmektedir. Söz konusu bu değişkenlerin X ve Y olduklarının kabul edilmesi durumunda nedensellik ilişkisi; X'den Y'ye tek yönlü, Y'den X'e tek yönlü hem X'den Y'ye

hem de Y'den X'e iki yönlü ve son olarak X ve Y arasında ilişkinin olmaması durumu olarak dört farklı şekilde gerçekleşmektedir.

Bu kapsamda yukarıda yer alan tanımlar iki değişkenli modeller kullanılarak gösterilecek olursa, X_t, Y'nin sıfır ortalamalı iki durağan zaman serisi olduğu varsayılmaktadır. Bu durumda basit bir nedensel model aşağıdaki gibidir:

$$X_t = \sum_{j=1}^{m} a_j X_{t-j} + \sum_{j=1}^{m} b_j Y_{t-j} + \varepsilon_t,$$
$$Y_t = \sum_{j=1}^{m} c_j X_{t-j} + \sum_{j=1}^{m} d_j Y_{t-j} + \omega_t, \quad (8)$$

Modele göre; ε_t ve ω_t, korelasyonun bulunmadığı beyaz gürültü (white-noise) hata terimleridir. bj'nin sıfır olmaması durumunda Y_t'nin X_t'ye neden olmaktadır. Benzer şekilde, cj sıfır değilse X_t Y_t'ye neden olmaktadır. Söz konusu varsayımların her ikisi de meydana gelirse, bu durumda X_t ve Y_t arasında bir geri bildirim ilişkisi yani çift yönlü nedensellik olduğu kabul edilir (Granger, 1969: 431).

Toda and Yamomoto (1995), VAR (k) modelinin tahminine dayanan Granger nedensellik testinden farklı olarak rastgele bir sırayla bütünleşmiş veya eş-bütünleşmiş olsa bile, seviyelerde formüle edilmiş VAR modellerinin nasıl tahmin edebileceğinin ve parametre matrislerindeki genel kısıtlamalarının nasıl test edebileceğini göstermektedir. Standart asimptotik teori geçerli olduğundan (sürecin bütünleşme sırası modelin gerçek gecikme uzunluğunu aşmadığı sürece) bütünleşik veya eş-bütünleşik bir VAR'a olağan bir gecikme seçim prosedürü uygulanabilmektedir. Gecikme uzunluğu (k) belirlendikten sonra (d) ile ifade edilen maksimum bütünleşme derecesine karar verilmektedir. Söz konusu süreçlerin ardından Toda and Yamomoto (1995) testi VAR (p+d) modelinin tahminini önermektedir. Modeldeki son gecikmeli vektörlerin katsayı matrisleri göz ardı edilerek ve standart asimptotik teori kullanarak ilk k katsayısı matrisleri üzerindeki doğrusal veya doğrusal olmayan kısıtlamaları test edebilir ve böylece serilerin durağan olmasına gerek duyulmadan serilerin daha fazla bilgi içermesi sağlanabilir.

Enders & Jones (2016) ve Nazlıoğlu, vd., (2016)'nin geliştirdikleri testler ise Fourier nedensellik test istatistikleridir ve çalışmada her ikisi de tek frekans ve kümülatif frekans olarak dikkate alınmıştır. Ancak iki test arasında Enders & Jones (2016)'un Granger (1969) nedensellik test prosedürlerini baz alması, Nazlıoğlu, vd., (2016)'nin ise Toda & Yamamoto (1995) test prosedürünü uygulamaları yönünden farklılık bulunmaktadır.

Enders & Jones (2016)'a göre herhangi bir değişkendeki kırılma, sistemin diğer değişkenlerinde de kendini göstereceğinden, kırılmanın orijinal kaynağını açıklamak zor olacaktır. Bu kapsamda VAR modelindeki kırılmalar uygun şekilde kontrol edilmedikçe, tahmin edilen model yanlış tanımlanacak, böylece tüm dürtü yanıtları ve varyans ayrıştırmaları sorunlu olacaktır. Bu nedenle söz konusu kırılma sayısını, kırılma şekillerini ve tarihlerini doğru bir şekilde tahmin etme problemini basitleştirmek için Fourier yaklaşımının kullanılması önerilmektedir. Enders & Jones (2016), Gallant'ı (1981)

izleyerek, zaman serilerinin deterministik parçasını temsil etmek üzere (9) no'lu denklemdeki Fourier serisi yaklaşımını uygulamaktadır.

$$d_{it} = a_{i0} + \sum_{k=1}^{n} a_{ik} \sin\left(\frac{2\pi kt}{T}\right) + \sum_{k=1}^{n} b_{ik} \cos\left(\frac{2\pi kt}{T}\right) \quad (9)$$

dit, zamanın potansiyel olarak yumuşak geçişli fonksiyonunu göstermektedir. k, Fourier fonksiyonunun frekans sayısını; t, eğilim (trend) terimini ve T ise örneklem büyüklüğünü temsil etmektedir. π, 3.1416'ya eşittir (Enders & Jones, 2016: 5).

Nazlıoğlu vd. (2016) Toda-Yamamoto testini, Fourier kademeli kırılma yaklaşımını uyarlayarak yapısal kırılmaları dikkate almak amacıyla (α) kesişme tarihlerinin zaman içinde sabit olduğu varsayımını genişleterek VAR modelini aşağıdaki gibi modifiye etmektedirler.

$$y_t = \alpha(t) + \beta_1 y_{t-1} + \cdots + \beta_{p+d} + y_{t-(p+d)} + \epsilon_t \quad (10)$$

$\alpha(t)$ zamanı y_t ise herhangi bir yapısal kırılmayı göstermektedir. Nazlıoğlu, vd., (2016) Yapısal kırılmaları tarihi, sayısı ve şekli bilinmeyen kademeli bir süreç olarak yakalamak için Fourier açılımı aşağıdaki gibi tanımlamaktadır:

$$\alpha(t) = \alpha_0 + \sum_{k=1}^{n} \gamma_{1k} \sin\left(\frac{2\pi kt}{T}\right) + \sum_{k=1}^{n} \gamma_{2k} \cos\left(\frac{2\pi kt}{T}\right) \quad (11)$$

Burada n, frekansların sayısıdır, γ_{1k} ve γ_{2k}sırasıyla frekansın genişliğini ve yer değiştirmesini ölçer. Denklem 10 ve 11 birleştirildiğinde 12 no'lu denklem elde edilir.

$$\alpha(t) = \alpha_0 + \gamma_1 sin\left(\frac{2\pi kt}{T}\right) + \gamma_2 cos\left(\frac{2\pi kt}{T}\right) \quad (12)$$

Denklemdeki k yakınlaşma frekansını temsil etmektedir. 12 no'lu denklem 10 no'lu denklemin içine yerleştirildiğinde ise aşağıda yer alan 4 nolu denklem elde edilmektedir.

$$y_t = \alpha_0 + \gamma_1 sin\left(\frac{2\pi kt}{T}\right) + \gamma_2 cos\left(\frac{2\pi kt}{T}\right) + \beta_1 y_{t-1} + \cdots + \beta_{p+d} + y_{t-(p+d)} + \epsilon_t \quad (13)$$

Toda-Yamamoto yaklaşımında sıfır hipotezi Granger nedensellik yoktur şeklinde kurulmakta ve sıfır hipotezinin reddedilmesi durumu Granger nedenselliğin olmadığını kanıtlamaktadır. Hem Toda-Yamamoto, hem de Fourier Toda-Yamamoto testlerinin sıfır hipotezini reddetmesi halinde ise elde edilen sonuçlar daha sağlam bir yapı arz etmektedir (Nazlıoğlu vd., 2016: 14).

Tablo 3'te yer alan nedensellik test sonuçlarına göre kullanılan bütün nedensellik testlerinde para ikamesinden faizlere doğru nedensellik ilişkisi olduğu görülmektedir. Yani para ikamesinin faizlerin nedenseli olmadığını ifade eden H_0 hipotezi Enders ve Jones (2016) nedensellik testi dışında %1 anlamlılık düzeyinde reddedilmekte ve para ikamesinden faizlere doğru nedensellik ilişkisi olduğu kabul edilmektedir. Fakat faizlerden para ikamesine doğru nedensellik ilişkisi olduğuna dair kanıt bulunamamıştır. Bu da

çalışmamızın ana sorusu olan Türkiye'de faizlerin para ikamesini etkileme gücünün olup olmadığı konusuna açıklık kazandırmıştır. Bu bağlamda tüm sonuçlar bir arada değerlendirildiğinde, Türkiye'de para ikamesi düzeyinin faiz oranları üzerinde etkiye sahip olduğu, faiz oranlarındaki değişimin ise para ikamesi üzerinde bir değişikliğe neden olmadığı yani para ikamesinin başka belirleyicileri olduğu görülmektedir.

Tablo: 3
Nedensellik Test Sonuçları

Ho: CS, WACF'in Granger Nedenseli Değildir						
	Wald	Asymp. p değeri	Boots. p değeri	K	p	d_{max}
Standart GC (Granger, 1969)	21.534	0.00***	0.00***	-	3	-
TY ve Bootstrap TY (Toda ve Yamomoto, 1995)	20.613	0.00***	0.00***	-	2	1
Fourier Standart GC Tek Frekanslı (Enders ve Jones, 2016)	7.032	0.00***	0.01**	3	1	-
Fourier TY Tek Frekanslı (Nazliogu vd., 2016)	20.042	0.00***	0.00***	3	2	1
Fourier Standart GC Kümülatif Frekanslı (Enders ve Jones, 2016)	12.601	0.00***	0.00***	3	1	-
Fourier TY Kümülatif Frekanslı (Nazlioglu vd., 2016)	21.529	0.00***	0.00***	3	2	1
Ho: WACF, CS'in Granger Nedenseli Değildir						
	Wald	Asymp. p değeri	Boots. p değeri	K	p	d_{max}
Standart GC (Granger, 1969)	0.987	0.804	0.815	-	3	-
TY ve Bootstrap TY (Toda ve Yamomoto, 1995)	0.697	0.706	0.699	-	2	1
Fourier Standart GC Tek Frekanslı (Enders ve Jones, 2015)	0.092	0.762	0.752	3	1	-
Fourier TY Tek Frekanslı (Nazlioglu vd., 2016)	0.201	0.904	0.908	3	2	1
Fourier Standart GC Kümülatif Frekanslı (Enders ve Jones, 2015)	0.857	0.355	0.36	3	1	-
Fourier TY Kümülatif Frekanslı (Nazlioglu vd., 2016)	0.213	0.899	0.898	3	2	1

*Notlar: ***, ** ve * değerleri sırasıyla %1. %5 ve %10 anlam seviyelerinde alternatif hipotezin kabul edildiğini göstermektedir. Bootstrap sayısı 1000'dir. k optimal frequency, p optimal gecikme uzunluğu, GC; Granger Causality (Granger Nedensellik), TY; Toda-Yamamoto Causality (Toda-Yamamoto Nedensellik) ifade etmektedir. Optimal gecikme uzunluğunun seçilmesinde Akaike Bilgi Kriteri kullanılmaktadır.*

Elde ettiğimiz sonuçları destekler nitelikte olan literatürde yer alan çalışmalara bakıldığında; Bacha vd. (2009) reel faiz oranının sistemik risk belirleyicilerini analiz etmek için finansal dolarizasyon (para ikamesi) literatürünün kapsamını genişletmek amacıyla hazırladıkları çalışmalarında 1996-2004 döneminde 66 ülkeden oluşan bir panel oluşturmuşlar ve ampirik analizlerinin neticesinde mevduat dolarizasyonun reel faiz oranını olumsuz etkilediği yani artırdığı sonucuna ulaşmışlardır. Darıcı (2004) çalışmasında bir ülkede para ikamesinin yüksek olması durumunun para politikasının etkin bir şekilde uygulanmasına engel olacağını ve merkez bankalarının politikalarının sonuçlarının istenildiği gibi olmayacağının altını çizmektedir. Ekonomide yerli para biriminin yanında yabancı para biriminin de yer alması, merkez bankasının piyasadaki yabancı para arzı üzerinde etkiye sahip olmaması nedeni ile faiz oranın araç olarak kullanıldığı politikaların uygulanmasını zorlaştıracak ve faiz oranlarında değişiklik meydana gelecektir. Bu kapsamda para ikamesi düzeyinin faiz oranları üzerinde etkiye sahip olduğu görülmektedir. Çalışmada ayrıca Türkiye'de para ikamesi sürecinde Türk lirasındaki değer kaybının ve fiyatlar genel düzeyindeki artışların önemli bir belirleyici olduğu belirtilmektedir.

Fretias (2003) para ikamesi histerisini Bolivya, Türkiye ve Endonezya için incelediği çalışmasında değişkenler olarak döviz tevdiat hesapları, yurtiçi bono nominal faiz oranları, döviz mevduatına uygulanan faiz oranları, döviz kurundaki değişmelerin beklenen değeri, ulusal paranın yurtiçi getirisi kullanmıştır. En Küçük Kareler Yöntemi kullanılarak yapılan analizlerin neticesinde Türkiye ekonomisinde faiz oranlarının para ikamesi üzerinde önemli

bir role sahip olmadığı, enflasyonun ve döviz kurlarının para ikamesi üzerinde etkili olduğu sonucuna ulaşılmıştır. Olayungbo ve Ajuwon (2015) yapısal vektör otoregresyonunun (SVAR) bir tahmin tekniğiyle birlikte, zamansal para-fayda modelini benimsedikleri çalışmalarının sonucunda istikrarlı ve düşük faiz oranlarına rağmen para ikamesinin artışta olduğu ve bu nedenle düşük faiz oranlarının para ikamesini caydırıcı bir etkisinin olmadığının altı çizilmektedir. Bununla beraber para ikamesinden enflasyona doğru tek yönlü bir nedensellik ilişkisi tespit edilmektedir. Bu bağlamda söz konusu çalışmalar bir arada değerlendirildiğinde Türkiye'de para ikamesinin faiz oranları dışında başka belirleyicilerinin olduğu (döviz kurları ve enflasyon gibi) anlaşılmakta, bununla beraber para ikamesinin faizler üzerinde etkiye sahip olduğu görülmektedir.

4. Sonuç ve Politika Önerileri

Türkiye'de 24 Ocak 1980 kararlarının ardından kambiyo rejiminde yapılan değişiklikler ile yabancı para birimleri ile ilgili kısıtlamaların ortadan kaldırılması ile birlikte yabancı para birimleri işlem ve saklama amaçlı gibi nedenler ile kullanılmaya başlanmıştır. Yaşanan bu sürecin sonucunda para ikamesi yani dolarizasyon olgusu ülke ekonomisinde yer bulmaya başlamıştır. Türkiye'de enflasyon ve para ikamesi arasında ilişki olduğu (Bahmani-Oskooee & Domac, 2003) su götürmez bir gerçektir. Ayrıca döviz kurunda yaşanan dalgalanma sonucu paranın değer kaybının da enflasyonla beraber para ikamesine neden olan faktörlerden olduğu görülmektedir (Elifoğlu & Taşseven, 2015).

Bu çalışmada ise söz konusu değişkenlere alternatif olarak para ikamesi sürecinde faiz oranlarının etkinliği araştırılmaktadır. Bu kapsamda Türkiye'de Ocak 2011-Kasım 2020 dönemi için faiz değişkeni olarak Türkiye Cumhuriyet Merkez Bankası ağırlıklı ortalama fonlama maliyeti (weighted average cost of the CBRT, WACF), para ikamesi göstergesi olarak ise döviz tevdiat hesaplarının M2 para arzına oranı (CS) baz alınmaktadır. Değişkenler arasındaki ilişkiyi tespit etmek amacıyla Granger (1969), Toda ve Yamomoto (1995), Enders ve Jones (2016), Nazlioglu, vd. (2016) tarafından geliştirilen geleneksel ve Fourier nedensellik testleri kullanılmıştır. Ampirik analiz sonuçlarına göre para ikamesinden faizlere doğru nedensellik ilişkisi bulunmakta, faizlerden para ikamesine doğru ise herhangi bir nedensellik ilişkisi bulunmamaktadır. Elde edilen bulgular Freitas (2003), Darıcı (2004), Bacha vd. (2009) ve Olayungbo ve Ajuwon (2015)'un çalışmaları ile de desteklenmektedir. Nedensellik sonuçlarına bir bütün olarak bakıldığında ilk olarak Türkiye'de para ikamesinin faizler üzerinde etkiye sahip olduğu görülmektedir. Bu bağlamda para arzı içinde yabancı para miktarının artması, merkez bankasının para arzı üzerindeki kontrolünü zayıflatır ve para ikamesinin faiz oranlarını etkilemesi, faiz oranları üzerinde bir baskı yaratır.

Yine para ikamesinin yüksek oluşu döviz kurlarının artmasına sebep olacağından böyle bir ortamda döviz kurlarını aşağıya çekme amaçlı olarak faiz oranlarında artışa gidilmesi muhtemel olacaktır. Dolayısıyla para ikamesi düzeyi faizler üzerinde etkili olmaktadır. İkinci olarak faizlerdeki değişikliğin para ikamesi üzerinde etkili olmaması durumu ise Türkiye'de para ikamesinin döviz kurlarında dalgalanma ve dolayısıyla Türk lirasındaki değer kaybı, enflasyon gibi faizler dışında başka belirleyicilerinin olduğuna işaret

etmektedir. Çalışmada ayrıca Kwiatowski vd. (1992) tarafından geliştirilen birim kök testi ve Becker vd. (2006) tarafından geliştirilen Fourier KPSS testi kullanılarak Türkiye'de para ikamesi histerisi ve faiz histerisinin varlığı araştırılmıştır elde edilen sonuçlar neticesinde para ikamesi histerisinin mevut olduğu ancak faiz histerisinin olmadığı görülmüştür.

Ekonomik birimler para ikamesine geçiş süreçlerinde para birimini değiştirmeleri nedeni ile sabit bir maliyetle karşılaşmakta ve bu maliyet bir enflasyon bandı oluşturmaktadır. Bu durumun sonucunda ise enflasyondaki geçici değişiklikler, ekonominin para ikamesi derecesinde kalıcı etkilere ve dolayısıyla para ikamesi histerisinin oluşmasına sebep olacaktır (Guidotti & Rodriguez, 1992). Ayrıca yerli ve yabancı para birimlerinin ödeme aracı olarak mükemmel ikame olmaları durumunda, döviz talebi istikrarın sağlamasının ardından bile azalmayacaktır (Freitas, 2003). Son olarak, para ikamesi histerisinin yalnızca ekonomiye yönelik güven eksikliğinden oluşmadığı, özellikle bazı finans piyasalarında portföy çeşitlendirmesinin sınırlı olmasından dolayı dövizin alternatif bir araç olarak hem nakit hem de mevduat biçiminde kullanılmasından ortaya çıktığı görülmektedir (Havrylyshyn & Beddies, 2003).

Çalışmadan elde edilen sonuçlara göre; Türkiye'de faizlerin para ikamesi sürecinde etkili olmadığı, bu kapsamda para politikasının etkinliğinin azalmasına sebep olan, ekonomik ve sosyal anlamda sıkıntılar doğurabilen para ikamesi sürecinin önüne geçilebilmesi adına Türkiye ekonomisinde para ikamesini etkileyen faktörler belirlenerek bu doğrultuda düzenlemeler yapmak önem arz etmektedir. Bu bağlamda özellikle döviz kurlarının istikrarlı bir yapıya kavuşturulmasının ve enflasyon oranının düşürülmesinin gerektiği görülmektedir. Bununla birlikte para ikamesinin faiz oranlarını etkilemesi ve para ikamesi histerisinin varlığı nedeniyle de politika yapıcıların konuyla ilgili düzenlemeler yapması gerektirmektedir. Bunun içinde uygun para politikası ve maliye politikası bileşimleri kullanılarak ülkedeki makroekonomik istikrarın sağlanması ekonomik birimlerin olumlu beklentilere sahip olmalarına yol açarak para ikamesini azalmasına katkıda bulunabilecektir.

Kaynaklar

Adom, A.D. et al. (2009), "Currency Substitution in Selected African Countries", *Journal of Economic Studies*, 36(November), 616-640.

Aigheyisi, O.S. (2015), "Currency Substitution, Inflation and Economic Growth in Nigeria: A Simultaneous Equations Analysis", *The Empirical Econometrics and Quantitative Economics Letters*, 4(1), 33-44.

Akçay, O.C. et al. (1997), "Currency Substitution and Exchange Rate Instability: The Turkish Case", *European Economic Review*, 41(3-5), 827-835.

Aziakpono, M. & S. Babatope-Obasa (2004), "Financial Liberalization, Currency Substitution and Savings in Nigeria: Evidence From Cointegration and Error Correction Modeling", *South African Journal of Economic and Management Sciences*, 7(2), 316-340.

Bacha, E.L. et al. (2009), "A Panel-Data Analysis of Interest Rates and Dollarization in Brazil", *Revista Brasileira de Economia*, 63(4), 341-360.

Bahmani-Oskooee, M. & I. Domac (2003), "On The Link Between Dollarisation and Inflation: Evidence from Turkey", *Comparative Economic Studies*, 45(3), 306-328.

Balaylar, N.A. & A.A. Duygulu (2004), "Türkiye'de Para İkamesi Olgusu ve Para Talebinin İstikrarı", *DEÜ İİBF Dergisi*, 19(2), 33-55.

Becker, R. et al. (2006), "A Stationarity Test in the Presence of an Unknown Number of Smooth Breaks", *Journal of Time Series Analysis*, 27(3), 381-409.

Bernholz, P. (1989), "Currency Competition, Inflation, Gresham's Law and Exchange Rate", *Journal of Institutional and Theoretical Economics (JITE)/Zeitschrift für die gesamte Staatswissenschaft*, 45(3), 465-488.

Calvo, G.A. & C. Vegh (1992), "Currency Substitution in Developing Countries: an Introduction", *IMF Working Paper No. 92/40*.

Canto, V.A. & G. Nickelsburg (1987), *Currency Substitution*, Springer, Dordrecht.

Civcir, I. (2005), "Dollarization and Its l-Long-run Determinants in Turkey", *Research in Middle East Economics*, Emerald Group Publishing Limited, (6), 201-232.

Clements, B. & G. Schwartz (1993), "Currency Substitution: The Recent Experience of Bolivia", *World Development*, Elsevier, 21(11), 1883-1893.

Cuddington, J. (1989), "Commodity Export Booms in Developing Countries", *The World Bank Research Observer*, 4(2), 143-165.

Darıcı, B. (2004), "Para İkamesi Olgusu ve Türkiye Ekonomisi Üzerine Etkileri", *Yüksek Lisans Tezi*, Balıkesir Üniversitesi Sosyal Bilimler Enstitüsü, Balıkesir, Türkiye.

Doguwa, S.I. (2014), "Currency Substitution: Evidence from Nigeria", *CBN Journal of Applied Statistics*, 5(2), 1-23.

Domac, I. & M. Bahmani-Oskooee (2002), "Between Dollarization and Inflation: Evidence from Turkey", *Discussion Paper 0207*, Research and Monetary Policy Department, Central Bank of the Republic of Turkey.

Drazen, A. & E. Helpman (1990), "Inflationary Consequences of Anticipated Macroeconomic Policies", *The Review of Economic Studies*, 57(1), 147-164.

Edwards, S. & M.S. Khan (1985), "Interest Rate Determination in Developing Countries: A Conceptual Framework", *NBER Working Papers* 1531, National Bureau of Economic Research, 377-403.

Elifoğlu, H. & Ö. Taşseven (2015), "Macroeconomic Determinants of Currency Substitution in Turkey", *Global Business Research Symposium* May 27-29, İstanbul: Beykent.

Enders, W. & P. Jones (2016), "Grain Prices, Oil Prices, and Multiple Smooth Breaks in a VAR", *Studies in Nonlinear Dynamics & Econometrics*, 20(4), 399-419.

Feige, E.L. (2003), "Dynamics of Currency Substitution, Asset Substitution and De Facto Dollarisation and Euroisation in Transition Countries", *Comparative Economic Studies*, 45(3), 358-383.

Fendoğlu, E. & E.C. Gökçe (2019), "Türkiye'nin Turizm Geliri Serisinin Durağanlığı: Fourier KPSS Durağanlık Testi", *Journal of Econometrics and Statistics*, (31), 17-28.

Fielding, D. & A. Shortland (2012), "The Dynamics of Terror During the Peruvian Civil War", *Journal of Peace Research*, 49(6), 847-862.

Freitas, M.L.D. (2003), "Revisiting Dollarisation Hysteresis: Evidence from Bolivia, Turkey and Indonésia", *NIPE Working Papers* 12/2003, NIPE, Universidade do Minho.

Ghaderi, S. (2017), "The Hysteresis Effect of Currency Substitution in Iran: Divisia Index Approach", *Iranian Journal of Economic Research*, 22(72), 187-212.

Ghobaee-Arani, Z. et al. (2018), "Welfare Effects of Currency Substitution in Iran (1959-2013)", *Monetary & Financial Economics*, 25(15), 251-274.

Giovanni, A. & B. Turtelboom (1992), "Currency Substitution", *NBER Working Paper*, No: 4232.

Girton, L. & D. Roper (1981), "Theory and Implications of Currency Substitution", *Journal of Money, Credit and Banking*, 13(1), 12-30.

Granger, C.W. (1969), "Investigating Causal Relations by Econometric Models and Cross-Spectral Methods", *Econometrica*, 37(3), 424-438.

Guidotti, P.E. & C.A. Rodriguez (1992), "Dollarization in Latin America: Gresham's law in reverse?", *International Monetary Fund, IMF Economic Review*, 39(3), 518-544.

Havrylyshyn, O. & C.H. Beddies (2003), "Dollarisation in the Former Soviet Union: From Hysteria to Hysteresis", *Comparative Economic Studies*, 45(3), 329-357.

İmrohoroğlu, S. (1994), "GMM Estimates of Currency Substitution Between the Canadian Dollar and the US Dollar", *Journal of Money, Credit and Banking*, 26(4), 792-807.

Kumamoto, H. (2014), "Recent Experiences with Currency Substitution", *International Journal of Financial Research*, 5(4), 1-12.

Kwiatkowski, D. et al. (1992), "Testing the Null Hypothesis of Stationarity Against the Alternative of a Unit Root", *Journal of Econometrics*, 54(1-3), 159-178.

Manjani, O. (2015), "Estimating the Determinants of Financial Euroization in Albania", *Graduate Institute of International and Development Studies Working Paper*, No. 07/2015.

McKinnon, R.I. (1982), "Currency Substitution and Instability in the World Dollar Standard", *The American Economic Review*, 72(3), 320-333.

Nazlioglu, S. et al. (2016), "Oil Prices and Real Estate Investment Trusts (REITs): Gradual-Shift Causality and Volatility Transmission Analysis", *Energy Economics*, 60, 168-175.

Olayungbo, D.O. & K.T. Ajuwon (2015), "Dollarization, Inflation and Interest Rate in Nigeria", *Journal of applied Statistics*, 6(1), 241-261.

Oomes, N. (2003), "Network Externalities and Dollarization Hysteresis: The Case of Russia", *IMF Working Paper*, No. 03/96.

Ortiz, G. (1983), "Currency Substitution in Mexico: The Dollarization Problem", *Journal of Money, Credit and Banking*, 15(2), 174-185.

Özbilgin, H.M. (2012), "Currency Substitution, Inflation, and Welfare", *Journal of Development Economics*, 99(2), 358-369.

Pepić, M. et al. (2015), "Determinants of Currency Substitution in Southeast European Countries", *Economic Themes*, 53(2), 162-184.

Samreth, S. (2011), "An Empirical Study on the Hysteresis of Currency Substitution in Cambodia", *Journal of Asian Economics*, 22(6), 518-527.

Savastano, M.A. (1992), "The Pattern of Currency Substitution in Latin American: An Overview", *Economic Analysis Review*, 7(1), 29-72.

Selçuk, F. (1994), "Currency Substitution in Turkey", *Applied Economics*, 26(5), 509-518.

Shahin, W.N. & F.G. Freiha (2005), "Hysteresis in currency substitution: the Middle East and North Africa", in: *Money and Finance in the Middle East: Missed Oportunities or Future Prospects?*, 165-181, Emerald Group Publishing Limited.

Sturzenegger, F. (1997), "Understanding the Welfare Implications of Currency Substitution", *Journal of Economic Dynamics and Control*, 21(2-3), 391-416.

Tkalec, M. (2013), "Determinants of Deposit Euroization in European Post-Transition Countries", *Panoeconomicus*, 60(1), 89-101.

Toda, H.Y. & T. Yamamoto (1995), "Statistical Inference in Vector Autoregressions with Possibly Integrated Processes", *Journal of Econometrics*, 66(1-2), 225-250.

Valev, N.T. (2010), "The Hysteresis of Currency Substitution: Currency Risk vs. Network Externalities, *Journal of International Money and Finance*, 29(2), 224-235.

Viseth, K.R. (2002), "Currency Substitution and Financial Sector Developments in Cambodia", *International and Development Economics Working Papers*, 1-4.

Westerlund, J. (2008), "Cointegration Tests of the Fisher Effect", *Journal of Applied Econometrics*, 23(2), 193-233.

Yasuda, M. (2009), "Link Between Inflation, Exchange Rates and Currency Substitution in Russia", *Conference of the Japan Association for Comparative Economic Studies (JACES) at Ritsumeikan University in Kusatsu, Japan, on* (Vol. 24).

Sosyoekonomi

2021, Vol. 29(50), 521-545

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.24
Date Submitted: 25.08.2021
Date Revised: 20.10.2021
Date Accepted: 23.10.2021

Kitlesel Fonlama Projelerinin Başarılarını Etkileyen Faktörler Üzerine Bir İnceleme[1]

Birten AKYILDIZ *(https://orcid.org/0000-0002-3985-5626), Hacettepe University, Turkey; birten.akyildiz@hacettepe.edu.tr*

Selin METİN-CAMGÖZ *(https://orcid.org/0000-0002-3304-7177), Hacettepe University, Turkey; selinm@hacettepe.edu.tr*

Kazım Barış ATICI *(https://orcid.org/0000-0003-0786-9641), Hacettepe University, Turkey; kba@hacettepe.edu.tr*

An Investigation on Factors Affecting Crowdfunding Project Success[2]

Abstract

Crowdfunding is an alternative financing method used by entrepreneurs or businesses to fund new ventures. This study aims to investigate the factors affecting the success of crowdfunding projects. Accordingly, data on successful and unsuccessful projects in the technology and film industries were collected from crowdfunding platforms in Turkey and the United States. The factors affecting the project's success are analysed and discussed using the variables determined by a comprehensive literature review and examined within the framework of Signalling Theory and Social Network Theory. It is thought that the findings of this study, which is quite comprehensive in terms of crowdfunding projects, will be a guide for entrepreneurs who want to carry out project ownership or for studies that will investigate the effectiveness of projects.

Keywords : Crowdfunding, Reward-Based Funding, Signalling Theory, Crowdfunding Success Factors.

JEL Classification Codes : L26, M10, M13.

Öz

Kitlesel fonlama, yeni girişimlere fon sağlamak üzere girişimciler veya işletmeler tarafından kullanılan alternatif bir finansman yöntemidir. Bu çalışmanın amacı, kitlesel fonlama projelerinin başarısına etki eden faktörlerin araştırılmasıdır. Bu doğrultuda, Türkiye ve Amerika Birleşik Devletleri'ndeki kitlesel fonlama platformlarından teknoloji ve film sektörlerine ait başarılı ve başarısız olmuş projelerin verisi toplanmıştır. Kapsamlı bir literatür taraması ile belirlenen ve Sinyal Teorisi ile Sosyal Ağ Teorisi çerçevesinde incelenen değişkenler kullanılarak proje başarısına etki eden faktörler analiz edilmiş ve tartışılmıştır. Kitlesel fonlama projeleri açısından oldukça kapsamlı bu çalışmanın bulgularının proje sahipliği yürütmek isteyen girişimciler veya projelerin etkinliğini araştıracak çalışmalar için yol gösterici nitelikte olacağı düşünülmektedir.

---

[1] *Bu makale, Hacettepe Üniversitesi, Sosyal Bilimler Enstitüsü, Muhasebe ve Finansman Yüksek Lisans programında sunulan "Gelişmiş ve Gelişmekte Olan Ülkelerdeki Kitlesel Fonlamanın Karşılaştırılması Üzerine Bir İnceleme" başlıklı yüksek lisans tezine dayanılarak hazırlanmıştır.*

[2] *This paper is produced based on the Master Thesis entitled as "A Review and Comparison of Crowdfunding in Developed and Developing Countries" submitted in Accounting and Finance Masters Programme at Hacettepe University, Institute of Social Sciences.*

Anahtar Sözcükler : Kitlesel Fonlama, Ödül Temelli Fonlama, Sinyal Teorisi, Kitlesel Fonlama Başarı Faktörleri.

1. Giriş

Kitlesel fonlama (*Crowdfunding*), kitlelerin coğrafya fark etmeksizin internet aracılığı ile iletişim kurduğu kuruluş veya bireyler tarafından başlatılan etkinlikleri desteklemek için fonları bir araya getirmesine dayanan bir kitle davranışı olarak tanımlanabilir (Agrawal vd., 2011; Sancak, 2016). Bu sayede, girişimci, girişimi ile ilgili ihtiyaçları gidermek için gereken fonu kendi dışında yer alan büyük bir kitleden temin edebilmektedir. Dolayısıyla, kitlesel fonlama ülkelerin girişimcilik ekosistemi kültürünün geliştirilmesi adına önemli katkılar sunmakta girişimcilerin kolaylıkla ve hızla kaynak temin edebilmesini sağlamaktadır (Çonkar & Canbaz, 2018). Kitlesel fonlama platformları özellikle Amerika Birleşik Devletleri ve Avrupa Birliği ülkelerinde 2000'lerin başından beri yaygın olarak kullanılmakta; bu platformların gelişmekte olan ülkelerde kullanımı ise her geçen gün artmaktadır. Dünya Bankası'nın 2013'te yayımladığı "*Gelişmiş Ülkeler için Kitlesel Fonlama Potansiyeli*" raporuna göre kitlesel fonlamanın en çok teknoloji, finans ve film sektörlerinde tercih edildiği görülmektedir. Raporda kitlesel fonlamanın gelişmekte olan ülkelerin gelişmiş ülkeleri teknoloji ve finans alanlarında yakalaması için bir araç olarak kullanabileceği belirtilmiştir.

Bu çalışma, kitlesel fonlama başarısını etkileyen faktörlerin tespiti için kitlesel fonlama platformlarından toplanan proje bilgilerinin analizi vasıtasıyla detaylı bir inceleme sunmayı amaçlamaktadır. Bu amaç doğrultusunda, Türkiye ve Amerika Birleşik Devletleri'ndeki kitlesel fonlama platformlarından elde edilen teknoloji ve film sektörlerine ait başarılı ve başarısız olmuş kitlesel fonlama projelerinin verisi toplanmıştır. Kapsamlı bir literatür taraması sonucu belirlenen ve Sinyal Teorisi ile Sosyal Ağ Teorisi çerçevesinde incelenen değişkenler açısından proje başarısına etki eden faktörler analiz edilmekte ve bulgular tartışılmaktadır. Çalışmanın örneklemi 120 adet kitlesel fonlama projesinden oluşmakta ve Türkiye-ABD ile Teknoloji-Film olmak üzere alt kırılımlar içermektedir. Proje başarısının bağımlı değişken olarak alındığı lojistik regresyon analizleri vasıtasıyla örneklemin bütününde ve bütün potansiyel alt kırılımlarında analizler gerçekleştirilmiş, bulguların uluslararası literatürle uyumluluğu tartışılmıştır. Dolayısıyla çalışmanın bulguları ülke ve sektör özelinde de zengin bulgular ortaya koymaktadır. Çalışma, Türkiye'de kitlesel fonlama başarısını inceleyen öncül çalışmalardan biridir. Güncel literatürde kitlesel fonlama projeleri üzerine yapılan çalışmalar daha çok tanımlayıcı nitelikte olup bu çalışmadaki kapsamda bir ampirik çalışma bulunmamaktadır.

Çalışma şu şekilde organize edilmiştir: İkinci bölümde kitlesel fonlama ile ilgili temel kavramlar, aktörler ve kitlesel fonlama çeşitleri tartışılmaktadır. Üçüncü bölüm kitlesel fonlama projelerinin başarısına etki etme potansiyeli olan faktörlerin literatür incelemesi bağlamında detaylı incelenmesini ve çalışmanın hipotezlerini sunmaktadır. Dördüncü bölüm çalışmanın model tasarımını ve veri setini tartışmaktadır. Beşinci bölüm analiz sonuçlarına,

altıncı bölüm bulguların literatür ve hipotezler çerçevesinde tartışılmasına ayrılmıştır. Yedinci bölüm sonuç bölümüdür.

2. Kavramsal Çerçeve

Kitlesel fonlama çeşitli girişimlere fon sağlamak için çeşitli amaçlarla oluşturulan projelerin bireylerden fon sağlamasına olanak sağlayan çağdaş bir yöntemdir. Ticari, kültürel veya sosyal projelerin kurucularının gelecekteki ürünleri veya hisseleri karşılığında birçok kişiden finansman talep etmelerine olanak tanımaktadır (Mollick, 2014). Genel olarak, kitlesel fonlama sistemi Türk kültüründeki imece usulü yardımlaşmanın internet üzerinden yirmi birinci yüzyıl şartlarına uyarlanmış haline benzetilebilir (Ünsal, 2017). Kitleler sayesinde küçük yatırımların büyük yatırımlara dönüşmesine olanak sağlamaktadır. Geleneksel finansmanla karşılaştırıldığında kitlesel fonlama yatırımcıya fiyat çeşitlendirmesi yaparak daha çok fon bulma avantajı sağlamaktadır (Belleflamme vd., 2012). Bunun yanı sıra, kitle ile kaynaklardan yararlanmayı birleştirmesi fonlama maliyetlerini azaltmaktadır (Howe, 2006).

2.1. Kitlesel Fonlama Aktörleri

Kitlesel fonlama sisteminde literatürde de kabul edilen üç temel aktör vardır: Fon talep eden girişimci, fon sağlayan yatırımcı ve bu iki grubu birleştiren aracı platform (Valanciene & Jegeleviciute, 2013; Ordanini vd., 2011).

- Fon talep eden girişimci (proje sahibi), kendine ait bir iş fikri veya projesini hayata geçirmek için gerekli fonu kitlelere açık çağrıda bulunarak toplamayı amaçlayan kişi(leri) veya kuruluş(ları) ifade etmektedir. Bütün sektörlerden proje sahipleri kitlesel fonlama platformlarını kullanabilir. Bugüne kadar çoğunlukla müzik albümleri için kullanılan platformlar, sanat, yardım projeleri ve bilimsel araştırma gibi birçok alanda fon toplanılmasını sağlamıştır (Gerber vd., 2012).
- Fon sağlayan yatırımcı, geleneksel fonlamanın aksine çoğunlukla yatırım bilgisi ve geçmişi olmayan sıradan insanları ifade eder. Genellikle, platformlar üzerinden cüzi miktarlarda katkı sağlarlar. Kitlesel fonlamada fon sağlayan yatırımcı genel olarak bu kitle ile ifade edilse de bilgisi olan alanında uzman kişilerin veya melek yatırımcıların da çeşitli meblağlarda yatırımlarda bulunmasında bir engel yoktur (Ordanini vd., 2011). Kitlesel fonlama platformlarında buluşacak fon sağlayıcıları ile girişimcilerin aynı coğrafi konumda olmasına gerek bulunmamaktadır. Bu sürecin en pratik ve çekici özelliklerinden biri de bu sebeple coğrafi konuma bağlı olmamasıdır (Agrawal vd., 2011).
- Kitlesel fonlama platformları, ülkeden ülkeye değişen yasal düzenlemelerin içerisinde taraflar arasındaki anlaşmayı kontrol altına yasal bir şekilde alan, sistemin işleyişi açısından önemli bir aktördür. Kitlesel fonlama platformlarında toplanan fonun aktarımı ile ilgili de farklılaşan yaklaşımlar bulunmaktadır. Platformlarda kullanılan modellerden biri "Hepsi veya hiç" modelidir. Bu model ile proje başarıya ulaşamazsa toplanan fonların tamamı fon sağlayan yatırımcılara

geri ödenirken, "Hepsini tut" modelinde toplanan fon hedeflenen fona ulaşmasa dahi girişimciye ödenmektedir (Valanciene & Jegeleviciute, 2014).

2.2. Kitlesel Fonlama Modelleri

Kitlesel fonlama modelleri fon sağlayan yatırımcının finansal getiri amacı olması ve olmamasına göre iki ana sınıfa ayrılmaktadır. Finansal getiri amacı olamayan modeller bağış temelli ve ödül temelli kitlesel fonlama modelleridir. Finansal getiri amaçlı fonlamalar ise borç temelli ve hisse temelli kitlesel fonlamalardır.

- Bağış temelli kitlesel fonlama, herhangi bir kazancı ve beklentisi olmadan başka insanlara destek vermek veya ilgisini çeken projeye fon desteği sağlamak amacıyla katkıda bulunarak sosyal motivasyon ve hayırseverlik ile bütünleşen fonlama modelidir. Bu fonlama türünde projelere destek olan fon sağlayıcılar, karşılığında herhangi bir kazanç beklememektedirler (Griffin, 2012; Gulati, 2014).
- Ödül temelli kitlesel fonlama, genellikle bir ürün veya hizmet sunan yeni bir *"start-up"* veya kuruluş için fon toplamak için kullanılan yaygın bir kitlesel fonlama türüdür. Ödül temelli fonlama modelinde projesi başarılı olan girişimci, yatırımcıya bunun karşılığında finansal olmayan bir ödül sunmaktadır. Bu ödüller projenin içeriğinde de yer alan müzik albümü, bir tişört veya bir teşekkür mektubu olabilmektedir. (Atsan, Erdoğan; 2015).
- Borç temelli kitlesel fonlama hem bireyler hem de işletmeler için ihtiyaç duydukları finansal desteği hızlı ve kolay bir şekilde elde etme yollarından biridir. Borçlanma temelli kitlesel fonlamada girişimciler kitlelerden borç olarak fon toplamaktadır. Bu modelde, amaçlanan projenin başarılı olmasıyla girişimci dönem sonunda borcunu faiziyle geri ödemeyi kabul etmektedir (Griffin, 2012).
- Hisse temelli fonlama fon sağlayıcıya hisse vaadi ile işlemektedir. Projeye finansal destek sağlayan yatırımcılar, proje ortağı olmak amacıyla getiri beklentisi içerisinde olmaktadırlar. Fon sağlayan yatırımcının girişimi desteklemesinin sonucunda amacı, desteklediği projenin belirli bir düzeye gelmesi ve sonrasında kendi hisselerini değer kazandıktan sonra satmak istemesidir (İstfonbul, 2018).

3. Literatür Taraması: Kitlesel Fonlama Proje Başarısını Etkileyen Faktörler

Akademik literatürde, sayısı çok olmasa da kitlesel fonlama projelerinin başarısını etkileyen faktörlerin belirlenmesi amacını güden çalışmalar bulunmaktadır. Bu faktörler teorik olarak Sinyal Teorisi bağlamında ele alınabilir. Sinyal Teorisi, temelde bir sosyal değişim ilişkisinde iki taraf (bireyler veya kuruluşlar) arasındaki bilgi asimetrisini azaltmakla ilgilidir (Spence, 1973; Spence, 2002). Tipik olarak, bir taraf (gönderen) bilginin iletilip iletilmeyeceğini ve nasıl iletileceğini seçmekte ve diğer taraf (alıcı) sinyali nasıl yorumlayacağına (veya görüntüleyeceğine) karar vermektedir. Kitlesel fonlama projeleri açısından sinyal gönderen proje sahibi, sinyalin alıcısı ise fon sağlayan yatırımcı olarak ele alınabilir. Wang vd. (2015)'nin kitlesel fonlama başarısına nelerin etkilediğini anlamak için gerçekleştirdiği sinyal teorisi odaklı araştırmalarında da sinyal teorisi, içerik

oluşturuculardan yani proje sahiplerinden gelen sinyaller ve projelerden gelen sinyaller bağlamında incelenmektedir. Dolayısıyla bu bölümde, kitlesel fonlama başarısını etkileyen faktörler proje ile ilgili faktörler ve proje sahibi ile ilgili faktörler olmak üzere iki başlık altında ele alınmaktadır. Proje ile ilgili faktörler proje sinyalleri, proje sahipleri ile ilgili faktörler de proje sahibi sinyalleri olarak düşünülebilir.

Literatürde kitlesel fonlama başarısını etkileyen faktörlerin belirlenmesine yönelik çalışmalarda yer alan proje sinyallerine ilişkin değişkenler, videoya sahip olma durumu, video süresi, minimum yatırım tutarı, maksimum yatırım tutarı, ödül sayısı, hedeflenen fon miktarı, fonlama süresi ve proje açıklaması karakter uzunluğu gibi değişkenlerdir. Proje sahibi sinyalleri boyutunda ise proje sahibi hakkında bilgi olup olmaması, proje sahibinin yaşı, eğitimi, cinsiyeti, web sayfasına sahip olup olmaması ve proje sahibinin sosyal ağ büyüklüğü ile ilgili değişkenlerdir. Burada özellikle proje sahibinin sosyal ağ büyüklüğü ile ilgili değişkenler sinyal teorisinin yanı sıra kuramsal olarak Sosyal Ağ Teorisi bağlamında da incelenebilir. Ağ teorisinin en temel özelliği aktörler arasındaki (bireyler veya firmalar) ilişkiye odaklanmasıdır. Örneğin, bir yeniliğe sahip olacak tarafın karakteristik özelliklerini (yaş, kişilik, vb.) dikkate almak yerine ağ teorisini savunanlar, insanlar arasındaki birbirlerini etkileme süreçlerinin önemini ve başkası tarafından etkilendiklerini savunmaktadır. Böylece bir kişi *iPhone* gibi bir yeniliği yalnızca bu marka için doğru kişiliğe sahip olduğu için değil aynı zamanda arkadaşı da buna sahip olduğu için benimsemektedir (Borgatti vd., 2014).

3.1. Proje ile İlgili Faktörler

Proje sinyalleri olarak da isimlendirilebilecek bu faktörler, kitlesel fonlama platformlarında yer alan projelerin platform üzerindeki temel özellikleri ile ilgilidir. Burada yer alan faktörler ile ilintili değişkenler, kitlesel fonlama projelerinin başarısını etkileyen faktörlerin belirlenmesine yönelik çalışmalarda yaygınlıkla yer almaktadır. Aşağıda bu faktörler (değişkenler) tartışılmakta, değişkenleri proje başarısı ile ilişkisine yönelik literatüre dayalı hipotezler oluşturulmaktadır.

Video: Kitlesel fonlama platformlarında proje sayfasında yer alan videolar projenin kapsamı ve proje sahipleri hakkında bilgiler içermektedir. Petitjean (2018), girişimci ile destekçiler arasındaki bilgi asimetrilerini azaltmakla ilgilenen sinyal teorisi temelli araştırmasında proje sahiplerinin web sayfalarında video olup olmaması durumunun destekçilere verdiği sinyal kalitesini artırdığını belirtmektedir. Bununla beraber, Kunz vd. (2016)'ne göre bir videoda, proje sahibi genellikle finanse edilen ürün veya hizmeti göstermekte, bu durum finansman sürecini daha güvenilir kılmaktadır. Marom, Sade ve Gafni (2018)'nin araştırmasında projenin bulunduğu sayfada videonun bulunmasının, projenin başarısını videoya yer vermeyenlere göre %81,4 artırdığı sonucuna varılmıştır. İncelenen çalışmaların bulgularından hareketle proje sayfasında video olup olmamasının proje başarısı üzerinde etkisine yönelik olarak aşağıdaki hipotez oluşturulmuştur:

H1: Proje sayfasında video yer alması ile proje başarısı arasında olumlu yönde bir ilişki vardır.

Video Süresi: Geleneksel reklamcılığa bakıldığında reklam süresi, kampanyanın etkililiğini etkileyebilmektedir (Swaminathan & Kent, 2013). Sinyal teorisinin sinyali alan karşı tarafı (yatırımcıyı) etkileme temeli olması video süresinin proje başarısı ile ilişkilendirilebileceğini göstermektedir. Drablos (2015), kitlesel fonlama projesini etkileyen faktörlerin ne olduğu sorusunu araştırırken cevap olarak video uzunluğunun ne kadar olması hakkında çeşitli cevaplar almakta ancak bunlardan sadece birkaçı aynı noktada buluşmaktadır. Ortak düşünce videoların uzunluğunun 3 dakikadan kısa olması yönündedir. Bu araştırmalardan hareketle bu çalışmada proje sayfasında yer alan videoların uzunluğunun (saniye) proje başarısı üzerinde etkisine yönelik olarak aşağıdaki hipotez oluşturulmuştur:

H2: Proje sayfasında yer alan videonun süresinin uzunluğu ile proje başarısı arasında olumlu yönde bir ilişki vardır.

Minimum Yatırım Tutarı: Projeye destekçiler tarafından en az ne kadar yatırılabileceğini gösteren minimum yatırım tutarı da projeye fon sağlama potansiyeli olan yatırımcılara proje ile ilgili önemli sinyal sağlamaktadır. Bu konudaki genel eğilim, proje sahiplerinin daha çok destekçi çekeceklerini düşünerek ödül miktarını düşük tutmaları yönündedir (Forbes & Schaefer, 2017). Kıran (2013) yatırım miktarının küçük olmasının katkının yüksek olacağını belirtmektedir. Buradan hareketle, bu ters yönlü ilişkiye yönelik olarak Projelerin minimum yatırım tutarları ile proje başarısı arasında aşağıdaki hipotez oluşturulmuştur:

H3: Proje sayfasında yer alan ödülün minimum yatırım tutarı ile proje başarısı arasında olumlu yönde bir ilişki yoktur.

Maksimum Yatırım Tutarı: Kitlesel fonlama platformlarında, minimum yatırım tutarının yanı sıra maksimum yatırım tutarları ödül katmanları şeklinde görülmektedir (Kohli vd., 2016). Literatür genellikle minimum yatırım tutarı üzerinde yoğunlaşsa da maksimum yatırım tutarlarının etkisi de test edilebilir. Bu amaçla aşağıdaki hipotez oluşturulmuştur:

H4: Proje sayfasında yer alan ödülün maksimum yatırım tutarı ile proje başarısı arasında olumlu yönde bir ilişki vardır.

Ödül Sayısı: Ödül Temelli Kitlesel Fonlama, farklı sayılarda ve çeşitlerde ödüllere sahiptir. Bu ödüller teminat olarak değerlendirilmektedir. Proje başarılı sonuçlandığında bu ödüller yatırımcılara ulaştırılmaktadır. Kuppuswamy ve Bayus (2013) kitlesel fonlama platformları içerisinde proje destekçilerine verilen ödüllerin yatırımcı motivasyonu açısından önemli bir yeri olduğunu belirtmektedirler. Destekçilerin katılımının ödülün miktarı ve fon tutarı içerisindeki tutarına göre etkileneceği belirtilmiştir (Lacan & Desmet, 2017). Diğer yandan karışıklık olmaması adına ödül sayısının çok fazla olmaması gerektiğiyle ilgili sonuçlar da elde edilmiştir (Forbes & Schaefer, 2017). Daha basit bir ödül

sistemi olmasının, daha az ve ilgi çekici ödülle destekçilerin ilgisini çekebileceği savunulmaktadır (Leite & Moutinho, 2012). Ödül çeşitliliğinin proje başarısına etkisini görebilmek adına ödül sayısı ile proje başarısı arasındaki ilişkiye yönelik aşağıdaki hipotez oluşturulmuştur:

H5: Proje sayfasında yer alan ödüllerin sayısı ile proje başarısı arasında olumlu yönde bir ilişki vardır.

Hedeflenen Fon Miktarı: Proje sahiplerinin projelerini hayata geçirebilmek için kitlesel fonlama platformlarından yardım alarak ulaşmak istedikleri tutar hedeflenen fon miktarı olarak tanımlanmaktadır (Mollick, 2014). Proje sahipleri hedefledikleri fon miktarına ulaştıklarında projeleri başarılı kabul edilmektedir. Kunz vd. (2016) ödül temelli kitlesel fonlamada sinyal teorisi araştırması dikkate alınarak hedeflenen fonlama miktarı proje sinyali olarak değerlendirilmiş ve bu amaçla aşağıdaki hipotez oluşturulmuştur:

H6: Projede hedeflenen fon miktarı ile proje başarısı arasında olumlu yönde bir ilişki vardır.

Fonlama Süresi: Fonlama süresi, bir projenin fonlamayı kitlesel fonlama platformu üzerinde kabul ettiği süre olarak tanımlanmaktadır (Mollick, 2014). Projelerin destekçilerden finansal destek alabileceği süre (gün) *Kickstarter'da* maksimum 60 gündür (Frydrych vd., 2014). Kunz vd. (2016), Mollick (2014) ve Claus vd. (2017) başarı ile fonlama süresi arasında negatif ilişki olduğunu rapor ederken, Cordova vd. (2015) ile Burtch vd. (2013) pozitif bir ilişki rapor etmektedir. Kitlesel fonlama proje sayfalarında yer alan başlangıç ve bitiş süreleri arasında gün sayısı üzerinden aşağıdaki hipotez oluşturulmuştur:

H7: Proje fonlama süresi ile proje başarısı arasında olumlu yönde bir ilişki vardır.

Açıklama Uzunluğu: Girişimcinin meşruiyet kazanması ve kaynaklara daha kolay erişebilmesi için hikayesini iyi inşa etmesi gerekmektedir (Lounsbury & Glynn, 2001). Literatürde, kitlesel fonlamanın alternatif veya sosyal fayda yatırımlarını kolaylaştırdığı anlayışı yaygındır (Lehner, 2013). Bu bakış açısından meşruiyet, yatırımcıyı sosyal ve ticari hedefte birleştirecektir (Frydrych vd., 2014). Dolayısıyla, ikna edici bir yatırım hikayesi oluşturmak kitlesel fonlama faaliyetlerinin başarısında önemli bir rol oynayacaktır (Lounsbury & Glynn, 2001). Kunz vd. (2016) ödül temelli kitlesel fonlamada sinyal teorisi araştırması dikkate alınarak proje açıklama uzunluğu kelime sayısı proje sinyali olarak analiz edilmiş ve bu amaçla aşağıdaki hipotez oluşturulmuştur:

H8: Proje açıklama uzunluğu karakter sayısı ile proje başarısı arasında olumlu yönde bir ilişki vardır.

3.2. Proje Sahipleri ile İlgili Faktörler

Kitlesel fonlama bağlamında proje sahipleri, projelerini veya hayata geçirmek istedikleri iş fikirlerini ticarileştirmek adına kitlelerden fon toplayan girişimcilerdir. Genel olarak, proje sahibinin veya ekibinin kitlesel fonlama platformunda proje sayfasında kişisel bilgilerinin bulunması potansiyel yatırımcılara güven ve ciddiyet vererek olumlu bir etki

yaratmaktadır (Boeuf vd., 2014). Aşağıda, proje başarısı ile ilişkili olabilecek proje sahipleri ile ilgili kişisel faktörler tartışılmaktadır.

Proje Sahibi Hakkında Bilgi: Proje sahipleri ile ilgili öncelikli test edilmesi gereken proje sayfasında proje sahibi hakkında bilgi olup olmamasının proje başarısı üzerindeki etkisidir. Proje sahibinin veya ekibin kitlesel fonlama platformunda proje sayfasında kişisel bilgilerinin bulunması potansiyel yatırımcılara güven ve ciddiyet vererek olumlu bir etki yaratmaktadır (Boeuf vd., 2014). Kitlesel fonlama platformlarının sosyal bir çevre olarak görülmesinden dolayı proje sahipleri hakkında bilgilerin yer alması olumlu bir etki yaratacaktır (Colombo vd., 2015). Aynı şekilde Frydrych vd. (2014)'ye göre proje sahibi hakkında bilgi olması projenin yasallığını artıracak ve projenin başarılı olmasına katkı sağlayacaktır. Bu amaçla, aşağıdaki hipotez oluşturulmuştur:

H9: Proje sayfasında proje sahibi hakkında bilgi olmasının proje başarısını olumlu yönde bir ilişki vardır.

Proje Sahibinin Cinsiyeti: Kitlesel fonlama ile fonlanan projeleri inceleyen çalışmalar projeye fonlama ile destek veren yatırımcıların projeyi yürüten kişilerin bilgilerinden etkilendiklerini göstermektedir (Şahinoğlu, 2019). Kadın kitlesel fonlama proje sahipleri veya projeyi erkek ve kadın beraber yönetenlerin, sadece erkek proje sahiplerine göre daha başarılı oldukları görülmüştür (Frydrych vd., 2014). Diğer taraftan bazı çalışmalar projenin desteklenme durumunun proje sahibi cinsiyetine bağlı olmadığını savunmaktadır (Levin, 2015; Marom vd., 2018). Proje sahibinin cinsiyetinin kadın olmasının proje başarısını etkilediği yönünde çalışmalar olsa da cinsiyetin proje başarısında etkisiz kaldığını gösteren birçok çalışma bulunmaktadır. Araştırmalardan hareketle proje sahibinin cinsiyetinin proje başarısı üzerinde etkisinin testi amacıyla aşağıdaki hipotez oluşturulmuştur:

H10: Proje sahibinin kadın olması veya ekibi içerisinde kadın olması ile proje başarısı arasında olumlu yönde bir ilişki vardır.

Proje Sahibinin Yaşı: Levin (2015), bir kitlesel fonlama projesine destekçiler tarafından destek verilmesi kararının proje sahibinin yaşı gibi özelliklerden etkilenmediğini ortaya koymaktadır. Alois (2014)'e göre kitlesel fonlamayı kullanan insanlar ortalama 35 yaşındadır. Literatürde, girişimcilerin yaşının kitlesel fonlama başarısına etkisi yönünde yeterince çalışma bulunmasa da genel görüş proje başarısını etkilemeyeceği şeklindedir. İlişkinin test edilmesi amacıyla aşağıdaki hipotez oluşturulmuştur:

H11: Proje sahibi yaşı ile proje başarısı arasında olumlu yönde bir ilişki vardır.

Proje Sahibinin Eğitim Durumu: Genel anlamda, proje sahiplerinin eğitim durumundaki farklılıkların da kitlesel fonlama proje başarısına anlamlı bir etkisi bulunmamıştır (Marom vd., 2018). Ancak, profesyonel yatırımcılar için eğitim durumu gibi özellikli bilgilerin yatırım kararlarını etkilemede önemli bir etkisi olduğu tespit edilmiştir (Audretsch vd., 2012). Girişimci eğitim durumunun kitlesel fonlama proje başarısına etkisi

üzerinde net sonuçlar olmamasıyla beraber ilişkinin test edilmesi adına aşağıdaki hipotez oluşturulmuştur:

H12: Proje sahibinin eğitim durumu ile proje başarısı arasında olumlu yönde bir ilişki vardır.

Proje Sahibinin Harici Web Sayfası: Drablos (2015), proje sahiplerinin insanların iletişimde kalacağı, güncellemeleri alacağı, resimleri görebileceği ve proje ayrıntılarını görebilecekleri kendilerine ait web sayfalarının kurulması gerektiğinden bahsetmektedir. Proje sayfasına eklenen web sayfaları kitlesel fonlama proje sonucuyla pozitif bir ilişki vermektedir (Skirnevsky vd., 2017). Proje harici web sitelerini "daha fazla bilgi" değişkeni olarak kaydeden bir çalışma ise dış bağlantıların önemli sonuçlar vermediğini belirtmiştir (Colombo vd., 2014). Proje sayfasında proje sahibinin harici bir web sitesine sahip olmasının proje başarısı üzerinde etkisini belirlemek adına aşağıdaki hipotez oluşturulmuştur:

H13: Proje sahibinin harici web sayfasına sahip olma durumu ile proje başarısı arasında olumlu yönde bir ilişki vardır.

Proje Sahibinin Sosyal Ağ Büyüklüğü: Araştırmalar, proje sahibinin ağındaki bağlantı sayısının, projelerin topladığı fon başarısıyla olumlu bir ilişkisi olduğunu göstermektedir (Hui vd., 2014; Mollick, 2014). Ağın genişletilmesi konusunda yapılan diğer çalışmalar, sadece miktarın değil, aynı zamanda proje sahibi ile proje destekçisi arasındaki güçlü ve zayıf bağların da projenin başarısı için önemli olduğuna işaret ederek ilerlemektedir (Bakshy vd., 2012). Çevrim içi ortamlar, kitlesel fonlama projelerinin potansiyel destekçileri tarafından projenin varlığından haberdar olmaları ve aktif bir şekilde fonlamalarına olanak sağlamaktadır (Şahinoğlu, 2019). Borst vd. (2017) proje sahibinin yakınları dışında kalan proje destekçileri ile *Instagram*, *Twitter* ve *Linkedin* gibi sosyal medya platformları üzerinden tanıtılma başarısı ilişkilendirmiştir. Aynı şekilde, Mollick (2014), sadece proje sahibi yakınları ile hedeflenen fon miktarına ulaşılamayacağını düşünmüş ve başka kişilere de ulaşılması gerektiğini vurgulamıştır. Sosyal ağlar yardımıyla kitlesel fonlama platformlarının tanıtılması fon talep edenden fon sağlayana doğru farkındalığı artırarak potansiyel destekçileri artırmaktadır. Proje sahibi çevrim içi platformlarından projesinin tanıtımını yaparak daha çok kişiye ulaşmasını sağlayarak projesinin güçlenmesini sağlamaktadır (Lu vd., 2014). Literatürde proje sahiplerinin çevrim içi platformlarının bulunmasının projelerin başarısını olumlu etkilediği görülmektedir. Dolayısıyla, proje sahiplerinin çevrim içi platformlarda bulunan bağlantı (takipçi) sayılarının proje başarısına etkisi de değerlendirilmesi gereken bir faktördür. Araştırmalardan hareketle proje sayfasında proje sahibinin Instagram, Twitter veya Linkedin hesabına sahip olup olmaması ile toplam bağlantı sayılarının proje başarısı üzerinde etkisinin analizi amacıyla aşağıdaki hipotezler oluşturulmuştur:

H14: Proje sahibi Instagram, Twitter veya Linkedin hesabına sahip olma durumu ile proje başarısı arasında olumlu yönde bir ilişki vardır.

H15: Proje sahibi Instagram, Twitter ve Linkedin hesabı bağlantı sayısı ile proje başarısı arasında olumlu yönde bir ilişki vardır.

4. Veri Seti ve Yöntem

Kitlesel fonlama projelerinin başarısını etkileyen faktörleri belirlemek amacıyla literatür taramasına dayandırılarak bir önceki bölümde verilen hipotezler oluşturulmuştur. Bu hipotezleri test etmek amacıyla gelişmiş ülkeleri temsilen kitlesel fonlamanın en yaygın kullanıldığı ülke olan Amerika Birleşik Devletleri'nden (ABD), gelişmekte olan ülkeleri temsilen ise Türkiye'den sonuca ulaşmış bir kitlesel fonlama proje örneklemi seçilmiştir. Örneklem belirlenirken Türkiye'de en yaygın kullanılan kitlesel fonlama modeli olan Ödül Temelli Kitlesel Fonlama modeli esas alınmıştır. Her bir ülkeden 60 projenin yer aldığı örneklem, sektör olarak her iki ülkede de kitlesel fonlamanın en yaygın kullanıldığı sektörler olan film ve teknoloji endüstrilerinden eşit sayıda proje içermektedir. Örneklemde yer alan her bir ülkenin her bir sektöründe eşit sayıda başarılı ve başarısız proje yer almaktadır. Örneklem toplamda 120 projeden oluşmaktadır. Ülke, sektör ve başarı durumu açısından örneklem büyüklüğü dağılımı Tablo 1'de özetlenmektedir.

Tablo: 1
Örneklem Büyüklükleri

Ülke	Sektör	Proje Başarısı	Proje Sayısı
Türkiye	Film	Başarılı	15
		Başarısız	15
	Teknoloji	Başarılı	15
		Başarısız	15
ABD	Film	Başarılı	15
		Başarısız	15
	Teknoloji	Başarılı	15
		Başarısız	15
		Toplam	**120**

Örneklemde yer alan kitlesel fonlama projeleri için hipotezlere uygun olarak belirlenen değişkenlere ait veriler toplanmıştır. ABD örneklemi için tüm veriler Dünya'da en popüler kitlesel fonlama platformu olan *Kickstarter* platformundan toplanırken, Türkiye için en yaygın kullanılan kitlesel fonlama platformları olan *Fongogo*, *Crowdfon*, *Reward Fon Bulucu*, *Arı Kovanı* platformlarından yararlanılmıştır.

Bağımlı değişken olarak kitlesel fonlama projesinin başarıya ulaşması 0 veya 1 değerini alan ikili bir değişken olarak belirlenmiştir. Bağımlı değişkenin ikili yapısından hareketle hipotezler ikili lojistik regresyon kullanılarak test edilmiştir. Bağımsız değişkenler ise hipotezlere uygun olarak tespit edilmiştir. Belirlenen bağımsız değişkenler Tablo 2'de listelenmektedir.

Belirlenen bağımsız değişkenlerden proje sahiplerinin harici bir web sitesine sahip olup olmaması (WEB), projelerin ödül sayısı (ODUL), projelerin fonlama süresi (SURE) ve proje sahiplerinin sosyal medya hesabına sahip olup olmaması (SOSMED) değişkenleri kontrol değişkenleri olarak kabul edilmiştir. Bağımsız değişkenlere ait tanımlayıcı istatistikler Tablo 3'te sunulmaktadır.

Tablo: 2
Bağımsız Değişkenler

	Proje ile İlgili Değişkenler	Kısaltma
1	Videoya sahip olma /olmama	VID
2	Video süresi (sn)	VIDSURE
3	Minimum yatırım tutarı	MINYT
4	Maksimum yatırım tutarı	MAXYT
5	Ödül sayısı	ODUL
6	Hedeflenen fon miktarı	HEDEF
7	Fonlama süresi (gün)	SURE
8	Açıklama uzunluğu karakter sayısı	ACIKKAR
9	Proje sahibi hakkında bilgi olup olmaması	SAHIPBILGI
10	Proje sahibi cinsiyeti	CINS
11	Proje sahibi yaşı	YAS
12	Proje sahibi eğitim düzeyi	EGTM
13	Web sitesine sahip olma /olmama	WEB
14	Sosyal medya hesabına sahip olma / olmama	SOSMED
15	Sosyal medya bağlantı sayısı	SOSMEDNET

Tablo: 3
Bağımsız Değişkenlere Ait Tanımlayıcı İstatistik Tablosu

		Ortalama	Standart Sapma	Minimum	Maksimum	Değişken Tipi
1	VID	0,80	0,40	0	1	Kukla
2	VIDSURE	134,68	196,81	0	1.620	Metrik
3	MINYT	12,43	27,57	0,67	198	Metrik
4	MAXYT	2.170	4.372	1	30.000	Metrik
5	ODUL	8,34	6,81	1	50	Metrik
6	HEDEF	30.018	101.606	93,34	1.000.000	Metrik
7	SURE	42,54	15,43	15	89	Metrik
8	ACIKKAR	5.161	4.581	0	26.76	Metrik
9	SAHIPBILGI	0,71	0,46	0	1	Kukla
10	CINS	0,23	0,51	0	2	Kukla
11	YAS	33,19	12,60	11	61	Metrik
12	EGTM	15,52	3,73	8	23	Metrik
13	WEB	0,54	0,50	0	1	Kukla
14	SOSMED	0,70	0,46	0	1	Kukla
15	SOSMEDNET	11.712	92.029	0	1.000.000	Metrik

Belirlenen kontrol değişkenleri öncüllenerek diğer bağımsız değişkenler modellere eklenip çıkarılarak anlamlılığı yüksek lojistik regresyon modelleri oluşturulmuştur. Verisi toplanan tüm projelerin yanı sıra verinin alt örneklemleri ile de analizler gerçekleştirilerek ülkeler, sektörler ve ülke-sektör kombinasyonları bazında da sonuçlar üretilmiştir. Kurulan modellerin içerdiği değişkenler ve ele aldıkları örneklemler Tablo 4'te gösterilmektedir. 9 ayrı örneklem kategorisinde 19 ayrı lojistik regresyon modeli kurularak kitlesel fonlama proje başarısını etkileyen faktörler hem tüm örneklem hem de örneklemin alt kırılımları açısından incelenmiştir. Örneklemin tamamı ile yapılan analizlerin haricinde projeler ülkeler (Türkiye ve ABD), sektörler (Film ve Teknoloji) ve sektör-ülke kombinasyonları (Türkiye-Film, Türkiye-Teknoloji, ABD-Film ve ABD-Teknoloji) olarak sınıflanarak bu alt örneklemlerde de analizler gerçekleştirilmiştir.

Tablo 4'te görüldüğü üzere belirlenen kontrol değişkenleri (WEB, ODUL, SURE ve SOSMED) modellerde en yaygın yer alan değişkenlerdir. Çeşitli örneklemlerde bu değişkenlere yeni bağımsız değişkenler aşama aşama eklenerek, her aşamada modellerin anlamlılığı gözlenmiştir (Burada bahsedilen modelin anlamlılığıdır, yüksek anlamlılıktaki bir modelde bazı değişkenlerin bağımlı değişkenle anlamlı bir ilişkisi bulunamayabileceği

unutulmamalıdır). Model anlamlılığının yeterli düzeyde görüldüğü noktada model bulguları kaydedilerek tablolaştırılmıştır. Bu bulgular bir sonraki bölümde tartışılmaktadır.

Tablo 4'te sunulan modellerde yer alan değişkenler incelendiğinde çalışma başında belirlenen 6 değişkenin anlamlı modellerin hiçbirinde yer almadığı (bütün örneklemler açısından) görülmektedir. Bu değişkenler herhangi bir şekilde modellere eklendiğinde modelin anlamlılığını ciddi seviyede düşürmekte olduğu dolayısıyla, kitlesel fonlama projelerinin başarısına yönelik modellerin anlamlılığına herhangi bir katkı yapmadığı tespit edilmiştir. Bu değişkenler, proje sayfasında yer alan video süresi (VIDSURE), proje sahibi cinsiyeti (CINS), hedeflenen fon miktarı (HEDEF), proje sahibi eğitim durumu (EGTM), proje sahibi sosyal medya bağlantı sayıları (SOSMEDNET) ve proje sahibi yaşı (YAS) değişkenleridir.

Tablo: 4
Proje Başarısını Etkileyen Faktörlerin Test Edildiği Modellere İlişkin Açıklamalar

Model	Örneklem	Bağımsız Değişkenler
1	Tüm Veri	WEB-ODUL-SURE-SOSMED
2	Tüm Veri	WEB-ODUL-SURE-SOSMED-ACIKKAR
3	Tüm Veri	WEB-ODUL-SURE-SOSMED-ACIKKAR-MINYT-MAKSYT
4	Tüm Veri	WEB-ODUL-SURE-SOSMED-ACIKKAR-MINYT-MAKSYT-SAHIPBILGI
5	TR	WEB-ODUL-SURE-SOSMED
6	TR	WEB-ODUL-SURE-SOSMED-SAHIPBILGI
7	TR	WEB-ODUL-SURE-SOSMED-ACIKKAR
8	ABD	WEB-ODUL-SURE
9	ABD	WEB-ODUL-SURE-MINYT-MAKSYT
10	Film	WEB-ODUL-SURE
11	Film	WEB-ODUL-SURE-MINYT
12	Film	WEB-ODUL-SURE-MINYT-VID
13	Teknoloji	WEB-ODUL-SURE
14	Teknoloji	WEB-ODUL-SURE-SAHIPBILGI
15	TR-Film	WEB-SURE-VID
16	TR-Film	WEB-SURE-VID-MINYT-MAKSYT
17	TR-Teknoloji	SAHIPBILGI-MINYT-MAKSYT
18	ABD-Film	ODUL-SURE-SOSMED
19	ABD-Teknoloji	ODUL-SAHIPBILGI-MINYT-MAKSYT

Not: TR: Türkiye, ABD: Amerika Birleşik Devletleri.

5. Bulgular

5.1. Örneklemin Tamamı için Bulgular

Yapılan analizlerde öncelikle toplanan örneklemde yer alan tüm projeler (120 adet, bkz. Tablo 1) dört ayrı modelde incelenmiştir. Bu analizin bulguları Tablo 5'te sunulmaktadır.

Tablo 5'te yer alan *-2 Log Likelihood* değerlerine göre dört modelin de anlamlı sonuçlar ürettiği görülmektedir (Model 1: *-63,2157; P=0,0001*, Model 2: *-60,0780; P=0,0000*, Model 3: *55,2503; P=0,0000*, Model 4: *-52,9983; P=0,0000*). Hosmer ve Lemeshow test değerlerinin anlamlı çıkmaması (Model 1: *P=0,6576; p>0,05;* Model 2: *P=0,1962; p>0,05*; Model 3: *P=0,3410; p>0,05*; Model 4: *P=0,7930; p>0,05*), model-veri uyumunun yeterli düzeyde olduğu anlamına gelmektedir (Çokluk, 2010).

Model 1'de yer alan web sitesine sahip olma (WEB), ödül sayısı (ODUL) ve sosyal medya hesaplarına sahip olma durumu (SOSMED) değişkenleri proje başarısı bağımlı değişkenini pozitif yönde etkilemektedir. Fonlama süresi (SURE) ile proje başarısı arasında anlamlı bir ilişki görülmemektedir. Anlamlı olduğu kabul edilen Model 1 incelendiğinde modelin %67,89 oranla doğru tahmin yaptığı görülmektedir. Tablo 5'te Model 1 için verilen katsayı değerleri incelendiğinde diğer değişkenlerin sabit tutulduğu varsayılarak web sitesine sahip olma durumunun (WEB) proje başarısı ihtimalini 1,13 kat artırdığı görülmektedir. Ödül sayısı (ODUL) değişkeninin bir birim artırılması durumunda projenin başarı ihtimalinin ,102 kat arttığı görülmektedir. Sosyal medya hesaplarına sahip olma durumunda ise (SOSMED) proje başarısı ihtimalinin ,907 kat arttığı görülmektedir.

Model 2'de yer alan web sitesine sahip olma (WEB), sosyal medya hesaplarına sahip olma durumu (SOSMED) ve açıklama uzunluğu karakter sayısı (ACIKKAR) bağımsız değişkenleri proje başarısı bağımlı değişkenini pozitif yönde etkilemektedir. Bu modelde, ödül sayısı (ODUL) ve fonlama süresi (SURE) ile proje başarısı arasında anlamlı bir ilişki görülmemektedir. Açıklama karakter uzunluğunun modele girmesi ödül sayısı değişkeninin anlamlılığını etkilemektedir. Modelin %72,22 oranla doğru tahmin yaptığı görülmektedir. Tablo 5'te Model 2 için verilen katsayı değerlerini incelediğimizde diğer değişkenlerin sabit tutulduğu varsayılarak web sitesine sahip olma durumunun (WEB) proje başarısı ihtimalini 1,08 kat artırdığı görülmektedir. Sosyal medya hesaplarına sahip olma durumunun (SOSMED) proje başarısı ihtimalinin ,901 kat arttığı görülmektedir. Açıklama uzunluğu karakter sayısı (ACIKKAR) değişkeninin bir birim artırılması durumunda proje başarısı ihtimalinin ,709 kat arttığı görülmektedir.

Model 3 bulgularına göre web sitesine sahip olma (WEB), ödül sayısı (ODUL), sosyal medya hesaplarına sahip olma durumu (SOSMED), açıklama uzunluğu karakter sayısı (AUKS) ve minimum yatırım tutarı (MINYT) değişkenleri proje başarısı bağımlı değişkenini pozitif yönde etkilemektedir. Maksimum yatırım tutarı (MAKSYT) değişkeni proje başarısı bağımlı değişkenini negatif yönde etkilemektedir. Fonlama süresi (SURE) ile proje başarısı arasında anlamlı bir ilişki görülmemektedir. Modelin %75,93 oranla doğru tahmin yaptığı gözlenmiştir. Diğer değişkenlerin sabit tutulduğu varsayılarak web sitesine sahip olma durumunun (WEB) proje başarısı ihtimalini 1,22 kat artırdığı görülmektedir. Ödül sayısı (ODUL) değişkeninin bir birim artırılması durumunda proje başarısı ihtimalinin ,202 kat arttığı görülmektedir. Sosyal medya hesaplarına sahip olma durumunun (SOSMED) değişkeninin proje başarısı ihtimalinin 1,04 kat arttığı görülmektedir. Açıklama uzunluğu karakter sayısı (ACIKKAR) değişkeninin bir birim artırılması durumunda proje başarısı ihtimalinin ,611 kat arttığı görülmektedir. Minimum yatırım tutarı (MINYT) değişkeninin bir birim artırılması durumunda proje başarısı ihtimalinin ,642 kat arttığı görülmektedir. Maksimum yatırım tutarı (MAKSYT) değişkenindeki bir birimlik artışın (1-(-,40=1,40) proje başarısı ihtimalinde %140'lık düşüşe neden olduğu görülmektedir.

Model 4'te yer alan web sitesine sahip olma (WEB), ödül sayısı (ODUL), minimum yatırım tutarı (MINYT) ve proje sahibi hakkında bilgi (SAHIPBILGI) değişkenleri proje başarısı bağımlı değişkenini pozitif yönde etkilemektedir. Maksimum yatırım tutarı

(MAKSYT) değişkeni proje başarısı bağımlı değişkenini yine negatif yönde etkilemektedir. Model 4'te fonlama süresi (SURE), sosyal medya hesaplarına sahip olma durumu (SOSMED) ve açıklama uzunluğu karakter sayısı (ACIKKAR) ile proje başarısı arasında anlamlı bir ilişki görülmemektedir. Modelin %76,85 oranla doğru tahmin yaptığı görülmektedir. Web sitesine sahip olma durumunun (WEB) proje başarısı ihtimalinin 1,07 kat arttığı görülmektedir. Ödül sayısı (ODUL) değişkeninin bir birim artırılması durumunda proje başarısı ihtimalinin ,189 kat arttığı görülmektedir. Minimum yatırım tutarı (MINYT) değişkeninin bir birim artırılması durumunda proje başarısı ihtimalinin ,649 kat arttığı görülmektedir. Maksimum yatırım tutarı (MAKSYT) değişkenindeki bir birimlik artışın (1-(-,455)=1,455) proje başarısı ihtimalinde %146'lık düşüşe neden olduğu görülmektedir. Proje sahibi hakkında bilgi olmasının ise (SAHIPBILGI) proje başarısı ihtimalinin 1,31 kat arttığı görülmektedir.

Tüm örneklemin kullanıldığı modeller incelendiğinde proje sahibinin harici web sitesine sahip olması durumunun tüm modellerde proje başarısını olumlu ve anlamlı şekilde etkilediği gözlenmekte, fonlama süresi değişkeninin ise proje başarısı ile anlamlı bir ilişkisi olmadığı göze çarpmaktadır.

Tablo: 5
Örneklemin Tamamından Elde Edilen Lojistik Regresyon Model Sonuçları

	Model 1	**Model 2**	**Model 3**	**Model 4**
Örneklem	**Tüm Veri**	**Tüm Veri**	**Tüm Veri**	**Tüm Veri**
-2 Log Likelihood	-63,2157	-60,0780	-55,2503	-52,9983
Pseudo R2	0,1571	0,1925	0,2574	0,2876
Olasılık > Ki-Kare (P değeri)	0,0001	0,0000	0,0000	0,0000
Hosmer - Lemeshow Ki-Kare	5,91	11,10	9,02	4,66
Serbestlik Derecesi	4	5	7	8
Hosmer - Lemeshow Anlamlılık	0,6576	0,1962	0,3410	0,7930
Doğruluk Yüzdesi (%)	67,89	72,22	75,93	76,85
Katsayı (ß)				
Sabit (c)	-2,21**	-8,09***	-7,50**	-7,69**
WEB	1,13**	1,08**	1,22**	1,07**
ODUL	,102**	,064	,202**	,189**
SURE	-,002	,007	,015	,015
SOSMED	,907*	,901*	1,04*	,615
ACIKKAR_L		,709**	,611*	,618
MINYT_L			,642**	,649**
MAKSYT_L			-,400*	-,455**
SAHIPBILGI				1,31**

*Not: *** p<0,01; ** p<0,05; * p<0,10.*

5.2. Ülke Bulguları

Analizin bir sonraki aşamasında ülke örneklemleri ayıklanarak projeler yer aldıkları ülke örneklemleri içinde değerlendirilmiştir. Her bir ülke örnekleminde 60 adet proje bulunmaktadır (bkz. Tablo 1). Analizin bu bölümünde, Türkiye örneklemi için üç, ABD örneklemi için ise iki ayrı modelle test yapılmıştır. Analiz sonuçları Tablo 6'da sunulmaktadır.

Tablo 6'da yer alan *-2 Log Likelihood* değerlerine göre beş modelin de anlamlı sonuçlar ürettiği görülmektedir (Model 5: *-28,5152; P=0,0777*, Model 6: *-24,7389;*

P=0,0070, Model 7: *-25,9874; P=0,0289*, Model 8: *-27,8166; P=0,0000;* Model 9: *-23,2338; P=0,0000*). Hosmer ve Lemeshow test değerlerinin anlamlı çıkmaması (Model 5: *P=0,3548; p>0,05;* Model 6: *P=0,1440; p>0,05*; Model 7: *P=0,8632; p>0,05*; Model 8: *P=0,2997; p>0,05;* Model 9: *P=0,2236; p>0,05*), model-veri uyumunun yeterli düzeyde olduğu anlamına gelmektedir (Çokluk, 2010). Türkiye örneklemi modellerinin tahmin yüzdeleri %61,22 ile %75 arasında değişirken ABD örneklemleri için kurulan modellerde bu oran %80'dir.

Türkiye örneklemi için kurulan Model 5'te yalnızca fonlama süresi (SURE) ve sosyal medya hesabına sahip olma (SOSMED) değişkenleri proje başarısı ile düşük düzeyde anlamlı pozitif bir ilişkiye sahiptir (*p<0.10*). Türkiye örneklemine ait bir diğer model olan Model 6'da yalnızca proje sahibi ile ilgili bilgi olması değişkeni (SAHIPBILGI) proje başarısı ile anlamlı ve pozitif bir ilişkiye sahiptir. Türkiye için proje sayfasında proje sahibi ile ilgili bulunması proje başarı olasılığını neredeyse 3 kat artırmaktadır. Türkiye örneklemi ile kurulan son model olan Model 7'de ise fonlama süresi (SURE) ve sosyal medya hesabına sahip olma (SOSMED) proje başarısı ile pozitif yönlü anlamlı bir ilişkiye sahiptir.

ABD örneklemi için kurulan modellerin Türkiye örneklemi için kurulan modellere kıyasla tahmin gücü daha yüksek bulunmuştur. Yalnızca web sitesine sahip olma (WEB), ödül sayısı (ODUL) ve fonlama süresi (SURE) değişkenlerinin ele alındığı Model 8'de WEB ve SURE değişkenlerinin proje başarısı ile anlamlı ilişkisi olduğu tespit edilmiştir. Fonlama süresinin ilişkisi ters yönlüdür. Bu modele minimum ve maksimum yatırım tutarı değişkenleri (MINYT ve MAKSYT) eklendiğinde ise bütün değişkenlerin proje başarısı ile anlamlı bir ilişkiye sahip oldukları gözlenmiştir. Maksimum yatırım tutarı ve proje başarısı ilişkisi daha önceki modellerde olduğu gibi ters yönlüdür.

Tablo: 6
Ülke Örneklemlerinden Elde Edilen Lojistik Regresyon Model Sonuçları

	Model 5	**Model 6**	**Model 7**	**Model 8**	**Model 9**
Örneklem	**TR**	**TR**	**TR**	**ABD**	**ABD**
-2 Log Likelihood	-28,5152	-24,7389	-25,9874	-27,8166	-23,2338
Pseudo R2	0,1285	0,2439	0,1935	0,3312	0,4413
Olasılık > Ki-Kare (P değeri)	0,0777	0,0070	0,0289	0,0000	0,0000
Hosmer - Lemeshow Ki-Kare	8,85	12,26	3,93	9,53	10,63
Serbestlik Derecesi	4	5	5	3	5
Hosmer - Lemeshow Anlamlılık	0,3548	0,1440	0,8632	0,2997	0,2236
Doğruluk Yüzdesi (%)	61,22	69,39	75,00	80,00	80,00
Katsayı (ß)					
Sabit (c)	-4,51**	-4,13	-10,65**	,622	1,39
WEB	,737	,196	,884	2,07***	2,39***
ODUL	-,044	-,277	-,179	,092	,225**
SURE	,043*	,04	,055**	-,082**	-,084**
SOSMED	2,28*	1,54	2,29*		
SAHIPBILGI		2,81**			
ACIKKAR_L			,799		
MINYT_L					,663**
MAKSYT_L					-,513**

*Not: TR: Türkiye, ABD: Amerika Birleşik Devletleri, *** p<0,01; ** p<0,05; * p<0,10.*

Türkiye örnekleminin ele alındığı modellerde (Model 5-7) web sitesine sahip olma (WEB) değişkeninin hiçbir modelde proje başarısı ile anlamlı bir ilişkisi gözlenmemektedir.

Bunun aksine ABD için kurulan her iki modelde de bu değişkenin bağımlı değişken olan proje başarısı ile pozitif yönde anlamlı bir ilişkisi bulunmaktadır. Ödül sayısı (ODUL) değişkeninin de Türkiye örnekleminde kurulan hiçbir modelde proje başarısı ile anlamlı bir ilişkisi gözlenmemektedir. Bu değişkenin yalnızca ABD örneklemi için kurulan Model 9'da proje başarısı ile pozitif yönlü bir ilişkisi olduğu tespit edilmiştir.

5.3. Sektör Bulguları

Analizin bir sonraki aşaması toplanan verinin sektörler bazında gruplanarak film ve teknoloji sektörleri özelinde sonuçlar üretilmesi olmuştur. Analizin bu bölümünde, Film sektörü örneklemi için üç, Teknoloji sektörü örneklemi için ise iki ayrı modelle test yapılmıştır. Analiz sonuçları Tablo 7'de sunulmaktadır.

Tablo 7'de yer alan *-2 Log Likelihood* değerlerine göre beş modelin de anlamlı sonuçlar ürettiği görülmektedir (Model 10: *-32,9594; P=0,0006*, Model 11: *-30,0340; P=0,0001*, Model 12: *-26,6894; P=0,0000*, Model 13: *-23,1679; P=0,0003;* Model 14: *-17,5722; P=0,0000*). Hosmer ve Lemeshow test değerlerinin anlamlı çıkmaması (Model 10: *P=0,4753; p>0,05;* Model 11: *P=0,8901; p>0,05*; Model 12: *P=0,7239; p>0,05*; Model 13: *P=0,7906; p>0,05;* Model 14: *P=0,7641; p>0,05*), model-veri uyumunun yeterli düzeyde olduğu anlamına gelmektedir (Çokluk, 2010). Film sektörü örneklemi modellerinin tahmin yüzdeleri %66,67 ile %78,33 arasında değişirken ABD örneklemleri için kurulan modellerde bu oran %75,51 ve %79,59'dur.

Tablo: 7
Sektör Örneklemlerinden Elde Edilen Lojistik Regresyon Model Sonuçları

	Model 10	**Model 11**	**Model 12**	**Model 13**	**Model 14**
Örneklem	**Film**	**Film**	**Film**	**Teknoloji**	**Teknoloji**
-2 Log Likelihood	-32,9594	-30,0340	-26,6894	-23,1679	-17,5722
Pseudo R2	0,2075	0,2778	0,3583	0,2919	0,4629
Olasılık > Ki-Kare (P değeri)	0,0006	0,0001	0,0000	0,0003	0,0000
Hosmer - Lemeshow Ki-Kare	7,58	3,61	5,31	4,69	4,94
Serbestlik Derecesi	3	4	5	3	4
Hosmer - Lemeshow Anlamlılık	0,4753	0,8901	0,7239	0,7906	0,7641
Doğruluk Yüzdesi (%)	66,67	73,33	78,33	75,51	79,59
Katsayı (ß)					
Sabit (c)	-4,24***	-7,23***	-9,36***	,246	-,101
WEB	1,89***	2,09***	2,05***	,378	-,523
ODUL	,109*	,161**	,128*	,431**	,559**
SURE	,05**	,062**	,067**	-,078***	-,096***
MINYT_L		1,11**	1,20**		
VID			2,51**		
SAHIPBILGI					2,92***

*Not: *** p<0,01; ** p<0,05; * p<0,10.*

Film sektörü için kurulan modellerde ele alınan değişkenlerin tamamının proje başarısı ile pozitif yönlü ve anlamlı bir ilişkiye tespit olduğu tespit edilmiştir. Model 10'a göre web sitesine sahip olma (WEB), ödül sayısı (ODUL) ve fonlama süresi (SURE) değişkenlerinin proje başarısı ile anlamlı ilişkisi bulunmaktadır. Model 11'de bu değişkenlere minimum yatırım tutarı (MINYT) ve Model 12'de ise proje sayfasında proje ile ilgili bilgilendirme yapan video olup olmama durumu (VID) değişkeni eklenmiştir. Buna

göre, film sektöründeki kitlesel fonlama projelerinde proje sayfasında tanıtıcı bir video bulunması proje başarısı olasılığını 2,5 kat artırmaktadır.

Teknoloji sektöründe ise ödül sayısı (ODUL) ve fonlama süresi (SURE) değişkenlerinin proje başarısı ile anlamlı bir ilişkisi bulunduğu gözlenmektedir. Her iki sektörün bütün modellerinde proje başarısına anlamlı bir şekilde etki ettiği belirlenen değişkenler ödül sayısı (ODUL) ve fonlama süresi (SURE) değişkenleridir. Bu sektörde, fonlama süresinin proje başarısı ile ilişkisi ters yönlüdür. Teknoloji sektörü için kurulan her iki modelde de proje sahibinin harici bir web sayfası olması (WEB) proje başarısı ile anlamlı bir ilişkiye sahip değildir. Bu noktada film sektöründen ayrılmaktadır. Model 14'e göre proje sayfasında proje sahibi ile ilgili bilgi bulunması değişkeni (SAHIPBILGI) proje başarısını yüksek düzey anlamlılıkta etkilemektedir.

5.4. Ülke-Sektör Bulguları

Analizin son bölümünde örneklemler ülke-sektör kombinasyonlarına ayrılarak modelleme yapılmıştır. Bu bölümdeki örneklemler 30'ar adet projeden oluşmaktadır (bkz. Tablo 1). Türkiye-Film sektörü örnekleminde iki, Türkiye-Teknoloji sektörü örnekleminde bir ve ABD film ve teknoloji sektörlerinde birer olmak üzere toplam beş modelle proje başarısına etki eden faktörler değerlendirilmektedir. Bu analizin bulguları Tablo 8'de sunulmuştur.

Tablo 8'de yer alan *-2 Log Likelihood* değerlerine göre beş modelin de anlamlı sonuçlar ürettiği görülmektedir (Model 15: *-13,9327; P=0,0033*, Model 16: *-10,7460; P=0,0012*, Model 17: *-10,5268; P=0,0001*, Model 18: *-13,4629; P=0,0021;* Model 19: *-11,5764; P=0,0010*). Hosmer ve Lemeshow test değerlerinin anlamlı çıkmaması (Model 15: *P=0,2091; p>0,05;* Model 16: *P=0,9528; p>0,05*; Model 17: *P=0,9492; p>0,05*; Model 18: *P=0,5681; p>0,05;* Model 19: *P=0,1361; p>0,05*), model-veri uyumunun yeterli düzeyde olduğu anlamına gelmektedir (Çokluk, 2010). Modellerin tahmin yüzdeleri %73,33 ile %90 arasında değişmektedir.

Türkiye-Film örneklemini ele alan Model 15'te film sektörü örneklemi ile uyumlu olarak (bkz. Model 10-12) web sitesine sahip olma (WEB), ödül sayısı (ODUL) ve fonlama süresi (SURE) değişkenlerinin proje başarısı ile anlamlı ilişkisi bulunduğu tespit edilmiştir. Model 16'da minimum ve maksimum yatırım tutarlarının proje başarısı ile sırasıyla pozitif ve ters yönlü ilişkisi tespit edilirken bu modele göre fonlama süresi ile proje başarısı arasında anlamlı bir ilişki bulunmamaktadır. Türkiye-Teknoloji örneklemini ele alan Model 17'ye göre minimum ve maksimum yatırım tutarları ile proje sayfasında proje sahibi ile ilgili bilgi bulunması (SAHIPBILGI) değişkenleri ile proje başarısı arasında anlamlı bir ilişki bulunmaktadır. SAHIPBILGI değişkeni ile ilgili bulgu Teknoloji sektörü örneklemini ele alan Model 14'ün bulgusu ile uyumludur. ABD-Film ele alan Model 18'de yalnızca SAHIPBILGI değişkeninin anlamlı ilişkisine işaret etmektedir. ABD-Teknoloji örnekleminin ele alındığı Model 19'da ise minimum ve maksimum yatırım tutarları ile ödül sayısı değişkenlerinin proje başarısı ile anlamlı ilişkisi tespit edilmiştir. Maksimum yatırım

tutarı katsayısı bu değişkenin ele alındığı diğer modellerde olduğu gibi negatiftir ve ters yönlü ilişkiyi işaret etmektedir.

Tablo: 8
Ülke-Sektör Örneklemlerinden Elde Edilen Lojistik Regresyon Model Sonuçları

	Model 15	**Model 16**	**Model 17**	**Model 18**	**Model 19**
Örneklem	**TR-Film**	**TR-Film**	**TR-Teknoloji**	**ABD-Film**	**ABD-Teknoloji**
-2 Log Likelihood	-13,9327	-10,7460	-10,5268	-13,4629	-11,5764
Pseudo R2	0,3300	0,4832	0,49	0,3526	0,4433
Olasılık > Ki-Kare (P değeri)	0,0033	0,0012	0,0001	0,0021	0,0010
Hosmer - Lemeshow Ki-Kare	10,87	2,68	2,75	6,71	12,35
Serbestlik Derecesi	3	5	3	3	4
Hosmer - Lemeshow Anlamlılık	0,2091	0,9528	0,9492	0,5681	0,1361
Doğruluk Yüzdesi (%)	83,33	83,33	90	73,33	86,67
Katsayı (B)					
Sabit (c)	-6,68***	-3,3	-4,62*	-4,07	-2,58
WEB	2,01*	2,92*			
SURE	,084*	,087		-,002	
VID	2,78**	5,13**			
MINYT_L		2,86*	2,52*		,847**
MAKSYT_L		-1,63*	-1,06**		-,804*
SAHIPBILGI			3,16**		1,77
ODUL				,222**	,853**
SOSMED				1,89	

*Not: TR: Türkiye, ABD: Amerika Birleşik Devletleri, *** p<0,01; ** p<0,05; * p<0,10.*

5.5. Bulguların Özeti

Toplamda 19 modelde 15 değişken ile yapılan analizlerde kitlesel fonlama başarısına etki eden faktörler değerlendirilmiştir. Tablo 9 bütün modellerde anlamlı ilişki tespit edilen değişkenleri anlamlılık dereceleri ile özetlemektedir. Herhangi bir modelde proje başarısı ile anlamlı ilişkisi tespit edilemeyen proje sayfasında yer alan video süresi (VIDSURE), proje sahibi cinsiyeti (CINS), hedeflenen fon miktarı (HEDEF), proje sahibi eğitim durumu (EGTM), proje sahibi sosyal medya bağlantı sayıları (SOSMEDNET) ve proje sahibi yaşı (YAS) değişkenleri bu tabloda yer almamaktadır.

Kurulan modellerde proje başarısı ile en fazla sayıda anlamlı ilişkisi tespit edilen değişken proje sahibinin harici web sitesine sahip olması (WEB) değişkenidir. Bu değişkeni ödül sayısı (ODUL) ve fonlama süresi (SURE) değişkenleri izlemektedir. Fonlama süresi örneklemin bütününde anlamlı bir ilişki göstermese de örneklemin alt kırılımlarında sıklıkla karşımıza çıkmaktadır. Minimum yatırım tutarı değişkeni de (MINYT) değişik örneklem tiplerinde proje başarısı ile anlamlı bir ilişki ortaya koymaktadır. Film sektörü örneklemlerinde proje sayfasında video bulunması değişkeni (VID) proje başarısına pozitif yönlü ve anlamlı etki eden bir değişken olarak karşımıza çıkmaktadır. Maksimum yatırım tutarı değişkeni (MAKSYT) bağımlı değişkenle anlamlı ilişkiye sahip bulunduğu tüm modellerde ters yönlü bir ilişkiye sahiptir. Bir başka ters yönlü ilişki yalnızca Amerika örneklemi ve Teknoloji sektörü örnekleminde fonlama süresi (SURE) proje başarısı arasındadır. Proje sahibinin sosyal medya hesaplarına sahip olması örneklemin tamamı ve Türkiye örneklemi için kurulan modellerde karşımıza çıkmaktadır.

Tablo: 9
Analiz Bulgularının Özeti

Model	Örneklem	VID	MINYT	MAKSYT	ODUL	SURE	ACIKKAR	SAHIPBILGI	WEB	SOSMED
1	Tüm Veri				**				**	*
2	Tüm Veri						**		**	*
3	Tüm Veri		**	*	**		*		**	*
4	Tüm Veri		**	**	**			**	**	
5	TR					*				*
6	TR							**		
7	TR					**				*
8	ABD					**			***	
9	ABD		**	**	**	**			***	
10	Film				*	**			***	
11	Film		**		**	**			***	
12	Film	**	**		*	**			***	
13	Teknoloji				**	***				
14	Teknoloji				**	***		***		
15	TR-Film	**				*			*	
16	TR-Film	**	*	*					*	
17	TR-Tekno.		*	**				**		
18	ABD-Film				**					
19	ABD-Tekno.		**	*	**					

*Not: TR: Türkiye, ABD: Amerika Birleşik Devletleri, *** p<0,01, ** p<0,05, * p<0,10.*

6. Tartışma

Bu bölümde, gerçekleştirilen ampirik analiz sonuçları literatürdeki bulgular, ele alınan temel teoriler (Sinyal Teorisi ve Sosyal Ağ Teorisi) ve bunlar ışığında belirlenen hipotezler kapsamında özetlenerek tartışılmaktadır.

Öncelikli bulgu olarak, proje sahibinin cinsiyeti, eğitim durumu, yaşı, proje hedeflenen fon miktarı, video süresi ve sosyal medya bağlantı sayısı değişkenlerinin kurulan modellerin anlamlılığına olumlu bir katkıda bulunmadığı, dolayısıyla proje başarısına etki etmediği gözlenmiştir. Benzer bir biçimde, Levin (2015) ile Marom vd. (2018) projenin desteklenme durumunun proje sahibi cinsiyetine bağlı olmadığını savunmaktadır. Marom vd. (2018)'e göre proje sahibi eğitim durumundaki farklılıkların kitlesel fonlama projesine anlamlı bir sonuçta etkisi bulunmamıştır. Benzer şekilde, Levin'in (2015) yaptığı araştırmaya göre bir kitlesel fonlama projesine destekçiler tarafından destek verilmesi kararı proje sahibinin yaşı gibi özelliklerden de etkilenmemektedir. Kohli vd. (2016)'nin araştırması da fon desteği miktarları ile video uzunluğunun proje başarısı ile önemli ölçüde ilişkili olmadığını göstermiştir. Dolayısıyla, cinsiyet, eğitim durumu, yaş, hedeflenen fon miktarı ve video süresi değişkenleri açısından bu çalışmanın bulguları literatürdeki bulgularla uyumludur. Ancak, sosyal ağ sitelerinde daha çok bağlantı sayısına sahip olan proje sahibinin proje başarısının daha yüksek olacağını savunan Mollick (2014)'ün aksine sosyal medya bağlantı sayısı ile proje başarısı arasında olumlu yönde bir ilişki olduğu hipotezi doğrulanamamaktadır.

Bu çalışmadaki analiz sonuçlarına göre fonlama konusu veya yer aldığı ülke fark etmeksizin kurulan modellerin çoğunluğunda yatırımcının dikkatini çekeceğini savunan ve sinyal teorisini destekleyecek şekilde proje başarısı ile proje sahibinin harici bir web sitesine sahip olması arasında olumlu yönde ilişki olduğu tespit edilmiştir. Analiz sonuçları, proje

sahibinin web sayfasına sahip olmasının kitlesel fonlama proje sonucuyla pozitif bir ilişki verdiğini savunan Drablos (2015)'un ve Skirnevsky vd. (2017)'nin çalışmaları ile uyum sağlamaktadır. Genel itibari ile, proje sayfasında proje sahibinin harici bir web sayfasına sahip olma durumu ile proje başarısı arasında olumlu bir ilişki vardır hipotezi doğrulanmaktadır.

Ödül sayısının, tüm verilere ilişkin model sonuçlarında proje başarısı ile olumlu yönde bir etkisi olduğu gözlemlenmiştir. Analiz sonucunda elde edilen sonuçlar ödül sayısı ile proje başarısı arasında olumlu bir ilişki vardır hipotezini doğrulamaktadır. Kunz vd. (2016)'ne göre çok sayıda ödül olması potansiyel destekçilerin özelliklerine ve ihtiyaçlarına göre zaman harcandığını ve çaba gösterildiğinin algılanmasını sağlamaktadır. Öte yandan, karışıklık olmaması adına ödül sayısının az olması gerektiğini savunan Forbes ve Schafer (2017) ile basit bir ödül sisteminin olmasının destekçilerin ilgisini çekeceğini savunan Leite ve Moutinho (2012)'nun çalışmaları ile çalışma sonuçları uyum sağlamamaktadır.

Projenin fonlama süresinin Türkiye ve film sektörü örneklemlerinde gerçekleştirilen analiz sonuçlarına göre proje başarısını pozitif yönde etkilediği tahmin edilmektedir. Proje başarısı ile fonlama süresi arasında pozitif bir ilişki olduğunu rapor eden Cordova vd. (2015) ve Burtch vd. (2013) ile bu çalışmada yer alan analiz sonuçları uyum sağlamaktadır. Bu çalışmada elde edilen Türkiye ve film sektörü verilerine ilişkin sonuçlar, fonlama süresi ile proje başarısı arasında olumlu bir ilişki vardır hipotezini doğrulamaktadır. Bunun aksine, Amerika ve teknoloji verilerine göre fonlama süresi proje başarısını negatif yönde etkilemektedir. Kunz vd. (2016), Mollick (2014) ve Claus vd. (2017) çalışmalarında başarı ile proje arasında negatif ilişki olduğunu rapor ederken açıklama olarak fonlama süresinin uzamasının olumsuz yönde bir güven eksikliğine sebep olduğunu belirtmektedirler.

Analiz sonuçlarına göre, proje sayfasında yer alan ödüllerin minimum yatırım tutarı projenin başarısını pozitif yönde etkilemektedir. Ancak bu durum Kıran (2013)'ın, yatırım miktarı ne kadar küçük olursa yatırımcı daha çok katkıda bulunacaktır görüşü ile minimum yatırım tutarının düşük tutulmasını savunun Forbes ve Schaefer (2017)'in çalışmaları ile uyum sağlamamaktadır. Sonuç olarak analiz sonuçları, minimum yatırım tutarı ile proje başarısı arasında olumlu yönde bir ilişki yoktur hipotezini doğrulamamaktadır.

Kitlesel fonlama projelerinin proje sayfasında yer alan ödüllerin maksimum yatırım tutarı ile proje başarısı arasında negatif yönlü bir ilişkisi olduğu gözlemlenmiştir. Maksimum yatırım tutarı literatürde analizlere yeteri kadar konu edilmemiştir. Analiz sonuçları maksimum yatırım tutarı ile proje başarısı arasında olumlu yönde bir ilişki vardır hipotezini doğrulamamaktadır. Analiz sonuçlarına göre maksimum yatırım tutarı azaldıkça proje başarısı artacaktır tahmini yapılabilmektedir.

Proje sayfasında proje sahibi hakkında bilgi olup olmaması sinyal teorisini destekleyecek şekilde proje başarısı ile pozitif ilişkili olduğu sonucuna ulaşılmıştır. Proje sahibinin veya ekibin kitlesel fonlama platformundaki proje sayfasında kişisel bilgilerinin bulunması potansiyel yatırımcılara güven ve ciddiyet vererek olumlu bir etki yaratacağına

araştırmalarında yer veren Boeuf vd. (2014) ile proje sayfasında proje sahipleri hakkında bilgilerin yer almasının olumlu bir etki yaratacağını savunan Colombo vd. (2014) ve projenin yasallığını artıracağını savunan Frydrych (2014)'in çalışmaları ile analiz sonuçları uyum sağlamaktadır. Analiz sonuçları ve literatür araştırmaları, proje sahipleri hakkında bilgi ile proje başarısı arasında olumlu ilişki vardır hipotezini doğrulamaktadır.

Proje sahiplerinin sosyal medya hesaplarına sahip olması sosyal ağ teorisinin tanınırlığı artırması yönünden desteklediği şekilde proje başarısına olumlu yönde bir etkisi olduğu sonucu elde edilmiştir Proje sahibinin sosyal medya hesaplarına sahip olması Lu vd. (2014)'nin çalışmasıyla uyum sağlamaktadır. Proje sahibinin sosyal medya sayfalarını gören destekçiler projeyi kendileriyle özdeşleştirerek daha çok kişiye ulaştırmakta ve projenin başarısına katkı sağlamaktadır (Kromidha & Robson, 2016). Çalışmada elde edilen sonuçlar, proje sahibinin sosyal medya hesabına sahip olma durumu ile proje başarısı arasında olumlu bir ilişki vardır hipotezini doğrulamaktadır.

Proje sayfasında video olup olmaması çalışmada yer alan analiz sonuçları, girişimciler ile destekçiler arasındaki bilgi asimetrisini azaltmakla ilgilenen Petitjean (2018) ile ödül temelli bir projenin başlangıcında bir videonun varlığının olmasının kitlesel fonlama projesinin başarıya ulaşma ihtimalini artırdığını savunan Marom, Sade ve Gafni (2018)'nin çalışmaları ile uyumlu bir sonuçtur. Kunz vd. (2016)'ne göre videoların sayısının proje başarısının artmasına neden olabilecek pozitif bir sinyal görevi görebilmektedir. Analiz sonuçlarına göre video olup olmaması Film ve Türkiye-Film kategorilerinde anlamlı ve proje başarısıyla pozitif yönde ilişkili olarak sonuç vermektedir. Projenin videoya sahip olması ile proje başarısı arasında olumlu yönde bir ilişki vardır hipotezi doğrulanmaktadır.

Projelerin tanıtımının yapıldığı açıklama uzunluklarının tüm verilere ilişkin sonuçlara göre proje başarısını olumlu yönde etkilediği tahmin edilmektedir. Lounsbury ve Glynn (2001)'nin çalışmaları analiz sonuçları ile uyum sağlamaktadır. Mollick'e (2014) göre proje sayfasındaki ayrıntılı açıklamalar yatırımcıların şüphelerinden biri olan dolandırıcılık algısını azaltacaktır. Analiz sonuçları, proje açıklama uzunluğu karakter sayısı ile proje başarısı arasında olumlu yönde bir ilişki vardır hipotezini doğrulamaktadır.

Çalışmada yer alan analiz sonuçlarını ülkeler bazında incelemek de mümkündür. Sadece Türkiye verileri incelendiğinde fonlama süresi, sosyal medya hesaplarına sahip olma durumu ile proje sahibi hakkında bilgi olması proje başarısı ile pozitif yönde ilişkilidir sonucuna ulaşılmıştır. Dolayısıyla Türkiye'de yürütülen kitlesel fonlama projelerinde fonlama süresi arttıkça, proje sahibi sosyal medyada ulaşılabilir oldukça ve proje sahibi hakkında bilgiye proje sayfasında yer verildikçe proje başarısı artacağı tahmin edilebilir.

ABD verilerinden elde sonuçlara göre kitlesel fonlama projelerinin fonlama süreleri Türkiye'nin aksine proje başarısı ile negatif yönde bir ilişkiye işaret etmektedir. Fonlama süresinin kısalması ABD'de yürütülen kitlesel fonlama projeleri için proje başarısını artıracağı tahminlenebilir. Bunun yanı sıra, proje sahibinin harici web sayfasına sahip olma durumunun ABD'de yürütülen kitlesel fonlama projeleri için proje başarısını yüksek

olasılıkla pozitif olarak etkilediği tahmin edilebilir. Minimum ve maksimum yatırım tutarı eklenerek oluşturulan bir diğer model ile Amerika için ödül sayısı ve minimum yatırım tutarının proje başarısı ile pozitif bir ilişkisi olduğu, maksimum yatırım tutarı ile negatif yönde bir ilişkisi olduğu tespit edilmiştir.

Son olarak, analiz bulguları ele alınan iki ayrı sektör açısından da değerlendirilebilir. Analiz bulgularına göre fonlama konusu film verilerine ilişkin kurulan modellerde (Amerika-Film kategorisi hariç) proje başarısı ile yatırımcının dikkatini çekeceğini savunulan proje sahibinin harici bir web sitesine sahip olması arasında sinyal teorisini destekleyen bir biçimde pozitif yönde ilişki olduğu tespit edilmiştir. Bu sektörde, ayrıca ödül sayısı, fonlama süresi, minimum yatırım tutarı ve projenin videoya sahip olup olmamasının da proje başarısını olumlu yönde etkilediği gözlenmektedir. Teknoloji sektörü bulgularına göre ise proje ödül sayısı arttıkça ve proje sayfasında proje sahibi hakkında bilgiye yer verildikçe proje başarısı artmaktadır. Bu sektörde, fonlama süresinin film projelerinin aksine proje başarısı ile negatif yönlü bir ilişkisi olduğu gözlenmiştir.

7. Sonuç

Bu çalışma, kitlesel fonlama başarısını etkileyen faktörlere kitlesel fonlama platformlarından toplanan proje bilgileri vasıtasıyla detaylı bir inceleme sunmayı amaçlamaktadır. Bu amaç doğrultusunda Türkiye ve Amerika Birleşik Devletleri'ndeki kitlesel fonlama platformlarından elde edilen başarılı ve başarısız kitlesel fonlama projelerine ait veriler 15 değişken açısından 19 ayrı modelle analiz edilmiş ve bulguları sunulmuştur. Bulgular, örneklemin seçildiği ülke veya sektöre göre farklılıklar gösterse de genel anlamı ile kitlesel fonlama projelerinin başarısını inceleyen uluslararası literatür ile oldukça uyumludur. Sonuçlar ülkeler ve sektörler bazında karşılaştırılmış Türkiye ve ABD örneklemleri ile Teknoloji ve Film sektörleri örneklemleri açısından farklılıklar ortaya konmuştur. Türkiye'de her geçen gün yaygınlaşan kitlesel fonlama projeleri için çalışmanın bulgularının proje sahipliği yürütmek isteyen girişimciler veya bu projelerin etkinliğini araştıracak çalışmalar için yol gösterici nitelikte olacağı düşünülmektedir. İlerleyen çalışmalarda örneklemlerin ülkeler ve sektörler bazında geliştirilmesi düşünülebilir.

Kaynaklar

Agrawal, A. et al. (2011), "The Geography of Crowdfunding", *NBER Working Paper* 16820.

Alois, J.D. (2014), *Crowdfund Global Expo Shares Encouraging Data on Crowdfunding*, Crowdfund Insider.

Atsan, N. & E.O. Erdoğan (2015), "Girişimciler İçin Alternatif Bir Finansman Yöntemi: Kitlesel Fonlama (Crowdfunding)", *Eskişehir Osmangazi İİBF Dergisi*, 10(1), 297-320.

Audretsch, D.B. et al. (2012), "Financial signaling by innovative nascent ventures: the relevance of patents and prototypes", *Research Policy*, 41(8), 1407-1421.

Bakshy, E. et al. (2012), "The role of social networks in information diffusion", *Proceedings of the 21st International Conference on World Wide Web*, 519-528.

Belleflamme, P. et al. (2012), "Crowdfunding: Tapping the Right Crowd", *Journal of Business Venturing*, 29(5), 585-609.

Boeuf, B. et al. (2014), "Financing Creativity:Crowdfunding as a New Approach for Theatre Projects", *International Journal of Arts Management*, 16(3), 33-48.

Borgatti, S.P. et al. (2014) "Social network research: confusions, criticisms, and controversies", *Research in the Sociology of Organizations*, 40, 1-29.

Borst, I. et al. (2017), "From Friendfunding to Crowdfunding: Relevance of Relationships, Social Media, and Platform Activities to Crowdfunding Performance", *New Media & Society*, 1-19.

Burtch, G. et al. (2013), "An Empirical Examination of The Antecedents And Consequences of Investment Patterns In Crowd-funded Markets", *SSRN Electronic Journal. Information Systems Research*, 24(3), 499-519.

Chen, S. et al. (2016), "What Really Makes a Promotional Campaign Succeed on Crowdfunding Platform", *Journal of Advertising Research*, 6(1), 81-94.

Clauss, T. et al. (2017), "Directing the wisdom of the crowd : the importance of social interaction among founders and the crowd during crowdfunding campaigns", *Economics of Innovation and New Technology*, 27(8), 709-729.

Colombo, M. et al. (2014), "Internal Social Capital and the Attraction of Early Contributions in Crowdfunding", *Entrepreneurship Theory and Practice*, 39(1), 75-100.

Cordova, A. et al. (2015), "The Determinants of Crowdfunding Success: Evidence from Technology Projects", *Procedia - Social and Behavioral Sciences*, 181, 115-124.

Çokluk, O. vd. (2010), *Sosyal bilimler için çok değişkenli istatistik SPSS ve LISREL Uygulamaları*, Ankara: Pegem.

Çonkar, M.K. & M.F. Canbaz (2018), "Kitle Fonlaması Finansman Yöntemi: Türkiye'de Sistemin Geliştirilmesine Yönelik Öneriler", *Optimum Ekonomi ve Yönetim Bilimleri Dergisi*, 5(2), 119-132.

Drablos, C. (2015), "What Influences Crowdfunding Campaign Success", *Unpublished Master Thesis*, University of Agder, Faculty of Economics and Social Science, Department of Economics and Business Administration, Norway.

Forbes, H. & D. Schaefer (2017), "Guidelines for Successful Crowdfunding", *Procedia CIRP*, 60, 398-403.

Frydrych, D. et al. (2014), "Exploring Entrepreneurial Legitimacy in Reward-based Crowdfunding", *Venture Capital*, 16(3), 247-269.

Gerber, E.M. et al. (2012), "Crowdfunding: Why people are motivated to post and fund projects on crowdfunding platforms", in *Proceedings of the International Workshop on Design, Influence, and Social Technologies: Techniques, Impacts and Ethics*, 2(11), 10.

Griffin, Z. (2012), "Crowdfunding: Fleecing the American Masses", *Case Western Reserve Journal of Law, Technology & the Internet*, 4, 375.

Gulati, S. (2014), "Crowdfunding: A Kick Stater for Startups", *Special Report*, TD Economics.

Howe, J. (2006), "The Rise of Crowdsourcing", *Wired Magazin*, <http://archive.wired.com/wired/archive/14.06/crowds.html>, 21.02.2015.

Hui, J. et al. (2014), "Understanding and leveraging social networks for crowdfunding: implications for support tools", in *CHI'14 Extended Abstracts on Human Factors in Computing Systems*, 2083-2088.

InfoDev/The World Bank (2013), *Crowdfunding's Potential for the Developing World*; Finance and Private Sector Development Department, Washington, DC: World Bank.

Kıran, T. (2013), "Sermaye Piyasalarında Kitle Fonlaması", *Yeterlilik Etüdü*, Sermaye Piyasası Kurulu Ortaklıklar Finansmanı Dairesi.

Kromidha, E. & P. Robson (2016), "Social Identity and Signalling Success Factors in Online Crowdfunding", *Entrepreneurship & Regional Development*, 28(9-10), 605-629.

Kunz, M.M. et al. (2016), "An Empirical Investigation of Signaling in Reward-based Crowdfunding", *Electronic Commerce Research*, 17(3), 425-461.

Kuppuswamy, V. & B.L. Bayus (2013), "Crowdfunding Creative Ideas: The Dynamics of Projects Backers", in *The economics of crowdfunding*, 151-182, Palgrave Macmillan, Cham.

Lacan, C. & P. Desmet (2017), "Motivations for Participation and e-WOM Among Supporters of Crowdfunding Campaigns", in *Strategic innovative marketing*, 315-321, Springer, Cham.

Lehner, O.M. (2013), "Crowdfunding social ventures: a model and research agenda", *Venture Capital*, 15(4), 289-311.

Leite, P.M. & N. Moutinho (2012), "Innovation Through Crowdfunding: A Quantitative and Qualitative Analysis of Kickstarter", in *CINET 2012: 13th International CINet Conference, Continuous Innovation Across Boundaries*.

Levin, F. (2015), "Success Determinants of Crowdfunding Projects", *Review of Business and Economics Studies*, 3(4), 79-87.

Lounsbury, M. & M.A. Glynn (2001), "Cultural Entrepreneurship: Stories, Legitimacy, and the Acquisition of Resources", *Strategic Management Journal*, 22(6-7), 545-564.

Lu, C.T. et al. (2014), "Inferring the Impacts of Social Media on Crowdfunding", *WSDM'14*, February 24-28, New York, USA.

Marom, D. et al. (2018), "Are the Life and Death of an Early Stage Venture Indeed in the Power of the Tongue? Lessons from Online Crowdfunding Pitches", *Leeds & Kauffman Crowdfunding Conference*, Jerusalem.

Mollick, E. (2014), "The Dynamics of Crowdfunding: An Exploratory Study", *Journal of Business Venturing*, 29(1), 1-16.

Ordanini, A. et al. (2011), "Crowdfunding: Transforming customers into investors through innovative service platforms", *Journal of Service Management*, 22(4), 443-470.

Petitjean, M. (2018), "What explains the success of reward-based crowdfunding campaigns as they unfold? Evidence from the French crowdfunding platform KissKissBankBank", *Finance Research Letters*, 26, 9-14.

Sancak, E. (2016), "Applicability and Readiness of Crowdfunding in Turkey", *International Journal of Business and Social Science*, 7(1), 99-110.

Skirnevsky, V. et al. (2017), "The Influence of Internal Social Capital on Serial Creators' Success in Crowdfunding", *Entrepreneurship Theory and Practice*, 41(2), 209-236.

Spence, M. (1973), "Job Market Signaling", *The Quarterly Journal of Economics*, 87(3), 355-374.

Spence, M. (2002), "Signaling in retrospect and the informational structure of markets", *American Economic Review*, 92, 434-459.

Swaminathan, S. & R. Kent (2013), "Second-by-Second Analysis of Advertising Exposure in TV Pods: The Dynamics of Position, Length, and Timing", *Journal of Advertising Research*, 53(1), 91-100.

Şahinoğlu, E. (2019), "Kitlesel Fonlama Başarı Faktörleri: Türkiye'de Ödül Bazlı Kitlesel Fonlama Projelerinin Durumu", *Yüksek Lisans Tezi*, Kırklareli.

Ünsal, S. (2017), *Kitlesel Fonlama, İş Yapma Yöntemini Değiştirecek Yeni Sistem*, İstanbul: Ceres Yayınları.

Valanciene, L. & S. Jegeleviciute (2013), "Valuation of Crowdfunding: Benefits and Drawbacks", *Economics and Management*, 18(1), 39-48.

Valanciene, L. & S. Jegeleviciute (2014), "Crowdfunding for creating value: stakeholder approach", *Procedia-Social and Behavioral Sciences*, 156, 599-604.

Wang, N. et al. (2015), "How to Crowdfund More: A Signaling Perspective", DIGIT *2015 Proceedings*, 15.

Sosyoekonomi

2021, Vol. 29(50), 547-564

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2021.04.25
Date Submitted: 23.03.2021
Date Revised: 18.10.2021
Date Accepted: 24.10.2021

Yenilenebilir Enerji Yatırımları ve İstihdam İlişkisi: E-7 Ülkeleri Üzerine Bir Analiz

Muharrem AFŞAR *(https://orcid.org/0000-0002-4071-9330), Anadolu University, Turkey; mafsar@anadolu.edu.tr*

Başak ÖZARSLAN-DOĞAN *(https://orcid.org/0000-0002-5126-7077), Anadolu University, Turkey; bozarslan@anadolu.edu.tr*

Relation of Renewable Energy Investments and Employment: An Analysis on E-7 Countries

Abstract

In general, one of the most important economic problems in all economies, especially in the E-7 countries, is low employment. In this sense, it is of great importance to adopt policies to increase employment in these countries. In this context, the relationship between employment and investment in renewable energy is analysed with the help of "Panel ARDL Method PMG Estimator" using the data set for the period 2000-2019 for E-7 countries. The study includes fixed asset investment, economic growth, inflation, and total labour force in addition to renewable energy investment in the analysis. The result of the analysis: it was found that renewable energy investment, economic growth, and fixed investment have a positive effect on employment, while total labour force and inflation have a negative effect.

Keywords : Renewable Energy, Employment, Panel Data Analysis.

JEL Classification Codes : C33, E24, O13.

Öz

Genel olarak bütün ekonomilerde, özellikle E-7 ülkelerinde temel ekonomik sorunlardan birisini düşük istihdam seviyeleri oluşturmaktadır. Bu anlamda söz konusu ülkelerde istihdam seviyesini arttıracak politikaların uygulanması büyük önem taşımaktadır. Bu kapsamda çalışmada istihdam ve yenilenebilir enerji yatırımları arasındaki ilişki E-7 ülkeleri için 2000-2019 dönemi veri seti yardımıyla "Panel ARDL Yöntemi PMG Tahmincisi" kullanılarak analiz edilmektedir. Çalışmada yenilenebilir enerji yatırımlarının yanı sıra, sabit sermaye yatırımları, ekonomik büyüme, enflasyon ve toplam işgücü de analize dahil edilmiştir. Analiz sonucunda; yenilenebilir enerji yatırımları, ekonomik büyüme ve sabit sermaye yatırımlarının istihdam üzerinde pozitif, toplam işgücü ve enflasyonun ise negatif bir etkiye sahip olduğu tespit edilmiştir.

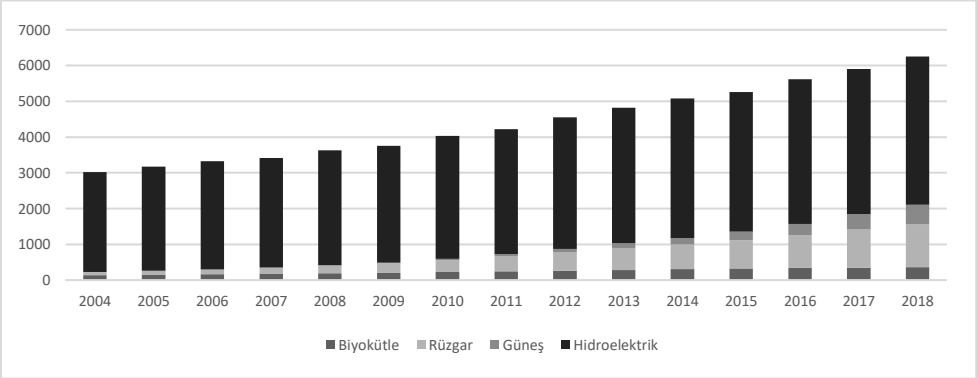
Anahtar Sözcükler : Yenilenebilir Enerji, İstihdam, Panel Veri Analizi.

1. Giriş

İçinde bulunduğumuz sosyoekonomik süreç, dünyada her geçen gün daha yoğun enerji kullanımına ve artan bir enerji talebine neden olmaktadır. Enerji talebin karşılanmasında ise kömür, petrol ve doğalgaz gibi fosil kökenli enerji kaynakları yoğun şekilde kullanılmaktadır. Karbon salınımı yüksek bu kaynakların kullanımının, artan küresel ısınma ve iklim değişikliği gibi çevresel sorunlara neden olması, dikkatleri yenilenebilir enerji kaynaklarına yöneltmektedir. Yenilenebilir enerji kaynaklarının tekrar tekrar kullanıma müsait olması ve çevre dostu olmaları nedeniyle, küresel iklim değişikliği ile mücadelede oldukça önemli bir etkiye sahip olduğu bilinmektedir. Bu bağlamda, yenilebilir enerji kaynakları kullanılarak üretilen yenilenebilir enerjinin önemi, her geçen gün artmakta ve dikkatleri üzerine çekmektedir.

Enerji kaynakları temel olarak fosil, yenilenebilir ve nükleer enerji kaynakları olarak sınıflandırılmaktadır. Yenilenebilir enerji kaynakları ise hidroelektrik, rüzgâr, güneş, biokütle, okyanus enerjisi, jeotermal vb. kaynaklar olarak alt sınıflandırmaya tabi tutulmaktadır. Artan enerji ihtiyacının karşılanmasında kullanılan fosil yakıtların, rezerv sorununun olması, coğrafi ve siyasi çatışmalar yaratması ve arz güvenliği endişesi gibi nedenler göz önüne alındığında, yenilenebilir enerji kaynakları fosil yakıtlara iyi bir alternatif oluşturmaktadır. Bu bağlamda yenilenebilir enerji kaynakları, günümüzde şimdilik toplam dünya enerjisinin yaklaşık %15-20'sini sağlamaktadır (Kumar, 2019).

Sekil: 1
Küresel Yenilenebilir Enerji Kapasitesi, 2004-2018, GW



Kaynak: IRENA, 2020.

Şekil 1'den görüldüğü gibi, başta güneş ve rüzgâr olmak üzere yenilenebilir enerji kapasitesi sürekli bir artış eğilimi içindedir. Yenilenebilir enerji kapasitesinin artış göstermesi ise iklim değişikliği, toplumsal farkındalık, fosil yakıtların fiyatlarında zaman

zaman ortaya çıkan belirsizlikler gibi nedenlere dayanmaktadır. Bununla birlikte, bu artıştaki en önemli etken, kuşkusuz yenilenebilir enerji yatırımlarında ortaya çıkan maliyet düşüşleri olmaktadır. Uluslararası Yenilenebilir Enerji Ajansı'nın (IRENA) yayınladığı ''Yenilenebilir Enerji Üretim Maliyetleri'' adlı rapora göre; 2010-2019 döneminde güneş enerjisini elektrik akımına dönüştüren teknoloji olarak bilinen fotovoltaik güneş enerjisinde %82, yoğunlaştırılmış güneş enerjisinde %47, kara rüzgarında %39 ve deniz üstü rüzgâr enerjisinde ise %29 maliyet azalışı olduğu bildirilmiştir (IRENA, 2019).

Günümüzde karbon emisyonunun büyük bir kısmı, fosil yakıtların yanmasından kaynaklanmaktadır. Bu bağlamda, fosil yakıtların kullanımının kısılması, karbon emisyonlarının azaltılmasında büyük önem taşımaktadır (Kralova & Sjöblom, 2010: 409). Yenilenebilir enerji kaynaklarının kullanımına ilişkin 2040 yılına kadar tahmin edilen küresel senaryo Tablo 1'de görülmektedir.

Tablo: 1
2040 Yılına kadar Tahmin Edilen Küresel Yenilenebilir Enerji Senaryosu

	2001	2010	2020	2030	2040
Toplam Tüketim (MTEP)	10,038	10,549	11,425	12,352	13,31
Biokütle	1080	1313	1791	2483	3271
Hidroelektrik (Küçük Ölçekli)	9,5	19	49	106	189
Hidroelektrik (Büyük Ölçekli)	22	266	309	341	358
Jeotermal	43	86	186	333	493
Rüzgâr	4,7	44	266	542	688
Güneş	4,3	17,4	93	481	872
Elektrik Üretimine Katkısı (%)	13,6	16,6	23,6	34,7	47,7

Kaynak: Kralova & Sjöblom, 2010: 410.

Buna göre; 2040 yılına gelindiğinde küresel enerji arzının yaklaşık yarısı yenilenebilir enerji kaynaklardan karşılanacaktır. Bu kaynaklar içerisinde ise biokütle, güneş ve rüzgâr enerjisinin ise daha bir ön plana çıkacağı görülmektedir. Ayrıca, güneş ve rüzgâr enerjisinin yanında, biokütle enerjisinin, gelişmiş ülkelerin sahip olduğu modern teknolojiler nedeniyle de daha yoğun kullanım oranlarına kavuşacağı tahmin edilmektedir.

Nüfus ve büyümenin sürekli artması, aynı zamanda daha fazla üretim ve buna bağlı olarak da daha fazla enerji ihtiyacı anlamına gelmektedir. Bu artan enerji ihtiyacının ise fosil kaynaklar yerine yerinebilir kaynaklardan karşılanması daha sürdürülebilir bir çevre ve daha sürdürülebilir bir ekonomik büyümenin sağlanması açısından da önemlidir (Öymen & Ömeroğlu, 2020: 1072). Diğer taraftan yenilenebilir enerji sektörel olarak değerlendirildiğinde, birçok ülkede halen daha yeni olan bir sektördür. Bu nedenden dolayı sektör, hem birçok yatırımcıyı çekebilecek kadar cazip hem de yeni olmasından dolayı içerdiği belirsizlikler nedeniyle yatırımcılar için riskli olabilmektedir. Fakat bu noktada çeşitli hükümet ve devlet teşviklerinin uygulanması, riski en aza indirmede büyük önem taşımakta ve bu alana yapılacak yatırımlarında önünü açmaktadır. Bu bağlamda yenilenebilir enerji sektöründe yatırım miktarının artması, başta gelişmekte olan ülkeler olmak üzere birçok ülkede işsizlik oranlarının düşürülmesine katkı sağlayabilir. Böylece ülke

ekonomileri arasındaki farklılıkların giderilmesine yardımcı olacağı düşünülmektedir. Yenilenebilir enerjide yüksek yatırım miktarları ve kurulu güç kapasitesindeki artış hem bu sektörde hem de ülke genelindeki istihdam üzerinde de önemli katkılar sağlayacaktır (Lehr vd., 2008: 109).

2. Yenilenebilir Enerji ve İstihdam

Enerji sektöründe, yaşanan enerji arz güvenliği problemi ve küresel iklim değişikliğinin zorunlu hale getirdiği bir dönüşümün yaşandığı gözlenmektedir. Bu dönüşüm; yaşanan teknolojik gelişmeler ve hükümetlerin uyguladığı çeşitli teşvik politikalarıyla, özellikle 90'lı yıllardan sonra dinamik bir hale gelmiştir. Bu ve benzeri gelişmeler doğrultusunda, dünya ülkeleri yenilenebilir enerji kaynaklarına yönelmiş ve ilerleyen yıllar için kendilerine çeşitli hedefler belirlemişlerdir. Bu bağlamda, örneğin, Danimarka ve İskoçya'nın %100, Almanya ve Litvanya'nın ise %60 yenilenebilir enerji hedefi koyması, sektördeki beklentilerin artmasına neden olmaktadır (REN21, 2016: 26-35, Ağpak & Özçiçek, 2018: 113). Yenilenebilir enerji sektöründeki beklentilerin artması, sektörün özellikle büyüme ve istihdam başta olmak üzere, makroekonomik etkilerinin araştırılmasını gerekli kılmaktadır.

Son yıllarda yenilenebilir enerji alanındaki gelişmeler dikkate alındığında, daha çok gelişmiş ülkelerde mevcut olan toplam kurulu güç kapasitenin, özellikle 2000'li yıllardan sonra, Çin ve Hindistan gibi gelişmekte olan ülkelere de kaymaya başladığı görülmektedir. Fakat gelişmekte olan ülkelerin en büyük sorunlarından biri, artan nüfusa paralel şekilde ortaya çıkan işgücündeki artışlardır. Bu sebepten dolayı, gelişmekte olan ülkeler, işgücü artışına paralel bir istihdam kapasitesi geliştiremediği için, düşük istihdam, yüksek işsizlik oranlarına sahiptir (Aksu, 2017: 41). Yenilenebilir enerji yatırımlarının artışı, iktisat teorisinde yatırımların istihdam artırıcı etkisi bağlamında düşünüldüğünde, uygulandığı ülkede istihdam artışı ve işsizlik oranlarında azalış yaratması, teoriden gelen bir beklenti oluşmasına neden olmaktadır.

İşsizlik oranının uzun süre doğal oranın üzerinde seyretmesi hem insan sermayesinde azalmaya hem de toplumsal sorunların artmasına yol açmaktadır. Özellikle son yıllarda istihdam oranlarını artırıcı politikaların uygulanması, tıpkı küresel ısınma ve iklim değişikliği gibi, önemli konular arasında yer almaktadır. İlgili süreçte, yenilenebilir enerji sektörünün desteklenmesi, çoğu ülkede istihdam politikası aracı olarak da işlev görmektedir. (Markandya vd., 2016: 1342; Cameron & van der Zwaan, 2015: 161; European Comission, 2014; Ağpak & Özçiçek, 2018: 113).

Yapılan çalışmalar da ilgili sektördeki istihdam gelişimi hakkında ön bilgiler sunmaktadır. Bu bağlamda, 2013 yılında 6,5 milyon kişi yenilenebilir enerji ile ilgili işlerde çalışırken, 2019 yılında doğrudan veya dolaylı olarak yaklaşık 11,5 milyon kişi söz konusu sektörde istihdam edildiği, bu istihdamın büyük bölümünün ise güneş, hidroelektrik, rüzgâr

ve biokütle enerjisi sektöründe gerçekleştirildiği ifade edilmektedir (IRENA, 2020). Buna göre, ilgili süreçte dünya genelinde yeni 5,5 milyon kişilik istihdamın oluşması, yenilenebilir enerjinin istihdam oluşturma kapasitesi açısından dikkat çekicidir. Tablo 2'de 2012-2019 yılları arasında, teknoloji bazında küresel yenilenebilir enerji istihdamı gösterilmektedir. Buna göre; ilgili dönemde en çok istihdamın yaratıldığı yenilenebilir enerji teknolojisi, güneş enerjisi ve biokütle olmuştur. Hidroelektrikte ise istihdam artırıcı kapasite, ifade edilen yıllarda güneş ve biokütlenin arkasından üçüncü sırada yer almaktadır.

Tablo: 2
Teknoloji Bazında Küresel Yenilenebilir Enerji İstihdamı (Milyon Kişi 2012-2019)

Yıllar	Hidroelektrik	Güneş	Rüzgâr	Biokütle	Diğer	Toplam
2012	1.66	2.25	0.75	2.40	0.22	7.28
2013	2.21	2.77	0.83	2.50	0.23	8.55
2014	2.04	3.25	1.03	2.99	0.19	9.50
2015	2.16	3.71	1.08	2.88	0.20	10.04
2016	2.06	3.92	1.16	2.74	0.24	10.13
2017	1.99	4.18	1.15	3.05	0.16	10.53
2018	2.05	4.48	1.16	3.18	0.18	10.98
2019	1.95	4.57	1.17	3.58	0.18	11.46

Kaynak: IRENA (2020), Renewable Energy and Jobs- Annual Review 2020.

Yenilenebilir enerji ve yatırımları nasıl olur da istihdama etki eder sorusu, çalışmanın amacı bağlamında düşünüldüğünde oldukça önemlidir. Yatırımların zaten bilinen istihdam etkisi dışında, aslında yenilenebilir enerji kaynaklarından etkin bir şekilde yararlanabilmek için, sektöre özgü önemli gerekliliklerin olduğu ifade edilmektedir. Bu gerekliliklerin başında, tasarlanan yenilenebilir enerji projelerinde üretiminin verimliliğini sağlayacak, uygun çalışma ekibi kurulması gelir. Ayrıca yenilenebilir enerji projelerine yatırım konusunda, danışmanlık hizmeti verecek nitelikli insanlara ihtiyaç olmaktadır. İlgili projelerin ülke içinde uygulanmasının sağlanması için, yeterli niteliklere sahip hukuk uzmanlarının varlığı da ayrı bir gereklilik olarak karşımıza çıkmaktadır (Yüksel vd. 2020). Öte yandan, teknik çalışmaların gerçekleştirilmesinde mühendis ve teknikerlere ihtiyaç duyulmaktadır. Bu bağlamda özellikle son yıllarda mühendislik ve teknikerlik işlerinin çoğunun, yenilenebilir enerji alanına yönlendirildiği de bir gerçektir (Lund, 2009; Dinçer & Karakuş, 2020). Bu benzeri durumların mevcudiyeti göstermektedir ki, yenilenebilir enerji yatırımlarının, özellikle belli alanlardaki istihdam üzerinde etkilerinin olması beklenir.

Yenilenebilir enerji alanında, gelişmiş ve gelişmekte olan pek çok ülkede gerek satış ve kurulum gerek işletme ve bakım gibi aşamalarda, istihdam olanakları giderek artmaktadır. Özellikle Çin, Hindistan, Brezilya, ABD ve AB ülkeleri söz konusu alanda yüksek istihdam olanağı yaratma konusunda, öne çıkan ülkelerdir (Kaya, 2020: 17). Aşağıdaki Tablo 3'te Çin, Hindistan, Brezilya, ABD ve AB ülkelerine ait yenilenebilir enerji istihdam verileri görülmektedir. Buna göre; her ülkenin farklı özelliklerine göre öne çıkan yenilenebilir enerji sektörleri olmasına karşın, genel olarak en fazla istihdamın güneş ve biokütle enerjisinde yaratıldığı görülmektedir. Özellikle Çin hem güneş enerjisinde hem de rüzgâr enerjisinde bir

liderlik sağlarken, Brezilya biokütle alanında en çok istihdama sahiptir. Mevcut durumda Brezilya'nın, küresel biyoetanol ihracının yaklaşık %50'ye yakınını gerçekleştirmesi, ülkenin ilerleyen dönemlerde bu alanda yeni tesisler kurma planlarının bulunması, istihdam olanaklarını daha da arttıracağına işaret etmektir.

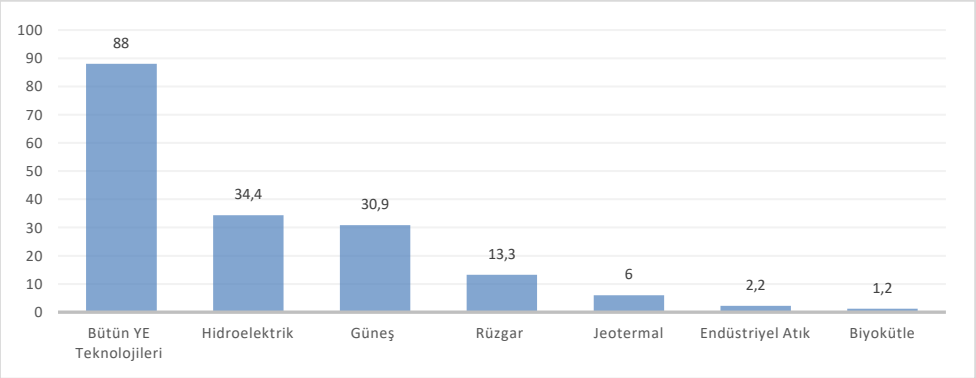
Türkiye'de yenilenebilir enerji kaynaklarının gelişimi 2000'li yıllardan sonra artmaya başlamıştır. 2005 yılında yürürlüğe giren "Yenilenebilir Enerji Kaynaklarının Elektrik Enerjisi Üretimi Amaçlı Kullanımına İlişkin Kanun" ile birlikte, özellikle rüzgâr ve güneş gibi yenilenebilir enerji kaynaklarının yatırımlarında artışlar yaşanmıştır. Ayrıca, yenilenebilir enerji yatırımlarında yerli üretime sağlanan teşvikler de yenilenebilir enerji yatırımlarındaki artışta önemli bir etkendir. Şekil 2, Türkiye'de 2020 yılına ait yenilenebilir enerji istihdamına yönelik son verilerinin izlenebilmesi açısından önemlidir.

Tablo: 3
Yenilenebilir Enerji İstihdamında Öne Çıkan Ülkeler ve İstihdam Miktarları, 2019 (Bin Kişi)

	Çin	Brezilya	Hindistan	ABD	AB
Güneş	2884	87	227	245	163
Rüzgâr	518	19	63	120	292
Biyokütle	384	839	178	355	706
Hidroelektrik	561	213	367	22	78
Jeotermal	3	-	-	9	40

Kaynak: IRENA (2020), Renewable Energy and Jobs-Annual Review 2020.

Şekil: 2
Türkiye'de Yenilenebilir Enerji İstihdamı, 2020 (Bin Kişi)



Kaynak: IRENA (2020), Renewable Energy and Jobs-Annual Review 2020.

Tabloya göre; Türkiye'de en yüksek istihdama sahip yenilenebilir enerji kolu hidroelektrik sektörü olarak görülmektedir. Sektörde yaklaşık 35 bin kişilik bir istihdam yaratılmıştır. Hidroelektriği sırasıyla, yaklaşık 30 bin kişi ile güneş, yaklaşık 13 bin kişi ile

rüzgâr ve yaklaşık 6 bin kişi ile de jeotermal enerji takip etmektedir. Biokütle ve endüstriyel atık sektöründeki istihdam oranları ise nispeten daha az olarak görünmektedir. Bunun yanında 2020 yılında Türkiye'de yenilenebilir enerji sektöründe yaratılan toplam istihdamın ise 88 bin olduğu görülmektedir.

3. Literatür Taraması

Son yıllarda ekonomi literatüründe yenilenebilir enerji ile ilgili birçok çalışma yapılmıştır. Ancak yapılan çalışmaların büyük bir bölümünün, yenilenebilir enerjinin belirleyicilerine yönelik olduğunu söyleyebiliriz. Bunun dışında özellikle yenilenebilir enerjinin gelir üzerindeki etkileri de araştırılan konular arasındadır. Yenilenebilir enerji kaynakları ile ilgili araştırmalar yaygınlaştıkça, ilgili alanın farklı makroekonomik etkilerinin araştırılması da beklenmelidir.

Yenilenebilir enerji yatırımlarının istihdam üzerindeki etkilerinin tespitine yönelik, literatürde nispeten sınırlı çalışma örneği bulmaktadır. Yapılan çalışmaların büyük çoğunluğu ise, analitik değil, daha çok teorik saptamaları içermektedir. Konu ile ilgili yaptığımız bu çalışmanın, yazında tespit edilen eksikliğin giderilmesine katkı sunacağı düşünülmektedir. Çalışmanın bu bölümünde, ilgili konudaki literatür taramasına özet olarak yer verilmektedir:

Ağpak ve Özçiçek (2018) yaptıkları çalışmada, yenilenebilir enerji kullanımının istihdam üzerindeki etkisinin belirlenmesinde Ortak İlişkili Etkiler Ortalama Grup (CCEMG) Tahmincisini kullanarak 59 ülke için 1991-2014 dönemini kapsayan bir analiz gerçekleştirmişlerdir. Elde edilen analiz sonuçlarına göre, yenilenebilir enerji kullanımı ile istihdam oranları arasında negatif bir ilişki bulunmuştur.

Apergis ve Salim (2015), 80 ülke için 1990-2013 dönemini kapsayan çalışmalarında, yenilenebilir enerji tüketiminin işsizlik oranları üzerindeki etkisini Panel veri ve Granger Nedensellik analizi yardımı ile incelemişlerdir. Elde edilen sonuçlarda, genel olarak yenilenebilir enerjinin işsizlik üzerindeki etkisinin pozitif yönde olduğu, bunun nedeni olarak da yenilenebilir enerjinin istihdam yaratma potansiyelinin maliyete bağlı olduğunu ifade etmişlerdir.

Apergis ve Payne (2010) çalışmalarında yenilenebilir enerji kullanımı ve ekonomik büyüme ilişkisini, 1992-2007 dönemi veri seti ve Avrasya kıtasında yer alan 13 ülke için Panel eşbütünleşme, nedensellik ilişkisi yardımıyla incelemişlerdir. Çalışmada kontrol değişken olarak istihdam oranları kullanılmıştır. Buna göre elde edilen sonuçlar, yenilenebilir enerji ve istihdam arasında tarafsızlık hipotezinin geçerli olduğunu kanıtlar niteliktedir.

Aşkın ve Aşkın (2019) yenilenebilir enerji sektörünün istihdam yaratma potansiyelini teorik olarak incelemişlerdir. Buna göre, yenilenebilir enerji sektörüne yapılan yatırımların, yurt içindeki sektörlerin yerlileştirilmesi ve millileştirilmesi ile birlikte gerçekleştiği takdirde, istihdam artışının daha fazla olacağını ortaya koymuşlardır.

Özsoy ve Özpolat (2020) yüksek gelirli gelişmekte olan BRICS ve MIST ülkelerinde 1991-2014 dönemi için, yenilenebilir enerji, yenilenemeyen enerji ve istihdam arasındaki nedensellik ilişkisini Bootstrapt Granger Nedensellik Analizi aracılığı ile incelemişlerdir. Elde edilen analiz sonucuna göre; Rusya, Hindistan ve Endonezya'da yenilenebilir enerji ve istihdam arasında çift yönlü nedensellik ilişkisi bulunurken, Güney Afrika ve Türkiye'de yenilenebilir enerjiden istihdama doğru bir nedensellik tespit edilmiştir. Çin, Güney Kore ve Meksika'da ise yenilenebilir enerji ve istihdam arasında nedensellik ilişkisi tespit edilememiştir.

Elfani (2011) Endonezya için, yenilenebilir enerjinin istihdam üzerindeki etkisini teorik boyutları ile incelemiştir. Buna göre 2011 döneminde Endonezya'nın işsizlik oranlarının düşürülmesinde yenilenebilir enerji alanında kapasite artışının etkili olabileceği sonucuna ulaşmıştır. Gelecek yıllarda Endonezya'da yenilenebilir enerji yatırımlarının artışı ile istihdam oranlarının da artması tahmin edilmektedir.

Karaca ve Eşgünoğlu (2017) Türkiye'nin elektrik üretiminde yenilenebilir enerjinin payının %100 olması durumunda, söz konusu sektöre ek yatırımların istihdam üzerindeki etkisini tahmin etmek için bir çalıştırma gerçekleştirmişlerdir. Ek yatırımlarda hangi yenilenebilir kaynağa ne kadar pay ayrılacağı COPRAS çok kriterli karar verme yöntemiyle belirlenirken, yenilenebilir enerji yatırım büyüklüklerinin ülkedeki istihdama yapacağı katkı ise JEDI modeline göre tahmin edilmiştir. Buna göre, fosil yakıtlı santraller yerine kurulacak 56 Bin MW büyüklüğündeki yenilenebilir enerji santrallerinin kurulumu, ülkede yaklaşık 1.132.500 kişiye istihdam sağlayacağı tahmin edilmiştir.

Kaya (2020) yenilenebilir enerji istihdamında küresel durum değerlendirmesi gerçekleştirmiştir. Buna göre işgücü piyasalarını etkileyen politikaların etkin işlemesi durumunda yenilenebilir enerji istihdamının artacağını düşünmektedir. Bu noktada Çin özellikle güneş enerjisinde, ABD ve Brezilya biyoyakıt enerjisinde istihdam artışına öncülük ederken, Hindistan'da yenilenebilir enerji yatırımlarının artması kırsal kesimde işsizliğin azalmasına katkı sağlayacağını öngörmektedir.

Lehr vd. (2008) Almanya için yaptıkları çalışmada yenilenebilir enerji sektörü ve istihdam arasındaki ilişkiyi 1000 kişilik kapsamlı bir anket oluşturarak incelemişlerdir. Elde edilen bulgulara göre Almanya'nın yenilenebilir enerji alanındaki konumunu muhafaza etmesi durumunda 2030 yılına kadar yaklaşık 400.000'in üzerinde istihdam yaratma potansiyeli bulunmaktadır.

Zhao ve Luo (2017) Çin için yaptıkları çalışmada 1978-2013 dönemi veri seti ile ARDL Sınır Testi aracılığıyla istihdamın yenilenebilir enerji üzerindeki etkilerini incelemişlerdir. Elde edilen bulgulara göre, Çin için belirtilen dönem aralığında istihdam, yenilenebilir enerji üzerinde uzun dönemde pozitif ve anlamlı bir ilişki içindedir.

Yukarıda literatür özetinden de anlaşıldığı gibi; yenilenebilir enerjinin istihdam etkisine yönelik yapılan çalışmalarda farklı sonuçlar mevcut olup, fikir birliği oluşturacak sonuçlar mevcut değildir. Sonuçlar, ele alınan ülkeye/bölgeye, yenilenebilir enerji teknolojisinin çeşidine, çalışmanın zaman aralığına ve çalışmada kullanılan modele göre değişebilmektedir.

Bu çalışmanın mevcut literatüre katkı sağlaması amacıyla, daha yeni verileri kullanarak ve örneklem alanını farklılaştırarak yeni bir denemeyi içermektedir. Bu bağlamda çalışma; 2000-2019 veri seti ve E-7 ülkeleri için, yenilenebilir enerjinin istihdam üzerindeki etkilerinin araştırılması kapsamında bir özgünlüğe sahiptir.

4. Veri Seti ve Model

Çalışma, 2000-2019 dönemine ait yıllık verilerle E-7 ülkelerinde yenilenebilir enerji yatırımlarının istihdam üzerindeki etkisini incelemeyi amaçlamaktadır. Brezilya, Çin, Hindistan, Endonezya, Meksika, Rusya ve Türkiye çalışmanın örneklemini oluşturmaktadır. Çalışmada E-7 ülkelerinin seçilme nedeni; son yıllarda hızlı ekonomik büyüme içinde olmaları ve gelecekte dünyanın ana üretim merkezi konumuna gelecekleri yönündeki beklentilerin yarattığı önemdir. Bunun yanı sıra başta Çin, Hindistan ve Brezilya olmak üzere E-7 ülkeleri, her yıl yenilenebilir enerji alanında yarattıkları kapasite artışı ve bu alandaki istihdam oranları anlamında da önemli ülkelerdir. Örneğin 2019 yılı itibariyle tüm yenilenebilir enerji işlerin yaklaşık %40'ını Çin gerçekleştirirken, yaklaşık 830 bin istihdam ile Brezilya ise dünyanın en büyük sıvı biyoyakıt istihdamını gerçekleştirmektedir. Hindistan ise daha çok hidroelektrik, güneş ve rüzgâr enerjisi sektörlerine ağırlık vererek yaklaşık 720 bin kişilik istihdama sahiptir. Bununla birlikte güneş enerjisine yönelik istihdamda ilk 10 ülke arasında Çin, Hindistan ve Türkiye yer alırken, biokütle ve rüzgâr enerjisine yönelik istihdamda ilk 10 ülke arasında Çin, Hindistan ve Brezilya bulunmaktadır. Rusya ve Endonezya ise daha çok hidroelektrik enerjisi sektöründe istihdam gerçekleştirmektedir. Son olarak Meksika'da ise Brezilya'ya benzer şekilde en çok istihdam yaratılan sektör, biokütle enerjisi sektörüdür (IRENA, 2020).

Yenilenebilir enerji yatırımlarının istihdam üzerindeki etkisini araştırmak amacıyla kullanılan değişkenler, Tablo 4'te yer almaktadır.

Tablo: 4
Ekonometrik Analizde Kullanılan Değişkenler ve Elde Edilen Kaynaklar

Değişken	Tanımı	Kaynağı
Bağımlı Değişken		
EMP	Genel İstihdam Oranı-% (15+ yaş)	Dünya Bankası-WDI
Bağımsız Değişkenler		
LBR	Toplam İşgücü	Dünya Bankası-WDI
GRW	Ekonomik Büyüme-% (Yıllık)	Dünya Bankası-WDI
GF	Sabit Sermaye Yatırımlarının GSYİH İçindeki Payı (%)	Dünya Bankası-WDI
LRE	Yenilenebilir Enerji Yatırımları (YE Elektrik üretim kapasitesi MW)	Uluslararası Yenilenebilir Enerji Ajansı-IRENA
INF	Enflasyon-% (Yıllık TÜFE)	Dünya Bankası-WDI

Yenilenebilir enerji yatırımlarının istihdam üzerinde yarattığı etkiyi ampirik olarak sınamak için tahmin edilen model Eşitlik 1 'de gösterilmiştir.

$$EMP= \beta_{0i}+ \beta_{1i}LLBR + \beta_{2i}\ GRW + \beta_{3i}\ GF + \beta_{4i}\ LRE + \beta_{5i}\ INF + \varepsilon_{it} \quad (1)$$

İfade edilen model aracılığıyla uzun dönem denklemi ve parametre katsayılarına ulaşmak için izlenecek aşamalar aşağıda ifade edilmiştir:

- Yatay kesit bağımlılığı
- Serilerin durağanlığının belirlenmesi için birim kök testleri
- Kao (1999) Eşbütünleşme Testi
- Pesaran vd. (2007) tarafından önerilen PMG Tahmincisi

Ekonometrik çalışmalarda, zaman serisi verileri, kesit verileri ve zaman serisi verileri ile kesit verilerinin bir birleşimi olan karma veriler olmak üzere üç tür veri kullanılmaktadır. Şayet, aynı kesit birimi belirli bir zaman içinde inceleniyorsa bu tür karma verilere panel veri adı verilmektedir (Gujarati, 1999).

Panel verinin kullanıldığı araştırmalarda genel olarak üç amaç bulunmaktadır. Bunlardan ilki, birimler arası değişkenliği veya her bir birimin zaman boyunca değişkenliğini tanımlamaktır. İkincisi, bu değişkenlikleri diğer bazı değişkenler bakımından açıklamaktır. Bu değişkenler cinsiyet gibi zaman boyunca sabit olacağı gibi, ruhsal durum gibi zaman içerisinde değişebilen türden olabilmektedir. Üçüncüsü ise her bir birimin ilgili değişken bakımından kestirimini yapmaktır (Hsiao, 2003: 89; Çemrek & Burhan, 2014: 49). Panel veriler genel olarak Eşitlik 1'de ifade edildiği gibidir:

$$Y_{it} = \beta_0 + \beta_{1it}X_{1it} +\ldots+ \beta_{kit}\ X_{kit} + e_{it.}\ i=1,2,\ldots N\ t=1,2,\ldots T \quad (2)$$

Eşitlik 2'de yer alan i kesitleri, t ise zamanı ifade etmektedir. Y değişkeni ise her bir birimin her bir zaman periyodunda farklı değerlere sahip olduğu için i ve t olmak üzere iki alt göstergeyle ifade edilmiştir.

Ekonometrik analizlerde serilerin durağanlıktan uzak olması durumunda, sahte regresyon denilen yanıltıcı sonuçlar ortaya çıkabilmektedir. Bu sebepten dolayı, serilerin durağanlığının test edilmesi ekonomerik analizler için büyük önem taşımaktadır (Barak & Naimoğlu, 2018: 88). Bu çalışmada serilerin durağanlığının test edilmesinde Maddala ve Wu (1999) birim kök testi kullanılmıştır. Söz konusu birim kök testine göre, boş hipotez serinin durağan olmadığını yani birim kökün varlığını, alternatif hipotez ise serinin durağan olduğunu yani birim kökün olmadığını ifade etmektedir. Birim kök testleri ile serilere ait durağanlık incelemesi yapıldıktan sonra seriler arasında uzun dönemde karşılıklı bir ilişkinin bulunup bulunmadığının araştırılmasında Kao (1999) Eşbütünleşme Testi uygulanmıştır. Eşbütünleşme ilişkisi araştırıldıktan sonra ise eşbütünleşme ilişkisi olan değişkenler için Panel ARDL Yönteminin önerdiği Pesaran vd. (1999) tarafından geliştirilen (Pooled Mean Group) PMG tahmini ile kısa ve uzun dönem katsayılar tahmin edilmiştir. Panel Veri analizi ile tahmin edilmek üzere oluşturulan model, yukarıda da belirtildiği gibi Eşitlik 1 olarak sunulmuştur. Buradan hareketle Panel ARDL denklemi Eşitlik 3'teki gibi ifade edilebilmektedir:

$$\Delta EMP = \beta_0 + \sum_{i=1}^{p} \beta_{1i}\, \Delta EMP_{t-p} + \sum_{i=1}^{p} \beta_{2i}\, \Delta LBR_{t-p} + \sum_{i=1}^{p} \beta_{3i}\, \Delta GRW_{t-p} + \sum_{i=1}^{p} \beta_{4i}\, \Delta GF_{t-p} + \sum_{i=1}^{p} \beta_{5i}\, \Delta LRE_{t-p} + \sum_{i=1}^{p} \beta_{6i}\, \Delta INF_{t-p} + \varepsilon_t \quad (3)$$

Burada yer alan p; optimum gecikme uzunluğunu, Δ; fark operatörünü, εt; hata terimini, harf kısaltmaları ile verilenler ise değişkenlerin tanımındaki anlamlarını ifade etmektedir. Pesaran vd (1999)'nin metodolojisine göre Eşitlik 3 tekrar düzenlendiğinde değişkenler arasındaki uzun dönemli ilişkiyi içeren PMG modeli aşağıdaki gibidir:

$$\Delta EMP = \beta_0 + \sum_{i=1}^{p} \beta_1 ** \Delta EMP_{t-p} + \sum_{i=1}^{p} \beta_2 ** \Delta LLBR_{t-p} + \sum_{i=1}^{p} \beta_3 * * \Delta GRW_{t-p} + \sum_{i=1}^{p} \beta_4 ** \Delta GF_{t-p} + \sum_{i=1}^{p} \beta_5 ** \Delta LRE_{t-p}$$

$$\sum_{i=1}^{p} \beta_6 ** \Delta INF_{t-p} + + \beta_7 * \Delta EMP_{t-1} + \beta_8 * \Delta LLBR_{t-1} + \beta_9 * \Delta GRW_{t-1}$$

$$+ \beta_{10} * \Delta GF_{t-1} + \beta_{11} * \Delta LRE_{t-1} + \beta_{12} * \Delta INF_{t-1} + \varepsilon_t \quad (4)$$

Eşitlik 3'te yer alan $\beta_{1,2,3,4,5,6}$* terimleri uzun dönem katsayıları ifade ederken, $\beta_{1,2,3,4,5,6}$ ** terimleri ise kısa dönemli katsayıları ifade etmektedir. Panel ARDL, değişkenlerin uzun dönem homojenliğinin yanında kısa dönem heterojenliğini de sağlamaktadır.

5. Modelin Bulguları

E-7 ülkelerinde yenilenebilir enerji yatırımlarının istihdam üzerindeki etkisine yönelik analize başlamadan önce birtakım testlerin yapılması gerekmektedir. İlk olarak panel veriyi oluşturan ülkeler için yatay kesit birimleri olan ülkelerden birinde meydana gelecek bir şokun diğer ülkelere yansıması durumu olarak ifade edilen yatay kesit bağımlılığının incelenmesi gerekmektedir. İkinci olarak ise değişkenlere ait durağanlık analizinin yapılması gerekmektedir. Bu incelemelerin yapılmasıyla ancak, çalışmada uygun yöntemin kullanılması, daha etkin ve tutarlı tahminlerin yapılabilmesi mümkün olmaktadır (Doğan, 2020: 163). Bu kapsamda ilk olarak yatay kesit bağımlılığını araştırmak amacıyla, Pesaran (2004) CD testi yapılmış ve sonuçlar Tablo 5'te verilmiştir.

Tablo: 5
Yatay Kesit Bağımlılığı Test Sonuçları

Test istatistiği	İstatistik Değeri	Olasılık Değeri
CD Testi	0.614	0.5394

**0,10, **0,05 ve ***0,01 anlamlılık düzeylerini göstermektedir.*

Tablo 5'te ifade edilen yatay kesit bağımlılığı test sonuçlarına göre, panel veri setinde yer alan E-7 ülkelerinde yatay kesit bağımlılığının olmadığını ifade eden boş hipotez kabul edilerek, alternatif hipotez reddedilmiştir. Buna göre, örneklem grubundaki ülkelerde ele alınan modelde yatay kesit bağımlılığının olmadığı, yani E-7 ülkelerinden birinde ortaya çıkacak etkinin, diğer ülkelere yansımayacağı anlamına gelmektedir. Yani, elde edilen bu sonuca göre E-7 ülkelerinin birinde yaşanan makroekonomik bir şoktan, diğer ülkeler etkilenmeyecektir. Bu aşamadan sonra yatay kesit bağımlılığı olmadığından dolayı, değişkenlerin durağanlık analizinde birinci kuşak birim kök testlerinin kullanılması daha doğru olmaktadır. Çalışmada birinci kuşak birim kök testlerinden Maddala ve Wu (1999) birim kök testi kullanılmış ve elde edilen test istatistikleri Tablo 6'da gösterilmektedir.

Tablo: 6
Maddala ve Wu (1999) Birim Kök Test Sonuçları

Değişkenler	Test İstatistikleri	Uygun Gecikme Uzunluğu	Olasılık Değeri
EMP	45.259	0	0.00***
LLBR	27.106	3	0.01**
GRW	42.588	0	0.00***
GF	4.481	0	0.99
ΔGF	55.559	0	0.00***
LRE	44.993	0	0.00***
INF	53.090	0	0.00***

**0,10, **0,05 ve ***0,01 anlamlılık düzeylerini göstermektedir.*

Tablo 6'da yer alan Maddala ve Wu (1999) birim kök test sonuçlarına göre EMP, LBR, GRW, RE ve INF değişkenlerinin orijinal hallerinde birim kök içermediği, yani I(0) düzeyinde durağan oldukları, GF değişkeninin ise birinci farkı alındığında durağan hale geldiği, yani I(1) düzeyinde durağan olduğu görülmektedir.

Birim kök testleri yapıldıktan sonra, değişkenler arasında uzun dönemde eşbütünleşme ilişkisinin varlığının test edilmesinde Kao Panel Eşbütünleşme Testi uygulanmıştır. Tablo 7'de ifade edilen Kao Eşbütünleşme testi sonucuna göre, değişkenler arasında uzun dönemli bir ilişkinin varlığı tespit edilmiştir.

Tablo: 7
Kao Panel Eşbütünleşme Sonuçları

	t-istatistiği	Olasılık Değeri
ADF	-2.084691	0.0185**

**0,10, **0,05 ve ***0,01 anlamlılık düzeylerini göstermektedir.*

Tablo: 8
ARDL (3,1,1,1,1) PMG Tahmin Sonuçları (2000-2019)-Uzun Dönem

Değişkenler	Katsayı	t-istatistik	Olasılık Değeri
LLBR	-0.170455	-3.001201	0.0038***
GRW	0.182099	4.740662	0.0000***
GF	0.442976	9.676932	0.0000***
LRE	0.025113	3.471021	0.0009***
INF	-0.175573	-4.285376	0.0001***

**0,10, **0,05 ve ***0,01 anlamlılık düzeylerini göstermektedir.*

Tablo 8'de ifade edilen PGM Modeline ait uzun dönem katsayıları değerlendirildiğinde, katsayılar istatistiksel olarak anlamlı bulunmuştur. Buna göre incelenen ülkelerde yenilenebilir enerji yatırımlarının, istihdamı 0.025 oranında arttırdığı sonucuna ulaşılmıştır. Bu sonuç, Hilledrand vd. (2006) ve Apergis ve Salim (2015) ve Ağpak ve Özçiçek (2018)'in yaptıkları çalışmalar ile ayrışırken, Zhao ve Luo (2017) ve Kaya (2020)'nin çalışmaları ile uyumluluk göstermektedir. Başta Çin ve Hindistan olmak üzere E-7 ülkelerinin son yıllarda enerjide dışa bağımlılığın azaltılması ve ihtiyaç duyulan enerjinin ülke sınırlarında bulunan yenilenebilir enerji kaynaklarından karşılanması için uyguladıkları politikalar, söz konusu kaynakların yatırımlarını arttırmaktadır. Artan yatırımlar ise yeni istihdam alanlarını oluşturmaktadır. Böylelikle E-7 ülkeleri yenilenebilir enerjiye gerek Ar-Ge desteği vererek gerekse de hibe ve vergi indirimleri gibi politikalarla bu alanı destekleyerek hem rekabet gücüne sahip yeni teknolojiler yaratmakta hem de ihracat imkanlarını genişleterek istihdamın artmasına katkı sağlamaktadırlar. Ayrıca ülkelerin daha yeşil bir ekonomiye geçişte yenilenebilir enerji kaynaklarını daha yoğun kullanmak için hem yeni meslekler hem de yeşil ekonomi için yeni becerilere ihtiyaç duyan dönüştürülmüş meslekler yaratmaları gerekmektedir. Yenilenebilir enerji yatırımları gibi yeni teknolojilere yatırım yapan firmaların, doğru becerilere sahip çalışanları bulabilmeleri, söz konusu sektördeki istihdam oranlarını yakından etkilemektedir.

İstihdama etkisi incelenen kontrol değişkenlerden biri de toplam işgücüdür. Çalışmada E-7 ülkelerinde toplam işgücünde meydana gelen %1'lik artışın, istihdam oranını-0.17 oranında azalttığı görülmektedir. Nüfustaki gelişmelere bağlı olarak oluşan işgücü hem istihdam edilenleri hem de işsizleri kapsamaktadır (Esen, 2020: 9). Bu çerçevede

elde edilen sonuca göre, E-7 ülkelerinde toplam işgücünün büyük bir bölümünün istihdam edilemediği sonucu ortaya çıkmaktadır. Söz konusu ülkelerde emek talebinin emek arzını karşılamakta yetersiz kaldığı söylenebilmektedir. Diğer bir ifadeyle bu negatif etkinin nedeni, işgücünün sermayeden daha hızlı artması olabilmektedir. Bu genellikle emek yoğun üretim gerçekleştiren E-7 ülkeleri gibi ülkelerde görülen bir durum olarak karşımıza çıkmaktadır. Söz konusu ülkelerde emek yoğun sektörler, üretimde daha yüksek bir paya sahiptir.

İstihdam üzerindeki etkisi incelenen bir diğer kontrol değişken ise ekonomik büyüme oranıdır. Çalışma sonuçlarına göre, ekonomik büyümedeki %1'lik artış, istihdam oranını 0,18 oranında artırmaktadır. Ekonomik büyümenin, istihdam oranındaki artışını tek başına sağlamakta her zaman yeterli olamamasıyla beraber, istihdamı pozitif etkilediği yönünde genel bir görüş birliği mevcuttur. İstihdam ve ekonomik büyüme arasındaki ilişkinin incelenmesi için yapılan birçok çalışmada, istihdam için büyümenin bir ön koşul olarak gerekli olduğu fakat, yeterli olmadığı savunulmaktadır.

Çalışmada, istihdam üzerindeki etkisi incelenen değişkenlerden birini de sabit sermaye yatırımları oluşturmaktadır. Çalışma bulgularına göre, sabit sermaye yatırımlarındaki %1'lik artış istihdam oranını 0,44 oranında yükseltmektedir. Sabit sermaye yatırımlarının ortaya çıkardığı pozitif dışsallıklar, ekonomik büyümede artışlar meydana getirerek, istihdam oranını da arttırmaktadır.

İstihdam üzerindeki etkisi incelenen son değişken ise enflasyon oranıdır. Çalışmada elde edilen ampirik sonuçlara göre enflasyon oranındaki %1'lik artış, istihdamı -0.17 oranında azaltmaktadır. Literatürde enflasyon ile istihdam arasındaki ilişkiyi inceleyen çalışmalar iki gruba ayrılmaktadır. Bunlardan ilkini, enflasyon oranının ekonomik büyümeyi artırdığı ve bunun sonucunda istihdam oranlarının da arttığını ifade eden çalışmalar oluşturmaktadır. İkincisini ise, enflasyonun ekonomik büyüme kanalıyla istihdam üzerindeki etkisinin negatif olduğu çalışmalar oluşturmaktadır. Bu görüşlerden ilkine göre, enflasyon ülkede belirsizlik yaratarak yatırım kararlarını olumsuz etkileyerek istihdamı azaltırken, ikinci görüşe göre ise artan enflasyon, üretimi ve yatırım kararını pozitif yönde etkileyerek istihdamı artırmaktadır. Ampirik bulgular sonucunda E-7 ülkelerinde enflasyon artışı, istihdamı azaltmaktadır.

Tablo: 9
ARDL (3,1,1,1,1) PMG Tahmin Sonuçları (2000-2019)-Kısa Dönem

Değişkenler	Katsayı	t-istatistik	Olasılık Değeri
ΔEMP(-1)	0.146147	2.428192	0.0180
ΔEMP(-2)	0.131475	1.184120	0.2407
ΔLLBR	0.498946	4.319259	0.0001
ΔLGRW	-0.025124	-0.887955	0.3778
ΔGF	0.032932	0.520762	0.6043
ΔLRE	0.056258	1.395643	0.1676
ΔINF	0.008929	0.731787	0.4669
ECM	-0.183274	-2.235760	0.0288

Tablo 9'da ifade edilen değişkenlerin uzun dönem dengesine ne kadar bir hızda geri döndüğünü ifade eden Hata düzeltme Katsayısı (ECM), -0.18 olarak bulunmuştur. Bu sonuç teoriye uygun olarak negatif ve istatistiksel olarak da anlamlıdır. Buna göre, ECM terimine ait (-0.18) katsayısı, t-1 dönemindeki bir sapmanın yaklaşık %18'inin t döneminde düzeleceğini ifade etmektedir.

6. Sonuç ve Politik Önerme

Günümüzde hala küresel ölçekte kullanılan birincil enerji arz kaynaklarını, fosil kökenli enerji kaynakları oluşturmaktadır. Fosil kökenli enerji kaynaklarının ise kullanımları sırasında meydana getirdiği çevresel bozulmalardan kaynaklı küresel ısınma ve bunun yanı sıra söz konusu kaynakların homojen dağılmamalarından dolayı enerjide yarattığı dışa bağımlılık sorunu, dünya ülkeleri açısından çözüm bekleyen sorunların başında gelmektedir. Gelecek 20 yıl içerisinde bir enerji dönüşümü beklenmekte ve bu dönüşümün, yenilenebilir enerji kaynaklarının lehine olması öngörülmektedir. Fosil kökenli enerji kaynaklarının yarattığı negatif dışsallıklar nedeniyle yenilenebilir enerjiye yönelik yatırımlar da son yıllarda artış göstermektedir. Yenilebilir enerji istihdam ilişkisi ise, araştırılması gereken bir makro etkileşim sorunudur.

Bu kapsamda 2000-2019 dönemi verileri kullanılarak, yenilenebilir enerji yatırımlarının istihdam üzerindeki etkileri E-7 ülkeleri için Panel ARDL yöntemi PMG Tahmincisi aracılığıyla analiz edilmiştir. Yenilenebilir enerji yatırımları ve istihdam değişkenlerine ek olarak, istihdam üzerinde etkisi olduğu düşünülen ekonomik büyüme, toplam işgücü, sabit sermaye yatırımları ve enflasyon oranları da modelde kullanılan değişkenler arasında yer almaktadır.

Çalışmada yenilenebilir enerji yatırımlarına ilişkin katsayı pozitif ve istatistiki olarak anlamlı bulunmuştur. Yenilenebilir enerji yatırımlarında meydana gelen %1'lik artış, E-7 ülkelerinde istihdamı 0.025 oranında arttırmaktadır. Bu sonucun ortaya çıkmasında ülkelerin enerji dönüşümünü gerçekleştirmelerinde yenilenebilir enerji kaynaklarını daha yoğun kullanmak durumunda kalmaları hem yeni meslekler hem de yeşil ekonomi için yeni becerilere ihtiyaç duyan dönüştürülmüş meslekleri ortaya çıkmasının önemli bir etkisi vardır. Yenilenebilir enerji yatırımları gibi yeni teknolojilere yatırım yapan firmaların doğru

becerilere sahip çalışanları bulabilmeleri bu sektördeki istihdam oranlarını yakından etkilemektedir. Böylelikle E-7 ülkelerinin enerjide dışa bağımlılık oranlarının azaltılması ve ihtiyaç duyulan enerjinin ülke sınırlarında bulunan yenilenebilir enerji kaynaklarından karşılanması için uyguladıkları birtakım politikalar, yenilenebilir enerji kaynaklarının yatırımlarını arttırmaktadır. Artan yatırımlar ise yeni istihdam alanlarını oluşturmaktadır. Bu çerçevede E-7 ülkelerinin yenilenebilir enerjiyle ilgili Ar-Ge çalışmalarını arttırmaları, hibe ve vergi indirimi gibi politikalarla bu alanı desteklemeleri, rekabet gücüne sahip yeni teknolojiler yaratarak, ihracat imkanlarını da genişletmektedir. Bunun da istihdam artışına katkı sağladığı düşünülmektedir. Elde edilen bu sonucun oluşmasında her bir E-7 ülkesi özelinde değerlendirildiğinde ise Çin'in, sadece E-7 grubunda değil küresel toplamda da yenilenebilir enerji sektörüne en çok yatırım yapan ve bu alanda istihdam sağlayan ülkelerin başında gelmektedir. Diğer taraftan Hindistan'da ülkenin her yıl özellikle güneş ve rüzgâr enerjisi sektörleri başta olmak üzere yenilenebilir enerji sektörüne yoğun yatırım yapması, söz konusu alanın ülke içinde istihdam oranlarına olumlu katkı yapmaktadır. Bununla birlikte Brezilya ise diğer yenilenebilir enerji teknolojilerinden daha fazla biyoyakıtlara yönelmiş ve bunun neticesinde ülke, dünyanın en büyük sıvı biyoyakıt istihdamını gerçekleştirmesi yenilenebilir enerji yatırımlarının istihdam üzerindeki olumlu etkileri bakımından önemlidir. Meksika ise, Brezilya'ya benzer şekilde biyoyakıtların ağırlıkta olduğu bir yatırım stratejisi belirlemesi ülke istihdamına olumlu olarak yansıdığı söylenebilir. Rusya, Endonezya ve Türkiye'de ise yenilenebilir enerji yatırımlarının başta hidroelektrik olmak üzere güneş ve rüzgâr enerjisi sektörlerinde yoğunlaşması sonucu bu sektörlerde yaratılan istihdam ülke içinde genel istihdama katkı sağlamaktadır. Diğer taraftan, çalışmada toplam işgücü ve enflasyonun istihdam üzerindeki etkisi negatif olurken, ekonomik büyüme ve sabit sermaye yatırımlarının ise istihdam üzerindeki etkisi pozitif olarak bulunmuştur.

Günümüzde dünyadaki birçok ülkede, özellikle kamu teşvikleri ve özel sektörün işbirliği sonucunda, yenilenebilir enerji kaynaklarına yönelik yatırımlar, gerek küresel ısınmanın önlenmesi, gerekse enerjide dışa bağımlılığı azaltmaya yönelik politikalara bağlı olarak sürekli bir artış trendi göstermektedir. Bu durum sadece yatırım anlamında değil, yarattıkları yeni teknolojiler bağlamında da istihdam kaynağı olarak görülmeye başlanmıştır. Ancak özellikle Türkiye gibi gelişmekte olan ülkelerin birçoğunda, yenilenebilir enerji kullanımı ve dolayısıyla bu alandaki yatırımlar istenilen düzeyde değildir. Bu durum ise söz konusu enerjinin yarattığı fırsatları olumsuz etkilemektedir. Bu nedenle E-7 ülkeleri özelinde, tüm gelişmekte olan ülkelerin; önümüzdeki dönemde yenilenebilir enerji kaynakları kullanımı ve yatırımlarını daha da artırmalarına yönelik politikaları benimsemeleri, başta istihdam olmak üzere birçok makroekonomik değişken üzerinde olumlu katkı sağlayacağı düşünülmektedir.

Kaynaklar

Ağpak, F. & Ö. Özçiçek (2018), "Bir İstihdam Politikası Aracı Olarak Yenilenebilir Enerji", *Ömer Halisdemir Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 11(2), 112-128.

Aksu, L. (2017), "Türkiye'de istihdam, verimlilik ve iktisadi büyüme ilişkilerinin analizi", *İktisat Politikası Araştırmaları Dergisi*, 4(1), 39-94.

Apergis, N. & J.E. Payne (2010), "Renewable energy consumption and growth in Eurasia", *Energy Economics*, 32, 1392-1397.

Apergis, N. & R. Salim (2015), "Renewable energy consumption and unemployment: evidence from a sample of 80 countries and nonlinear estimates", *Applied Economics*, 47(52), 5614-5633.

Aşkın, E. & U. Aşkın (2019), "Yeşil İşler: Yenilenebilir enerji sektörünün istihdam yaratma potansiyeli", International Congress of Energy Economy And Security.

Barak, D. & M. Naimoğlu (2018), "Reel döviz kurunun dış ticaret üzerindeki etkisi: Kırılgan Beşli örneği", *Ömer Halisdemir Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 11(2), 82-95.

Brady, D. & M. Wallace (2000), "Spatialization, Foreign Direct Investment and Labor Outcomes in the American States, 1978-1996", *Social Forces*, The University of North Carolina Press, 79(1), 67-99.

Cameron, L. & B. van der Zwaan (2015), "Employment factors for wind and solar energy technologies: A literature review", *Renewable and Sustainable Energy Reviews*, 45, 160-172.

Çemrek, F. & E. Burhan (2014), "Petrol Tüketiminin Ekonomik Büyüme Üzerindeki Etkisinin Panel Veri Analizi ile İncelenmesi: Avrupa Birliği Ülkeleri ve Türkiye Örneği", *Journal of Alanya Faculty of Business/Alanya Isletme Fakültesi Dergisi*, *6*(3), 47-58.

Dinçer, H. & H. Karakuş (2020), "Yenilenebilir Enerji Yatırımları ile İstihdam Arasındaki İlişkinin Belirlenmesi: G7 Ülkeleri Üzerine Ekonometrik Bir Analiz", *İstatistik ve Uygulamalı Bilimler Dergisi*, 1(1), 40-49.

Elfani, M. (2011), "The impact of renewable energy on employment in Indonesia", *International Journal of Technology*, 2(1), 47-55.

Ernst, C. (2005), "The FDI employment link in a globalising world: The case of Argentina, Brasil and Mexico", *Employment Strategy Papers*, 2005/17, Employment Analysis Unit, Employment Strategy Department.

European Comission (2014), *An investment plan for Europe*, COM/903 final, <http://ec.europa.eu/transparency/regdoc/rep/1/2014/EN/1-2014-903-EN-F1-1.pdf>, 12.06.2017.

Gujarati, D.N. (1999), *Temel Ekonometri*, (Çev. Ü. Şenesen, G.G.Şenesen), İstanbul.

Hillebrand, B. et al. (2006), "The expansion of renewable energies and employment effects in Germany", *Energy Policy*, 34(18), 3484-3494.

Hisarcıklılar, M. et al. (2009), "Can FDI Be A Panacea For Unemployment? The Turkish Case", *Workshop on Labour Markets, Tade and FDI*, Istanbul Technical University, October, İstanbul.

Hsiao, C. (2003), *Analysis of Panel Data*, Cambridge, Newyork, 366p.: 18.

IRENA (2020), *Renewable Energy and Jobs-Annual Review 2020*, <https://public.tableau.com/profile/irena.resource#!/vizhome/IRENARETimeSeries/Charts>, 01.03.2021.

Kao, C. (1999), "Spurious regression and residual-based tests for cointegration in panel data", *Journal of econometrics*, 90(1), 1-44.

Karaca, C. & M. Eşgünoğlu (2017), "Yenilenebilir Enerji Yatırımlarının İstihdam Artırıcı Etkisi: Türkiye Örneği", *IMCOFE2017*, Barselona.

Kaya, H. (2020), "Yenilenebilir Enerji İstihdamında Küresel Durumun Değerlendirilmesi", *Sosyal Bilimler Araştırmaları Dergisi*, (2020 Sonbahar Özel Sayı I/II), 10-21.

Kralova, I. & J. Sjöblom (2010), "Biofuels-renewable energy sources: a review", *Journal of Dispersion Science and Technology*, 31(3), 409-425.

Kumar, M. (2020), "Social, Economic, and Environmental Impacts of Renewable Energy Resources", in: *Wind Solar Hybrid Renewable Energy System*, IntechOpen.

Lehr, U. et al. (2008), "Renewable energy and employment in Germany", *Energy Policy*, 36(1), 108-117.

Lund, P.D. (2009), "Effects of energy policies on industry expansion in renewable energy", *Renewable Energy*, 34(1), 53-64.

Markandya, A. et al. (2016), "Towards a green energy economy? Tracking the employment effects of low-carbon technologies in the European Union", *Applied Energy*, 179, 1342-1350.

Öymen, G. & M. Ömeroğlu (2020), "Yenilenebilir enerjinin sürdürülebilirlik üzerindeki rolü", *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi*, 19(39), 1069-1087.

Özsoy, F.N. & A. Özpolat (2020), "Yenilenebilir Enerji ve İstihdam İlişkisi: Boothstrap Granger Nedensellik Analizi", *Uluslararası Ekonomi İşletme ve Politika Dergisi*, 4(2), 263-280.

Pesaran, M.H. (2007), "A simple panel unit root test in the presence of cross-section dependence", *Journal of Applied Econometrics*, 22(2), 265-312.

Pesaran, M.H. et al. (1999), "Pooled mean group estimation of dynamic heterogeneous panels", *Journal of the American Statistical Association*, 94(446), 621-634.

Zhao, X. & D. Luo (2017), "Driving force of rising renewable energy in China: Environment, regulation and employment", *Renewable and Sustainable Energy Reviews*, 68, 48-56.

NOTES FOR CONTRIBUTORS

1. Articles not published/presented or submitted for publication/presentation elsewhere accepted in either *Turkish* or *British English*. Only papers not published but presented in scientific events of Sosyoekonomi Journal may be accepted for submission.

2. Manuscripts should not exceed single-spaced 24 A4 pages with the *Times New Roman* 11-font character size. Only the DergiPark platform welcomes article submissions.

3. The first page should include in both English and Turkish (i) the title of the article; (ii) the name(s) and the ORCID ID numbers of the author(s); (iii) institutional affiliation(s) of the author(s); (iv) abstract of not more than 100 words; (v) keywords; (vi) JEL codes. The name, address, e-mail address, phone numbers, affiliated institution and position, and academic sphere of interest of the author(s) should be indicated on a separate page.

4. Tables, figures, and graphs should be numbered consecutively and contain full references. The titles of the tables, figures, and graphs should be placed at their heading; the references of tables, figures, and graphs should be placed at the bottom of them. A comma should separate decimals. Equations should be numbered consecutively. Equation numbers should appear in parentheses at the right margin. The complete derivation of the formulas (if abridged in the text) should be provided on a separate sheet for referee use.

5. Footnotes should be placed at the bottom of the page.

6. All references should cite in the text (not in footnotes) and conform to the following examples:

It has been argued (Alkin, 1982: 210-5)....
Griffin (1970a: 15-20) states....
(Gupta et al., 1982: 286-7).
(Rivera-Batiz & Rivera-Batiz, 1989: 247-9; Dornbusch, 1980: 19-23).

7. References should appear at the end of the text as follows:

Books: Kenen, P.B. (1989), *The International Economy*, Englewood Cliffs, N.J.: Prentice-Hall, Inc.

Periodicals: Langeheine, B. & U. Weinstock (1985), "Graduate Integration", *Journal of Common Market Studies*, 23(3), 185-97.

Articles in edited books: Krugman, P. (1995), "The Move Toward Free Trade Zones", in: P. King (ed.), *International Economics and International Economic Policy: A Reader*, New York: McGraw-Hill, Inc., 163-82.

Other sources: Central Bank of the Republic of Turkey (2003), *Financial Stability*, Press Release, March 24, Ankara, <http://www.tcmb.gov.tr>.

Chang, R. (1998), "The Asian Crisis", *NBER Discussion Paper*, 4470, National Bureau of Economic Research, Cambridge, Mass.

8. Cited web pages should exist at the References with their full address and specific cited date as follows:

……, <http://www.sosyoekonomijournal.org>, 18.12.2021.

YAZARLARA DUYURU

1. Sosyoekonomi Dergisinde sadece *Türkçe* ve *İngilizce* makaleler yayımlanmaktadır. Dergiye gönderilen makaleler başka bir yerde yayımlanmamış/sunulmamış veya yayımlanmak/sunulmak üzere gönderilmemiş olmalıdır. Sadece Sosyoekonomi Dergisi tarafından düzenlenen bilimsel etkinliklerde sözlü olarak sunulan ve yazılı olarak tam metni basılmamış çalışmalar yayınlanmak üzere gönderilebilir.

2. Yazılar A4 boyutunda kâğıda, tek aralıkla, *Times New Roman* karakterinde, 11 punto ile ve 24 sayfayı geçmeyecek şekilde yazılmalıdır. DergiPark platformu dışından yapılan gönderiler kesinlikle kabul edilmemektedir.

3. Yazının ilk sayfasında Türkçe ve İngilizce olarak şu bilgiler yer almalıdır: (i) yazının başlığı; (ii) yazar(lar)ın adı ve ORCID ID numaraları; (iii) yazar(lar)ın bağlı bulunduğu kurumun adresi; (iv) en çok 100 kelimelik özet, (v) anahtar sözcükler ile (vi) çalışmanın JEL kodları; ayrı bir sayfada yazarın adı, adresi, e-mail adresi, telefon ve faks numaraları, çalıştığı kurum ve bu kurumdaki pozisyonu ile akademik ilgi alanları belirtilmelidir.

4. Tablo, şekil ve grafiklere başlık ve numara verilmeli, başlıklar tablo, şekil ve grafiklerin üzerinde yer almalı, kaynaklar ise tablo, şekil ve grafiklerin altına yazılmalıdır. Rakamlarda ondalık kesirler virgül ile ayrılmalıdır. Denklemlere verilecek sıra numarası parantez içinde sayfanın en sağında ve parantez içinde yer almalıdır. Denklemlerin türetilişi, yazıda açıkça gösterilmemişse, hakemlerin değerlendirmesi için, türetme işlemi bütün basamaklarıyla ayrı bir sayfada verilmelidir.

5. Yazılarda yapılan atıflara ilişkin dipnotlar sayfa altında yer almalıdır.

6. Kaynaklara göndermeler dipnotlarla değil, metin içinde, sayfa numaralarını da içererek, aşağıdaki örneklerde gösterildiği gibi yapılmalıdır:

……..belirtilmiştir (Alkin, 1982: 210-5).
.....Griffin (1970a: 15-20) ileri sürmektedir.
(Gupta vd., 1982: 286-7).
(Rivera-Batiz & Rivera-Batiz, 1989: 247-9; Dornbusch, 1980: 19-23).

7. Metinde gönderme yapılan bütün kaynaklar, sayfa numaraları ile birlikte, "Kaynaklar" ("Kaynakça" diye yazılmayacak) başlığı altında ve aşağıdaki örneklere uygun olarak belirtilmelidir:

Kitaplar: Kenen, P.B. (1989), *The International Economy*, Englewood Cliffs, N.J.: Prentice-Hall, Inc.

Dergiler: Langeheine, B. & U. Weinstock (1985), "Graduate Integration", *Journal of Common Market Studies*, 23(3), 185-97.

Derlemeler: Krugman, P. (1995), "The Move Toward Free Trade Zones", P. King (ed.), *International Economics and International Economic Policy: A Reader* içinde, New York: McGraw-Hill, Inc., 163-82.

Diğer Kaynaklar: Türkiye Cumhuriyet Merkez Bankası (2001), *2002 Yılında Para ve Kur Politikası ve Muhtemel Gelişmeler*, Basın Duyurusu, 2 Ocak, Ankara, <http://www.tcmb.gov.tr>.

Chang, R. (1998), "The Asian Crisis", *NBER Discussion Paper*, 4470, National Bureau of Economic Research, Cambridge, Mass.

8. Kaynaklar'da web sitelerine yapılan atıflar muhakkak, gün, ay, yıl olarak alındığı tarih itibariyle ve tam adresleriyle birlikte belirtilmelidir.

……, <http://www.sosyoekonomijournal.org>, 18.12.2019.