

EGE AKADEMİK BAKIŞ

EGE ACADEMIC REVIEW

Ekonomi, İşletme, Uluslararası İlişkiler
ve Siyaset Bilimi Dergisi

Journal of Economics, Business Administration,
International Relations and Political Science



Cilt 25 • Sayı 4 • Ekim 2025

Volume 25 • Number 4 • October 2025

ISSN 1303-099X

EGE AKADEMİK BAKIŞ

Ekonomi, İşletme, Uluslararası İlişkiler
ve Siyaset Bilimi Dergisi

EGE ACADEMIC REVIEW

Journal of Economics, Business Administration,
International Relations and Political Science



Cilt 25 • Sayı 4 • Ekim 2025

Volume 25 • Number 4 • October 2025

EGE ÜNİVERSİTESİ İKTİSADİ VE İDARİ BİLİMLER FAKÜLTESİ ADINA SAHİBİ

THE OWNER ON BEHALF OF EGE UNIVERSITY FACULTY OF ECONOMICS AND ADMINISTRATIVE SCIENCES

Dilek DEMİRHAN

BAŞ EDITÖR / EDITOR IN CHIEF

Keti VENTURA

ALAN EDITÖRLERİ / FIELD EDITORS

Ali Onur TEPECİKLİOĞLU

Altuğ GÜNAL

Barış ALPASLAN

Betül AYDOĞAN ÜNAL

Feride Aslı ERGÜL JORGENSEN

Gül HUYUGÜZEL KIŞLA

Hakan ERKAL

İnanç KABASAKAL

Miray BAYBARS

Mustafa KÜÇÜK

Nazlı Ayşe AYYILDIZ ÜNNÜ

Özge KOZAL

Utku AKSEKİ

DİL EDITÖRÜ / LANGUAGE EDITOR

Betül AYDOĞAN ÜNAL

DANIŞMA KURULU / ADVISORY BOARD

Adrian GOURLAY

Carlos E. Frickmann YOUNG

Cengiz DEMİR

Chris RYAN

Christopher MARTIN

C. Michael HALL

David LAMOD

Dilek DEMİRHAN

Erinç YELDAN

Francis LOBO

G. Nazan GÜNAY

Gülçin ÖZKAN

Haiyan SONG

Hakan YETKİNER

James KIRKBRIDE

John FLETCHER

Loughborough University, UK

Universidade Federal do Rio de Janeiro de Economia Industrial, Brazil

Katip Çelebi University, Türkiye

The University of Waikato, New Zealand

University of Bath, UK

University of Canterbury, New Zealand

David Lamond & Associates, Australia

Ege University, Türkiye

Kadir Has University, Türkiye

Edith Cowan University, Australia

Ege University, Türkiye

King's College London, UK

The Hong Kong Polytechnic University, Hong Kong

İzmir Economy University, Türkiye

London School of Business and Finance ,UK

Bournemouth University, UK

Juergen GNOTH	University of Otago, New Zealand
Justus HAUCAP	University of Düsseldorf, Germany
Joyce LIDDLE	Northumbria University, UK
Luiz MOUTINHO	University of Suffolk, UK
Lydia MAKRIDES	Evexia Inc and Global Wellness Head, Canada
Mehmet CANER	North Carolina State University, USA
Michael R POWERS	Tsinghua University, Beijing, China
Mohsen Bahmani-OSKOOEE	The University of Wisconsin-Milwaukee, USA
Pan JIAHUA	Chinese Academy of Social Sciences (CASS), China
Ron SMITH	Birkbeck, University of London, UK
Slawomir MAGALA	University of Warsaw: Warsaw, Poland
Sumru ALTUĞ	American University of Beirut, Lebanese
Thomas N. GARAVAN	University of Limerick, Ireland
Wesley J. JOHNSTON	Georgia State University, USA
William GARTNER	Babson College, USA
Zahir IRANI	University of Bradford, UK

Yayın Sekreteryası: Cihan ZEYREK, Kübra OKTA

Yayınlanma Sıklığı / Frequency: Yılda dört kez / Quarterly

Graphic and Design / Fatih Akın ÖZDEMİR

Yayınlayan / Publisher

Ege Üniversitesi, İktisadi ve İdari Bilimler Fakültesi
Bornova 35100 İZMİR / TÜRKİYE

E-mail: eab@mail.ege.edu.tr

Ege Akademik Bakış

Ege Akademik Bakış Dergisi, iktisat, işletme, uluslararası ilişkiler ve siyaset bilimi alanlarında çalışan akademisyenler, araştırmacılar ve profesyonellerin görüşlerini paylaştıkları bir forum oluşturmak amacıyla, bu alanlarda yapılmış olan uluslararası çalışmaları kapsamaktadır. Ege Üniversitesi İktisadi ve İdari Bilimler Fakültesi tarafından Ocak, Nisan, Temmuz ve Ekim aylarında olmak üzere yılda dört defa yayınlanan hakemli bir dergi olup, Türkçe veya İngilizce olarak kaleme alınmış tüm çalışmalar dergide yayınlanmak üzere gönderilebilir. Ege Akademik Bakış Dergisi aşağıdaki veri tabanlarınca taranmaktadır:

- EconLit (<http://www.aeaweb.org/>)
- ULAKBİM, Sosyal ve Beşeri Bilimler Veri Tabanı (<http://www.ulakbim.gov.tr/>)
- Emerging Sources Citation Index (ESCI)
- Director of Open Access Journals(<http://www.doaj.org/>)
- EBSCO Publishing (<http://www.ebscohost.com/>)
- PERO(<http://knjiznica.irb.hr/pero>)
- Scientific Commons(<http://en.scientificcommons.org>)
- WorldWideScience(<http://worldwidescience.org>)
- ProQuest(<http://www.proquest.com>)
- ASOS Index(<http://www.asosindex.com>)
- RePEc (<http://www.repec.org>)

Makaledeki görüşler yazarlarına aittir. Dergide yayınlanan makaleler kaynak göstermeden kullanılamaz.

Ege Academic Review includes international papers about economics, business administration, international relations and political science with the aim of providing a forum for academicians, researchers and professionals interested in these fields. This journal is subject to a peer-review process. Ege Academic Review is published by Ege University Faculty of Economics and Administrative Sciences for four times in a year. Papers written in Turkish and English can all be sent in order to be published in the journal. The articles in Ege Academic Review are indexed/abstracted in:

- EconLit (<http://www.aeaweb.org/>)
- ULAKBİM, Social Sciences and Humanities Database (<http://www.ulakbim.gov.tr/>)
- Director of Open Access Journals(<http://www.doaj.org/>)
- EBSCO Publishing (<http://www.ebscohost.com/>)
- PERO(<http://knjiznica.irb.hr/pero>)
- Scientific Commons(<http://en.scientificcommons.org>)
- WorldWideScience(<http://worldwidescience.org>)
- ProQuest(<http://www.proquest.com>)
- ASOS Index(<http://www.asosindex.com>)
- RePEc (<http://www.repec.org>)

Authors are responsible for the content of their articles. Papers published in the journal can not be quoted without reference.

Volume 25 • Number 4 • October 2025

Cilt 25 • Sayı 4 • Ekim 2025

Contents

Analysing the Relationship Among Poverty, Income Inequality, and Environmental Pollution Based on Kuznets Curve Model: Evidence from Developed Countries

Fuat LEBE, Yusuf Ekrem AKBAŞ 627-640 Article Type: Research Article

Central Bank Digital Currencies: Implications for the Turkish Lira

Muhammet DURDU 641-656 Article Type: Research Article

Overview of Economic Relationships between Türkiye and Turkic Republics

Merve Vural ALLAHAM, Cemal ZEHİR 657-678 Article Type: Research Article

How Does Organizational Justice Affect Job Satisfaction? The Mediating Role of Job Involvement

Ozan BÜYÜKYILMAZ, Cihan KARA 679-698 Article Type: Research Article

Underemployment Experiences Among Youth with Higher Education Graduates: A Qualitative Research Study in Istanbul

Halim BAŞ, Yürsa AK, Merve YOSUNKAYA 699-718 Article Type: Research Article

“(IL)Liberal Peace” As a Solution? Rethinking Pitfalls in Post-Gaddafi Libya’s Sociopolitical Transformation

Hikmet MENGÜASLAN 719-734 Article Type: Research Article

Regulations on Covert Advertising: An Analysis of Advertising Board Decisions in Türkiye

Güldane ZENGİN 735-752 Article Type: Research Article

Time-Varying Beta Estimation: A Comparison of DCC-GARCH and Rolling-Window Methods in Turkish Industry Portfolios

Cihan ÇOBANOĞLU 753-768 Article Type: Research Article

A Global Bibliometric Perspective on Organizational Attractiveness: Patterns, Influences, and Future Directions

Esra SİPAHİ DÖNGÜL, Şerife UĞUZ ARSU 769-794 Article Type: Research Article

Understanding Suicide in Türkiye: The Role of Income, Unemployment, Consumer Loans, Cost of Living, and Health Expenditure

Gökçen AYDINBAŞ, Merve ÜNLÜOĞLU 795-814 Article Type: Research Article

Analysing of the Relationship Among Poverty, Income Inequality, and Environmental Pollution Based on Kuznets Curve Model: Evidence from Developed Countries

Fuat LEBE¹, Yusuf Ekrem AKBAŞ²

ABSTRACT

This study, analyses the relationship between carbon dioxide (CO₂) emissions, income inequality, and poverty within the framework of the Environmental Kuznets Curve (EKC) in 15 developed countries over the period 2000-2021. The panel Fourier unit root test, Dynamic Seemingly Unrelated Regression (DSUR) estimator, and panel causality test are applied to analyze the relationship between these variables. The results show that there is no significant relationship between poverty, income inequality, energy consumption and CO₂ emissions. Moreover, it is found out that the EKC hypothesis, which suggests an inverted U-shaped relationship between per capita income and CO₂ emissions, is valid in developed countries. As a result, the fact that the EKC hypothesis' validity and poverty, income inequality, and energy consumption are not effective on CO₂ in developed countries shows that energy conservation policies, such as controlling carbon dioxide emissions and rationing energy consumption, will not negatively affect the real output growth.

Keywords: Poverty, Income Inequality, EKC, Panel Dynamic SUR, Panel Causality.

JEL Classification Codes: Q43, C23, I30

Referencing Style: APA 7

INTRODUCTION

Recently, climate change due to global warming has started to bring up again the take environmental pollution into account while realizing their economic growth targets for countries. Therefore, studies on the EKC hypothesis have begun to increase. The studies on the EKC hypothesis have commonly investigated the relationship between income per capita and environmental degradation. In these studies, researchers ignored the effects of variables such as poverty and income distribution, which have socio-economic effects, on environmental pollution. Poverty and income distribution are variables that have an impact on individuals' all kinds of consumption expenditures, including energy consumption. Since the EKC hypothesis is related to the effect of energy consumption on carbon dioxide emission, it is expected that differences in poverty and income distribution among countries affect the carbon dioxide emission and the validity of the EKC hypothesis. Besides, poverty and income distribution can affect the income level and correspondingly energy consumption and carbon emissions. Therefore, it cannot be expected that energy consumption and carbon dioxide emission will be the same in countries

where poverty and income inequality are different from each other. For this reason, investigating the countries that indicate similarity in terms of poverty and income distribution in the same group ensures to reviewing more comprehensively both the effect of these variables on energy consumption and the energy consumption-carbon emission nexus. Therefore, it is crucial to include poverty and income distribution in the EKC model.

Besides, when investigating energy consumption and carbon emission, categorizing the countries in this way is also important for countries in terms of showing how energy and carbon emission change as the countries go from high poverty and income inequality to low poverty and income inequality. Thus, if income distribution and poverty are not attached to studies, possible relationships between income distribution, poverty, and environmental degradation cannot be exposed completely (Grunewald, Klasen, Martinez-Zarzoso & Muris 2017; Wolde-Rufael & Idowu 2017). The traditional EKC hypothesis mainly considers the relationship between two variables, economic growth and environmental quality. Very few studies have included social factors (such as income inequality, poverty) in the framework of the EKC hypothesis (Wang,

¹ Department of Economics, Faculty of Economics and Administrative, Adiyaman University, 02040 Adiyaman/Turkey, flebe@adiyaman.edu.tr

² Department of Economics, Faculty of Economics and Administrative, Adiyaman University, 02040 Adiyaman/Turkey, yeakbas@adiyaman.edu.tr

Yang & Li, 2023). Therefore, there is a gap in the studies analyzing the EKC hypothesis in the literature due to the neglect of social effects on environmental pollution. In this study, due to the addition of social factors such as poverty and income inequality to the model, the effects of social effects on environmental pollution were taken into account. In this respect, the study is expected to fill the gap in the analysis of the effects of social factors in the EKC literature. In this context, this manuscript is the pioneer study analyzing the EKC hypothesis by including poverty and income inequality except for the study of Hassan, Zaman, and Gul (2015). Apart from the study of Hassan et al. (2015), this study takes into account the cross-section dependence, structural breaks, and non-linearity. Also, this study covers the larger country group compared to the study of Hassan et al. (2015).

Therefore, this study aims to analyze the traditional EKC hypothesis from the perspective of income inequality and poverty. It also aims to conceptualize the EKC hypothesis in developed countries by adding poverty and income inequality. Starting from here, the relationship between poverty, income inequality, energy consumption and income level is investigated. There are two main reasons for choosing this variable and country group. *i)* Kuznets (1955) states that income inequality increases as industrialization increases in developing countries. Grossman and Krueger (1991) reached similar findings in their study. Coşkun (2025) found that reducing income inequality reduces CO₂ only in high-income countries. *ii)* Khan et al. (2022), Yu and Liu (2022), Grunewald et al. (2017), Collins and Zheng (2015) emphasize that the relationship between income inequality, poverty and environmental degradation is uncertain¹. These findings and determinations lead to the question "Is the EKC hypothesis valid for developed country economies when income inequality and poverty are taken into account? If so, in which direction is its effect? Indeed, Is the effect of income inequality and poverty uncertain?" Such questions are the main motivation for our study.

This study contributes to the literature in three-way *i)* Although the earlier have investigated the EKC linkage between income per capita and energy consumption, almost no study has examined this relationship for poverty and income inequality except the studies of Hassan et al. (2015), Khan et al. (2022), Coşkun (2025). Given the importance of environmental degradation, it is crucial to fill this gap in the literature. *ii)* In this study, unlike the traditional econometric methods in the

literature, the Fourier panel unit root test, the dynamic SUR test and the panel causality test were used. These tests make the study different from the other studies in the literature as these tests take into consideration the structural shifts and cross-section dependence between observed countries. Neglecting the structural changes and the cross-section dependence between cross-section units may lead to biased results. *iii)* Finally, to test the validity of EKC by including poverty and income inequality variables in our analyzes, a large population of countries was formed, including 15 developed countries.

This study is organized as follows: In the second part, the theoretical model of the EKC hypothesis is described. In the third part, there is literature about the EKC hypothesis focusing on income inequality and poverty nexus. In the fourth part, the econometric methods used in the study can be found. In the fifth part, the data used in the study can be found. In the sixth part, there are empirical findings, and in the last part, there is a section for the results and policy recommendations.

THEORETICAL MODEL

Kuznets (1955) stated in his study that the amount of income per capita increases in line with economic growth and development, but income inequality also increases in the first stage of economic development. With industrialization, the increase in the wealth and capital accumulation of those who have the first income increase from this activity leads the rich and wealthy to become richer and this situation brings income inequality. It has been argued that this increasing income inequality decreases after a certain turning point depending on the continuation of economic development and that the course of change is an inverted U (Kuznets, 1955). This inverted-U relationship paved the way for the birth of the Environmental Kuznets Curve (EKC). Equation (1) shows the mathematical and empirical reduced form of Kuznets' work.

$$\text{GINI} = f(\text{GDP}, \text{GDP}^2, Z) \quad (1)$$

where 'GINI' indicates income inequality, GDP indicates GDP per capita, and 'Z' is the other variables.

In the 1990s, this issue was adapted to the environment and revisited in some studies based on the relationship between per capita income and environmental quality (Grossman and Krueger, 1991, 1995; Shafik, 1994; Panayotou, 1993). In these studies, it has been found that the environmental pollution level first increases and then decreases during the economic growth process. Therefore, there is an inverted-U-shaped relationship between per

¹ For more information see: Das & Khan (2023).

capita income and environmental pollution level. This relationship is called the Environmental Kuznets Curve (EKC) hypothesis in the literature (Lebe, 2016). The EKC hypothesis determines that environmental pollution rises at the first phase of economic growth. On the other hand, after reaching a certain level of income, environmental pollution starts to decrease (Coşkun, 2025). The reduced form of the EKC hypothesis is presented in equation (2).

$$CO_2 = f(GDP, GDP^2, Z) \quad (2)$$

where CO_2 represented per capita carbon dioxide emissions (Khan et al., 2016).

Very few studies have attempted to incorporate social factors into the framework of the EKC hypothesis. This easily leads to biases in the understanding of the EKC hypothesis, which in turn leads to doubts about the existence of the EKC curve (Wang et al., 2023). However, the relationship between income inequality, poverty, and environmental degradation is theoretically uncertain as highlighted in Khan et al. (2022), Yu and Liu (2022), Grunewald et al. (2017), and Collins and Zheng (2015). To reduce this ambiguity and to incorporate social factors such as income inequality and poverty into the EKC hypothesis, equation (3) is constructed below.

$$CO_2 = f(GDP, GDP^2, EC, POV, GINI) \quad (3)$$

Equation (3) is an adaptation of the EKC hypothesis in equation (2) for our study. In equation (3), EC, POV, and GINI indicate the control variables. Equation (3) exhibits the dynamic relationship between GDP per capita, energy consumption, poverty, income inequality, and CO_2 emission. This relationship can be rewritten as follows:

$$\ln CO_2 = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP^2_{it} + \beta_3 \ln EC_{it} + \beta_4 \ln POV_{it} + \beta_5 \ln GINI_{it} + u_{it} \quad (4)$$

Equation (4) determines the log-linear version of the model used in this study. CO_2 represents the carbon dioxide emission per capita that is often used for environmental pollution. GDP , EC , POV , and $GINI$ represent the real gross domestic product per capita, energy consumption, poverty, and income inequality, respectively. Also, ε_{it} determines the error term of the regression. According to the EKC hypothesis, β_1 and β_2 coefficients must be negative and positive, respectively. The EKC hypothesis expresses only β_1 and β_2 coefficients. Therefore, β_3 , β_4 , and β_5 coefficients can be determined by the authors in this study.

LITERATURE REVIEW

In the literature, the studies of Holtz-Eakin and Selden (1995), Grossman and Krueger (1995), and Cole, Raymer, and Bates (1997) are accepted as the pioneer studies to test the validity of the EKC hypothesis. Recently, studies on the EKC hypothesis have begun to increase since the effects of global warming and, accordingly, climate change has become more noticeable (Saqib & Benhmad, 2021).

The effect of income inequality on socio-economic developments has been extensively analyzed in the literature. In some of these studies (Nielsen & Alderson, 1997; List & Gallet, 1999; Galor & Moav, 2004; Paweenawat & McNown, 2014; Hao, Chen & Zhang, 2016; Grunewald et al., 2017; Knight, Schor & Jorgenson, 2017; Jorgenson, Schor & Huang, 2017; McGee & Greiner, 2018; Khan, Saleem & Fatima, 2018; Liu, Wang, Zhang, Li & Kong, 2019; Uzar & Eyuboglu, 2019; Kusumawardani & Dewi, 2020), the income inequality and the macroeconomic variables such as financial development, economic growth, export diversification nexus has been investigated. In some of these studies (Nielsen & Alderson, 1997; Paweenawat & McNown, 2014; Grunewald et al., 2017; Khan et al., 2018; Liu et al., 2019; Uzar & Eyuboglu, 2019; Kusumawardani & Dewi, 2020), findings confirm the EKC hypothesis. In some empirical studies specified above, conclusions do not support the EKC hypothesis (List & Gallet, 1999; Galor & Moav, 2004; McGee & Greiner, 2018). In these studies, poverty has been ignored and is not included in the models.

There are a lot of studies analysing the linkage between income inequality and CO_2 emissions (Qu & Zhang, 2011; Zhu, Xia, Guo & Peng 2018; Padhan, Haouas, Sahoo & Heshmati, 2019; Belaïd, Boubaker & Kafrouni, 2020; Hailemariam, Dzhumashev & Shahbaz, 2020; Chen, Xian, Zhou & Li, 2020; Wan, Wang, Wang & Zhang, 2022; Wang et al., 2023). On the other hand, there are a few studies investigate the linkage between environmental pollution and poverty (Zaman, Shah, Khan & Ahmad, 2011; Rizk & Ben Slimane, 2018; Koçak, Ulucak, Dedeoğlu & Ulucak, 2019; Khan, 2019; Baloch, Danish, Khan, Şentürk Ulucak & Ahmas 2020; Dhrifi, Jaziri & Alnahdi, 2020; Yu & Liu, 2022, He, Li, & Ayub, 2024). For instance, Zaman et al. (2011) investigated the relationship between environment degradation and poverty in Pakistan from 1975 to 2009 using the ARDL method. The results show that air pollution caused poverty. Rizk and Ben Slimane (2018) investigated the relationship between CO_2 emission and poverty in 146 countries between 1996 and 2014. It was found out a negative relationship between poverty and

CO₂ emission for both low-high income countries and the overall sample. Also, it was concluded that there was an inverted N-shaped linkage between poverty and CO₂ emissions. Koçak et al. (2019) analyzed the CO₂ emissions and poverty nexus in the 48 Sub-Saharan African countries between 2010 and 2016. They used panel data methods. The results of the analysis show that there is a strong linkage between poverty alleviation and CO₂ emissions reduction efforts. Khan (2019) examined the role of poverty under environmental deterioration in ASEAN states between 2007 and 2017. The results show that there is a significant and positive linkage between environmental degradation and poverty. Findings indicate that an increase in income inequality and poverty cause rising CO₂ emissions. However, the EKC hypothesis was not tested in the study. Baloch et al. (2020) tested the linkage between income inequality, poverty, and CO₂ emissions in 40 Sub-Saharan African countries between the period 2010-2016. Dhrifi et al. (2020) tested the CO₂ emission and poverty nexus in 98 developing countries between 1995 and 2017. As a result of the analysis, a bi-directional causal link between CO₂ emission and poverty was determined. Besides, they found that poverty negatively affects CO₂ emissions and confirms the EKC hypothesis's validity. Yu and Liu (2022) examined the relationship between poverty and CO₂ emissions using data from 30 provinces of China for the period 2005-2019. First, panel ARDL analysis was conducted. Findings confirm that poverty has a negative impact on CO₂ emissions in the short run and a positive impact in the long run. The study also used a moderating effect (ME) model and a dynamic panel threshold (DPT) models. The results of this analysis show that the negative effect of poverty on CO₂ emissions diminishes with the moderation of inclusive finance. He, Li, & Ayub (2024) examined the impact of income inequality and poverty on environmental pollution using ecological footprint (a comprehensive measure of pollution) and CO₂ emissions for the period 1990-2021 for 13 South Asian countries. Dynamic panel Quantile regression methods are used in this study. The empirical results reveal that carbon emissions and ecological footprint increase when income inequality and poverty are present.

In the literature, there is a lack of studies investigating both poverty and income inequality within the EKC hypothesis framework. There is almost no EKC study in the literature except for the studies of Hassan et al. (2015), Khan et al. (2022), Coşkun (2025) includes poverty and income inequality. Hassan et al. (2015) analyzed the factors affecting the CO₂ emissions in Pakistan for the period of 1980-2011. They applied a cointegration approach for the

analysis and they concluded that there was no significant relationship between poverty and CO₂ emissions, while there was a negative relationship between CO₂ emissions and income inequality. On the other hand, they found out that there was a positive relationship between poverty and income inequality. The findings showed that the EKC hypothesis is valid in Pakistan. Khan et al. (2022) analyzed the relationship between poverty, income inequality and ecological footprint (EFP) using data from 18 Asian developing countries for the period 2006-2017. For this purpose, the Driscoll-Kraay (D-K) standard error approach was used. The analysis revealed that poverty causes environmental degradation in terms of ecological footprint. Increasing income inequality is found to have a detrimental impact on the environment for developing countries in Asia. It also confirms the inverted U-shaped Environmental Kuznets Curve for the countries studied. Coşkun (2025) investigated the relationship between income inequality, poverty and CO₂ emissions using a panel data set of 83 countries from 1990 to 2020. As a result of the analysis, it was found that regardless of the level of development of the countries, the higher the income, the higher the emissions. In particular, reducing income inequality in high-income (developed) countries reduces consumption-based emissions, but increases production-based emissions. On the other hand, poverty-related factors are found to increase emissions. It is also emphasized that the EKC hypothesis is not valid.

ECONOMETRIC METHODOLOGY

Fourier panel unit root test

The conventional panel unit root test such as LLC (Levin, Lin & Chu, 2002), IPS (Im, Pesaran & Shin, 2003) or Breitung (2001) does not take into account the cross-section dependency and structural shift in constant or trend. Also, panel unit root test developed by Carrion-i-Silvestre, Castro, and López-Bazo (2005) and Westerlund (2012) allows for cross-section dependency and structural breaks. On the other hand, these two methods need to know the break date. Therefore, the break dates are designated endogenously in the model. Nazlioglu and Karul (2017) developed the Fourier panel unit root test takes into account gradual structural breaks, cross-sectional dependency, and non-linearity. Apart from the panel unit root tests developed by Carrion-Silvestre et al. (2005) and Westerlund (2012), this test can capture the unknown nature of structural breaks without having information about the number of breaks. This panel unit root test takes into account the heterogeneity across cross-sectional units.

Also, the test procedure of this panel unit root test bases on the Fourier approximation, developed by Becker, Enders, and Lee (2006). There are two test statistics in this method. These are individual and panel statistics. The individual statistic has a Fourier frequency and the panel statistic has a standard normal distribution. This test shows the stationarity under the null hypothesis both in individual statistics and panel statistics.

The individual statistic of this test can be obtained as follows:

$$\eta_i(k) = \frac{1}{T} \frac{\sum_{t=1}^T \tilde{S}_{it}(k)^2}{\tilde{\sigma}_{\varepsilon i}^2} \quad (5)$$

Where $\tilde{S}_{it}(k) = \sum_{j=1}^t \tilde{\varepsilon}_{ij}$ is the partial sum process by using the OLS residuals from equation (5), and $\tilde{\sigma}_{\varepsilon i}^2$ is an estimation of ε_{it} 's long-run variance. This situation can be defined as follows:

$$\sigma_{\varepsilon i}^2 = \lim_{T \rightarrow \infty} T^{-1} E(S_{it}^2) \quad (6)$$

The Fourier panel statistic [FP(k)] can be calculated by the average of individual statistics. The FP(k) can be obtained as follows:

$$FP(k) = \frac{1}{N} \sum_{i=1}^N \eta_i(k) \quad (7)$$

Dynamic SUR

Mark, Ogaki, and Sul (2005) developed Dynamic SUR (DSUR) estimator to test the long-run relationship between variables. DSUR estimator takes into account the the cross-sectional dependence, heterogeneity, and endogeneity. The significance of coefficients is determined by wald statistics, which have chi-square distributions. This test can be applied to both the heterogeneous panel and the homogeneous panel. The test procedure of DSUR can be designated as follows:

$$y_{it} = x'_{it} \beta_i + u_{it} \quad (8)$$

$$\Delta x'_{it} = u_{it} \quad (9)$$

In the equation (8), y_{it} , x_{it} and u_{it} are $k \times 1$ dimensional vector of dependent variable, independent variables and error term, respectively. It is presumed that u_{it} is correlated with leads (p) and lags of $\Delta x'_{it}$ in the method ($i = 0, 1, 2, \dots, n$). The lags and leads are attached to regression model to solve the endogeneity problem.

The vector of leads and lags can be described as follows:

$$z'_{it} = (\Delta x'_{i,t-\rho}, \dots, \Delta x'_{i,t+\rho}) \quad (10)$$

Where z'_{it} is a vector of all lead and lag values of the variable $\Delta x'_{it}$. If there are N cross-sectional equations in the model, then the variable z is a vector of N equations constructed across time where t goes from 1 to T (Mark et al., 2005). In this case, z'_{it} vector can be rewritten as follows:

$$z'_t = (z'_1, \dots, z'_N) \quad (11)$$

After the lags and leads are attached to equation (8), the SUR methodology is applied to the residuals of equation (8).

$$y_{it} = x'_{it} \beta_i + z'_t \gamma_i + \varepsilon_{it} \quad (12)$$

The SUR methodology also solves the problems of cross-section dependence and different stationarity levels of the series since the lags and leads are included in the regression. Therefore, series with stationarity orders $I(0)$ or $I(1)$ can be tested by DSUR method (Mark et al., 2005).

Panel causality test

In this study, we used the panel causality test developed by Emirmahmutoglu and Kose (2011). This test was prepared for heterogeneous panel. Also, this test estimates the VAR ($k_i + d_{max,i}$) model under the null hypothesis of non-causality.

The VAR ($k_i + d_{max,i}$) models can be obtained as follows:

$$x_{i,t} = \mu_i^* + \sum_{j=1}^{k_i+d_{max,i}} A_{1,ij} x_{i,t-j} + \sum_{j=1}^{k_i+d_{max,i}} A_{12,ij} x_{i,t-j} + u_{i,t}^x \quad (13)$$

$$y_{it} = \mu_i^y + \sum_{j=1}^{k_i+d_{max,i}} A_{21,ij} x_{i,t-j} + \sum_{j=1}^{k_i+d_{max,i}} A_{22,ij} x_{i,t-j} + u_{i,t}^y \quad (14)$$

In equation (13) and (14), $d_{max,i}$ and k_i indicate the maximum order of integration and optimum VAR lag length, respectively. To test the null hypothesis of non-causality, Fisher test statistic (λ), which is based on wald statistic, is used.

Fisher test statistic (λ) can be calculated as follows:

$$\lambda = -2 \sum_{i=1}^N \ln(p_i) \quad i = 1, 2, \dots, N \quad (15)$$

In equation (15), p_i represents the p -value of the i -th individual cross-section. If there is a cross-section dependency problem among the cross-sectional units, the limit distribution of the Fisher test statistic is not valid (Emirmahmutoglu & Kose, 2011). Therefore, the bootstrap distribution is applied to eliminate the cross-section dependency problem.

The bootstrap methodology of y can be obtained and can be generated as follows:

$$y_{i,t}^* = \hat{\mu}_i^y + \sum_{j=k_i+1}^{k_i+d \max_i} \hat{A}_{21,ij} x_{i,t-j} + \sum_{j=1}^{k_i+d \max_i} \hat{A}_{22,ij} y_{i,t-j}^* + \tilde{u}_{i,t}^* \quad (16)$$

where, $\hat{\mu}_i^y$, $\hat{A}_{21,ij} x_{i,t-j}$ and $\hat{A}_{22,ij} y_{i,t-j}^*$ are the estimations from equation (13) and (14). After the equation (16) is estimated, the Fisher test statistic obtained by equation (15) can be recalculated (Emirmahmutoglu & Kose, 2011).

DATA

The Gini coefficient (GINI), poverty (POV), real gross domestic product per capita (GDP), carbon dioxide emissions (CO₂), and energy consumption (EC) were used as variables for the analysis. The analysis covers the period 2000-2021 for 15 developed countries². The GINI coefficient is used to determine income inequality. The poverty gap (at \$3.65 a day) is used to represent poverty. GDP and its square express the real GDP measured as US dollars in 2010 prices. EC is measured in billion-kilowatt hours. The carbon dioxide emission per capita is expressed as CO₂. The data of POV, GINI and real GDP per capita were obtained from World Development Indicators (WDI). The data of CO₂ and EC were obtained from the Energy Information Administration (EIA).

The data and countries were preferred according to their availability in the database. The World Bank (WB) and Energy Information Administration (EIA) database from which the data were obtained includes 35 developed countries according to the IMF. For most of these developed countries there were missing observations, especially for the Gini coefficient (GINI) and poverty (POV). Countries with missing data were not included in the study. Therefore, only 15 developed countries (Austria, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Norway, Sweden, Switzerland, UK and US) were analyzed. In addition, since the poverty (POV) variable (poverty gap at \$3.65 a day) data for Finland, Japan, Norway, Sweden and Switzerland are available in the WB database as of 2000, our study is limited to the 2000-2021 period. All variables were used in logarithmic form.

EMPIRICAL FINDINGS

To test whether there was a cross-sectional dependency, we used CD_{LM} tests developed by Breusch and Pagan (1980) and Pesaran, Ullah, and Yamagata (2008). Table A1 in the Appendix indicates that the null

hypothesis of no cross-section dependence for all of the variables is rejected. After determining the cross-section dependence, we applied the Fourier panel unit root test, DSUR estimator, and panel causality test, respectively. The results of these tests are shown in Table 1, Table 2, and Fig 1, respectively.

Results of panel Fourier unit root test

According to Table 1, the null hypothesis of stationarity is rejected for six variables in developed countries³. The overall panel results differ from individual statistics of countries. According to individual statistics, when the Fourier frequency is one, CO₂ is stationary in three countries (Denmark, Ireland, Netherlands); GDP and GDP² are stationary in one country (Canada). Also, EC is stationary in four countries (Netherlands, Norway, Sweden, US). Furthermore, POV is stationary in five countries (Austria, Ireland, Netherlands, Sweden, Switzerland); and GINI is stationary in six countries (Denmark, Finland, Germany, Ireland, Norway, Switzerland). When the Fourier frequency is two, we found that the number of variables determined as stationary increased. When the frequency is two, CO₂ is stationary in twelve countries except for three countries (Canada, Finland, Italy). Furthermore, GDP and its square are stationary in one country (Japan); EC is stationary in seven countries (Austria, France, Italy, Netherlands, Sweden, UK, US). Also, POV is stationary in three countries (Canada, France, Switzerland); and GINI is stationary in seven countries (Austria, Finland, France, Germany, Italy, Japan, Netherlands, Switzerland, and UK).

The results of panel statistics indicate that all of the series include unit roots in both country groups. However, individual statistics differ between countries. In some countries, the series is stationary, while in others, they are non-stationary. But in most countries, when the Fourier frequency is one, it is determined that the series are non-stationary (See Table 1)⁴. These results indicate that CO₂ emissions and energy consumption can be guided by the policies implemented by national and international organizations. Moreover, these results show that poverty and income inequality can be influenced by the policies implemented by policy authorities such as the government and the central bank.

² Austria, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, UK, and US.

³ The statistics of the Fourier panel unit root test are constructed using the Bartlett kernel with the Kurozumi (2002) rule.

⁴ The critical values of the Fourier unit root test for constant and trend models are reported in Becker et al. (2006).

Table 1: The results of panel unit root test for developed countries

Country	<i>CO₂</i>		<i>GDP</i>		<i>GDP²</i>		<i>EC</i>		<i>POV</i>		<i>GINI</i>	
	<i>k=1</i>	<i>k=2</i>	<i>k=1</i>	<i>k=2</i>	<i>k=1</i>	<i>k=2</i>	<i>k=1</i>	<i>k=2</i>	<i>k=1</i>	<i>k=2</i>	<i>k=1</i>	<i>k=2</i>
Austria	0.41	0.07	2.50	0.55	0.70	0.55	0.28	0.17	0.10	0.65	0.35	0.15
Canada	0.37	1.25	0.15	0.55	0.15	0.50	0.32	0.80	0.62	0.17	0.39	0.62
Denmark	0.08	0.09	0.47	0.48	0.67	0.63	0.27	0.69	0.63	0.78	0.14	0.77
Finland	0.45	0.54	0.51	0.69	0.62	0.69	0.30	0.79	0.45	0.72	0.16	0.14
France	1.28	0.09	0.45	1.85	0.57	1.85	0.32	0.26	0.40	0.24	0.71	0.34
Germany	0.24	0.18	0.60	0.65	0.60	0.71	0.35	0.55	0.42	0.88	0.07	0.25
Ireland	0.19	0.18	0.90	1.25	0.90	1.35	0.25	0.60	0.16	0.75	0.08	1.05
Italy	0.43	0.38	0.72	1.14	0.72	1.14	0.67	0.16	0.30	0.71	0.61	0.23
Japan	0.28	0.19	0.47	0.11	0.35	0.30	0.45	0.78	0.31	0.87	0.69	0.27
Netherlands	0.13	0.13	0.34	1.02	0.26	1.01	0.08	0.25	0.16	0.73	0.75	0.23
Norway	0.36	0.19	2.01	1.46	1.09	1.24	0.07	0.92	0.55	0.83	0.08	0.70
Sweden	0.37	0.19	0.31	0.49	0.28	0.63	0.09	0.13	0.17	0.86	1.10	0.68
Switzerland	0.61	0.21	0.58	1.06	0.70	1.12	0.60	0.77	0.18	0.18	0.07	0.21
UK	0.51	0.19	0.35	0.77	0.65	0.89	0.14	0.19	0.52	0.75	0.13	0.17
US	0.52	0.28	0.33	0.68	0.25	0.95	0.16	0.18	0.43	0.91	0.73	0.79
Panel st.	20.7	7.58	40.2	48.1	40.2	48.1	22.7	18.07	15.6	15.82	9.2	9.10
<i>p</i> -value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Bold numbers state that the null of stationary hypothesis is accepted at least at the 10 percent level of significance. The critical values of constant model for individual statistics are 0.2699(1%), 0.1720(5%), and 0.1318(10%) for *k=1*; 0.6671(1%), 0.4152(5%), and 0.3150(10%) for *k=2*; 0.7182(1%), 0.4480(5%), and 0.3393(10%) for *k=3*.⁴

Results of dynamic SUR estimator

The results indicating the *CO₂* and *GDP* nexus in developed countries are shown in Table 2. Accordingly, *GDP* and *GDP²* are statistically significant. The *GDP* and the *GDP²* coefficients are positive and negative, respectively. Thus, the linkage between *CO₂* and *GDP* is an inverted U-shaped. Therefore, the EKC hypothesis is valid in developed countries. However, the individual statistics

confirm the EKC hypothesis in nine countries. However, these statistics do not support the EKC hypothesis in the other five countries (Austria, France, Italy, Japan, Switzerland). Also, turning points are smaller than *GDP* per capita in fifteen countries (Table 2).

relationships directed from the variables *POV*, *GINI*, and *EC* to *CO₂*. This result may be caused by low-income inequality and low level of poverty in developed countries.

Table 2: The results of dynamic SUR estimator for developed countries

Country	<i>GDP</i>		<i>GDP²</i>		<i>POV</i>		<i>GINI</i>		<i>EC</i>		Turning point(\$)
	Coeff.	<i>t</i> -st.	Coeff.	<i>t</i> -st.	Coeff.	<i>t</i> -st.	Coeff.	<i>t</i> -st.	Coeff.	<i>t</i> -st.	
Austria	0.06	1.613	-0.04	-1.70	-0.14	-1.13	0.48	2.410**	0.75	1.014	39.969
Canada	0.10	3.49***	-0.05	-3.2***	-0.18	-0.88	0.13	1.11	0.60	1.235	30.998
Denmark	0.32	2.488**	-0.11	-2.5**	0.11	1.135	0.23	0.984	0.07	0.992	41.536
Finland	0.15	1.712	-0.06	-1.78*	-0.20	-2.1**	0.17	0.854	0.05	1.167	37.395
France	0.10	-1.394	-0.07	-1.35	-0.31	-1.10	0.08	1.87*	0.09	0.933	25.015
Germany	0.10	4.90***	-0.03	-4.9***	-0.26	-1.20	0.25	0.945	0.18	0.979	39.130
Ireland	0.13	2.526**	-0.06	-2.6**	0.73	0.911	0.65	0.976	0.30	0.907	42.667
Italy	0.17	-1.372	-0.07	-1.172	-0.37	-1.14	0.08	1.807*	0.55	1.171	35.123
Japan	0.23	1.060	0.10	1.26	0.10	1.01	0.76	1.124	0.17	0.866	42.725
Netherlands	0.03	2.010*	-0.02	-2.12*	0.85	1.01	0.46	1.049	0.26	1.360	40.011
Norway	0.14	3.964***	-0.07	-2.58**	-0.44	-0.95	-0.20	-1.124	0.77	1.264	73.565
Sweden	0.12	4.732***	-0.06	-4.7***	0.45	1.278	0.40	0.104	0.49	0.993	14.712
Switzerland	0.066	-1.032	-0.04	-1.28	0.46	1.220	-0.15	-1.035	0.28	0.931	46.934
UK	0.09	3.568***	-0.05	-3.75***	0.27	1.045	0.34	1.209	0.33	1.231	33.254
US	0.06	3.892***	-0.02	-3.8***	-0.14	-0.88	0.60	0.859	0.45	1.147	34.265
Panel stat.	0.077	4.834***	-0.03	-4.9***	-0.02	-1.18	0.580	0.920	0.504	0.750	-

Note: *, **, and *** show the significance at 10, 5 and 1% levels, respectively.

The fact that there is no relationship between income inequality, poverty, energy consumption, and CO₂ may originate from a too low level of poverty and inequality in developed countries. The fact that poverty and income inequality are of too low value to affect other variables in developed countries may cause the causality relationship between these two variables to become insignificant. Moreover, in developed countries, individuals have high environmental awareness and use environmentally friendly technology. High environmental awareness and environmentally friendly technology do not much-increase carbon monoxide emissions, even if it increases energy consumption. This situation may cause the effect of energy consumption on CO₂ to be insignificant.

The results of the panel causality test

The panel causality test results are reported in Table A2,

correlated with poverty alleviation in the primary sector and positively correlated with poverty-alleviation in the non-agricultural sector (Jin, Fu, Li, Wu & Zhang, 2018). Moreover, social transition and climate change due to the reduction of CO₂ emissions are expected to positively affect nature and human well-being, especially poverty (Trenberth, Fasullo & Shepherd, 2015).

Another causal relationship for the developed countries is between CO₂ and EC (Fig 1). As stated in Table A2, the null hypothesis that there is no causality from CO₂ to EC can be rejected for the overall the panel. So, CO₂ is the cause of EC in developed countries. CO₂ affects energy consumption by reducing production areas and reducing the productivity of production areas. CO₂ emissions cause the productive sector to become a red zone where production is impossible. Therefore, as the increase in CO₂ decreases production areas, the energy

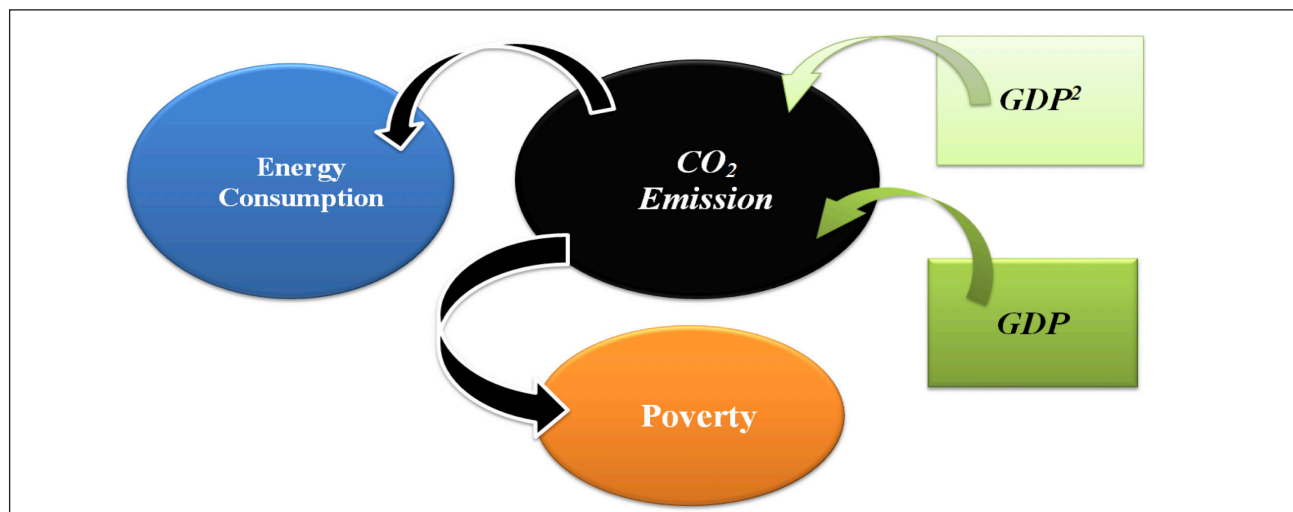


Figure 1: Causality diagram

A3, and A4. Final summary of these results are presented in Fig. 1.

Based on the results of Table A2, the null hypothesis, which states that there is no causality from GDP and GDP² to CO₂, is rejected in the overall panel analysis. According the EKC hypothesis is valid in developed countries, and this result is consistent with the outcome of the DSUR estimator.

According Table A2, the null hypothesis, which stated that there is no causal effect that goes directly from CO₂ to POV, is also rejected. Consequently, CO₂ is the cause of POV in developed countries. CO₂ emissions can affect poverty through employment. CO₂ emissions have a significant and positive relationship with the employment rate in all industries. The employment rate is negatively

use resulting from these production areas also decreases (Hassan et al., 2015).

Lastly, according to the results of Table A3 and A4, any causal effects that go directly from POV, GINI, and EC to CO₂ cannot be determined. This result is consistent with the findings of the DSUR estimator. This result may be originated from a too low level of poverty and inequality in developed countries. The fact that poverty and income inequality levels are too low to affect other variables in developed countries may cause the causality relationship between these two variables to become insignificant.

CONCLUSION

This study analyzed the EKC hypothesis between 2000 and 2021 in developed countries. Also, whether there was a relationship among poverty, income inequality, energy

use, personal income, and carbon dioxide was analyzed in the study. For this purpose, the DSUR estimator and the panel causality test were used.

The results of the DSUR estimator show that the EKC hypothesis is valid in developed countries since there is an inverted U-shaped relationship between GDP and CO₂ emissions. These results support the results of Jorgenson et al. (2017). Also, it is found that the effects of income inequality, energy consumption, and poverty on CO₂ emissions are insignificant in developed countries.

The findings of the causality test indicate the unidirectional causality from GDP and GDP² to CO₂ in developed countries. The causality relationships from GDP and GDP² to CO₂ indicate that the EKC hypothesis is valid. These results are consistent with the results of the Dynamic SUR estimator. Finally, the presence of causal effects that go from CO₂ emissions to poverty and energy consumption in developed countries shows that policymakers need to implement CO₂ emissions reduction policies in these countries. Since an increase in CO₂ may reduce the production areas, the energy use resulting from these production areas is expected to decrease. Moreover, decreasing production areas can hurt poverty since it reduces employment. Thus, in developed countries, policy authorities can implement precautions and policies to reduce CO₂ emissions.

The fact that the EKC hypothesis' validity and poverty, income inequality, and energy consumption have no impact on CO₂ in developed countries shows that energy conservation policies, such as controlling carbon dioxide emissions and rationing energy consumption, will not negatively affect the real output growth. Therefore, policy authorities should implement policies to reduce CO₂ emissions in developed countries. Moreover, using renewable energy sources rather than fossil fuels in the manufacturing industry, the transportation sector, and heating systems can be encouraged to reduce CO₂ emissions. Besides, in 2021, the turning points of all developed countries were higher than the income levels.

LIMITATIONS

According to the IMF, there are 35 developed country economies. However, for most of these developed countries there were missing observations, especially for the Gini coefficient (GINI) and poverty (POV). Countries with missing data were not included in the study. Therefore, in this study, 15 developed countries (Austria, Canada, Denmark, Finland, France, Germany,

Ireland, Italy, Italy, Japan, Japan, Netherlands, Norway, Norway, Sweden, Switzerland, UK and US) were analyzed.

In addition, since the poverty (POV) variable (poverty gap at \$3.65 a day) data for Finland, Japan, Norway, Sweden and Switzerland are available in the WB database as of 2000, our study is limited to the 2000-2021 period.

REFERENCES

- Baloch, M.A., Danish, Khan, S.U.-D., Şentürk Ulucak, Z. & Ahmad, A. (2020). Analyzing the relationship between poverty, income inequality, and CO₂ emission in Sub-Saharan African countries. *Science of The Total Environment*, 740, 139867.
- Becker, R, Enders, W. & Lee, J. (2006). A stationarity test in the presence of an unknown number of smooth breaks. *Journal of Time Series Analysis*, 27(3), 381-409.
- Belaïd, F., Boubaker, S. & Kafrouni, R. (2020). Carbon emissions, income inequality and environmental degradation: the case of Mediterranean countries. *European Journal of Comparative Economics*, 17(1), 73-102.
- Breitung, J. (2001). The local power of some unit root tests for panel data. In: Baltagi BH, Fomby TB, Carter Hill, R (Ed) *Nonstationary Panels, Panel Cointegration, and Dynamic Panels (Advances in Econometrics 15)*, Emerald Group Publishing Limited, Bingley, 161-177.
- Breusch, T.S. & Pagan, A.R. (1980). The lagrange multiplier test and its applications to model specification tests in econometrics. *Review of Economic Studies*, 47(1), 239-53.
- Carrion-i Silvestre, J.L., Barrio-Castro, T.D. & Lopez-Bazo, E. (2005). Breaking the panels: an application to the gdp per capita. *Econometrics Journal*, 8(2), 159- 175.
- Chen, J., Xian, Q., Zhou, J. & Li, D. (2020). Impact of income inequality on CO2 emissions in G20 countries. *Journal of Environmental Management*, 271, 110987.
- Cole, M.A., Raymer, A.J. & Bates, J.M. (1997). The Environmental Kuznets curve: an empirical analysis. *Environment and Development Economics*, 2(4), 401-416.
- Collins, D. and Zheng, C. (2015). Managing the poverty-CO2 reductions paradox: the case of China and the EU. *Organization & Environment*, 28(4), 355–373.
- Coşkun, E. A. (2025). "Exploring the trade-offs between carbon emissions, income inequality, and poverty: A theoretical and empirical framework" *Energy Economics*, 143, March, 108223.
- Das, A. & Khan, S. (2023). The relationship between income inequality and emissions. *Reference Module in Social Sciences*, <https://doi.org/10.1016/B978-0-44-313776-1.00179-3>
- Dhrifi, A., Jaziri, R. & Alnahdi, S. (2020). Does foreign direct investment and environmental degradation matter for poverty? evidence from developing countries. *Structural Change and Economic Dynamics*, 52, 13-21.
- Emirmahmutoglu, F. & Kose, N. (2011). Testing for Granger causality in heterogeneous mixed panels. *Economic Modelling*, 28, 870–876.
- Galor, O. & Moav, O. (2004). From physical to human capital accumulation: inequality and the process of development. *Review of Economic Studies*, 71(4), 1001-1026.
- Grossman, G.M. & Krueger, A.B. (1995). Economic growth and the environment. *Quarterly Journal of Economics*, 110(2), 353-377.
- Grossman, G.M. and Kreuger, A.B. (1991). Environmental impacts of a North American free trade agreement. NBER Working Paper, No. 3914.
- Grossman, G.M. and Krueger, A.B. (1995). Economic environment and the economic growth. *Quarterly Journal of Economics*, 110(2), 353-377.
- Grunewald, N., Klasen, S., Martinez-Zarzoso, I. & Muris, C. (2017). The trade-off between income inequality and carbon dioxide emissions. *Ecological Economics*, 142, 240-256.
- Hailemariam, A., Dzhumashev, R. & Shahbaz, M. (2020). Carbon emissions, income inequality and economic development. *Empirical Economics*, 59, 1139-1159.
- Hao, Y., Chen, H. & Zhang, Q. (2016). Will income inequality affect environmental quality? analysis based on China's provincial panel data. *Ecological Indicators*, 67, 533-542.
- Hassan, S.A., Zaman, K. & Gul, S. (2015). The relationship between growth-inequality-poverty triangle and environmental degradation: unveiling the reality. *Arab Economics and Business Journal*, 10, 57-71.
- He, Z., Li, J. & Ayub, B. (2024). How do income inequality, poverty and industry 4.0 affect environmental pollution in South Asia: New insights from quantile regression. *Heliyon*, 10(13), e33397.
- Holtz-Eakin, D. & Selden, T.M. (1995). Stoking the fires? CO₂ emissions and economic growth. *Journal of Public Economics*, 51(1), 85-101.

- Im, K.S., Pesaran, M.H. & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115(1), 53-74.
- Jin, G., Fu, R., Li, Z., Wu, F. & Zhang, F. (2018). CO₂ emissions and poverty alleviation in China: an empirical study based on municipal panel data. *Journal of Cleaner Production*, 202, 883-891.
- Jorgenson, A., Schor, J. & Huang, X. (2017). Income inequality and carbon emissions in the United States: a state-level analysis, 1997-2012. *Ecological Economics*, 134, 40-48.
- Khan, A.Q., Saleem, N. & Fatima, S.T. (2018). Financial development, income inequality, and CO₂ emissions in Asian countries using STIRPAT model. *Environmental Science and Pollution Research*, 25, 6308-6319.
- Khan, S., Yahong, W. and Zeeshan, A. (2022). Impact of poverty and income inequality on the ecological footprint in Asian developing economies: assessment of sustainable development goals. *Energy Report*, 8, 670-679.
- Khan, S.A.R. (2019). The nexus between carbon emissions, poverty, economic growth, and logistics operations-empirical evidence from Southeast Asian countries. *Environmental Science and Pollution Research*, 26(13), 13210-13220.
- Khan, S.A.R., Zaman, K. and Zhang, Y. (2016). "The relationship between energy-resource depletion, climate change, health resources and the environmental Kuznets curve: Evidence from the panel of selected developed countries" *Renewable and Sustainable Energy Reviews*, 62, pp.468-477.
- Knight, K.W., Schor, J.B. & Jorgenson, A.K. (2017). Wealth inequality and carbon emissions in high-income countries. *Social Currents*, 4, 403-412.
- Koçak, E., Ulucak, R., Dedeoğlu, M. & Ulucak, Z.Ş. (2019). Is there a trade-off between sustainable society targets in Sub-Saharan Africa? *Sustainable Cities and Society*, 51, 101705.
- Kurozumi, E. (2002). Testing for stationarity with a break. *Journal of Econometrics*, 108(1), 63-99.
- Kusumawardani, D. & Dewi, A.K. (2020). The effect of income inequality on carbon dioxide emissions: a case study of Indonesia. *Heliyon*, 6(8), e04772.
- Kuznets, S. (1955). Economic growth and income inequality. *The American Economic Review*, 45(1), 1-28.
- Lebe, F. (2016). Çevresel Kuznets Eğrisi Hipotezi: Türkiye İçin Eşbütünleşme Ve Nedensellik Analizi, *Doğuş Üniversitesi Dergisi*, 17 (2), 177-194.
- Levin, A., Lin, C. & Chu, C.J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of Econometrics*, 108, 1-24.
- List, J.A. & Gallet, C.A. (1999). The Kuznets Curve: what happens after the inverted-U? *Development Economics*, 3(2), 200-206.
- Liu, Q., Wang, S., Zhang, W., Li, J. & Kong, Y. (2019). Examining the effects of income inequality on CO₂ emissions: evidence from non-spatial and spatial perspectives. *Applied Energy*, 236, 163-171.
- Mark, N.C., Ogaki, M. & Sul, D. (2005). Dynamic seemingly unrelated cointegrating regressions. *Review of Economic Studies*, 72(3), 797-820.
- McGee, J.A. & Greiner, P.T. (2018). Can reducing income inequality decouple economic growth from CO₂ emissions? *Socius*, 4, 1-11.
- Nazlioglu, S. & Karul, C (2017). A panel stationarity test with gradual structural shifts: re-investigate the international commodity price shocks. *Economic Modelling*, 61, 181-192.
- Nielsen, F. & Alderson, A.S. (1997). The Kuznets Curve and the great U-turn: income inequality in U.S. counties, 1970 to 1990. *American Sociological Review*, 62(1), 12-33.
- Padhan, H., Haouas, I., Sahoo, B. & Heshmati, A. (2019). What matters for environmental quality in the next eleven countries: economic growth or income inequality? *Environmental Science and Pollution Research*, 26, 23129-23148.
- Panayotou, T. (1993). Empirical tests and policy analysis of environmental degradation at different stages of economic development. *ILO Technology and Employment Programme Working Paper*, WP238.
- Paweenawat, S.W. & McNown, R. (2014). The determinants of income inequality in Thailand: a synthetic cohort analysis. *Journal of Asian Economics*, 31-32, 10-21.
- Pesaran, H.M., Ullah, A. & Yamagata, T. (2008). A bias-adjusted LM test of error cross-section independence. *Econometrics Journal*, 11(1), 105-127.

- Qu, B. & Zhang, Y. (2011). Effect of Income Distribution on the Environmental Kuznets Curve. *Pacific Economic Review* Pacific Economic Review, 16(3), 349–370.
- Rizk, R. & Ben Slimane, M. (2018). Modelling the relationship between poverty, environment, and institutions: a panel data study. *Environmental Science and Pollution Research*, 25, 31459-31473.
- Saqib, M. & Benhmad, F. (2021). Updated meta-analysis of Environmental Kuznets curve: where do we stand? *Environmental Impact Assessment Review*, 86, 106503.
- Shafik, N. (1994). Economic development and environmental quality: An econometric analysis. *Oxford Economic Papers*, 46(Special Issue), 757-773.
- Trenberth, K.E., Fasullo, J.T. & Shepherd, T.G. (2015). Attribution of climate extreme events. *Nature Climate Change*, 5, 725-730.
- Uzar, U. & Eyuboglu, K. (2019). The nexus between income inequality and CO₂ emissions in Turkey. *Journal of Cleaner Production*, 227, 149-157.
- Wan, G., Wang, C., Wang, Z. & Zhang, X. (2022). The income inequality-CO₂ emissions nexus: Transmission mechanisms. *Ecological Economics*, 195, 107360.
- Wang, Q., Yang, T., & Li, R. (2023). Does income inequality reshape the environmental Kuznets curve (EKC) hypothesis? A nonlinear panel data analysis, *Environmental Research*, 216 (2), 114575.
- Westerlund, J. (2012). Testing for unit roots in panel time-series models with multiple level breaks. *The Manchester School*, 80(6), 671–699.
- Wolde-Rufael, Y. & Idowu, S. (2017). Income distribution and CO₂ emission: a comparative analysis for China and India. *Renewable and Sustainable Energy Reviews*, 74, 1336-1345.
- Yu, Y. and Liu, Q. (2022). An empirical study on correlation among poverty, inclusive finance, and CO₂ emissions in China. *Environmental Science and Pollution Research*, 29(47), 71400–71411.
- Zaman, K., Shah, I.A., Khan, M.M. & Ahmad, M. (2011). Exploring the link between poverty-pollution-population (3Ps) in Pakistan: time series evidence. *Journal of Economics and Sustainable Development*, 2(11-12), 1-27.
- Zhu, H., Xia, H., Guo, Y. & Peng, C. (2018). The heterogeneous effects of urbanization and income inequality on CO₂ emissions in BRICS economies: Evidence from panel quantile regression. *Environmental Science and Pollution Research*, 25, 17176-17193.

Table A1: The results of cross section dependence test for variables

Variables	<i>CD_{LM}</i>		<i>CD_{LMadj}</i>	
	Statistic	<i>p</i> -value	Statistic	<i>p</i> -value
<i>CO₂</i>	6.425***	0.0000	7.287***	0.0000
<i>GDP</i>	5.316***	0.0000	6.584***	0.0000
<i>GDP</i> ²	5.416***	0.0000	9.187***	0.0000
<i>EC</i>	8.214***	0.0000	9.787***	0.0000
<i>POV</i>	8.987***	0.0000	5.654***	0.0000
<i>GINI</i>	10.01***	0.0000	8.1154***	0.0000

*** indicates the significance at 1% level.

Table A2: The results of panel causality test in developed countries

Country	GDP to CO ₂			GDP ² to CO ₂			CO ₂ to POV			CO ₂ to EC			EC to CO ₂	
	<i>k</i>	<i>w_t</i>	<i>p_t</i>	<i>k</i>	<i>w_t</i>	<i>p_t</i>	<i>k</i>	<i>w_t</i>	<i>p_t</i>	<i>k</i>	<i>w_t</i>	<i>p_t</i>	<i>w_t</i>	<i>p_t</i>
Austria	2	1.53	0.27	1	1.54	0.23	1	0.01	0.98	3	1.04	0.28	1.84	0.16
Canada	1	1.15	0.25	1	1.15	0.31	1	60.9	0.00***	1	1.07	0.30	1.59	0.21
Denmark	1	3.40	0.06*	1	3.39	0.06*	1	0.11	0.73	1	2.75	0.09*	0.80	0.35
Finland	1	7.26	0.00***	1	7.15	0.00***	1	0.02	0.86	1	4.39	0.03**	1.37	0.25
France	1	1.35	0.25	3	1.35	0.25	1	0.88	0.36	1	3.48	0.06*	1.55	0.22
Germany	2	3.61	0.06*	1	3.64	0.06*	1	0.48	0.49	1	4.46	0.03**	1.44	0.20
Ireland	1	2.48	0.09*	1	2.51	0.09*	1	1.20	0.28	2	7.21	0.00***	0.07	0.76
Italy	1	4.47	0.03**	1	4.55	0.03**	3	7.40	0.00***	1	7.80	0.00***	0.06	0.82
Japan	1	0.01	0.99	1	0.01	0.99	1	5.40	0.02**	1	0.69	0.43	1.63	0.18
Netherlands	3	0.36	0.58	1	0.34	0.57	1	0.99	0.34	1	0.78	0.40	2.04	0.16
Norway	1	0.05	0.86	3	0.05	0.85	1	2.89	0.09*	1	0.88	0.37	1.24	0.23
Sweden	1	12.9	0.00***	1	12.8	0.00***	1	0.86	0.37	1	0.48	0.50	0.45	0.52
Switzerland	1	3.58	0.06*	1	3.55	0.06*	2	4.99	0.02**	2	3.15	0.07*	0.92	0.34
UK	1	4.56	0.04**	1	4.87	0.04**	2	3.85	0.06*	2	4.76	0.03**	1.15	0.30
US	1	5.49	0.02**	1	5.48	0.02**	1	2.85	0.09*	1	0.15	0.64	2.06	0.16
F stat.		74.837**			70.747**			110.454**			62.417**		27.041	

k is lag order selected by minimizing SBC. ***, ** and * indicate the significance at 1%, 5% and 10% level.**Table A3:** The results of panel causality test in developed countries

	POV to EC			EC to POV			POV to CO ₂			GINI to EC			EC to GINI	
Country	k	w _t	p _t	w _t	p _t	k	w _t	p _t	k	w _t	p _t	w _t	p _t	
Austria	2	1.20	0.27	2.80	0.12	1	0.27	0.59	3	0.00	0.99	0.30	0.58	
Canada	1	1.42	0.23	7.40	0.00***	1	0.08	0.77	1	0.84	0.35	4.46	0.03**	
Denmark	1	0.05	0.81	0.27	0.59	1	0.95	0.32	1	7.84	0.00***	1.10	0.29	
Finland	1	6.30	0.02**	0.09	0.97	1	10.1	0.00***	1	0.43	0.51	0.73	0.39	
France	1	1.44	0.23	0.80	0.37	1	0.11	0.73	1	1.28	0.25	0.03	0.85	
Germany	3	0.56	0.45	0.02	0.89	1	0.88	0.34	3	2.47	0.14	0.01	0.91	
Ireland	1	1.02	0.31	0.01	0.98	1	0.59	0.44	1	1.63	0.20	0.34	0.55	
Italy	1	4.19	0.04	11.8	0.01	3	1.12	0.29	1	2.68	0.13	1.16	0.28	
Japan	1	6.56	0.01***	2.13	0.14	1	0.01	0.95	1	0.68	0.40	0.12	0.72	
Netherlands	1	2.82	0.11	0.05	0.81	1	0.04	0.82	1	0.12	0.72	5.87	0.02**	
Norway	2	2.12	0.14	4.99	0.02	1	2.29	0.13	2	0.11	0.73	0.39	0.53	
Sweden	1	1.36	0.24	0.03	0.84	1	0.80	0.37	1	0.03	0.84	0.84	0.35	
Switzerland	1	1.49	0.22	2.79	0.09	2	2.60	0.10	1	1.14	0.28	1.20	0.27	
UK	1	1.74	0.19	2.21	0.14	1	0.52	0.47	1	1.45	0.23	1.14	0.23	
US	1	0.09	0.75	2.05	0.15	1	0.01	0.92	1	3.54	0.06*	0.03	0.84	
F stat.		23.102		21.056			18.105			14.980		21.298		

k is lag order selected by minimizing SBC. ***, ** and * indicate the significance at 1%, 5% and 10% level.

Table A4: The results of panel causality test in developed countries

Country	<i>k</i>	POV to GINI		GINI to POV		<i>k</i>	CO ₂ to GINI		GINI to CO ₂	
		<i>w_t</i>	<i>p_t</i>	<i>w_t</i>	<i>p_t</i>		<i>w_t</i>	<i>p_t</i>	<i>w_t</i>	<i>p_t</i>
Austria	3	0.166	0.684	7.82	0.00***	1	2.22	0.13	3.61	0.06**
Canada	1	2.219	0.136	0.38	0.53	1	0.17	0.67	1.44	0.22
Denmark	1	12.35	0.000**	0.05	0.82	1	1.32	0.25	1.72	0.18
Finland	1	0.156	0.693	0.00	0.98	1	0.46	0.49	2.39	0.12
France	2	0.342	0.559	0.24	0.61	3	0.39	0.53	3.39	0.06**
Germany	1	1.430	0.232	7.47	0.00***	1	1.36	0.24	0.14	0.70
Ireland	1	0.553	0.451	0.43	0.50	1	0.08	0.77	1.29	0.22
Italy	1	0.411	0.521	0.01	0.89	1	0.54	0.45	3.85	0.04**
Japan	1	0.001	0.970	0.01	0.99	2	0.26	0.60	0.06	0.87
Netherland	2	1.558	0.212	0.04	0.84	1	0.13	0.71	0.64	0.42
Norway	1	1.094	0.296	0.01	0.94	1	0.44	0.50	0.23	0.63
Sweden	1	0.390	0.532	0.16	0.68	1	4.86	0.02**	0.20	0.65
Switzerland	2	0.782	0.377	4.82	0.02**	2	4.28	0.03**	0.37	0.54
UK	2	0.367	0.550	0.13	0.70	2	1.98	0.17	0.20	0.68
US	1	7.267	0.007***	0.45	0.49	1	2.13	0.14	1.93	0.16
F stat.		32.127		34.653		35.766		39.776		

k is lag order selected by minimizing SBC. ***, ** and * indicate the significance at 1%, 5% and 10% level.

Central Bank Digital Currencies: Implications for the Turkish Lira

Muhammet DURDU¹ 

ABSTRACT

Central Bank Digital Currencies (CBDCs) are digital central bank liabilities that differ from traditional wholesale settlement and saving accounts. States worldwide commenced CBDC projects in response to the rising private digital payment instruments and crypto assets. Especially emerging countries are in danger of being invaded by these new payment providers. In addition, some states moved toward researching CBDCs due to the diminishing cash usage among their citizens. Türkiye is also under threat from those new payment providers. Therefore, the Central Bank of the Republic of Türkiye started the project of the national CBDC. With this project, Turkish society could be equipped with reliable and practical fiat money, which is crucial for preventing citizens from using the new digital payment providers. In addition, high informality in the economy could be minimized by making cash usage obsolete thanks to incentivizing digital central bank money.

Keywords: Central Bank Digital Currencies, Digital Turkish Lira, Informal Economy, Cash Usage.

JEL Classification Codes: E26, E31, E42, E52

Referencing Style: APA 7

INTRODUCTION

Roughly a decade ago, Bitcoin emerged with aiming to become a world currency. But the money supply monopoly has been a crucial prerogative for sovereign states. Without sovereign currency with legal tender status, states lack the advantage of seigniorage income and the inflation tax. Consequently, states have commenced battling with Bitcoin usage in daily transactions. Using Bitcoin (and other crypto assets) in daily transactions has been banned in different parts of the world. Initially, states coined bitcoin and its fellows as “cryptocurrency”. Nowadays, they refrain from coining them as “currency”; instead, they call them “crypto assets” since the possible deterioration of “monetary sovereignty” (Group of Central Banks, 2020, p. 9).

States have logical reasons for battling with crypto assets as they were wielded in illicit transactions seen in the Silk Road incident in the USA. In their first years, limited users generally wielded Bitcoin and its fellows on the Dark Web. As time has passed, ordinary individuals have commenced using crypto assets for investment purposes in general. After the huge gains generated through crypto investments, taxation issues of crypto

assets have become an issue for states. Some states regulated taxation regimes for crypto assets, but a clear tax regime has not been constituted yet. In addition, they have regulated crypto asset exchanges for AML purposes. However, their virtual and decentralized structures make them generally hard to regulate (IMF Staff Report, 2020, p. 33).

The increasing tendency towards digitalization has been decreasing the usage of cash in daily transactions (Norges Bank, 2018, p. 15). The COVID-19 pandemic has hastened this process further (Deutsche Bank Wealth Management, 2020, p. 3). Most people in developed and emerging countries use bank money in digital form through their mobile apps which is not the liability of the central bank (Federal Reserve, 2022, p. 3; Norges Bank, 2018, p. 6). In addition, private digital currencies, including Bitcoin and other cryptocurrencies, paved the way to make obsolete central bank liabilities (Committee on Payments and Market Infrastructures, 2018, p. 3). Cash is the sole instrument for citizens to use reliable central bank money. Diminishing cash usage could culminate in breaking the direct link between citizens and central banks. This could reduce the impact of central bank

¹ Necmettin Erbakan University Faculty of Law, Aşkan Mahallesi Yeni Meram Caddesi P.K. 42090 Meram / KONYA, mdurdu@erbakan.edu.tr

policy decisions on the economy as a whole and leave individuals undefended against financial crashes, which cannot be completely assuaged by any deposit insurance systems (Browning & Evans, 2022, p. 2). To prevent these consequences, central banks have commenced researching central bank money in the digital form used by all citizens and maybe all people around the world (Auer, ve diğerleri, 2021, p. 2; Labonte & Nelson, 2022, p. 9, 10; Visa, 2022, p. 10).

Central bank digital currencies (CBDCs) are the answer to the rise of digitalization and the fall of cash usage by central banks. By using them, central banks endeavor to protect their sovereign power over the monetary system in their respective countries. In addition, they have a chance to increase their impact on the economy with CBDCs by eliminating effective lower-bound limits and directly contacting individuals. In this article, I will demystify CBDCs and try to grasp their implications for the Turkish Lira (TL). At the outset, I will focus CBDCs in general and, afterward, try to show some risks for the Turkish economy and demonstrate some characteristics of the CBDC that are convenient for the Turkish economy.

CBDCs

In today's world, there are two central bank liabilities in markets. One of them is cash, which can be used by citizens and everyone worldwide if there are acceptors of that liability. The other one is the wholesale settlement and saving accounts in digital form, used by banks and some other specific financial institutions (Committee on Payments and Market Infrastructures, 2018, p. 1; Bech & Garatt, 2017, p. 59). Cash usage is decreasing around the world, insomuch that, in some places, there are limited shops to accept cash because of the burden it brings to the shop owners (Bech & Garatt, 2017, p. 64). If cash ceases to be used in daily transactions, there is no direct link between the central bank and society. This could narrow the ability of the central bank to steer the economy. Thereby central banks try to achieve a society in the digital form directly; otherwise, their sovereign power over the monetary system could weaken. This necessity has resulted in research on CBDCs around the world (Group of Central Banks, 2020, p. 5). Other reasons for CBDCs include encouraging financial inclusion, improving cross-border payments, facilitating direct fiscal transfers from states to society, and supporting public privacy (Group of Central Banks, 2020, p. 6). Few

emerging economies have already commenced their CBDCs lately (Kosse & Mattei, 2022, p. 1).

Defining CBDCs

Defining the CBDC concept is challenging since its fundamentals are not laid down appropriately yet. They could be concisely defined as sovereign fiat money in digital form. According to Bank for International Settlements (BIS) *"CBDC is a digital form of central bank money that is different from balances in traditional reserve or settlement accounts"* (Committee on Payments and Market Infrastructures, 2018, p. 4). Kosse and Mattei defined them as *"A CBDC is central bank-issued digital money denominated in the national unit of account, and it represents a liability of the central bank"* (Kosse & Mattei, 2022, p. 2). Lastly, according to FED, *"a digital liability of a central bank that is widely available to the general public"* (Federal Reserve, 2022, p. 1).

Classification of CBDCs

CBDCs are generally classified according to their users mainly. On the one hand, general-purpose (retail) CBDCs, are used by individuals without limits like cash. On the other hand, wholesale CBDCs, are used by specific financial institutions for settlement and saving purposes, like the RTGS system¹. Central banks keep researching both, but general-purpose CBDCs have more challenging and rewarding implications because there are also wholesale digital central bank liabilities nowadays, making wholesale CBDCs familiar to the financial world. Wholesale CBDCs could benefit some countries, but this work will mostly focus on general-purpose CBDCs.

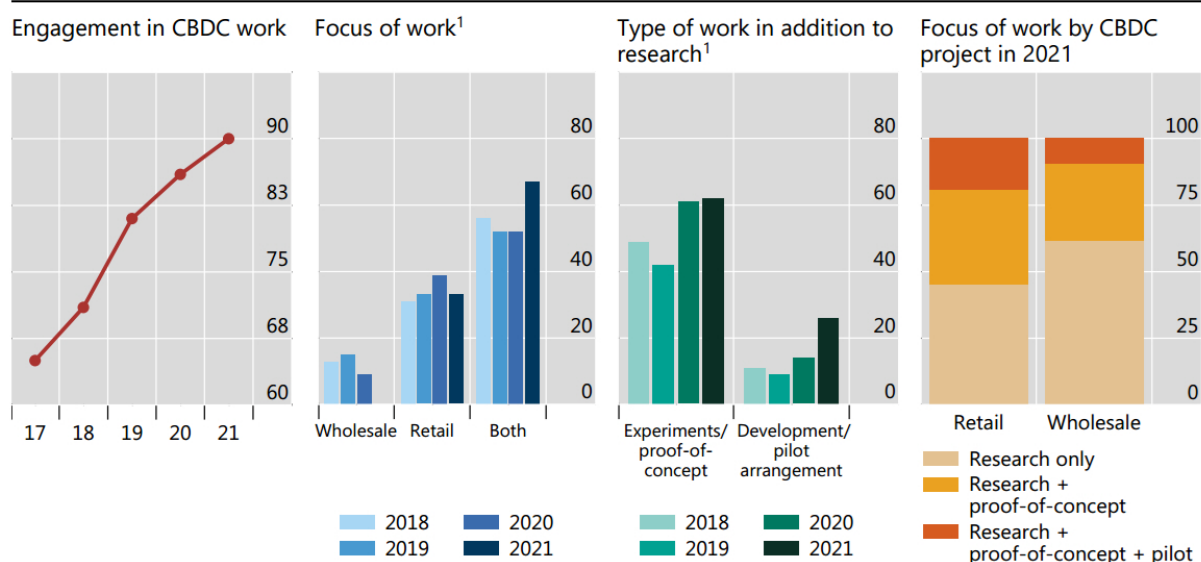
Central banks around the world have been investigating the CBDC concept to find out whether they wield this new phenomenon to improve their financial system. For example, in Sweden, Sveriges Riksbank, the central bank of the state, commenced the "e-krona" project in 2017 to respond the extinction of cash usage in the society (Sveriges Riksbank, 2023). The European Central Bank has also on the way to issue "digital euro". They planned that the digital euro will be distributed by intermediaries like bank, be available both online and offline, and give a chance to society to access the digital central bank money directly (European Central Bank, 2023). The Federal Reserve, the central bank of the USA, has been

¹ RTGS is a real time settlement system used between central bank and other banks in Europe. Refer to: (Bank of England, 2023).

Table 1: Central bank involvement in CBDC projects

Share of respondents

Graph 1

¹ Share of respondents conducting work on CBDCs.**Source:** (Kosse & Mattei, 2022, p. 4)

investigating the CBDC concept. They committed the cash usage even if they issue “digital dollar”. Federal Reserve Chair Jerome Powell said that the bank needs the approval of Congress to issue digital dollars (Board of the Governors of the Federal Reserve System, 2024).

It is possible to give more examples from different states about CBDC projects, but the foregoing instances are enough to prove the different objectives of CBDC projects. Each state has different needs and may design its expectative CBDC with different choices. Giving many examples of ongoing CBDC projects is not the main goal of this article. This work tries to demystify the CBDC concept further by giving general characteristics of them in the following section.

General Characteristics of CBDCs

General-purpose CBDCs are classified in themselves according to various technical and economic criteria. These criteria include token or account-based, interest bearing or not, universal or limited to the respective country, offline functionality or not, available times, ledger structure, and implemented with or without cash (Gnan & Masciandaro, 2018, p. 10). To make decisions about these issues, central banks should consider all relevant variables, specific to the related country, and

work with related stakeholders such as tax authorities, bank regulators and governments. It is supposed to exist various CBDCs in the future, and each of them is expected to be specific to a country. There will be no one-fit-all solution (IMF Staff Report, 2020, p. 7). Conversely, states should work together to reshape the financial structure because there is a good chance to increase the efficacy of the international financial structure. It could be possible to decrease the burden of international money transfers and increase their speed. Interoperability between CBDCs is of paramount importance to achieve these utilities. If this opportunity is missed, it will be more difficult to operate the international financial market in the future (Labonte & Nelson, 2022, p. 20).

The first prominent taxonomy of general-purpose CBDCs is token-based or account-based. Token-based systems consist of independent units, which is called “token”, and digital wallets. Individuals wield a digital wallet to store their tokens just like the cash system (Bossu, ve diğerleri, 2020, p. 11). Thanks to the cryptography between the user and the wallet, token-based systems can ensure anonymity however illicit users may exploit this anonymity. Most states will probably have preferred account-based systems to prevent this result and ensure the AML requirements. Account-based systems resemble contemporary bank accounts. With this system, users will

have precise accounts. The balance of these accounts is kept by intermediaries or less likely by central banks since central banks do not have sufficient experience in consumer relationships (Labonte & Nelson, 2022, p. 25; Lis & Gouveia, 2019, p. 13). Besides, there are plenty of public and private banks, fully fledged in financial services like AML requirements which could be used for intermediary services in the CBDC system (Didenko & Buckley, 2021, p. 16-18). Preferring the account-based model with intermediary services of banks is the most likely solution in this respect. Privacy concerns in the account-based model are also current for today's systems. In other words, there is no new problem with an account-based CBDC from the privacy perspective. Moreover, the ECB made important tests on an account-based model for alleviating privacy concerns which have crucial implications for practice (ECB, 2022). In addition, CBDCs raise concerns about bank runs (Committee on Payments and Market Infrastructures, 2018, p. 2; Bech & Garatt, 2017, p. 63). Thanks to the intermediary function of banks, such concerns may be alleviated since customers have not the choice to transfer their funds to the central bank directly in case of bank stresses. Banks keep on providing money instruments to the public in turbulent times.

Another reason for states to refuse the token-based model is the anonymity that the token-based model ensures. Anonymity could make a CBDC convenient for illicit users. It is unthinkable wielding a financial product provided by a state for illicit purposes. Hence, states will have chosen an account-based model to ensure AML/CFT requirements. It could come to mind that states also provide society with an anonym medium of exchange, namely cash. But the anonymity in cash is not the choice of states. It is a historical happenstance (Bech & Garatt, 2017, p. 65).

The question of whether interest-bearing or not is the most important preference when designing a CBDC from an economic perspective. Since the 2008 financial crisis, low-interest rates have been the primary option for developed countries. However, lowering the interest rates has a limit, which is called the effective lower bound. Because cash ensures individuals zero interest rate, lowering the rates below zero will direct individuals to hoard cash instead of using bank accounts. Hence it is not an option to cut rates below zero as cash is in use (Ward & Rochemont, 2019, p. 12). But with a CBDC,

removing cash from the market could be possible, eliminating the effective lower bound. In addition, cash is the main source of the informal economy, resulting in tax evasion, especially in emerging and frontier regions. Although central banks do not prefer the elimination of cash (Group of Central Banks, 2020, p. 10), it should be considered that a CBDC system could make possible to eliminate cash if the system has a reliable offline function. Without the offline execution capacity, a CBDC system cannot be convenient to take cash off the market in case of online system failures like power cuts.

Today, because of excessive intermediary institutions and security requirements, international settlement systems are not efficient and fast, resulting in the loss of time and money (World Bank Group, 2021, p. 32). With the beginning of CBDCs, the world has a chance to improve international settlement systems. To ensure a quicker and more efficient international settlement system, it is imperative for states to work together in establishing the CBDC systems which is a priority of G20 countries (Financial Stability Board, 2021). Each state has a different priority when establishing its own CBDC system. Besides these priorities, states should consider the interoperability of the CBDC systems worldwide. Otherwise, they will miss a paramount opportunity to improve the international settlement system (Group of Central Banks, 2020, p. 2; Kosse & Mattei, 2022, p. 8; IMF Staff Report, 2020, p. 6; Labonte & Nelson, 2022, p. 20).

The importance of CBDCs' available times has lost its merit since the emergence of 7/24 available central bank systems like FAST². Asserting the digital transformation, CBDCs have no choice but to operate 7/24 since it is expected that CBDCs improve the ease of use of financial systems (Federal Reserve, 2022, p. 2; Visa, 2022, p. 23). Owing to its technologies, CBDCs will be expected not only to operate at all times but also to activate smart contracts making money smart for various reasons including restricted spending areas for stimulation funds namely helicopter money and making payments between smart devices automatically.

The distributed ledger option for CBDCs is unfavorable to the throughput and velocity concerns. Besides, full

² The Instant and Continuous Transfer of Funds (FAST) System is a system developed within the framework of the Central Bank of the Republic of Türkiye (CBRT), where customers can send payment instructions through banking systems 24/7, operating independently from the Electronic Funds Transfer (EFT) system and managed by the CBRT. Refer to: (CBRT, 2024).

control over the system is an indispensable feature for central banks, which could be achieved owing to centralized systems. The cyber-security ensured by distributed systems could be achieved by other methods (Group of Central Banks, 2020, p. 8, 15; Auer, ve diğerleri, 2021, p. 13). Central banks do not prefer to use distributed systems like the Bitcoin system operated by all willing miners (Auer, Cornelli, & Frost, Rise of the central bank digital currencies: drivers, approaches and technologies, 2020, p. 18).

As the financial structure has evolved, real-time settlements with 7/24 operation times have become widespread across the globe, and payment systems have become extremely durable, especially in developed countries. For this reason, some opinions in developed countries impugn the necessity of CBDCs. According to them, it should be studiously researched whether CBDC could improve the financial system before establishing it (Labonte & Nelson, 2022, p. 7; Norges Bank, 2019, p. 6; Gnan & Masciandaro, 2018, p. 20). It seems that CBDCs could bring more benefits to emerging countries than developed one since developed countries also have a foremost financial system.

DETERMINING THE CHARACTERISTICS OF THE DIGITAL TURKISH LIRA

Türkiye is one of the countries researching for implementation of CBDCs. The system is called the "Digital Turkish Lira (DTL)". The practice test of the system has been made in 2023. It is important to consult the public while making such a big reform in the monetary system. The Central Bank of the Republic of Türkiye (the CBRT) should release an official report and make public consultation about this project. The DTL's technical and economic features are not certain for the public hitherto. The sole technical thing the public knows is the possible implementation of blockchain technology in the project.

Türkiye, an emerging country, has an immense informal economy. The primary source of the informal economy in the country is cash usage. A CBDC could help combat this issue which is detrimental to not only fiscal revenue but also tax fairness perception among taxpayers. With a CBDC, the CBRT could minimize cash usage in the market, making concealing taxable gains and transactions hard or even impossible for taxpayers.

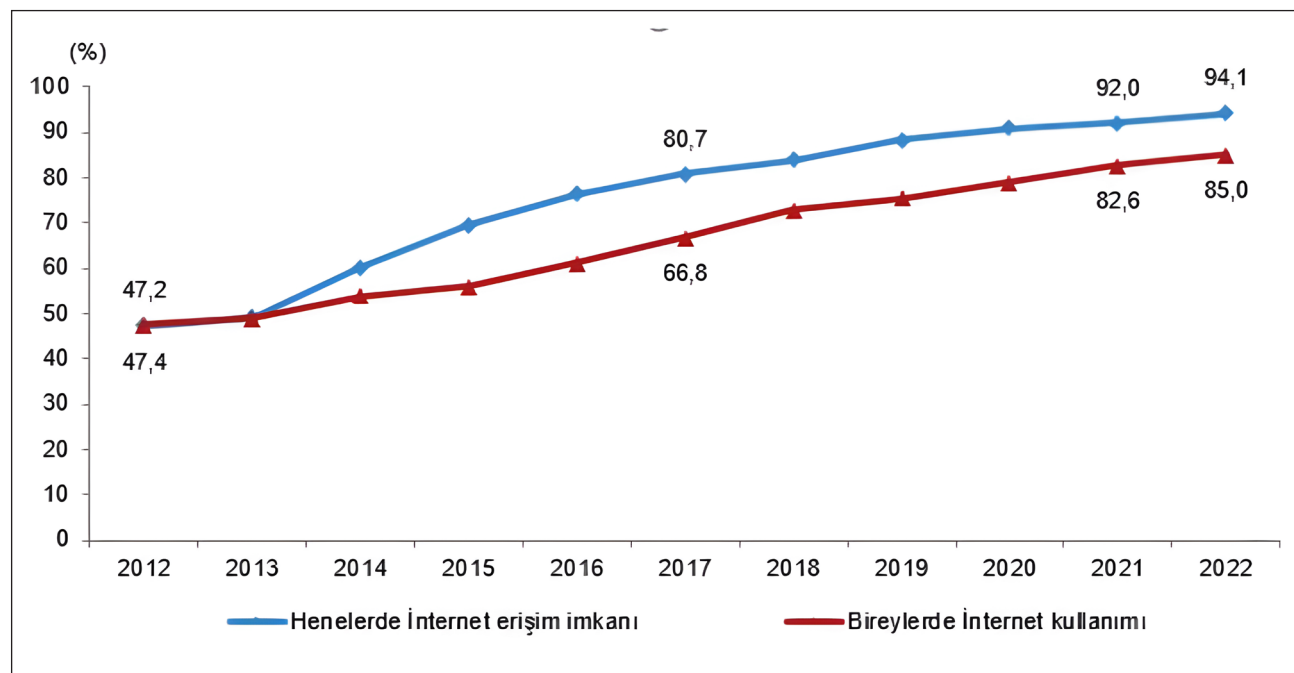
In addition, private digital money suppliers and crypto assets are able to invade daily transactions as a medium of exchange. Besides, another CBDC belonging to a developed country could weaken the TL's position further in terms of both medium of exchange and store of value since Turkish society tends to wield a stable foreign currency as a store of value (T.C. Cumhurbaşkanlığı Finans Ofisi, 2021, p. 35). A reliable CBDC system could help to improve the trustworthiness of the TL.

In order to describe the characteristics of potential DTL, it is crucial to understand the Turkish economy. In the following subsections, we will present important aspects of the Turkish economy crucial for designing the DTL. Afterward, possible threats coming from digital currencies, crypto assets, and other CBDCs for the monetary sovereignty of the state will be demonstrated. Finally, according to the literature review and experimental samples, some features that must be found in the DTL will be recommended.

General Features of the Turkish Economy Relating to CBDC

Türkiye is an emerging country and a member of the G20 countries. It is a candidate for European Union and has a population relatively younger than developed countries. Turkish people tend to easily adopt information and communication technologies. Internet usage among Turkish people keeps on increasing. According to the survey implemented by the Turkish Statistical Institute, the proportion of internet usage is 85% for individuals in the 16-74 age group. 94.1% of households have access to an internet connection (See Table 1). Lastly, 46.2% of individuals buy or order goods and services over the internet (Turkish Statistical Institute, 2022). 85% of internet usage shows that the offline functionality of DTL is crucial for 15% of Turkish people if the government wants to eliminate cash from the market. In addition, internet usage is even less in the age group of more than 74. To prevent financial exclusion for those not using the internet, it must be done with the DTL having offline functionality or maintaining the cash in the market (Ward & Rochemont, 2019, p. 8).

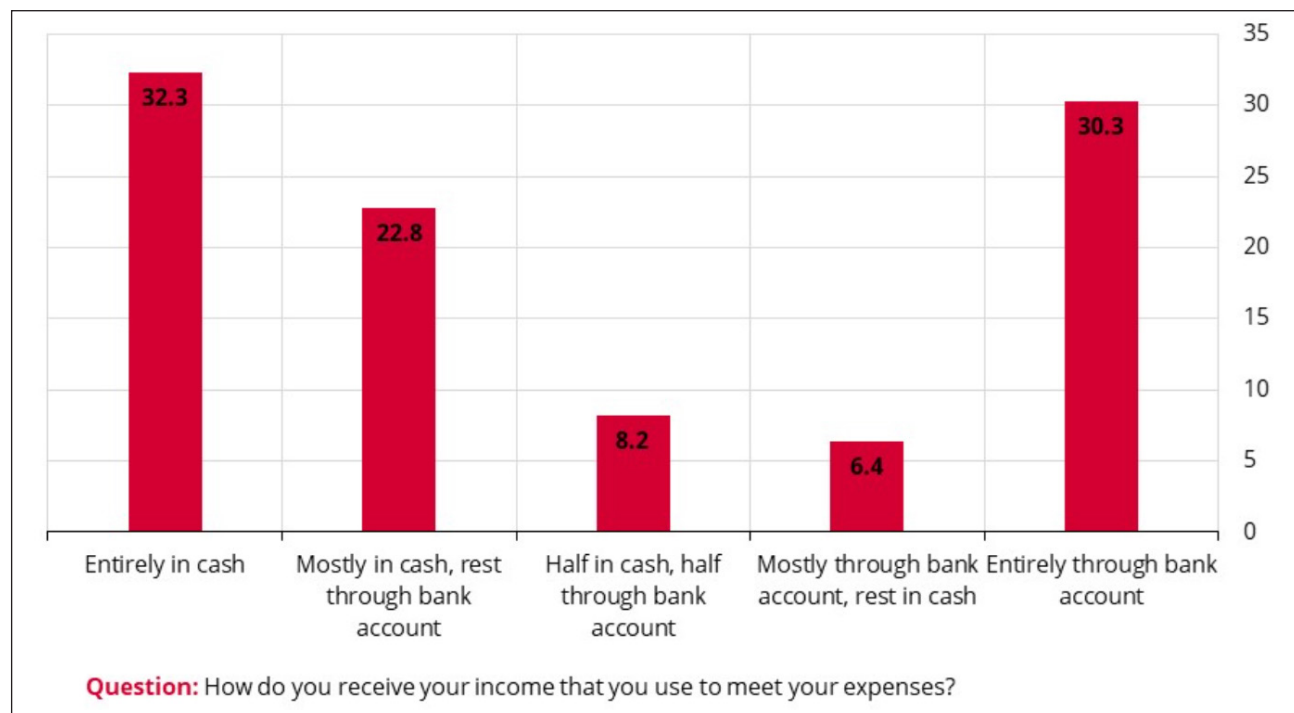
Türkiye, like other emerging countries, has a substantial informal economy and employment. It is estimated that the rate of the informal economy to the GDP exceeds 50% from time to time in Türkiye (Yurdakul, 2008, p. 209). But the estimation of the informal economy is not

Table 2: Internet usage in Turkish people

Source: (Turkish Statistical Institute, 2022).

based on any solid data culminating in different results by different academics (Erkuş & Karagöz, 2009, p. 133; Meriç & Günay, 2004, p. 910; Çalış, Çitak, & Çakır, 2022, p. 48; Davutyan, 2008, p. 261). Over the past ten years, the informal sector has grown even more due to the massive influx of refugees abroad. (Özbay, 2020, p. 4). According to the Turkish Statistical Institute, at the end of 2021,

the rate of employees who are employed informally is 27.8%. Informal employment is much bigger in farm employment than non-farm employment; the rate of it is 83.9%. On the other side, the non-farm informal employment rate is 18.3% (Turkish Statistical Institute, 2021). These high rates of the informal economy and employment in Türkiye demonstrate the social injustice

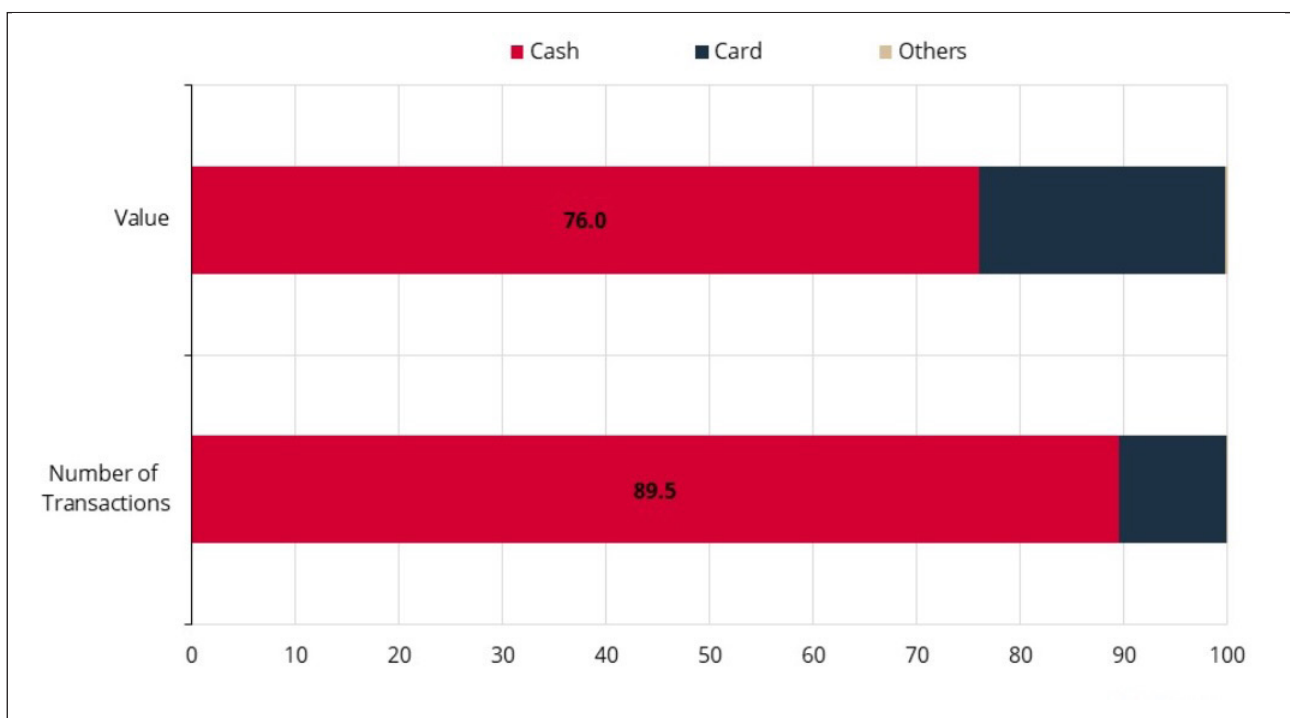
Table 3: Income receiving way in Turkish people

Source: (Çevik & Altınel, 2021).

in the country's tax system. Those who pay taxes and social insurance payments have disadvantages against those who do not pay them. With the DTL, which will eliminate cash usage from the market, this injustice could be assuaged. Because the main source of informal employment and economy is cash usage, malignant taxpayers may be desperate to disguise their employment and economic activities without cash usage. It has been expected that the informal economy problem cannot be resolved in the short term (Dam, Ertekin, & Kızılca, 2018, p. 315), even though it is declining (Bağır, Küçükbayrak, & Torun, 2021). But with a proper CBDC, this issue could be

anticipate using more cash in the coming year, while 11.9% anticipate using less cash. The rest do not think they will change their cash usage habits (Çevik & Altinel, 2021). This survey was implemented during the COVID-19 pandemic, and Turkish people kept using cash and thought about increasing their cash usage habits despite the virus-carrying effect of cash. These results demonstrate that cash usage is crucial for the Turkish economy, like other emerging countries (Maryaningsih, Nazara, Kacaribu, & Juhro, 2022, p. 6), and the DTL should be available for offline transactions or used alongside cash.

Table 4: Cash percentage in transaction number and amount



Source: (Çevik & Altinel, 2021).

eliminated before long (Auer, Cornelli, & Frost, Rise of the central bank digital currencies: drivers, approaches and technologies, 2020, p. 28).

Cash usage in daily life is very high in Türkiye. People mostly use cash for both their means of payment and their means of earning. According to the survey implemented by the CBRT in September/October 2020, the rate of individuals getting their income mostly or completely in cash is 55.1%, and 61.5% of people prefer to spend their money largely in cash. The rate of cash transaction number is 89.5%, and the rate of cash amount in transactions is 76%. 25.3% of respondents

Not only central banks but also other private and public banks make expenses for supplying cash to society (Didenko & Buckley, 2021, p. 22). For example, the FED, the Central Bank of the USA, has a 983.8 million USD budget to print USDs for 2022 (The Federal Reserve, 2022). When it comes to Türkiye, according to the audit report implemented by the Supreme Audit Court, also called Sayıştay, the CBRT spent 264.7 million TL for only banknote paper and ink in 2021 (Sayıştay, 2021). It seems negligible compared to the federal budget of the USA, which is worth 6 trillion USD and the general budget of Türkiye, which is worth 1.6 trillion TL (TBMM, 2022; Amadeo, 2022). However, removing them by

eliminating cash from the market grants governments essential additions to their budget. On the other side, 5-10% of banks' budgets consist of cash distribution expenses on average, which is an important burden on banks culminating in the rise of credit interests (Brugge, Denecker, Jawaid, Kovacs, & Shami, 2018). These resources could be used for more beneficial public services if cash usage becomes obsolete.

The Revenue Administration of Türkiye has made registering some payments through banking documents mandatory for some taxpayers to combat the informal economy. (Erkuş & Karagöz, 2009, p. 128). Thanks to a proper CBDC, all payments could be recorded through receipts helping to reduce tax losses and the informal economy. The DTL could be designed to provide the abolishment of cash usage. Policymakers should consider this choice seriously before making decisions about the characteristics of the DTL. In the next sections, we try to show some threats to the monetary sovereignty of Türkiye and describe a CBDC useful for the Turkish economy.

LITERATURE REVIEW

In this section, the academic works relating to the DTL project will be reviewed in brief. Ünlü and others have accentuated that the DTL project could enhance financial inclusion, make payments faster, weaken the informal economy, and ease the activities of the CBRT (Ünlü, Künc, Tutgun, & Çelik, 2023, p. 19, 20). Kara, Yapan, and Mutlu have stressed the risks of CBDC relating to personal liberty (Kara, Yapan, & Mutlu, 2023, p. 379). Acar has demonstrated the possible threats to banking sector coming from expectative CBDC projects (Acar M. , 2024). Acar and Öztürk have pointed out that specification of CBDC project should be determined having regard to necessities of respective country (Acar & Öztürk, 2021). According to Toraman, the DTL could become widespread against crypto assets in the Turkish society thanks to its trustworthiness arising from the CBRT (Toraman, 2022, p. 370).

Küçükkıralı and Eser Afşar, have put forward possible pros and cons of the DTL in their works. According to them, the DTL could assist the security and effectiveness of the financial system and monetary policy. In addition, it could increase the financial inclusion. By this means, the CBRT may gain an important tool against private digital money providers and decentralized systems. On

the other hand, a weak designated DTL and concerns about sensitive personal data could culminate in fading away the project. (Küçükkıralı & Eser Afşar, 2022).

Possible Threat to the Monetary Sovereignty of Türkiye

Private money providers in digital form and crypto assets are a serious threat to sovereign currencies in terms of money circulation in the respective country (IMF Staff Report, 2020, p. 6, 7). 25.7% of people worldwide use mobile private payment solutions in their transactions. People in emerging countries use mobile private payment solutions more than developed countries. For instance, 62.7% of China's population wield digital mobile payment methods with their phones. This rate is expected to increase in the coming years (MoneyTransfers, 2022). The mobile payment users rate among internet users is 84% in Kenya and 60% in Nigeria (Armstrong, 2022). During the severe inflation period, crypto assets are used widely in Venezuela for payment purposes, but there is no statistical information about them (Bergen, Bergen, Levy, & Semenov, 2022). These examples indicate that some private digital payment methods or crypto assets could invade especially emerging countries' monetary systems easily since citizens of emerging countries can easily adopt new payment methods due to the unreliable sovereign fiat currencies.

Türkiye is not immune to this new money providers' threat. The CBRT has already banned the usage of crypto assets as a medium of exchange. The rate of digital mobile payment methods is 21% in 2021 and keeps increasing in Türkiye (Strategy, 2021). To preclude the Turkish daily transactions market from being invaded by new private money providers, the DTL project is crucial since the CBRT could bring advantages of private digital currencies to the TL for enhancing the attractiveness of the TL (Labonte & Nelson, 2022, p. 17; Gnan & Masciandaro, 2018, p. 13). Even though they lack the security of having legal tender status, people may prefer more practical private payment methods against the Central Bank money. Through the DTL, the CBRT could enhance the convenience of the TL in daily transactions by using smart contracts. In this way, it could be easy to protect the TL's unit of account and medium of exchange functions. If a sovereign currency loses these functions in its country, the state's monetary sovereignty could be questioned.

Another threat to the TL in the digital era is another CBDC that could be used across borders without any restriction (IMF Staff Report, 2020, p. 22; Landau, 2021, p. 15). Especially CBDCs belonging to developed countries is a more serious threat to the Turkish economy in terms of currency substitution since hoarding foreign currencies belonging to a developed currency area is a habit for Turkish people (T.C. Cumhurbaşkanlığı Finans Ofisi, 2021, p. 35). With the introduction of CBDCs, hoarding foreign currencies for saving purposes may be much easier and more uncontrollable (Visa, 2022, p. 20; Carstens, 2021, p. 13). In order to avoid this undesirable consequence, the store of value function of TL should be significantly ramped up.

Describing the Potential Characteristics of the DTL

Current Situation of the DTL

Türkiye, like many other countries, is planning to implement a CBDC. The CBDC plan of the country has been announced in official government plans. The 2022-24 Medium Term Government Plan, published in 2021, stressed that the advanced pilot tests of the DTL would be conducted in the 2022-24 term. The 2023 Annual Program of the Presidency has declared that the payment pilot of the DTL would be conducted in 2023. In addition, the integration process of the DTL, the FAST payment system, and the digital identities will be completed in 2023. Lastly, tests, research, and development of a wholesale CBDC will be conducted with banks in 2023. In other words, there is a general-purpose CBDC plan and a wholesale CBDC plan in Türkiye.

In July 2021, the Governor of the CBRT announced they would begin a pilot test in September 2021 (MYNET Haber, 2021). In September 2021, the CBRT made a press release and gave important information about the DTL project. First, it cooperated with ASELSAN, HAVELSAN, and TÜBİTAK-BİLGEM, which are state-owned technology firms and agencies, for the DTL project. Secondly, it will begin pilot tests. Through pilot tests implemented with stakeholders scalability, integration, and payment system capability of new technologies, such as blockchain and distributed ledger, would be evaluated. Lastly, the CBRT stressed that the final decision about the DTL had not been made yet. Through the project, the economic, fiscal, and legal implications of the DTL would be investigated (TCMB, 2021). In the 2021 Annual Report, the Bank stated the pilot tests of both general purpose and wholesale

projects were continuing, recent developments relating to CBDCs were monitored, and it had meetings with other central banks about CBDC projects (TCMB, 2021, p. 63). In December 2022, the CBRT announced the pilot tests had been completed successfully and would continue. In 2023 legal and economic aspects of the project would be prioritized (TCMB, 2022). These comments and reports indicate that implementing the CBDC in the Turkish financial system is highly possible. It is crucial to construct it with the needs of the Turkish economy in mind. The Turkish economy can benefit greatly from the DTL if the DTL project is carried out in a proper manner.

Recommendations for the DTL

It is crucial to design the DTL regarding scalability, payment systems and interoperability with other financial systems. There are many opportunities with the DTL, not only for the Turkish financial system but also for the tax system. First, the DTL could make obsolete cash in Türkiye, which is crucial for diminishing the informal sector. The DTL's offline capability is indispensable to abolish cash usage in case of a failure of the online system or a power cut. The offline capability of CBDC is "the make-or-break feature" for many regions of the importance of cash usage and the population deprive of internet connection. Special cards or offline digital wallets operated by smartphones could be used with near-field communication technologies or authorization codes (Kiff, 2022).

In Türkiye, both special cards and offline digital wallets should be used for ease of use. Since there are many people in Turkish society not using smartphones. 23% of the Turkish population did not have smartphones in 2020 (Taşçı, 2020). Special cards are the most convenient means of payment in the absence of cash for them. On the other hand, offline digital wallets are the most convenient for smartphone users. Devices having near-field communication technology should be used at shops. When it comes to money transfers between individuals, authorization codes and QR codes could be used. Thanks to the intermediary model, offline operability could be developed by private intermediaries. There is also such an initiative from Visa, a foremost financial institution in the world (Christodorescu, ve diğerleri, 2020, p. 5-7). Similar initiatives could be developed by Turkish private financial institutions.

Thanks to the abolishment of cash, all citizens have a sole and integrated account to make or receive payments. Recording all payments digitally on the ledger makes concealing any financial activity from the Revenue Administration impossible. It was declared in the 2023 Annual Program of the Presidency that the DTL would cooperate with digital identities, which ensures the record of all financial activities of any person for fiscal purposes. Conversely, this recording may give rise to privacy concerns among individuals. For this reason, the financial information of individuals should be used solely for fiscal purposes. Government agencies should be regulated with privacy concerns in mind. The European Central Bank (ECB) prioritizes the privacy issues of the digital euro project since privacy emerged as the main concern for 43% of respondents in the public consultation conducted by the ECB in 2020. Full anonymity is not an option for the ECB due to the potential illicit users. Users will have to identify themselves before using the digital euro. Transaction surveillance will be conducted by intermediaries. The data from this surveillance will remain at the intermediaries and be used for anti-money laundering (AML) and combating the financing of terrorism (CFT) requirements. Intermediaries will share data based on a related regulation or digital euro related tasks. When it comes to low-value transactions, some cash-like anonymity features will be granted to users based on risk assessments. (ECB, 2022, p. 6-8). This model could also be used for the DTL.

A CBDC system could be implemented with intermediaries or directly by central banks and could be account-based or token-based. The account-based system with intermediaries resembles contemporary bank accounts in which payments and settlements are approved by banks by controlling the rights of the sender and recipient accounts. This system is more convenient than the token-based one (Auer, ve diğerleri, 2021, p. 11; Carstens, 2021, p. 13). Thanks to intermediaries (generally banks) and account basing AML and CFT requirements could be easily done without giving the burden on the Central Bank since banks have a huge experience in doing it. In addition, banks have a significant experience in customer service. They could easily produce a system for offline payments and online settlements thanks to the competition incentive (The Office of Science and Technology Policy, 2022, p. 13, 14). Exposing the Central Banks directly to customer services engenders uncertain

risks since it has not faced customers directly; even cash distribution task is done by banks, which is the liability of the Central Bank. What is more, the account-based system is more convenient for resolving tax compliance issues. Thanks to certain account holders, all transaction histories in the economy could be easily specified by tax authorities giving them to easily spot the tax incompliance (Deutsche Bank Wealth Management, 2020, p. 9). On the other hand, a token-based system and direct implementation by the Central Bank is not a favorable choice since they lack the advantages of an account-based system with the intermediary model (Auer, ve diğerleri, 2021, p. 14). The sole advantage of a token-based system may be privacy since token-based systems resemble cash in terms of circulation. But some privacy could be ensured in an account-based system to allay the concerns of sensitive users, as in the digital euro project (ECB, 2022, p. 6-8).

An account-based system with intermediaries could easily ensure to carry out interest rates on the CBDC system. Banks can make paying interest for CBDC easy because they have experience in paying interest for deposits (Bossu, ve diğerleri, 2020, p. 37). The Central Bank decides the rate of interest, and banks could implement this interest. The Central Bank could eliminate the effective lower-bound limit if it wants to stimulate the economy on the condition that cash becomes obsolete. In addition, it could directly steer the economy without relying upon banks to transmit the policy it has decided (Deutsche Bank Wealth Management, 2020, p. 6).

Banks also can carry out smart contracts for their customers, thanks to the competition incentive. By using smart contracts, helicopter money could be used for various purposes including incentivizing specific sectors and encouraging spending (Fan, 2021, p. 10).

Giving many tasks to banks in a CBDC system may raise some hesitancy. However, they could reinforce their position in the new financial structure constructed with the beginning of CBDCs employing those tasks. They might gain more thanks to those tasks also. As a result, they benefit from new tasks instead of feeling new burdens due to those tasks. It could be also possible that everyone can choose between intermediaries and the Central Bank as a service provider. If they choose to hold reserves in the Central Bank, they have the trust of central bank liability. If they choose to hold reserves in

commercial banks, they have the convenience of private banking experience. In the second choice, the CBDC may resemble the synthetic CBDC concept (Auer, Cornelli, & Frost, *Rise of the central bank digital currencies: drivers, approaches and technologies*, 2020, p. 18; Visa, 2022, p. 14).

The effect of CBDCs on the seigniorage depends on the design of them. Today, seigniorage income are shared by the Central Bank and other banks due to the fractional reserve banking. If the DTL is more attractive than today's demand deposits, the income of the central bank from seigniorage could increase and vice versa (Committee on Payments and Market Infrastructures, 2018, p. 26). The Central Bank could wield interest rates to change the attractiveness of the DTL for stabilization of bank (Group of Central Banks, 2020, p. 11; IMF Staff Report, 2020, p. 22; Federal Reserve, 2022, p. 17; Labonte & Nelson, 2022, p. 28; Carstens, 2021, p. 10). It could impose a limit for the DTL if it is needed for banks' balance sheet necessities (Deutsche Bank Wealth Management, 2020, p. 7).

Incentivizing the Abandonment of Cash Usage

If it is impossible to abolish cash usage for various reasons, a special tax for cash usage could be laid. "The Informal Economy Tax" could be collected through withholding by banks. The rationale for the tax can be the internalisation of negative externalities like the plastic bag tax which has been in practice since the beginning of 2019 in Türkiye (Tabar, 2021). Cash users should pay for the negative consequences of cash usage on the economy since they support the informal sector. In this scenario, wages, salaries, retirement pensions, and others should be paid through the DTL. If people request cash from their bank, the bank could withhold the allowed percentage of the suggested tax and send it to the state. In this way, tax loss from the informal economy may be partly compensated. Besides, individuals tend to alter their cash usage habits, helping reduce the informal economy. Decreasing the cash usage may direct some shops to cease accepting cash as a means of payment, which also hastens the disappearance of cash (Gnan & Masciandaro, 2018, p. 14).

A new tax could be seen as a heavy burden on Turkish taxpayers. If the government does not want to levy new tax on citizens, it should incentivize the usage of the DTL by other means. For example, a special tax cut could be given for those who do not request cash from the bank.

Free museum visits could also be granted for them. Other methods resemble these examples for incentivizing the use of DTL could be laid out to minimize cash usage in daily transactions.

CONCLUSIONS

The transition to digital payment methods marks a turning point for money. Private digital currencies and crypto assets paved the way for digitalization in daily transactions and saving instruments. Sovereign states are in danger of weakening monopolies in monetary system. In reply to this threat, states commenced researching CBDCs to change the form of sovereign currencies. Developed countries have a fully-fledged financial system that provides more reliable means of payments for their citizens than emerging countries, in which citizens easily adopt new means of payments and store of values other than domestic fiat currencies. Therefore, emerging states are in danger of weakening monetary sovereignty over their territory more than developed states due to the new digital payment instruments and other digital fiat currencies circulating across borders without any restriction.

Türkiye is not immune from this threat. Therefore, the DTL project is of paramount importance for the monetary system. The DTL could help responsible authorities for preventing currency substitution. Thanks to the practical digital form of TL with stable value, Turkish society will not prefer to use any medium of exchange and store of value apart from the TL. Besides, by using the DTL, responsible authorities could improve the ability of the CBRT to steer the economy and minimize the informal economy by making obsolete cash.

Fading the informal sector ensures increased tax revenues, reducing tax rates and stepping up life standards in the country. In addition, it will end the suffering of honest taxpayers due to the injustice of the tax system resulting from the informal economy. Therefore, it is crucial to use the DTL to make cash obsolete, which is crucial for battling with the informal economy. However, digital data of personal transactions should be stored with privacy concerns in mind. Otherwise, Turkish society will go towards using crypto assets as a medium of exchange owing to their pseudo-anonymous characters.

In this work, it has been reached that the end of the importance of the DTL project in the wiping out of the

informal economy in **Türkiye** thanks to its capacity to diminish cash usage. In addition, the project carries weight with the possibility of currency substitution coming from a digital currency of a developed country or from private digital currencies and decentralized systems. This goal can only be achieved with a TL that possesses a stable value.

The DTL project has of paramount importance in preserving monetary sovereignty and increasing the tax fairness of the country. In the digital era of the economy, a digital central bank liability, which is reliable systematically and legally, is an essential part of the robust centralized monetary system. An account-based CBDC with offline capability, controlled by the CBRT in collaboration with private banks, and respectful of personal data could be a possible design.

There are a lot of policy considerations relating to the DTL project which cannot be sufficiently evaluated in this article. Hence, it is important to research the DTL's scalability, privacy, monetary policy, and operational issues before rolling it out. The CBRT should contact academics, other central banks, and private payment intermediaries like banks to make the project fully fledged.

REFERENCES

- Acar, M. (2024). Merkez Bankası Dijital Para Birimlerinin Geleneksel Bankacılık Sistemi Üzerindeki Etkisi. *Bankacılık ve Finansal Araştırmalar Dergisi*, 11 (1), 54-62.
- Acar, O., & Öztürk, N. (2021). Paranın Dönüşümünde Yeni Bir Evre: Merkez Bankası Dijital Parası. *International Journal of Accounting and Finance Researches*, 3(2), 85-104.
- Amadeo, K. (2022, June 24). *U.S. Federal Budget Breakdown*. Retrieved from The Balance: <https://www.thebalancemoney.com/u-s-federal-budget-breakdown-3305789>
- Armstrong, M. (2022, March 18). *Mobile payment in Africa is more popular than you may think - here's why*. Retrieved from World Economic Forum: <https://www.weforum.org/agenda/2022/03/mobile-payments-africa-covid-pandemic/>
- Auer, R., Cornelli, G., & Frost, J. (2020). *Rise of the central bank digital currencies: drivers, approaches and technologies*. BIS.
- Auer, R., Frost, J., Gambacorta, L., Monnet, C., Rice, T., & Shin, H. S. (2021). *Central bank digital currencies: motives, economic implications and the research frontier*. BIS.
- Bağır, Y. K., Küçükbayrak, M., & Torun, H. (2021). *Declining Labor Market Informality in Turkey: Unregistered Employment and Wage Underreporting*. Ankara: The Central Bank of the Republic of Türkiye.
- Bank of England. (2023, January 30). *A brief introduction to RTGS and CHAPS*. Retrieved from BankofEngland: <https://www.bankofengland.co.uk/-/media/boe/files/payments/rtgs-chaps-brief-intro.pdf>
- Bech, M., & Garatt, R. (2017, September). Central bank cryptocurrencies. *BIS Quarterly Review*, 55-70.
- Bergen, M. E., Bergen, T., Levy, D., & Semenov, R. (2022, November 30). *3 Lessons from Hyperinflationary Periods*. Retrieved from Harvard Business Review: <https://hbr.org/2022/11/3-lessons-from-hyperinflationary-periods>
- Board of the Governors of the Federal Reserve System . (2024, January 28). *Central Bank Digital Currency (CBDC)*. Retrieved from Federal Reserve: <https://www.federalreserve.gov/cbdc-faqs.htm>
- Bossu, W., Itatani, M., Margulis, C., Rossi, A., Weenink, H., & Yoshinaga, A. (2020). *Legal Aspects of Central Bank Digital Currency: Central Bank and Monetary Law Considerations*. IMF.
- Browning, S., & Evans, J. (2022). *Central bank digital currencies*. UK Parliament Commons Library.
- Brugge, J., Denecker, O., Jawaid, H., Kovacs, A., & Shami, I. (2018). *Attacking the cost of cash*. McKinsey on Payments.
- Carstens, A. (2021). *Central bank digital currencies: putting a big idea into practice*. Bank for International Settlements.
- CBRT. (2024, January 26). *Elektronik Fon Transfer Sistemi - Elektronik Menkul Kıymet Transfer Sistemi - Fonların Anlık ve Sürekli Transferi (FAST) Sistemi*. Retrieved from CBRT: [https://www.tcmb.gov.tr/wps/wcm/connect/TR/TCMB+TR/Main+Menu/Temel+Faaliyetler/Odeme+Sistemleri/Turkiyedeki+Odeme+Sistemleri/Elektronik+Fon+Transfer+%28EFT%29+Sistemi#:~:text=Fonlar%C4%B1n%20Anl%C4%B1k%20ve%20S%C3%BCrekli%20Transferi%20\(FAST\)%20Sistemi%2C](https://www.tcmb.gov.tr/wps/wcm/connect/TR/TCMB+TR/Main+Menu/Temel+Faaliyetler/Odeme+Sistemleri/Turkiyedeki+Odeme+Sistemleri/Elektronik+Fon+Transfer+%28EFT%29+Sistemi#:~:text=Fonlar%C4%B1n%20Anl%C4%B1k%20ve%20S%C3%BCrekli%20Transferi%20(FAST)%20Sistemi%2C)
- Christodorescu, M., Gu, W. C., Kumaresan, R., Minaei, M., Özdayı, M., Price, B., . . . Zamani, M. (2020). VISA.
- Committee on Payments and Market Infrastructures. (2018). *Central Bank Digital Currencies*. Bank for International Settlements.
- Çalış, Y. E., Çıtak, N., & Çakır, S. (2022, Ocak-Şubat). Kayıtdışı Ekonomiden Kaynaklanan Vergi Kaybı ve Tespit Etme Yöntemleri. *Mali Çözüm Dergisi*, 32(169), 35-72.
- Çevik, S., & Altınel, A. T. (2021, July 27). *CASH USAGE HABITS IN TÜRKİYE*. Retrieved from The Central Bank of the Republic of Türkiye: <https://tcmbblog.org/wps/wcm/connect/blog/en/main+menu/analyses/cash+usage+habits+in+turkey>
- Dam, M. M., Ertekin, Ş., & Kızılca, N. (2018). Türkiye'de Kayıt Dışı İstihdamın Boyutu: Ekonometrik Bir Analiz. *Dokuz Eylül Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 33(1), 293 - 318.
- Davutyan, N. (2008, December). Estimating the size of Turkey's informal sector: an expenditure-based approach. *Journal of Economic Policy Reform*, 11(4), 261-271.

- Deutsche Bank Wealth Management. (2020). *Central bank digital currencies: Money reinvented*. Deutsche Bank.
- Didenko, A. N., & Buckley, R. P. (2021). *Central Bank Digital Currencies: A Potential Response to the Financial Inclusion Challenges of the Pasific*. Asian Development Bank.
- ECB. (2022, September 28). *Progress on the investigation phase of a digital*. Retrieved from ECB: https://www.ecb.europa.eu/paym/digital_euro/investigation/governance/shared/files/ecb.degov220929.en.pdf?c7289d0032238188c71a4803112ea552
- Erkuş, H., & Karagöz, K. (2009). Türkiye’de Kayıt Dışı Ekonomi ve Vergi Kaybının Tahmini. *Maliye Dergisi*(156), 126-140.
- European Central Bank. (2023, October 18). *Eurosystem proceeds to next phase of digital euro project*. Retrieved from Europa: <https://www.ecb.europa.eu/press/pr/date/2023/html/ecb.pr231018~111a014ae7.en.html>
- Fan, S. (2021). *Central bank digital currencies and gold: implications for reserve managers*. OMFIF Digital Monetary Institute.
- Federal Reserve. (2022). *Money and Payments: The U.S. Dollar in the Age of Digital Transformation*. The Federal Reserve.
- Financial Stability Board. (2021). *G20 Roadmap for Enhancing Cross-border Payments*. Financial Stability Board.
- Gnan, E., & Masciandaro, D. (2018). Do We Need Central Bank Digital Currency: Economics, Technology and Institutions. In E. Gnan, & D. Masciandaro, *Do We Need Central Bank Digital Currency: Economics, Technology and Institutions* (pp. 8-23). Vienna: SUEF.
- Group of Central Banks. (2020). *Central bank digital currencies: foundational principles and core features*. BIS.
- IMF Staff Report. (2020). *Digital Money Across Borders: Macro-Financial Implications*. IMF.
- Kara, H., Yapan, S., & Mutlu, S. (2023). Merkez Bankası Dijital Para Birimlerine Global Bir Bakış Açısı. *Sakarya İktisat Dergisi*, 12(3), 370-383.
- Kiff, J. (2022, September). *Taking the Digital Currencies Offline*. Retrieved from IMF: <https://www.imf.org/en/Publications/fandd/issues/2022/09/kiff-taking-digital-currencies-offline>
- Kosse, A., & Mattei, I. (2022). *Gaining momentum – Results of the 2021 BIS survey on central bank digital currencies*. BIS.
- Küçükkıralı, Z., & Eser Afşar, K. (2022). Türkiye’de Merkez Bankası Dijital Parasının Potansiyel Etkileri: SWOT Analiziyle Bir Değerlendirme. *Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*(48), 142-158.
- Labonte, M., & Nelson, R. M. (2022). *Central Bank Digital Currencies: Policy Issues*. US Congressional Research Service.
- Landau, J.-P. (2021). Central bank digital currencies and financial stability. *The Third Conference on Financial Stability* (pp. 11-19). Banco de España and CEMFI.
- Lis, S. F., & Gouveia, O. (2019). *Central Bank digital currencies: features, options, pros and cons*. BBVA Research.
- Maryaningsih, N., Nazara, S., Kacaribu, F. N., & Juhro, S. M. (2022). Central Bank Digital Currency: What Factors Determine Its Adoption. *Bulletin for Monetary Economics and Banking*, 25(1), 1-24.
- Meriç, M., & Günay, A. (2004). Türkiye’de Vergi Kayıp ve Kaçaklarının Bütçe Gelirleri Üzerindeki Etkisi. 19. *Türkiye Maliye Sempozyumu* (pp. 908-930). Antalya: Uludağ Üniversitesi.
- MoneyTransfers. (2022, November 21). *22 Mobile Payment Statistics Detailing the Industry’s Growth*. Retrieved from MoneyTransfers: <https://moneytransfers.com/news/content/mobile-payment-statistics>
- MYNET Haber. (2021, July 29). *Merkez Bankası’ndan dijital para açıklaması: Eylül ayında başlıyoruz!* Retrieved from MYNET Haber: <https://finans.mynet.com/haber/detay/kripto-para/son-dakika-merkez-bankasi-ndan-dijital-para-aciklamasi-eylul-ayinda-basliyoruz/424574/>
- Norges Bank. (2018). *Central bank digital currencies*. Norges Bank.
- Norges Bank. (2019). *Central bank digital currencies*. Norges Bank.
- Özbay, B. (2020). Türkiye’de Çocuk, Kadın ve Göçmenlerin Kayıt Dışı İstihdamı. *Atlas Sosyal Bilimler Dergisi*, 1(5), 1-6.
- Savaşan, F., & Odabaş, H. (2005). Türkiye’de Vergi Kayıp ve Kaçaklarının Nedenleri Üzerine Ampirik Bir Çalışma. *Sosyal Ekonomik Araştırmalar Dergisi*, 5(10), 1-28.

- Sayıştay. (2021). *Türkiye Cumhuriyet Merkez Bankası Mali Tabloları*. Ankara: Sayıştay.
- Strategy. (2021, Nisan 29). *Ödemeler Artık Daha Nakitsiz*. Retrieved from Fintechistanbul: <https://fintechistanbul.org/wp-content/uploads/2021/05/Strategy-Odemeler-artik-daha-nakitsiz.pdf>
- Sveriges Riksbank . (2023, December 19). *E-krona*. Retrieved from Sveriges Riksbank: <https://www.riksbank.se/en-gb/payments--cash/e-krona/>
- T.C. Cumhurbaşkanlığı Finans Ofisi. (2021). *Türkiye Hanehalkı Finansal Algı ve Tutum Araştırması*. Ankara: T.C. Cumhurbaşkanlığı Finans Ofisi.
- Tabar, Ç. (2021). Negatif Dışsalılıkların İçselleştirilmesinde Plastik Poşet Vergisi: Türkiye’de Ücretli Poşet Uygulamasının Değerlendirilmesi. *Mali Çözüm Dergisi*, 31(165), 167-186.
- Taşçı, E. (2020, April 28). *Türkiye Nüfusunun Yüzde 77’si Akıllı Telefon Kullanıyor*. Retrieved from İstanbul Üniversitesi: <https://www.istanbul.edu.tr/tr/haber/turkiye-nufusunun-yuzde-77si-akilli-telefon-kullaniyor-67006B00640038004B0076003000310059002D00440039007900700046006200610041004F003200370077003200>
- TBMM. (2022, June 28). 2021 Yılı Merkezi Yönetim Kesin Hesap Kanunu Teklifi. *TBMM Başkanlığı*. Ankara.
- TCMB. (2021, September 15). *Merkez Bankası Dijital Türk Lirası Ar-Ge Projesi Hakkında Basın Duyurusu*. Retrieved from TCMB: <https://www.tcmb.gov.tr/wps/wcm/connect/TR/TCMB+TR/Main+Menu/Duyurular/Basin/2021/DUY2021-40>
- TCMB. (2021). *Yıllık Faaliyet Raporu*. Ankara: TCMB.
- TCMB. (2022, December 29). *Dijital Türk Lirası Kullanımına İlişkin Basın Duyurusu*. Retrieved from TCMB: <https://www.tcmb.gov.tr/wps/wcm/connect/TR/TCMB+TR/Main+Menu/Duyurular/Basin/2022/DUY2022-55>
- The Federal Reserve. (2022). *2022 Currency Budget*. Washington, USA: The Federal Reserve.
- The Office of Science and Technology Policy. (2022). *Technical Evaluation for a U.S. Central Bank Digital Currency System*. Washington / USA: The White House.
- Toraman, Y. (2022). Dijital Türk Lirasının (DTL) Kullanım Kabulü: Teknoloji Kabul Modeli (TKM) ve Planlı Davranış Teorisi (PDT) Çerçevesinde İncelenmesi. *Sosyoekonomi*, 30(54), 357-376.
- Turkish Statistical Institute. (2021). *The ratio of persons who are not registered to social security institution due to main job*. Ankara, Türkiye: Turkish Statistical Institute.
- Turkish Statistical Institute. (2022). *Survey on Information and Communication Technology (ICT) Usage in Households and by Individuals, 2022*. Ankara, Türkiye: Turkish Statistical Institute.
- Ünlü, A., Künc, S., Tutgun, S., & Çelik, S. (2023). Merkez Bankalarının Dijital Para İhracı: TCMB Örneği. *Akademik Yaklaşımlar Dergisi*, 14(1), 1-27.
- Visa. (2022). *The art of public money: Policy considerations for central bank digital currencies*. Visa Economic Empowerment Institute.
- Ward, O., & Rochemont, S. (2019). *Understanding Central Bank Digital Currencies*. Institute and Faculty of Actuaries.
- World Bank Group. (2021). *Central Bank Digital Currencies for Cross Border Payments*. World Bank.
- Yurdakul, F. (2008). Türkiye’de Kayıtdışı Ekonomi: Bir Model Denemesi. *Ankara Üniversitesi SBF Dergisi*, 63(4), 205 - 221.

Overview of Economic Relationships Between Türkiye and Turkic Republics

Merve Vural ALLAHAM¹ , Cemal ZEİR² 

ABSTRACT

In the wake of the Soviet Union's collapse in 1991, the Turkic Republics, sharing a common history, languages, and cultures, embarked on establishing political and economic ties. Numerous scholarly inquiries have since delved into the economic connections and collaborations between these amicable nations. This study endeavors to contribute to the evolving landscape of research on the integration of these Turkic Republics by tracking the growth and development of academic studies concerning Türkiye's economic relations and cooperations with Azerbaijan, Kazakhstan, Kyrgyzstan, Turkmenistan, and Uzbekistan. Employing a bibliometric analysis approach, we delve into the theoretical foundations that underpin these academic investigations. Our analysis focuses on 119 publications drawn from the academic database Web of Science (WoS), spanning the years 1993 to 2023. These studies predominantly lean towards the utilization of econometric models and quantitative methods in their exploration of the economic relationships. Remarkably, the most frequently cited journals emerge from the domains of energy, environment, and sustainability, suggesting a clear thematic concentration. However, it is worth noting that the range of subjects covered in the research remains relatively limited, presenting a promising avenue for further exploration and diversification in future studies.

Keywords: Bibliometric analysis, Economic relations of Turkic Republics, Trade cooperation between Turkic Republics, Economic relations of Turkish States, Turkish States.

JEL Classification Codes: F13, F42, C88

Referencing Style: APA 7

INTRODUCTION

In a rapidly changing global landscape, collaborative efforts play a pivotal role in addressing contemporary challenges and threats, offering a pathway to shared prosperity, stability, and economic growth (Guan & Qamruzzaman, 2022; Adanma & Ogunbiyi, 2024). At the crossroads of this dynamic global environment lie the Central Asian and Caucasian nations, where Türkiye's deepening political, economic, and military relations with the Turkic Republics assume critical significance. In recent years, the Turkic Republics in this region have gained increasing prominence, leading to a more comprehensive examination of their economic and socio-political performance (Çelik et al., 2023). Since the end of the Cold War, these nations, largely due to Türkiye's initiatives, have been actively working to strengthen their political, economic, and cultural ties (Kaplan et al., 2015). The prospect of fostering economic cooperation among these Turkic Republics, which share a common language, history, identity, and culture, holds the potential to

contribute not only to the economic development of the Eurasian continent but also to global economic progress. This strategic alignment not only facilitates inclusive development but also serves as a counterbalance to the expanding influence of major global powers like Russia, China, and Iran. It enables Türkiye to create vital logistics infrastructure, expand transportation corridors, and access global markets, including the potential for a connection to China via Turkmenistan-Uzbekistan-Kyrgyzstan. This development of transport networks offers a cost-effective alternative, potentially bridging Asia and Europe (Al Shaher, 2022).

The Nahchivan Agreement of 2009 formalized the summits of the Heads of Turkic Speaking States, held since 1992, as the Cooperation Council of Turkic Speaking States. This council's overarching goal is to promote collaboration among Turkic Speaking States. The Turkic Republics share common ethnic, linguistic, geographical, and cultural characteristics, and can contribute to regional development through multilateral cooperation.

¹ Asst. Prof. Dr., Istanbul Gelisim University, Faculty of Economics, Administrative and Social Sciences, Management Information Systems Department, mvural@gelisim.edu.tr

² Prof. Dr., Yıldız Technical University, Faculty of Economics and Administrative Sciences, Business Administration Azerbaijan State University of Economics(UNEC) Center for Islamic Finance, cemalzehir@gmail.com

Since the end of the Cold War, Türkiye has actively worked to strengthen its cultural, economic, and political ties with the Turkic Republics in the Caucasus and Central Asia, taking significant steps in foreign policy as these regions gained strategic importance (Kaplan et al., 2015).

To promote political unity among the Turkic Republics, the Organization of Turkic States (OTS) was established (Buyar & Uğur, 2022). The OTS is taking concrete steps to increase trade among Turkic Republics. The organization aims to facilitate more efficient trade flows between countries by accelerating customs procedures and eliminating trade barriers. Additionally, it seeks to connect the Turkic Republics through joint projects to enhance energy infrastructure and increase energy cooperation (Çetinkaya & Demirel, 2024). Economic collaboration is at the core of the OTS's objectives, which include facilitating financial and banking processes, promoting trade and investment by establishing favorable conditions, and streamlining customs and transit procedures. The summits held by the organization have covered important economic areas, including transportation, tourism collaboration, and assistance for small and medium-sized enterprises.

Baghirov (2022) underscored the untapped economic potential within the OTS, pointing out that its total trade volume constitutes a mere 3% of the global trade figures. In a similar vein, Akçapa (2023) emphasized that only 14 billion dollars out of the total 720 billion dollars in foreign trade among the member nations of the OTS is conducted within the framework of the organization itself. This disparity highlights that the full economic potential of the Turkic States has not yet been effectively harnessed or realized.

In a study based on IMF (International Monetary Fund) data, İstikbal (2022) projected that the total Gross Domestic Product (GDP) of the member countries of the OTS will reach 2 trillion dollars by 2027. This indicates the rise of a regional economic power (Akçapa, 2023). These developments will enhance the economic influence of the OTS and strengthen regional economic integration. Increasing cooperation among Turkic States will enhance their competitiveness in global markets and consolidate regional stability. Moreover, the geographical location of the OTS in strategically significant regions offers significant opportunities for countries along the trade corridors from China to Europe.

Additionally, global changes and regional developments are making the organization more important. The economic impacts of COVID-19, energy

and food crises exacerbated by the Ukraine-Russia conflict, and other issues have made it difficult for states to address these challenges alone (Akçapa, 2023). In this context, it is crucial to assess the effectiveness of the OTS's activities and explore further opportunities for cooperation. The OTS provides a platform to strengthen positions in common markets and gain greater access to global markets.

Turkey plays a key role in scientific research, benefiting from its strategic position in Eurasia, which enables robust collaboration with both Western and neighboring countries. Nevertheless, there is a limited number of bibliometric studies focused on Turkey's economic partnerships, particularly with Azerbaijan, Kazakhstan, Kyrgyzstan, Turkmenistan, and Uzbekistan. Highlighting the need for more recent research on Turkey's economic ties with the Turkic Republics.

This study's primary objective is to scrutinize the academic literature concerning economic connections between Türkiye and the aforementioned Turkic Republics. Employing the bibliometric analysis method, this research explores the academic literature available within the WoS database, delving into the sources referenced by researchers and examining the interconnections and impacts of publications contributing to this subject. By identifying prevalent themes and influential authors in the domain of economic ties among the Turkic Republics, this study lays the foundation for future research endeavors. It provides insights into Türkiye-Turkic Republics' economic relations by analyzing references, publication journals, citations, keywords, and collaborative authorships.

The analysis of the results shows that most of the publications are classified as articles, with other types of academic publications, such as conference proceedings and reviews, being comparatively limited. Noteworthy keywords in the literature include "Turkey," "Azerbaijan," "energy," "trade," "financial development," "Central Asia," "China," and "Russia." It is worth highlighting that the literature predominantly centers around the energy sector. However, sectors such as cotton yarn, construction materials, leather, furniture, steel and metal, sports, education, and tourism—despite receiving investments among these countries—seem to attract comparatively less attention.

The study further indicates a robust interest in this field, primarily evident in research articles, underscoring the academic enthusiasm for exploring the economic dynamics of the Turkic World. Yet, the limited number

of proceeding papers highlights the need for additional academic events and collaborations to facilitate the exploration of economic, political, and cultural ties among these nations. Organizing conferences and promoting academic collaborations focusing on the economic relationships between these countries can play a pivotal role in enhancing these multifaceted relationships.

Academic focus on these topics has grown in direct response to key historical events, particularly the collapse of the Soviet Union in 1991 and the subsequent formation of the Organization of Turkic States (OTS) in 2009. These milestones significantly spurred scholarly interest. Despite the rising attention, however, the body of research remains somewhat limited, failing to fully capture the intricate nuances and multi-faceted nature of the subject matter.

Moreover, the analysis of bibliometric coupling data highlights a distinct preference for quantitative methodologies over qualitative approaches within the studies. Methodologies rooted in econometrics enable versatile analyses involving multiple variables and require expertise in mathematics, economics, and statistics. Notably, the presence of technically sound and up-to-date publications among the bibliographically matched references underscores a recent shift in scholarly interest toward more technically oriented research methods.

Authors in the field increasingly seek to optimize resource utilization, particularly in areas related to environmental sustainability and the integration of clean energy sources, signifying substantial investments in ambitious projects. These trends emphasize the need for comprehensive assessments of their effectiveness.

Economic policy-focused publications that cater to policymakers tend to take the form of review articles. These reviews make significant contributions to the existing literature by offering insights into progress within a given field, tracing the historical evolution of events, and fostering diverse perspectives.

Furthermore, this study compiles essential resources, serving as a foundational reference for future meta-analyses and quantitatively validated literature reviews. The study's outcomes are presented with accompanying discussions and illustrated through tables and figures. The concluding section offers recommendations for future research, along with an explication of the study's key findings.

LITERATURE REVIEW

Despite the long-standing independence of the new Turkic Republics, it is apparent that our socioeconomic connections with them continue to fall short of expectations. The current state of the literature in this field, encompassing aspects such as energy, trade, diplomacy, and more, can be characterized as a dynamic repository of studies that predominantly focus on various subtopics. It is important to recognize the considerable impact of dominant powers like Iran, the USA, and Russia in the region, in addition to the significant contribution of the Turkic Republics.

Notably, the ruling elites in these countries express a shared desire for the redefinition of the center-periphery relationship. However, it's important to underscore that none of them seek to break ties with Russia (Çınar, 2013). Russia's formidable authority over the Turkic Republics in this context remains a noteworthy factor that should not be underestimated. Within this context, it is reasonable to assert that Turkish foreign policy operates within a spectrum of both competition and cooperation, as it navigates the vast resources and potential offered by Central Asia and the Caucasus.

Beyond the well-recognized cultural and historical connections frequently discussed in the literature, Sobirov (2020) argues that the opportunities for political and economic integration among Turkic Republics remain limited. The expansion of commercial relations is specifically highlighted in the Charter of the OTS, which emphasizes the creation of "favorable conditions for trade and investment, the simplification of customs and transit procedures, and the facilitation of financial and banking processes to support the movement of technologies, services, goods, and capital". However, upon scrutinizing the overall trade volume between the Turkic Republics in this council, discernible growth trends are not readily apparent. Sobirov (2020) observed that prior to the establishment of the Council of Turkish-speaking countries, Azerbaijan and Kazakhstan maintained stronger commercial relations with Türkiye. While Türkiye's commercial connections with Azerbaijan and Kyrgyzstan have witnessed improvement since 2009, Kazakhstan's participation in the Council has not significantly impacted their commercial relations.

The establishment of the Turkic Council Turkic Universities Union serves as a significant initiative to foster cooperation among member nations of the Turkic Council within the realm of higher education. This organization's primary objective is to encourage

collaboration among higher education institutions in member countries, with the aim of cultivating friendship and cooperation among Turkish-speaking communities that share a common language, culture, and history (Turkish Council Turkic Universities Union, 2019). Research conducted by Budak and Terzi (2021) focuses on exchange programs among Turkic Council member nations through interviews with students. The research findings revealed that students emphasized factors such as a common language, a shared scholarship program, increased collaboration in the field of education, and cooperative sports competitions. Notably, the absence of a functional common communication language among the Turkic Republics remains the most substantial impediment to the cultural integration of Turkic Republics today. While historical origins suggest a shared linguistic background, contemporary languages spoken in the Turkic Republics exhibit significant differences in terms of communication. The authors also highlighted a marked distinction between the scholarship initiatives of the Turkic Council States and those of other global powers. Specifically, a significantly higher number of students participate in programs offered by the US, Russia, China, and European nations compared to programs within the Turkic Republics. The data obtained indicates that the budget allocated by the Turkic Council for these initiatives is insufficient when compared to the resources available to other major players. In light of these circumstances, there remains a limited number of endeavors to establish collaborative exchange programs to address the prevailing needs. Efforts such as the Orhun Exchange Program have been specifically designed for the Turkish population at the higher education level. Nevertheless, more universities must join such programs, and both faculty members and students at participating universities should be actively encouraged to participate (Akıllı, 2019).

As established by Humbatov and Sari's (2017) analysis of the trade potential between Türkiye and the Turkic Republics, the current level of trade over time has remained remarkably low. Their analysis reveals that none of the Turkic Republics rank among the top 20 export or import destinations for Türkiye. This situation is perplexing given the mutual desire of these nations to engage in trade, which is supported by their significant trade potential. However, the major hindrance to establishing robust economic relations between these countries lies in the absence of efficient economic transportation means connecting them. In essence, the challenge arises from the lack of direct access to open seas and their geographical remoteness from Türkiye.

While there is a genuine desire for economic cooperation, the absence of practical transportation options limits the realization of this potential.

Azerbaijan, characterized by its heavy reliance on oil for its economy, has recognized the necessity of economic diversification as a paramount goal in its pursuit of sustainable development. This commitment is clearly articulated in its "Azerbaijan 2020: Vision for the future" strategy, which underscores the imperative to reduce its dependence on natural resources. To achieve this vision, Azerbaijan acknowledges the need for cutting-edge technologies, innovative management approaches, and enhanced connectivity to international markets. These elements are pivotal in the process of restructuring the economy and addressing the challenges and constraints associated with transitioning away from oil dependency. Consequently, this intensified focus on economic diversification amplifies the demand for Foreign Direct Investment (FDI) and the invaluable experiences that FDI consistently brings to the table (Humbatov & Sari, 2017).

In their study on logistics and transportation, Humbatov and Sari (2017) highlight the detention attempts made by Russian customs officials when goods are being transported over the Georgian border in trade between Kyrgyzstan and Türkiye. The efficient functioning of logistics and transportation is pivotal in facilitating trade and economic activities, and these detention attempts pose a significant challenge to this process. Consequently, as a consequence of these challenges, Kyrgyzstan is compelled to reroute its trade via Azerbaijan and the Caspian Sea, which, in turn, leads to the imposition of high logistics costs. This complex situation underscores the critical role of smooth and unhindered transportation in fostering efficient trade relationships.

Additionally, it is imperative to acknowledge the pivotal role played by China in the context of trade with Europe (Sandkamp, 2024). In this geographic region, Türkiye and the Turkic Republics are strategically positioned, enjoying a highly advantageous location. Situated at the crossroads between Europe and China, where substantial trade volumes are prevalent, they are well-positioned to secure a significant share of this trade. Türkiye, in particular, exhibits strong performance in logistics and transportation when compared to other Eurasian nations (Bentyn, 2021). Nonetheless, there are certain areas within the realm of logistics and transportation that warrant further development. Notably, there appears to be an underutilization of railroad transportation both at the national and international levels (Zeybek, 2019).

Addressing this gap in the transportation infrastructure could significantly enhance the region's connectivity and trade capabilities.

This literature review underscores the presence of economic and commercial potential among these countries, alongside the evident obstacles that hinder the realization of robust economic relationships. It is imperative to delve into the underlying reasons why solid economic relations with a potential economic ally like Türkiye have not been fully developed, especially as these nations aspire to integrate into the global economy and diversify their economies. To comprehensively evaluate this potential and identify alternative solutions to the obstacles, the guidance and insights provided by studies within the academic world are invaluable. Therefore, to optimize our socio-economic relations, a comprehensive research effort is warranted. Such research aims to pinpoint the problems and disruptions that arise from both Türkiye and the other Turkic Republics and to propose effective solutions. In this context, questions like "In which years have studies been conducted on this subject?", "What are the focal points and topics of the studies in the literature?", and "Do academic sources indexed in WoS address these issues?" gain particular relevance. It's worth highlighting the significance of this study in seeking answers to these crucial questions. Throughout the preceding sections of this literature review, we have highlighted both the positive and negative aspects of the relationships among the Turkic Republics. In the forthcoming sections, we will explore examples of bibliometric studies in the literature and instances of research on the Turkish World conducted through different methodologies.

The advancement of technology has ushered in a new dimension in understanding distance, fostering closer relations and cooperation between nations while also nurturing human connections. Across diverse fields of collaboration, the cornerstone of international agreements lies in the sharing and dissemination of scientific knowledge. Consequently, a range of activities, such as academic partnerships, collaborative ventures, symposiums, workshops, and exchange programs, have flourished (Şahin & Candan, 2018). These events play a pivotal role in addressing shared regional challenges, seeking solutions, and elevating awareness of potential forces and threats.

Bibliometrics holds a key position in assessing the efficiency and impact of scientific endeavors, academic research, and collaborative efforts (Reyes-Gonzales et al., 2016). By analyzing citation patterns and publication

trends, bibliometrics offers valuable insights into the evolution of research fields and the strength of academic collaborations. Bibliometrics emerged as a response to the growing need for innovative methods to assess scientific research in the rapidly changing academic environment. With the rise in publications and citations, as well as greater access to information, scientific production and collaboration have become increasingly strategic. Bibliometric data provides essential indicators for both nations and international organizations, offering insights into current science policies and shaping future decisions. Therefore, bibliometric studies are essential for the development of science policies at both the national and global levels (Şahin & Candan, 2018).

By employing bibliometric and citation analysis, one can uncover important insights about the influence of a publication, as well as the patterns of information flow and global collaboration (Allaham, 2022). This method not only helps in understanding the impact of specific publications but also sheds light on the processes of knowledge spread and international cooperative efforts.

Türkiye stands as a nation with a thriving culture of scientific inquiry, a facet intricately linked to its unique geopolitical standing within the Eurasian region. This vibrant scientific landscape is a testament to Türkiye's active engagement in scientific collaboration with both Western countries and neighboring nations, a fact clearly mirrored in publication statistics. Nevertheless, the realm of bibliometric studies focused on research endeavors related to Türkiye's economic cooperation currently appears to be relatively limited in scope. To the best of the authors' knowledge, there is a notable dearth of studies employing a bibliometric approach to investigate the economic ties between Türkiye and the Turkic Republics. This presents a notable gap in the existing literature, underscoring the pressing need for more contemporary bibliometric studies to shed light on the landscape of international economic cooperation between Türkiye and these Republics. Despite the limited presence of bibliometric investigations on this specific subject, it is worth noting that several related studies are believed to exist within the broader academic landscape.

In their detailed bibliometric analysis of scientific output and cooperation within the Turkish World, Şahin and Candan (2018) offer valuable insights into the academic collaborations and publication records of the Turkic Republics. Their findings highlight key trends in scientific productivity and collaborative efforts among these nations. Türkiye emerges as a prominent figure in this landscape, with a significantly higher number of

documents produced when compared to Kazakhstan, Azerbaijan, and Kyrgyzstan. Impressively, Türkiye's involvement is noted in a substantial 95.24% of joint research endeavors. Moreover, the study delves into citation rankings, ranking Türkiye at 28th place among 151 countries, while Azerbaijan, Kazakhstan, and Kyrgyzstan occupy the 98th, 111th, and 146th positions, respectively. This analysis reveals Türkiye's strong presence on the global academic stage and its pivotal role in scientific collaborations within the Turkish World. In terms of specific scientific cooperation, the study underscores that Türkiye-Azerbaijan collaborations surpass collaborative efforts between other member countries, signaling a strong foundation of scientific activities between these nations. Türkiye also emerges as a primary hub for such cooperative studies. Interestingly, the research indicates a shifting landscape over time. While the early 2000s witnessed a limited number of co-authored documents between Türkiye, Azerbaijan, Kazakhstan, and Kyrgyzstan, the study documents a significant uptick in academic cooperation among Turkic Council member countries from 2008 onward. The surge is visible in the increasing volume of research publications across all four member states in comparison to prior years. Notably, the study identifies the top 10 research areas of co-authored documents, including Physics, Mathematics, Chemistry, Environmental Sciences, Ecology, and Life Sciences. It is revealed that the countries most commonly partnered with Turkic Council member nations in publishing documents are Türkiye, the United States, and various European countries. Azerbaijan's scientific collaborations are closely tied to Türkiye and Russia, while Kazakhstan and Kyrgyzstan exhibit a propensity for cooperation with Russia and the United States. Kyrgyzstan further demonstrates close academic relations with Germany and Türkiye. Remarkably, the analysis underscores a concerning observation. Despite the collaborative aspirations, an examination of co-authored documents in the WoS database indicates that documents were not jointly produced at the higher education level between Türkiye and Azerbaijan, Kyrgyzstan, and Kazakhstan. This signals a gap in the institutional cooperation between these nations. In conclusion, Şahin and Candan's (2018) bibliometric study provides a valuable insight into the evolving landscape of scientific collaboration among Turkic Republics, showcasing Türkiye's leadership position and pioneering role in fostering scientific cooperation within the Turkish World. The findings underscore both the progress made and areas that warrant further attention in enhancing academic partnerships among these nations.

In a study conducted by Demir et al. (2016), an extensive comparison of the socio-economic and academic development of Turkic Republics was undertaken based on publications spanning the period from 1992 to 2014. The findings of this analysis reveal several key insights into the academic landscape and research output of these nations. First and foremost, the study highlights Türkiye's prominent position, ranking 1st in both the number of publications and publication efficiency among the Turkic Republics. This signifies Türkiye's robust commitment to academic research and its effectiveness in producing scholarly work. Additionally, the study notes that Kyrgyzstan and Turkmenistan secured the 2nd position in this ranking, indicating their noteworthy contributions to academic publications. A further examination of Türkiye's publications reveals that the field of Medicine emerges as the top area of focus, boasting the highest number of publications. This is followed by significant contributions in the fields of Chemistry, Physics, Materials Science, Computer Science, and Mathematics. These areas of research emphasize the diversity of academic interests and expertise within Türkiye, reflecting its multifaceted approach to scholarly activities.

Dölek et al. (2023) used the bibliometric analysis method to review medical research conducted in Turkic Republics. Medical research has a direct correlation with economic expansion, long-term, sustainable development, and raising living standards and quality in these Republics. It has been reported that while Türkiye has produced a large number of publications compared to other Turkic Republics, the number of citations has not grown at the same pace. According to some interpretations, this indicates that, in comparison to a developed nation, the scientific infrastructure is still immature. Kyrgyzstan has the highest number of citations per article (132.7), while Uzbekistan has the lowest number (6.5). Turkish researchers received a total of 84,692 citations across 147,147 articles, whereas Kyrgyz researchers' work garnered 396 citations for 164 articles. The countries' scientific output increased as the Soviet regime's influence declined. Beyond the impact of Soviet influence, several other factors may contribute to the low scientific productivity. These include limited funding for medical research, insufficient facilities for clinics and laboratories, and a shortage of researchers. Additionally, the lack of journals indexed in databases such as Scopus, WoS, and PubMed, as well as underdeveloped editorial skills, impede scientific progress. Other contributing factors are scientific isolation, high costs of publishing in open access journals, and a diminished desire to enter academic fields. Furthermore, the study mentioned that

numerous generations of scholars from other Turkic Republics outside of Türkiye were trained in Russian writing and publishing. This could be one of the main causes of the Turkic Republics' comparatively low levels of scientific productivity in terms of interacademic collaboration. Even though learning English is required in each of the member republics, researchers may have been forced to publish in less prestigious journals with little impact due to their poor English writing abilities.

Toklu (2023) analyzed the science and technology activities of the Turkish World using a comparative performance analysis and emphasized that the formulation of well-established and effective science and technology policies in these Republics will lead to significant improvements in the production of patents, industrial designs, and scientific publications. The study further indicated that fostering researchers' involvement in R&D and innovation, promoting stronger collaborations between universities and industries, and developing long-term strategic plans would have a constructive effect on advancing the science and technology infrastructure.

Hirv (2022) noted that internationally coordinated research projects exhibit a positive correlation with the number of citations. Developed countries tend to allocate more resources to internationally coordinated research efforts, resulting in a higher number of authored articles. Among the articles examined in the study, the proportion of articles with multiple authors is significantly lower. Many underdeveloped or developing countries are making a notable scientific impact relative to their research expenditures. Furthermore, the author suggests that the landscape of science is on the verge of a taxonomic transformation, where impact will no longer be measured solely in terms of citations, but rather in terms of its influence on all sectors of society. A well-balanced funding strategy may lead to a lower number of citations per article but can have a positive effect when considering its broader cultural and economic impacts.

It should be stated that one of the main difficulties is that Turkic Republics use different dialects such as Azeri, Turkmen, Kyrgyz, Tatar and Uzbek, as well as Turkish. In addition, cultural differences and management styles of the regions can be considered among other difficulties. Undoubtedly, the most reliable sources of information are scientific studies. For this reason, scientific research on the Turkish World is very important resources in terms of international relations, sociological, cultural, political and economic aspects. Güvendi (2023) examined a total of 1249 publications with the phrase "Turkish World"

among the publications scanned in the WOS database using the bibliometric method. 1159 of the publications that is, the majority of them, are of the research article type, and it has been observed that types of publications such as letters, editorial materials, and article reviews are comparatively scarce. While Turkish researchers mostly conducted research in the fields of Health Sciences, non-Turkish researchers worked in the fields of Social Sciences. The most published categories according to WOS categories with the expression "Turkish World" are field research, international relations, economy, environment, political sciences, occupational health, education, and sociology.

"Traditional Turkish Sports" refers to recreational sports that incorporate customs that have been developed over time in accordance with the nomadic lifestyle of the Turkish people. It is stated that major sports events organized within the scope of sports tourism affect the host country or city in many ways. While the global image of the country or city hosting such events increases, its economic, social, cultural, environmental and political development accelerates. New employment opportunities emerge for the people of the countries that organize these sports organizations, awareness of the country increases, tourism develops, social education improves, and the cultural level of individuals increases. It acts as a stimulus for major developments such as major sports organizations, new sports facilities, new roads, airports, public transportation development works, initiatives to revitalize the regional economy, beautification works, tourism businesses and social services. Especially organizations such as traditional sports games are an important tool in preserving cultural identity. According to the study by Korkmaz and Kızanlıklı (2023), traditional sports events have significant social, economic, cultural, environmental, and political impacts on tourism in Kyrgyzstan. Positive effects have been detected on issues such as increasing the country's image, increasing the number of tourists, and world-wide recognition. Sports games have contributed to political cooperation between participating countries. Traditional sports games, which are the common cultural heritage of the Turkish people, have brought the Turkish World closer together by bringing them together on a common ground. Thus, political, economic and cultural cooperation between the countries of the Turkish World has increased.

Kravtsov (2019) examined the scientific collaborations between Russia and the post-Soviet countries over the period from 2000 to 2017. The findings show that most of

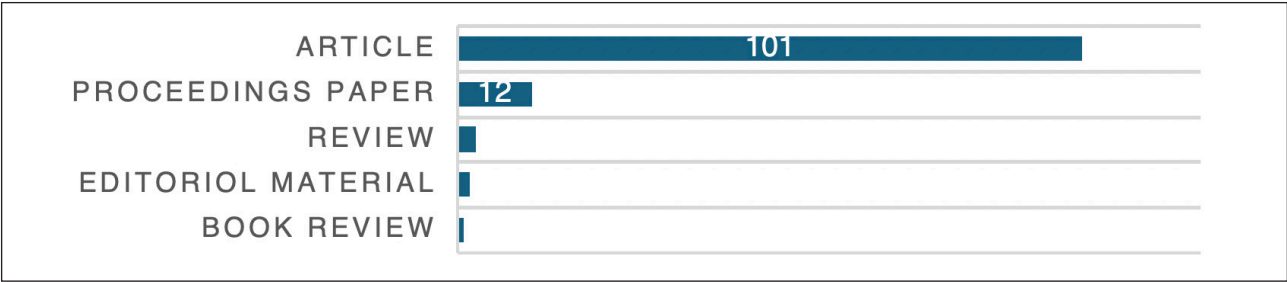


Figure 1: Publication Types

the research on Russia’s collaborations with Azerbaijan, Kazakhstan, and Uzbekistan has been concentrated in the fields of chemistry and physics. This is largely due to the fact that the primary form of cooperation among these nations revolves around petrochemical industries. For Turkmenistan, the key areas of scientific cooperation with Russia are geochemistry and geophysics, and it is noted that Turkmenistan stands out as Russia’s most engaged scientific partner.

Although the potential for socio-economic relations between the Turkic Republics and Türkiye is substantial, challenges such as geographical barriers, inadequate transportation infrastructure, and cultural differences hinder the development of these relations. These challenges make it difficult to fully realize the economic potential in the region. Furthermore, the lack of an effective communication language among the Turkic Republics negatively affects cultural integration and academic cooperation. The aim of this study is to provide recommendations for addressing these gaps in order to strengthen the economic relations between Türkiye and the Turkic Republics. Addressing these gaps will facilitate the increase of regional trade and enhance integration with the global economy.

FINDINGS

Methodology

Bibliometric analysis is a valuable tool for analyzing published data and generating a link map. It is a branch of study that examines publication patterns in the distribution of data among studies using statistical and mathematical methodologies. This method involves mapping, bibliometric coupling, co-citation analysis, and impact indicators. It is possible to compile information on published studies’ keywords, typical citation patterns, country of origin, number of cited journals, and other elements with the asset of bibliometric analysis. Co-citation analysis is a method that examines works which reference a particular pair of sources, using information from academic databases and analytical techniques. It is

required to look for sources on a specific topic and gather pertinent information in order to conduct such analysis (Allaham, 2022).

Keywords and Publications

In this study, a keyword-based search was performed in the WoS database using terms such as “economic relationship”, “economic ties”, “economic cooperation”, “bilateral economy”, “trade”, “trade relationship”, “trade cooperation”, “trade ties”, and “bilateral trade” in order to determine academic studies on Türkiye’s relationship with other Turkic Republics and the relevant results were listed. For example, a search was made for each keyword for each country, such as “Turkey and Azerbaijan economic relationship” or “Turkey and Kazakhstan economic cooperation”. In the WoS database, there are 119 publications on Turkey-Azerbaijan economic relations, 79 on Turkey-Kazakhstan economic relations, 48 on Turkey-Turkmenistan economic relations, 34 on Turkey-Uzbekistan economic relations, and 26 on Turkey-Kyrgyzstan economic relations. Repeated publications and more than one in the same list have been removed since publications with a similar subject can be listed in each search list. 119 publications were studied after being sorted through a total of 187 publications. The analysis was carried out with the help of Vosviewer, a software tool specialized in visualizing bibliometric networks. Figure 1 illustrates the types of publications that were analyzed. Most of the studies are published as articles. 1 book review, 3 reviews, 12 proceedings papers, 101 articles, and 2 editorial materials make up the studies. Most of articles on this topic are evidence that researchers prefer to publish in scientific journal sources in general. The conferences are held with certain themes and subject limitations, which limits the publication’s subjects accordingly. Even if it is only a tiny amount, the presence of editorial content indicates that a journal on Turkic Republics economic relations has a special issue or is particularly interested in this topic. Editors frequently offer a tool for assessing a special issue once it is published.

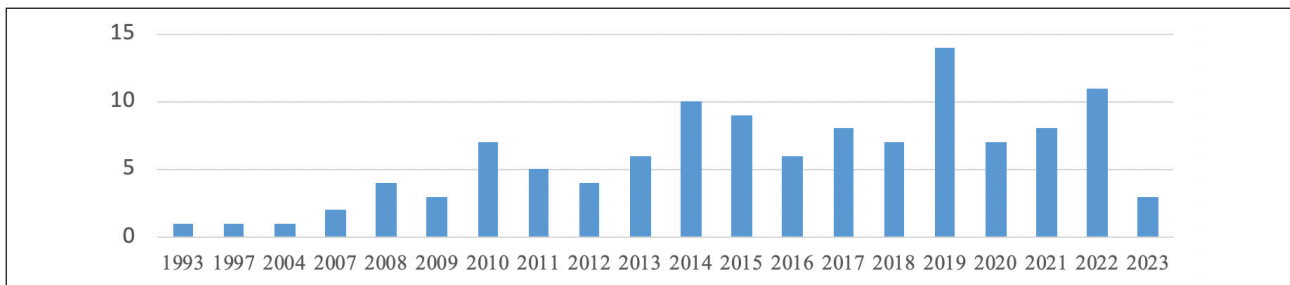


Figure 2: Publication Years

The articles were published between 1993 and 2023. The years the research was published and the number of publications per year are shown in Figure 2. One could say that interest in research on Turkic Republics has grown since 2007 and that the allocation by year is balanced. It should be noted that the studies are insufficient when the economic ties between 6 countries are taken into account.

Co-occurrence of Keywords

The keywords of the studies were analyzed using 652 different keywords. Figure 3 displays 26 keywords

“China”, and “Russia”. One of the most crucial components that enables researchers to locate a published article is keywords. Keywords are divided into 4 themes on the map. When analyzing the primary focus of the keywords, geographical region location, neighboring countries, energy and natural resource exchange play an important role in Türkiye’s bilateral economic relations with other Turkic Republics. In addition, the methods used by the studies are also evident in keyword analysis (for example, panel data analysis or unit root tests). See appendix A for an example of individual co-occurrence of keywords by country.

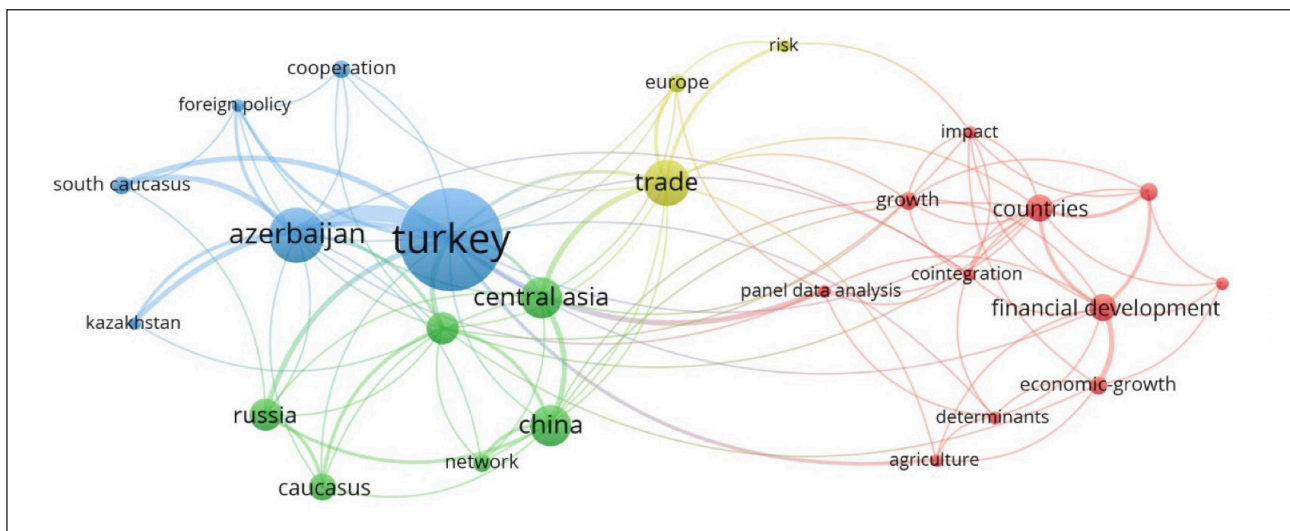


Figure 3: Co-occurrence Network of Keywords

that appear together a minimum of three times. On the map, the rounded nodes stand in for keywords. Each keyword’s usage frequency is shown by the size of the nodes (Allaham, 2022). The intensity of a pair of nodes’ relationship is expressed by the distance between them. When the distance is short, the relationship is stronger; when it is long, the relationship becomes weaker. “Turkey” and “Azerbaijan” are at the top of the list of the most searched terms. Other most used words are “energy”, “trade”, “financial development”, “Central Asia”,

Research Fields

Figure 4 illustrates the research areas covered by the publications. The most published fields are business and economics, government and law. International relations studies try to find answers to questions from various sources, regardless of the level of analysis. Like wars, nationalism, ideology, government, politics, genetics, economics. The study of economic relations between different countries also covers a kind of international relations issues. The subject of the research

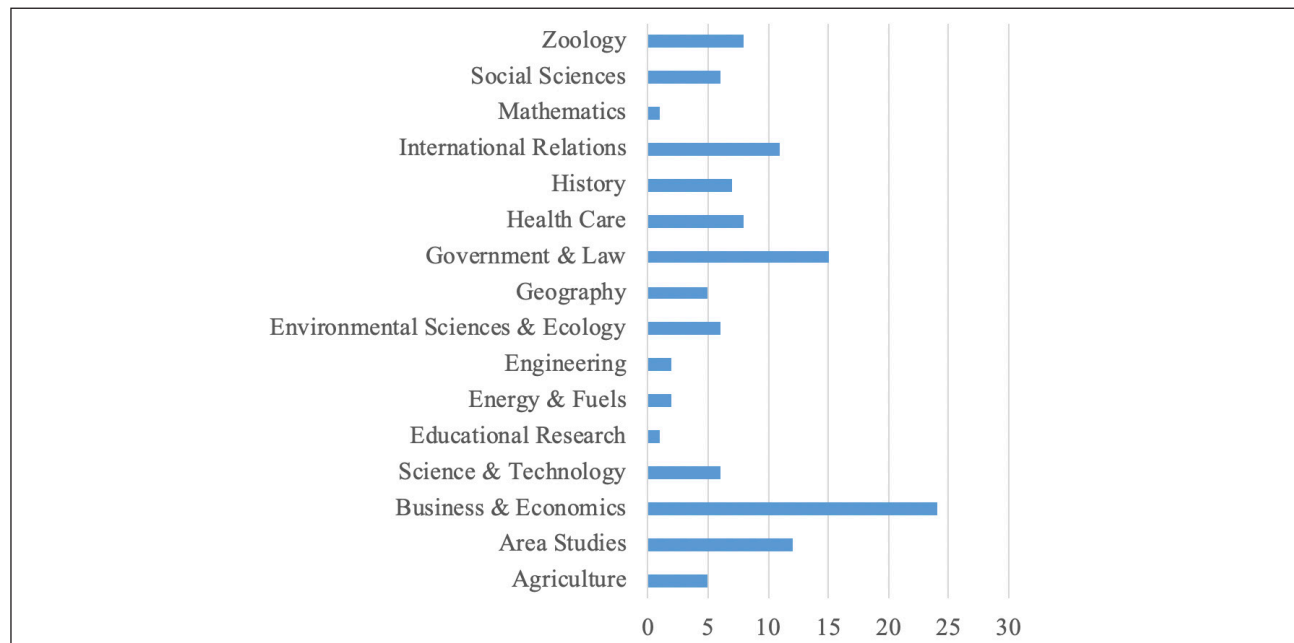


Figure 4: Research Fields

goes far beyond history and political science and includes economics, psychology, social psychology and anthropology. Because the studies cover a wide range, researchers prefer to focus on one aspect. At the same time, researchers approach the subject with a certain point of view. Since the economic relations between the Turkic Republics are mostly energy, oil and gas, it is expected that the study fields will be shaped within the framework of these and related issues. Studies in Figure 4 are spreading to different areas. Considering that there are cooperation and exchanges in specific fields such as construction, tourism, education, local products, textile, construction, service, agriculture, technology among these Republics, spreading the studies over a wide area is necessary to deepen the research field and evaluate it in a wider perspective.

Bibliographic Coupling - Documents

Bibliographic coupling is used to identify studies in reference lists that have been identified as citing one or more common references (Kessler, 1963). It is citing the same publication from two different sources. This approach is the opposite of the co-citation approach. It is measured how many times a publication cites the same references. This refers to the practice of citing one another within the publications themselves. Table 1 and Figure 5 display the common references found across all studies on the economic relations of the Turkic Republics. The studies that are most frequently cited are presented in Table 1, along with details about their authors, publication year, and their connections to other

works. The references with the strongest links across all studies are those by Yıldırım et al. (2020), Jamilov (2013), and Mercan & Azer (2013). See appendix B for an example of individual bibliometric coupling by country.

All the papers in Table 1 are similar studies, not just these three. Most of the research is current studies, and the methods and analysis techniques used in them are highlighted and brought to the fore. This circumstance demonstrates that the employment of various, more specialized analytical techniques is valued in the sources that discuss economic issues. Studies that are bibliographically matched are those that cover econometric models and methods.

The total strength of connections for an object is a measure of how many other items it is linked to and the intensity of these connections. For example, the strength of a researcher's co-authorship links with other researchers illustrates the overall power of their collaborative relationships.

Bibliographic coupling analysis assesses the closeness of researchers by examining how often they cite the same publications. The frequency of shared citations between two researchers correlates with the strength of their relationship. Specifically, "N" represents the total number of researchers involved in the study, while "M" refers to total count of publications examined. The citation matrix $C = [C_{ik}]$ is an $N \times M$ matrix where each element, C_{ik} , indicates the number of times researcher i has cited publication k . Furthermore, n_k refers to the total number of citations a publication has received from all

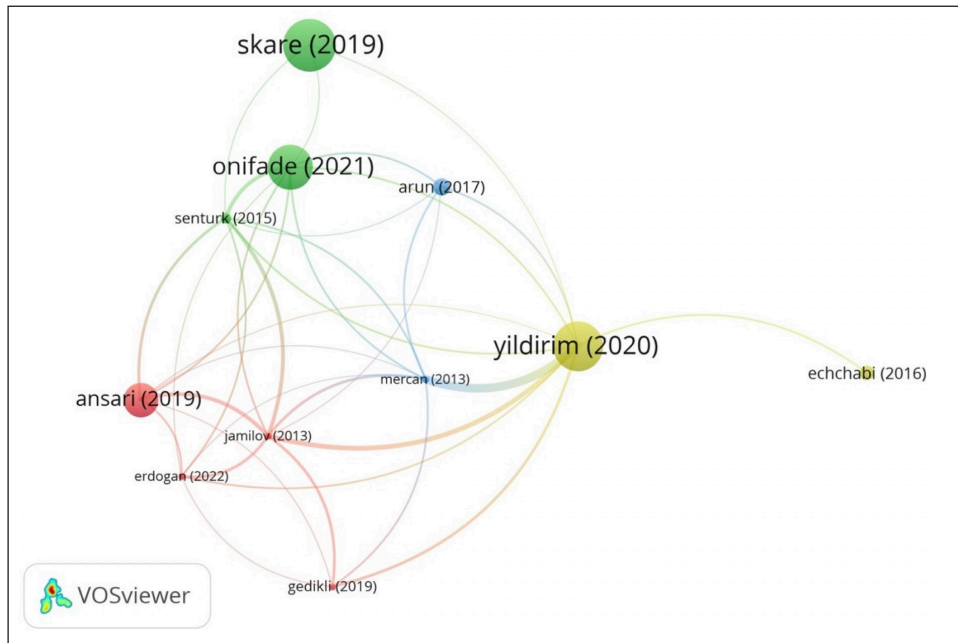


Figure 5: Bibliographic Coupling Network of Publications

researchers in the study, providing a comprehensive view of the publication's influence (Perianes-Rodriguez et al., 2016). Formula:

$$n_k = \sum_{i=1}^N c_{ik} \quad (1)$$

Publications with fewer than two citations are excluded from bibliographic analysis as they do not create any meaningful connections. Hence, it is assumed that each publication has at least two citations, ensuring that $n_k > 0$ for all publications. The matrix $V = [v_{ij}]$ represents the $N \times N$ full-count bibliographic coupling matrix. In this matrix, v_{ij} indicates the number of full-count bibliographic coupling links between researchers i and j , and is defined as follows:

$$v_{ij} = \sum_{k=1}^M c_{ik} c_{jk} \quad (2)$$

Thus, the bibliographic coupling matrix V is represented as:

$$V = CC^T \quad (3)$$

The total strength of connections for an object measures how many other items it is linked to and the intensity of these links. In bibliographic coupling analysis, the closeness of researchers is determined by how often they cite the same publications. "N" represents the number of researchers, and "M" refers to the number

of publications analyzed. A citation matrix tracks how many times each researcher cites a given publication, while a full-count coupling matrix indicates the number of connections between researchers. Publications with fewer than two citations are excluded from the analysis.

Co-citation - Cited References

In order to search for similar publications, publications in the same field are cited together. In particular, the presentation of publications that provide theoretical infrastructure and contribute to the field provides resources for researchers who want to study in this field. The intellectual organization of a discipline is analyzed and understood through co-citation analysis (Allaham, 2022). Co-citation analysis is performed by determining the reference pairs cited together in the resources. When publications on a subject cite the same reference pairs together, research clusters are created (Surwase et al., 2011). These citations also contain common themes. One useful technique for mapping the research field is co-citation analysis (Allaham, 2022). Figure 6 illustrates the co-cited references map, while Table 2 provides detailed information regarding these references. A total of 4923 references were analyzed, with the condition that they must have been cited at least three times. 15 significant connections were found. The most cited and related to each other references are Im et al., (2003), and Breusch & Pagan, (1980).

The co-cited references are studies involved in econometric methods. Indicates that these articles are analysis and technical research articles, not reviews.

Table 1: Details of Analyzed Publications

	Citations	Total Link Strength	Number of Authors	Type
Yıldırım (2020)	38	29	4	Article
Jamilov (2013)	4	25	1	Article
Mercan (2013)	4	22	2	Article
Senturk (2015)	8	19	2	Proceedings Paper
Onifade (2021)	34	16	4	Article
Ansari (2019)	26	14	3	Article
Erdogan (2022)	4	12	1	Article
Gedikli (2019)	5	10	4	Article
Arun (2017)	13	8	2	Article
Skare (2019)	40	3	2	Article
Echchabi (2016)	11	2	3	Article

Quantitative models also allow the use of qualitative variables. These techniques are used in important areas of economics such as industry and business to see upfront, make predictions and take precautions. The authors referenced quantitative numerical estimation methods in their studies, not subjective estimation techniques.

Co-citation - Cited Sources

The analysis of common citations across journals, journal selections, and journal collections that assist publication-oriented researchers on a given subject reveals significant insights. By examining journal titles,

co-citation networks of journals provide a broad overview of the scientific domain. The co-citation analysis of the publications is presented based on the published sources in Table 3 and Figure 7. The study involved the analysis of 3310 cited sources.

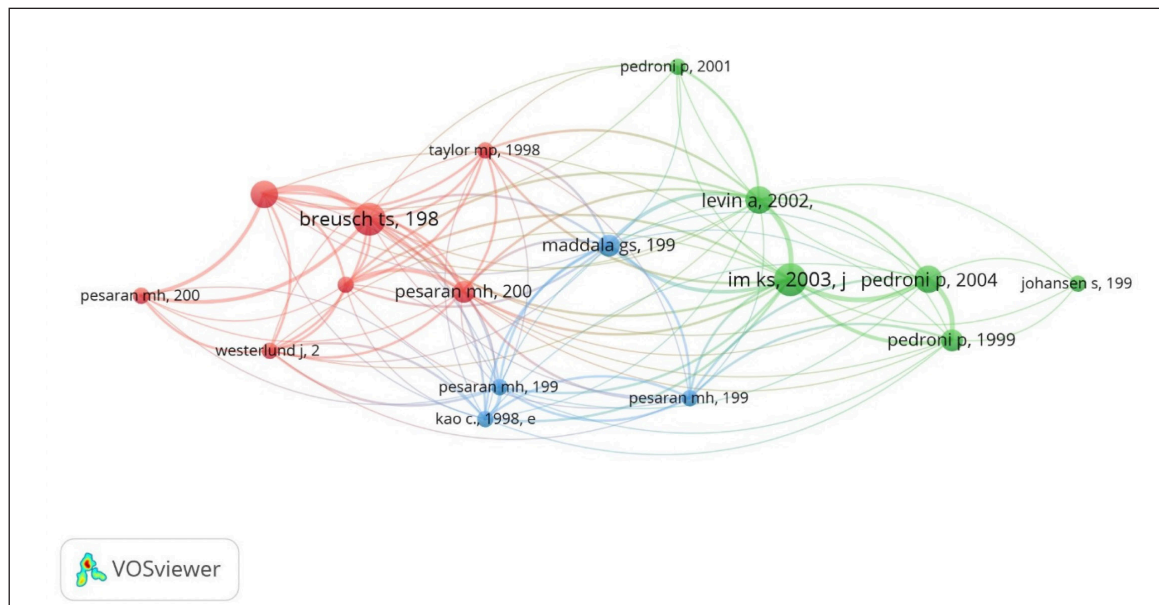
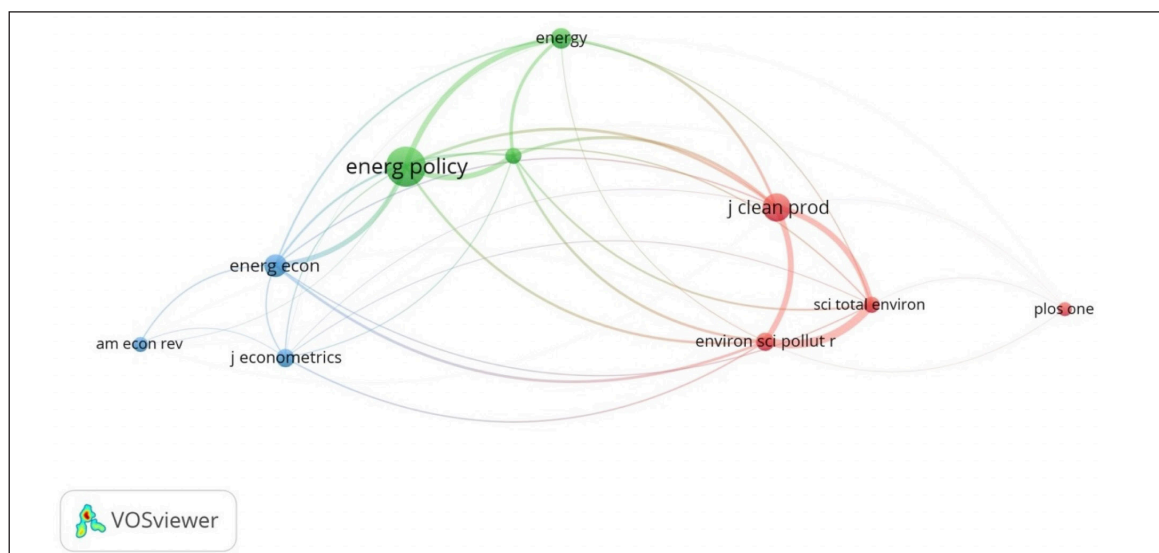
The journal with the highest citation count is Energy Policy, followed by Environmental Science and Pollution Research. When other sources are examined, most of the sources are journals with the scope of energy and sustainability.

Table 2: Co-Cited References

Reference	Citations	Total Link Strength
Im et al., (2003)	6	32
Breusch & Pagan, (1980)	6	29
Levin et al., (2002)	5	25
Maddala & Wu, (1999)	4	25
Pesaran, (2007)	4	24
Pesaran et al., (2008)	5	22
McCoskey & Kao, (1998)	3	21
Pesaran & Smith, (1995)	3	21
Pesaran et al., (1999)	3	19
Taylor & Sarno, (1998)	3	19
Westerlund & Edgerton, (2007)	3	19
Pedroni, (1999)	4	16

Table 2: Co-Cited References

Name of the Source	Citations	Total Link Strength
Energy Policy	54	510
Environmental Science and Pollution Research	25	506
Journal of Cleaner Production	39	462
Science of the Total Environment	22	436
Renewable and Sustainable Energy Reviews	23	404
Energy Economics	31	360
Energy	28	328
Journal of Econometrics	25	157
American Economic Review	21	58
Plos One	20	19

**Figure 6:** Network of Co-Cited References**Figure 7:** Network of Co-Cited Sources

CONCLUSION

This study has provided a comprehensive bibliometric analysis of the economic literature concerning Türkiye's interactions with other Turkic Republics since 1993. The examination of 119 studies published in the WoS database from 1993 to 2023 has uncovered several significant findings. Firstly, the majority of publications in this field are research articles, indicating a strong academic interest in the economic dynamics of the Turkic World. However, the limited number of proceeding papers underscores the need for more academic events and collaborations to further facilitate the exploration of economic, political, and cultural ties among these nations.

This finding aligns with the findings of Güvendi (2023), whose dataset primarily comprises research articles centered around the concept of the Turkic World. Notably, conferences often impose specific subject constraints. Therefore, the organization of conferences and the fostering of academic collaborations that focus on the economic relationships between these countries can be instrumental in sustaining and enhancing their economic, political, and cultural ties. Through international cooperation, countries share scientific knowledge based on mutual agreements, which, in turn, leads to the establishment of collaborative initiatives such as symposiums, workshops, and exchange programs, as highlighted by Şahin and Candan (2018). These collaborative endeavors serve to illuminate regional challenges and promote a deeper understanding of the intricacies of economic relations among the Turkic Republics. The scarcity of proceeding papers underscores the existing gap in this domain and emphasizes the pressing need for more of these activities to rejuvenate and strengthen the economic relationships among these nations.

Authors' interest in these studies has demonstrated a direct correlation with significant historical developments. The dissolution of the Soviet Union in 1991 and the establishment of the OTS in 2009 marked pivotal moments that spurred increased scholarly attention. However, despite this growing interest, the available body of research still appears to be insufficient to comprehensively address the complexities of the topic. An analysis of the distribution of these studies over the years reveals a consistent trend, aligning with the uptick noted after 2008, as highlighted in Şahin and Candan (2018). Several underlying factors may contribute to the shortage of studies in this field. These include the lingering influence of the Soviet regime,

limited research funding, the high costs associated with journal publications, scientific isolation, and the preference of some Turkic Republics to write in Russian, as discussed by Dölek et al. (2023). Language barriers, as mentioned in Akilli (2019), can also play a role in limiting the scope of research. Furthermore, challenges in English writing skills may lead authors to opt for publishing in journals that are not indexed in reputable databases like WoS. Addressing these barriers and promoting research initiatives may be vital to bridge the gap and encourage further comprehensive exploration of the economic relationships among the Turkic Republics.

The keyword analysis has revealed that the predominant themes in the studies revolve around energy and regional policies. Nevertheless, there are diverse sectors within these partner countries, including cotton yarn, construction materials, leather, furniture, steel and metal, sports, education, and tourism, where investments are being made beyond the energy sector. In future research endeavors, there is a significant opportunity to delve into the economic relations and advancements within these diverse sectors, enabling a more granular examination of the subject matter. For instance, the current literature lacks investigations into the economic dimensions of educational activities among the Turkic Republics, with only one study identified in this area. This gap presents an opportunity to explore the diversification of programs, such as the Orhun Exchange Program, and evaluate their effectiveness in achieving their intended goals and their economic contributions. Allocating resources from universities for both students and academics to partake in such programs can be a constructive step forward (Budak & Terzi, 2021; Akilli, 2019). Furthermore, there is a dearth of studies on the economic impacts of cultural and sports activities, as mentioned by Korkmaz and Kızanlık (2023). Conducting research in these areas can shed light on the economic consequences of such activities and their potential to foster economic ties among the Turkic Republics. An additional noteworthy finding from the keyword analysis is the dominance of Russia and China in the region, as pointed out by Çınar (2013), which is conspicuously reflected in the results of the analysis. Understanding the influence of these regional giants on the economic dynamics of the Turkic Republics remains a critical avenue for future research and policy consideration.

Natural resources constitute the backbone of the economies in nations such as Kazakhstan, Azerbaijan, and Turkmenistan. Consequently, the wealth of natural resources provides these nations with significant

economic and political leverage. However, to ensure sustainable economic growth, it is imperative to channel investments into technological advancements, research and development, and education. Failure to enact policies promoting the development of new technologies could perpetuate dependence on wealthier nations. As a crucial final point, enhancing the quality and quantity of the healthcare and education sectors is essential to bolster the human capital needed for technological innovation and development. For example, consider Azerbaijan's aspiration for non-petrol diversification, as articulated in its 2020 Vision goal. There exists a significant opportunity to explore the direction in which Azerbaijan should foster its relations with Türkiye to achieve this goal and identify the necessary investments in innovative technologies. It is noteworthy that this vision goal may not have been addressed in academic sources, leaving questions about its implementation and potential impact (Humbatov & Sari, 2017). In line with the findings of Kravtsov (2019), Russia's engagement with other Turkic Republics, aside from Türkiye, continues in fields such as chemistry, physics, and petrochemistry. This highlights the enduring collaboration among these Republics in specific domains and suggests the potential for further investigation into the dynamics of these collaborations.

The analysis of bibliometric coupling data reveals a distinct inclination within the studies towards quantitative methodologies as opposed to qualitative approaches. Methodologies anchored in econometrics enable versatile analyses involving multiple variables and demand proficiency in mathematics, economics, and statistics. Notably, the presence of technically sound and current publications among the bibliographically matched references underscores a recent shift in scholarly interest toward more technically oriented research methods. This is further substantiated by the strong coupling of references to econometric methods. It is essential to highlight that the majority of the articles are characterized by their quantitative, numerical estimation methods rather than relying on subjective estimations. In contrast to conventional economic or bilateral economic articles, method-oriented papers occupy a more prominent position, signifying their increasing relevance and recognition within this field of study.

The escalating demand for energy resources is an indisputable reality, closely tied to population growth and rising income levels. Furthermore, it is only natural that the interest in primary energy sources, such as oil and gas, intensifies in tandem with industrialization and urbanization. These resources, while crucial for various

aspects of development, also come with substantial economic costs, exerting a significant influence on international business transactions between nations. The existing literature underscores a profound interest in these energy-related issues. Notably, authors are increasingly driven to explore ways to optimize the utilization of these resources, with a particular emphasis on factors related to environmental sustainability, such as the integration of clean energy sources. This drive has led to substantial investments in ambitious projects, highlighting the need for comprehensive assessments of their effectiveness. It is imperative to ascertain whether these projects successfully meet their objectives, the extent to which they contribute to society, and to carefully scrutinize any adverse effects that may emerge from their implementation (Hirv, 2022). This multi-faceted analysis is pivotal for informed decision-making in the realm of energy resource management and sustainability.

In forthcoming studies, there is a valuable opportunity to conduct a thorough analysis of the specific products that form the core of economic relationships among the Turkic Republics, both in terms of imports and exports. Notably, within the current body of research, there is a conspicuous scarcity of studies focusing on areas such as technology, military and defense, iron and steel, textiles, paper, plastics, machinery industries, food, agriculture, and education. Publications addressing economic policies and geared toward policymakers tend to assume the form of review articles. These reviews make significant contributions to the existing literature by offering insights into the progress within a given field, tracing the historical evolution of events, and fostering diverse perspectives. In addition to econometric methods, artificial intelligence and machine learning, which have come to the fore recently, and working with big data techniques can be an alternative for researchers. Because the studies are international and include economic factors, it may be necessary to conduct studies using open data. At this point, it can be ensured that the OTS takes steps for academic cooperation and academic research incentives and encourages projects.

REFERENCES

- Adanma, U. M., & Ogunbiyi, E. O. (2024), "Evaluating the effectiveness of global governance mechanisms in promoting environmental sustainability and international relations", *Finance & Accounting Research Journal*, 6(5), 763-791.
- Akçapa, M. (2023), "Türk Devletleri Teşkilatı'nın tarihsel gelişimi: Teşkilatın dünü, bugünü ve yarını", *Avrasya Uluslararası Araştırmalar Dergisi*, 11(34), 473-491.
- Akilli, E. (2019), "TURKSOY, Turkic Council and Cultural Diplomacy: Transactionalism Revisited", *Bilig*, (91), 1-25.
- Allaham, M. V. (2022), "Bibliometric Analysis of HR Analytics Literature", *Elektronik Sosyal Bilimler Dergisi*, 21(83), 1147-1169.
- Al Shaher, S. I. (2022), "Organization of Turkic States: Old Turkish Ideas with Modern Templates", *PalArch's Journal of Archaeology of Egypt/Egyptology*, 19(1), 394-412.
- Ansari, M. A., Khan, N. A., & Ganaie, A. A. (2019), "Does Foreign Direct Investment Impede Environmental Quality in Asian Countries? A Panel Data Analysis", *OPEC Energy Review*, 43(2), 109-135.
- Arun, K., & Yıldırım, D. Ç. (2017), "Effects of Foreign Direct Investment on Intellectual Property, Patents and R&D", *Queen Mary Journal of Intellectual Property*, 7(2), 226-241.
- Baghirov, O. (2022), "The Organization of Turkic States' Economic Potential and Cooperation Prospects among its Members", *Perceptions: Journal of International Affairs*, 27(1), 53-73.
- Bentyn, Z. (2021), "Comparing Of Logistic Performance In Turkey And Poland. Explaining Divergence In Development", *European Proceedings of Social and Behavioural Sciences*.
- Breusch, A., & Pagan, A. (1980), "e Lagrange Multiplier Test and its applications to model specification in econometrics", *Review of Economic Studies*, 47(1), 239-253.
- Budak, M. M., & Terzi, H. M. (2021), "Scholarship Programs as Public Diplomacy Tool and Implementations in Turkic Council Countries", *Bilig*, (96 (TBMM'NİN 100. YILI ÖZEL SAYISI)), 229-253.
- Buyar, C., & Uğur, Ü. N. A. L. (2022), "Contribution of Organization of Turkic States Members to World Heritage at a Time of Cultural Convergence from the Past to the Future", *Bilig*, (100), 1-35.
- Çelik, E. U., Erdal, F. B., Küçüker, M. C., & Tolga, O. M. A. Y. (2023), "How Does Macroeconomic and Socio-political Index Affect the Real GDP per Qualified Worker? Evidence from Turkish Republics", *Bilig*, (105), 1-38.
- Çetinkaya, A. F., & Demirel, N. (2024), "Analyzing the impact of the organization of Turkic states on the foreign trade of member countries", *Cogent Social Sciences*, 10(1), 2288370.
- Çınar, K. (2013), "Turkey and Turkic Nations: A Post-Cold War Analysis of Relations", *Turkish Studies*, 14(2), 256-271.
- Demir, E., Cengiz, M. A., & Şenel, E. (2016), "Türk Dünyasının 1992-2014 Sürecindeki Sosyo-Ekonomik, Akademik Gelişmişlikleri ve Yayın Verimlilikleri Üzerine Bibliyometrik Analiz", *Hitit Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 9(1).
- Dölek, Ü. C., Gökçe, M. K., & Azimkhanova, G. (2023), "Scientific Publication Efficiency of Organization of Turkic States Scientists in the Field of Medicine: A Bibliometric Study", *Türkiye Klinikleri Tıp Bilimleri Dergisi*, 43(2), 195-202.
- Echchabi, A., & Idriss, U. (2016), "Does Sukuk Financing Promote Economic Growth? An Emphasis on the Major Issuing Countries", *Turkish Journal of Islamic Economics*, 3(2), 63-73.
- Erdogan, S. (2022), "Investigating the Effects of Food Production on Sustainable Development: The Case of The Upper Middle-Income Countries", *Sustainable Development*, 30(4), 606-619.
- Gedikli, A., Erdoğan, S., Kirca, M., & Demir, İ. (2019), "An Analysis of Relationship between Health Expenditures and Life Expectancy: The Case of Turkey and Turkic Republics", *Bilig*, 91, 27-52.
- Guan, C., & Qamruzzaman, M. (2022), "A symmetric and asymmetric nexus between environmental sustainability and tourism development in BRIC nations: What is the role of good governance and globalization?", *Frontiers in Environmental Science*, 10, 973420.

- Güvendi, N.E. (2023), "Evaluation of Research on the Turkish World in the Context of Intercultural Communication and Communication Sociology", *Ulusal ve Uluslararası Sosyoloji ve Ekonomi Dergisi*, 5(2), 281-291.
- Hirv, T. (2022), "The Interplay of the Size of the Research System, Ways of Collaboration, Level, and Method of Funding in Determining Bibliometric Outputs", *Scientometrics*, 127(3), 1295-1316.
- Humbatov, M., & Sari, K. (2017), "Turkic Council Countries: Infrastructure, Trade, Logistics and Transportation", *Center for Strategic Studies*, volume 18-19.
- Im, K. S., Pesaran, M. H., & Shin, Y. (2003), "Testing For Unit Roots in Heterogeneous Panels", *Journal of econometrics*, 115(1), 53-74.
- İstikbal, D. (2022), "Türk Dünyasının Ekonomik Geleceği: 2040 Vizyonu", *Kriter Dergi*. <https://kriterdergi.com/dosya-turk-devletleri-teskilati/turk-dunyasinin-ekonomik-gelecegi-2040-vizyonu>. Access date: 13.02.2024).
- Jamilov, R. (2013), "Capital Mobility in the Caucasus", *Economic Systems*, 37(2), 155-170.
- Kaplan, M., Yuvaci, A., & Amanov, S. (2015), "One Nation, Many Voices? External Cohesion of the Turkic Council States in the United Nations General Assembly 1993-2011", *Bilig*, (74), 125-149.
- Kessler, M. M. (1963), "Bibliographic Coupling between Scientific Papers", *American documentation*, 14(1), 10-25.
- Korkmaz, A., & Kızanıklı, M. M. (2023), "Geleneksel Spor Oyunlarının Turizme Etkileri Üzerine Bir Araştırma: Kırgızistan Örneği", *MANAS Sosyal Araştırmalar Dergisi*, 12(3), 1193-1208.
- Kravtsov, A. A. (2019), "Russia's Scientific Collaboration with the Post-Soviet States: Assessment on Web of Science Publications", *Herald of the Russian Academy of Sciences*, 89, 351-369.
- Levin, A., Lin, C. F., & Chu, C. S. J. (2002), "Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties", *Journal of econometrics*, 108(1), 1-24.
- Maddala, G. S., & Wu, S. (1999), "A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test", *Oxford Bulletin of Economics and statistics*, 61(S1), 631-652.
- McCoskey, S., & Kao, C. (1998), "A Residual-Based Test of the Null of Cointegration in Panel Data", *Econometric reviews*, 17(1), 57-84.
- Mercan, M., & Azer, O. A. (2013), "The Relationship between Economic Growth and Income Distribution in Turkey and the Turkish Republics of Central Asia and Caucasus: Dynamic Panel Data Analysis with Structural Breaks", *Eurasian Economic Review*, 3, 165-182.
- Onifade, S. T., Erdoğan, S., Alagöz, M., & Bekun, F. V. (2021), "Renewables as a Pathway to Environmental Sustainability Targets in the Era of Trade Liberalization: Empirical Evidence from Turkey and the Caspian Countries", *Environmental Science and Pollution Research*, 28, 41663-41674.
- Pedroni, P. (1999), "Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors", *Oxford Bulletin of Economics and statistics*, 61(S1), 653-670.
- 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., & Smith, R. (1995), "Estimating Long-Run Relationships from Dynamic Heterogeneous Panels", *Journal of econometrics*, 68(1), 79-113.
- Pesaran, M. H., Shin, Y., & Smith, R. P. (1999), "Pooled Mean Group Estimation of Dynamic Heterogeneous Panels", *Journal of the American statistical Association*, 94(446), 621-634.
- Pesaran, M. H., Ullah, A., & Yamagata, T. (2008), "A Bias-Adjusted LM Test of Error Cross-Section Independence", *The econometrics journal*, 11(1), 105-127.
- Reyes-Gonzalez, L., Gonzalez-Brambila, C. N., & Veloso, F. (2016), "Using Co-Authorship and Citation Analysis to Identify Research Groups: A New Way to Assess Performance", *Scientometrics*, 108, 1171-1191.
- Sandkamp, A. N. (2024), "EU-China trade relations: Where do we stand, where should we go?", *Kiel Policy Brief*, (No. 176), <https://www.econstor.eu/handle/10419/297975> (Accessed: 18 February 2025).
- Senturk, C., & Sataf, C. (2015), "The Determination of Panel Causality Analysis on the Relationship Between Economic Growth and Primary Energy Resources Consumption of Turkey and Central Asian

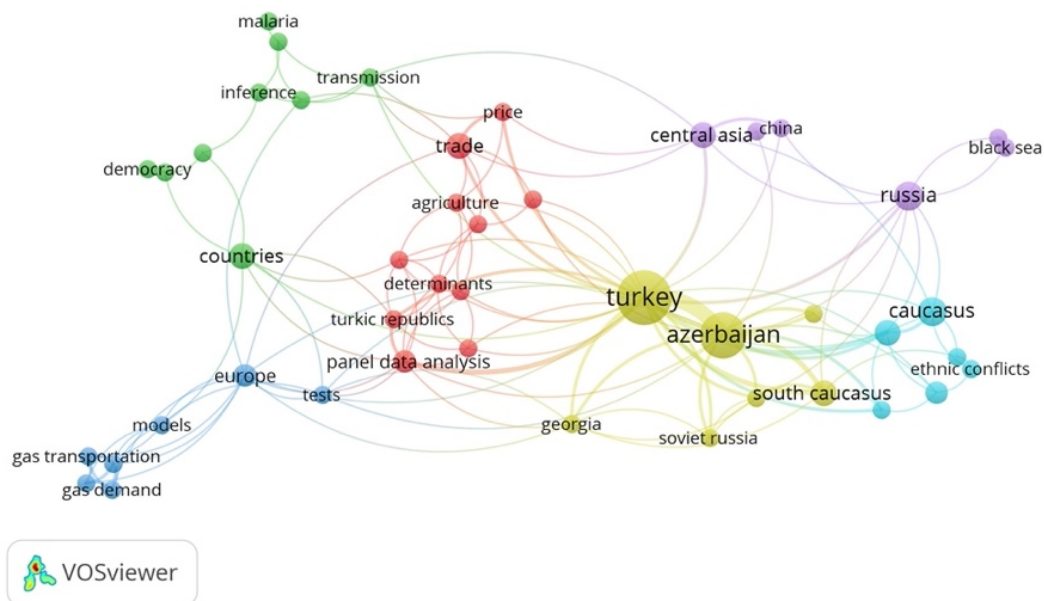
Turkish Republics", *Procedia-Social and Behavioral Sciences*, 195, 393-402.

Skare, M., & Porada-Rochoń, M. (2019), "Financial and Economic Development Link in Transitional Economies: A Spectral Granger Causality Analysis 1991-2017", *Oeconomia copernicana*, 10(1), 7-35.

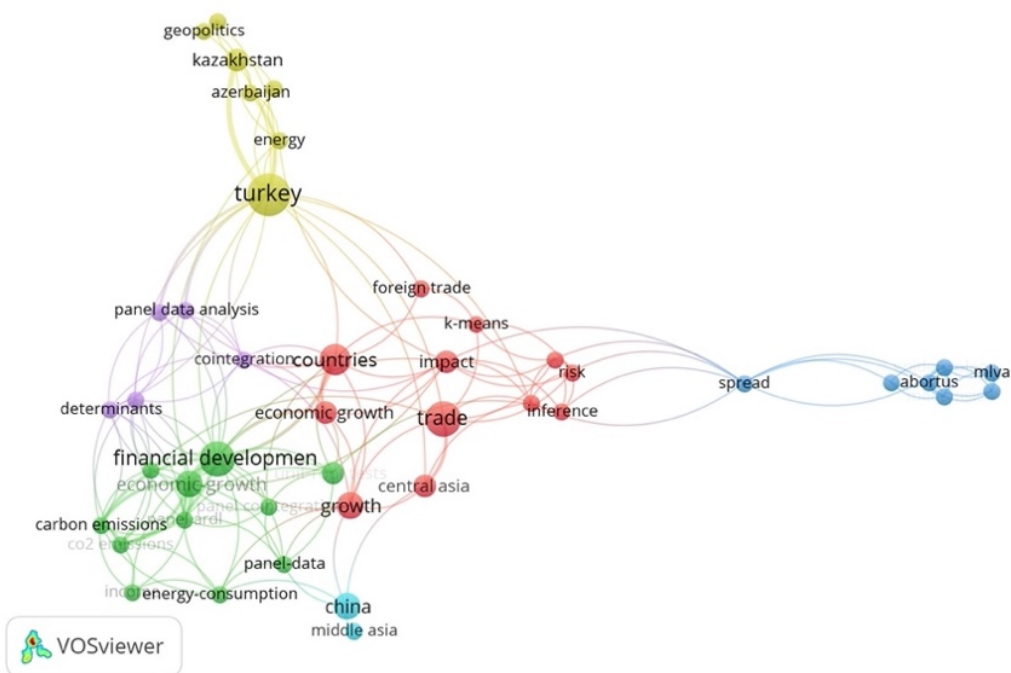
Sobirov, J. (2020), "International Relations Between Turkic Speaking States", *The American Journal of Political Science Law and Criminology*, 2(12), 144-149.

Appendix A. Co-occurrence of Keywords by Country

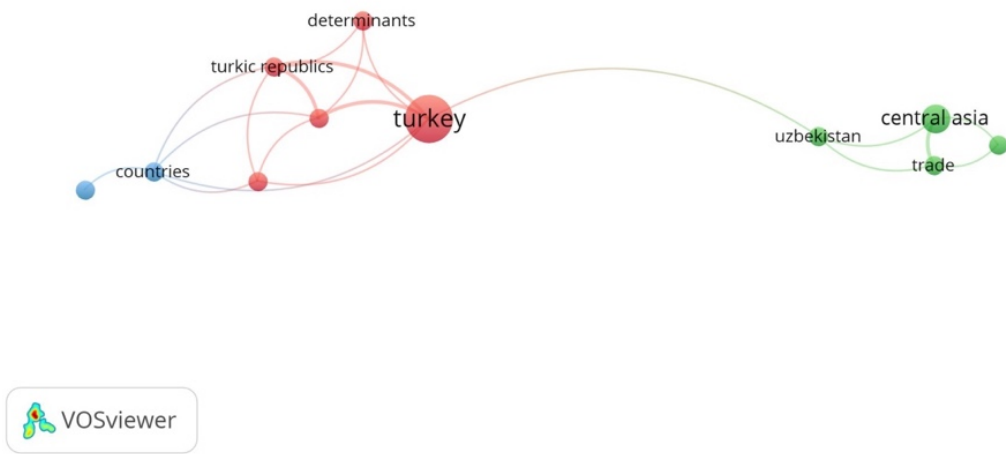
Azerbaijan



Kazakhstan

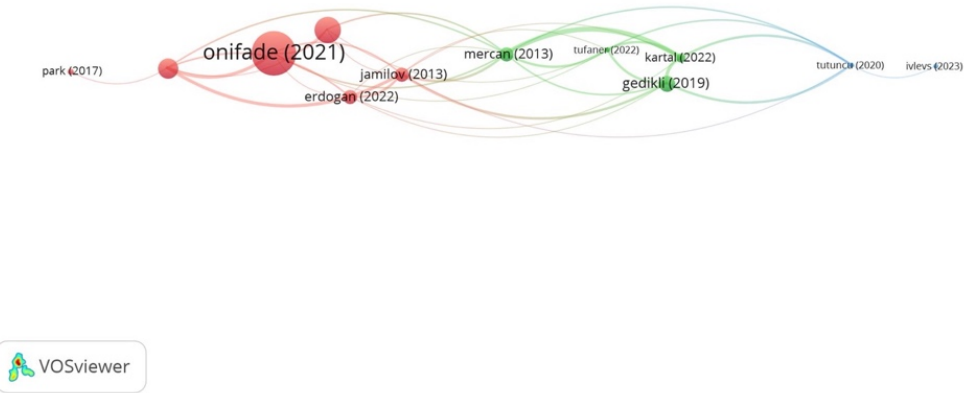


Uzbekistan

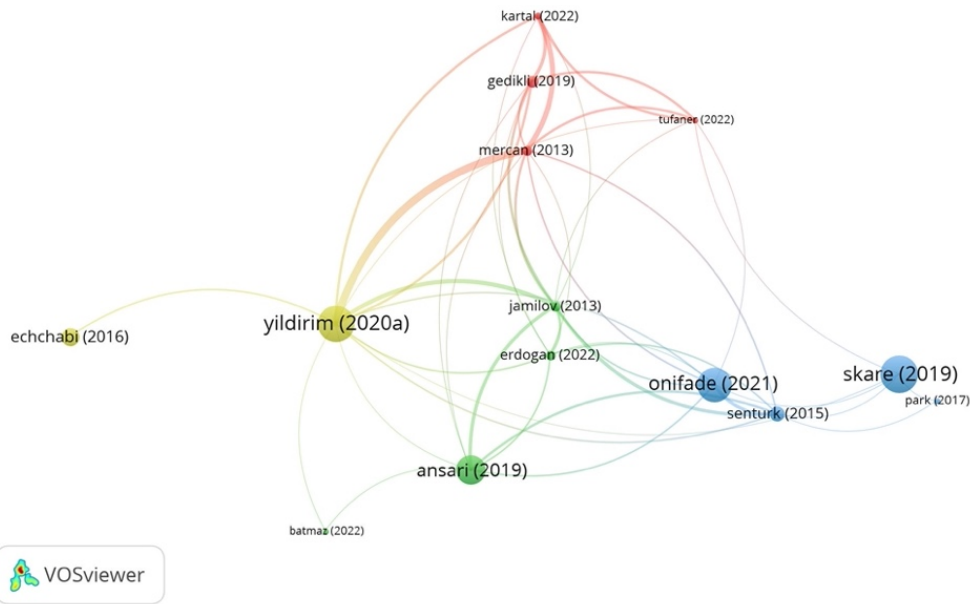


Appendix B. Bibliographic Coupling-Documents by Country

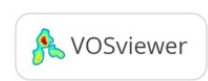
Azerbaijan



Kazakhstan



Kyrgyzstan



How Does Organizational Justice Affect Job Satisfaction? The Mediating Role of Job Involvement

Ozan BÜYÜKYILMAZ¹ , Cihan KARA²

ABSTRACT

The current study aims to explore the mediating role of job involvement in the connection between organizational justice and job satisfaction. Data for this research were collected through questionnaires administered to 202 employees in various roles within a production and wholesale enterprise located in Karabuk province, Turkey. The research hypotheses were examined using hierarchical regression analysis. The results revealed that both distributive and interactional justice dimensions of organizational justice positively influence job satisfaction, whereas the procedural justice dimension lacks significant impact. Furthermore, the study identified that job involvement partially mediates the relationship between distributive and interactional justice and job satisfaction. This investigation illuminates the mediating function of job involvement within the framework of organizational justice. The implications of these findings are expected to guide organizations in fostering an engaged and satisfied workforce, thereby enhancing overall organizational effectiveness and well-being.

Keywords: Organizational Justice, Distributive Justice, Procedural Justice, Interactional Justice, Job Satisfaction, Job Involvement.

JEL Classification Codes: D23, M10

Referencing Style: APA 7

INTRODUCTION

Improving employee job satisfaction and engagement is a pivotal objective for contemporary organizations striving to achieve sustainable success and competitive advantage. Research highlights that contented employees who demonstrate loyalty to their organization tend to achieve higher levels of performance, innovation, and loyalty (Dhir, Dutta, & Ghosh, 2020; Judge, Thoresen, Bono, & Patton, 2001; Schleicher, Watt, & Greguras, 2004; Williams & Anderson, 1991). Consequently, understanding the factors that impact job satisfaction and their underlying mechanisms has gained considerable attention among researchers and practitioners.

In organizations, there exist three primary relationships that significantly affect employees' job satisfaction, namely: (1) the employee-organization relationship, (2) the employee-supervisor relationship, and (3) the employee-coworker relationship (Alegre, Mas-Machuca, & Berbegal-Mirabent, 2016, p. 1390). However, previous research has thoroughly investigated multiple individual and organizational factors that influence employee job satisfaction. Factors such as personality traits (Judge, Heller, & Mount, 2002; Sudak & Zehir, 2013), salary

structures (Imamoglu, Keskin, & Erat, 2004; Judge, Piccolo, Podsakoff, Shaw, & Rich, 2010), working conditions (Raziq & Maulabakhsh, 2015), organizational culture (Akkoc, Caliskan, & Turunc, 2012; Belias & Koustelios, 2014), work-family conflict (Ernst Kossek & Ozeki, 1998; Ozdevecioglu & Doruk, 2015), perceived organizational support (Donmez & Topaloglu, 2020; Eisenberger, Cummings, Armeli, & Lynch, 1997), leader-member exchange (Eryilmaz, Dirik, & Gulova, 2017; Janssen & Van Yperen, 2004; Kengatharan, 2020), emotional labor (Kinman, Wray, & Strange, 2011), workaholism (Burke, 2001), and workplace friendships (Nielsen, Jex, & Adams, 2000) have been identified as crucial variables that play a significant role in shaping job satisfaction.

One of the key factors that has been extensively studied in relation to job satisfaction is organizational justice. Organizational justice refers to the perceived fairness in the distribution of rewards, resources, and opportunities within an organization, in the processes by which decisions are made, and in the relationships within the organization (Colquitt, Conlon, Wesson, Porter, & Ng, 2001, p. 425; Moorman, 1991, p. 845; Niehoff & Moorman, 1993, p. 528). Research has shown that employees' perceptions of justice play an important role in shaping

¹ Prof. Dr., Department of Business Administration, Faculty of Business, Karabuk University, Karabuk, Turkey, ozanbuyukyilmaz@karabuk.edu.tr

² PhD. Department of Business Administration, The Institute of Graduate Studies, Karabuk University, Karabuk, Turkey, ozgurday@hotmail.com

their attitudes, behaviors, and overall job satisfaction (Lam, Schaubroeck, & Aryee, 2002; McFarlin & Sweeney, 1992; Simons & Roberson, 2003; Tekleab, Takeuchi, & Taylor, 2005).

However, the direct relationship between organizational justice and job satisfaction is not always unequivocal. Numerous studies have shown that a variety of mediating factors may have an impact on this relationship. According to these studies, the complex interactions between organizational justice and job satisfaction are mediated by factors including trust (Aryee, Budhwar, & Chen, 2002; Sokmen, 2020), perceived organizational support (Gillet, Colombat, Michinov, Pronost, & Fouquereau, 2013), identification with the organization (Yuan, Jia, & Zhao, 2016), and the quality of work life (Totawar & Nambudiri, 2014). One of the factors believed to facilitate this interaction can be identified as job involvement. Job involvement is an important employee attitude that represents the extent to which employees are psychologically attached to and immersed in their job roles (Kanungo, 1982, p. 342). A high degree of job involvement suggests a strong identification with one's job and a deep willingness to accomplish one's role's obligations (S. P. Brown, 1996).

Job involvement, when considered as a mediating factor, serves as a link connecting the perceived fairness of organizational procedures to employees' satisfaction with their work. When employees perceive their organizations as fair and just, this perception can catalyze a heightened degree of job involvement, subsequently bolstering their overall job satisfaction. Conversely, when perceptions of organizational justice are low, employees' involvement in their work may be weakened, leading to lower levels of job satisfaction.

Despite the potential significance of comprehending the mediating function of job involvement, there exists a scarcity of research in this domain, necessitating more comprehensive empirical investigation. Therefore, this study endeavors to bridge this gap in the existing literature by investigating the mediating impact of job involvement on the relationship between organizational justice and job satisfaction. In this regard, the study aims to contribute to the growing body of knowledge on the antecedents and determinants of employees' job satisfaction. By shedding light on the mediating role of job involvement within the context of organizational justice, it is anticipated that organizations will be better poised to foster an engaged and contented workforce, thereby advancing overall organizational efficacy and well-being.

ORGANIZATIONAL JUSTICE

Organizational justice, also known as workplace justice or organizational equity, is one of the fundamental concepts in the field of organizational behavior and human resource management. Organizational justice is considered to have a significant impact on the overall functioning and success of an organization as it directly affects employee motivation, satisfaction and commitment (Roch & Shanock, 2006).

Organizational justice refers to an individual's perception of the fairness of the processes used to determine outcomes and the fairness of the treatment he/she receives in those processes and the sum of his/her reactions to them. In other words, whether an organization's processes, decisions, and outcomes are perceived as fair, and how these perceptions affect employees' attitudes, behaviors, and overall well-being (Greenberg, 1987, 1990). Colquitt (2001, p. 386) defines organizational justice as employees' perceptions of fairness in the workplace, shaped by the treatment they receive and the outcomes they experience. According to Niehoff and Moorman (1993, p. 528), it encompasses individuals' overall judgments of the fairness of their treatment at work, including both the fairness of decision outcomes and the fairness of decision-making processes.

Generally, the definitions of organizational justice emphasize its multidimensional nature, encompassing distributive, procedural, and interactional justice. Researchers leverage these conceptualizations to explore the impact of organizational justice on various employee attitudes and behaviors. Therefore, organizational justice encompasses several sub-dimensions that pertain to the allocation of outcomes such as opportunities for promotion or financial rewards (distributive justice), the procedures employed for making allocations (procedural justice), and the quality of interpersonal treatment during these proceedings (interactional justice) (Colquitt, 2001; Greenberg, 1990; Niehoff & Moorman, 1993).

Distributive justice refers to the perceived fairness in the allocation and distribution of rewards, resources, and outcomes within an organization (Colquitt et al., 2001, p. 426; Cropanzano, Goldman, & Benson, 2005, p. 64). Within distributive justice, employees evaluate whether the distribution of wages, promotions, bonuses, benefits, and other tangible rewards is fair. When employees perceive these rewards are distributed fairly, they are more likely to be satisfied and motivated. In contrast, perceptions of inequity can lead to feelings of resentment, reduced motivation, and decreased job satisfaction (Aryee et al., 2002).

Procedural justice centers on the perceived fairness of the processes and procedures employed in decision-making within an organization (Greenberg, 1990, p. 402). In essence, it involves evaluating whether the decision-making processes are characterized by transparency, consistency, impartiality, and reliance on accurate information (Colquitt, 2001, p. 388). When employees perceive that decisions are made through fair procedures, they are more likely to accept and be satisfied with the outcomes, even when those outcomes are not in their favor. Conversely, instances of procedural unfairness can undermine trust in management and negatively influence employee attitudes (Tekleab et al., 2005).

Interactional justice is associated with the quality of interpersonal treatment that employees encounter within the decision-making process. This encompasses the manner in which employees are treated, communicated with, and the degree of respect and dignity they encounter during their engagements with supervisors, colleagues, and the organization holistically (Cropanzano et al., 2005, p. 65). Generally, interactional justice is assessed through the consideration of two factors. The first one is related to the respect and dignity exhibited towards employees; while the second one concerns the adequacy and completeness of the information provided to employees (Bies, 1987).

JOB SATISFACTION

Job satisfaction is one of the most widely studied concepts in organizational behavior. It is considered to be an employee's constructive response to his or her work, resulting from a comparison of actual and expected results (Johns, 1981; Rusbult, Farrell, Rogers, & Mainous, 1988). There are several definitions of this concept. Luthans (1995, p. 171) defines job satisfaction as the extent to which the job fulfills the values that are important to him/her as a result of the employee's evaluation of his/her job. On the other hand, Hackman and Oldham (1975, p. 162) describe the concept as the degree of satisfaction and happiness that an employee feels from his/her job. The most widely accepted definition in the literature characterizes job satisfaction as "a pleasurable or positive emotional state resulting from the evaluation of one's job or work experiences" (Locke, 1976, p. 1304). Thus, the concept of job satisfaction can be succinctly defined as the emotional disposition employees have toward their jobs, which encompasses various facets.

Job satisfaction is generally considered to be a universal concept that encompasses several dimensions (Judge et al., 2001). According to the broadest classification, these

dimensions include pay, rewards, supervision, coworkers, and the job itself (Smith, Kendall, & Hulin, 1969). However, studies have examined these five dimensions in relation to both intrinsic and extrinsic factors (Bektas, 2017; Buyukyilmaz & Akyuz, 2015; Calik, Alkan, & Saprak, 2022; Feleki, Karamanis, & Arnis, 2021; Schleicher et al., 2004). In this study, job satisfaction is treated as a unidimensional construct, measured generally rather than focusing on specific motivational factors or dimensions. This approach allows us to capture the overall emotional disposition of employees toward their jobs, providing a broad perspective on how organizational justice and job involvement influence job satisfaction as a whole.

Organizations place a high value on employee job satisfaction for several reasons. First, from a humanitarian perspective, employees deserve to be treated fairly and respectfully, and job satisfaction somewhat reflects such treatment. In addition, job satisfaction can serve as an indicator of emotional well-being and psychological health (Haccoun & Jeanrie, 1995, p. 168). Second, from a utilitarian perspective, job satisfaction leads employees to engage in behaviors that affect organizational performance and effectiveness. Furthermore, differences in job satisfaction among employees may be an indicator of potential problems within the organization that need to be addressed (Rowden, 2002, p. 412).

It has been shown that job satisfaction is of great importance for both employees and organizations. Various research efforts conducted for this purpose have established that when employees are satisfied with their jobs, their commitment to the organization tends to increase (Aksoy & Taskaya, 2022; Buyukyilmaz, Karakulle, & Karatas, 2018; Cini, 2022). In addition, job performance is improved (Cetin, Arslan, & Buyukyilmaz, 2021; Judge et al., 2001; Wright, Cropanzano, & Bonett, 2007), willingness to engage in organizational citizenship behavior is increased (Buyukyilmaz & Yegin, 2017; Moorman, 1993; Williams & Anderson, 1991), and the tendency to seek alternative employment or leave the profession is reduced (Buyukyilmaz, Vargun, & Uygurturk, 2020; Cekmecelioglu, 2006; Cini, 2022; Kengatharan, 2020).

JOB INVOLVEMENT

Job involvement is an important concept that has been studied extensively in the field of organizational behavior and human resource management for many years. It has received considerable attention as a key determinant of employee satisfaction, productivity, and overall organizational success. In general, job involvement

encompasses the emotional connection, commitment, and enthusiasm that an employee invests in his or her job tasks and organizational goals (S. P. Brown, 1996, p. 236). In essence, it encompasses the emotional, cognitive, and behavioral dimensions of an employee's attachment to his or her job and the organization. It embodies a deep sense of purpose and fulfillment that not only enhances job performance, but also motivates employees to go beyond their core responsibilities (Diefendorff, Brown, Kamin, & Lord, 2002).

There are several definitions of the concept in the literature. Kanungo (1982, p. 342), who emphasizes the distinction of the concept from basic work-related attitudes such as job satisfaction and organizational commitment, defines job involvement as "a psychological state in which an individual experiences a strong sense of identification and emotional attachment to his/her job or job tasks". While job involvement focuses on the degree to which an individual identifies with and feels attached to their job, it is also distinct from work engagement. Work engagement, as defined by Schaufeli, Salanova, González-Romá, and Bakker (2002, p. 73), refers to a broader, more dynamic state of mind characterized by vigor, dedication, and absorption in one's work. Unlike job involvement, which centers on emotional attachment to the job itself, work engagement encompasses a more active, energetic, and enthusiastic connection to work tasks and the work environment. Thus, while both concepts reflect an individual's connection to their work, job involvement emphasizes identification with the job, whereas work engagement emphasizes the active and energetic expression of that connection (Hallberg & Schaufeli, 2006).

Building on these distinctions, the concept of job involvement has been further explored and refined by other scholars, who emphasize its multidimensional nature and its role in shaping employees' psychological connection to their work. Lawler and Hall (1970, p. 306) define job involvement as "the psychological state of being actively and emotionally involved in one's job duties and experiencing a deep sense of belonging and commitment to one's job". In the study conducted by Lodahl and Kejnar (1965, p. 25), which presents one of the definitions of job involvement frequently referenced, the concept refers to the degree of an individual's psychological alignment with their job, the significance of perceived performance levels in relation to their self-esteem, and the centrality of their job to their self-concept. Derived from the previously mentioned definitions, the notion of job involvement can be expansively

characterized as a psychological condition that indicates the extent to which an employee associates themselves with their job, experiences a feeling of connection to their role, forms an attachment to their responsibilities, and demonstrates dedication.

In the realm of research, it has been established that an employee's level of job involvement can be influenced by a range of factors. Within this context, the most significant elements among the precursors of job involvement include job meaningfulness, autonomy in decision-making, chances for skill enhancement, a supportive work environment, perceived fair processes, and alignment of personal values with organizational objectives (S. P. Brown, 1996; Lambert & Paoline III, 2012).

Furthermore, research indicates that elevated levels of job involvement are connected with favorable results for both employees and organizations. Engaged and involved employees generally demonstrate increased job satisfaction (Paoline & Lambert, 2011; Zopiatis, Constanti, & Theocharous, 2014), organizational commitment (Zopiatis et al., 2014), enhanced performance (Diefendorff et al., 2002), decreased job stress (Paoline & Lambert, 2011), and reduced turnover intention (Zopiatis et al., 2014). Orpen (1997, pp. 519-520) states that job involvement shares a robust association with intrinsic motivation, as employees who harbor a profound link with their work are more prone to derive gratification and contentment from their job responsibilities. Moreover, job involvement is directly related to psychological well-being and overall job satisfaction (Huang, Ahlstrom, Lee, Chen, & Hsieh, 2016).

Overall, job involvement constitutes a crucial aspect of employee well-being and organizational effectiveness. Organizations that prioritize the enhancement of job involvement among their employees are likely to harvest the advantages of a motivated, committed, and engaged workforce.

HYPOTHESIS DEVELOPMENT

Organizational justice is closely linked to the degree to which an organization treats its employees fairly in decisions pertaining to the distribution and allocation of resources (Colquitt, 2001; Niehoff & Moorman, 1993). In this context, it significantly influences employees' attitudes toward their work. Job satisfaction stands out as one of the primary work-related attitudes that is believed to be directly impacted by the perceived level of justice within the organization. Job satisfaction is defined as an individual's overall positive or negative emotional

evaluation of their job and the experiences related to it (Luthans, 1995). It reflects the extent to which employees find their jobs fulfilling, rewarding, and aligned with their needs and expectations (Locke, 1976).

Studies have consistently demonstrated a positive relationship between organizational justice and job satisfaction (Altintas, 2017; Gori, Topino, Palazzeschi, & Di Fabio, 2020; Lam et al., 2002; Pehlivan Kurnaz & Oruc, 2019; Sokmen, 2020; Totawar & Nambudiri, 2014; Yuan et al., 2016). Therefore, when employees perceive the organization's operations as fair, it enhances job satisfaction, whereas perceptions of injustice diminish job satisfaction. Greenberg (1990) asserts that employee satisfaction is a fundamental necessity for the effective functioning of an organization and is influenced by equitable practices within the organization.

The relationship between organizational justice and job satisfaction can be explored within various theoretical frameworks. One of the theories that provides the most comprehensive explanation of this relationship is the "equity theory" developed by Adams (1965). Equity theory posits that individuals assess their inputs (effort, skill, time) and outputs (wages, recognition, benefits) in comparison to those of their colleagues in their workplace. When individuals perceive an equitable balance between their inputs and outcomes relative to their peers, they experience a sense of fairness and are more likely to find satisfaction in their jobs.

Another theory that can elucidate the relationship between organizational justice and job satisfaction is the 'Social Exchange Theory' (Blau, 1964; Homans, 1958). Social Exchange Theory posits that individuals engage in reciprocal relationships that they perceive as advantageous and believe they can gain from. Within this framework, organizational justice plays a crucial role in fostering a positive social exchange where employees feel valued and respected. This, in turn, leads to heightened job satisfaction and a greater willingness to invest more in their work.

However, it can be argued that the three dimensions of organizational justice (distributive, procedural, and interactional justice) each have an independent influence on job satisfaction.

In terms of distributive justice, employees are more likely to derive job satisfaction when they perceive that outcomes are distributed equitably based on their contributions. This perception fosters a sense of fairness and encourages employees to continue putting in effort

because they believe they will receive appropriate rewards.

Within the realm of procedural justice, employees seek transparency, consistency, and impartiality in decision-making processes. When employees have a voice, are treated with respect, and perceive that they have a fair opportunity to provide input, they are more inclined to embrace and support organizational decisions. This, in turn, nurtures trust and confidence in the organization, contributing to higher job satisfaction.

Regarding interactional justice, employees anticipate being treated with dignity, respect, and consideration by their supervisors and colleagues. When employees perceive that they are treated courteously, respectfully, and honestly, they are more likely to feel valued and respected, resulting in elevated levels of job satisfaction. In light of these findings, the following hypotheses has been formulated;

H1: Organizational justice has a positive and significant impact on job satisfaction.

H1a: Distributive justice has a positive and significant impact on job satisfaction.

H1b: Procedural justice has a positive and significant impact on job satisfaction.

H1c: Interactional justice perception has a positive and significant impact on job satisfaction.

As previously mentioned, employees' perception of justice within an organization can have a positive impact on various attitudes and behaviors. One such outcome of organizational justice is job involvement, which reflects the extent to which employees are committed, dedicated, and engaged in their job roles and responsibilities (Kanungo, 1982).

Organizational justice encompasses employees' perceptions of fairness within the work environment. It is widely held that employees anticipate fair and equitable treatment from their organization. When employees perceive that they are treated fairly in terms of rewards, decision-making processes, and interpersonal interactions, they are more likely to develop a strong commitment and dedication to their jobs. In this regard, van Knippenberg (2000) asserts that when employees perceive positive organizational justice within their organizations, they may internalize the goals and values of their organizations as their own, thereby motivating them to become more engaged in their work. According to Wildermuth and Pauken

(2008), employees' job involvement is influenced by a multitude of personal, occupational, and organizational factors, with organizational justice being one of the most pivotal organizational factors influencing employees' perceptions of job involvement.

In this context, research studies have consistently demonstrated that employees who perceive higher levels of organizational justice tend to exhibit greater job involvement. Saks (2006)0268-3946(Print identified distributive and procedural justice as significant antecedents of employees' job involvement, a finding corroborated by Sharma and Sharma (2021). Malhotra, Sahadev, and Sharom (2022) reported a significant relationship between the dimensions of organizational justice, including distributive, procedural, and interactional justice, and job involvement. Furthermore, in their study involving 174 participants from the Saudi Arabian Postal Authority, Al Naggar and Saad (2019) found that all three dimensions of organizational justice were important factors explaining variations in job involvement. Similarly, the research conducted by Turhan, Erol, Demirkol, and Ozdemir (2019) demonstrated that teachers' perceptions of organizational justice significantly predicted their interest and involvement in their work. In light of these findings, the following hypotheses has been formulated;

H2: Organizational justice has a positive and significant impact on job involvement.

H2a: Distributive justice has a positive and significant impact on job involvement.

H2b: Procedural justice has a positive and significant impact on job involvement.

H2c: Interactional justice perception has a positive and significant impact on job involvement.

Job involvement and job satisfaction are crucial factors that contribute to organizational and individual effectiveness and development. Consequently, extensive research has been conducted to comprehend the nature of the relationship between employees' job involvement and job satisfaction. According to Lawler and Hall (1970), one of the foundational studies in this area, job involvement, as an intrinsic motivator, drives individuals to perform better and leads them to perceive their jobs as more central, valuable, and satisfying. Various empirical studies have also indicated that employees with high levels of job involvement tend to develop a greater sense of responsibility and identification with their roles, resulting in elevated levels of job satisfaction (Paoline & Lambert, 2011; Zopiatis et al., 2014).

Hence, employees' perception of job involvement stands as a significant precursor to heightened job satisfaction. When employees exhibit a high level of involvement in their job, it generally signifies that they perceive their job as meaningful and purposeful. In such cases, employees believe that their contributions are meaningful and have a direct impact on the organization's objectives. This sense of purpose and significance, in turn, leads employees to find intrinsic value in their job, transcending mere material compensation, and subsequently, experience greater job satisfaction (Lodahl & Kejnar, 1965; Orpen, 1997). In light of these findings, the following hypothesis has been formulated;

H3: Job involvement has a positive and significant impact on job satisfaction.

Organizational justice stands as a significant factor influencing job satisfaction. In this context, numerous researchers have explored the relationship between organizational justice and job satisfaction and have affirmed that greater perceived justice within an organization corresponds to higher levels of job satisfaction (Altintas, 2017; Gori et al., 2020; Lam et al., 2002; Sokmen, 2020; Totawar & Nambudiri, 2014; Yuan et al., 2016). However, the impact of organizational justice on job satisfaction is not a fixed condition. In the scope of various studies, it has been established that variables such as organizational trust (Aryee et al., 2002; Sokmen, 2020), organizational support (Gillet et al., 2013), identification with the organization (Yuan et al., 2016), and quality of work life (Totawar & Nambudiri, 2014) mediate the relationship between organizational justice and job satisfaction. In addition to these variables, job involvement can be considered a crucial factor that reflects the significance of employees' connections with their jobs and influences the mechanism through which organizational justice impacts job satisfaction.

For this reason, this study posits that job involvement serves as a mediating mechanism that transforms the effects of organizational justice into job satisfaction. This proposition is grounded in social exchange theory (Blau, 1964; Homans, 1958). According to this theory, individuals engage in social relationships, including their work life, based on the principle of reciprocity. In other words, individuals expect their contributions and efforts to be reciprocated with fair treatment and rewards, leading them to invest more in the relationship. Thus, human relationships are formed through a subjective assessment of costs and benefits and an evaluation of alternative options, with individuals who incur obligations in the context of the relationship responding positively.

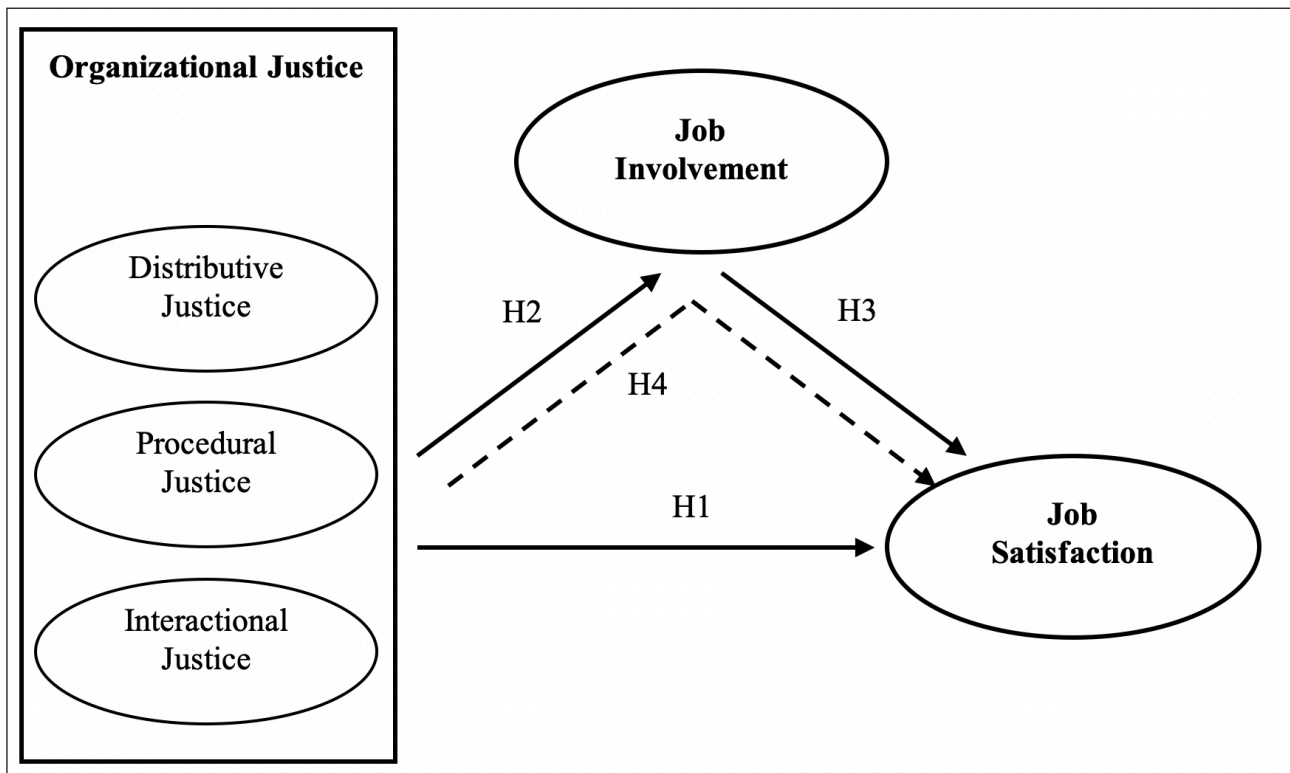


Figure 1: Research model

Social exchange theory elucidates the mediating role of job involvement in the impact of organizational justice on job satisfaction by emphasizing the reciprocal nature of the employee-organization relationship. When employees perceive organizational justice, it initiates a series of psychological and emotional responses that lead to increased job involvement. This heightened involvement, characterized by a high level of engagement, motivation, and a sense of commitment to one's tasks, subsequently contributes to greater job satisfaction. In other words, when employees perceive high levels of organizational justice, they respond with heightened job involvement due to the elevated levels of trust, respect, and reciprocity they receive from the organization, which in turn fosters a stronger sense of satisfaction and contentment with their job roles. In light of these findings, the following hypotheses have been formulated;

H4: Job involvement has a mediating role in the impact of organizational justice on job satisfaction.

H4a: Job involvement has a mediating role in the impact of distributive justice on job satisfaction.

H4b: Job involvement has a mediating role in the impact of procedural justice on job satisfaction.

H4c: Job involvement has a mediating role in the impact of interactional justice on job satisfaction.

METHODOLOGY

Sample and Procedure

The study's population comprises employees occupying various positions within a production and wholesale enterprise located in Karabuk province, Turkey. Information about the population was sourced from the enterprise's human resources department, which indicated that a total of 234 individuals were employed within the organization. Due to the relatively small population size, data collection was accomplished through a census method, without employing any sampling procedures. In this context, questionnaire forms were personally distributed to all employees, resulting in 211 completed questionnaires being returned. During the data entry phase, it was identified that 9 individuals had incompletely or incorrectly filled out the forms. Consequently, the final sample consisted of 202 individuals, and all subsequent analyses were conducted on this sample.

The tabulated data in Table 1 illustrates how the research participants are distributed concerning their gender, age, marital status, educational background, and tenure within the organization.

Drawing conclusions from the data in Table 1, it becomes apparent that most of the participants are male (85.6%), belong to the age bracket of 26-37 (76.3%), and are in a

Table 1: Demographic Characteristics of Participants

Variable	Category	N	%
Gender	Female	29	14.4
	Male	173	85.6
Age	25 and under	10	5.0
	26-31	69	34.2
	32-37	85	42.1
	38-43	33	16.2
	44 and over	5	2.5
Marital Status	Single	36	17.8
	Married	166	82.2
Educational Background	High school or below	172	85.1
	Graduate degree	29	14.4
	Post-graduate degree	1	0.5
Tenure	1 year or less	30	14.9
	2-5 years	64	31.7
	6-10 years	99	49.0
	11 years or over	9	4.4

married status (82.2%). Additionally, a notable portion of the participants holds educational qualifications high school or below level (85.1%). Concerning their length of service within the organization, the data reveals that a significant majority of the participants have been employed by the organization for a period ranging from 2 to 10 years (80.7%).

The research data were collected using a paper-and-pencil questionnaire technique, involving face-to-face participation of the research participants. The questionnaire was divided into two sections. The first part consisted of questions aimed at determining the demographic characteristics of the employees. In the second part, scales measuring the level of organizational justice, job involvement, and job satisfaction among employees were included. A rating scale ranging from 1=Strongly Disagree to 5=Strongly Agree was employed for these scales.

Regarding the questionnaire used in this research, ethical approval was granted by the Karabuk University Social and Human Sciences Research Ethics Committee (Date: 26.09.2023, Decision No: 2023/06-17).

As part of the analyses, the first step involved testing the validity and reliability of the measured variables. The construct validity of the organizational justice scale, job involvement scale, and job satisfaction scale was examined through confirmatory factor analysis.

Confirmatory factor analysis is employed to assess whether the scales, previously identified and combined into fewer factors, exhibit similarity within the sample under investigation (Anderson & Gerbing, 1988, p. 412; Byrne, 2016, p. 6). In this context, a confirmatory factor analysis that included all variables used in the study was conducted.

Following the validity analyses, the reliability of all scales was assessed. Within the framework of reliability analysis, Cronbach's Alpha (α) statistic was utilized to ascertain the internal consistency of the scales. The hypotheses to be tested in the study were then subjected to hierarchical regression analysis.

Measures

The scale developed by Niehoff and Moorman (1993) was employed to assess employees' perceptions of organizational justice. The organizational justice scale comprises three dimensions and a total of 20 statements: 5 statements pertain to distributive justice, 6 statements relate to procedural justice, and 9 statements address interactional justice. The Turkish version of this scale was obtained from a study conducted by Buyukyilmaz and Tuncbiz (2016) and incorporated into the questionnaire. Representative items from each of the dimensions include: for distributive justice "I feel that my job responsibilities are fair", for procedural justice "All job decisions are applied consistently across all affected

employees” and for interactional justice “The general manager offers adequate justification for decisions made about my job”. Notably, there were no reverse-coded statements in this scale.

To gauge the extent of employees’ job involvement, the scale developed by Kanungo (1982) was utilized. The Turkish version of this scale was adapted from a study conducted by Buyukyilmaz and Bicer (2018). The job involvement scale is unidimensional and comprises 10 statements. Sample items from the scale include “I am very much involved personally in my job” and “Usually I feel detached from my job (Reverse Coded)”. Within this scale, two statements were negatively phrased and subsequently reverse coded for analysis.

In the assessment of employees’ job satisfaction, the scale created by Rusbult et al. (1988) was employed. The job satisfaction scale consists of one dimension and incorporates five statements. The Turkish version of this scale was adapted from research conducted by Basaran, Buyukyilmaz, and Cevik (2011) and integrated into the questionnaire. Representative items for the scale include “I would recommend my work to someone else” and “I think I am doing my dream job”. Notably, there were no reverse-coded statements within this scale.

FINDINGS

In the context of the findings, the outcomes of the validity and reliability analysis are initially presented. This is followed by the provision of descriptive statistics, and ultimately, the disclosure of the results of the hypothesis tests.

Validity and Reliability Analysis

Before conducting hypothesis testing, the study assessed the construct validity of the scales employed through confirmatory factor analysis (measurement model). Following this analysis, it became evident that three statements in the job involvement scale and one

statement in the organizational justice scale had adverse effects on the factor structure and the goodness-of-fit statistics. Subsequently, four statements were removed from the analysis, and the analysis was re-executed.

Within the context of confirmatory factor analysis, the model fit was evaluated using various indices, including the chi-square fit test (χ^2/df), goodness of fit index (GFI), normed fit index (NFI), Tucker-Lewis index (TLI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). An acceptable fit is indicated by a χ^2/df value below 5, a GFI value above 0.850, and NFI, TLI, CFI values exceeding 0.900, alongside an RMSEA value below 0.080 (T. A. Brown, 2015, pp. 70-75; Byrne, 2016, pp. 90-102; Hair, Black, Babin, & Anderson, 2019, pp. 636-639; Kline, 2023, pp. 163-170).

This study adopted a five-variable model (distributive justice, procedural justice, interactional justice, job satisfaction, and job involvement). Accordingly, confirmatory factor analysis was conducted with five factors. Furthermore, the five-factor measurement model was compared against alternative models consisting of one, two, three, and four factors. The goodness-of-fit values resulting from the confirmatory factor analyses are presented in Table 2.

Upon scrutinizing the goodness-of-fit values presented in Table 2, it becomes apparent that the five-factor model generally demonstrates a robust fit ($\chi^2/sd=1.524$, RMSEA=0.051, GFI=0.853, NFI=0.855, TLI=0.932, CFI=0.940). Consequently, it can be affirmed that the relationships within the measurement model align well with the sample data, meeting the goodness-of-fit criteria. Furthermore, when comparing the validated five-factor measurement model to alternative models, it was ascertained that the five-factor model exhibited the most favorable fit.

Following the confirmatory factor analysis, Table 3 presents standardized values, standard errors, and

Table 2: Comparison of Measurement Models

Model	χ^2 (df)	$\Delta\chi^2$ (Δdf)	χ^2/df	RMSEA	GFI	NFI	TLI	CFI
Five-Factor	627.691 (412)	-	1.524	0.051	0.853	0.855	0.932	0.940
Four-Factor	747.716 (416)	120.025 (4)	1.797	0.063	0.803	0.815	0.896	0.907
Three-Factor	867.562 (419)	239.871 (7)	2.071	0.073	0.773	0.785	0.861	0.874
Two-Factor	960.939 (421)	333.248 (9)	2.283	0.080	0.746	0.762	0.833	0.849
One-Factor	1189.122 (422)	561.431 (10)	2.818	0.095	0.675	0.706	0.763	0.785

Table 3: Findings of Confirmatory Factor Analysis

Items	Standardized Values	Standard Errors	t-values
Distributive Justice			
DISJUST1	0.564	-	-
DISJUST2	0.661	0.169	6.740
DISJUST3	0.685	0.177	6.978
DISJUST4	0.718	0.171	6.583
DISJUST5	0.622	0.166	6.475
Procedural Justice			
PROJUST1	0.543	-	-
PROJUST2	0.734	0.184	7.444
PROJUST3	0.800	0.185	7.783
PROJUST4	0.855	0.198	7.477
PROJUST5	0.750	0.167	7.530
PROJUST6	0.587	0.146	6.453
Interactional Justice			
INTJUST1	0.812	-	-
INTJUST2	0.882	0.055	19.750
INTJUST3	0.858	0.072	14.506
INTJUST4	0.885	0.067	15.220
INTJUST5	0.831	0.077	13.874
INTJUST6	0.784	0.077	12.763
INTJUST7	0.797	0.073	13.050
INTJUST9	0.814	0.074	13.464
Job Involvement			
JOBINV3	0.565	-	-
JOBINV4	0.694	0.185	7.061
JOBINV5	0.744	0.177	7.383
JOBINV6	0.779	0.185	7.552
JOBINV7	0.499	0.156	5.756
JOBINV9	0.491	0.150	5.056
JOBINV10	0.491	0.159	5.620
Job Satisfaction			
JOBSAT1	0.721	-	-
JOBSAT2	0.788	0.113	10.070
JOBSAT3	0.504	0.094	7.375
JOBSAT4	0.702	0.097	9.082
JOBSAT5	0.731	0.102	9.437

Table 4: Cronbach's Alpha Values

Scale / Sub-Dimension	Number of Items	α
Organizational Justice	19	0.942
Distributive Justice	5	0.766
Procedural Justice	6	0.852
Interactional Justice	8	0.930
Job Involvement	7	0.784
Job Satisfaction	5	0.824

t-values for the organizational justice, job involvement, and job satisfaction scales.

Regarding the findings from the confirmatory factor analysis, it was observed that factor loadings for the organizational justice scale ranged from 0.543 to 0.885, while those for the job involvement scale fell between 0.491 and 0.779, and for the job satisfaction scale, they spanned from 0.504 to 0.788. Furthermore, the analysis indicated that the lowest t-value was 5.056, affirming the

established by Nunnally and Bernstein (1994, p. 265). These results provide confirmation that the organizational justice, job involvement, and job satisfaction scales utilized in this study are indeed valid and dependable instruments.

DESCRIPTIVE STATISTICS

Within the realm of descriptive statistics, the means, standard deviations, and correlation values of the variables employed in the study are examined. The findings are detailed in Table 5.

Table 5: Means, Standard Deviations, and Correlation

Variables	Mean	St.Dev.	1	2	3	4	5	6
1 Distributive Justice	2.849	0.875	-					
2 Procedural Justice	2.841	0.929	0.599**	-				
3 Interactional Justice	3.001	1.034	0.533**	0.706**	-			
4 Organizational Justice	2.911	0.850	0.750**	0.921**	0.935**	-		
5 Job Involvement	2.997	0.810	0.505**	0.455**	0.443**	0.521**	-	
6 Job Satisfaction	2.719	0.922	0.570**	0.526**	0.535**	0.540**	0.610**	-

N=202, *p < 0.05, **p<0.01

significance of the factor loadings at the 0.01 significance level. Consequently, the organizational justice scale was confirmed to have a three-factor structure (comprising distributive justice with 5 statements, procedural justice with 6 statements, and interactional justice with 8 statements), the job involvement scale maintained a one-factor structure (comprising 7 statements), and the job satisfaction scale retained a one-factor structure (comprising 5 statements).

Following the validity assessments, reliability evaluations were conducted by calculating Cronbach's Alpha (α) statistics for both the scales and their sub-dimensions. The obtained reliability values are outlined in Table 4.

As shown in Table 4, the reliability values achieved for both the scales and their respective sub-dimensions exceed the 0.70 threshold, in line with the criteria

After analyzing the averages displayed in Table 5, it's clear that employees tend to perceive higher levels of interactional justice in contrast to distributive and procedural justice. Conversely, the study reveals that employees' perceptions of job satisfaction are relatively lower when compared to their perceptions of job involvement and organizational justice. Additionally, it's evident that there exist significant correlations among all the variables examined in the study ($p<0.01$). As a result, it can be anticipated meaningful effects between these variables.

Hypotheses Testing

The study's hypotheses were examined using a hierarchical regression analysis, wherein gender, age, marital status, educational background, and tenure were introduced as control variables within the analysis. The findings of the hierarchical regression analysis are outlined in Table 6.

Table 6: Findings of Hierarchical Regression Analysis

	Job Involvement	Job Satisfaction	
	Stage 1	Stage 2	Stage 3
	β	β	β
Control Variables			
Gender	0.018	-0.091	-0.096
Age	0.116	0.120	0.089
Education	0.044	0.046	0.035
Marital Status	-0.003	0.054	0.054
Tenure	-0.003	-0.035	-0.034
Independent Variables			
Distributive Justice	0.347**	0.379**	0.287**
Procedural Justice	0.131	0.099	0.065
Interactional Justice	0.230*	0.229*	0.195*
Mediator Variable			
Job Involvement			0,265**
R²	0.319	0.426	0.473
Adjusted R²	0.291	0.402	0.449
F Value	11.295**	17.869**	17.431

N=202, *p < 0.05, **p<0.01

The initial hypothesis in this study examines how distributive, procedural, and interactional justice influence job satisfaction. After analyzing the results (Stage 2), it's evident that distributive justice (H1a: $\beta=0.379$, $p<0.01$) and interactional justice (H1c: $\beta=0.229$, $p<0.05$) have a significant and positive impact on job satisfaction. However, there's no statistically significant effect of procedural justice on job satisfaction (H1b: $\beta=0.099$, $p>0.05$). As a result, hypotheses H1a and H1c are supported, while hypothesis H1b is not.

The second hypothesis in this study explores the influence of organizational justice dimensions on job involvement. The analysis results (Stage 1) indicate that distributive justice (H2a: $\beta=0.347$, $p<0.01$) and interactional justice (H2c: $\beta=0.230$, $p<0.05$) significantly and positively impact job involvement. However, the effect of procedural justice on job involvement is not statistically significant (H2b: $\beta=0.131$, $p>0.05$). In line with the findings from the first hypothesis, hypotheses H2a and H2c are accepted, while hypothesis H2b is rejected.

The third hypothesis of this study investigates whether job involvement affects job satisfaction. Based on the findings (Stage 3), it is established that job involvement

perceived by employees positively and significantly influences job satisfaction (H3: $\beta=0.265$, $p<0.01$). Therefore, hypothesis H3 is confirmed.

Table 6- Findings of Hierarchical Regression Analysis

The fourth hypothesis of the study aims to determine whether there is a mediating effect of job involvement on the influence of the three dimensions of organizational justice on job satisfaction. To evaluate the presence of this mediation effect, the three-stage regression process proposed by Baron and Kenny (1986) was utilized. Baron and Kenny (1986, p. 1176) outline three conditions that must be met for a mediation effect to exist:

1st condition: The independent variable (organizational justice dimensions) should significantly impact the mediating variable (job involvement).

2nd condition: The independent variable (organizational justice dimensions) should significantly affect the dependent variable (job satisfaction).

3rd condition: When the mediating variable is introduced into the model in the third stage, the effect of the independent variable on the dependent variable should decrease or become insignificant,

while the mediating variable should significantly influence the independent variable.

In the framework of the third condition, when the impact of the independent variable on the dependent variable becomes statistically insignificant, it indicates a situation where a full mediation effect is likely at play. Conversely, if the influence decreases but remains statistically significant, it suggests the presence of a partial mediation effect (Baron & Kenny, 1986, p. 1177).

From the analysis outcomes, the impacts of distributive justice ($\beta=0.347, p<0.01$) and interactional justice ($\beta=0.230, p<0.05$) on job involvement and distributive justice ($\beta=0.379, p<0.01$) and interactional justice ($\beta=0.229, p<0.05$) on job satisfaction exhibit statistical significance. This indicates the fulfillment of the first and second conditions for these two aspects of organizational justice. Conversely, the effect of procedural justice on both job involvement ($\beta=0.131, p>0.05$) and job satisfaction ($\beta=0.099, p>0.05$) is considered insignificant. Consequently, the analysis results fail to meet the initial two conditions for procedural justice. In light of this discovery, hypothesis H4b is rejected.

To fulfill the third condition required to establish the presence of a mediating effect of job involvement on the relationship between distributive and interactional justice, and job satisfaction, the mediating role of job involvement was incorporated in the model during the third stage of regression analyses. To assess the significance of the mediation effect, the Sobel test was employed (Sobel, 1982).

Upon the inclusion of the mediating factor of job involvement in the model during the third stage, it was observed that the impacts of distributive justice ($\beta=0.379 \rightarrow 0.287$) and interactional justice ($\beta=0.229 \rightarrow 0.195$) on job satisfaction decreased. The Sobel test also indicated that the mediation effect was statistically meaningful. Consequently, the impacts of distributive justice ($Z=3.115, p<0.01$) and interactional justice ($Z=2.220, p<0.01$) on job satisfaction are partially channeled through job involvement. Based on these findings, hypotheses H4a and H4c are partially supported.

DISCUSSION

This research endeavors to provide a distinctive perspective on how organizational justice influences job satisfaction by exploring the relationships between organizational justice, job satisfaction, and job involvement within the framework of equity theory and social exchange theory. Within this context, the study

reveals the significance of organizational justice as a key determinant of job satisfaction. It highlights the potential enhancement of job satisfaction studies through a more pronounced focus on the interplay between job satisfaction and organizational justice. Furthermore, this study contributes to the existing literature by addressing the mediating role of job involvement in the relationship between various dimensions of organizational justice and job satisfaction.

The study's findings indicate that distributive justice and interactional justice have a significantly positive impact on job satisfaction, while procedural justice does not exhibit a significant effect. Consequently, employees' job satisfaction is primarily influenced by the fairness in the allocation of outcomes, such as opportunities for promotions and financial rewards, as well as the quality of interpersonal interactions experienced during decision-making processes. Although the procedures governing organizational decisions and activities are typically regarded as important, the perceived fairness in these processes was not identified by participants as a direct factor influencing job satisfaction. This finding diverges from certain analogous studies in the literature. Some of these studies assert that procedural justice is a critical determinant of job satisfaction, with an even stronger influence compared to other dimensions of organizational justice (Gillet et al., 2013; Gori et al., 2020; Pehlivan Kurnaz & Oruc, 2019).

The insignificance of procedural justice in this context may be attributed to several factors. First, cultural values could play a role. In some cultures, employees may place greater emphasis on tangible outcomes (distributive justice) and interpersonal treatment (interactional justice) rather than the formal processes used to achieve those outcomes. For instance, in cultures like Turkish Culture, with high power distance or collectivist tendencies, employees may prioritize the fairness of outcomes and the respect they receive from supervisors over the fairness of procedures (Hofstede, 2000; Lam et al., 2002). Second, organizational values and practices may also explain this finding. If the organization is more task-oriented and results-driven, employees might focus less on procedural fairness and more on whether they achieve desired outcomes. Conversely, in process-oriented organizations, procedural justice might hold greater significance. Finally, the nature of the tasks themselves could influence perceptions of procedural justice. In highly structured or routine tasks, employees may perceive procedural fairness as less relevant compared to roles requiring creativity or autonomy, where processes are more critical to their work experience.

However, in alignment with the current research findings, there are also studies that suggest distributive justice and/or interactional justice hold a more substantial sway over job satisfaction (Lam et al., 2002; Tekleab et al., 2005). In this context, McFarlin and Sweeney (1992) and Simons and Roberson (2003) observed that distributive and interactional justice serve as more influential predictors of individual outcomes, such as satisfaction with pay and job satisfaction, whereas procedural justice primarily predicts organizational outcomes, such as organizational commitment and a sense of belonging to the organization.

Within the realm of the research findings, it has been established that job involvement plays a partial mediating role in the favorable impact of distributive justice and interactional justice on job satisfaction. The findings indicate that employees' perception of fairness in the allocation of rewards, resources, and outcomes, coupled with their sense of being valued and respected by their managers, fosters a robust sense of connection and dedication to their job responsibilities. Consequently, this heightened involvement translates into an elevated sense of job satisfaction. Thus, employees' interpretation of the organization's distributive and relational processes as unbiased and just instigates a heightened level of job involvement, ultimately leading to increased contentment with their roles. Conversely, a diminished perception of justice diminishes employees' involvement in their duties, consequently dampening their job satisfaction. In existing literature, limited research delves into the variables postulated to mediate the correlation between organizational justice and job satisfaction (Aryee et al., 2002; Sokmen, 2020; Totawar & Nambudiri, 2014; Yuan et al., 2016), and notably absent is any exploration of job involvement's mediating impact. Therefore, this study is important due to its contribution to the existing literature.

The partial mediation role of job involvement suggests that both organizational justice and job involvement are vital for employees to experience satisfaction. While organizational justice (distributive and interactional) directly influences job satisfaction, it also operates indirectly by enhancing employees' psychological attachment to their work. This dual pathway underscores the importance of fostering fair practices and interpersonal treatment in the workplace, as they not only directly improve satisfaction but also strengthen employees' engagement with their tasks, further amplifying their contentment. In other words, organizational justice creates the conditions for employees to feel valued and

motivated, while job involvement channels these feelings into a deeper commitment to their roles, collectively driving job satisfaction.

PRACTICAL IMPLICATIONS

The findings of this study provide valuable insights to assist managers in comprehending how to enhance job satisfaction by bolstering employee involvement through improved decision-making regarding outcomes and procedures. The research findings underscore the significance of both equitable procedure distribution and equitable interpersonal interactions in augmenting job satisfaction. Consequently, these findings aid managers in appreciating how equitable decisions in practices like reward systems and performance evaluations can contribute to effective workforce management.

Although procedural justice did not exhibit a significant impact on job satisfaction or involvement in this study, it is noteworthy that respondents reported similar mean scores for procedural justice and distributive justice. This suggests that employees perceive procedural fairness as equally important in their work environment, even if it does not directly translate into higher satisfaction or involvement in this context. Therefore, managers should not overlook the role of procedural justice, as it may still contribute to a broader sense of organizational fairness and legitimacy. Ensuring transparent, consistent, and participatory decision-making processes can help maintain employees' trust in the organization, which may indirectly support their satisfaction and involvement over time.

Hence, the research findings offer significant practical implications for managers. In order to foster a positive perception of distributive and interactional justice, managers should administer rules impartially and consistently to all employees while recognizing and rewarding performance and merit without any personal bias. This is crucial because the perception of injustice can result in reduced job involvement, thereby diminishing satisfaction with the job tasks and potentially eliciting negative reactions towards the organization.

This study makes significant contributions to the literature on organizational justice and job satisfaction in several ways. Firstly, the study demonstrates that investigating the mediation mechanism within this relationship provides a more nuanced understanding of how organizational justice influences job satisfaction compared to direct studies. In this context, the study furnishes evidence indicating that organizational justice

can impact job satisfaction through various and distinct pathways, notably via job involvement. Consequently, it becomes evident that there is no single definitive answer to the question of how organizational justice affects job satisfaction; rather, it necessitates examination within diverse relational contexts.

Secondly, this study enriches the job satisfaction literature by underscored the significance of organizational justice and job involvement as often overlooked variables in research. Many studies predominantly concentrate on determinants of job satisfaction such as working conditions, organizational culture, work-family conflict, workaholism, workplace friendships, and organizational support (Akkoc et al., 2012; Belias & Koustelios, 2014; Burke, 2001; Eisenberger et al., 1997; Ernst Kossek & Ozeki, 1998; Nielsen et al., 2000; Ozdevecioglu & Doruk, 2015; Raziq & Maulabakhsh, 2015). Nevertheless, the findings of this study clearly emphasize that when examining justice and job satisfaction within the organizational context, researchers should also thoroughly investigate employees' job involvement and related variables.

CONCLUSION, LIMITATIONS AND FUTURE RESEARCH

In addition to its significant contributions, it can be stated that the study has several limitations. Firstly, due to time and budget constraints, the sample used in the research analysis is restricted to a specific group of employees within a production and wholesale enterprise operating solely in Karabuk province, Turkey. Consequently, the findings may not be generalizable to employees in other organizations or regions. Secondly, the research design employed cross-sectional data, collected at a single point in time. This restricts our ability to draw definitive conclusions regarding the causal relationships between variables.

This study was conducted with employees of a private enterprise, where management practices are predominantly focused on employee job performance. However, human resource management systems in public or other not-for-profit organizations may diverge from those in the private sector. Consequently, individual performance may hold less significance in such organizations. Therefore, further research is required to generalize the findings of this study to public and/or not-for-profit organizations. Furthermore, it is recommended that additional research addressing similar issues should be conducted in different regions and within private sector organizations.

Another suggestion for future research is to assess whether the findings remain valid with a larger sample size. Future researchers can enhance the validity of the current study by replicating the results obtained here using different samples and methodologies. Additionally, future research should explore the impacts of organizational justice on various organizational outcomes, such as organizational commitment and turnover intention. It is also advisable for future research to consider adopting an experimental or longitudinal approach.

In conclusion, the findings of this study represent a promising step towards a more comprehensive understanding of the relationship between organizational justice and job satisfaction. The research suggests that employees' perceptions of justice within organizational processes and their involvement to their job can be significant factors in enhancing job satisfaction. This underscores the importance for businesses to prioritize their employees.

REFERENCES

- Adams, J. S. (1965). Inequity in Social Exchange. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 2, pp. 267-299). New York: Academic Press.
- Akkoc, I., Caliskan, A., & Turunc, O. (2012). The Effect of Development Culture and Perceived Organizational Support to the Job Satisfaction and Job Performance: The Mediating Role of Trust. *Journal of Management and Economics*, 19(1), 105-135.
- Aksoy, A., & Taskaya, S. (2022). The Relationship between Organizational Commitment and Job Satisfaction: A Comprehensive Meta-Analysis Study from the Perspective of Healthcare Workers in Turkey. *Dumlupinar University Journal of Social Sciences*(74), 151-169. doi:10.51290/dpusbe.1128528
- Al Naggar, S. A., & Saad, M. A. (2019). The Impact of Organizational Justice on Job Involvement Level on Saudi Postal Corporation. *International Journal of Advanced and Applied Sciences*, 6(7), 19-28. doi:10.21833/ijaas.2019.07.003
- Alegre, I., Mas-Machuca, M., & Berbegal-Mirabent, J. (2016). Antecedents of Employee Job Satisfaction: Do They Matter? *Journal of Business Research*, 69(4), 1390-1395. doi:10.1016/j.jbusres.2015.10.113
- Altintas, F. C. (2017). A Meta-Analysis Study on the Relationship Between Organizational Justice and Job Satisfaction. *International Journal of Academic Value Studies*, 3(9), 332-343. doi:10.23929/javs.162
- Anderson, J. C., & Gerbing, D. W. (1988). Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychological Bulletin*, 103(3), 411-423. doi:10.1037/0033-2909.103.3.411
- Aryee, S., Budhwar, P. S., & Chen, Z. X. (2002). Trust as A Mediator of the Relationship between Organizational Justice and Work Outcomes: Test of A Social Exchange Model. *Journal of Organizational Behavior*, 23(3), 267-286. doi:10.1002/job.138
- Baron, R. M., & Kenny, D. A. (1986). The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic and Statistical Considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182. doi:10.1037//0022-3514.51.6.1173
- Basaran, U., Buyukyilmaz, O., & Cevik, E. I. (2011). The Mediating Effect of Job Satisfaction on the Relationship Between Internal Marketing and Perceived Service Quality. *Dokuz Eylul University Journal of Faculty of Business*, 12(2), 201-225.
- Bektas, C. (2017). Explanation of Intrinsic and Extrinsic Job Satisfaction via Mirror Model. *Business & Management Studies: An International Journal*, 5(3), 627-639. doi:10.15295/bmij.v5i3.118
- Belias, D., & Koustelios, A. (2014). Organizational Culture and Job Satisfaction: A Review. *International review of management and marketing*, 4(2), 132-149.
- Bies, R. J. (1987). The Predicament of Injustice: The Management of Moral Outrage. *Research in Organizational Behavior*, 9, 289-319.
- Blau, P. M. (1964). *Exchange and Power in Social Life*. New Brunswick, USA: Transaction Publishers.
- Brown, S. P. (1996). A Meta-Analysis and Review of Organizational Research on Job Involvement. *Psychological Bulletin*, 120(2), 235-255. doi:10.1037/0033-2909.120.2.235
- Brown, T. A. (2015). *Confirmatory Factor Analysis for Applied Research* (2. ed.). New York: Guilford Publications.
- Burke, R. J. (2001). Workaholism Components, Job Satisfaction, and Career Progress. *Journal of Applied Social Psychology*, 31(11), 2339-2356. doi:10.1111/j.1559-1816.2001.tb00179.x
- Buyukyilmaz, O., & Akyuz, S. (2015). The Effect of Perceived Work-Family Life Conflict on Job Satisfaction for the Employees Working in Hotels and Mansions in Safranbolu. *Journal of Academic Review*(52), 265-284.
- Buyukyilmaz, O., & Bicer, C. (2018). The Mediating Role of Job Involvement in the Effect of Workplace Friendship on Intention to Leave. *NWSA Social Sciences*, 13(2), 28-41. doi:10.12739/NWSA.2018.13.2.3C0170
- Buyukyilmaz, O., Karakulle, I., & Karatas, I. (2018). The Mediating Role of Job Satisfaction in the Effect of Organizational Career Management on Emotional Commitment. *Cankiri Karatekin University Journal of the Faculty of Economics and Administrative Sciences*, 8(1), 1-29. doi:10.18074/ckuiibfd.310160

- Buyukyilmaz, O., & Tuncbiz, B. (2016). The Effect of Organizational Justice on Organizational Commitment: A Study on Academic Staff. *Bartın University Journal of Faculty of Economics and Administrative Sciences*, 7(14), 89-113.
- Buyukyilmaz, O., Vargun, H., & Uygurturk, H. (2020). The Effect of Job Stress on Accounting Professionals' Intention to Leave the Profession: The Moderation Role of Career Satisfaction. *Accounting and Auditing Review*, 21(61), 105-124.
- Buyukyilmaz, O., & Yegin, T. (2017). The Effect of Bank Employees' Perceived Person-Organization Fit and Job Satisfaction on Organization Citizenship Behavior. *Papers on Social Science*, 2017(1), 75-87.
- Byrne, B. M. (2016). *Structural Equation Modeling with Amos: Basic Concepts, Applications, and Programming* (3. ed.). New York: Routledge.
- Calik, A., Alkan, D., & Saprak, I. (2022). Analysis of Employees Job Satisfaction and Organizational Commitment Levels: The Case of TR2A Region Professional Accountants Society. *Van Yuzuncu Yil University The Journal of Social Sciences Institute*(57), 123-142. doi:10.53568/yyusbed.1127764
- Cekmecelioglu, H. (2006). Evaluation of Effect of Work Satisfaction and Organizational Commitment on Intention to Leave and Productivity: A Research. *ISGUC The Journal of Industrial Relations and Human Resources*, 8(2), 153-168.
- Cetin, E., Arslan, B., & Buyukyilmaz, O. (2021). The Effect of Job Satisfaction on Job Performance During the COVID-19 Pandemic Period. *International Journal of Social Sciences Academic Researches*, 5(1), 19-36.
- Cini, M. A. (2022). The Relationship Between Job Satisfaction, Organizational Commitment and Intention to Leave: A Research Through White Collar Workers. *Journal of Academic Value Studies*, 8(1), 91-109. doi:10.29228/jav.57404
- Colquitt, J. A. (2001). On the Dimensionality of Organizational Justice: A Construct Validation of A Measure. *Journal of Applied Psychology*, 86(3), 386-400. doi:10.1037/0021-9010.86.3.386
- Colquitt, J. A., Conlon, D. E., Wesson, M. J., Porter, C. O. L. H., & Ng, K. Y. (2001). Justice at the Millennium: A Meta-Analytic Review of 25 Years of Organizational Justice Research. *Journal of Applied Psychology*, 86(3), 425-445. doi:10.1037/0021-9010.86.3.425
- Cropanzano, R., Goldman, B. M., & Benson, L. (2005). Organizational Justice. In J. Barling, E. K. Kelloway, & M. R. Frone (Eds.), *Handbook of Work Stress* (pp. 63-87). Thousand Oaks: SAGE Publications.
- Dhir, S., Dutta, T., & Ghosh, P. (2020). Linking Employee Loyalty with Job Satisfaction Using PLS-SEM Modelling. *Personnel Review*, 49(8), 1695-1711. doi:10.1108/PR-03-2019-0107
- Diefendorff, J. M., Brown, D. J., Kamin, A. M., & Lord, R. G. (2002). Examining the Roles of Job Involvement and Work Centrality in Predicting Organizational Citizenship Behaviors and Job Performance. *Journal of Organizational Behavior*, 23(1), 93-108. doi:10.1002/job.123
- Donmez, F. G., & Topaloglu, C. (2020). The Relationship among Perceived Organizational Support, Workplace Loneliness and Job Satisfaction on Hotel Employees. *The Journal of Human and Work*, 7(2), 311-324. doi:10.18394/iid.703526
- Eisenberger, R., Cummings, J., Armeli, S., & Lynch, P. (1997). Perceived Organizational Support, Discretionary Treatment, and Job Satisfaction. *Journal of Applied Psychology*, 82(5), 812-820. doi:10.1037/0021-9010.82.5.812
- Ernst Kossek, E., & Ozeki, C. (1998). Work-Family Conflict, Policies, and the Job-Life Satisfaction Relationship: A Review and Directions for Organizational Behavior-Human Resources Research. *Journal of Applied Psychology*, 83(2), 139-149. doi:10.1037/0021-9010.83.2.139
- Eryilmaz, I., Dirik, D., & Gulova, A. A. (2017). Leader-Member Exchange as A Determinant of Job Satisfaction and the Moderating Role of Political Skill. *International Journal of Economics and Administrative Studies*(Special Issue), 167-182.
- Feleki, E., Karamanis, K., & Arnis, N. (2021). Employee's Job Satisfaction in Economic Recession: A Descriptive Empirical Analysis in the Greek Public Sector. *Management Research and Practice*, 13(2), 15-25.
- Gillet, N., Colombat, P., Michinov, E., Pronost, A. M., & Fouquereau, E. (2013). Procedural Justice, Supervisor Autonomy Support, Work Satisfaction, Organizational Identification and Job Performance: The Mediating Role of Need Satisfaction and Perceived Organizational Support. *Journal of Advanced Nursing*, 69(11), 2560-2571.

- Gori, A., Topino, E., Palazzeschi, L., & Di Fabio, A. (2020). How Can Organizational Justice Contribute to Job Satisfaction? A Chained Mediation Model. *Sustainability*, 12(19), 7902. doi:10.3390/su12197902
- Greenberg, J. (1987). A Taxonomy of Organizational Justice Theories. *The Academy of Management Review*, 12(1), 9-22. doi:10.2307/257990
- Greenberg, J. (1990). Organizational Justice: Yesterday, Today, and Tomorrow. *Journal of Management*, 16(2), 399-432. doi:10.1177/014920639001600208
- Haccoun, R. R., & Jeanrie, C. (1995). Self Reports of Work Absence as a Function of Personal Attitudes Towards Absence, and Perceptions of the Organisation. *Applied Psychology: An International Review*, 44(2), 155-170. doi:10.1111/j.1464-0597.1995.tb01072.x
- Hackman, J. R., & Oldham, G. R. (1975). Development of the Job Diagnostic Survey. *Journal of Applied Psychology*, 60(2), 159-170. doi:10.1037/h0076546
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate Data Analysis* (8. ed.). Andover, Hampshire, UK: Cengage Learning.
- Hallberg, U. E., & Schaufeli, W. B. (2006). "Same Same" But Different? Can Work Engagement Be Discriminated from Job Involvement and Organizational Commitment? *European Psychologist*, 11(2), 119-127. doi:10.1027/1016-9040.11.2.119
- Hofstede, G. J. (2000). Organizational Culture: Siren or Sea Cow? A Reply to Dianne Lewis. *Strategic Change*, 9(2), 135-137. doi:10.1002/(SICI)1099-1697(200003/04)9:2<135::AID-JSC464>3.0.CO;2-E
- Homans, G. C. (1958). Social Behavior as Exchange. *American Journal of Sociology*, 63(6), 597-606. doi:10.1086/222355
- Huang, L.-C., Ahlstrom, D., Lee, A. Y.-P., Chen, S.-Y., & Hsieh, M.-J. (2016). High Performance Work Systems, Employee Well-Being, and Job Involvement: An Empirical Study. *Personnel Review*, 45(2), 296-314. doi:10.1108/PR-09-2014-0201
- Imamoglu, S. Z., Keskin, H., & Erat, S. (2004). The Relationships between Salary, Career, Creativity and Job Satisfaction: An Application in Textile Sector. *Journal of Management and Economics*, 11(1), 167-176.
- Janssen, O., & Van Yperen, N. W. (2004). Employees' Goal Orientations, the Quality of Leader-Member Exchange, and the Outcomes of Job Performance and Job Satisfaction. *Academy of Management Journal*, 47(3), 368-384. doi:10.2307/20159587
- Johns, G. (1981). Difference Score Measures of Organizational Behavior Variables: A Critique. *Organizational Behavior and Human Performance*, 27(3), 443-463. doi:10.1016/0030-5073(81)90033-7
- Judge, T. A., Heller, D., & Mount, M. K. (2002). Five-Factor Model of Personality and Job Satisfaction: A Meta-Analysis. *Journal of Applied Psychology*, 87(3), 530-541. doi:10.1037/0021-9010.87.3.530
- Judge, T. A., Piccolo, R. F., Podsakoff, N. P., Shaw, J. C., & Rich, B. L. (2010). The Relationship between Pay and Job Satisfaction: A Meta-Analysis of the Literature. *Journal of Vocational Behavior*, 77(2), 157-167. doi:10.1016/j.jvb.2010.04.002
- Judge, T. A., Thoresen, C. J., Bono, J. E., & Patton, G. K. (2001). The Job Satisfaction-Job Performance Relationship: A Qualitative and Quantitative Review. *Psychological Bulletin*, 127(3), 376-407. doi:10.1037/0033-2909.127.3.376
- Kanungo, R. N. (1982). Measurement of Job and Work Involvement. *Journal of Applied Psychology*, 67(3), 341-349. doi:10.1037/0021-9010.67.3.341
- Kengatharan, N. (2020). Too Many Big Fish in A Small Pond? The Nexus of Overqualification, Job Satisfaction, Job Search Behaviour and Leader-Member Exchange. *Management Research and Practice*, 12(3), 33-44.
- Kinman, G., Wray, S., & Strange, C. (2011). Emotional Labour, Burnout and Job Satisfaction In UK Teachers: The Role of Workplace Social Support. *Educational Psychology*, 31(7), 843-856. doi:10.1080/01443410.2011.608650
- Kline, R. B. (2023). *Principles and Practice of Structural Equation Modeling* (5. ed.). New York: The Guilford Press.
- Lam, S., S. K., Schaubroeck, J., & Aryee, S. (2002). Relationship between Organizational Justice and Employee Work Outcomes: A Cross-National Study. *Journal of Organizational Behavior*, 23(1), 1-18. doi:10.1002/job.131
- Lambert, E. G., & Paoline III, E. A. (2012). Exploring Potential Antecedents of Job Involvement: An Exploratory Study Among Jail Staff. *Criminal Justice and Behavior*, 39(3), 264-286. doi:10.1177/0093854811433533

- Lawler, E. E., & Hall, D. T. (1970). Relationship of Job Characteristics to Job Involvement, Satisfaction, and Intrinsic Motivation. *Journal of Applied Psychology*, 54(4), 305-312. doi:10.1037/h0029692
- Locke, E. A. (1976). The Nature and Causes of Job Satisfaction. In: , Ed., *Handbook of Industrial and Organizational Psychology*, Vol. 1, 1297-1343. In M. D. Dunnette (Ed.), *Handbook of Industrial and Organizational Psychology* (Vol. 1, pp. 1297-1343). Chicago: Rand McNally.
- Lodahl, T. M., & Kejnar, M. (1965). The Definition and Measurement of Job Involvement. *Journal of Applied Psychology*, 49(1), 24-33. doi:10.1037/h0021692
- Luthans, F. (1995). *Organizational Behavior* (7. ed.). New York: McGraw-Hill.
- Malhotra, N., Sahadev, S., & Sharom, N. Q. (2022). Organisational Justice, Organisational Identification and Job Involvement: The Mediating Role of Psychological Need Satisfaction and the Moderating Role of Person-Organisation Fit. *The International Journal of Human Resource Management*, 33(8), 1526-1561. doi:10.1080/09585192.2020.1757737
- McFarlin, D. B., & Sweeney, P. D. (1992). Distributive and Procedural Justice as Predictors of Satisfaction with Personal and Organizational Outcomes. *Academy of Management Journal*, 35(3), 626-637. doi:10.2307/256489
- Moorman, R. H. (1991). Relationship between Organizational Justice and Organizational Citizenship Behaviors: Do Fairness Perceptions Influence Employee Citizenship? *Journal of Applied Psychology*, 76(6), 845-855. doi:10.1037/0021-9010.76.6.845
- Moorman, R. H. (1993). The Influence of Cognitive and Affective Based Job Satisfaction Measures on the Relationship Between Satisfaction and Organizational Citizenship Behavior. *Human Relations*, 46(6), 759-776. doi:10.1177/001872679304600604
- Niehoff, B. P., & Moorman, R. H. (1993). Justice as a Mediator of the Relationship between Methods of Monitoring and Organizational Citizenship Behavior. *The Academy of Management Journal*, 36(3), 527-556. doi:10.2307/256591
- Nielsen, I. K., Jex, S. M., & Adams, G. A. (2000). Development and Validation of Scores on a Two-Dimensional Workplace Friendship Scale. *Educational and Psychological Measurement*, 60(4), 628-643. doi:10.1177/00131640021970655
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric Theory* (3. ed.). New York: McGraw-Hill Inc.
- Orpen, C. (1997). The Interactive Effects of Communication Quality and Job Involvement on Managerial Job Satisfaction and Work Motivation. *The Journal of Psychology*, 131(5), 519-522. doi:10.1080/00223989709603540
- Ozdevecioglu, M., & Doruk, N. C. (2015). The Effects of Work-Family Conflict and Family-Work Conflict on Employee's Job and Life Satisfaction in Organizations. *Erciyes University Journal of Faculty of Economics and Administrative Sciences*(33), 69-99.
- Paoline, E. A., & Lambert, E. G. (2011). Exploring Potential Consequences of Job Involvement Among Jail Staff. *Criminal Justice Policy Review*, 23(2), 231-253. doi:10.1177/0887403411398304
- Pehlivan Kurnaz, İ., & Oruc, I. (2019). Investigation on the Relationship Between Organizational Justice and Job Satisfaction of Applied Research. *Kirklareli University Journal of Social Sciences*, 3(3), 375-390.
- Raziq, A., & Maulabakhsh, R. (2015). Impact of Working Environment on Job Satisfaction. *Procedia Economics and Finance*, 23, 717-725. doi:10.1016/S2212-5671(15)00524-9
- Roch, S. G., & Shanock, L. R. (2006). Organizational Justice in an Exchange Framework: Clarifying Organizational Justice Distinctions. *Journal of Management*, 32(2), 299-322. doi:10.1177/0149206305280115
- Rowden, R. W. (2002). The Relationship between Workplace Learning and Job Satisfaction in U.S. Small to Midsize Businesses. *Human Resource Development Quarterly*, 13(4), 407-425. doi:10.1002/hrdq.1041
- Rusbult, C. E., Farrell, D., Rogers, G., & Mainous, A. G. (1988). Impact of Exchange Variables on Exit, Voice, Loyalty, and Neglect: An Integrative Model of Responses to Declining Job Satisfaction. *Academy of Management Journal*, 31(3), 599-627. doi:10.2307/256461
- Saks, A. M. (2006). Antecedents and Consequences of Employee Engagement. *Journal of Managerial Psychology*, 21(7), 600-619. doi:10.1108/02683940610690169

- Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002). The Measurement of Engagement and Burnout: A Two Sample Confirmatory Factor Analytic Approach. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being*, 3(1), 71-92. doi:10.1023/A:1015630930326
- Schleicher, D. J., Watt, J. D., & Greguras, G. J. (2004). Reexamining the Job Satisfaction-Performance Relationship: The Complexity of Attitudes. *Journal of Applied Psychology*, 89(1), 165-177. doi:10.1037/0021-9010.89.1.165
- Sharma, A., & Sharma, A. (2021). Beyond Exchange Relationship: Exploring the Link Between Organizational Justice, Job Involvement, and Citizenship Behavior. *The Journal of Behavioral Science*, 16(3), 123-135.
- Simons, T., & Roberson, Q. (2003). Why Managers Should Care About Fairness: The Effects of Aggregate Justice Perceptions on Organizational Outcomes. *Journal of Applied Psychology*, 88(3), 432-443. doi:10.1037/0021-9010.88.3.432
- Smith, P. C., Kendall, L. M., & Hulin, C. L. (1969). *The Measurement of Satisfaction in Work and Retirement*. Chicago: Rand McNally.
- Sobel, M. E. (1982). Asymptotic Confidence Intervals for Indirect Effects in Structural Equation Models. *Sociological Methodology*, 13, 290-312. doi:10.2307/270723
- Sokmen, A. (2020). Organizational Justice, Organizational Trust, Job Satisfaction, and Intention to Leave Relationship: A Research on Public Servants. *Third Sector Social Economic Review*, 55(4), 2651-2663. doi:10.15659/3.sektor-sosyal-ekonomi.20.11.1492
- Sudak, M. K., & Zehir, C. (2013). Types of Personality, Emotional Intelligence, with a Study on the Relationship between Job Satisfaction. *Journal of Administrative Sciences*, 11(22), 141-165.
- Tekleab, A. G., Takeuchi, R., & Taylor, M. S. (2005). Extending the Chain of Relationships among Organizational Justice, Social Exchange, and Employee Reactions: The Role of Contract Violations. *Academy of Management Journal*, 48(1), 146-157. doi:10.5465/AMJ.2005.15993162
- Totawar, A. K., & Nambudiri, R. (2014). Can Fairness Explain Satisfaction? Mediation of Quality of Work Life (QWL) in the Influence of Organizational Justice on Job Satisfaction. *South Asian Journal of Management*, 21(2), 101-122.
- Turhan, M., Erol, Y. C., Demirkol, M., & Ozdemir, T. (2019). The Relationship between Organizational Justice Perception and Job Involvement in Teachers. *SDU International Journal of Educational Studies*, 6(2), 161-173. doi:10.33710/sduijes.637366
- van Knippenberg, D. (2000). Work Motivation and Performance: A Social Identity Perspective. *Applied Psychology: An International Review*, 49(3), 357-371. doi:10.1111/1464-0597.00020
- Wildermuth, C. d. M. e. S., & Pauken, P. D. (2008). A Perfect Match: Decoding Employee Engagement – Part I: Engaging Cultures and Leaders. *Industrial and Commercial Training*, 40(3), 122-128. doi:10.1108/00197850810868603
- Williams, L. J., & Anderson, S. E. (1991). Job Satisfaction and Organizational Commitment as Predictors of Organizational Citizenship and In-Role Behaviors. *Journal of Management*, 17(3), 601-617. doi:10.1177/014920639101700305
- Wright, T. A., Cropanzano, R., & Bonett, D. G. (2007). The Moderating Role of Employee Positive Well Being on the Relation Between Job Satisfaction and Job Performance. *Journal of Occupational Health Psychology*, 12(2), 93-104. doi:10.1037/1076-8998.12.2.93
- Yuan, G., Jia, L., & Zhao, J. (2016). Organizational Identification Moderates the Impact of Organizational Justice on Job Satisfaction. *Work: Journal of Prevention, Assessment & Rehabilitation*, 54(1), 189-195. doi:10.3233/WOR-162271
- Zopiatis, A., Constanti, P., & Theocharous, A. L. (2014). Job Involvement, Commitment, Satisfaction and Turnover: Evidence from Hotel Employees in Cyprus. *Tourism Management*, 41, 129-140. doi:10.1016/j.tourman.2013.09.013

Underemployment Experiences Among Youth with Higher Education Graduates: A Qualitative Research Study in Istanbul

Halim BAŞ¹, Yüstra AK², Merve YOSUNKAYA³

ABSTRACT

This study aims to determine the causes of youth underemployment in emerging economies and to propose measures to minimize it, thereby drawing attention to its significance. In this context, semi-structured interviews were conducted with 12 young individuals aged 15-29 who work outside the fields in which they received their education, in the province of Istanbul, one of the emerging economies of Türkiye, characterized by a youth-dominant demographic structure and numerous universities. According to the findings of the study, there are several clear reasons for the education–employment mismatch among higher education graduates. Over the years, labor market conditions in Türkiye have hindered graduates' ability to secure jobs in their own fields. Factors such as high living costs, environmental pressures, and psycho-social issues have significantly aggravated this mismatch by forcing young people to seek employment outside their educational backgrounds. Furthermore, it was found that early career experiences often create a vicious cycle largely shaped by negative experiences. The similarity between our findings and those of numerous previous studies in the existing literature indicates credibility and consistency.

Keywords: Underemployment, youth, higher education, qualitative research, Istanbul.

JEL Classification Codes: J24, J63, J64

Referencing Style: APA 7

INTRODUCTION

Changes and transformations are occurring in many countries across the world. These shifts driven by rapid technological innovation significantly affect human existence in fundamental areas such as education, health, and law, particularly the economy. It is highly challenging to term these effects as unilateral and progressive. Instead, it would be more comprehensive to classify impacts as positive or negative, considering the dynamic interaction between economic and social factors. For instance, economic liberalization has directly positive effects on trade volume and economic development rates. In addition, from an improvement/development perspective, increases in poverty reduction organizations, legal frameworks aimed at reducing or preventing discrimination in the labor market, and a series of employment policies aimed at reducing unemployment can also be considered positive effects. Nevertheless, these positive effects are not without their shadows. For instance, it is asserted that while diversity and efficiency in employment policies increase, they harm productivity. Although multiple factors contribute

to this situation, the increasing deregulation of markets with developed industries and the resulting conditions (Appelbaum and Schettkat, 1995) and the inability to adequately utilize labor capacity based on education and qualifications may be among the most complicated.

In general, two phenomena influence the equilibrium of the labor market: unemployment and underemployment. While unemployment can be managed through macroeconomic considerations and practical interventions, underemployment poses a more complex challenge, potentially leading to structural economic problems arising from multifaceted factors that resist easy solutions. Underemployment, like unemployment, is a problem that can be solved, however it is a complex process that requires rigorous coordination between institutions. Over time, various definitions of underemployment have emerged, including a mismatch between an individual's education and job requirements. (Dooley et al., 2000).

Underemployment was initially defined at the 13th International Conference on Labor Statistics in 1982

¹ Associate Professor, Marmara University, Faculty of Economics / Department of Labour Economics and Industrial Relations, İstanbul-Türkiye, halimbask001@gmail.com

² Doctoral Researcher (PhD Candidate), Istanbul University, Faculty of Economics / Department of Labour Economics and Industrial Relations, İstanbul-Türkiye, YsraAk@gmail.com

³ Doctoral Researcher (PhD Candidate), Istanbul University, Faculty of Economics / Department of Labour Economics and Industrial Relations, İstanbul-Türkiye, mervesyosunkaya@gmail.com

and was categorized along two dimensions. The first dimension is related to time-related insufficient working hours/duration as a visible form. The other, with its invisible aspect, covered all aspects of underemployment. However, a shift occurred at the 19th International Conference on Labor Statistics in 2013, where underemployment was redefined as the inadequate utilization of the workforce in terms of time. However, the perspective outlined at the 16th International Conference on Labor Statistics reflects the framework for understanding labor underutilization. Therefore, since 2013, underemployment also represents the mismatch between labor supply and demand, considering the “underemployment” approach.

Underemployment is a form of employment that directly reflects the quality of individuals, including their productivity, reducing their capacity and, therefore their welfare. More precisely, it is a mismatch between an individual's education level, skills, and job. This is a situation in which individuals are primarily employed in jobs below their educational qualifications or involuntarily in many fields unrelated to their education (Montcho et al., 2022).

Within the framework of the 2013 approach, the classification Thompson et al. (2013) is given in Table 1 below.

The effective utilization of the labor force presents challenges, particularly in emerging economies. These nations have limited economic resources, lower employment rates than developed countries, and a high rate of disguised unemployment. This situation reflects the misappropriation of scarce resources and the need for economic efficiency in emerging economies.

The consequences of inefficient labor force use extend beyond the economic realm, directly affecting a nation's development. This problem at the macro level is caused by many factors, including slow or jobless growth, inadequate education, and employability skills, skills mismatch, geographical mismatches, malfunctioning labor markets, and discriminatory practices toward culture, gender, and socioeconomic differences (ILO, 1998). Among these macro factors, those related to incompatibilities are directly related to the concept of “underemployment,” which will serve as the primary focus of this study. On the other hand, when solving this critical problem, some priorities come to the fore regarding the effectiveness of the measures.

Emerging economies must take a series of strategic steps to achieve sustainable economic development goals and fight underemployment. The most important steps are reforms in education and employment. When educational reforms are congruent with technological advancement, they directly impact productivity. Therefore, it will maximize the productivity of companies engaged in economic activities and contribute positively to collective welfare. Thus, emerging economies can sustain their economic development by providing high-quality employment. However, implementing the measures/solutions has limitations. These restrictions are primarily due to limited economic resources.

This study highlights the significance of integrating education and workforce planning for emerging economies to maintain a balanced labor market. Emerging economies should reduce mismatches between educational qualifications and labor market demands while focusing on rapid development and prioritizing innovations that create value. In this context,

Table 1: The types of underemployment

Education/Knowledge Underemployment	The degree to which a person's education level, knowledge, skill, and abilities exceed the education level that is required for their job
Experience/HierarchicalLevel Underemployment	The degree to which an individual experience level or previous hierarchical level exceeds that which is required for their job
Wage Underemployment	The degree to which a person's previous wages exceed the current wages on his/her job
Job Status Underemployment	The degree to which a person's desired job status (e.g., full-time, part-time) matches their current job status
Job Field Underemployment	The degree to which a person's desired occupation or field of employment matches the occupation or field of employment of their current job

this study illuminates the root causes of inadequate employment, which is one an obstacle to economic development in emerging economies. Specifically, this study focuses on the adverse effects/losses associated with inadequate employment in Türkiye, a prominent emerging economy.

Within the framework of Thompson et al. (2013) underemployment classification, this study focuses on a participant group who experiences both education and knowledge underemployment and job field underemployment.

However, many theories explain the mismatch between education, skills, and jobs. Rather than being an independent theory, this situation is presented as being intertwined with economic, sociological, and educational theories. For example, human capital theory is based on the idea that individual's qualities, such as knowledge, skills, education, and health, have economic value and that investments made in these qualities increase individual productivity and contribute to economic growth (Becker, 1993). Another is related to the theory of job fit and intention to leave, which is addressed within the productivity framework (Jovanovic, 1979). There are also objective criteria that determine education-job mismatch.

International standards have been developed to measure objective mismatches between education, jobs, and skills. The first is ISCED (International Standard Classification of Education), a standard classification system developed by UNESCO to compare and analyze education systems internationally. The other is ISCO (International Standard Classification of Occupations), an occupation classification system created by the International Labor Organization (ILO). ISCO seeks to standardize labor market analyses by categorizing occupations according to tasks and skills. These two classification systems provide a basic standard for analyzing the matching of education and occupation by classifying educational background and occupational roles. The education level and fields of education provide clues in this regard. For example, ISCED 6 (undergraduate education) is expected to be in ISCO-08 Major Group 2 (Professional Occupations). If individuals work in ISCO-08 Major Groups 4 or 5 (Clerical, Service, and Sales Personnel), there may be a mismatch between education and occupation. In terms of field of study, an individual who graduated from ISCED in the field of "Engineering, Manufacturing, and Construction" but works in the ISCO group of "Service and Sales Personnel" may reflect a skills mismatch. Finally, according to ISCED levels of education, it is essential to consider whether an individual has met the

minimum level of education required for the occupation in which he or she is working, and this is where the concepts of overqualification and underemployment come into play.

Young individuals in Türkiye and the experiences of those with a bachelor's degree or higher in terms of employment opportunities are the targets of these forms of underemployment and the focus this study. The scope of the research represents the opinions of 12 young participants (15-29) within Istanbul's province. To gather insights, conducted an in-depth field research in Istanbul's province. This location is a strategic choice due to its significance in terms of population size, the number of universities, and employment potential within Türkiye.

The primary contribution of this study lies in raising awareness among the younger generation through a comprehensive examination of underemployment and the development of tailored strategies. The contribution of exhaustive analyses and a qualitative methodology is crucial. A further contribution of this review is that the young workforce, which is one of the groups most affected by the crisis in emerging economies, particularly in developed economies, after the 2008 financial crisis, examines the losses or disadvantages of flexible work arrangements in depth, using qualitative methodology, and in the context of an emerging economic structure. Furthermore, this research offers valuable insights for countries undergoing demographic transformation and facing an aging population. This can aid in shaping awareness regarding the nature of jobs available to the young workforce and in making necessary policy adjustments.

The study is divided into four main sections. The first section is the introduction section, followed by the literature review section. The methodology and findings are presented in the third section, discussion followed by the conclusion, , and recommendations are presented in the final section.

LITERATURE REVIEW

Many empirical and theoretical studies on underemployment have been published in the literature; factors such as gender, education level, wages, education system, perception of overqualified, and productivity are mentioned as essential critical concepts used to define or measure underemployment in various dimensions. In this context, previous studies have addressed multiple methods and dimensions. These studies provide a comprehensive perspective on the effects and causes of underemployment.

Many empirical studies in the academic literature investigate the causes of underemployment. By comparing the employment opportunities of highly and relatively less educated individuals over 25 years, Aberg (2003) found that the highly educated workforce needed to be more employed due to the limited job opportunities. A similar study focused on the causes of unemployment. Since 1970, Klein (2015) has conducted a study to determine whether there is a distinction between the unemployment risks of individuals from diverse educational backgrounds in West Germany. This study determined that individuals who graduated from institutions that provide vocationally qualified education have a lower unemployment risk than those who graduated from institutions that offer general education. At the same time, the adverse effects and fluctuations of the economy have been acknowledged as external factor that exacerbate the disparity in unemployment risk between individuals with low and high levels of education. In another study, in which the analysis of higher education and skilled, Green and Heenseke (2021) analyzed graduate labor supply and demand, high-skilled positions, and underemployment in 26 European countries for the period 2005–2015 using the European Labor Force Survey and EU-Income and Living Conditions Statistics. A study of the workforce between the ages of 30 and 59 found that the proportion of highly educated workers is increasing in all countries.

However, the supply of highly-skilled workers is decreasing at the same rate in all countries, so underemployment is gradually growing. In another study, based on the assumption that the causes of underemployment of those with higher education may differ, Verhaest and Velden (2013) investigated the reasons for the variation in the underemployment rate of postgraduate-educated workers across nations. In this study, which is based on people who graduated no more than five years ago and included 13 European countries and Japan, it was determined that the quality of the education system and programs of the countries, the economic climate, and the relative surplus of the highly educated workforce account for the mismatch in the underemployment rate of the highly educated workforce. At the same time, it has been discovered that the education system and its quality can cause a distinction between countries and various education levels within a country. In an economy in which unemployment has become a long-term issue, underemployment can significantly decrease productivity. In this context, Nunez and Livanos (2010) analyzed the effects of education level and the work sector on short- and long-term unemployment

in 15 European countries. The study, based on data from a labor force survey, found that an individual's education level is more effective in reducing short-term unemployment than long-term unemployment. In another study focusing on labor productivity, McGowan and Andrews (2015) used PIACC data from 19 OECD countries to investigate the relationship between labor market mismatch and labor productivity. As a result, it was determined that labor productivity declines as the underemployment rate rises because of the conflict between the labor market and high-skill mismatch.

However, significant research exist on underemployment determinants by category. Studies conducted four times in Türkiye yielded overlapping and distinct results. A study by Taşçı and Darıcı (2010) examined the causes of underemployment in Türkiye using data from the 2006, 2007, and 2008 Turkish Statistical Institute Household Labor Force Surveys (TURKSTAT). The findings show that while women are less likely to be underemployed than men, city women are statistically more likely to be underemployed. In contrast, men did not differ significantly statistically between rural and urban areas. Both men and women are less likely to be underemployed after marriage. College graduates, regardless of gender, are more likely to be underemployed than illiterates. In addition, Central Anatolia, West Anatolia, and West Marmara have the highest underemployment rates for women in Türkiye. In contrast, the East Black Sea and West Marmara have the highest rates of male migration.

Ünal and Gönülağan (2019) examined the characteristics of underemployed Turkish people. The 2014-2017 TUIK Household Labor Force Surveys were used to determine gender, age, marital status, education level, graduated school, workplace status, region of residence, and year of employment. According to logistic regression analysis, being male, young, single, low-educated, a social science graduate, living in developed regions, and recently starting a job increase the likelihood of underemployment. In recent years, the most underemployed graduate departments in Türkiye are in social sciences, and initiatives that will offer employment prospects for educated workers despite increasing labor supply have been stressed. Dikmen (2021) used socioeconomic variables such as gender, education level, company size, sector structure, marital status, and working style to explain the underemployment status of 19-30-year-olds in Türkiye across time. TURKSTAT 2018 Household microdata were used. According to the findings, women with less education than university

graduates, those working in medium and large enterprises, and those in the informal sector are more likely to be underemployed than men, while married and divorced / widowed women are less likely than singles. Unpaid family workers are more likely to be underemployed than casual workers, and young adults in the education sector are more likely to be underemployed than others.

In addition to its causes, underemployment has many distinct effects. Literature on these specific categories of impact is relatively recent and noteworthy. In this literature review, the individual, social, and economic consequences of underemployment following the global COVID-19 pandemic, which has not only health but also economic and social dimensions, are examined. Following the pandemic, job losses, economic recession, etc., have occurred. Because of these factors, it is predicted that global underemployment will progressively increase, negatively impacting the psychological health of people and the economies of countries. (Kaur, et al., 2020).

In another study, Lee et al. (2021) investigated the effects of unemployment and underemployment on mental health during the COVID-19 pandemic. The survey conducted between April and May 2020 in the United States determined that the underemployed workforce was left to deal with psychological issues such as melancholy and anxiety due to the inability to work full-time and employment insecurity. In addition, this condition was more prevalent among women (55.7%) and young adults (18-29) (57.0%) than among males. Li et al. (2022) examined the effects of underemployment on employee health using the China Labor Force Statistics for 2014-2016 compiled by the Sun Social Science Research Center. According to these findings, the average number of underemployed workers in China increased from 0.035 in 2014 to 0.103 in 2016, indicating that underemployment is increasing in China. It has been stated that underemployment has similar negative consequences to unemployment, even if it protects workers from unemployment. It has been demonstrated that underemployment can have short-term and long-term negative psychological impacts on the individuals. In another study on the effect of underemployment, More and Rosenbloom (2020) examined underemployment and career satisfaction. The survey of 310 Israeli academics found that job satisfaction decreased with employment underemployment. The study considered underemployment to be a violation of the "psychological contract"—an individual's business expectations.

In addition to empirical studies examining underemployment across various age groups, studies

focusing on the young workforce, which is also the focus of this study, are gaining importance. Using a various academic methodologies, the compatibility between the education level of the younger age group and the jobs they hold is examined. Gender and other factors were also discussed. The 2008 crisis affected underemployment in Türkiye between 2007 and 2011, according to Acun and Güneş (2014). This study uses TURKSTAT household data from 2006 to 2011. The survey found that 25-29-year-olds were more likely to be underemployed. Due to the lower labor force participation rate, women are likely to be underemployed. Women are more underemployed in textiles than men. Research shows that underemployment rises with schooling. Being male, young, unmarried, a university graduate, working in a small-scale firm, working informally, and being underemployed during economic crises enhance the likelihood of underemployment.

This research is conducted within the context of Türkiye. Therefore, a framework that considers the impact of the dynamics in Türkiye is reflected. Thus, numerous studies have been conducted at various times on education level, unemployment, and skill-job matching in Türkiye. In one study, Selim et al. (2014) used panel data from the 2007–2010 TURKSTAT Income and Living Conditions Survey to study the socioeconomic factors of unemployment. First, the unemployment problem in Türkiye is structural due to rapid population pressure from migration, negative population structure, technological unemployment due to technological advances, unjust income distribution, unregistered employment, low female employment, inadequate labor force education, and investment costs. This study discovered a counterintuitive association between education and unemployment in Türkiye. Thus, university graduates are more likely to be unemployed than illiterates, and educational status increases unemployment. This contradicts research that education reduces unemployment.

In particular, youth Emeç et al. (2020) investigated the underemployment status of young people aged 15 to 29 in Türkiye. Using TURKSTAT 2014-2017 Household Labor Force survey data, this study emphasized the impact of actual wage level, age, and education status on underemployment. As the individual's real wage increases, the probability of being underemployed decreases; as the individual's age increases, the likelihood of being underemployed increases; and contrary to the assumption that the level of education would harm underemployment, the level of education has a positive effect on underemployment. In another study reflecting

a structure comparable to that of Türkiye in international literature, Rajmohan and Abeysekera (2016) found that the mismatch between labor market expectations and graduate's skills caused unemployment, arguing that unemployed university graduates threaten Sri Lanka's economic growth. More private universities have highlighted the competitiveness between public and private university graduates. One hundred business graduates from three organizations and human resources managers from linked companies were surveyed. Education quality has a weak effect on boosting income in labor markets, and the difference is attributable to human resources manager's education quality criteria. Meyer and Mncayi (2021) analyzed South African 20-34-year-old graduate underemployment. In a quantitative study of 1072 youth, 45% reported being underemployed and 55% not. 63% of underemployed youth wish to shift careers and are financially and morally exhausted from working below their credentials. The survey also indicated that 25-29-year-olds were more likely to be underemployed than 30-34-year-olds. Büyükgöze-Kavas et al. (2021) examined the validity and reliability of the Subjective Underemployment Scale among Turkish employees. The research revealed that this scale, which measures employees' perceptions of their employment level, is significantly related to variables such as job suitability, job satisfaction, and career expectations in the Turkish context. Based on 20 years of Household, Income, and work dynamics from Australia data, Fauser and Mooi-Reci (2023) evaluated underemployment for men and women aged 25–34. Women are more likely than men to face underemployment in the early phases of their careers, which traps them in the cycle and exposes them to unfavorable long-term work experiences. This study demonstrated gender imbalance in early career underemployment. Developing programs to eliminate underemployment and increase women's employment was stressed. Kirazcı and Büyükgöze-Kavas (2024) examined the effects of underemployment on job needs and job satisfaction among Turkish employees. The findings revealed that social support plays a vital role in these relationships and can mitigate the adverse effects of underemployment.

Finally, another research conducted following the qualitative methodology analyzes time-based underemployment in a single province in Türkiye. Tartılcı (2022) conducted a qualitative study on time-based underemployment in Türkiye, focusing on Denizli province. This study used a semi-structured questionnaire to conduct in-depth interviews with 20 participants. The results showed that participants wished to shift jobs

due to "low wages," "mismatch of the field of education and the job they did," and "working for too long"; most were unfamiliar with underemployment. In the study, the participants explained underemployment using negative concepts like "human capital loss," "low productivity," "job dissatisfaction, unhappiness," and "shrinking the economy, decrease in taxes and decrease in value added" in an individual sense. The remedy to underemployment was "improving the education system" and "increasing employment opportunities."

METHODOLOGY

This study used a qualitative research methodology. Interviews using semi-structured form were preferred for data collection. In accordance with the purpose of the study, the sample type was determined to be purposive sampling.

In the study, semi-structured interviews were conducted with 12 young people working in different sectors and various statuses aged 15-29 in Istanbul and detailed information was provided in Table 2.

The majority of participants are graduates of state universities. Participants are also inhabitants of districts on Istanbul's European (6) and Anatolian (6) sides with distinct socioeconomic characteristics. In addition to balancing the number of participants, the heterogeneity of the settlements in Istanbul was tried to be reflected. In terms of gender, there is a balance between women (6) and males (6). To determine whether the gender of the participants affected their status, we ensured that an equal number of men and women were included in the study. The increase in the age of marriage (Coşan, 2023) and the limited employment opportunities for those in this age group support the focus of this study.

Other side, purposive sampling of these species was preferred in the present study. Because it is designed to identify individuals with the potential to provide diverse and rich data, in this research, as a first step, we received approval for this research from the ethics committee of Marmara University (Date and number: 2022-24/11, Ethical approval number: 2022-7/7). Then, to determine the participants, we posted a form on the Marmara University Population and Social Policies Application and Research Center (PSP) website by the scope of the study. Among the participants who completed the form, we identified those with high potential to provide rich data. Two female researchers (PhD©) involved in the study communicated with the candidates and conducted preliminary interviews. As a result of these interviews, we assessed the participant candidates based on their characteristics and potential to provide a various of data to the research team. We then

Table 2: Characteristics of the participants

P. No	Age	Sex	Marital status	The type of university	Graduated department	Graduation year	Working position
1	28	Female	Single	State	Business Administration	2017	R&D Specialist
2	27	Male	Married	State	History	2019	Store manager
3	26	Female	Single	State	Contemporary Turkish Dialects and Literature	2019	Pastry maker
4	22	Male	Single	State	Chemical	2022	Waiter
5	26	Female	Married	Private/Foundation	Industrial Engineering	2019	Grant officer
6	29	Male	Married	Private/Foundation	Psychology	2019	Social worker
7	28	Female	Married	State	Archeology	2017	Teller
8	29	Female	Single	State	Archeology	2019	Employee of linking machine
9	28	Male	Single	State	Journalism	2016	Police officer
10	29	Male	Single	State	Math	2018	Bailiff
11	23	Female	Single	Private/Foundation	Turkish language and literature	2022	Sales Consultant
12	29	Male	Single	State	Department of Business Administration	2015	Sales Consultant

finalized the final list of candidates to be interviewed. Sharing the form again in certain periods, preliminary interviews, determining the final list, and negotiations took about four months. During the preliminary interviews, it was made clear to the candidates why and for what purpose the study was conducted. While qualifying in the process, considered the criteria of being a reluctant employee, especially outside the training field, due to the circumstances. In addition, the year of graduation was another criterion. The criteria used in this study must explain underemployment independently. Therefore, the limited scope of the requirements is one of this study's most critical limitations.

We wanted to determine how long it has been since the candidates graduated and whether they showed any

change, break, or acceptance/unacceptance reflexes over the years regarding their situation. We hypothesized that one of the reasons our participants worked outside of their field of study was because they were unintentionally continuing their education in a department from which they had enrolled. However, after conducting interviews, we realized that this was largely not the case and that mismatching emerged later in the process. The fact that a faculty member in the research team and two female researchers who conducted the interviews were actively working at universities, non-governmental organizations, and research centers with their projects and publications on employment and unemployment highlighted the experience factor in the healthy conduct of the interviews.

DATA COLLECTION AND ANALYSIS

We prepared the questions in the interview form based on the literature and gave their final shape by receiving feedback from experts who have field experience in the employment of young people. Three experts provided their opinions. The questions were structured according to their fields of study: work psychology, sociology, and social policy. We conducted pilot interviews with three individuals to assess the clarity of the prepared questions. These three individuals possess the characteristics of those who met the participant criteria. Then, we proceeded to the primary interviews. In the study, we reached out to 30 people through a form and asked them about the mismatch between their field of education and their jobs.

Using the Zoom , interviews lasted 45 minutes and 1.5 hours and were recorded with the user's permissions. In addition, after each interview, the research team discussed observations and notes to acquire contextual details and exchange ideas to ensure data richness. We interviewed candidates who met this criterion individually. In the 12th interview, we realized that the data was repeating itself, and we ended the interviews by assuming that we had reached data saturation.

There were no repeated interviews with any participants. The data processing procedure was initiated after the transcription of the interview data, marking the beginning of the collaborative journey. The transcribed data were first interpreted by the research team and sent to some participants for verification, which invited them to contribute to the validation process. However, sufficient feedback on the findings is still needed, which highlights the ongoing nature of our collaboration.

The obtained data were analyzed first, and a guide was created according to interpreting the data. To question the meanings derived from the experiences by the nature of the phenomenology design, the transcribed text was divided into various experience groups, and open coding was performed. It was decided to create explanatory themes in propositions about the research question and which themes would be brought together by establishing relationships between the explained themes.

The most frequently mentioned concepts and opinions in the obtained volume data were coded and categorized in the subsequent data processing step. A single researcher performed this procedure to ensure analysis integrity. The researcher who conducted the coding provided a detailed explanation. The codes were

then evaluated and checked according to the guidelines created by the research team. In addition, no software-based application was used in the coding process. In addition, no software-based application was used for the coding process.

The analytical techniques used to analyze the obtained data can be differentiated according to the problem, structure, and purpose of the study. Thematic analysis was preferred in this research. This made it possible to reveal a more in-depth cause-effect relationship and contributed significantly to shaping the analysis process. (Çelik et al., 2020).

RESULTS

The open coding and themes, derived from the significant findings of our study, are presented below, along with the conclusions.

The first of these themes examines the intricate dynamics of education and job mismatch, a crucial aspect in the field of education and employment studies. The study sheds light on the personal motivations and challenges faced by individuals in their preferred university departments. The participants' candid sharing of their experiences in department preferences and the career path-building process is insightful and relatable.

The effects of the first employment experience on out-of-field employment during the transition to work life after education and the burdens brought by the psychology of unemployment are revealed. The next theme is that the tensions created by the long-term breaks after graduation emerge as long-term unemployment and financial concerns. The next theme focuses on the effects of out-of-field employment experience on job satisfaction, motivation, and social connections. The effects of education and job mismatch on psychological and physical health are determined as separate theme. The impact of being employed out of the field on family and social relations is also explored in terms of an individual theme. Experience, wage expectations, and future perspectives are presented as the dynamics of out-of-field work. In addition, an aims of this study was to examine the effect of the participants' gender on their employment status. Although the number of participants was equal, no gender-related findings were observed in the interviews. Therefore, underemployment experiences are almost similar for everyone.

Dynamics of Education and Job Mismatch: Major Choices, Experiences, and Career Paths

In Türkiye, university preferences are determined by the results of a centralized examination system. Even though the exam name has changed over the years, its structure has remained consistent and unchanged. This examination is given to all students who wish to pursue university education. Students choose based on their results and examination rank. In addition to state universities, foundation universities also make accepts based on the outcomes of these examinations, and the exam rankings play a significant role in the provision of scholarships at foundation universities.

Typically, students take the exam with a specific university and department in mind. If their exam scores are insufficient for their target department, they will either retake the exam or seek alternative departments that accept the exam score. Some students who voluntarily or involuntarily read the department realize, over time that it does not meet their desires and expectations. This motivation motivated some students to quit their department and retake the university examination. However, if a university-placed student retakes the exam, a portion of the placement score is reduced. This situation diminishes the likelihood of enrolling in college compared to those who have not previously taken the exam. Due to many reasons, such as the difficulty of re-preparing for the exam, exam anxiety, the fact that a part of the score will be cut, and family and environmental factors, many students finish the department they have chosen and then look for a job in different fields, even though they realize that the department is not suitable for them once they are placed.

Initially, we believed that one of the reasons our participants were working outside their field of study was because they were unintentionally continuing their education in a department from which they had enrolled. Therefore, they would naturally pursue distinct careers upon completing their university education. However, the interviews revealed that eight participants voluntarily studied the department. Although their reasons for choosing and reading in their departments varied, the participants that they preferred to study in their departments. The influence of personal interest and role models are the primary motivations for choosing their disciplines.

"When I was choosing university, that is, when I was choosing my department, I did so with some encouragement from a high school teacher. After

recognizing my high school history instructor as a role model, I decided at that time..." (P1)

"I studied my department with great interest. I thought it was a great fit for my character, which I recognized while reading it. It was a perfect fit for my character. This has always been the foundation of my existence. Even when traveling in a single direction, I find it extremely annoying to take an extended route. Industrial engineering is founded in part on this concept. To conduct all operations as efficiently as feasible. Here, you are mathematically calculating what I did and the decisions I made personally..." (P5)

People who stated that they did not study the department voluntarily did so because they did not receive enough points for the department they targeted and were forced to remain in their home city due to financial difficulties.

"I chose a department in Istanbul. Since I reside in Istanbul, I had to make a decision based on my city of residence. Financially, I would have to leave town. As I will be living with my family, I selected the city where I currently reside as my first option..." (P8)

"I chose my department reluctantly. I chose my college with the expectation that I would not win in the first year. It was going to be a department from IIBF¹, but I was unable to find a department that suited my abilities and desires..." (P12)

The process of obtaining a job in one's field after graduating from college is influenced by many factors, including individual and social capital growth and development. In other words, successful academic and social participation during college years will facilitate the job search process. Consequently, a second assumption for the participants working in a field unrelated to their education was that they may have yet to actively participate in such a development process despite having studied in their favored departments. This assumption was based on the notion that individuals who have yet to develop their skills and competencies in a highly competitive job market may have trouble obtaining employment in their preferred field. However, only two participants indicated they could not participate because they had to work while attending university. One participant stated that he was more interested in recreational activities than departmental activities despite studying in the chemistry department.

¹ IIBF: Faculty of Economics and Administrative Sciences

Conversely, the remaining nearly all participants indicated that they actively participated in various departmental activities. Numerous participants organized or participated in these activities, which included internships, volunteer work, university club activities, archaeological excavations, and field excursions. These experiences contributed to their personal growth and facilitated their integration into the social milieu of their chosen field.

"...I utilized my college years productively. I participated in numerous activities and symposias both inside and outside the classroom. In particular, we organized international symposiums at our university. In addition, I was involved in the creation and organization of various symposiums. I was both the university's history department representative and the faculty representative. Afterwards, we also established a history department-specific community with a few of our peers. Additionally, we functioned as a community at our university. In addition, I was the chairman of this society of history for four years..." (P2)

"...when we entered the third grade, we became more active as a result of forming a group with our peers. Here we are, conducting research on sports culture. This approach eventually gained some attention. L... They invited us to appear on the air. We communicated in this manner. They requested that we create a radio program for their station. [They said]. Then we went to a similar programme..." (P9)

Processes in Which Long-Term Unemployment and Financial Concerns Lead to Off-Field Employment After Graduation

When beginning out-of-field work, it is essential to consider the effects of job search time. The individual who has been looking for a job for the shortest period has been looking for a job for approximately two months, while the individual who has been looking for a job for the most significant period has stated that he has been looking for a job for approximately two and a half years. The average duration of the participant's employment search is was approximately nine months. Regarding job search duration, the participants' experiences highlight the prevalence of long-term unemployment or unsuccessful attempts to obtain employment based on education level.

Individual financial concerns and expectations, which encompass personal expectations and themselves and external influences, are also influential in this process. After graduation, the anxiety of obtaining sufficient income to cover living expenses increases, revealing the need to enter the workforce to support themselves and their families and to provide financial stability, regardless of the field. This situation, as there are no jobs in their field, also forces people to accept jobs outside of their desired field, and the low wages of the available jobs make their qualifications incompatible with their positions.

"I took the position solely for financial reasons. Because, after a certain age, I stated that I worked in higher education, etc. Since my university days, I have been attempting to sustain myself without any financial assistance. Upon graduation, I intend to continue my current life..." (P7)

"...I looked for a job in my profession for 2.5 years without success. The employment I found did not adequately pay, and in some cases, it paid ridiculously low wages..." (P11)

The Effects of First Work Experience, Out-of-Field Employment, and Unemployment Psychology on the Transition from Education to Work

Negative experiences in the transition from education to employment stand out as a possible explanation for participants' employment outside their education and below their qualifications, given that they received education in their preferred field and participated in the academics. This assumption highlights the significance of individuals' initial employment experiences. The prevalent belief is that practical knowledge and skills are acquired through on-the-job training, regardless of the caliber of university education; in other words, the job is learned on the job. Therefore, the first work experience provides the opportunity to work in the selected field and gain real experience of their academic background. This experience enhances the continuance of the learning process and field-specific expertise. It also assists individuals in comprehending the inner workings of the industry. Therefore, the first work experience after graduation is crucial for individuals who advance in their field.

"...I worked in a shop. Also, there were book festivals. It was seasonal, occurring primarily once a year, and I spent 10–15 days. In addition, I worked for a theater company. There, I was a member of a light-related technical staff. There, I had a working procedure..." (P7)

"I worked in a cafe as a server. Honestly, I even worked at a doner centre. I have always labored outside my education." (P11)

The examination of the participants' responses revealed various reasons why people choose to work in a field outside their own fields. One of such aspect is the psychological aspect of unemployment. The longer an individual is unemployed, the less likely they are to find a job and the greater their level of anxiety. As a result, individuals gravitate toward different areas with two distinct perspectives. The first is a temporary orientation to non-field and frequently low-skilled employment until a job in their field is found. Job hunting is an expensive endeavor; the longer it takes, the greater the expense. Individuals with no income temporarily accepts positions outside their field to continue their job search in their desired field over time. However, in this process, individuals continue to work in the position they have entered because there are no available positions or time to look for work.

"There was only one chemistry-related company near me." I submitted an application upon graduation. I thought working temporarily until I heard from them. But there was also no news..." (P4)

Accepting that he cannot find a job in his field and beginning to search permanently for employment in a different field is another situation. The unemployment rate is high, and the labor market is highly competitive. Each year, new graduates begin their job search in the market. While recent graduates are preferred for low-paying positions, those with experience are sought for positions with comparatively better working conditions. Individuals working outside their field of study only partially enter both classes, so they begin their job search at a disadvantage. The psychology of unemployment, environmental pressure, and market conditions causes this disadvantageous position.

"At that time, you may hear from my colleagues, acquaintances, or cousins, but not from family, 'Did you study for nothing, why are you unemployed?' Certainly, such pressures do exist..." (P1)

"...the impulse to miss something due to my age, the need for something, that is, I will have difficulty in employment related to my field; After researching KPSS² and similar processes, I observed that this was not a very hopeful situation for me, and I

actually felt compelled to work in a field unrelated to my department. My family and the environment had an undeniable impact on me. Constant pressure, constant inquiry, and a constant desire to know whether something has been accomplished compel people to conform to what they hear from their surroundings rather than their own actions. Since I am 23 to 24 years old; They were saying "you've studied so much for this," "you've read for nothing," "you've studied a blank department," "how old are you, you're going to get married, and you still don't have a job,"..You know, I turned to a different business, a sector, to say, 'I can also achieve something.'" (P2)

Effects of Education and Job Mismatch on Job Satisfaction, Motivation, and Social Connections

In addition, participants emphasized the mismatch between their education, credentials, and the requirements of their current position. Regarding the relationship between education and employment, most participants who reported possessing more knowledge and skills than their current status stated that the education they received was unrelated to their current position and made no significant contribution to their work

"My work has nothing to do with the orientation of my education. Because I perform with my physique here. In other words, the faster I move my arm... My only benefit from my duties here is my physical health. Aside from that, even the smallest detail of my previous training is irrelevant here. Let's not say it's unimportant, but if it's not happening here, it's of no use." (P8)

Other participants stated that their education or, more generally, undergraduate education indirectly impacted their employment and the tasks they performed. In this context, the relationship between education and work is not directly related to the nature of the work but rather to the individual's influence on the individual's attitudes and behaviors while conducting his duties.

"To make a correlation, I am a graduate of the Journalism Faculty, specifically the Communication Faculty. As a police officer in the field, my education at the Faculty of Communication offers me an advantage. Because I can communicate effectively, I believe I can better analyzing the opposing side. In this sense, it is related. A second connection is that journalism is a public service to me, which is also how I view policing." (P9)

² KPSS: Public Personnel Selection Exam

The participants' comments illuminate on numerous aspects of their current jobs. Participants predominantly expressed discontent regarding the workload. However, a few participants, linked their problems with their superiors to their educational heritage.

"...I dislike the atmosphere at work as well. For instance, I don't like it when they demean people, say things to a few working [university graduates] peers like me such as "you read it for nothing," "why don't you do your own job," and "you can't be anything," and it drives me away. (P3)

"...My manager has never attended college, etc., which humiliates my education and humiliates me. They always speak as if they were on top..." (P11)

The participants also mentioned their positive workplace experiences, even if they initially did not enter the job and workplace willingly. Positive experiences are primarily described in relationships with coworkers rather than financial matters. These friendships with other employees in the workplace help the individual become accustomed to and adapt to the unfamiliar job and workplace, make it easier to bear with the situation and contribute to the individual's motivation to continue working. The emphasis on workplace relationships and friendships demonstrates that social connections and a supportive work environment can serve as coping mechanisms for underemployed individuals. Therefore, solid social links can provide a sense of belonging and motivation to continue working while mitigating some of the negative aspects of an unsuitable job.

"I adore my coworkers very much. We converse, even among ourselves, we converse. Our companionship is the primary factor that keeps us in this institution. There are instances such as writing reports in the afternoon. These instances are what kept us to work..." (K6)

Effects of Education and Job Mismatch on Psychological and Physical Health

Nearly all participants acknowledged and described the psychological effects of working outside their field of education, a remarkable finding. Although the participants do not actively consider this issue and did not always experience associated emotions, they reported that when they thought about their situation, they frequently concluded that their efforts were futile and that they were on a different path than anticipated. Although they occasionally attribute this situation to the system, it causes them to doubt themselves and

feel regret. In addition, some participants reported experiencing hair loss, sleep disturbances, headaches, muscle/joint discomfort, and skin issues due to these conditions. In addition, one participant described experiencing protracted depressive episodes.

...while I was studying, I tried to do my best and absorb as much as possible, but why was I unable to achieve anything? Maybe I'm a store manager in the industry I'm in, or maybe I'll be a regional manager, but I always ask myself, "Why can't I do anything about my own field? ", "Am I unsuccessful? ", "What am I missing? ", and "Do I have a defect?" I'm forming mental symbols. It has a detrimental psychological impact on me..." (P2)

"...I endured such periods of psychological depression for an extended period of time. These periods lasted between two and three months. I was utterly depressed and in a constant state of anxiety for two to three months. It has a profound psychological effect. That is, because I could not handle it. There were so many things I shouldn't have done that I was saying shouldn't have happened. This shouldn't be the case, as there are alternative versions; why are these versions implemented in this manner? It was a lot of trouble for me, I couldn't lift it..." (P5)

In addition, it has been observed that being employed outside of the education field impacts the motivation and performance of some participants, resulting in a lack of job satisfaction or a decline over time.

"It has no negative effect on my work performance, but it does impact my motivation. Because I have an education and I cannot do anything about that education. Since I could not find employment related to my education, I began to a negative attitude toward it. (P3)

"It has a negative effect on our motivation in a 100% cases. If I worked here as a psychologist, I might come to work with flowers in bloom, but now I arrive with a sigh and have trouble waking up (...) I endeavor to do whatever is asked of us, but I am not motivated. In no manner, especially over the past two to three years, I am undergoing a process with which I am unsatisfied." (P6)

Effects of Out-of-Field Employment on Families and Social Relations: Expectations, Pressures, and Response by Individuals

Some participants stated that their employment circumstance affected their familial and social relationships. Advice and encouragement to find a job as soon as feasible before beginning work can gradually become condemnation when people work in unrelated positions. Participants occasionally asked themselves, "Did you study that for nothing?" Interestingly, this discourse does not always correspond to occupation and salary. Even workers outside their field of study earn a higher wage, they are still expected to advance in their field of study. Therefore, young people confront expectations and pressure generated by their current situation in the jobs they choose to avoid or ease family and environmental pressure.

"...My family asks, "Since you have an education, why don't you do your own job?" They actually do not appear to comprehend a little..." (P3)

"...my family opposed my entry into the textile industry." They stated, "You are a college graduate, a door may open; try your luck in various fields." Although they do not wish to, they continue to pose queries such as "why you are there?" However, as stated, I submitted applications and conducted interviews. But as I said, I was the one who made the applications and interviews. After negative results or irreversible places, after a time, I gave myself to this field. Otherwise, everyone reactions to me, such as "why are you there? You shouldn't be there," However I was only who went through the unemployment process alone. (P8)

Off-Field Employment Dynamics: Work Experiences, Salary Expectations, and Future Perspectives

Age and time since graduation are variables that influence the participants' preferences and decisions regarding their employment status. Participants who graduated less than a year ago continue to seek employment in their field, but those who graduated more than a year ago appear more inclined to remain in the current industry. This reflects the reality that people progressively lower their expectations and goals because of their experiences and the labor market's challenges.

"...it is better to do the profession when the information is much fresher in journalism (...) But if I were to be in that situation today [if I had quit

my job], I would not continued in my field, in that respect..." (P9)

"...I graduated in 2017, how many years have passed, regrettably, information decays if it is not utilized, if it is not processed. I feel incredibly insufficient regarding the department I just study..." (P7)

The wage level is a contributing factor to this circumstance. Only respondents indicated that they would earn a higher salary if they worked in their field of education. Other respondents noted that their wages would remain unchanged or decrease. This suggests a structural issue. As education is a form of human capital, it is anticipated that barring exceptions, wages and fringe benefits will increase alongside education levels.

On the other hand, participants who have yet to have the opportunity to obtain employment in their fields know the general wage level by observing the people around them or following developments in the field based on their prior experiences. In addition, low wages discourage switching employment. Thus, inconsistent wages contribute to underemployment.

"Full-time retail employees are paid roughly the same as those who have been in their field for three to four years, and the majority of them say, "I read it for nothing." I don't think I will not gain much by working in my field." (P12)

However, despite being employed outside their field of study, nearly all participants reported that their jobs enhanced their abilities and allowed them to acquire new skills. These skills are not explicitly related to their field of study but encompass a variety of knowledge and skills. Participants tried to learn the position, mapped out a career path to advance in the current order, and attended periodic trainings provided by their institutions. These investments influence participants' decisions regarding in skill development and the potential costs of leaving their current position.

"...Not only as a service, but after experiencing the process from retail mathematics, computers, sales programs, starting from the starting point of the products to the sale in the store, maybe you can learn something at a level to establish your own business when you have the opportunity in the future." (P2)

Participants expressed various emotions and attitudes regarding their future outlooks, including anxiety,

uncertainty, optimism, and hopelessness. These diverse responses demonstrate the complexity and interconnectedness of their future perspectives, which are influenced by their employment-related experiences, expectations, and challenges

DISCUSSION

Lent et al. (1994) developed the Social Cognitive Career Theory (SCCT) to explain the factors that shape individuals' career and academic interests, preferences, and performance. This theory describes how individuals interact with environmental and individual factors by addressing the effects of self-efficacy, outcome expectations, and personal goals on career development. In our study, personal interests and role models were identified as the primary source of motivation and were consistent with the social cognitive career theory. On the other hand, Brunello and Checchi (2007) revealed that academic or vocational guidance (tracking) at an early age can increase social inequalities because low-income or disadvantaged groups are often directed to less advantageous tracking paths. Van de Werfhorst and Mijs (2010) revealed that the centralized examination system, early guidance, and school differences can increase individual achievement inequalities. What emerges when educational preferences, influencing factors, and career paths are constructed is the relationship between educational systems and social inequality. The environmental effect is seen intensely in the findings of our study, and the guidance effect has a structure that further increases inequalities.

On the other hand, long-term unemployment and financial concerns have caused individuals to turn to out-of-field employment. Wiczer (2013) states that individuals who have been unemployed for a long time have a reduced probability of rejoining the labor market. This situation often stems from a mismatch between skills and job requirements. However, those who find it are likely also reflexed to escape the psychology of long-term unemployment and the pressures brought by financial concerns. Therefore, matching of the job with the field of education can be put on the back burner due to these concerns. In this context, Aronson et al. (2015) reveal that the uncertainties experienced by individuals in the process of finding a job due to the economic crisis have increased the tendency to turn to low-income and out-of-field employment, and this situation has profound effects on individuals' sense of identity and career development. More (2024) reveals that graduates who experience a mismatch between education and field of work remain unemployed for more extended periods

than those who are compatible. Indeed, in our study, it was observed that awareness that the time it takes to find a job is long and that meeting the costs of living is the primary motivation. In this sense, the findings and the literature are similar.

The first job experience can help individuals gain a permanent identity over time due to financial concerns under competitive conditions. In this context, Botezat et al. (2024) show that individuals who experience mismatching between high school and university education fields are more likely to experience skill mismatch in their first job after graduation, and this effect decreases after five years. Still, the mismatching in the first job is effective in the long term. Albert et al. (2023) stated that vertical mismatch (education level is higher than job requirements) is less permanent than horizontal mismatch (education field not being compatible with the job field) because some graduates who experience horizontal mismatch prefer to stay in their first job. The study states that this situation reflects the high youth unemployment characteristic of the Spanish labor market. From this perspective, one of the labor market characteristics in Türkiye is high youth unemployment, and young people may prefer to stay in their first job due to intense competition concerns. The effect of flexible working arrangements on labor markets can even be considered. In this sense, the relative increase in part-time jobs in Türkiye has caused a tendency towards jobs outside the field and an obligatory effect. This supports the consistency of our findings.

Jackson and Li (2022) revealed that many graduates turn to out-of-field or low-qualified positions during the job search process, which negatively affects career satisfaction and income potential in the long term. Banerjee and Sequeira (2023) similarly state that when job opportunities do not arise immediately, job seekers become more impatient, reduce their reservation fees, and turn to lower-paid jobs closer to home. In this respect, the perception of a lack or inadequacy of job opportunities indicates a tendency for individuals to psychologically lower their expectations and take the first job they find. The findings we obtained in our study reflect this situation.

Mismatches between the field/department of education and the job for individuals need to be clarified. Robst (2007) examined the matching of individuals' university departments with their jobs and evaluated the effects of this matching on income, job satisfaction, and career success. He demonstrated that individuals with high education and job matching generally experience

higher income and job satisfaction. Still, in the event of mismatching, there may be losses in skill use and wages. Similarly, Somers et al. (2019) demonstrated that the mismatching between the field of education and the job in which individuals work negatively affects their earnings and job satisfaction. Still, the effects vary according to the sector, country, and labor market characteristics. Sloane (2020) emphasizes that these incompatibilities are associated with low wages, low job satisfaction, and limited career advancement, but the effects may vary between sectors and individual characteristics. Therefore, the impact of job and education matching on motivation and performance can be seen. However, when it is considered that the results in question are directly related to the countries' labor market, sector, and individual characteristics, structural problems in Türkiye's labor market are a determining factor. Our study noticed how the perception of higher qualifications substantially affects motivation performance and job satisfaction through behaviors.

The problem set for individuals can be even more profound. The effects on psychological and physical health are pronounced. Bracke et al. (2014) showed that situations where education level and job position are incompatible increase mental health problems such as depression and anxiety, and this effect is significantly more pronounced in highly educated individuals. Dunlavy et al. (2016) stated that individuals who experience mismatching between education level and job requirements have worse general health status, and especially highly educated individuals working in low-status jobs are more affected by this situation. Xu and Chen (2024) show that education level being higher or lower than job requirements is associated with an increase in mental health problems such as depression and anxiety. These findings emphasize that work and education compatibility is a critical factor for individuals' psychological well-being, and our findings are consistent with these findings.

For individuals, being employed outside the field also affects family and social relationships. In this context, related studies that include indirect findings, although not direct, are essential. Taş and Özmen (2019) focus on the effects of the material and moral support provided by the family on individuals' positive future expectations and career adaptability. Bacanlı et al. (2018) reveal that parents' career expectations have a decisive effect on adolescents' career preferences and adaptation. Sarsıkoğlu and Bacanlı (2019) found that perceived career barriers negatively affect students'

career adaptability and that this effect varies depending on variables such as gender, social environment, and individual factors. Therefore, when the literature is examined, the family's primary position as a material and moral support provider for career adaptation is high due to their expectations. It can be said that working outside the field where the individual is educated is related to the costs brought by these expectations in this respect. However, the role of the environment that prevents career adaptation stems from the pressure element. The individual takes action regarding their position against the environment. When this disrupts career adaptation, it is considered an inhibitory factor. In Türkiye, the effect of family expectations and the social environment on a career can be considered to have a significant impact within this framework. We can say that this has an intense effect on the findings of our study

Employment experiences outside the field, salary expectations and awareness, and future projections are essential indicators for determining individuals' positions. Kim and Choi (2018) revealed that job mismatch leads to lower wages, reduced job satisfaction, and poor performance and that individuals whose qualifications exceed the requirements of the job are particularly negatively affected by this situation. Similarly, Rios-Avila and Saavedra-Caballero (2019) emphasize that education-job mismatch reduces individuals' income potential and job satisfaction and that the dynamics of the labor market and individual choices are among the main reasons for this mismatch. Serikbayeva and Abdulla (2022) take a broader perspective and state that individuals experiencing mismatch generally earn lower incomes and that this situation negatively affects both individual well-being and economic efficiency at the national level. Aytun and Meçik (2023) revealed that graduates experiencing mismatch face more serious income losses, especially in low-wage segments. More advanced, Abdulla (2024) shows that this mismatch reduces total labor productivity and negatively affects economic growth.

On the other hand, it is undeniable that there are also positive new skills and experiences. However, the intense emphasis here is that the participants' expectations about wages and the future align with the realities of the labor market, and the expectations are low. However, it should be stated that in Türkiye, which is undergoing a demographic transformation and facing the reality of an aging population, inadequate employment due to insufficient education and job mismatch is problematic for the future, and there is a need for awareness about

the nature of the work offered to individuals and the experiences of individuals.

CONCLUSION

This study address the causes of underemployment among employed young people. We applied the interview form questions that we determined based on the literature with the help of a semi-structured interview technique. Underemployment turns into a form that starts in the early career periods of young people and then takes the form of a negative vicious circle.

Young population potential is essential to the economic development of countries. Keeping the labor supply and demand in balance is appropriate to ensure economic sustainability. In a nation where quality education is available, it will be possible to increase and expand the skill level of the young population. Also, the efficiency level in labor productivity will grow in a country with a qualified workforce structure. Thanks to these situations, it will be possible to reach the sustainable development goals easily.

In this study, strategic due diligence is made for countries to reveal and minimize the causes of underemployment. The most significant limitation of this study is that only Türkiye, one of the emerging economies, is considered. The study was conducted only in Istanbul, one of the emerging economies in Türkiye. There are some reasons why we only focused on Istanbul in the study. In this sense, it was thought to be more reasonable to take a picture of Istanbul and make predictions because it is a city where the service economy is most intense, where the young university graduate population is relatively high, where the highest number of higher education institutions are located, where job opportunities are relatively high, where finding a job is relatively faster but where there is a lack of qualifications, and because it allows the phenomenon of underemployment to be experienced more intensely.

In Türkiye, macrodata can be considered an indicator of education and job mismatch, namely time-dependent underemployment data. According to the latest data of TÜİK, this time-dependent underemployment and the integrated unemployment rate is 18.2%. When the characteristics of the labor market in Türkiye and especially the youth unemployment data are taken into consideration, this corresponds to a very high rate. This situation

shows that many individuals who want to work full-time in Türkiye cannot work the hours they want due to economic conditions. Of course, the problem discussed here is more about the mismatch between the education system and the labor market than the benefit of the results brought by flexible working arrangements. In developing countries, these rates are high due to economic fluctuations and problems in the labor structure. The prevalence of informal employment, in particular, also paves the way for the emergence of underemployment. The inadequacy of work areas and work environments in developing countries exhibits a similar character to Türkiye (Van der Berg and Van Broekhuizen, 2012). Mismatches between education systems and labor markets also cause a loss of economic efficiency.

Türkiye can implement successful policy examples in different countries that can provide solutions to underemployment. It is stated that in Germany's dual-structure vocational education system, integrating practical training in the workplace and theoretical knowledge provided at school enables young people to successfully transition to the labor market (Euler, 2013). In the skills development system implemented in Singapore, the technical and vocational education system's success in responding to the labor market's needs is attributed to the synergy provided by the government's strategic guidance and the active participation of the private sector. Yoon (2017) evaluates the transformation of innovation-based policies and the country's technology-based growth in the context of employment policies. Türkiye can create strategic targets for the needs of the labor market by adapting these policies within the framework of its internal dynamics, and considering that its technology infrastructure is also expanding, technology-based employment can be an essential political goal in reducing underemployment.

The results and proposed strategies make it simpler for other emerging economies to address this issue effectively. On the other hand, the problem of underemployment is also an essential problem for other countries. This problem may be experienced if necessary measures are not taken in the labor markets of developed economies, which have taken on a different structure with the changes in the demographic structure and immigration policies. For this reason, it will be helpful to conduct comparative studies with other emerging and developed economies at the national and regional levels in future studies.

REFERENCES

- Aberg, R. (2003). Unemployment Persistence, Over-Education and the Employment Chances of the Less Educated. *European Sociological Review*, 19(2), p. 199-216. <https://doi.org/10.1093/esr/19.2.199>
- Acun, S., & Güneş, B. (2014). Türkiye'de 2008 Krizinin Eksik İstihdama Etkileri. *Ekonomik Yaklaşım*, 25(90), s. 49-69.
- Albert, C., Davia, M. A., & Legazpe, N. (2023). Educational mismatch in recent university graduates. The role of labour mobility. *Journal of Youth Studies*, 26(1), 113-135.
- Appelbaum, E., & Schettkat, R. (1995). Employment and productivity in industrialized economies. *International Labour Review*, 134, 4-5. 605.
- Aronson, P., Callahan, T., & Davis, T. (2015). The transition from college to work during the great recession: Employment, financial, and identity challenges. *Journal of Youth Studies*, 18(9), 1097-1118.
- Aytun, U., & Meçik, O. (2023). Wage Returns to Field of Study-Occupation Mismatch in Turkish Graduate Labor Market: Quantile Regression Approach. *Ege Academic Review*, 23(4), 653-666.
- Bacanlı, F., Akyol, E. Y., Kaynak, S., & Özhan, M. B. (2018). Ergen-ebeveyn kariyer uyumu ölçeği'ni Türkçeye uyarlama çalışması. *Ege Eğitim Dergisi*, 19(2), 389-407.
- Botezat, A., Incaltarau, C., Diac, S. A., & Grosu, A. C. (2024). Having your career path decided too early: the effects of high school track on education-occupation mismatch. *International Journal of Manpower*, 45(6), 1171-1190.
- Bracke, P., Van De Straat, V., & Missinne, S. (2014). Education, mental health, and education-labor market misfit. *Journal of Health and Social Behavior*, 55(4), 442-459.
- Brunello, G., & Checchi, D. (2007). Does school tracking affect equality of opportunity? New international evidence. *Economic policy*, 22(52), 782-861.
- Büyükgöze-Kavas, A., Allan, B. A., Turan, M., & Kirazci, F. (2021). Context and validation of the subjective underemployment scale among Turkish employees. *Journal of Career Assessment*, 29(2), 283-302.
- Çelik, H., Baykal, N. B., & Memur, H. N. K. (2020). Nitel veri analizi ve temel ilkeleri. *Eğitimde Nitel Araştırmalar Dergisi*, 8(1), s. 379-406. <https://doi.org/10.14689/issn.2148-2624.1.8c.1s.16m>
- Churchill, B., & Khan, C. (2021). Youth underemployment: A review of research on young people and the problems of less (er) employment in an era of mass education. *Sociology Compass*, 15(10), e12921. <https://doi.org/10.1111/soc4.12921>
- Coşan, B. (2023). *Dünyada ve Türkiye'de Evlilik Yaşını Artışı: Nedenler Muhtemel Sonuçlar ve Politika Önerileri*. Ankara: Nobel Bilimsel Eserler.
- Dikmen, F. H. (2021). Türkiye'de Genç Yetişkinlerde Zamana Dayalı Eksik İstihdamın Özellikleri. *Hacettepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 39(2), s. 211-222. <https://doi.org/10.17065/huniibf.744308>
- Dooley, D., Prause, J., & Ham-Rowbottom, K. A. (2000). Underemployment and depression: longitudinal relationships. *Journal of health and social behavior*, p. 421-436. <https://doi.org/10.2307/2676295>
- Dunlavy, A. C., Garcy, A. M., & Rostila, M. (2016). Educational mismatch and health status among foreign-born workers in Sweden. *Social Science & Medicine*, 154, 36-44.
- Emeç, H., Üçdoğruk Birecikli, Ş., & Kümbül Güler, B. (2020). Türkiye'de Gençlerle Eksik İstihdamın Analizi. *Yönetim ve Çalışma Dergisi*, 4(2), s. 137-152.
- Euler, D. (2013). Germany's dual vocational training system: a model for other countries? Gütersloh: Bertelsmann. https://www.bertelsmannstiftung.de/fileadmin/files/BSt/Publikationen/GrauePublikationen/GP_Germanys_dual_vocational_training_system.pdf
- Fausser, S., & Moo-Reci, I. (2023). Visualizing Underemployment Dynamics in Australia: Combining Sankey and Sequence Analysis Plots. *Socius*, 9, p. 1-3. <https://doi.org/10.1177/2378023123116064>
- Green, F., & Henseke, G. (2021). Europe's Evolving Graduate Labour Markets: Supply, Demand, Underemployment and Pay. *Journal for Labour Market Research*, 55(2), p. 1-13. <https://doi.org/10.1186/s12651-021-00288-y>

- ILO (1998). *The Sixteenth International Conference of Labour Statisticians*, Retrieved June 25 https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_087487.pdf
- Jackson, D., & Li, I. (2022). Transition to work, mismatch and underemployment among graduates: an Australian longitudinal study. *International Journal of Manpower*, 43(7), 1516-1539
- Kaur, M., Goyal, P., & Goyal, M. (2020). Individual, Interpersonal and Economic Challenges of Underemployment in the wake of COVID-19. *Work*, 67(1), p. 21-28. <https://doi.org/10.3233/WOR-203249>
- Kim, S. J., & Choi, S. O. (2018). The effects of job mismatch on pay, job satisfaction, and performance. *Journal of Open Innovation: Technology, Market, and Complexity*, 4(4), 49.
- Kirazci, F., & Buyukgoze-Kavas, A. (2024). Underemployment, Work Needs, and Job Satisfaction: Does Social Support Matter?. *Behavioral Sciences*, 14(4), 335.
- Klein, M. (2015). The Increasing Unemployment Gap Between The Low And High Educated in West Germany. Structural or Cyclical Crowding-out? *Social Science Research*, 50, p. 110-125. <https://doi.org/10.1016/j.ssresearch.2014.11.010>Get rights and content
- Lee, J., Kapteyn, A., Clomax, A., & Jin, H. (2021). Estimating Influences of Unemployment and Underemployment on Mental Health During the COVID-19 Pandemic: Who Suffers the most? *Public Health*, 201, p. 48-54. <https://doi.org/10.1016/j.puhe.2021.09.038>
- Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of vocational behavior*, 45(1), 79-122.
- Li, N., Liang, H., Gao, Y., & Wu, D. (2022). Short- and Long-Term Effects of Underemployment on Workers' Health: Empirical Analysis from the China Labor Force Dynamics Survey. *International Journal of Environmental Research and Public Health*, 19(24), p. 2-14. <https://doi.org/10.3390/ijerph192416695>
- Low, L. (2011). Singapore's skills development system: Synergies between state and market. In M. R. Godfrey & M. J. Slater (Eds.), *The Technical and Vocational Education and Training System in Singapore: Key Success Factors* (pp. 15-28). World Bank.
- McGowan, M. A., & Andrews, D. (2015). Labour Market Mismatch and Labour Productivity: Evidence From PIAAC Data. *OECD Economics Department Working Papers*(1209), p. 1-51. <https://doi.org/10.1787/18151973>
- Montcho, G., & Carrière, Y., & Mérette, M. (2022). A Dynamic Labor Utilization Framework for Measuring Under-Employment. *Available at SSRN* 3953837. <https://dx.doi.org/10.2139/ssrn.3953837>
- More, S., & Rosenbloom, T. (2021). Job-Field Underemployment and Career Satisfaction: A Relationship of Cause and Effect. *International Journal of Business and Management*, 15(10), p. 1-82. <https://doi.org/10.5539/ijbm.v15n10p82>
- Nunez, I., & Livanos, I. (2010). Higher Education and Unemployment in Europe: An Analysis of the Academic Subject and National Effects. *Higher Education*, 59, p. 475-487. <https://doi.org/10.1007/s10734-009-9260-7>
- Rios-Avila, F., & Saavedra-Caballero, F. (2019). It pays to study for the right job: Exploring the causes and consequences of education-occupation job mismatch. *Levy Economics Institute, Working Papers Series*, (922).
- Robst, J. (2007). Education and job match: The relatedness of college major and work. *Economics of Education review*, 26(4), 397-407.
- Schreurs, B. H., Hamstra, M., Jawadar, I., & Akkermans, J. (2020). Perceived Overqualification and Counterproductive Work Behavior: Testing The Mediating Role of Relative Deprivation and The Moderating Role of Ambition. *Personnel Review*, 50(3), p. 1038-1055. <https://doi.org/10.1108/PR-05-2019-0237>
- Selim, S., Kirel, H., Çelik, O., & Yazıcıoğlu, H. (2014). Türkiye'de İşsizliğin Sosyo-ekonomik Belirleyicileri: Panel Veri Analizi. *Uluslararası Yönetim İktisat ve İşletme Dergisi*, 10(22), s. 1-25. <https://doi.org/10.11122/ijmeh.2013.9.19.459>
- Serikbayeva, B., & Abdulla, K. (2022). Education-job mismatch: Implications for individual earnings and aggregate output. *Social Indicators Research*, 163(2), 723-752.
- Sloane, P. J. M. (2020). Overeducation, skill mismatches, and labor market outcomes for college graduates. IZA World of Labor.

- Somers, M. A., Cabus, S. J., Groot, W., & van den Brink, H. M. (2019). Horizontal mismatch between employment and field of education: Evidence from a systematic literature review. *Journal of Economic Surveys*, 33(2), 567-603.
- Tartılcı, H. İ. (2022). Türkiye'de Zamana Dayalı Eksik İstihdam ve Yetersiz İstihdam: Denizli İlinde Nitel Bir Araştırma. Pamukkale Üniversitesi Sosyal Bilimler Enstitüsü. Denizli.
- Taş, M. A., & Özmen, M. (2019). Meslek seçiminde aile desteği ve kariyer uyum yetenekleri ilişkisi: Olumlu gelecek beklentisinin aracılık rolü. *Avrasya Uluslararası Araştırmalar Dergisi*, 7(16), 736-761.
- Taşçı, H. M., & Darıcı, B. (2010). Türkiye'de Eksik İstihdamın Belirleyenleri: HIA ile Bir Mikro Veri Uygulaması. *Maliye Dergisi*(158), s. 278-300.
- Thompson, K. W., Shea, T. H., Sikora, D. M., Perrewe, P. L., & Ferris, G. R. (2013). Rethinking underemployment and overqualification in organizations: The not so ugly truth. *Business Horizons*, 56(1), p. 113-121. <https://doi.org/10.1016/j.bushor.2012.09.009>
- Ünal, H., & Gönülaçan, A. (2019). Türkiye'de Eksik İstihdam Edilenlerin Ortak Özelliklerinin Belirlenmesi: Lojistik Regresyon Analizi. *Maliye Dergisi*, 176, s. 128-139.
- Van de Werfhorst, H. G., & Mijs, J. J. (2010). Achievement inequality and the institutional structure of educational systems: A comparative perspective. *Annual review of sociology*, 36(1), 407-428.
- Van der Berg, S., & Van Broekhuizen, H. (2012). Graduate unemployment in South Africa: A much exaggerated problem. Centre for Development and Enterprise, Stellenbosch University.
- Verhaest, D., & Velden, R. (2013). Cross-Country Differences in Graduate Overeducation. *European Sociological Review*, 29(3), p. 642-653. <https://doi.org/10.1093/esr/jcs044>
- Wiczer, D. (2013). Long-term Unemployment: Attached and Mismatched?. In *2013 Meeting Paper* (No. 1101).
- Xu, Q., & Chen, Y. (2024). Educational mismatch and mental health: Evidence from China. *Social Science & Medicine*, 356, 117140.

“(IL)Liberal Peace” As a Solution? Rethinking Pitfalls in Post-Gaddafi Libya’s Sociopolitical Transformation

Hikmet MENGÜASLAN¹ 

ABSTRACT

This research is motivated by the question of why Libya has derailed from “liberal democratic” transition path following the demise of Gaddafi’s authoritarian regime by international intervention in 2011. The paper analyzes post-Gaddafi Libya’s sociopolitical transformation by employing a holistic framework which focuses on interaction between key international and domestic dynamics as a major determinant of the ongoing political turmoil and failed peace-building initiatives. Utilizing process-tracing as methodological framework, the paper identifies the repercussions of interaction between international and domestic dynamics across three thematic sectors: “geopolitical competition” that involves non-state armed actors as well as regional and great powers, “war economy” based primarily on struggle for controlling Libya’s rich hydrocarbon resources, and the rivalry between traditional and emerging norms of “conflict management”. The analysis arrives at two main conclusions regarding post-Gaddafi Libya’s sociopolitical transformation: firstly, both foreign and domestic actors increasingly operate by the logic of winner-takes-all, which turns any power-sharing/peacebuilding initiative into a zero-sum game. Secondly, the idea of ending Libya’s political deadlock through a military solution, to be followed by establishment of an authoritarian leadership, has considerably extended its appeal within either factions to Libyan politics especially since 2014 elections.

Keywords: Post-Gaddafi Libya, Conflict Resolution, Peacebuilding, Liberal Peace, Authoritarian Model of Conflict Management.

JEL Classification Codes: F51, N45

Referencing Style: APA 7

INTRODUCTION

This paper analyzes why post-Gaddafi Libya has derailed from “liberal democratic” transition path by reconstructing key mechanisms of Libya’s socio-political transformation with a special focus on the interaction between international and domestic dynamics. During the “Arab Revolts”, Muammar Gaddafi’s rule faced with armed opposition, in response to which Gaddafi unleashed brutal force to suppress. The clash between the opposition and forces loyal to Gaddafi turned into a full-scale armed conflict in a very short time. The international actors pioneered by the NATO powers - albeit the US, Britain and France – called for an international intervention based on humanitarian concerns and the controversial norm of “responsibility to protect”. When Gaddafi was deposed in 2011 with the help of foreign involvement, the interveners had in their mind a liberal democratic transformation for Libyan Jamahiriya. However, the current conditions on the ground tell quite a different story. After more than a decade, Libyan politics is still far from any stable, and more importantly legitimate, resolution. And given the abound human rights abuses, growing food insecurity,

and extensive power vacuum in Libya, the ongoing political turmoil spawns grave threats to not only Libya but also for its broader vicinity.

As such, the reasons for, and key dynamics of, why Libya has still not been crowned with peace, welfare, and democracy following demise of Gaddafi’s authoritarian regime have received a good deal of attention in both academic and policy circles. The paper suggests a classification of these perspectives under two broad categories based on their level of analysis. First group of studies sets for explaining the ways of international factors such as geopolitics, security and economic interests of state and non-state actors (ex. Russia-affiliated Wagner Group) preventing/promoting Libya’s political transition to democracy (e.g., Zambakari, 2016; Zoubir, 2020; Aktürk, 2021). These comments aim to demonstrate that due to their irreconcilable agendas those involved in the Libyan conflict has inflicted serious damage upon Libyan politics. A good and oft-cited example of this is the contradictory policies of the European Union and member states which have been driven primarily by managing migration flows to Europe through Libya (e.g., Pradella & Rad, 2017). The second group of perspectives,

¹ International Relations Department, Nazilli FEAS Isabeyli Campus - Aydın Adnan Menderes University, hikmet.menguaslan@adu.edu.tr

on the other hand, adopts a historico-institutional approach by examining local dynamics of conflict with specific interest in the lack of institutions, the implications of Gaddafi era politics on Libyan polity, and prevalence of armed non-state actors (e.g., Randall, 2015; Sawani, 2018; Badi, 2021). Development, and also implications, of weak state institutions, as well as a rentier economy, in Libya's post-colonial state-building process is considered as the major block before Libya's democratization process.

Accordingly, both group of, as well as other, perspectives regarding the political trajectory of post-Gaddafi Libya have examined in isolation the complex process of international forces' intertwining with domestic structures and networks, overlooking in particular its dissolving impact on the viability of "liberal peace" as a framework for conflict resolution and peacebuilding (see also Cooper, 2007; Chandler, 2010) in the case of post-Gaddafi Libya. Although there are previous studies focusing on the interaction between international and domestic mechanisms as a major determinant of Gaddafi's demise (Bilgenöğlu & Mengüaslan, 2020) and of Libya's broader sociopolitical transformation (Yalvaç & Mengüaslan, 2024), less attention has been paid to its implications for ongoing political turmoil and failed liberal peace-building initiatives in post-Gaddafi period.

To address this gap in the literature, the paper employs an interactive framework that examines key linkages among the geopolitical, geoeconomic (war economy), and normative (competing norms of conflict resolution) dimensions of post-Gaddafi Libya's protracted and multidimensional turmoil. It aims to provide a nuanced understanding of the interaction between foreign actors' self-interested and containment-focused involvement in Libyan politics and Libya's domestic sociopolitical features (such as lopsidedly developed state institutions and oil-dependent economy) as a major source of the pitfalls evolved in Libya's political transition from Gaddafi's authoritarian regime. Process-tracing serves as the methodological framework for the paper's in-depth analysis of post-Gaddafi Libya's sociopolitical transformation (or its current stagnation) as a single-case study. The research draws primarily on utilization of empirical data obtained through fieldwork-based reports by international organizations (e.g., UNSMIL), and NGOs (e.g., International Crisis Group), as well as policy think tanks. An interpretivist approach is used to analyze the collected data, which is contrasted by the arguments suggested by the academic sources.

The paper contributes to the literature by arguing that an illiberal solution looms larger over post-Gaddafi Libyan

politics as the liberal peace-building framework's key objectives (i.e., political reconciliation, the establishment of inclusive and legitimate governing structure), albeit prominent norms, have been transmuted by a complex set of mechanisms - reflecting broader shifts in systemic competition not just within geopolitical and economic spheres but also in the normative domain. In this vein, the paper's findings promise fresh insights not only into the political transformation following Gaddafi's overthrown but also the prospects for liberal conflict resolution frameworks. To put it another way, Libya's trajectory pledges one of the key moments for restoring the faith in "liberal peace" as a model for political transition from authoritarian/non-democratic regimes. Moreover, given the other ongoing civil conflicts such as the Syrian crisis, and the protracted peacebuilding initiatives as in the case of the Palestinian issue plaguing the Middle East and North Africa (MENA), the paper's conclusions may offer alternative and pragmatic recommendations for fostering regional peace and security.

The organization of the paper is as follows: the first section engages with the thematic implications of Gaddafi era social and institutional reforms upon making of a "decentralized", "rentier", and "tribal" state of Libya. This section gives a brief overview of the ways these reforms contributed to persistence and reproduction of weak state institutions, a heavily rentier economy, and sub-state traditional identities. The second section examines the repercussions of complex interaction between Libya's domestic features and international dynamics to the ongoing political turmoil across three key mechanisms consisting of geopolitical contest, war economy, and competitive interaction between traditional liberal and emerging/authoritarian norms of conflict resolution. The focus is on how, and also why, "liberal peacebuilding" initiatives have failed to prevail in post-Gaddafi Libya.

LEGACIES OF "JAMAHIRIYA": DE-INSTITUTIONALIZATION, RENTIERISM, AND TRIBALISM

When Libya gained its independence in 1951, it was ruled by King Idris (1951-1969) as a monarchy which predominately organized along tribal affiliations and relied on the network of the Sanussiyya religious sect in Cyrenaica. Indeed, post-colonial Libyan monarchy was more like a loose federation of three main regions - Tripolitania, Cyrenaica, and Fezzan (Ahmida, 2005: 6). Until the discovery of rich hydrocarbon reserves in 1959, Libyan economy remained highly dependent on revenues incurred from a military base leased to Britain and the sale of scrap metal left from World War II.

The beginning of oil production had profound implications on Libya’s sociopolitical transformation. King Idris utilized oil revenues to co-opt possible dissenting tribes against his monarchy while rewarding those loyal to himself. He established an extensive clientelist, and corporatist networks based on tribal affiliations to redistribute oil revenues, leading to the persistence of tribal and kinship relations. As such, the flow of substantial oil revenues became one of the central dynamics that distorted the institutionalization of state by leading to overdevelopment of its redistributive and security functions. And, from its inception, the building of a “Libyan nation” in the modern sense coexisted with the persistence and reproduction of traditional tribal affiliations and kinship ties. Despite his extensive clientelist network, however, King Idris could not neutralize the growing social discontent against his pro-Western foreign policy stance (e.g., as to the Arab Israeli War and the Palestinian issue). The elusive ground on which the Libyan monarchy’s foundations rested was severely upset when young military officer Muammar Gaddafi, inspired by radical ideas such as Arab nationalism and anti-imperialism championed by the charismatic Egyptian leader Gamal Abdul Nasser, had overthrown King Idris on September 1, 1969.

Muammar Gaddafi’s rule lasted for more than 40 years during which numerous pivotal moments and reforms were witnessed (see also Vandewalle, 2012), and therefore warrants a more thorough examination than presented here. However, considering the limits of space and subject of the paper, the study focuses on the implications of Gaddafi era across three thematic areas: “institutionalization of the state,” “economic transformation,” and “social development,” as these are the sectors most prominently representing the major problematic issues in post-Gaddafi Libya’s sociopolitical transformation.

Firstly, Muammar Gaddafi’s internal security oriented reforms were critical in the making of Libyan Jamahiriya’s (*state of the masses*) peculiar political institutions. Gaddafi based his 1969 revolution on the Egyptian example. As such, his initial step following the deposal of King Idris was to establish a similar political system to the “Arab Socialist Union” to mobilize Libyans along with his revolution. Yet, Libya had different economic, political, and social structures compared to Egypt. Libya, unlike Egypt, did not own large arable lands for extensive agricultural production and most of the Libyans preferred to continue their nomadic living style despite reforms encouraging urbanization. Once land tenure reform

was not a viable option to garner support from popular, and especially rural, classes in Libya, Gaddafi turned to Libya’s most strategic economic asset – oil. After he managed to nationalize Libya’s hydrocarbon resources, Gaddafi benefited from increasing oil revenues to enact his revolutionary ideas (Ahmida, 2005: 78). He attempted to construct a new power base by dismantling the previous one based on Sanussiyya sect in Cyrenaica. Thus, any powerful social group, establishment, or tribal notables from the monarchical rule became the direct target of revolutionary reforms. And he introduced “Popular Congresses” as an instrument of political participation which in theory would allow Libyans to express themselves politically yet in reality enabled Gaddafi to suppress any opposition before its start. This repressive trend grew further when Libya was subjected to regime of international sanctions during the late 1980s and 1990s, with the allegations of Gaddafi’s support to international terrorist networks. The US-led sanctions put Libya in a politically isolated position, even an international pariah state (Zoubir, 2006: 49). Subsequently, Libya was deprived of the blessings of US-led liberal order, meaning that it would be much more difficult to acquire foreign technology, expertise, and equipment vital to the sustenance of oil production. Moreover, the concurrent oil boom and bust cycles in the 1980s only further deteriorated the situation for Gaddafi’s regime by disrupting the flow of oil revenues. Against this backdrop, Gaddafi became more concerned about protecting his revolutionary regime. He opted for new political reforms - more repressive and security-oriented institutional reforms - which in the end led to development of more bifurcated and overlapping state organs. Through the political reforms, Gaddafi positioned himself as the “Guide of the Revolution” and put himself above the Jamahiriya’s formal administrative structures (Vandewalle, 2012: 6). In due course, the revolutionary Jamahiriya turned into a highly centralized and repressive polity where the power laid mainly at the hands of Gaddafi and his dualistic security forces completely loyal to himself.

Secondly, Gaddafi envisioned a radical Arab socialist economic transformation, characterized by state intervention in finance, planning, and the execution of investments on the basis of state-led import substitution industrialization. Despite being labeled as Arab socialist, however, economic model of the Jamahiriya was closer to state capitalism. The hydrocarbon sector, upon which the economic foundation of the Jamahiriya largely relied, was controlled by the National Oil Corporation (NOC). In addition to that, the state-owned enterprises oversaw

other economic activities and regulated their contracts with foreign companies. More importantly, growth of any autonomous socioeconomic class was strictly prohibited as the Libyan state exclusively managed economic transactions (St. John, 2008: 129-130). These policies, undergirded by stable flow of oil revenues, provided the necessary momentum for Gaddafi's radical sociopolitical transformation. However, the same reforms were not sufficient to achieve modernization and industrialization through import substitution. For they were not driven by economic rationality but by motivation to boost revolutionary fervor, i.e., loyalty against Gaddafi. To this end, Gaddafi allocated huge amounts of financial resources to his infrastructure projects (also known as "crazy projects"). A classic example of this was the "Great Man-Made River" project, which aimed at expanding irrigated lands into Fezzan where most of land was desert. Aside from negligible boost to revolutionary zeal among Libyans, these and other crazy projects merely contributed to Libya's dependence on foreign technology and equipment. Consequently, despite its oil revenues, the Libyan Jamahiriya shared the common economic fate of many late-developing countries on the periphery and could not manage its transition from a rentier economy to an industrialized one.

Thirdly, Gaddafi's political and economic reforms implicated deeply upon Libya's social development. According to Hinnebusch (1984: 69), Libya's experience can be described as a case of "crash modernization", characterized by significant social costs. In contrast, Ahmida (2012: 78-79) presents a more optimistic view than Hinnebusch, arguing that the Jamahiriya as a political experiment reflects the historical and cultural specificities of Libya. Indeed, with hindsight, it is reasonable to assert that Libya's social development during Jamahiriya was primarily driven by Gaddafi's concerns about securing his regime against internal and external pressures. Following the 1969 coup, Gaddafi saw the predominance of kinship and tribal networks as a major threat against his revolutionary ideas. In a way, this was why he introduced a model of decentralized, anti-modernist state that would challenge any form of social stratification, whether modern (such as bourgeoisie, working class, and bureaucrats) or traditional (tribal). The outcome of his reforms however was the opposite of what he planned - reproduction and further entrenchment of traditional features of Libyan society, albeit under contemporary conditions. For instance, when his revolutionary committees and congresses failed to absorb oppositional movements, Gaddafi had to turn again to tribal networks to coopt dissent. The tribal

affiliations were also instrumentalized in the context of favoring certain tribes with bureaucratic positions while marginalizing ethnic minorities and tribes in Cyrenaica. Ultimately, Gaddafi's regime fashioned a Libyan society that was deeply fragmented along traditional kinship and tribal identities and highly dependent on state.

In summary, the institutional, economic, and social structures inherited from Gaddafi's Jamahiriya should not be viewed in a static manner, as such an approach would obscure the ways in which the historical and social features of Libyan society have evolved into new and complex forms in the post-Gaddafi context (Issaev & Zakharov, 2020). In other words, concepts such as "stateless state" or "accidental state" (Vandewalle, 2012), which aim to describe the specificities of the Libya's weak state institutions and rentier economy, fail to account for the dynamic relationships contributing to political turmoil in post-Gaddafi Libya. It should not mean however that Libyan state Gaddafi left behind was not authoritarian, rentier, and overdeveloped in repression and re-distribution functions. To the contrary, the specificities of Libyan state attest to implications of interaction between international and domestic dynamics onto the sociopolitical transformation.

AFTER TOPPLING OF GADDAFI: DYNAMICS OF ENDLESS CONFLICT IN LIBYA

When social protests erupted against Gaddafi's regime during the Arab Revolts, it quickly turned into an armed conflict between opposition groups and those remained loyal to Gaddafi. In this context, the primary objective of international intervention was to prevent the opposition from being crushed under Gaddafi's brutal response. However, as Lisa Anderson (2017) argued, international interventions in Libya since the Ottoman period have only further complicated the political landscape. In this case, post-intervention Libya has turned into a fragile, and in some respects a failed state (Sawani, 2018: 80), mainly due to the political contest which produced two additional civil wars after Gaddafi. Moreover, Libyan state has been failing to provide most of the public services, which has put vast segments of society under harsh living conditions. Some pessimist analysts such as Ammar (2022: 1), even argue that Libya's social fabric may have been so irreparably damaged that any attempt at national reconciliation would be futile.

In essence, after toppling of Gaddafi, Libya has fallen victim to an endless contest for power involving foreign state, as well as non-state actors, and unfolding through geopolitical, geoeconomic, and normative spheres.

As such, post-Gaddafi Libyan politics necessitates an interactive framework well-suited to be able to grasp the implications of complex and multidimensional mechanisms at play. The argument below draws on a framework that integrates three of the most prominent mechanisms -among several others- shaping the failure of liberal peacebuilding attempt in Libya, “geopolitical competition”, “war economy”, and the rivalry between traditional and emerging norms of “conflict management”. For these mechanisms, and key linkages among them, have become particularly relevant to proliferation, and persistence, of armed non-state actors, failed efforts to establish a legitimate government, and splitting of state institutions, which together reflect the broader implications of Libya’s diversion from liberal solution.

To illustrate, Libya’s current political turmoil has been entangled in a fierce geopolitical competition unfolding on national, international, and regional levels, as a result of which Libya’s political deadlock has been characterized as an internationalized conflict (e.g., Joffe, 2019; Colombo & Varvelli, 2020; Melcangi, & Mezran, 2022). The involvement of foreign state, as well as non-state, actors has thoroughly upset the Libyan politics which set stage for interim governments with limited authority, civil wars involving rival governments, upset negotiation tables, and shelved political agreements aiming at a peaceful resolution. Likewise, post-2011 Libyan economy has turned into a war economy combining oil revenues, strategic aids from foreign powers, as well as money flows acquired from illegal activities ranging from human trafficking and smuggling to control of strategic locations (Eaton, 2018: 7, 23–25). War economy structures, networks, and activities reflect the most salient implications of complex interaction between international geoeconomic contest and domestic sociopolitical characteristics, such as failed processes of DDR (disarmament, discharge and re-integration of armed groups) and re-centralization of state authority (Capasso, 2020). Thirdly, the normative plane on which Libya’s conflict resolution/mediation process has been overseen has undergone significant transformation since 2011, in that, to the contrary of the expectations of intervening actors, liberal and democratic peace framework failed at guiding post-intervention Libya’s sociopolitical transition. Moreover, as Libyan conflict has become more internationalized, conflict resolution has itself become another site for contest between traditional liberal and emerging/authoritarian norms (Costantini & Santini, 2021; Lewis, 2022; Keen, 2021).

Beyond Geopolitical Competition: Persistence of Decentralizing Factors in Libya

To begin with, geopolitical competition at the national and regional-international levels have functioned as a counterforce to attempts at centralizing political authority and monopolizing the use of force within the post-Gaddafi state (Megerisi, 2020: 1) by seriously undermining the already weak state institutions (especially Ministry of Defense and Ministry of Interior) and further complicating the overlapping authorities within these institutions (Yeşilyurt, 2023: 469). A case in point is the establishment of a legitimate governing structure in the post-2011 period, which has become an integral part of domestic geopolitical contest. An interim government—the National Transitional Council (NTC)—was established in 2011 in Benghazi (later relocated to Tripoli) to guide Libya toward elections. According to Mezran (2018: 213), the NTC’s prioritization of holding national elections in 2012 rather than addressing first the issues such as ensuring national reconciliation and disarmament of proliferating militias after the fall of Gaddafi was critical in crystallization of divisions between the rival factions in Libya’s post-2011 governing structures. The Arab Revolts in Libya, as Mezran (2018: 213) argues, was more than “a simple revolt of a population against the long-term dictator and his few mercenaries.” It was a civil war, as there were also groups supporting the Gaddafi regime against the opposition. Moreover, the 2011 social protests against Gaddafi were driven by tribal affiliations and unfolded on a city-by-city basis, each with diverse agendas (Hweio, 2012: 112). The fragmented and polarized nature of the opposition persisted even after Gaddafi was deposed. An outstanding example of this was the voting on secessionist demands in local councils. Seeking to capitalize on the nationwide power vacuum, opposition groups in Misrata and Benghazi utilized the Gaddafi-era governing bodies, such as the popular congresses and local councils, to hold independent elections from the NTC and voted for secession. Subsequently, the NTC denied legitimacy to these decisions; however, these moves demonstrated from the very beginning how difficult the process of political re-centralization would be in post-Gaddafi Libya.

Under these circumstances, the 2012 elections for the General National Congress (GNC) had two significant outcomes for Libya’s political transition. First, having a liberal economic agenda, the National Forces Alliance (NFA) led by Mahmoud Jibril gained 48% of the votes. However, Justice and Construction Party (affiliated with Muslim Brotherhood) -combined with the Islamist

oriented politicians elected independently- also secured a non-negligible victory. And the election results proved that a mutually beneficial relationship between politicians and armed groups was evolving, in that, politicians secured electoral success and in return armed groups utilized political power to advance their own agendas (Issaev & Zakharov, 2020: 57). This can be seen in the passing of Resolution No.7 (military operation against armed groups loyal to Gaddafi) and the controversial “Political Isolation Law”, which barred individuals involved in Gaddafi-era governing structures from participating in politics for a decade (Lacher, 2020: 30). In addition to creating an exclusionary political context, these two proposals demonstrated the expanding clout of armed militia within the GNC and their growing embeddedness in formal state institutions such as Ministry of Defense and Ministry of Interior (Aslan, 2020: 146-147). Secondly, the proliferation of armed groups and emergence of a new political movement, Islamism, acquired a new meaning in post-2012 elections Libya when the foreign actors involved in Libyan conflict expressed starkly contrasting responses to growing influence of Islamist politicians within the GNC. Countries such as Türkiye, and Qatar warmly welcomed the election results and the rise of Islamist-affiliated political movements, while others, including Saudi Arabia and the United Arab Emirates, expressed their concerns (see, Telci, 2020; Aktürk, 2021).

The ways in which this elusive interaction between international and national dynamics of Libyan politics has been feeding the drive for the establishment of rival governments and spiraling of a vicious circle of civil wars have become more pronounced in the run up to the 2014 parliamentary elections for House of Representatives (HoR). In response to the expansion of the influence of Islamist politicians and armed militias over weak state institutions through the use of force, as well as the increase in their exclusionary and marginalizing attitudes against other political factions, opposition groups, including the NFA, Gaddafi regime supporters, and federalism advocates, began to unite under the leadership of Khalifa Haftar. And when the GNC decided to reject ending its mandate, which was supposed to conclude in February 2014, Haftar launched “Operation Dignity” in May against GNC-aligned armed militias, including jihadist groups such as Ansar al-Sharia, in Benghazi.

In certain respects, these developments were the early signs of Libya’s deviation from the path of liberal power-sharing, as well as increasing appeal of using armed forces to ensure political decisions (Sawani, 2020: 48). This is evidenced by the reaction of the Islamist parties

against the results of 2014 elections when they could not secure a dominant position in the HoR. The armed militias aligned with the Islamist political actors did not allow the newly elected members of the HoR to convene in Tripoli. As a consequence, the HoR was compelled to relocate to Tobruk due to growing pressures by Islamist armed militia. Those moved to Tobruk declared their support to Haftar’s Libyan Arab Armed Forces (LAAF) and his campaign over Islamist militias in Benghazi in 2014. In response, those stayed in Tripoli founded a rival government backed by Islamist politicians and armed militia who formed a coalition called “Libya Dawn” against Haftar’s forces. When international actors recognized the HoR as a legitimate legislative body, despite the Libyan Supreme Court ruling the HoR invalid in 2014, it only added new dimensions of controversy to the prevailing disputes regarding the status and legitimacy of rival governments.

After the failure of the peaceful transfer of power from the GNC to the HoR, along with other specific developments, the international, as well as regional, actors started to become more relevant to Libya’s geopolitical equation. Until then, the international actors maintained a low level of engagement based on ‘local ownership’ principle and had limited themselves to supporting and advisory roles in Libya’s political transformation. However, by 2015, issues such as the unprecedented rise in irregular migration to Europe from African countries, the expansion of terrorist networks in power vacuums within Libya, and the spillover effects of conflicts in other regions on Libya—and vice versa—necessitated a calculated reshaping of international engagement in the domestic political contest in Libya.

Subsequently, a multidimensional geopolitical sphere linking Libya, the Sahel region, the Middle East and Europe has begun to emerge especially due to the transnational threats such as irregular migration and the rise of radical Islamist terrorist networks. For instance, due to various armed groups that refused to disarm after Gaddafi’s fall, the decentralization of authority in Libya, particularly in the south, has led to increased control by communities such as the Tebu and Tuareg along the Libya’s borders with Sahel countries. Until 2015 when the EU countries managed to develop effective strategies for combating irregular migration and controlling migration flows, these communities generated a significant illicit economic network based on human smuggling. The criminalization of irregular migration by the EU thus directly threatened these communities’ livelihood (Tinti, 2024). As a consequence, the already stalled process of

political centralization, due to the emergence of two rival government structures in Libya, became even more complicated, as southern tribes sought to preserve the economic gains and political power they had attained in the post-Gaddafi era (Tinti, 2024: 20).

Moreover, the instability in Libya’s southern region resulted in uncontrolled flow of heavily trained and equipped fighters, as well as arms, into the Sahel region (Lacher, 2017). In this respect, the control of several cities such as Derna and Sirte by ISIS- affiliated groups towards the end of 2015 was a game changer, in that, it not only changed the context of Islamist militia and politicians’ political tenure but also transformed the way international actors have involved in Libya’s sociopolitical transformation.

However, the task of dismantling Islamist terrorist networks in Libya’s chaotic environment led to a complex and sometimes contradictory actions. On the one hand, in 2016 the two factions in Libya came to terms on establishing a unity government—the Government of National Accord (GNA)—led by Fayeze el-Sarraj under the auspices of the UN. Yet on the other hand, in response to GNA’s collaboration with the US against ISIS, Haftar sought Russian support for his campaign against Islamist militants in Benghazi (Krylova, 2017: 588). As such, Libya’s domestic power struggle after Gaddafi evolved once again into a broader internationalized conflict due to selective involvement of international actors.

In essence, the external powers’ involvement was in large part necessitated by Libya’s fragile and decentralized state institutions, for the interim government in charge failed to mobilize its security forces due to prevailing armed militia that easily shifted their loyalty. The cooperation against the threat of ISIS bore its fruits in a short period time (as shown by escaping of ISIS affiliated armed militia towards desert leaving from key locations in 2017); however, the external involvement had also several adverse effects on capacity-building and centralization efforts in Libya. To illustrate, after Gaddafi, the flow of arms and fighters into the region unleashed a wave of separatist movements and transnational terrorist networks (ex. the separatist and Islamist movement led by the Tuaregs in the Sahel). For instance, the Tuareg and Berber communities in the south of Libya attacked the oil fields in 2013 and disrupted oil production to compel the already weak government for concessions and oil revenues (Gentry, 2019: 123). Subsequently, with a range of objectives—including securing access to Libya’s oil revenues, combating irregular migration, countering extremism, and balancing against other

powers—numerous regional and international actors, such as France, Italy, Türkiye, and Chad, have continuously sought to establish a network of patronage over the armed militias in the Fezzan region (Raineri, 2022). The internationalization of power rivalry in Libya therefore introduced its second dynamic in the context of geopolitical contestation, i.e., the incorporation of additional areas of struggle such as political, economic, and security interests of foreign powers along with prevailing tribal, and ethnic divisions.

Accordingly, ‘winner-takes-all logic’ has begun to take over Libyan politics. In addition to the United Nations Support Mission in Libya (UNSMIL) which has been the impartial international body overseeing mediation between rival factions and observing election processes, international-regional state and non-state actors have shown a growing commitment to backing either of the factions struggling for power in Libya. It has been widely recognized that powers such as Türkiye, Qatar, Italy are in general aligned with the Tripoli based government while Egypt, United Arab Emirates and Saudi Arabia as well as Russia, and its affiliate paramilitary organization Wagner Group, provided military, financial and intelligence support to Khalifa Haftar (see ICG Report, 2021).

Thus, the struggle for power has begun on the one hand to include additional objectives such as securing oil exploration deals, keeping irregular migration flows at bay, and to divert from reaching a peaceful and democratic power sharing agreement among rival factions on the other. To give an example, Russia’s increasing military and paramilitary support for Haftar has particularly alarmed Western actors as this support could pose a significant threat to NATO members by extending Russian influence over the Mediterranean if Russia would secure a naval base in Tobruk (Eastern Libya) (Ramani, 2022: 11). Similarly, by the time separatist and anti-government movements against Sahel countries (e.g., Chad and Niger) found refuge in Libya’s political chaos and launched terrorist attacks from there, Libya’s African neighbors have had to involve in in post-Gaddafi Libya’s political crisis by giving up their initial reluctance (Gentry, 2019: 123) and favoring a strong-man solution with concerns of stability.

Indeed, the extent to which foreign involvement has become a decisive factor in Libya’s political future can best be seen in the “third civil war” that started in 2019 when Haftar’s LAAF attempted to invade Tripoli. After securing the control of oil fields (the Sahara and El-Feel) and strategic areas such as airbases and roads neighboring Benghazi, Haftar’s forces turned their direction towards

Tripoli in order to end power contest through a hard power-based solution. In doing so, Haftar received crucial support from Russia's Wagner Group (Krylova, 2017: 588). Likewise, it was largely due to Turkish technical support and military equipment (especially the Bayraktar drones) that the militias based in Tripoli succeeded in repelling Haftar's attack (Telci, 2020: 50). Türkiye's involvement in the Libyan geopolitical equation through hard power elements was a critical moment in further internationalization of the Libyan crisis (Quamar, 2020: 1). First and foremost, Türkiye's intervention functioned as an effective balancing act against growing impact of Haftar and his army by pushing for de-escalation of the conflict and return of the LAAF to its base. Secondly, Türkiye's support to GNA created a strategic shift in Libyan politics by paving the way for restarting negotiations for the unification of rival governments (the Berlin Process). As such, the balanced geopolitics of Libya, achieved through external actors after the third civil war, has enabled for a relative de-escalation of conflict, albeit a fragile stability, during which rival factions agreed upon establishing a unity government "Government of National Unity" (GNU). Although GNU could be functional only between 2021 and 2022, it was a significant step towards power-sharing agreement among rival governments.

On the other hand, given recent strategic shifts in the region, the elusive geopolitical balance in Libya could be recalibrated again. For instance, the collapse of Bashar al-Assad regime in Syria in December 2024 has such potential, as it would require Russia to reshape its engagement in other conflicts including Libya. Syria had been a key ally of Russia and a major outlet for Russia's naval power into the Mediterranean. Losing such a strategic ally could lead Russia to 'make a fragile pivot from Syria to Libya', as Badi (2025) puts it. Given the allegations of Russia's increased military personnel and equipment transfer to Haftar's LAAF (The New York Times, 19.12.2024), it can be argued that the relationship between Russia and Haftar has become more strategic, which in return could play a significant role in motivating Haftar to re-escalate the conflict in order to impose a military solution.

These examples, as well as others, highlight how diversely de-centralizing forces Libya's internationalized turmoil has been unleashing upon mediation efforts between rival governments. The ongoing geopolitical contest thus continues to be one of the critical dynamics slimming chances for a resolution based on power-sharing, even if it would not be liberal democratic.

Blessing or Curse? Hydrocarbon Fueled War Economy

In the post-2011 Libya, a broad-based war economy has evolved. The argument below focuses on two specific processes through which geoeconomic contest has been influential over protraction of political reconciliation, endurance of proliferated armed militia, and the splitting of state institutions.

Firstly, war economy structures have been disrupting peaceful resolution of conflict primarily by augmenting the strife between struggling factions. In the chaotic environment following Gaddafi's ouster, local armed groups have been authorized, and payrolled, by the Ministry of Internal Affairs to oversee key state functions such as provision of security, cleaning of cities, and border control (Perroux, 2019: 205). According to Sawani (2020: 57), successive governments in the post-2011 period could not subordinate these groups under their authority. On the contrary, the governments preferred to appease the armed militia by delegating official tasks and providing financial assistance, resulting in overlapping areas and sectors of authority. Costantini (2016: 414) describes this situation as warlordism, for grasping such authority provides these groups with immense political and economic power, even granting word over political reconciliation process.

The involvement of foreign actors in Libyan war economy structures had a further destructive impact on recentralization of state authority. In providing untapped resources to local armed groups and rival factions, international involvement has been encouraging spoilers of political reconciliation. An intriguing example of this is the financial assistance allocated by the EU to local armed militia primarily for the purpose of curbing irregular migration. After 2015 (when irregular migration to Europe was unprecedentedly high), the European Commission, in addition to member countries, began to collaborate with municipalities under control of local groups to improve governance structures and rule of law in Libya (Marcuzzi, 2022: 149). However, when EU's self-interested approach has not extended from economic assistance to military support, it turned into an instrument that spoilers of political process have benefited most.

Secondly, war economy networks have been pivotal in fueling divisive and secessionist forces against political centralization efforts. In parallel with the outset of the Second Civil War in 2014, two rival camps started to crystallize as argued above. The economic significance of governance fragmentation was that the war economy

enabled, and in some respects promoted, the split of state institutions along rival governments (ICG Report, 2019). The most obvious site of geoeconomic struggle since the fall of Gaddafi has been the Central Bank of Libya (CBL). CBL is quite crucial for Libya’s rival factions as it reposit the oil revenues and oversees financial allocations. The intermittent struggle between the rival factions over the control of CBL both highlights the constant risk of escalation into direct conflict and exacerbates the already abound institutional defects, e.g., preventing transition governments to administer Libya’s budget as they wanted (Perroux, 2015: 4). For instance, denied from access to oil revenues by the CBL, the HoR attempted to control the eastern division of CBL by designating its own governor. And to finance its expenditures, it utilized public debt mechanism between 2014 and 2019. The geoeconomic contest became more complicated when international actors involved in as in the example of Russian Federation’s printing Libyan Dinar to enable Haftar paying the mercenaries recruited in LAAF (Krylova, 2017: 584) when CBL renounced allocating economic resources to its Eastern Branch in Benghazi (WB, 2021: 4) with the purpose of putting Haftar in a hard position.

The “scramble for Libyan oil” is another salient example expressing the ways of how multidimensional geoeconomic rivalry intertwined with Libya’s war economy structures. In post-Gaddafi Libya, an intricate relationship has been developed between foreign powers and domestic factions to control oil production and export (Costantini, 2016: 410). The production and export of Libyan oil is overseen by National Oil Corporation (NOC) headquartered in Tripoli. However, the oil reserves are concentrated in the south and eastern regions which are under control of Haftar’s LAAF (Pargeter, 2020). Although local armed groups occasionally attempt to halt petroleum production (as in the case of Petroleum Facilities Guard’s seizure of oil fields in 2013 and in 2018 again) to push for secessionist demands in the East by depriving Libyan economy of oil revenues (ICG Report, 2015: 6-10), as of 2019 LAAF and armed groups loyal to Haftar gained a significant leverage by capturing all oil ports of Libya (Ras Lanuf, Es Sider, Marsa el Hariga, and Zueitina). Moreover, Haftar announced that Libyan oil would be sold by the eastern branch of NOC and oil revenues would be deposited in the eastern division of CBL. Against this backdrop, the international actors saw an opportunity through which they could promote de-escalation of conflict by encouraging joint management of oil production and export by the rival factions. Accordingly, the international community declared that they would conduct oil trade exclusively

with the Tripoli-based NOC, while conceding to Haftar’s control over Libya’s oil reserves. Indeed, promoting the establishment of joint economic management system to create a solid ground for political reconciliation has recently become a prominent strategy for international actors. In this context, although it has had little impact on political centralization, an informal agreement on a revenue-sharing model was reached in 2022 between officials of the two rival governments (Haftar in the East and Dbeibah in the West) (ICG, 2024: 2).

Nevertheless, the involvement of foreign actors in Libyan war economy did not always guarantee such stabilizing results as can be seen in the case of closing oil exploration and drilling deals. When the oil deals between the Government of National Unity (GNU) and Türkiye (2022); and Italy (2023) were concluded successfully in return for their political support to GNU, the deals aroused strong opposition from rival regional actors such as Egypt and Greece which sided with Tobruk-based House of Representatives and Haftar.

These, as well as other examples, demonstrate not only how Libyan oil has been weaponized as part of a geoeconomic rivalry but also reflect a social ailing it led to, i.e., tenacity of social fragmentation (mostly along tribal identities). War economy bestows armed groups with lucrative ventures; however, it is also responsible for countless economic problems – accumulation of public debt, social disempowerment, and liquidity crises. Since the Libyan state could not sufficiently meet most of its economic obligations, the dire economic situation many Libyans have been facing reinforce traditional clientelist and patrimonial networks that rely on re-distribution of rentier revenues (in this case, income generated from war economy structures) (WB, 2021, pp.10-11). The structure of Haftar-led LAAF equally proves this assertion that war economy culminates in the persistence of substate affiliations. To Eaton (2021), what brings together the dissimilar LAAF militia is exclusive patronage relations of Cyrenaica inherited from Gaddafi era Jamahiriya.

To sum, emerging financial, economic, and military networks that together constituted Libya’s war economy weaken state authority and disrupt endeavours of recentralizing it, while strengthening the spoilers of Libyan conflict by ensuring their financial resources. In this regard, being a principal component of the war economy, Libya’s hydrocarbon resources have so far turned out to be more of a curse than a blessing upon post-Gaddafi Libya’s sociopolitical transformation.

Pitfalls in “Liberal Peace”: Competing Norms of Conflict Resolution

The traditional framework for conflict resolution, also known as liberal peace, is based on liberal understanding of international politics which suggests that empowerment of democratic governance and liberal market would on the one hand facilitate reconciliation in areas of conflict and foster peaceful international relations on the other (for a detailed discussion, see Richmond, 2006; Paris, 2010). As a framework for peacebuilding, it has been particularly dominant following the Cold War's end (Heathershaw, 2008), and recently utilized, with adaptations to case specific conditions, in numerous civil conflicts including Kosovo, Afghanistan, and Sierra Leone. Its overall performance in conflict areas can be described as multifarious by looking at the criticisms directed against liberal mode of peacebuilding as being an imperialist instrument of Western powers (see for instance, Selby, 2013; Chandler, 2015). In this regard, the case of Libya has marked a significant milestone in the trajectory of liberal peacebuilding initiatives (Chandler, 2012: 221), as it has not only demonstrated how liberal peacebuilding norms transmuted (i.e., arising principles of local ownership and resilience) but also brought forward once again questions as to its viability in the face of emerging norms pioneered by rising non-Western powers (see Lewis et al., 2018).

To illustrate, in the case of Libya, United Nations Support Mission in Libya (UNSMIL) is the chief international organ overseeing Libya's conflict resolution and mediation attempts. Operating within liberal peace framework, UNSMIL has focused on encouraging political actors to come to terms with each other and promoting liberal values such as constitutionalism, rule of law, democratization, and respect for human rights. When the political actors in Libya could not succeed in establishing a legitimate and representative government after two national elections (in 2012 and 2014, respectively), it has assumed a key role by leading negotiations as a result of which 2015 “Libyan Political Agreement (LPA)” was signed proposing “Presidential Council” as an organ that would consist of members from both rival governments and be in charge of state and the Libyan army (Giumelli, 2020: 115). This liberal peacebuilding initiative's fate however can be described as tragic as it fell prey to more urgent problems on the ground, such as spreading of ISIS in 2015, the unprecedentedly high irregular migration flows to Europe as of 2015 and rise of emerging norms of conflict resolution.

Subsequently, when the intervening actors found the solution in adapting liberal peace to the conditions in Libya, the liberal peace framework, as it was, began to fail in putting Libya's reconciliation in track. There were several reasons underlying such shift. To Boduszyński (2017), Western actors did not have the leverage and linkages to impose what liberal peace required in Libya. In addition to that, neither of the factions were eager to accept any process of international monitoring in Libya (ICG Report, 2019). As a result of these and other dispositions, focus of liberal peacebuilding framework in Libya shifted to state-building- in a way that would be more suitable for foreign actors' immediate interests (see also Wagner & Anholt, 2016). Accordingly, it has been the complex interaction between international dynamics and domestic developments in Libya which fashioned the priority of peacebuilding process into containment of Libyan conflict, rather than providing a solution. The shift in liberal peacebuilding approach paradoxically permitted the spoilers of political reconciliation to impose their own narrower agendas. For instance, to be able to better cope with irregular migration flows, the EU member states needed a strong government to cooperate with. Thus, the EU's focus turned to supporting the GNA and protection of Tripoli. In return, the EU and member states would have leverage on Libya's political authority. When this plan did not work, the EU allowed its members to cooperate directly with local municipalities (i.e., armed militia, and local power holders) under the principles of “local ownership” and “building resilience”. Such moves resulted in two significant outcomes: while the cooperation between local and international actors adversely affected capacity building attempts in Libya, it further boosted the contesting rival governments towards a military solution rather than power-sharing (Giumelli, 2020: 118).

Moreover, the intertwining of domestic and international competition has already spilled into conflict resolution sector – as demonstrated by parallel initiatives of mediation, and negotiations hosted by other countries such as Türkiye, Russia, France, and UAE. And it was particularly obvious with criticisms, as well as staunch opposition, directed by the non-Western powers against liberal peace discourse (Sun & Zoubir, 2018: 239; Burton, 2019: 26; Lewis, 2022: 653). For instance, Russian and Chinese representatives in the UN voiced critically their convictions that liberal peace agenda had violated Libya's sovereign rights, and the principle of “ownership” by externally imposed solution. Given the internationalized nature of Libyan conflict, these perspectives suggested that Libyan-led political alternatives would be more

suitable to Libyan society (see also, Larssen, 2016; Kuo, 2012).

Costantini and Santini (2021: 2) use the term “authoritarian conflict resolution model” to describe the emerging norms of conflict mediation pioneered by the non-Western powers in the Libyan case. The authoritarian conflict management, despite still preliminary and underdeveloped as a framework, broadly implies the prioritization of political stability over liberal democratic governance, and utilization of biased mediators for mediation (Lewis, Heathershaw & Megoran, 2018; Keen, 2021: 246; Lewis, 2022: 653). While liberal peacebuilding strives to reach a legitimate power-sharing among rival actors, the authoritarian approach favours a strongman solution to political ails (Lewis, 2025) - General Haftar in the case of Libya. For instance, Akl (2019: 56) points to close relationship between Russian norm of conflict resolution – utility of military figures in conflict areas – and its support to Haftar. In return, backed by Russia, Haftar was able to turn down the political bodies settled on in LPA in 2015, and actualized his conviction – solving Libyan conflict through state capture and military conquest – by launching a military campaign (Operation Flood of Dignity) in 2019.

The “Berlin Process” of 2020 was thus considered as a key moment for liberal peacebuilding in Libya when it brought together all the involved parties and produced a solid political roadmap that appealed to both sides. It established again the High Council of State (HCS– in replacement of GNC) and recognized Tobruk-based HoR along with the former as two legitimate legislative bodies. And it designated Government of National Unity (GNU) as a unified executive body. Although the competing factions agreed upon a political reconciliation roadmap through the Berlin Process, combination of dynamics prevented the holding of elections since then. In the meantime, the GNU has lost its legitimacy as a unity government when Prime Minister Abdul Hamid Dbeibah refused to resign after failing at organizing free and fair national elections and the HoR withdrew its recognition of GNU. Moreover, no solid progress has been achieved on a framework to unify budget and allocation of financial resources. According to Sawani (2020: 47), the establishment of new bodies and devising roadmaps have not necessarily implied any concrete step toward political reconciliation and liberal power-sharing as these institutions proved to be fragile, lacking social legitimacy, and contested by rival factions. Thus, when the GNU started to falter as a unified body, Libya’s state institutions split again as of 2022. Put differently, Libya has currently been ruled by

two states – the GNU based in the northwest Libya and the government led by Osama Hammad controlling the southern and eastern parts of Libya.

Given that the emerging norms of authoritarian conflict resolution have been also shared by other countries such as France, as well as the non-Western powers, Libyan socio-political transformation continues to mark a significant derailing from liberal peace model. Up to now, this has meant further entanglement of political reconciliation process by spawning crucial questions such as who would be the legitimate actor to govern Libya, as well as how he/she would be chosen. However, considering the hitherto performance, albeit transmutation, of liberal peace framework together with further entrenchment non-Western actors (especially Russia) recently in Libya, the prospects for an illiberal solution based on a strongman to stabilize Libya’s political turmoil have significantly risen.

CONCLUSION

The paper asserts that it has been the interaction between international geopolitical, economic, and normative rivalries and sociohistorical features of Libyan society which fashioned post-Gaddafi Libya’s sociopolitical transformation into a deadlock. The paper thus pinpointed two interactive ways how these international and domestic dynamics have come together in disrupting liberal peacebuilding and statebuilding initiatives since 2011.

Firstly, both foreign and domestic actors seem to have adopted the principle of winner-takes-all, which turns any peacebuilding initiative into a zero-sum game. In post-Gaddafi Libya the involvement of foreign actors has been a major source of criticism as it undermines the political reconciliation process by providing military, financial, and political support to domestic actors struggling for power. However, as the argument above demonstrated, it was not their involvement per se, but their self-interested and containment-focused style that has complicated Libyan politics so far. The more the negotiations for political resolution in Libya have comprised the irreconcilable agendas of foreign actors, the more the rival factions in Libya have become tenacious thanks to external backing. Likewise, the international geoeconomic contestation has been described as one of the critical dynamics of ongoing political rivalry as it has increased the stakes for winner by greatly contributing to growing of war economy in Libya. Nevertheless, implications of war economy upon Libya can only be partly understood without looking

at its close relationship to proliferated autonomous groups. By means of revenues generated from war economy structures, the rival governments, as well as the local armed groups, have been able to sustain their autonomy, which in return has rendered them more useful to the interests of external actors – i.e., GNU's collaborating with the EU to curb irregular migration to Europe, and GNU's signing a highly strategic maritime deal with Türkiye.

Secondly, the idea of ending Libya's political deadlock through a military solution, to be followed by establishment of an authoritarian leadership, has considerably extended its appeal to all parties especially since 2014 elections. As a result of this growing inclination, previous attempts of political reconciliation in the past 14 years (as of 2025 at the time of writing) have been stillborn. The rival parties have been unable to achieve political reconciliation since 2014 and have failed to reach an agreement on the necessary conditions for the conduct of elections. Indeed, post-Gaddafi Libya has become one of the cases that represents diminishing faith in liberal peacebuilding as a viable framework for conflict resolution. For the same mechanisms turning Libyan politics into a zero-sum-game also proved existing norms of liberal peacebuilding useless. It has become particularly pronounced when the EU, the exemplary of liberal peace, transmuted the modality of liberal peacebuilding in Libya by employing principles of resilience and local ownership. Such moves have not only led to loss of credibility on the side of traditional actors of peacebuilding but also undermined the trust in negotiations as a way of political solution. Moreover, the failure of liberal peacebuilding in Libya has given further momentum to the emerging norms of authoritarian model of conflict management as alternative frameworks for political resolution.

To conclude, as the liberal peace driven attempts to put Libya on track of democratic transition has constantly failed, Libyan politics plunges deeper into a deadlock and vice versa. Political instability, nation-wide power contest, and economic difficulties have been just a few of the problems which afflicted post-Gaddafi Libya since 2011. In sum, the prospect of a liberal peace in post-Gaddafi Libya remains unpromising as ever.

REFERENCES

- Aslan, M. (2020). Hybrid Political Order in Libya: State, Non-State, and Armed Actors. *Insight Turkey*, 22(4), 139-156.
- Ahmida, A. A. (2005). *Forgotten Voices: Power and Agency in Colonial and Postcolonial Libya*. New York: Routledge.
- Ahmida, A. A. (2012). Libya, Social Origins of Dictatorship, and the Challenge for Democracy. *The Journal of the Middle East and Africa*, 3(1), 70-81.
- Akl, Z. (2019). Russia and Post-Arab Spring Political Elites in Egypt, Syria and Libya. V. Talbot, C. Lovotti, Z. Akl, Y. Cherif, Ch. Hartwell, M. Milosevich, & E. Tafuro Ambrosetti (Eds.), *The Role of Russia in The Middle East And North Africa Region. Strategy Or Opportunism?* (54-69). The European Institute of the Mediterranean.
- Aktürk, Ş. (2021). Turkey’s Grand Strategy and the Great Powers. *Insight Turkey*, 23(4), 95-118.
- Ammar, S. (2022). National Reconciliation in Libya: Challenges and Perspectives. Policy Brief 1/2022. Swiss Peace Foundation.
- Anderson, L. (2017). “They Defeated Us All’: International Interests, Local Politics, and Contested Sovereignty in Libya. *The Middle East Journal*, 71(2): 229–247.
- Badi, E. (2021). Of Conflict and Collapse: Rethinking State Formation in Post-Gaddafi Libya. *Middle East Law and Governance*, 13(1), 22-48.
- Badi, E. (2025). Russia is making a fragile pivot from Syria to Libya. The West should beware falling into a new trap. Atlantic Council. <https://www.atlanticcouncil.org/blogs/menasource/russia-syria-haftar-libya/>. Access Date:06.04.2025.
- Bilgenoğlu, A., & Mengüaslan, H. (2020). A Historical Sociology Perspective on the Legacy of State Formation and Dynamics of the Arab Spring in Libya: From Elusive Authority of Qadhafi to Masses Craving for Democracy. *Türkiye Ortadoğu Çalışmaları Dergisi*, 7(1), 203-234.
- Boduszyński, M. P. (2015) The external dimension of Libya’s troubled transition: the international community and ‘democratic knowledge’ transfer. *The Journal of North African Studies*, 20(5), 735-753.
- Burton, G. (2019). Chinese Conflict Management in Libya, Syria and Yemen after the Arab Uprisings. *Asian Journal of Middle Eastern and Islamic Studies*, 13(1), 18–34.
- Capasso, M. (2020) The war and the economy: the gradual destruction of Libya. *Review of African Political Economy*, 47(166), 545-567.
- Chandler, D. (2010). The uncritical critique of ‘liberal peace’. *Review of International Studies*, 36(S1), 137-155.
- Chandler, D. (2012). Resilience and human security: The post-interventionist paradigm. *Security Dialogue*, 43(3), 213–229.
- Chandler, D. (2015). The R2P Is Dead, Long Live the R2P: The Successful Separation of Military Intervention from the Responsibility to Protect. *International Peacekeeping*, 22(1), 1-5
- Colombo, M., & Varvelli, A. (2020). Libya: A Failed State in the Middle of the Mediterranean. *IEMed Yearbook*. <https://www.iemed.org/publication/libya-a-failed-state-in-the-middle-of-the-mediterranean/>. Access Date:30.10.2024.
- Cooper, N. (2007). On the Crisis of the Liberal Peace. *Conflict, Security & Development*, 7(4), 605–16.
- Costantini, I. (2016). Conflict dynamics in post-2011 Libya: a political economy perspective. *Conflict, Security & Development*, 16(5), 405-422.
- Costantini, I., & Santini, R. H. (2021). Power mediators and the ‘illiberal peace’ momentum: ending wars in Libya and Syria. *Third World Quarterly*, 43(1), 131-147.
- Eaton, T. (2018). Libya’s war economy: predation, profiteering and state weakness. Chatham House Research Paper. <https://www.chathamhouse.org/sites/default/files/publications/research/2018-04-12-libyas-war-economy-eaton-final.pdf>. Access Date:30.10.2024.
- Eaton, T. (2021). The Libyan Arab Armed Forces A network analysis of Haftar’s military alliance. Chatham House Research Paper. <https://www.chathamhouse.org/2021/06/libyan-arab-armed-forces>. Access Date:30.10.2024.
- Gentry, B. (2019). Regional and Global Impacts of Post-Gaddafi Liby. Anderson, M., & Holmsten, S. (eds.), *Political and Economic Foundations in Global Studies* (120-132). Routledge.
- Giumelli, F. (2020). Sanctions as a Regional Security Instrument: EU Restrictive Measures Examined. Cusumano, E., Hofmaier, S. (eds), *Projecting Resilience*

- Across the Mediterranean* (103-123). Palgrave Macmillan, Cham.
- Heathershaw, J. (2008). Unpacking the Liberal Peace: The Dividing and Merging of Peacebuilding Discourses. *Millennium*, 36(3), 597-621.
- Hinnebusch, R. (1984). Charisma, Revolution, and State Formation: Qaddafi and Libya. *Third World Quarterly*, 6(1), 59-73.
- Hweio, H. (2012). Tribes in Libya: From social organization to political power. *African Conflict and Peacebuilding Review*, 2(1), 111-121.
- International Crisis Group (2015). The Prize: Fighting for Libya's Energy Wealth. <https://www.crisisgroup.org/middle-east-north-africa/north-africa/libya/prize-fighting-libya-s-energy-wealth>. Access Date:30.10.2024.
- International Crisis Group (2019). Of tanks and banks: Stopping a dangerous escalation in Libya.<https://d2071andvip0wj.cloudfront.net/201-of-tanks-and-banks.pdf>.Access Date:30.10.2024.
- International Crisis Group (2021). Libya Turns the Page. <https://www.crisisgroup.org/middle-east-north-africa/north-africa/libya/222-libya-turns-page>. Access Date:30.10.2024.
- International Crisis Group (2024). Getting Past Libya's Central Bank Standoff. Crisis Group Middle East and North Africa Briefing N°93. <https://www.crisisgroup.org/middle-east-north-africa/north-africa/libya/b093-getting-past-libyas-central-bank-standoff>. Access Date:06.04.2025.
- Issaev, L., & Zakharov, A. (2020) Decentralization in Libya after the Arab Spring Middle East Policy, XXVII(1), 56-70.
- Joffé, G. (2019). Can Libya survive as a single State?, *L'Année du Maghreb*, 21, 253-262.
- Keen, M. (2021). Assessing Authoritarian Conflict Management in the Middle East and Central Asia. *Conflict, Security & Development*, 21(3), 245-272.
- Krylova, Y. (2017). Lock-in effect in the Russian-Libyan economic relations in the post-Arab Spring period. *The Journal of North African Studies*, 22(4), 578-594.
- Kuo, S. C. Y. (2012). Beijing's Understanding of African Security: Context and Limitations. *African Security*, 5(1), 24-43.
- Lacher, W. (2017). Was Libya's Collapse Predictable? *Survival*, 59(2), 139-152.
- Lacher, W. (2020). *Libya's Fragmentation: Structure and Process in Violent Conflict*. I.B. Tauris.
- Larssen, A. K. (2016). Russia: The Principle of Non-Intervention and the Libya Case. Henriksen, D.,&Larssen, A. K. (eds.), *Political Rationale and International Consequences of the War in Libya* (67-85). Oxford: Oxford University Press.
- Lewis, D. (2022). Contesting liberal peace: Russia's emerging model of conflict management. *International Affairs*, 98(2), 653-673.
- Lewis, D. (2025). 'Illiberal Peacebuilding' and Authoritarian Conflict Management. Ginty, R. M. (ed.), *Routledge Handbook of Peacebuilding* (66-76). Routledge.
- Lewis, D., Heathershaw, J., & Megoran N. (2018). Illiberal Peace? Authoritarian Modes of Conflict Management. *Cooperation and Conflict*, 53(4), 486-506.
- Marcuzzi, S. (2022). *The EU, NATO and the Libya Conflict: Anatomy of a Failure?*. Routledge.
- Megerisi, T. (2020). *Geostrategic Dimensions of Libya's Civil War*. Africa Center for Strategic Studies. <http://www.jstor.org/stable/resrep24408>.
- Melcangi, A., & Mezran, K. (2022). Truly a Proxy War? Militias, Institutions and External Actors in Libya between Limited Statehood and Rentier State. *The International Spectator*, 57(4), 121-138.
- Mezran, K. (2018). Libya: Stuck in Transition. *IEMED Mediterranean Yearbook*, 213-215.
- Pargeter, A. (2020). Haftar, tribal power, and the battle for Libya. <https://warontherocks.com/2020/05/haftar-tribal-power-and-the-battle-for-libya/>.Access Date:30.10.2024.
- Paris, R. (2010). Saving Liberal Peacebuilding. *Review of International Studies*, 36,(02): 337-365.
- Perroux, J. R. (2015). Libya's Untold Story: Civil Society amid Chaos. *Middle East Brief*, No. 93, 1-8.
- Perroux, J. R. (2019) The Deep Roots of Libya's Security Fragmentation. *Middle Eastern Studies*, 55(2), 200-224.
- Pradella, L., & Rad, S. T. (2017). Libya and Europe: imperialism, crisis and migration. *Third World Quarterly*, 38(11), 2411-2427.

- Raineri, L. (2022) Imagined Libya: geopolitics of the margins, *L'Année du Maghreb*, 28, 109-124.
- Ramani, S. (2022). Russia's Post-2011 Resurgence in Libya: A Four-Pronged Hybrid Intervention. Välimäki, J., & Hiltunen, A. (eds.), *Hybrid threat activity in the MENA region: State and non-state actors seeking status and expanding influence* (11-33). Hybrid CoE Research Reports, Finland.
- Randall, E. (2015). After qadhafi: Development and democratization in libya. *The Middle East Journal*, 69(2), 199-221.
- Richmond, O. P. (2006). The problem of peace: understanding the 'liberal peace.' *Conflict, Security & Development*, 6(3), 291-314.
- Quamar, Md. M. (2020). Turkey and the Regional Flashpoint in Libya. *Strategic Analysis*, 44(6), 597-602.
- Sawani, Y. M. (2018) Public Administration in Libya: Continuity and Change. *International Journal of Public Administration*, 41(10), 807-819.
- Sawani, Y. M. (2020). Gaddafi's Legacy, Institutional Development, and National Reconciliation in Libya. *Contemporary Arab Affairs*, 13(1), 46-68.
- Selby, J. (2013). The myth of liberal peace-building. *Conflict, Security & Development*, 13(1), 57-86.
- St. John, R. B. (2008). The Libyan Economy in Transition Opportunities and Challenges. Vandewalle, D. (ed.), *Libya since 1969: Qadhafi's Revolution Revisited* (127-151). New York: Palgrave Macmillian.
- Sun, D., & Zoubir, Y. (2018). China's Participation in Conflict Resolution in the Middle East and North Africa: A Case of Quasi-Mediation Diplomacy?. *Journal of Contemporary China*, 27(110), 224-243.
- Telci, I. N. (2020). Turkey's Libya Policy. *Insight Turkey*, 22(4), 41-54.
- The New York Times. (19.12.2024). Its Syrian Bases in Doubt, Russia Sends Cargo Flights to Libya. <https://www.nytimes.com/2024/12/19/world/middleeast/russia-flights-libya-syria.html>. Access Date:06.04.2025.
- Tinti, P. (2024). Tackling the Niger-Libya migration route: How armed conflict in Libya shapes the Agadez mobility economy. Chatham House. <https://www.chathamhouse.org/sites/default/files/2024-07/2024-07-31-transnational-links-agadez-conflict-libya-tinti.pdf>. Access Date:06.04.2025.
- Vandewalle, D. (2012). *A History of Modern Libya*. Cambridge University Press.
- Wolfgang, W., & Anholt, R. (2016). Resilience as the EU Global Strategy's new leitmotif: pragmatic, problematic or promising?. *Contemporary Security Policy*, 37(3), 414-430.
- World Bank. (2021). Libya Economic Monitor. https://thedocs.worldbank.org/en/doc/3d3cd163628175d3add84db3c707eaa5-0280012021/original/ENG-Libya-Economic-Monitor.pdf?_gl=1*eb6zok*_gcl_au*NDE2MTUwOTQwLjE3MTY2NjMyMjU. Access Date:30.10.2024.
- Yalvaç, F., & Mengüaslan, H. (2024). The Theory of Uneven and Combined Development and the Sociopolitical Transformations in Syria and Libya. *Middle East Critique*, 33(1), 105-120.
- Yeşilyurt, N. (2023). A New Balance between 'Local' and 'National'? Libya's Failed Security Sector Reform. *Journal of Intervention and Statebuilding*, 17(4), 456-476.
- Zambakari, C. (2016). The misguided and mismanaged intervention in Libya: Consequences for peace. *African Security Review*, 25(1), 44-62.
- Zoubir, Y. H. (2006). The United States and Libya: From Confrontation to Normalization. *Middle East Policy*, 13(2), 48-70.
- Zoubir, Y. H. (2020). The Protracted Civil War in Libya: The Role of Outside Powers. *Insight Turkey*, 22(4), 11 - 27.

Regulations on Covert Advertising: An Analysis of Advertising Board Decisions in Türkiye

Güldane ZENGİN¹ 

ABSTRACT

Complaints concerning covert advertising in Türkiye are evaluated and sanctioned by the Advertising Board. This study analyzes the decisions categorized under “covert advertising” in the press bulletins published by the Board and employs a content analysis technique with purposive sampling. A total of 173 cases labeled as covert advertising, spanning from January 2023 to July 2024, were examined. The key finding reveals that 87,3% of the penalties issued involved the suspension of advertisements, while only 12,7% resulted in administrative fines. The data indicates that sanctions were most frequently applied to individuals engaging in covert advertising on digital platforms, particularly Instagram. The leading cause for these penalties was the presence of links, tags, or similar elements without clear labels such as “advertisement” or “collaboration” (72,3%). This was followed by promotional expressions intended to praise, endorse, or encourage purchasing behavior (31,8%). The main contribution of this study is to highlight that, despite the prevalence of covert advertising, the current sanctions, especially on social media, are not sufficiently deterrent. These findings suggest the need for more nuanced approaches and updated regulatory policies.

Keywords: Covert Advertising, Advertising Board Decisions, Sanctions in Advertising, Advertising Ethics, Regulation.

JEL Classification Codes: M30, M37, M38

Referencing Style: APA 7

INTRODUCTION

Covert advertising, also known as surreptitious advertising, refers to the promotion of products and services through elements such as brand names, logos, or other identifiers without clearly indicating that the communication is an advertisement. Consumers have a legally protected right to know when a message is intended as advertising. When encountering an advertising message, consumers may wish to critically evaluate it or avoid exposure altogether. However, if it is not explicitly stated that a message is an advertisement, consumers are unknowingly exposed and deprived of the opportunity to assess the content properly.

To safeguard consumer rights, covert advertising is legally prohibited across all media platforms. Beyond its legal implications, covert advertising also raises ethical concerns, as it involves deceiving consumers. Erol (2017) examined the motivations behind covert advertising, considering factors related to consumer behavior, advertising effectiveness, economic pressures, legal frameworks, and publishing policies. The factors concerning consumer behavior and advertising effectiveness are closely linked. It can be argued

that consumers’ heavy exposure to advertisements, sometimes referred to as “advertising bombardment”, increases their tendency to avoid advertisements altogether. When a message is presented in a way that conceals its commercial intent, consumers are caught off guard.

In other words, when advertising is covert, consumers exposed to it might trust it more when, as Boyer et al. (2015, p. 104) state, they believe the message source has nothing to gain from conveying that message. Economic motivations also drive the use of covert advertising, as it can reduce advertising costs, however, legal restrictions may prohibit overt promotion of certain products. On television, covert advertising is particularly common in health and entertainment programs (Erol, 2017, p. 61). Similarly, newspapers often embed covert advertising within news articles, again catching consumers off guard and creating ethical concerns (Tomažic et al., 2014, p. 117).

On social media platforms, covert advertising is frequently encountered in influencer posts (Zengin & Zengin, 2021). In Türkiye, the Advertising Board of the Ministry of Commerce imposes sanctions against such

¹ Assoc. Prof. Dr. Güldane Zengin, Selçuk University Alaeddin Keykubat Campus Faculty of Communication No:422 Selçuklu/Konya, guldane@selcuk.edu.tr

practices. This study examines the Board's decisions through content analysis. These decisions, published as press releases, cover the period from January 2023 to July 2024. In total, 173 cases related to covert advertising were penalized during this timeframe.

Various studies on covert advertising have been conducted in Türkiye. The topic attracts interest not only from scholars in the field of advertising but also from disciplines such as law. Research in this area includes dissertations and books (e.g., Erol, 2017; Taşkaya, 2008; Özdil, 2023; Pektaş, 2007), as well as review articles (e.g., Atay, 2023; Aktekin & Gürbüz, 2009; Korkmaz, 2022; Çamdereli & Kocabay Şener, 2016; Erol, 2017). Some studies have specifically addressed covert advertising practices in newspapers (Eşiyok Sönmez, 2015) and health communication-related news articles (Taylan & Ünal, 2017). Although a few research articles analyze Advertising Board decisions and include data on covert advertising on television (e.g., Eşiyok, 2018; Çelik & Kükrer Aydın, 2016), these works do not focus exclusively on covert advertising itself.

As evidenced by the literature discussed above, there is a clear research gap concerning studies on the decisions made by the Advertising Board. Some existing works are outdated, not taking into account the latest regulatory changes, while most do not attempt to systematically analyze a large number of decisions. With the rise of social media influencers, the penalties issued against them have become a prominent topic of discussion in Türkiye, highlighting the need for a comprehensive review of the Board's recent decisions.

Thus, this study contributes to existing literature by examining the latest decisions made by the Advertising Board. Specifically, by analyzing various types of penalties across different media platforms, this study aims to provide a better understanding of the current scope of covert advertising practices. Furthermore, the findings may assist policymakers in revising and improving current regulations, helping to create an environment that discourages malicious actors while protecting ordinary users and well-intentioned influencers. Beyond imposing deterrent penalties, fostering mutual understanding and establishing clear, easily applicable rules would ultimately benefit both consumers and influencers.

Covert Advertising in Commercial Advertising and Unfair Commercial Practices Regulation

According to Arens et al. (2011, p. 8), "Advertising is the structured and composed non-personal communication

of information, usually paid for and usually persuasive in nature, about products (goods, services, and ideas) by identified sponsors through various media." Article 61 of Law No. 6502 on the Protection of Consumers (TKHK) (Resmi Gazete, 2013) similarly defines commercial advertisements as "announcements in the form of marketing communication made by advertisers through written, visual, audio, and similar means in any medium in order to ensure the sale or rental of a good or service in connection with trade, business, craft, or a profession, and to inform or persuade those who make up the target audience." As these definitions suggest, the basic elements of advertising include: conveying an informative or persuasive message, clearly identifying the advertiser, pursuing a commercial purpose, and being disseminated through a medium aimed at an audience.

Tomažič (2016, p. 244) created a typology of terms related to covert advertising and examined the concepts associated with it. In her study, she preferred the term covert advertising, which she used for "all texts that have been paid for and published in the form of journalistic texts and try to influence the public in terms of commercial benefits." In addition to Tomažič's typology, Alkhafagi and ALSiede (2022) suggest undercover marketing and buzz marketing as related terms. Moreover, there is the term "surreptitious advertising" especially used in Eur-Lex (Official Journal of the European Communities, 1989, p. 26) where it is defined as "the representation in words or pictures of goods, services, the name, the trade mark or the activities of a producer of goods or a provider of services in programmes when such representation is intended by the broadcaster to serve advertising and might mislead the public as to its nature." It is clear that there are many terms that scholars and practitioners are using interchangeably. Many studies in the communications literature (e.g., Tomažič et al., 2014; Göbel et al., 2017; De Veirman & Hudders, 2019; Wojdyski & Evans, 2019; Li et al., 2022; Pierre, 2023) adopt the term covert advertising; that convention is therefore followed in the present study.

Erol (2017, p. 45) defines covert advertising as any communication that is not clearly disclosed as advertising but whose message can still be understood by the average consumer. Although it may be difficult to prove whether a formal advertising agreement exists between the advertiser and the media organization, Erol emphasizes that the critical issue is the consumer's lack of awareness, leaving them vulnerable to undetected advertising exposure. Similarly, Wojdyski and Evans (2019, p. 4), in listing various types of covert advertising, argue that

a common characteristic is the missing, opaque, or obscured recognizability of the advertisement.

The Commercial Advertising and Unfair Commercial Practices Regulation (Resmi Gazete, 2015a) defines covert advertising as “the inclusion of names, brands, logos, or other distinctive forms or expressions related to goods or services in articles, news, publications, and programs for the purpose of advertising and presenting them in a promotional manner without clearly stating that it is advertising.” Although the definition mentions “articles, news, publications, and programs,” the regulation’s definition of “medium” is broad and includes the internet and “all kinds of communication channels.” According to Article 22 of the Regulation, covert advertising is prohibited. In addition, it is stated that advertisements must not be presented in a way that compromises editorial independence.

Further details on covert advertising are provided under the title “evaluation of covert advertisements” in the Regulation. Article 23 outlines specific rules concerning the use of distinctive elements such as brands, logos, and trade names within media content. These elements must be consistent with, and proportional to, the format, subject matter, presentation, and duration of the content. The primary purpose of the content should be to inform consumers and should not directly encourage the purchase of products or services. Additionally, the article addresses special content categories such as tourism, folklore, and urban documentaries, as well as product and service reviews. Brand and business information—such as signs or posters—should not be displayed prominently or exaggeratedly, and detailed contact information must not be included. The regulation also establishes guidelines for displaying brand and business names during urban area shots, interviews, and event coverage, emphasizing that brand elements should not be highlighted or overly emphasized.

Why Advertisers Resort to Covert Advertising and Ethical Issues?

The consumer’s most fundamental right is to know when a message has a commercial intent and to evaluate the content accordingly. This right is legally protected through the prohibition of covert advertising. Despite this prohibition, covert advertising remains widely used, resulting in violations of consumer rights (Atay, 2023, p. 222). It is also one of the most debated topics in the fields of advertising ethics and advertising regulation (Karadeniz, 2022, p. 954). Taşkaya (2008, p. 448) argues that covert advertising practices are deceptive because viewers do

not realize they are being exposed to advertising, and stresses that such practices conflict with the principles of fair competition. The strict enforcement of the ban on covert advertising in television programming has pushed advertisers toward social media platforms, where monitoring and control are more challenging (Karatepe Kaya, 2021, p. 709).

Erol (2017) identifies several reasons for the use of covert advertising: consumer-related factors, factors related to advertising effects, economic motives, legal constraints, and publishing policies. She attributes consumer-related reasons primarily to consumer resistance to advertising. Due to increasing media fragmentation and complexity, consumers today are exposed to thousands of commercial messages daily across both traditional media, such as television and newspapers, and digital environments (Kelly et al., 2010, p. 16; Dix & Phau, 2010). Consumers, overwhelmed by advertising clutter, actively seek to avoid advertisements. It is estimated that one-third of internet advertisements are blocked by ad-blocking applications. Consumers also ignore parts of web pages designated for advertisements, posing a significant challenge for marketers (Kelly L. et al., 2021, p. 343). As Boyer et al. (2015, p. 105) state, in a world saturated with advertising, marketers increasingly adopt covert methods to get their messages across.

Regarding factors related to advertising effects, advertising awareness plays a crucial role. When consumers recognize a message as advertising, they may engage in avoidance behaviors. This avoidance can take various forms, including physical avoidance (e.g., leaving the room or falling asleep), cognitive avoidance (e.g., engaging in conversation or shifting attention), or mechanical avoidance (e.g., zipping and zapping) (Dix & Phau, 2010, p. 115).

It should also be noted that overt advertising activates consumers’ persuasion knowledge, whereas covert advertising may be perceived as organic content (Wojdyski & Evans, 2019, p. 4). However, this strategy can backfire. Evidence suggests that once consumers recognize covert advertising, it leads to negative attitudes toward both the brand (van Reijmersdal et al., 2016, p. 1469) and the publisher (Amazeen & Wojdyski, 2020, p. 1978).

Advertisers and media outlets publishing advertisements are subject to tax liabilities arising from the advertisements they publish. In addition to high advertising costs, the legal obligation for media service providers to pay a 1.5% share of their commercial

communication revenues to the Radio and Television Supreme Council (RTÜK) (Resmi Gazete, 2015b) has been cited as an economic factor motivating covert advertising. When advertising is covert, however, advertisers and media outlets can avoid these costs (Erol, 2017).

There are also legal factors that lead to covert advertising. While certain products and services can be advertised with limitations, others are entirely prohibited. For instance, advertising is banned for products such as alcohol and tobacco, weapons, astrology services, and dating websites, as well as for medicines, supplements, herbal products marketed as medicinal, and the promotion of health-related products and services by praise (RTÜK, 2018; Türk Tabipleri Birliği, 2017). Since open advertising of these products is not permitted, they are often promoted through covert advertising in various media. In addition, both prohibited and non-prohibited products are often covertly advertised in the form of news content. Broadcasting policies further incentivize covert advertising. Health programs and entertainment shows, in particular, allocate significant space to covert advertisements. Some channels, particularly those with low annual commercial revenues, continue to broadcast such advertisements persistently, despite facing penalties. It has been suggested that fines imposed by RTÜK may in fact be covered by the advertisers (Erol, 2017, p. 61).

Covert advertisements have also been found in newspapers. Eşiyok Sönmez (2015) examined 106 Advertising Board decisions between 2010 and 2014, and documented penalties imposed on newspapers for publishing covert advertisements. The findings indicated that the health sector was the most frequent user of covert advertising, with some tobacco and alcohol brands also engaging in such practices. Furthermore, products and services subject to advertising bans were found to be more frequently promoted as news rather than through other types of programming (Çamdereli & Kocabay Şener, 2016, p. 222). However, according to Article 61/4 of the Consumer Protection Law (Resmi Gazete, 2013), it is prohibited to advertise through any text, news item, broadcast, or program without clearly stating that it is an advertisement. Ethical codes of journalism emphasize principles such as truthfulness, accuracy, and impartiality, and prohibit the use of journalism for propaganda or personal gain (Daştan, 2021, p. 41; Akdal, 2017, p. 2071). Thus, covert advertisements embedded within news content deceive readers and undermine journalistic integrity.

Covert advertising is frequently encountered not only in traditional media but also on social media platforms. Opinion leaders and influencers, in particular, engage in covert advertising practices (Atay, 2023, p. 232; Tam, 2020, p. 1326), creating an urgent need for new regulatory policies. In response, the Ministry of Trade published a guideline for social media influencers to ensure compliance with advertising regulations (T.C. Ticaret Bakanlığı, 2021). This guide, similar to the standards set by the Federal Trade Commission (2019) in the United States, specifies the types of disclosures influencers must make depending on the platform they use. In the event of a complaint, if the Advertising Board determines that the law has been violated, it may impose several sanctions: temporarily or permanently suspending the advertisement, requiring its correction, and/or imposing administrative fines on the responsible parties (Atay, 2023, p. 229).

METHODOLOGY

This study analyzes the covert advertising section of the Advertising Board decisions, as published by the Presidency of the Advertising Board. This section contains information on the sanctioned individuals and organizations, the justifications for the sanctions, and the specific laws and regulations cited. The study specifically examines how the sanctioned parties violated the law, the types of products or services that were covertly advertised, and the types of sanctions that were applied. It thus contributes to understanding enforcement patterns in covert advertising cases.

The research questions are:

RQ1: Which parties are most frequently penalized for covert advertising?

RQ2: What types of penalties are imposed?

RQ3: What reasons are cited for the penalties?

RQ4: Which categories of products and services are advertised covertly?

RQ5: Which CAUCPR articles are cited as being violated?

For RQ1–RQ4, the study further explores whether penalties differ by media vehicle.

The content analysis technique was used in the study. Content analysis is the careful, detailed, systematic examination and interpretation of a certain amount of material in an effort to identify patterns, themes, assumptions, and meanings (Berg & Lune, 2019, p. 344).

Table 1: Coding categories

Category	Values
Examined file	
Name of the party receiving the penalty	
Whether the penalized party is a person or organization	person, organization
How many instances of violations	
Media	internet, television, newspaper
Media vehicle	website, Instagram, X/Twitter, YouTube, Facebook, TikTok
Type of advertised product/service	electrical and electronic devices, clothing/accessories, personal care products/cosmetics, kitchen utensils, food/restaurant, accommodation, travel, health institution/healthcare worker, home decoration, cleaning products, alcohol, health products/supplements, marketplace store (such as Trendyol, Hepsiburada), market (such as Bim, A101), entertainment, events/organization, agency/production, other (automotive, bank, insurance)
Number of links, tags, hashtags, locations given	
Reason for penalties given	<p>Presence of links, tags, etc., but absence of expressions such as advertisement/collaboration</p> <p>Presence of expressions that praise, promote, direct, or create demand for purchases</p> <p>Going beyond the purpose of meeting consumers' need for enlightenment, information, and news reporting</p> <p>Promoting the product/service without links, tags, etc., and without using an expression indicating collaboration</p> <p>Being misleading to consumers and constituting a violation of fair competition principles</p> <p>Presenting the product as if it were a medicine or medical product</p> <p>By using small font sizes, failure to present labels such as advertisement, collaboration, partnership, etc. in a way that is immediately noticeable, easily readable, and visible to consumers</p> <p>Including misleading statements suggesting it's not an advertisement</p> <p>Making comparative advertising</p> <p>Disparaging one product while praising another</p>
Penalty given	penalty to suspend the advertisements mentioned, administrative fine
Violated articles	covers all articles in the CAUCPR (5, 6, 7, 8, 9, 10, 18, 22, 23, 26)

Purposive sampling, which is one of the non-probability sampling methods, was used in this study. "In a purposive sample, the researcher determines the characteristics of the target population and identifies units that match

these characteristics to include in the sample." (van Haute, 2021, s. 249).

A second rater coded a subset of the files and Cohen's Kappa analysis was performed to determine

the agreement between two raters. The Cohen's Kappa showed that for most of the categories, there was perfect agreement. For one of the categories, the level of agreement between the raters was above substantial levels ($\kappa=0.783$).

The evaluations and decisions made under the covert advertising section are primarily based on the Commercial Advertising and Unfair Commercial Practices Regulation (CAUCPR) and Article 61 of the Consumer Protection Law No. 6502. Article 61 outlines the general framework for commercial advertising and is referenced in nearly all files under the covert advertising title. While decisions are primarily based on the CAUCPR, depending on the content of the files, additional regulations such as the Cosmetics Regulation, the Regulation on Promotion and Information Activities in Health Services, and the Regulation on the Use of Health Declarations in Food and Supplementary Foods may also apply. However, in this study, the 12th item in the coding sheet focuses solely on the CAUCPR and does not consider these additional regulations.

The study examined all files under the covert advertising section in the Advertising Board's press releases published between January 2023 and July 2024. During this period, 19 press releases were issued. Two of these (numbered 333 and 336) did not include a covert advertising section, leaving 17 press releases for

examination. In total, 183 files were reviewed, however, 10 files resulted in the decision that "the relevant provisions of the CAUCPR and Article 61 of Law No. 6502 were not violated". Therefore, these were excluded from the analysis. Consequently, the final sample consisted of 173 files where sanctions were imposed. The study was conducted in August 2024.

It should be noted that the advertisements evaluated in these decisions pertain to earlier publication dates. In some cases, multiple advertisements published on different dates were evaluated collectively (for example, in a file from bulletin number 335 dated July 2023, the advertisement publication/access dates were 23.12.2022, 07.01.2023, 02.02.2023, and 04.02.2023). In such cases, multiple advertisements within the same product/service category were evaluated as a single instance. Furthermore, the analysis considered all forms of written and audio content. For social media platforms, stories, posts, highlights, tags, links, hashtags, locations, and both static and video posts were included in the Advertising Board's decisions.

The coding sheet used for data collection was refined following a pre-test. The categories addressed are listed in Table 1.

Table 2: Distribution of press releases

	n	%	Valid %	Cumulative %
329 (January 2023)	12	6,9	6,9	6,9
330 (February 2023)	8	4,6	4,6	11,6
331 (March 2023)	8	4,6	4,6	16,2
332 (April 2023)	10	5,8	5,8	22,0
334 (June 2023)	10	5,8	5,8	27,7
335 (July 2023)	7	4,0	4,0	31,8
337 (September 2023)	12	6,9	6,9	38,7
338 (October 2023)	15	8,7	8,7	47,4
339 (November 2023)	15	8,7	8,7	56,1
340 (December 2023)	10	5,8	5,8	61,8
341 (January 2024)	4	2,3	2,3	64,2
342 (February 2024)	14	8,1	8,1	72,3
343 (March 2024)	6	3,5	3,5	75,7
344 (April 2024)	6	3,5	3,5	79,2
345 (May 2024)	9	5,2	5,2	84,4
346 (June 2024)	18	10,4	10,4	94,8
347 (July 2024)	9	5,2	5,2	100,0
Total	173	100,0	100,0	

Table 3: Cross-tabulation for media vehicle and person/organization

		Party receiving penalty		Total
		Person	Organization	
Instagram	n	125	7	132
	% within Media vehicle	94,7	5,3	100,0
	% within Party receiving penalty	92,6	18,4	76,3
Website	n	1	19	20
	% within Media vehicle	5,0	95,0	100,0
	% within Party receiving penalty	,7	50,0	11,6
Facebook	n	2	0	2
	% within Media vehicle	100,0	,0	100,0
	% within Party receiving penalty	1,5	,0	1,2
X	n	2	3	5
	% within Media vehicle	40,0	60,0	100,0
	% within Party receiving penalty	1,5	7,9	2,9
YouTube	n	4	2	6
	% within Media vehicle	66,7	33,3	100,0
	% within Party receiving penalty	3,0	5,3	3,5
Tiktok	n	1	0	1
	% within Media vehicle	100,0	,0	100,0
	% within Party receiving penalty	,7	,0	,6
TV Channel	n	0	5	5
	% within Media vehicle	,0	100,0	100,0
	% within Party receiving penalty	,0	13,2	2,9
Newspaper	n	0	2	2
	% within Media vehicle	,0	100,0	100,0
	% within Party receiving penalty	,0	5,3	1,2
Total	n	135	38	173
	% within Media vehicle	78,0	22,0	100,0
	% within Party receiving penalty	100,0	100,0	100,0

The identity of the parties receiving the penalty has not been disclosed in the study to protect their privacy. The first four articles in the first part of the CAUCPR consist of purpose, scope, basis, and definitions, so they are not among the violated articles in the Advertising Board decisions. Therefore, in the coding sheet regarding violated articles, the listing begins with Article 5.

FINDINGS

The study examines 19 press releases listed under the “Advertising Board Decisions” section on the Board’s website, published between January 2023 and July 2024.

As explained in the methodology section, two of these press releases (numbers 333 and 336) do not contain a section dedicated to covert advertising.

When the table is examined on a monthly basis, it can be seen that the highest number of penalties (n=18) were issued in June 2024 (in the press release number 346). Comparing the first seven months of 2023 and 2024, 55 files were found to contain covert advertising in 2023, while 66 files did so in 2024. Throughout 2023, 97 suspension orders and 10 administrative fines were issued. Looking specifically at the first seven months

of 2023, 49 suspension orders and 6 administrative fines can be observed. Comparing these figures to the same period in 2024, it can be seen that the number of administrative fines has increased, with 54 suspension orders and 12 administrative fines issued.

When the number of administrative fines is compared by year, it can be seen that there is an increase in the first seven months of 2024 compared to all of 2023. Therefore, it is reasonable to expect that the Advertising Board will issue even more fines in the remaining months of 2024, indicating a rising trend in administrative penalties.

More than three-quarters (78%) of the covert advertising penalties were issued to people, i.e. influencers. When examined by medium, it can be seen that the most penalized covert advertisements are those made on Instagram (76,3%). Covert advertisements are mostly found on the Internet, particularly on social media

and websites (96%). Sanctions have also been imposed on covert advertisements broadcast on television (2,9%) and published in newspapers (1,2%).

Across all media, penalties for covert advertising were issued most frequently on Instagram (76,3%), followed by websites (11,6%) and YouTube (3,5%). A comparison of traditional and new media shows that the majority of penalties (96%) were issued about new media.

In addition, according to the cross-tabulation, when Instagram is taken into consideration, nearly all of the penalized parties are individuals (94,7%). However, the results are reversed for traditional media and websites. All penalized parties are organizations (TV channels and newspapers). And only one (0,7%) individual for websites. Moreover, the chi-square test indicates a statistically significant difference ($X^2(7) = 114,005, p=0$).

Table 4: Cross-tabulation for media vehicle and type of penalty received

		Order to suspend advertising	Order to suspend advertising and administrative fines	Total
Instagram	n	116	16	132
	% within Media vehicle	87,9	12,1	100,0
	% within Type of penalty received	76,8	72,7	76,3
Website	n	20	0	20
	% within Media vehicle	100,0	,0	100,0
	% within Type of penalty received	13,2	,0	11,6
Facebook	n	1	1	2
	% within Media vehicle	50,0	50,0	100,0
	% within Type of penalty received	,7	4,5	1,2
X	n	5	0	5
	% within Media vehicle	100,0	,0	100,0
	% within Type of penalty received	3,3	,0	2,9
YouTube	n	3	3	6
	% within Media vehicle	50,0	50,0	100,0
	% within Type of penalty received	2,0	13,6	3,5
Tiktok	n	1	0	1
	% within Media vehicle	100,0	,0	100,0
	% within Type of penalty received	,7	,0	,6
TV Channel	n	4	1	5
	% within Media vehicle	80,0	20,0	100,0
	% within Type of penalty received	2,6	4,5	2,9
Newspaper	n	1	1	2
	% within Media vehicle	50,0	50,0	100,0
	% within Type of penalty received	,7	4,5	1,2
Total	n	151	22	173
	% within Media vehicle	87,3	12,7	100,0
	% within Type of penalty received	100,0	100,0	100,0

Table 5: Reasons for penalty received

	n	%
A. Presence of links, tags, etc., but absence of expressions such as advertisement/collaboration	125	72,3
B. Presenting the product as if it were a medicine or medical product	17	9,8
C. Being misleading to consumers and constituting a violation of fair competition principles	25	14,5
D. Including misleading statements suggesting that the message in question is not an advertisement	1	0,6
E. Promoting the product/service without links, tags, etc., and without using collaboration expressions	27	15,6
F. Presence of expressions that praise, promote, direct, or create demand for purchases	55	31,8
G. By using small font sizes, failure to present advertisement, collaboration, partnership, etc. labels in a way that is immediately noticeable, easily readable, and visible to consumers	6	3,5
H. Going beyond the purpose of meeting consumers' need for enlightenment, information, and news	28	16,2
I. Comparative advertising	1	0,6
J. Disparaging one product while praising another	1	0,6

The penalty to suspend the advertisement was issued in all cases. However, as Table 4, shows, in 12,7% of cases, this penalty was coupled with an administrative fine. The rest of the cases (87,3%) did not include fines, just suspension of the ad in question. Additionally, it can be seen from the table that although most penalties were issued for Instagram, administrative fines amount to only 12,1% for this media vehicle. The table also shows that for websites, X and Tiktok, the only penalty given is to suspend advertising; no administrative fines issued. In addition, chi-square test indicates a statistically significant difference ($X^2(7) = 16,593, p=0,02$).

Various reasons have been cited as grounds for imposing penalties, and a single file may contain multiple

reasons. Among these, the most common reason was the presence of links, tags, or similar elements without clear expressions such as “advertisement” or “collaboration” (72,3%). This was followed by the presence of expressions that praise, promote, direct, or create demand for purchases (31,8%).

When reasons for penalties are cross-tabulated with types of penalties, it is observed that the order to suspend advertising dominates for all reasons. However, administrative fine ratios are relatively higher for certain reasons. The highest ratio is for “presenting the product as if it were a medicine or medical product” (35,3%), followed by misleading consumers and violating fair competition principles (32%).

Table 6. Cross-tabulation for media vehicle and reasons of penalty received

		A	B	C	D	E	F	G	H	I	J	TOTAL
Instagram	n	118	13	19	1	3	32	6	8	1	1	202
	% within Media vehicle	58,4	6,4	9,4	0,5	1,5	15,8	3,0	4,0	0,5	0,5	100,0
Website	n	2	2	2	0	11	12	0	13	0	0	42
	% within Media vehicle	4,8	4,8	4,8	0,0	26,2	28,6	0,0	31,0	0,0	0,0	100,0
Facebook	n	1	1	1	0	1	0	0	1	0	0	5
	% within Media vehicle	20,0	20,0	20,0	0,0	20,0	0,0	0,0	20,0	0,0	0,0	100,0
X	n	1	0	0	0	3	4	0	0	0	0	8
	% within Media vehicle	12,5	0,0	0,0	0,0	37,5	50,0	0,0	0,0	0,0	0,0	100,0
YouTube	n	2	0	1	0	4	4	0	1	0	0	12
	% within Media vehicle	16,7	0,0	8,3	0,0	33,3	33,3	0,0	8,3	0,0	0,0	100,0
Tiktok	n	1	1	1	0	0	1	0	0	0	0	4
	% within Media vehicle	25,0	25,0	25,0	0,0	0,0	25,0	0,0	0,0	0,0	0,0	100,0
TV Channel	n	0	0	0	0	3	2	0	3	0	0	8
	% within Media vehicle	0,0	0,0	0,0	0,0	37,5	25,0	0,0	37,5	0,0	0,0	100,0
Newspaper	n	0	0	1	0	2	0	0	2	0	0	5
	% within Media vehicle	0,0	0,0	20,0	0,0	40,0	0,0	0,0	40,0	0,0	0,0	100,0
TOTAL	n	125	17	25	1	27	55	6	28	1	1	286
	% within Media vehicle	43,7	5,9	8,7	0,3	9,4	19,2	2,1	9,8	0,3	0,3	100,0

Table 7. Product/service category distribution

	n	%
Clothing /Accessories	63	36,4
Personal Care/Cosmetics	52	30,1
Food/Restaurant	52	30,1
Marketplace store	33	19,1
Accommodations	21	12,1
Healthcare institution/Healthcare worker	18	10,4
Health Products/Supplements	16	9,2
Entertainment	16	9,2
Travel	15	8,7
Electronic equipment	14	8,1
Others	11	6,4
Kitchen utensils	10	5,8
Events/Organizations	10	5,8
Market	8	4,6
Home decoration	7	4,0
Agency/Production	7	4,0
Alcohol	5	2,9
Cleaning products	3	1,7

As shown in the table, the most common reason for penalties for different medium are as follows: On Instagram, the presence of links, tags, etc., but the absence of expressions such as advertisement/collaboration (58,4%); on websites, going beyond the purpose of meeting consumers' need for enlightenment, information, and news (31%); on X (formerly Twitter), presence of expressions that praise, promote, direct, or create demand for purchases (50%); on newspapers, promoting the product/service without links, tags, etc., and without using collaboration expressions and going beyond the purpose of meeting consumers' need for enlightenment, information, and news are both 40%.

In the Advertising Board's press release, the most frequently covertly advertised categories are clothing/accessories (36,4%), personal care/cosmetics (30,1%), and food/restaurants (30,1%). It has been found that products and services for which advertising is prohibited, such as praising health institutions/health workers (10,4%), health products/supplements (9,2%), and alcoholic products (2,9%), were also covertly advertised.

It has been revealed that the files of the penalized parties were evaluated under covert advertising for a minimum of one post and a maximum of 18 posts. Among the 173 files examined, 126 (72,8%) directed consumers to the advertiser by sharing tags/links/hashtags/locations. In the remaining 47 files, the product/service description was present either verbally or in writing.

On Instagram, most of the penalties are issued for clothing/accessories (19,7%), personal care/cosmetics (15,6%), and food/restaurants (13,1%) categories. On websites, the most penalties are for health institutions/health workers (17,4%). Health products/supplements (68,8%) with advertising restrictions are most penalized on Instagram, health institutions and organizations (66,7%) are most penalized on Instagram; alcohol is most penalized (60%) on YouTube for covert advertising. Marketplace stores matched with influencers were most commonly found on Instagram (97%) according to the Advertising Board's evaluations.

The penalties under the covert advertising section were evaluated according to certain articles in the CAUCPR (Resmi Gazete, 2015a). Table 9 lists the articles by their numbers, with details provided in the appendix. All files show violations of articles 22 and 23 of the regulation covering the prohibition of covert advertising. In the second part of the regulation, under the title of accuracy and honesty, articles 7/1, 7/2, 7/3 (99,4%), 7/4, 7/5 (97,7%), and under the title of advertisement distinction, articles 6/1, 6/3 (97,1%), 6/4 (95,4%) were violated in almost all files.

CONCLUSION

Today, consumers are bombarded with advertisements across both traditional and digital media. As a result, they increasingly tend to avoid advertising. Covert advertising, however, catches consumers off guard.

Table 8. Cross tabulation for media vehicle and product/service category

		Electronic equipment	Clothing /Accessories	Personal Care/Cosmetics	Kitchen utensils	Food/Restaurant	Accommodations	Travel	Healthcare Institution/Healthcare	Home decoration	Cleaning products	Alcohol	Health Products/Supplements	Marketplace store	Market	Entertainment	Events/Organizations	Agency/Production	Others
Instagram	n	10	62	49	10	41	19	15	12	6	3	2	11	32	5	13	10	7	7
	%	71,4	98,4	94,2	100,0	78,8	90,5	100,0	66,7	85,7	100,0	40,0	68,8	97,0	62,5	81,3	100,0	100,0	63,6
Website	n	2	1	1	0	3	1	0	4	1	0	0	2	0	3	2	0	0	3
	%	14,3	1,6	1,9	0,0	5,8	4,8	0,0	22,2	14,3	0,0	0,0	12,5	0,0	37,5	12,5	0,0	0,0	27,3
Facebook	n	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	%	0,0	0,0	0,0	0,0	3,8	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
X	n	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	1
	%	0,0	0,0	0,0	0,0	5,8	4,8	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	9,1
YouTube	n	2	0	1	0	1	0	0	0	0	0	3	0	1	0	0	0	0	0
	%	14,3	0,0	1,9	0,0	1,9	0,0	0,0	0,0	0,0	0,0	60,0	0,0	3,0	0,0	0,0	0,0	0,0	0,0
Tiktok	n	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	%	0,0	0,0	1,9	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	6,3	0,0	0,0	0,0	0,0	0,0	0,0
TV Ch.	n	0	0	0	0	1	0	0	2	0	0	0	1	0	0	1	0	0	0
	%	0,0	0,0	0,0	0,0	1,9	0,0	0,0	11,1	0,0	0,0	0,0	6,3	0,0	0,0	6,3	0,0	0,0	0,0
Newspaper	n	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
	%	0,0	0,0	0,0	0,0	1,9	0,0	0,0	0,0	0,0	0,0	0,0	6,3	0,0	0,0	0,0	0,0	0,0	0,0
TOTAL	n	14	63	52	10	52	21	15	18	7	3	5	16	33	8	16	10	7	11
	%	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Table 9. Violated Articles of the CAUCPR

Article	n	%	Article	n	%
26	32	18,5	7/2	172	99,4
5/1b	7	4,0	7/3	172	99,4
6	4	2,3	7/4	169	97,7
6/1	168	97,1	7/5	169	97,7
6/3	168	97,1	7/8	1	0,6
6/4	165	95,4	8/1	2	1,2
9/1	13	7,5	10/1	2	1,2
9/2	12	6,9	22/1	3	1,7
9/3	1	0,6	22	170	98,3
9/4	8	4,6	23/1a	173	100,0
9/5	11	6,4	23/1b	170	98,3
18/1	1	0,6	23/1c	173	100,0
7/1	172	99,4			

Covert advertising practices appear in all types of media, but the Advertising Board evaluates and penalizes such practices when a violation is identified. The Advertising Board is not a judicial body but oversees advertising regulation in Türkiye and its monthly bulletins publish

inspection outcomes and imposed sanctions across all media (Arat & Şimşek, 2025, p.268).

In this study, the files under the covert advertising sections of press releases published between January

2023 and July 2024 were analyzed using content analysis. According to the findings, a total of 173 files were penalized for covert advertising, with 78% of these violations occurring in digital media. Instagram, in particular, accounted for a large portion of covert advertising cases (76,3%). Each file may contain multiple instances of violations, with up to 18 instances evaluated in a single file.

It was revealed that the most advertised product/service categories were clothing/accessories (36,4%), personal care/cosmetics (30,1%) and food/restaurant (30,1%); with these covert advertisements primarily found on Instagram. In addition, it is seen that covert advertising is also made for products and services whose advertising is prohibited, such as health institutions/health workers (10,4%), health products/supplements (9,2%), and alcoholic products (2,9%).

A large portion of covert advertisements involved directing consumers to brands and products via tags, links, hashtags, or locations. These are elements of social media which can be included in the advertisement in a more interactive and easier way compared to traditional media. In addition, some directed the consumer by verbal, written or visual means. It was found that redirections to marketplace stores are mostly conducted through Instagram.

It was also found that penalties were most frequently issued for the presence of link, tag, etc. but the absence of expressions such as advertisement/collaboration (72,3%). It is followed by expressions that praise, promote, guide, and create demand for purchase (31,8%). It is also interesting that there is a file penalized for using the expression "not an advertisement", indicating that such disclaimers are insufficient to avoid penalties.

Although numerous studies have examined the decisions of the Advertising Board, the scopes and timeframes of these studies vary considerably, making direct comparisons challenging. For instance, Eşiyok (2018) focused solely on penalties issued to television broadcasters and found that only one out of 62 cases involved covert advertising. Similarly, Çelik and Kükrer (2016) analyzed television-related files and reported that 9,9% of the cases were penalized for covert advertising. In contrast, Eşiyok Sönmez (2015) examined newspaper-related cases and identified covert advertising in 106 out of 136 instances. The present study, by comparison, adopts a broader approach by analyzing multiple media platforms; however, it focuses exclusively on covert advertising cases.

Implications for Regulators, Influencers and Consumers in General

There are advertising regulations in many different countries around the world, and these regulations frequently involve sanctions (Mangani & Pacini, 2025). Nevertheless, issues similar to those addressed in this study are also encountered in other countries. For instance, in Nordic countries, it is required that social media posts containing advertising content clearly and explicitly indicate that they are advertisements. Despite this requirement, businesses and influencers attempting to engage in commercial communication without adhering to the established rules are still observed. Difficulties in monitoring compliance with regulations and enforcing penalties are cited as the primary reasons for this situation (Abidin et al., 2020).

Asquith and Fraser (2020) discuss problems related to the enforcement of regulations in the United States, Canada, and the United Kingdom. Chief among these are the self-regulatory structures of organizations such as the ASA and IAB, and the failures of entities like the FTC in monitoring and implementing sanctions. They particularly emphasize that the rapidly evolving nature of digital media exacerbates these challenges. Silver et al. (2023) argue that digital media poses significant challenges for regulators and that the FTC's guidelines are inadequate. They further assert that stronger enforcement of these guidelines is necessary.

Mangani and Pacini (2025) found that, although the amount of monetary penalties varies depending on the firm's size, sector, and the platform where the advertisement is published, the overall increase in fines has been generally effective. Gonzalez-Diaz and Quintas-Froufe (2024) propose the imposition of deterrent sanctions, such as the temporary suspension of influencers' posts, in cases where guidelines are not followed in digital media. Additionally, the authors suggest that advertisers should also be held accountable.

In this study, it was found that the main reason for the sanctions is that they do not include any of the expressions such as advertisement, collaboration, partnership as required by the Ministry of Trade's guide for social media influencers. Influencers, on the other hand, look at the situation from their own perspective. They claim that even though they do not collaborate with brands, they risk being penalized if they mention any brand. However, as Boerman et al. (2017) point out, there may be various motivations behind such posts, and these may not be clear for the consumer. This also applies when an

influencer presents their own brand to consumers. Some influencers argue that there is nothing covert when it comes to their own brands, so they do not have to write the collaboration statement (Cumhuriyet Gazetesi, 2024). Nevertheless, the guide for social media influencers (T. C. Ticaret Bakanlığı, 2021) does not distinguish advertising of influencers' own brands from collaborations with other brands. Thus, the regulation remains justified, given the difficulty of discerning the true intentions behind posts.

Although the administrative fines issued (amounting to 550,059 TL) are considerable, they are arguably not sufficiently deterrent, as 87,3% of penalties involve only a suspension. By the time action is taken, consumers have often already been exposed to covert advertisement. However, findings show that administrative fines have increased in the first seven months of 2024 compared to all of 2023, suggesting a move toward greater deterrence. However, there may be a better solution. As Korkmaz (2022) suggests, the application of these penalties should be fair, and influencers with a thousand followers and influencers with one million followers should not be given the same amount of fine; there should be lower and upper limits. Consequently, instead of imposing significant administrative fines for a small number of parties, the number of fines should increase, but the monetary amount should be scaled in accordance with the party's influence, such as audience size or follower count. Another approach could involve adopting Gonzalez-Diaz and Quintas-Froufe's (2024) suggestion of imposing temporary bans on influencer accounts. Clearly, a new and more nuanced regulatory framework is needed to better address covert advertising on digital platforms.

Limitations and Suggestions for Future Research

Despite the comprehensive approach of this study, several limitations should be acknowledged. First, the study relies solely on the decisions published by the Advertising Board within a specific timeframe (January 2023–July 2024), which may not fully capture the broader landscape of covert advertising practices beyond this period. As the data were restricted to officially sanctioned cases, instances of covert advertising that were either undetected or unresolved by the Board remain outside the scope of this research.

Future research could explore influencers' and consumers' perspectives. It would be valuable to investigate influencers' attitudes toward the penalties: Do they find the sanctions fair, deterrent, or coercive? The consumer perspective is also important: Are they

aware of these regulations, and do they believe the rules offer them protection? When a penalty is imposed on an influencer, how does it affect the level of trust between the influencer and the consumer? Future research might also broaden the scope of this study to uncover more about the patterns and implications of such penalties.

REFERENCES

- Abidin, C., Hansen, K., Hogsnes, M., Newlands, G., Nielsen, M. L., Nielsen, L. Y., & Sihvonen, T. (2020). A review of formal and informal regulations in the Nordic influencer industry. *Nordic Journal*, 2, 71-83. doi: 10.2478/njms-2020-0007.
- Akdal, T. (2017). Haberciliğin etik kodları bağlamında gazetecilerin polis adliye haberlerine ve haber öznelerine bakışıyla ilgili bir derinlemesine mülakat çalışması. *Ulakbilge*, 5(18), 2067-2085.
- Aktekin, U., & Gürbüz, B. (2009). Türkiye’de örtülü reklamlar ve uygulamadaki durum. *Ankara Barosu Fikri Mülkiyet ve Rekabet Hukuku Dergisi*, 9(4) 41-55.
- Alkhafa, Y.A.M., & ALSiede, Y.A.H. (2022). Is the stealth marketing an element of promotion mix? A review of the techniques. *Webology*, 19(1), 6246- 6266.
- Amazeen, M. A., & Wojdyski, B. (2020). The effects of disclosure format on native advertising recognition and audience perceptions of legacy and online news publishers. *Journalism*, 21(12), 1965-1984. doi: 10.1177/14648849187548.
- Arat, A., & Şimşek, S. (2025). Reklam yoluyla tüketicilerin satın alma davranışının etkilenmesi örneği olarak örtülü reklamlar ve bunların hukuki denetimi. *Manas Sosyal Araştırmalar Dergisi*, 14(1), 260-273. doi:10.33206/mjss.1504663.
- Arens, W., Weigold, M., & Arens, C. (2011). *Contemporary advertising and integrated marketing communications*. McGraw-Hill.
- Asquith, K., & Fraser, E. M. (2020). A critical analysis of attempts to regulate native advertising and influencer marketing. *International Journal of Communication*, 14, 5729–5749.
- Atay, G. (2023). Örtülü “influencer” reklamlarının idari denetimi, *İstanbul Medipol Üniversitesi Hukuk Fakültesi Dergisi*, 10(1) 209-236.
- Berg, B., & Lune, H. (2019). *Sosyal bilimlerde nitel araştırma yöntemleri*. Eğitim Yayınevi.
- Boerman, S. C., Willemsen, L. M., & Van Der Aa, E. P. (2017). “This post is sponsored” effects of sponsorship disclosure on persuasion knowledge and electronic word of mouth in the context of Facebook. *Journal of Interactive Marketing*, 38(1), 82-92. doi: 10.1016/j.intmar.2016.12.002.
- Boyer, S. L., Edmondson, D. R., Baker, B., & Solom, P. (2015). Word-of-mouth, traditional and covert marketing: Comparative studies, *Academy of Marketing Studies Journal*, 19(1), 102.
- Cumhuriyet Gazetesi. (2024). *Sosyal medyadan isyan etti: Temizlik videolarıyla tanınan Cem Özkök’e 500 bin liralık ceza*, 7July, available at: <https://www.cumhuriyet.com.tr/turkiye/sosyal-mediyadan-isyan-etti-temizlik-videolarıyla-taninan-cem-ozkoke-2231251>
- Çamdereli, M., & Kocabay Şener, N. (2016). Örtülü reklamın örtüsünü aralamak, *Akdeniz Üniversitesi İletişim Fakültesi Dergisi*, 25, 211-224. doi: 10.31123/akil.438543.
- Çelik, Y., & Kükrer Aydın, Ö. (2016). Reklamların idari denetimi: Televizyon reklamlarına ilişkin reklam kurulu kararlarının analizi, *Gümüşhane Üniversitesi İletişim Fakültesi Elektronik Dergisi*, 4(4), 220-252. doi: 10.19145/guifd.84422.
- Daştan, F. (2021). Gazetecilikte haberin objektiflik niteliği, *EURO Politika*, 9, 41-50.
- DeVeirman, M., & Hudders, L. (2019). Disclosing sponsored Instagram posts: the role of material connection with the brand and message-sidedness when disclosing covert advertising, *International Journal of Advertising*, 39(1), 94–130, doi: 10.1080/02650487.2019.1575108
- Dix, S., & Phau, I. (2010). Television advertising avoidance: Advancing research methodology, *Journal of Promotion Management*, 16(1-2), 114–133. doi: 10.1080/10496490903574013.
- Göbel, F., Meyer, A., Ramaseshan, B., & Bartsch, S. (2017), Consumer responses to covert advertising in social media, *Marketing Intelligence & Planning*, 35(5), 578-593, doi: 10.1108/MIP-11-2016-0212
- Erol, A. (2017). *Türk hukukunda örtülü reklam* (Publication No. 494164) [Master’s thesis, İstanbul Şehir Üniversitesi]. Ulusal Tez Merkezi. <https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp>
- Eşiyok Sönmez, E. (2015). Gazetelerde yer alan örtülü reklamlar: Reklam Kurulu kararları üzerinden bir inceleme, *İletişim Kuram ve Araştırma Dergisi*, 41, 192-206.
- Eşiyok, E. (2018). Türkiye’de reklamların denetimi: Reklam Kurulu kararları üzerinden bir inceleme, *İnönü*

- Üniversitesi Hukuk Fakültesi Dergisi*, 9(2), 593-606, doi: 10.21492/inuhfd.483229.
- Federal Trade Commission (FTC). (2019). Disclosures 101 for social media influencers, available at: <https://www.ftc.gov/business-guidance/resources/disclosures-101-social-media-influencers>.
- González-Díaz, C., & Quintas-Froufe, N. (2024). Regulating influencers' commercial communication: No legislation, hardly any self-regulation and policy recommendations. *Policy & Internet*, 16, 859-878 .doi: 10.1002/poi3.411.
- Karadeniz, Ö. (2022). Reklam etiği ve Türkiye'de reklam denetimi: Vodafone, TEB ve Coca Cola örneği, *RumeliDE Dil ve Edebiyat Araştırmaları Dergisi*, 31, 946-974. doi: 10.29000/rumelide.1222162.
- Karatepe Kaya, M. (2021). Sosyal medya etkileyicileri tarafından internet aracılığıyla yapılan reklamlara ilişkin hukuki düzenlemelerin değerlendirilmesi, *Ankara Üniversitesi Hukuk Fakültesi Dergisi*, 70(3), pp. 667-719. doi: 10.33629/auhfd.927424.
- Kelly, L., Kerr, G., & Drennan, J. (2010). Avoidance of advertising in social networking sites: The teenage perspective, *Journal of Interactive Advertising*, 10(2), 16-27. doi: 10.1080/15252019.2010.10722167.
- Kelly, L., Kerr, G., Drennan, J., & Fazal-E-Hasan, S. (2021). Feel, think, avoid: Testing a new model of advertising avoidance, *Journal of Marketing Communications*, 27(4), 343-364, doi: 10.1080/13527266.2019.1666902.
- Korkmaz, A. (2022). Sosyal medya etkileyicilerinin yaptığı tanıtımların örtülü reklam yasağı bakımından değerlendirilmesi, *TBB Dergisi*, 35(160), 181-210.
- Li, D., Chow, U. T., & Cheong, C. Y. M. (2022). A Critical Genre Analysis of Covert Advertising Through Short-Videos in Douyin: The Chinese Version of Tik-Tok. *SAGE Open*, 12(4). doi: 10.1177/21582440221134608
- Mangani, A., & Pacini, B. (2025). The impact of fines on deceptive advertising: evidence from Italy. *Journal of Consumer Policy*, Springer 48(1), 23-50. doi: 10.1007/s10603-024-09579-6.
- Official Journal of the European Communities. (1989). "Council", 2 October, available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31989L0552>
- Özgül, Ö. (2023). Tüketici hukuku bakımından sosyal medyada örtülü reklam (Publication No. 802069) [TOBB Ekonomi ve Teknoloji Üniversitesi]. Ulusal Tez Merkezi. <https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp>
- Pektaş, Ö. (2007). Tüketicinin korunması açısından reklam kurulu çalışmaları, M. Babaoğlu and A. Şener (Eds.), *Tüketici yazıları (I)*, Hacettepe Üniversitesi Hastaneleri Basımevi, Ankara, pp. 89-96.
- Pierre, L. (2023). The effect of covert advertising recognition on consumer attitudes: A systematic review. *Journal of Marketing Communications*, 30(8), 1077-1098. doi: 10.1080/13527266.2023.2184851
- Resmi Gazete. (2013). "Tüketicinin korunması hakkında kanun", 28 November, available at: <https://www.resmigazete.gov.tr/eskiler/2013/11/20131128-1.htm>
- Resmi Gazete. (2015a). "Ticari reklam ve haksız ticari uygulamalar yönetmeliği", 10 January, available at: <https://www.mevzuat.gov.tr/mevzuat?Mevzuat-No=20435&MevzuatTur=7&MevzuatTertip=5>
- Resmi Gazete. (2015b). "Medya hizmet sağlayıcı kuruluşlarının elde ettiği ticari iletişim gelirlerinin denetimi ve bu gelirler üzerinden alınacak üst kurul paylarının beyan ve ödenmesine ilişkin usul ve esaslar hakkında yönetmelik", 16 July, available at: <https://www.resmigazete.gov.tr/eskiler/2015/07/20150716-9.htm>
- RTÜK. (2018). "Görsel – işitsel medyada ticari iletişim mevzuatı ve uygulamaları", 24 January, available at: <https://www.rtuk.gov.tr/gorsel-isitsel-medyada-ticari-iletisim-mevzuati-ve-uygulamaları/3559>
- Silver, N. A., Bertrand, A., Kucherlapaty, P., & Schillo, B. A. (2023). Examining influencer compliance with advertising regulations in branded vaping content on Instagram. *Front Public Health*, 10, 1-7. doi: 10.3389/fpubh.2022.1001115.
- T. C. Ticaret Bakanlığı. (2021). "Sosyal medya etkileyicileri tarafından yapılan ticari reklam ve haksız ticari uygulamalar hakkında kılavuz", 5 May, available at: <https://tuketici.ticaret.gov.tr/duyurular/sosyal-medya-etkileyicileri-tarafından-yapılan-ticari-reklam-ve-haksiz-ticari-uyg>
- Tam, M. S. (2020). Sosyal medya etkileyicilerinin kanaat önderliği rolü, *Gümüşhane Üniversitesi İletişim Fakültesi Elektronik Dergisi*, 8(2), 1325-1351. doi: 10.19145/e-gifder.726057.

- Taşkaya, M. (2008). Türkiye’de neo-liberal süreçte örtülü reklam deneyimi: Düzenlemeler, denetim ve aktörler. Doctoral dissertation, Ankara University.
- Taylan, A., & Ünal, R. (2017). Ana akım medyada sansasyonel habercilik: Sağlık iletişimi örneği, *Atatürk İletişim Dergisi*, 14, 27-44.
- Tomažič, T. (2016). The growth of covert advertising in the context of local self-government. *Lex localis- Journal of Local Self-Government*, 14(4), 739-758, doi:10.4335/14.4.739-758.
- Tomažič, T., Boras, D., Jurišić, J., & Lesjak, D. (2014). Covert advertising as inadmissible presentation of information, *Industrial Management & Data Systems*, 114(1), 107-122. doi: 10.1108/imds-04-2013-0204.
- Türk Tabipleri Birliği. (2017). “Hekimler ile sağlık kurum ve kuruluşlarının elektronik ortamlardaki paylaşımlarına ilişkin kılavuz”, 17 February, available at: https://www.ttb.org.tr/yazisma_goster.php?Guid=f2e81512-8840-11e7-8318-948af52f0cac
- van Haute, E. (2021). Sampling techniques: Sample types and sample sizes, J. F. Morin, C. Olsson and E. Ö. Atıkcın (Eds.), *Research methods in the social sciences: An A-Z of key Concepts*, Oxford University Press, Oxford, OUP, pp. 247-251.
- van Reijmersdal, E. A., Fransen, M. L., van Noort, G., Oprea, S. J., Vandeberg, L., Reusch, van Lieshout, F., & Boerman, S. C. (2016). Effects of disclosing sponsored content in blogs: How the use of resistance strategies mediates effects on persuasion, *Strategies Mediates Effects on Persuasion. American Behavioral Scientist*, 60(12), 1458-1474. doi: 10.1177/0002764216660141.
- Wojdyski, B. W., & Evans, N. J. (2019). The Covert Advertising Recognition and Effects (CARE) model: Processes of persuasion in native advertising and other masked formats, *International Journal of Advertising*, 39(1), 4-31. doi: 10.1080/02650487.2019.1658438.
- Zengin, G., & Zengin, A. M. (2021). An analysis on the ways brands are featured in celebrity posts on Instagram and the level of Sponsorship disclosure, *Selçuk İletişim*, 14(1), pp. 1-22, doi: 10.18094/josc.773238.

APPENDIX

Articles of Commercial Advertising and Unfair Commercial Practices Regulation (CAUCPR) mentioned in the study (Resmi Gazete, 2015a).

5/1 Advertisements;

b) Cannot be of a nature that damages public health.

6/1 Regardless of its form and medium of publication, an advertisement must be clearly recognizable as an advertisement.

6/2 Advertisements cannot be made using electronic devices or other tools displaying images for very brief durations, or by manipulating their structure in a way that viewers cannot notice or know, enabling subliminal perception.

6/3 Advertisements must be clearly distinguishable from editorial content both visually and audibly.

6/4 When a title, logo, set, or music identified with any published writing, broadcast, or program in any medium is used in an advertisement, the message must be easily recognizable as an advertisement by consumers.

6/5 When an image or sound effect associated with news bulletins or public service announcements is used in an advertisement, the message must be easily recognizable as an advertisement by consumers.

7/1 Advertisements must be truthful and honest.

7/2 Advertisements must be prepared with economic and social responsibility and in a way that does not lead to unfair competition.

7/3 Advertisements must be prepared considering the average consumer’s perception level and the potential impact of the advertisement on consumers.

7/4 Advertisements cannot abuse consumer trust or exploit their lack of experience and knowledge.

7/5 Advertisements cannot contain statements or images that may directly or indirectly mislead consumers about any matter, including but not limited to:

a) Product characteristics such as: structure, composition, supply, benefits, risks, accessories, production method and date, fitness for purpose, usage method, lifespan and areas of use, technical specifications, efficiency and performance, quantity, origin, environmental impact,

- b) Service qualities,
 - c) Trade name, business name, status, and areas of authority of the person or organization offering goods or services,
 - ç) Value of goods or services and actual total price to be paid,
 - d) Other payment terms such as lease, rental, installment sales, and credit sales,
 - e) Delivery, replacement, take-back, warranty, after-sales services, spare parts or maintenance and repair conditions,
 - f) Intellectual and industrial property rights,
 - g) Official recognition or approval, medals, awards, diplomas, and similar documents,
 - ğ) Social aid,
 - h) Consumers' legal rights or risks they may face.
- 7/8 In advertisements: a) Research results or quotations from scientific publications cannot be distorted. b) Statistics cannot be presented in a way that would yield results different from reality. c) Scientific terms cannot be used in a misleading way. d) Claims cannot contain scientific terminology and expressions suggesting a scientific basis they do not actually possess.
- 8/1 Comparative advertisements can only be made under the following conditions:
- a) Not including competitors' product names, brands, logos, trade names, business names, or other distinctive elements,
 - b) Not being deceptive or misleading,
 - c) Not leading to unfair competition,
 - ç) The compared goods or services meeting the same needs or having the same purpose,
 - d) Comparing an aspect that will benefit consumers,
 - e) Objectively comparing one or more material, essential, verifiable, and typical features, including price, of the compared goods or services,
 - f) Claims based on objective, measurable, numerical data being proven with scientific tests, reports, or documents,
 - g) Not disparaging or discrediting competitors' goods, services, activities, or other characteristics,
 - ğ) In comparisons regarding goods or services with stated origin, the goods or services being from the same geographical location,
 - h) Not causing confusion regarding the advertiser's and competitor's brand, trade name, business name, or other distinctive mark or goods or services,
 - i) Not being contrary to principles determined by the Advertising Board.
- 9/1 Advertisers are obligated to prove the truthfulness of claims in their commercial advertisements.
- 9/2 Definitions, claims, or exemplified explanations regarding verifiable facts in advertisements must be proven with scientifically valid information and documents. When deemed necessary, information and documents from relevant university departments or accredited or independent research, testing, and evaluation organizations shall be requested.
- 9/3 Claims in comparative advertisements must always be proven with information and documents obtained from relevant university departments or accredited or independent research, testing, and evaluation organizations.
- 9/4 Reports submitted under paragraphs two and three must be of a nature that proves the claims in the advertisement during the period of publication.
- 9/5 Advertisers are obligated to submit documents proving the claims in advertisements to those authorized and assigned to oversee the implementation of principles determined in this Regulation.
- 10/1 Advertisements cannot demean, explicitly ridicule, or similarly disparage any person, institution or organization, commercial or professional activity, goods or services, advertisement, or brand.
- 18/1 Information that may affect consumer purchasing decisions must be communicated in a duration and form that the average consumer can perceive.
- 22/1 Covert advertising through any means of communication, whether audio, written, or visual, is prohibited.
- 22/2 Advertisements cannot be used in a way that affects the editorial independence of media organizations.

23/1 In evaluating written content, news, broadcasts, and programs containing names, brands, logos, or other distinctive forms or expressions related to goods or services, and trade names or business names, along with information and images about institutions and persons representing them, for covert advertising:

- a) Information and images about names, brands, logos, or other distinctive forms or expressions and trade names or business names, and the institutions and persons representing them, must be compatible, unexaggerated, and proportional in terms of format, subject, content, presentation, positioning, and duration with the written content, news, broadcast, or programs in which they appear,
- b) Written content, news, broadcasts, or programs published within the framework of the right to report, disseminate, and receive information must meet consumers' need for enlightenment and information,
- c) Conditions shall be considered regarding not encouraging the rental or purchase of goods or services by making special promotional references that could consciously influence consumer preferences.

26 Advertisements for medicines, human medical products, medical devices, health services, foods, food supplements, cosmetic and cleaning products, biocidal products, tobacco products, and alcoholic beverages must also comply with other provisions regarding advertising and promotion in their relevant legislation.

Time-Varying Beta Estimation: A Comparison of DCC-GARCH and Rolling-Window Methods in Turkish Industry Portfolios

Cihan ÇOBANOĞLU¹ 

ABSTRACT

This study empirically compares the accuracy of two common methods for estimating time-varying betas in Turkish industry portfolios: rolling-window OLS regression and the DCC model. Using daily return from 2004 to 2024, the methods are evaluated based on their alignment with CAPM predictions, specifically the insignificance of Jensen's alpha and the significance of the market risk premium. Findings show that despite its complexity, the DCC model does not outperform the rolling-window approach. The rolling-window approach produces insignificant Jensen's alpha estimates for more industries and yields slightly higher mean and t-statistics for the market risk premium. These findings challenge the view that rolling-window estimators are inefficient due to assuming beta constancy within short windows and suggest that the DCC model's reliance on multiple constant parameters imposes a rigid structure that may hinder its adaptability to evolving market conditions. This study contributes to the literature by directly comparing these two widely used methods and highlighting the importance of carefully considering model assumptions when estimating time-varying betas.

Keywords: CAPM; Time-Varying Beta; DCC; Rolling-Window; Jensen's Alpha; Market Risk Premium.

JEL Classification Codes: C18, C53, C58, G10, G12

Referencing Style: APA 7

INTRODUCTION

Sharpe (1964), Lintner (1965), and Mossin (1966) independently developed the CAPM, which uses market beta to quantify an asset's exposure to market risk and estimate its expected return. This framework has been a crucial development in finance, significantly influencing capital budgeting, asset pricing, performance evaluation and academic research on market efficiency. However, Fama and French (1992) showed that market beta alone cannot explain return differences across size and book-to-market portfolios. Graham and Harvey (2001) showed that it continued to be widely used. Hence, empirical failure of the model lead to a search for improvements to the model instead of abandoning it.

Fama and French (2004) identified several potential explanations for the empirical failures of the basic CAPM and its multifactor extensions. These explanations include irrational stock pricing, the inadequacy of the model, and poor proxies for the market portfolio. Additionally, Lettau and Ludvigson (2001) and Adrian and Franzoni (2009) argued that the poor empirical performance could be attributed to neglecting the time-

varying nature of conditional moments of returns as well as beta. Jagannathan and Wang (1996) were among the early studies to criticize the basic CAPM's implicit presumption of time-invariant beta, which underpinned the use of straight ordinary least squares (OLS) in earlier studies. There are concerns that a constant beta may not accurately reflect real-world conditions in which investors' expectations change over time.

Empirical investigations overwhelmingly confirm that beta is time-varying and this concept is well acknowledged in the literature. One of the earlier studies, Fabozzi and Francis (1977), showed that beta changes with bull and bear market conditions. Alexander and Chervany (1980) examined how time-variation of beta is associated with the portfolio formation approach and the size of the portfolios. Brooks, Faff and Lee (1992) compared varying-coefficient models for describing beta. Several other studies have introduced new methods for modeling the time-variation in beta, including the rolling-window OLS regression (Fama & MacBeth, 1973), multivariate GARCH models (Bollerslev, Engle & Wooldridge, 1988), state variable approach (Ferson & Harvey, 1991), Kalman filter (Shah & Moonis, 2003), regime-switching models

¹ BAİBU, Faculty of Economics & Administrative Sciences, Bolu Abant İzzet Baysal University, Gölköy, BOLU, 14030, cihancobanoglu@ibu.edu.tr

(Korkmaz et al., 2010), and nonparametric models (Esteban & Orbe-Mandaluniz, 2010).

Among the many alternatives, using the rolling-window OLS regression is the oldest and simplest, yet a common method for estimating time-varying betas. This approach is commonly associated with Fama and MacBeth (1973), although they neither named nor specifically promoted it. They calculated betas from five years of monthly observations to use in the cross-sectional regressions carried out every month over the subsequent four years. At the end of each four-year period, they rolled the estimation window forward. Estimating beta using data from the latest five-year window has become a standard procedure, and Groenewold and Fraser (2000) referred to it as the “five-year rule of thumb”. Agrawal, Gilbert and Harkins (2022) questioned this rule and investigated the optimal return frequency and window length to produce betas that better forecast subsequent period’s returns. Nonparametric models, such as the one developed by Baillie, Calonaci and Kapetanios (2022), are general versions of the rolling-window OLS regression. These models don’t require determining a fixed window length but are not as commonly used as the rolling-window OLS regression approach.

A prominent alternative method for calculating time-varying betas is using one of the multivariate GARCH models. These models are formulated to address the time variation in volatility of return series and the clustering of that volatility. Multivariate versions of GARCH extend this capability by modeling co-movements in financial volatilities, providing conditional variances as well as covariances that can be used to calculate conditional betas. Silvennoinen and Teräsvirta (2009), as well as the earlier study by Bauwens, Laurent, and Rombouts (2006), carried out detailed surveys of multivariate GARCH models, highlighting the diversity within this family of models. The BEKK and DCC models are the most widely used among multivariate GARCH models, leading Caporin and McAleer (2012) to carefully select them for analytical comparison. Notably, the DCC model is the more recent of the two and avoids over-parameterization.

The Dynamic Conditional Correlations (DCC) model, a widely recognized framework in financial econometrics, was initially developed by Engle and Sheppard (2001). They designed it to provide strong estimation performance while allowing for ease of implementation across many assets by reducing the number of parameters that need to be estimated. Engle (2002) subsequently refined the model, enhancing its applicability and theoretical foundations, and found that

the DCC model provides the most accurate correlation estimates among multivariate GARCH models in the two-asset case. Building on this work, Bali, Engle and Tang (2016) conducted an analysis and found that dynamic conditional betas estimated with the DCC model significantly predict the cross-sectional variation in daily stock returns. Shortly after, Engle (2016) developed a new approach based on the DCC model that allows for joint estimation of multiple covariance matrices, enabling the estimation of time-varying betas for multifactor CAPM. They applied it to industry portfolios and found lower significance for alphas, as predicted by the theoretical model, compared to traditional models other than the rolling-window approach.

A group of studies focused on comparing alternative methods using some in- and out-of-sample forecasting accuracy criteria on Australian industry portfolios (Brooks, Faff & McKenzie, 1998), European industry portfolios (Mergner & Bulla, 2008) and UK company stocks (Choudhry & Wu, 2008). However, they didn’t include the rolling-window approach or DCC model. Nieto, Orbe and Zarraga (2014) conducted a more comprehensive comparison, including both methods, using time series and cross-section criteria on Mexican stock returns. They didn’t provide conclusive evidence of better performance for the DCC model compared to the rolling-window approach. Recently, Aloy et al. (2021) found that the DCC model has unsatisfactory out-of-sample predictive performance on the US and European REITs data. These studies concluded that Kalman filter models are superior to other methods but the majority did not compare the relative performance of the DCC and the rolling-window approaches, despite their widespread use.

There is no consensus on whether the newer DCC model or the rolling-window approach is superior for estimating time-varying betas to be used in financial applications. The rolling-window approach is simple but has limitations, such as ignoring the behavior of return volatility and assuming a constant beta within each window. As noted by Adrian and Franzoni (2009), Aloy et al. (2021), and Lettau and Ludvigson (2001), an incomplete or inadequate treatment of time-variation in conditional moments can lead to model misspecification, resulting in both subpar empirical performance of the CAPM and suboptimal financial decisions. The DCC model attempts to mitigate these limitations by specifying a dynamic process for modeling conditional correlations, from which conditional moments are then calculated. However, the DCC model is inherently predicated on the assumption of constant parameters over the entire sample period, an

overly simplifying assumption which may not hold for long horizons and may lead to misspecification either. The solution of Lewellen and Nagel (2006) to avoid the challenges of specifying conditioning information and beta instability over longer windows was estimating CAPM regressions over shorter windows.

Mixed findings on the DCC model's effectiveness and the enduring relevance of the rolling-window approach raise the question of whether increased model complexity necessarily leads to more accurate beta estimates. The author's review of the literature reveals that no study has directly compared these two specific methods within the context of industry portfolio beta estimation. This study aims to fill that gap by evaluating the estimation accuracy of the DCC model relative to the rolling-window approach, based on how each aligns with two key CAPM implications: (1) insignificant Jensen's alphas in time-series regressions, and (2) a significant positive relationship between betas and expected returns in cross-sectional regressions. Using Turkish industry portfolio data from 2004 to 2024 with daily returns, the study assesses which model produces time-varying betas that more faithfully reflect these CAPM predictions.

This study contributes to the time-varying beta literature by empirically comparing two widely used estimation methods and highlighting the importance of carefully considering the assumptions underlying these methods. It builds on recent work examining the time-varying nature of asset pricing model parameters. For instance, Çatık, Huyugüzel Kışla, and Akdeniz (2020) used OLS recursive regression betas, and Ustaoglu (2022) employed DCC betas to demonstrate beta variability in Turkish industry returns. İlbasmış (2024) compared two versions of the DCC model for forecasting accuracy. In contrast, this study directly compares the basic DCC model with the traditional rolling-window approach, focusing on their consistency with CAPM implications.

The remaining sections are arranged as follows. Section 2 describes the data and outlines the methodology for obtaining time-varying betas using rolling-window regressions and DCC model covariance estimates. Section 3 presents the comparison results of the two estimation methods and examines their robustness to parameter instability. Finally, Section 4 ends the paper by discussing the findings.

DATA AND METHODOLOGY

The data is retrieved from the Financial Information News Network (Finnet) database, which contains sector

and market index values for Turkish stocks listed on Borsa Istanbul (BIST), as well as index values for Turkish government bonds. BIST calculates sector and market indices using the free-float market values of the included stocks. It systematically identifies and selects the top 100 stocks based on specific criteria and designates their index as the main equity market index. This index was thus selected to function as the proxy for the market portfolio. The risk-free interest rate is proxied by the yield of the most actively traded Turkish government bond. The data available for the analysis spans the period from April 1, 2004 to August 2, 2024 at a daily frequency and covers 24 industry indices some of which are not mutually exclusive. The following subsections describe how the data are transformed into excess returns, detail the estimation procedures for time-varying betas using both the rolling-window and DCC approaches, and interpret summary statistics for excess returns and conditional betas.

Calculation of Excess Returns

The excess return for each industry index, along with that of the market, was derived by subtracting the risk-free rate from each portfolio's return. Specifically, the excess returns at day t for industry i and the market are calculated as $r_{it} = R_{it} - R_{ft}$ and $r_{mt} = R_{mt} - R_{ft}$, respectively. In this formulation, R_{ft} represents the daily risk-free rate expressed in percentage terms, obtained by dividing the annual bond yield at time t by 365. R_{it} and R_{mt} denote the daily continuously compounded returns for the industry and market indexes, respectively, both expressed in percentage. R_{it} was computed as the log return using $R_{it} = \ln(P_{it}/P_{it-1}) * 100$, where P_{it} is the index value at time t , and R_{mt} was calculated from the market index analogously. Annualized values reported throughout the paper are calculated using the standard compounding formula $(1 + r)^{251} - 1$, assuming 251 trading days per year, where r denotes the daily return, Jensen's alpha or risk premium.

Table 1 presents summary statistics for the excess returns of the industry indices and the market index. The transportation and storage industry recorded the highest average daily excess return at 0.0773% (21.4% annually), followed by the wholesale and retail trade industry at 0.0617% (16.7% annually), and the technology industry at 0.0591% (16.0% annually). In contrast, the property trusts industry had the lowest average return at 0.0125% (3.2% annually). These figures reflect the influence of government-led investments, sector-specific incentives and an inflation-related policy mix. Robust infrastructure projects such as the construction of

Table 1: Summary statistics of returns

Code	Index	Mean	Std. Dev.	Skew.	Kurtosis	J-B test	ADF test
XU100	BIST100 Turkish Market Index	0.0358	1.6754	-0.4223	6.9439	3461.54	-12.0320
XUSIN	Industrials	0.0441	1.4822	-0.8169	8.4557	6901.65	-11.8893
XGIDA	Food, Beverage & Tobacco	0.0386	1.7343	-0.5695	7.3482	4299.35	-12.8357
XTEKS	Textile & Leather	0.0442	1.6895	-1.1315	9.5581	10241.59	-12.5415
XKAGT	Wood & Paper Products	0.0248	1.8357	-0.6366	6.9137	3604.32	-12.8238
XKMYA	Chemicals	0.0492	1.7679	-0.4578	6.8945	3405.78	-11.4833
XMANA	Basic Metal	0.0501	2.0928	-0.1981	6.5054	2648.07	-12.3458
XTAST	Mineral Products	0.0411	1.5831	-0.6011	8.2806	6241.19	-13.1292
XMESY	Fabricated Metal Products	0.0444	1.7408	-0.6234	7.5554	4746.60	-12.6506
XUHIK	Services	0.0467	1.4908	-0.4500	7.1977	3921.85	-11.9935
XELKT	Electricity Gas & Steam	0.0210	2.0126	-0.4562	8.4065	6397.11	-12.4850
XTCRT	Wholesale & Retail Trade	0.0617	1.7038	-0.2333	9.1823	8179.27	-10.8475
XULAS	Transportation & Storage	0.0773	2.3371	-0.0888	5.8565	1742.98	-13.5450
XSPOR	Sports Activities	0.0187	2.4117	-0.3744	10.7372	12857.84	-9.6696
XTRZM	Hotels & Restaurants	0.0277	2.2413	-0.5200	7.2945	4154.54	-13.0898
XILTM	Telecommunications	0.0211	2.1163	-0.1347	6.2081	2205.48	-13.1623
XUTEK	Technology	0.0591	1.9272	-0.5680	7.5501	4680.17	-11.8573
XBLSM	Information Technology	0.0446	1.9435	-0.5330	7.5523	4651.56	-11.3383
XUMAL	Financial Institutions	0.0322	1.9319	-0.2629	6.2053	2245.09	-12.1105
XBANK	Banks	0.0338	2.2912	-0.0451	5.6902	1541.74	-12.9480
XSGRT	Insurance	0.0585	1.8321	-0.3197	7.7411	4870.19	-11.5079
XFINK	Leasing & Factoring	0.0381	2.4554	-0.2648	10.5740	12266.70	-12.3813
XHOLD	Holding & Investment	0.0306	1.7917	-0.4401	6.7655	3181.96	-12.1535
XYORT	Brokerage Houses	0.0195	1.7189	-0.8905	11.6020	16420.40	-11.3147
XGMYO	Property Trusts	0.0125	1.7474	-0.6899	6.9501	3725.40	-10.3424

Notes: The statistics are based on daily percentage excess returns for 24 Turkish industry indices and the market index, covering the period from April 1, 2004, to August 2, 2024. Each series includes 5,107 daily observations. All Jarque-Bera and Augmented Dickey-Fuller test statistics are significant at the 1% level, with ADF tests using MacKinnon p-values.

Istanbul Airport boosted the transportation and storage industry. The extension of Region 5 incentives to defense and aerospace investments nationwide bolstered the technology industry's returns. Low real interest rates encouraged short-term consumer spending, contributing to the strong performance of the wholesale and retail trade industry. Conversely, high nominal mortgage rates constrained housing affordability and limited long-term housing investments. This, coupled with restrictive measures such as the 25% cap on rental income growth, contributed to the underperformance of the property trusts industry.

Table 1 also reports the standard deviations of excess returns, highlighting substantial variation in return volatility across industries. For instance, the leasing and factoring industry shows a high standard deviation of

2.4554% despite a modest average daily excess return of 0.0381% (10% annually), suggesting that returns in this sector are highly volatile relative to their mean. In contrast, the industrials and services industries exhibit more stable performance, with standard deviations of 1.4822% and 1.4908%, respectively. This variation in the return volatility aligns with the number of constituent stocks in each industry index. The industrials and services indices exhibit lower return volatility due to greater diversification, each comprising more than a hundred stocks. In contrast, the leasing and factoring industry shows significantly higher volatility, reflecting its limited diversification, with fewer than ten constituent.

Table 1 further shows that all of the excess return series exhibit negative skewness, indicating longer left tails than would be expected under a normal distribution. Their kurtosis values exceed 3, suggesting a more peaked distribution compared to a normal distribution. As expected, the null of normality is rejected for these series with very high Jarque-Bera test statistics significant at the 0.01 level. These characteristics are compatible with the common observation that financial return series exhibit negative skewness and leptokurtosis. To ensure the validity of subsequent empirical analyses, testing for stationarity in the excess return series is essential to prevent spurious regression results arising from unit roots. The results of the stationarity check based on the ADF unit root test with a constant are displayed in the last column of Table 1. Unit roots are strongly and consistently rejected based on statistical evidence for all series at the 0.01 significance level using MacKinnon p-values. This confirms that the excess return series are stationary and therefore suitable for use in time-series modelling.

Estimation of Conditional Betas

The rolling-window approach estimates the conditional beta at each date by applying OLS regression to a fixed-size subsample of prior observations, referred to as the window. For period t , the window includes observations from $t-1-w$ to $t-1$, where w is the window size. Within each window, the following market model is re-estimated to generate the rolling beta series:

$$r_{i\tau} = \alpha_{it} + \beta_{it}^{ROLL} r_{m\tau} + e_{i\tau}$$

where $r_{i\tau}$ and $r_{m\tau}$ are the excess returns of industry portfolio i and the market index, respectively, at each observation point τ within the window ending at time $t-1$; $e_{i\tau}$ denotes the regression residual; α_{it} is the intercept; and β_{it}^{ROLL} corresponds to the market beta estimated for time t .

Alternatively, the DCC model estimates conditional variances and covariances, which are subsequently employed to calculate conditional betas. Engle (2002) decomposed the conditional covariance matrix in the following form:

$$H_t = D_t R_t D_t$$

D_t is a diagonal matrix containing the conditional standard deviation σ_{it} on its i th diagonal, which is obtained from a univariate GARCH(1,1) model with variance equation $\sigma_{it}^2 = b_{i0} + b_{i1}u_{it-1}^2 + b_{i2}\sigma_{it-1}^2$ and mean equation $r_{it} = \mu_i + u_{it}$ where $u_{it} \sim N(0, \sigma_{it}^2)$. The

matrix R_t contains the expected conditional correlations $\rho_{im,t}$ as its elements, defined as:

$$\rho_{im,t} = q_{im,t} / \sqrt{q_{ii,t} \cdot q_{mm,t}}$$

where $q_{im,t}$ denotes the quasi-correlation between industry i and market m . This normalization ensures that $\rho_{im,t} \in [-1, 1]$.

The quasi-correlations $q_{im,t}$ are updated recursively according to:

$$q_{im,t} = \bar{\rho}_{im} + \lambda_1 \cdot (\varepsilon_{i,t-1}\varepsilon_{m,t-1} - \bar{\rho}_{im}) + \lambda_2 \cdot (q_{im,t-1} - \bar{\rho}_{im})$$

where $\varepsilon_{i,t-1}$ and $\varepsilon_{m,t-1}$ are the standardized residuals from the GARCH models fitted to the excess returns of industry portfolio and the market index, respectively. The term $\bar{\rho}_{im}$ denotes the unconditional sample correlation between the two returns (or their standardized residuals). The scalars λ_1 and λ_2 govern the responsiveness of the quasi-correlations to new shocks and their persistence over time, implying an exponentially decaying weight on past observations. This updating mechanism gives greater weight to recent information, enabling the DCC betas to adapt more rapidly to changes in market conditions while still incorporating longer-term trends. Although this greater responsiveness can help capture sudden market movements, it may also lead to over-adjustment, causing short-term fluctuations in beta estimates that diverge from underlying systematic risk. By contrast, the rolling-window approach assigns equal weights to all observations within a fixed window, resulting in smoother beta dynamics that limit responsiveness to sudden shifts and yield a more stable relationship between beta and expected returns.

The bivariate DCC model described above involves a total of 11 parameters. These include two mean parameters (μ_i for the industry and market returns), six GARCH parameters (b_{i0}, b_{i1}, b_{i2} for each series), two DCC parameters (λ_1, λ_2), and one unconditional correlation $\bar{\rho}_{im}$. The number of estimated parameters directly determines the degrees of freedom used in the likelihood ratio tests for parameter stability, discussed later in the Parameter Stability of the DCC Model section. Since the model is specified in bivariate form, with industry and market returns as the two variables, the DCC parameters are estimated separately for each industry. However, this specification implicitly assumes that GARCH parameters and the DCC parameters remain constant over the estimation period. While the DCC model is designed to capture evolving conditional correlations, this constant-parameter assumption may limit its flexibility in adapting to structural changes in financial relationships over

time. In contrast, the rolling-window approach re-estimates parameters over shorter intervals, potentially offering greater responsiveness to such changes. These considerations motivate the parameter stability tests presented in a later section.

Estimation of the DCC model involves finding the maximum of the log-likelihood function:

$$L = -\frac{1}{2} \sum_{t=1}^T (n \log(2\pi) + 2 \log |D_t| + \log |R_t| + \varepsilon_t' R_t^{-1} \varepsilon_t)$$

where ε_t denotes the vector of standardized residuals and T represents the number of observations. The DCC beta series associated with each industry portfolio is calculated by utilizing the entries of conditional covariance matrix H_t using the following formula:

$$\beta_{it}^{DCC} = \frac{\sigma_{im,t}}{\sigma_{m,t}^2}$$

where $\sigma_{im,t}$ denotes the conditional covariance between the market and i -th industry portfolio, and $\sigma_{m,t}^2$ represents the conditional variance of the market return on day t . β_{it}^{DCC} corresponds to the market beta estimated for day t .

For brevity, market betas estimated by the methods described above are referred to as rolling betas and DCC betas. Both are calculated using the information available from the prior time period to provide one-period-ahead forecasts. The rolling-window approach uses a window size of 120 days, following prior literature (Nieto, Orbe & Zarraga, 2014). Unreported results indicate that among 60-, 120- and 180-day windows, the 60-day window produces rolling beta means closest to DCC beta means for the highest number of industries, while the 180-day window yields rolling beta standard deviations closest to those of DCC betas for the most industries. The 120-day window provides a balance between these two metrics, facilitating comparisons. Since rolling beta estimates are unavailable for the first 120 days, the first 120 DCC beta estimates are also excluded from further analysis to ensure consistency across two approaches. This limits the sample of beta estimates to the timeframe from September 22, 2004 to August 2, 2024. Note that although the DCC model provides beta estimates from the beginning of the sample, the first few estimates may contain biases due to the initial values assigned to the lagged factors used in DCC estimation. Excluding these early estimates also mitigates the issue.

Table 2 provides a summary of the means and standard deviations of time-varying beta estimates derived from the rolling-window approach and the DCC model for Turkish industry portfolios, along with comparisons of

their means and standard deviations. The average beta values reflect meaningful variation in systematic risk exposure across industries. For example, based on rolling betas, the banks industry exhibits the highest average beta (1.2635), consistent with its high financial leverage and macroeconomic sensitivity. In contrast, the sports activities industry has the lowest (0.5157), reflecting an investor base driven by team loyalty, which dampens responsiveness to market-wide movements.

The DCC beta means are numerically close to the rolling beta means. The largest difference between two approaches appears in the mineral products industry, where the rolling beta exceeds the DCC beta by 0.0241, corresponding to approximately 3.5% of their average beta value. Assuming a daily market risk premium of 0.0358%, this beta difference translates into an expected return differential of about 0.00086% per day ($0.0241 \times 0.0358\%$), or 0.22% annually. This is economically small, as beta differences across industries can lead to larger variation in expected returns. However, t-tests reject the equality of means for most industries, suggesting statistically significant differences between the two estimation methods. This result confirms that, although the long-run averages of beta estimates appear similar, the two methods capture fundamentally different dynamics in beta evolution. Specifically, the rolling-window approach's equal weighting leads to smoother but slower adjustments to recent market shocks. In contrast, the exponential decay in the DCC model enables its betas to respond more quickly to new information. This difference in responsiveness likely explains the divergence in short-term beta estimates, even when their long-run means remain comparable.

The standard deviations of DCC betas are close to those of rolling betas, though they are slightly lower in most cases. The sports activities industry displays the largest difference in standard deviations between the two methods with the rolling beta has a standard deviation that is 0.0484 higher than the DCC beta, corresponding to approximately 9.6% of their average beta. This implies that, in this industry, the rolling-window approach attributes nearly 10 percent more day-to-day variation in systematic risk exposure than the DCC model. Assuming the same daily market risk premium of 0.0358%, this additional beta volatility translates into a swing of about $\pm 0.0017\%$ in daily expected returns. This amounts to 0.44% annually, which though small may still impact return forecasting and risk assessments. These comparisons depend on the chosen window length in the rolling-window approach. As discussed

Table 2: Summary statistics of conditional betas

Industry	Roll. β Mean	DCC β Mean	Mean Difference	Roll. β St. Dev.	DCC β St. Dev.	St. Dev. Difference
Industrials	0.7906	0.7895	0.0011	0.1090	0.0920	0.0170
Food, Beverage & Tobacco	0.6497	0.6582	-0.0085***	0.1603	0.1407	0.0196
Textile & Leather	0.7083	0.6943	0.0140***	0.2044	0.1729	0.0315
Wood & Paper Products	0.7749	0.7567	0.0182***	0.1738	0.1798	-0.0060
Chemicals	0.8073	0.8243	-0.0170***	0.1246	0.1200	0.0046
Basic Metal	0.8940	0.9013	-0.0073**	0.1449	0.1415	0.0034
Mineral Products	0.7000	0.6759	0.0241***	0.1758	0.1699	0.0059
Fabricated Metal Products	0.8245	0.8190	0.0055**	0.1258	0.1186	0.0072
Services	0.7639	0.7681	-0.0042**	0.0939	0.0899	0.0040
Electricity Gas & Steam	0.7951	0.7887	0.0064*	0.1687	0.1725	-0.0038
Wholesale & Retail Trade	0.6421	0.6567	-0.0146***	0.1326	0.1235	0.0091
Transportation & Storage	0.9950	0.9840	0.0110**	0.2394	0.2024	0.0370
Sports Activities	0.5157	0.4944	0.0213***	0.3000	0.2516	0.0484
Hotels & Restaurants	0.7770	0.7676	0.0094*	0.2565	0.2369	0.0196
Telecommunications	0.8268	0.8391	-0.0123***	0.1844	0.1649	0.0195
Technology	0.8053	0.7917	0.0136***	0.1985	0.1751	0.0234
Information Technology	0.7540	0.7440	0.0100***	0.1917	0.2008	-0.0091
Financial Institutions	1.1311	1.1355	-0.0044***	0.0820	0.0790	0.0030
Banks	1.2635	1.2627	0.0008	0.1677	0.1629	0.0048
Insurance	0.6766	0.6784	-0.0018	0.3125	0.2783	0.0342
Leasing & Factoring	0.7564	0.7461	0.0103**	0.2359	0.2642	-0.0283
Holding & Investment	0.9661	0.9694	-0.0033*	0.0922	0.0819	0.0103
Brokerage Houses	0.5705	0.5802	-0.0097**	0.2032	0.1741	0.0291
Property Trusts	0.8150	0.8080	0.0070**	0.1540	0.1447	0.0093

Notes: Mean differences are calculated as rolling beta mean minus DCC beta mean. Standard deviation differences are calculated as rolling beta standard deviation minus DCC beta standard deviation. Statistical significance of mean differences (based on t-tests) is indicated by asterisks: * (10%), ** (5%), *** (1%).

earlier, increasing the window size reduces the standard deviation of rolling betas, making them more comparable to those of DCC betas. Yet this adjustment comes at the cost of greater differences in mean estimates, which may complicate comparisons by obscuring whether observed performance differences reflect genuine predictive differences or simply shifts in beta levels.

COMPARISON OF CONDITIONAL BETAS

This section presents the comparison results of rolling and DCC betas based on two criteria. The first criterion, pertaining to time-series analysis, is the insignificance of Jensen's alpha. The second criterion, related to cross-sectional analysis, is the significance of the market risk premium.

Evaluation Based on Jensen's Alpha

Jensen's alpha estimated from conditional beta time-series serves as a metric for comparing beta estimation methods. In particular, it quantifies how much the realized return diverges from the expected under a given asset pricing model. For the CAPM, the model-implied expected excess return is a risk-adjusted premium calculated as an asset's beta multiplied by the market's excess return. Hence, Jensen's alpha is computed as the difference between the realized and model-implied excess returns, as follows:

$$\alpha_{it}^J = r_{it} - \hat{\beta}_{it} r_{mt}$$

where α_{it}^J is Jensen's alpha at day t , r_{it} and r_{mt} denote the realized excess returns for industry portfolio i and the market index. $\hat{\beta}_{it}$ refers to the estimated conditional

beta at day t , estimated in the previous section using either rolling-window approach or the DCC model. The term $\hat{\beta}_{it}r_{mt}$ represents the model-implied expected excess return.

Any insignificant deviations from the expected return can be considered random noise. However, a significant non-zero alpha can signal either superior performance, potentially due to skillful management as in the case of actively managed funds, or significant model misspecifications. These misspecifications might arise from unaccounted-for risk factors, such as industry-specific influences, unobserved risk dimensions, or market anomalies. When comparing rolling beta and DCC beta, the model that yields a smaller Jensen's alpha is considered more accurate in capturing the portfolio's systematic risk and, consequently, its true performance.

Table 3 presents the Jensen's alpha statistics calculated using both rolling beta and DCC beta, along with t-statistics for the mean tests and mean equality tests. The transportation and storage industry exhibits the highest mean alphas of 0.0474% and 0.0411%, based on rolling and DCC betas, respectively. The technology industry follows, with 0.0355% and 0.0389%. The property trusts industry has the smallest mean alphas, at -0.0170% and -0.0110%. In approximately three-quarters of the industries, mean Jensen's alpha values remain close to zero and statistically indistinguishable from zero. This finding reflects the success of the CAPM in the time-series context, suggesting that market beta alone, whether estimated via the rolling-window or DCC approach, adequately captures the variation in industry returns.

Table 3: Jensen's Alpha Means and t-tests

Industry	Roll. α Mean	Roll. α t-stat.	DCC α Mean	DCC α t-stat.	Mean Diff.	Mean Eq. t-stat.
Industrials	0.0113	1.3200	0.0139	1.6536*	-0.0026	-0.2206
Food, Beverage & Tobacco	0.0145	0.7646	0.0128	0.6796	0.0017	0.0631
Textile & Leather	0.0219	1.2899	0.0211	1.2699	0.0008	0.0356
Wood & Paper Products	-0.0024	-0.1275	0.0007	0.0400	-0.0031	-0.1187
Chemicals	0.0154	1.0034	0.0167	1.0927	-0.0013	-0.0587
Basic Metal	0.0084	0.4131	0.0190	0.9392	-0.0106	-0.3712
Mineral Products	0.0139	0.9321	0.0193	1.3044	-0.0054	-0.2581
Fabricated Metal Products	0.0108	0.7465	0.0108	0.7508	0.0000	-0.0004
Services	0.0193	1.8646*	0.0181	1.7549*	0.0011	0.0780
Electricity Gas & Steam	-0.0040	-0.1863	-0.0083	-0.3940	0.0044	0.1458
Wholesale & Retail Trade	0.0324	1.7510*	0.0319	1.7287*	0.0005	0.0189
Transportation & Storage	0.0474	1.9860**	0.0411	1.7163*	0.0062	0.1848
Sports Activities	0.0011	0.0340	0.0043	0.1349	-0.0032	-0.0710
Hotels & Restaurants	0.0086	0.3386	0.0136	0.5471	-0.0051	-0.1426
Telecommunications	-0.0103	-0.4711	-0.0095	-0.4349	-0.0008	-0.0245
Technology	0.0355	1.8712*	0.0389	2.0636**	-0.0034	-0.1286
Information Technology	0.0281	1.3613	0.0297	1.4515	-0.0016	-0.0551
Financial Institutions	-0.0047	-0.6941	-0.0057	-0.8499	0.0010	0.1065
Banks	-0.0062	-0.4344	-0.0079	-0.5557	0.0017	0.0819
Insurance	0.0301	1.6923*	0.0329	1.8537*	-0.0027	-0.1085
Leasing & Factoring	0.0013	0.0472	0.0068	0.2401	-0.0055	-0.1360
Holding & Investment	-0.0087	-0.8843	-0.0065	-0.6610	-0.0022	-0.1560
Brokerage Houses	-0.0043	-0.2196	-0.0041	-0.2091	-0.0002	-0.0077
Property Trusts	-0.0170	-1.1044	-0.0110	-0.7160	-0.0060	-0.2783

Notes: Jensen's alphas are calculated using either the rolling beta or the DCC beta, both estimated from daily returns. Roll. α t-stat. and DCC α t-stat. are the t-statistics testing whether each alpha mean differs from zero. Mean Eq. t-stat. is the t-statistic testing equality of mean alphas between the two methods. Significance levels are indicated by asterisks: * (10%), ** (5%), *** (1%).

A rough pattern emerges when comparing alpha rankings in Table 3 to the mean excess return rankings presented in Table 1, with industries exhibiting the highest (or lowest) excess returns also tending to outperform (or underperform) on a risk-adjusted basis. For instance, the transportation and storage industry, which recorded the highest average daily excess return, also shows the highest Jensen's alpha (12.6% annually). In practical terms, an alpha of this scale is attractive to active managers and can motivate sector rotation strategies seeking to exploit persistent excess returns. This elevated alpha likely reflects industry-specific factors, such as large-scale infrastructure investments during the sample period (as discussed earlier), that are not fully captured by market beta alone. It should be viewed as an exception rather than as evidence of a systematic failure of the CAPM.

To compare the estimation methods based on their Jensen's alphas, Table 3 also reports the differences in alpha values computed using DCC beta and rolling beta for each industry. These differences are generally small, and the mean equality test fails to reject the null hypothesis of equal means at conventional significance levels, suggesting no systematic advantage for either estimation method. However, rolling betas tend to produce alpha values closer to zero more often, indicating more accurate estimation of systematic risk under the CAPM framework. Specifically, in 15 out of 24 industries, the alpha based on rolling beta is lower. One illustrative case is the industrials portfolio, where the DCC alpha is statistically significant at 10% level ($t = 1.65$), while the rolling alpha is smaller and insignificant ($t = 1.32$). Although the overall differences are modest, this pattern points to lower beta estimation accuracy for the DCC model. Based on the Jensen's alpha criterion, the findings provide no evidence that the more sophisticated DCC model outperforms the traditional rolling-window approach in estimating time-varying beta.

Evaluation Based on Market Risk Premium

Estimating the market risk premium through cross-sectional regressions offers another way to compare beta estimation methods. Since the CAPM posits that an asset's model-implied expected excess return equals the market risk premium scaled by the asset's beta, a more accurate beta estimate should yield a market risk premium that is significantly different from zero and more closely aligned with the realized average excess return when tested in cross-sectional regressions.

Conducting a one-time cross-sectional regression analysis, wherein the average returns of assets are regressed upon their estimated betas, fails to produce correct t-ratios. Fama and MacBeth (1973) put forward a solution which involves performing cross-sectional regressions for each individual time period and conducting hypothesis tests on the average of the coefficient estimates. Following their methodology, a cross-sectional analysis is conducted by running the following regression for each day using the estimated conditional betas for each industry portfolio:

$$r_{it} = \lambda_{0t} + \lambda_{1t}\hat{\beta}_{it} + e_{it}$$

where r_{it} is the realized excess return, $\hat{\beta}_{it}$ is the conditional beta estimated either by the rolling-window approach or the DCC model and e_{it} refers to the residual for industry portfolio i . The intercept term, λ_{0t} , is expected to have a value close to zero as the market is the sole factor affecting the returns in the basic market model. The coefficient, λ_{1t} , is the estimated risk premium and is expected to have a value near the average excess return of the equity market because, theoretically, portfolios with a beta equal to one should generate same return as the market.

Table 4: Fama-MacBeth results

	Roll. β	DCC β
λ_0 Estimate	0.0275	0.0350
Std. Error	0.0234	0.0219
t-Statistic	1.1753	1.5984
p-Value	0.2399	0.1100
λ_1 Estimate	0.0133	0.0063
Std. Error	0.0306	0.0295
t-Statistic	0.4341	0.2143
p-Value	0.6643	0.8303
Adjusted R^2	0.0701	0.0714

Notes: Results are based on daily excess returns expressed in percentage terms. λ_0 is the time-series average intercept, λ_1 is the time-series average slope on conditional betas, and the adjusted R^2 is the time-series average from the cross-sectional regressions. Standard errors (and the resulting t-statistics and p-values) are based on the Fama-MacBeth procedure.

Table 4 reports the time-series averages of the intercept (λ_{0t}) and slope (λ_{1t}) coefficients from cross-sectional regressions of the industry portfolios' returns on their respective conditional market betas, estimated using either a rolling-window or a DCC approach. The associated Fama-MacBeth t-statistics assess the significance of these coefficients. For the rolling-window beta, the average intercept is 0.0275% and the average slope is 0.0133%. For the DCC beta, the intercept is slightly higher at 0.0350%, while the slope is lower at 0.0063%. All estimated coefficients are positive, but none are statistically significant at the 10% level. The adjusted values are 0.0701 for the rolling betas and 0.0714 for the DCC betas.

The slope estimates reported in Table 4 can be viewed as daily market risk premia. A one-unit increase in beta raises the model-implied expected excess returns by just 0.0133% per day (3.4% annually) for the rolling beta and 0.0063% per day (1.6% annually) for the DCC beta. Both estimated market risk premia are statistically insignificant and lie well below the realized average daily excess return of the BIST 100 Turkish Market Index, 0.0358% (9.4% annually; see Table 1). Moreover, the adjusted R^2 values, both around 7%, indicate that the conditional betas explain only a small fraction of the cross-industry return variation. Although these betas produce alpha values close to zero in the time-series context, consistent with CAPM predictions, they are less informative in explaining return difference across industries. These results challenge a central implication of the CAPM that higher systematic risk reliably commands higher expected returns. For portfolio managers, they imply that beta-tilting strategies aimed at earning superior returns by overweighting high-beta industries may yield limited benefit for cross-industry allocation in the Turkish market.

When comparing the two estimation methods, the DCC model offers only marginal gains in explanatory power, as reflected by its slightly higher adjusted R^2 . However, it yields a weaker empirical relationship between beta and expected return. Its higher average intercept and lower average slope imply a flatter securities market line, contrary to the CAPM's core prediction that higher beta should be associated with higher expected return. In contrast, the rolling-window approach produces a steeper, though still statistically insignificant, risk-return relation and a slope coefficient that is closer in magnitude to the observed market premium. While neither model generates a significant or economically meaningful risk premium, the smoother beta dynamics of the rolling-window approach appear to better preserve the theoretical pricing relation. The findings provide no

compelling evidence that the DCC model offers a clear advantage over the simpler rolling-window approach in capturing cross-sectional return variation either.

Parameter Stability of the DCC Model

Given that the previous analysis is based on a 20-year sample, it is important to assess whether the DCC model's relatively weak performance stems from parameter instability. To investigate this, the stability of the DCC parameters is formally tested. Subsequently, model performance is re-evaluated on shorter subsamples to determine whether estimation over these intervals improves results according to both the Jensen's alpha criterion and the market risk premium criterion.

Because the DCC model is estimated via maximum likelihood, a likelihood ratio (LR) test is employed to evaluate parameter stability. In this procedure, the full sample is first divided into two equal halves. The DCC model estimated over the full sample is regarded as the restricted model because it imposes constant parameters. Estimating the DCC model separately on each subsample forms a composite model, regarded as the unrestricted model since it allows parameters to vary between subsamples. The restricted and unrestricted models are then compared using the LR test statistic, computed as

$$-2 \ln \lambda = -2(\ln L_R - \ln L_U)$$

where $\ln L_R$ denotes the log-likelihood of the restricted model, and $\ln L_U = \ln L_1 + \ln L_2$ is the log-likelihood of the unrestricted model, obtained by summing the log-likelihoods from the two subsamples. Under the null hypothesis that the full-sample DCC parameters apply to each subsample, implying parameter stability, the test statistic follows a chi-squared distribution with degrees of freedom equal to the difference between the total number of parameters estimated in the composite model and those in the full-sample model.

Table 5 reports the results of likelihood ratio tests for parameter stability across three time spans: the most recent 20-year, 10-year, and 5-year periods of the dataset. The reported test statistics follow a chi-squared distribution with 11 degrees of freedom, calculated as $(11 + 11) - 11 = 11$. Under the null hypothesis, the test statistic is expected to fall within the typical range of this distribution. A high test statistic indicates that the composite model fits the data significantly better than the full-sample model, suggesting that the parameters differ between the two halves of the sample and the null hypothesis should be rejected. For the 20-year

Table 5: Results of Likelihood Ratio Tests for DCC Parameter Stability

Industry	χ^2 (20-Year)	χ^2 (10-Year)	χ^2 (5-Year)
Industrials	67.06***	77.32***	29.53***
Food, Beverage & Tobacco	29.19***	43.87***	11.97
Textile & Leather	111.73***	48.23***	28.11***
Wood & Paper Products	13.12	85.70***	24.41**
Chemicals	5.53	83.67***	20.75**
Basic Metal	42.75***	71.68***	34.37***
Mineral Products	99.81***	173.61***	6.47
Fabricated Metal Products	20.62**	64.13***	25.29***
Services	53.77***	44.61***	20.02**
Electricity Gas & Steam	35.67***	52.63***	16.55
Wholesale & Retail Trade	4.76	45.09***	33.13***
Transportation & Storage	28.63***	45.97***	24.74***
Sports Activities	69.73***	71.75***	8.83
Hotels & Restaurants	14.58	47.60***	21.81**
Telecommunications	1.04	35.52***	32.19***
Technology	31.03***	35.99***	38.69***
Information Technology	40.61***	54.01***	7.14
Financial Institutions	27.24***	87.42***	24.50**
Banks	25.39***	69.67***	39.86***
Insurance	71.07***	70.19***	29.00***
Leasing & Factoring	65.89***	68.87***	3.91
Holding & Investment	13.77	89.99***	28.51***
Brokerage Houses	47.18***	93.57***	29.29***
Property Trusts	9.46	72.01***	17.59*

Notes: Each cell reports the likelihood ratio test statistic, which follows a chi-squared distribution with 11 degrees of freedom. The test compares a restricted DCC model estimated on the full sample (either the last 20, 10 or 5 years of the study period) to a composite model estimated separately on each half of the same sample. Significance levels are indicated by asterisks: * (10%), ** (5%), *** (1%).

sample, parameter stability is rejected at conventional significance levels in 17 out of 24 industries. In particular, industries such as textile & leather, mineral products, and sports activities exhibit especially large test statistics, implying substantial shifts in conditional dynamics over time and a clear violation of the constant-parameter assumption.

Given the widespread rejections in the 20-year sample, the test is repeated using more recent and shorter samples to examine whether parameter stability can be achieved over reduced time spans. This question is particularly relevant because instability in longer samples could undermine the earlier findings regarding the DCC model's underperformance in capturing time-varying betas. If, however, stability cannot be attained even in shorter periods, this would point to a more broad

practical limitation of the model. In the 10-year sample, the null hypothesis of parameter stability is rejected for all industries, indicating that instability remains pervasive. Even in the 5-year sample, the null is rejected in 18 industries, suggesting that parameter shifts persist despite the shorter estimation span. The test is not applied to smaller samples, such as the last 2.5 years, because each half of that period contains fewer than 500 observations, a threshold recommended by Hwang and Valls Pereira (2006) to ensure convergence and reduce estimation bias in GARCH(1,1) models.

Following the parameter stability tests on the three samples, the performance of the DCC model is re-evaluated using the second halves of these samples, namely the most recent 10-year, 5-year, and 2.5-year periods, to assess whether shorter estimation spans yield

improved results based on the Jensen's alpha criterion and the market risk premium criterion. In terms of the Jensen's alpha criterion, unreported results indicate that the relative underperformance of the DCC model persists or even worsens with shorter estimation periods. Specifically, in the 10-year sample, DCC betas produce higher alpha estimates than rolling betas in 14 out of 24 industries, slightly fewer than the 15 industries observed in the full sample. However, this number increases to 16 industries in the 5-year sample and further to 18 industries in the 2.5-year sample. This pattern suggests that as the estimation period shortens, the DCC model tends to generate more positive Jensen's alphas compared to the rolling-window approach, implying a weaker alignment with CAPM predictions.

Table 6: Fama-MacBeth results for DCC Betas over Shorter Subsamples

	10-Year	5-Year	2.5-Year
λ_0 Estimate	0.0905	0.2217	0.1430
Std. Error	0.0345	0.0579	0.0891
t-Statistic	2.6243	3.8267	1.6045
p-Value	0.0087	0.0001	0.1091
λ_1 Estimate	-0.0197	-0.0953	0.0526
Std. Error	0.0426	0.0695	0.1070
t-Statistic	-0.4624	-1.3705	0.4917
p-Value	0.6439	0.1707	0.6231
Adjusted R^2	0.0698	0.0697	0.0746

Notes: The results are based on DCC beta estimates for three shorter subsamples: the most recent 10-year, 5-year, and 2.5-year periods. See Table 4 for the full-sample results and explanatory notes.

Table 6 presents the Fama-MacBeth regression results for the DCC model estimated over shorter subsamples of the dataset. While the adjusted R^2 values remain fairly stable around 0.07 across all subsamples, no meaningful improvement in explanatory power is observed compared to the full 20-year sample (adjusted $R^2 = 0.0714$; see Table 4). Notably, the intercept (λ_0) increases substantially in the 5-year sample (0.2217) relative to the full-sample estimate (0.0350; see Table 4), indicating a larger pricing error and a greater departure from the CAPM expectation of a zero intercept. The slope (λ_1), representing the market risk premium, remains statistically insignificant and even turns negative in the 10-year and 5-year samples, contradicting the CAPM prediction that higher beta should be associated with higher expected returns. Although the 2.5-year sample shows a positive slope, it is not statistically significant. Overall, these results

suggest that shortening the estimation period does not resolve the DCC model's limited ability to capture cross-sectional variation in returns. This limitation highlights challenges in applying the DCC model for researchers and practitioners seeking reliable conditional beta estimates.

CONCLUSION

Accurate estimation of time-varying beta is essential for understanding systematic risk and for informing asset pricing, portfolio allocation, and performance evaluation. Two of the most common methods for modelling time-varying beta are the rolling-window OLS regression and the DCC model. This study compares them using daily returns of Turkish industry portfolios to assess how well each method reflects the core predictions of the CAPM, specifically whether Jensen's alpha is insignificant in time-series tests and whether the market risk premium is significant in cross-sectional tests.

The time-series analysis of Jensen's alpha shows that, in most industries, both estimation methods yield mean alphas close to zero, consistent with CAPM predictions. However, rolling betas more frequently produce smaller, insignificant alphas, suggesting that they capture systematic risk better than the DCC model. Cross-sectional Fama-MacBeth regressions further reveal that neither method produces a statistically significant market risk premium, with slope estimates well below the realized average excess return of the Turkish equity market. While both approaches explain a small fraction of cross-industry return variation, the rolling-window method generates a steeper slope coefficient, closer in magnitude to the observed average market return, preserving the CAPM's risk-return relation more faithfully than the DCC model. Using the 10-year, 5-year, and even 2.5-year subsamples did not improve, and in some cases worsened, the performance of the DCC model.

The findings suggest that, the rolling-window approach provides beta estimates more consistent with the CAPM framework when estimating time-varying betas for Turkish industry portfolios. Although the DCC model accounts for time variation in return volatility and its clustering, its additional complexity does not translate into improved performance according to the evaluation criteria used. The DCC model's reliance on multiple constant parameters imposes a rigid structure that may struggle to adapt when market dynamics shift, even in shorter samples. Furthermore, because the DCC model is designed to capture evolving conditional correlations through implied exponential weighting, its heightened responsiveness to recent return shocks can lead to over-

adjustment in beta estimates, which may contribute to its lower performance. In contrast, the rolling-window method's periodic re-estimation over short windows, without rigid parametric constraints, allows it to better accommodate evolving market conditions, while the short estimation window limits the risk of misspecification when betas vary moderately.

The results highlight the importance of considering model flexibility and stability when selecting beta estimation methods, especially in emerging markets prone to structural changes or heightened volatility. Practitioners should recognize that rigid methods performing well in stable markets may yield unreliable risk assessments and misguided asset allocation decisions in more volatile or structurally changing markets. Future research could explore nonparametric models, such as those of Baillie, Calonaci and Kapetanios (2022), which generalize the rolling-window OLS regression without requiring a fixed window length. Additionally, comparing these generalized rolling-window approaches with the DCC model in a multifactor setting could be fruitful, for example using Engle (2016)'s extended DCC framework that estimates multiple betas simultaneously.

REFERENCES

- Adrian, T. & Franzoni, F. (2009). Learning about beta: Time-varying factor loadings, expected returns, and the conditional CAPM. *Journal of Empirical Finance*, 16(4), 537–556. <https://doi.org/10.1016/j.jempfin.2009.02.003>
- Agrawal, P., Gilbert, F. W. & Harkins, J. (2022). Time dependence of CAPM betas on the choice of interval frequency and return timeframes: Is there an optimum? *Journal of Risk and Financial Management*, 15(11), 520. <https://doi.org/10.3390/jrfm15110520>
- Alexander, G. J. & Chervany, N. L. (1980). On the estimation and stability of beta. *The Journal of Financial and Quantitative Analysis*, 15(1), 123–137. <https://doi.org/10.2307/2979022>
- Aloy, M., Laly, F., Laurent, S. & Lecourt, C. (2021). Modeling time-varying conditional betas: A comparison of methods with application for REITs. In G. Dufrénot & T. Matsuki (Eds.), *Recent Econometric Techniques for Macroeconomic and Financial Data* (pp. 229–264). Springer. https://doi.org/10.1007/978-3-030-54252-8_9
- Baillie, R. T., Calonaci, F. & Kapetanios, G. (2022). Hierarchical time-varying estimation of asset pricing models. *Journal of Risk and Financial Management*, 15(1), 14. <https://doi.org/10.3390/jrfm15010014>
- Bali, T. G., Engle, R. & Tang, Y. (2016). Dynamic conditional beta is alive and well in the cross-section of daily stock returns. *Management Science*, 63(11), 3760–3779. <https://doi.org/10.1287/mnsc.2016.2536>
- Bauwens, L., Laurent, S. & Rombouts, J. V. K. (2006). Multivariate GARCH models: A survey. *Journal of Applied Econometrics*, 21(1), 79–109. <https://doi.org/10.1002/jae.842>
- Bollerslev, T., Engle, R. F. & Wooldridge, J. M. (1988). A capital asset pricing model with time-varying covariances. *Journal of Political Economy*, 96(1), 116–131. <https://doi.org/10.1086/261527>
- Brooks, R. D., Faff, R. W. & Lee, J. H. H. (1992). The form of time variation of systematic risk: Some Australian evidence. *Applied Financial Economics*, 2(4), 191–198. <https://doi.org/10.1080/758527100>
- Brooks, R. D., Faff, R. W. & McKenzie, M. D. (1998). Time-varying beta risk of Australian industry portfolios: A comparison of modelling techniques. *Australian Journal of Management*, 23(1), 45–66. <https://doi.org/10.1177/031289629802300101>
- Caporin, M. & McAleer, M. (2012). Do we really need both BEKK and DCC? A tale of two multivariate GARCH models. *Journal of Economic Surveys*, 26(4), 736–751. <https://doi.org/10.1111/j.1467-6419.2011.00683.x>
- Choudhry, T. & Wu, H. (2008). Forecasting ability of GARCH vs Kalman filter method: Evidence from daily UK time-varying beta. *Journal of Forecasting*, 27(8), 670–689. <https://doi.org/10.1002/for.1096>
- Çatık, A. N., Huyugüzel Kışla, G. & Akdeniz, C. (2020). Time-varying impact of oil prices on sectoral stock returns: Evidence from Turkey. *Resources Policy*, 69, 101845. <https://doi.org/10.1016/j.resourpol.2020.101845>
- Engle, R. (2002). Dynamic conditional correlation: A simple class of multivariate generalized autoregressive conditional heteroskedasticity models. *Journal of Business & Economic Statistics*, 20(3), 339–350. <https://doi.org/10.1198/073500102288618487>
- Engle, R. F. (2016). Dynamic conditional beta. *Journal of Financial Econometrics*, 14(4), 643–667. <https://doi.org/10.1093/jjfinec/nbw006>
- Engle, R. F. & Sheppard, K. (2001). *Theoretical and empirical properties of dynamic conditional correlation multivariate GARCH* (NBER Working Paper 8554). National Bureau of Economic Research. <https://doi.org/10.3386/w8554>
- Esteban, M. V. & Orbe-Mandaluniz, S. (2010). A nonparametric approach for estimating betas: The smoothed rolling estimator. *Applied Economics*, 42(10), 1269–1279. <https://doi.org/10.1080/00036840701721257>
- Fabozzi, F. J. & Francis, J. C. (1977). Stability tests for alphas and betas over bull and bear market conditions. *The Journal of Finance*, 32(4), 1093–1099. <https://doi.org/10.2307/2326515>
- Fama, E. F. & French, K. R. (1992). The cross-section of expected stock returns. *The Journal of Finance*, 47(2), 427–465. <https://dx.doi.org/10.2307/2329112>
- Fama, E. F. & French, K. R. (2004). The capital asset pricing model: Theory and evidence. *Journal of Economic Perspectives*, 18(3), 25–46. <https://dx.doi.org/10.1257/0895330042162430>

- Fama, E. F. & MacBeth, J. D. (1973). Risk, return, and equilibrium: Empirical tests. *Journal of Political Economy*, 81(3), 607–636. <https://dx.doi.org/10.1086/260061>
- Ferson, W. E. & Harvey, C. R. (1991). The variation of economic risk premiums. *Journal of Political Economy*, 99(2), 385–415. <https://doi.org/10.1086/261755>
- Graham, J. R. & Harvey, C. R. (2001). The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics* 60(2–3), 187–243. [https://doi.org/10.1016/s0304-405x\(01\)00044-7](https://doi.org/10.1016/s0304-405x(01)00044-7)
- Groenewold, N. & Fraser, P. (2000). Forecasting beta: How well does the 'five-year rule of thumb' do? *Journal of Business Finance & Accounting*, 27(7–8). <https://doi.org/10.1111/1468-5957.00341>
- Hwang, S., & Valls Pereira, P. L. (2006). Small sample properties of GARCH estimates and persistence. *The European Journal of Finance*, 12(6–7), 473–494. <https://doi.org/10.1080/13518470500039436>
- İlbasmış, M. (2024). A comparison of forecasting accuracy between two dynamic conditional correlation (DCC) models. *Journal of Economics Business and Political Researches*, 9(23), 1–11. <https://doi.org/10.25204/iktisad.1388428>
- Jagannathan, R. & Wang, Z. (1996). The conditional CAPM and the cross-section of expected returns. *The Journal of Finance*, 51(1), 3–53. <https://doi.org/10.2307/2329301>
- Korkmaz, T., Çevik, E. I., Birkan, E. & Özataç, N. (2010). Testing CAPM using Markov switching model: The case of coal firms. *Economic Research-Ekonomska Istraživanja*, 23(2), 44–59. <https://doi.org/10.1080/131677X.2010.11517411>
- Lewellen, J. & Nagel, S. (2006). The conditional CAPM does not explain asset-pricing anomalies. *Journal of Financial Economics*, 82(2), 289–314. <https://doi.org/10.1016/j.jfineco.2005.05.012>
- Lettau, M. & Ludvigson, S. (2001). Resurrecting the (C) CAPM: A cross-sectional test when risk premia are time-varying. *Journal of Political Economy*, 109(6), 1238–1287. <https://doi.org/10.1086/323282>
- Lintner, J. (1965). Security prices, risk, and maximal gains from diversification. *The Journal of Finance*, 20(4), 587–615. <https://doi.org/10.2307/2977249>
- Mergner, S. & Bulla, J. (2008). Time-varying beta risk of Pan-European industry portfolios: A comparison of alternative modeling techniques. *The European Journal of Finance*, 14(8), 771–802. <https://doi.org/10.1080/13518470802173396>
- Mossin, J. (1966). Equilibrium in a capital asset market. *Econometrica*, 34(4), 768–783. <https://doi.org/10.2307/1910098>
- Nieto, B., Orbe, S. & Zarraga, A. (2014). Time-varying market beta: Does the estimation methodology matter? *Statistics and Operations Research Transactions*, 38(1), 13–42. <http://hdl.handle.net/2117/88929>
- Shah, A. & Moonis, S. A. (2003). Testing for time-variation in beta in India. *Journal of Emerging Market Finance*, 2(2), 163–180. <https://doi.org/10.1177/097265270300200202>
- Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, 19(3), 425–442. <https://doi.org/10.2307/2977928>
- Silvennoinen, A. & Teräsvirta, T. (2009). Multivariate GARCH models. In T. G. Andersen, R. A. Davis, J-P. Kreiß, T. Mikosch (Eds.), *Handbook of Financial Time Series* (pp. 201–229). Springer-Verlag. https://doi.org/10.1007/978-3-540-71297-8_9
- Ustaoglu, E. (2022). Time-varying beta coefficients of BIST sector indices. *Muhasebe ve Finansman Dergisi*, 96, 135–150. <https://doi.org/10.25095/mufad.1143257>

A Global Bibliometric Perspective on Organizational Attractiveness: Patterns, Influences, and Future Directions

Esra SİPAHİ DÖNGÜL¹ , Şerife UĞUZ ARSU² 

ABSTRACT

This study aims to identify key patterns, trends, and influential contributors within the academic literature on organizational attractiveness through a comprehensive bibliometric analysis. A total of 396 publications from 1988 to 2023 were retrieved from the Web of Science (WoS) database using the keyword “organizational attractiveness” in titles, abstracts, and keywords. The analysis was conducted using VOSviewer (Version 1.6.19) and SciMAT (Version 1.1.06) software tools. The results show that the highest number of publications occurred in 2023 (n=38), reflecting increasing scholarly interest. In terms of geographical distribution, the United States ranks first with 64 publications. Keyword co-occurrence analysis revealed that “organizational attractiveness” (133), “recruitment” (65), “employer branding” (32), and “corporate social responsibility” (22) are the most prominent terms, indicating the thematic structure of the field. SciMAT analysis also highlights the conceptual evolution of the topic across three periods, revealing a transition from foundational constructs to more diverse and strategic themes. The study contributes to a better understanding of the field’s development, identifies gaps for future research, and offers insights into the dynamics of scholarly production in organizational attractiveness.

Keywords: Organizational Attractiveness, Recruitment, Employer Branding, Corporate Social Responsibility, Signaling Theory, Organizational Reputation, Organizational Prestige, Organizational Image.

JEL Classification Codes: M1, M10, M11, M14, M16

Referencing Style: APA 7

INTRODUCTION

Today, the increasing level of competition makes it necessary for organizations to be evaluated not only by the quality of their products and services, but also by their capacity to attract talented individuals. In this context, the concept of organizational attractiveness stands out as an important factor that determines the degree to which an organization is seen as attractive by potential employees and stakeholders. Organizational attractiveness includes multifaceted factors such as perceptions, employer brand, image, prestige, corporate social responsibility and recruitment strategies that are effective in individuals’ preference for an institution. Although this concept has been extensively covered in both the human resources strategies of organizations and the academic literature, there is a limited literature on the in-depth examination of bibliometric elements such as the change of publications in the field over time, influential authors, countries, and institutions. This study seeks to address this gap by providing an in-depth bibliometric analysis of the works scanned in the WOS database from 1988

to 2023 on the topic of organizational attractiveness. In the analysis of the works, the relationships between the publications, cooperation networks and thematic focal points were visualized using the VOSviewer (Version 1.6.19) software. The main purpose of the research is to systematically reveal the current knowledge in this field by identifying the historical trends, the most influential authors, institutions, countries, the most cited studies and key themes in the organizational attractiveness literature. In addition, highlighting the deficiencies in the literature and possible research areas for future studies are among the other important goals of the study. Although the study is limited to only 396 works in the WOS database, it is thought that it will shed light on the development process of the literature dealing with the concept of organizational attractiveness and will guide the research to be done in this field. For future studies, it is suggested to incorporate databases like Scopus and PubMed to further broaden the scope of the literature.

¹ Department of Social Work, Faculty of Health Sciences, Aksaray University, Aksaray, Turkey, dresrasipahi@gmail.com

² Department of Social Work, Faculty of Health Sciences, Aksaray University, Aksaray, Turkey, serifeuguz@gmail.com

CONCEPTUAL FRAMEWORK

Organizational Attractiveness and Some Related Concepts

Organizational attractiveness, which is one of the most frequently discussed issues in both business and academic life recently, is recruitment, employer brand, qualified workforce, organizational image (Devendorf and Highhouse, 2008:607; Van Hove and Saks, 2011:311), organizational prestige/image/reputation (Cable and Graham, 2000:929; Williamson et al., 2010:669), corporate social responsibility (Kim and Park, 2011:639), sustainability, and signaling theory. The expansion of the concept of organizational attractiveness by affecting these concepts stems from the fact that the concept is seen as a critical element that affects organizations in many aspects such as the selection, attraction and productivity of expert personnel for the success of organizations. Studies suggest that these signals, both at the individual and organizational levels, influence individual-level outcomes, such as applicants' intentions to seek a job, interest in the organization, and intentions to accept (Rynes, 1991:399). So, it is seen that the concept of organizational attractiveness has become increasingly popular in the literature and in daily life as a multifaceted and comprehensive concept that is related to and includes all these elements.

Recruitment

One of the most studied concepts that is considered together with organizational attractiveness is recruitment. In light of the competitive dynamics of the business world, where the ability to recruit talented employees provides a significant competitive edge, understanding how candidates respond to their experiences during the recruitment process is essential for attracting potential employees to the organization (Krys and Konradt, 2022:43). Candidates' reactions include their perception of an organization's attractiveness. Organizational attractiveness is expressed as an attitude towards an organization or the overall positive impact expressed, seeing the organization as a desirable entity to initiate some kind of relationship, and is thought of as the interest of job applicants in the pursuit of employment (Evertz and Süß, 2017:141).

Employer Branding

Brand equity, which highlights an organization's unique traits as an employer in comparison to competitors, is a strategic approach aimed at influencing the awareness and perceptions of employees, prospective recruits, and other key stakeholders regarding the organization

(Backhaus & Tikoo, 2004:501). Employer brand equity is another concept that affects organizational attractiveness. A study by Jiang and Iles (2011:97), in which job applicants evaluated job offers or corporate positions based on their perceptions of corporate attractiveness and brand value, concluded that organizational attractiveness and brand value can play an important role as an intermediary variable in candidates' behaviour to accept a job offer and in initial recruitment.

Cooperate Social Responsibility (CSR)

CSR is a key concept closely tied to organizational attractiveness. It refers to an organization's commitment to meeting its obligations across various dimensions, including economic, legal, ethical, and philanthropic responsibilities, to a range of stakeholders (Albinger and Freeman, 2000: 243). Kim and Park (2011:639) argued that CSR can be an effective reputation management tool for attracting potential employees, particularly when an organization faces challenges in its business operations. They explored the impact of CSR initiatives on both attitudinal and behavioral outcomes, concluding that person-organization fit acts as a mediator between CSR efforts and organizational attractiveness.

Signaling Theory

Another concept associated with organizational attractiveness is signaling theory. Signaling theory is a theory widely used to explain how the interest of candidates applying for recruitment to the organization in general can be affected by information or signals about the characteristics of the organization that arise during recruitment activities. According to this theory, job applicants interpret many activities and information related to recruitment as signals of unknown characteristics or behaviors of the organization. In this regard, it is crucial for job seekers to use the organization's reputation as a signal that provides insight into the working conditions, especially considering the challenges job seekers face in obtaining information about potential jobs before deciding which to apply for or eliminate from consideration (Rynes, 1991:399).

Organizational Reputation, Image and Prestige

Other concepts related to the concept of organizational attractiveness are organizational reputation, image and prestige. An organization's reputation is defined as the public's overall assessment of the institutions' name in comparison to others (Fombrun and Shanley, 1990:233) and impacts various outcomes that are closely linked to organizational performance. For instance, organizational

prestige affects the composition of the workforce, as job seekers' initial interest in an organization is shaped by their perception of its prestige (Rynes, 1991:399). In addition, most of the candidates who apply for jobs are potential consumers for the organization. Establishing a strong reputation during the recruitment process can enhance brand value and contribute to future marketing success, ultimately increasing an organization's attractiveness (Keller, 1993:1; Rynes & Barber, 1990:286; Cable & Graham, 2000:929). Van Hove and Saks (2011:311) found that specific instrumental image attributes influence perceived organizational appeal among both prospective applicants (e.g., social activities, organizational structure, and career advancement opportunities) and their peers (e.g., educational opportunities).

METHOD

Purpose and Importance of the Research

This study aims to analyze scientific publications on the concept of "organizational attractiveness" from the WOS database using bibliometric analysis, with the goal of identifying current research trends. The aim of this study is to conduct a bibliometric analysis of the concept of "organizational attractiveness" in all languages and types of publications based on research scanned in the WOS from 1988 to 2023. In order to achieve the aims of this study, answers to the following research questions were sought:

How has the annual distribution of studies on organizational attractiveness evolved?

- What types of studies have been conducted on organizational attractiveness?
- Which countries have contributed the most to research on organizational attractiveness?

- How are studies on organizational attractiveness distributed across different academic indexes?
- What are the primary research domains and the number of publications related to organizational attractiveness?
- Which 50 institutions have made the most significant contributions to research on organizational attractiveness?
- Which are the top ten publishers with the most publications on organizational attractiveness?
- Who are the top ten most prolific authors in the field of organizational attractiveness?

The research questions answered by bibliometric analysis provide a comprehensive and systematic understanding of the concept of "organizational attractiveness".

Research Design

The research was structured using a descriptive survey model, and the bibliometric analysis method was applied throughout the study. In the descriptive research model, the aim is to define the situation, event or concept that has existed in the past or present and is the subject of the research as it exists by describing it quantitatively or qualitatively (Balci, 1989:411). Bibliometric methods are used to perform quantitative analysis of written publications (Ellegaard and Wallin, 2015:1809). This study adopted the descriptive survey model as it focused on analyzing scientific publications on the concept of "organizational attractiveness" through bibliometric indicators and identifying the current research trends. The methodological design of the study conducted by bibliometric analysis is shown in Figure 1 with the Bibliometric Workflow Diagram.

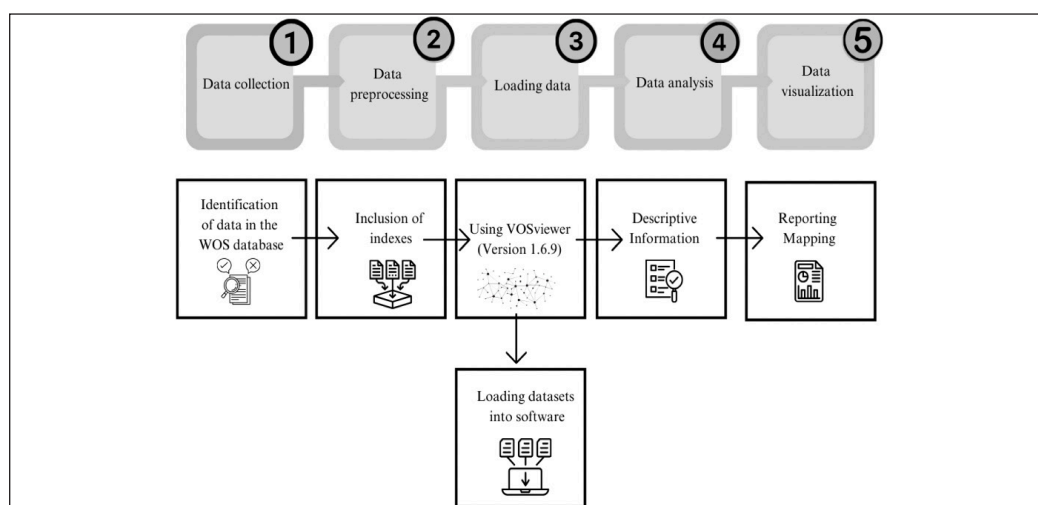


Figure 1: Bibliometric Workflow Diagram

Source: Figure 1 was created by the authors (2024)

Data Collection Process

The Web of Science offers broad categories classified as multidisciplinary to describe the content of journals publishing in all fields of science (Milojević, 2020:183). With its broad scope and international validity, WOS is the most preferred database for scientific research, citation analysis, and bibliometric evaluation (Huang et al., 2023:2305).

Within the scope of this study, a search was carried out on August 14, 2024 using the keyword “organizational attractiveness” in the Web of Science (WOS) database. Scan; made in the title, abstract and keyword fields; All publication types and all citation indexes are included. In addition, no language filter is applied and publications in all languages are covered. A total of 396 publications were identified. It was observed that all of these publications were in English, so the necessity of exclusion based on language criteria did not arise. The same post is not listed more than once. Since it was seen that the first publication was made in 1988, studies published between 1988-2023 were included in the analysis, and records for 2024 were excluded. Records that do not contain relevant information (title, author, source, year, etc.) are also excluded. The data were downloaded via WOS in “tab delimited” format and made available for bibliometric analysis.

ANALYSIS OF DATA

In this research, the bibliometric analysis method was employed to analyze the data. Bibliometric analysis; It is used to evaluate the performance of journals, authors, institutions, and countries, and to analyze co-authorship situation, as well as to guide scientists in identifying research themes, developments, and leading institutions in a particular field in terms of content and geography (Yan and Zhiping, 2023:1). Network visualizations, such as those showing co-authorship, co-attribution, and bibliographic connections are used to explore and visualize bibliometric data, aiding in the understanding of research domains and emerging trends (Tsilika, 2023:1). Bibliometric analysis is a method for evaluating scientific output, tracking publication patterns, assessing the influence of authors and institutions, and analyzing citations. It is also employed for various objectives, such as assessing academic Research and measuring the performance of researchers and academic institutions (Sipahi Döngül and Skica, 2023:33; Sipahi Döngül, 2024:122).

According to Yang et al. (2021:1), bibliometric analysis can be used to understand the key points and limits of research in a particular field, as well as to provide a panoramic view with unique visualizations.

The data were analyzed using two complementary bibliometric software tools: VOSviewer (Version 1.6.19) and SciMAT (Version 1.1.06). VOSviewer was used to visualize co-authorship networks, keyword co-occurrence, and citation-based relationships. It enables the creation and exploration of bibliometric maps using network data, facilitating the identification of publication clusters and key contributors in the field (Arruda et al., 2022:392; Van Eck & Waltman, 2023). This tool helps uncover scientific interactions and detect emerging trends within the literature.

SciMAT was employed to analyze the conceptual structure and thematic evolution of the literature across three periods (1988-1999, 2000-2010, and 2011-2023). It supports the generation of strategic diagrams, overlapping maps, and evolution graphs that reflect the continuity, density, and transformation of key research themes over time (Cobo et al., 2012).

Additionally, to examine statistical relationships between key variables—such as centrality and density, and co-authorship strength and citation impact—Pearson correlation and simple linear regression analyses were conducted using IBM SPSS Statistics Version 27.0.

FINDING

The bibliometric analysis results show the status of published studies on organizational attractiveness across several categories, such as publication year, type of work, countries, indexing details, research areas, publication volume, notable institutions, leading publishers, and authors with the highest number of publications. These analyses will contribute to understanding the level of development of the concept of organizational attractiveness, identifying important actors in the area and predicting future research directions.

Descriptive Information

Basic data set information about the research was analyzed using the WOS database. The descriptive information obtained is summarized in Table 1.

Table 1. Descriptive Statistics

Category	Explanation	Result
General Information		
Timeframe	Years covered by the publications examined in the research	1988-2023
Source	The database on which the study is based	Web of Science (WOS)
Number of Scientific Studies	Total number of scientific studies examined	396
Keywords	The most frequently used keywords by authors	organizational attractiveness recruitment employer branding corporate social responsibility signaling theory
Author Information		
Top Published Authors	Authors with the most publications on organizational attractiveness	Van Hoya, Greet (19 publications) Lievens, Filip (16 publications) Baum, Matthias (9 publications)
Citation Analyses	Top cited authors	Greening, Daniel W. (2 publications, 2802 citation) Turban, Daniel B. (5 publications, 2391 citation)
Publication Types		
Publication Type Distribution	Research Article Proceeding Paper Book Chapters Review Article	348 (%87,88) 27 (%6,7) 11 (%2,78) 10 (%2,53)
Index Information		
Social Sciences Citation Index (SSCI)	Nu. of indexed works	269
Emerging Sources Citation Index (ESCI)	Nu. of indexed works	76
CPCI-SSH	Index of conference proceedings for social sciences and humanities	27
Science Citation Index Expanded (SCI-EXPANDED)	Nu. of indexed works	13
BKCI-SSH	The total number of publications indexed in the citation database for humanities and social sciences.	11
Affiliations Information		
Featured Affiliations	Affiliations with the highest number of publications in the field of organizational attractiveness	University of Ghent (28 publications) State University System of Florida (9 publications) University of Missouri Columbia (8 publications)
Publisher Information		
Top Publishers	Publishers with the most publications on organizational attractiveness	Wiley (84 publications) Emerald Group Publishing (70 publications) Elsevier (40 publications) Springer Nature (37 publications)
Country		
Top Publishers Countries	Countries with the most publications on organizational attractiveness	USA (64 publications) Germany (35 publications) Belgium (22 publications)
Interest		
Research Interests	The most common research areas are for organizational attractiveness	Management (112 publications) Psychology Applied (75 publications) Business (69 publications)

Source: Table 1 created by the authors (2024)

Table 2. The Year Information of the Works

Publication Years	Number of Publications	%
2023	38	9,60
2022	31	7,83
2021	32	8,08
2020	34	8,59
2019	31	7,83
2018	23	5,81
2017	16	4,04
2016	28	7,07
2015	14	3,54
2014	16	4,04
2013	17	4,29
2012	14	3,54
2011	13	3,28
2010	14	3,54
2009	5	1,26
2008	13	3,28
2007	12	3,03
2006	4	1,01
2005	6	1,52
2004	9	2,27
2003	8	2,02
2002	6	1,52
2001	4	1,01
2000	2	0,51
1999	2	0,51
1997	1	0,25
1994	1	0,25
1993	1	0,25
1988	1	0,25

Table 2 presents the distribution of the works by publication year.

As shown in Table 2, the number of publications has seen a notable rise since 2020. In particular, the highest number was reached in 2023 with 38 publications. Between 2010 and 2019, a relatively stable publication trend is noteworthy. It is seen that between 13 and 34 publications were made each year in these years, and the number of publications in this field was very low before 2000. In 1988, 1993, 1994 and

1997, only one publication was made. The highest number of publications were made in 2023, accounting for 9.60% of the total. Table 3 contains information about the publication type of published works.

As seen in Table 3, research articles make up the vast majority of studies, followed by symposium papers and book chapters.

Table 3. Information of Publications by Work Type

Document Types	Number of Publications	%
Research Article	348	87,88
Proceedings Paper	27	6,82
Review Article	10	2,53
Book Chapter	11	2,78
Total	396	100

Source: Table 3 was created by the authors (2024)

Table 4 contains the country information of the published works.

As illustrated in Table 4, the United States leads the literature in both volume and citation impact, reflecting

its dominant role in organizational research. Several European countries also show strong contributions, suggesting a regional clustering of scholarly activity.

Table 4. The Country Information of the Published Works

Countries/Regions	Number of Publications	%
USA	64	16,16
Germany	35	8,84
Belgium	22	5,56
Canada	21	5,30
England	20	5,05
China	20	5,05
India	17	4,29
Netherlands	15	3,79
France	14	3,54
Australia	13	3,28
Spain	12	3,03
South Korea	11	2,78
Switzerland	10	2,53
Taiwan	10	2,53
Türkiye	9	2,27
Portugal	8	2,02
Malaysia	7	1,77
Italy	6	1,52
Japan	6	1,52
Greece	5	1,26
Norway	5	1,26
Singapore	5	1,26
Bangladesh	4	1,01
Lithuania	4	1,01
United Arab Emirates	4	1,01
Denmark	3	0,76
New Zealand	3	0,76
Austria	2	0,51
Croatia	2	0,51
Czech Republic	2	0,51
Finland	2	0,51
Indonesia	2	0,51
Pakistan	2	0,51
Romania	2	0,51
Russia	2	0,51
Saudi Arabia	2	0,51
South Africa	2	0,51
Sweden	2	0,51
Thailand	2	0,51
Vietnam	2	0,51
Bahrain	1	0,25
Brazil	1	0,25
Bulgaria	1	0,25
Chile	1	0,25
Cyprus	1	0,25
Egypt	1	0,25
Ghana	1	0,25
Iran	1	0,25
Ireland	1	0,25
Israel	1	0,25
Kazakhstan	1	0,25
Morocco	1	0,25
North Macedonia	1	0,25
Philippines	1	0,25
Scotland	1	0,25
Serbia	1	0,25
Ukraine	1	0,25
Total	396	100

Source: Table 4 was created by the authors (2024)

Table 5. The Index Information of the Published Works

Web of Science Index	Number of Publications
Social Sciences Citation Index (SSCI)	269
Emerging Sources Citation Index (ESCI)	76
Conference Proceedings Citation Index – Social Science & Humanities (CPCI-SSH)	27
Science Citation Index Expanded (SCI-EXPANDED)	13
Book Citation Index – Social Sciences & Humanities (BKCI-SSH)	11
Total	396

Source: Table 5 was created by the authors (2024)

Table 5 contains the index information of the published works.

As shown in Table 5, the majority of studies on organizational attractiveness are indexed in SSCI, indicating the field's strong grounding in the social sciences and its frequent publication in high-impact journals. This concentration within SSCI also underlines the academic credibility and global relevance of the topic. Additionally, the presence of studies in ESCI and CPCI-SSH demonstrates that the subject is not only recognized in established academic outlets but also actively discussed in emerging platforms and

conference proceedings. Furthermore, the inclusion of documents in SCI-EXPANDED and BKCI-SSH reflects the interdisciplinary nature of the field, linking social sciences with broader academic domains.

Table 6 shows which research areas the publications on organizational attractiveness focus on.

According to Table 6, the management area was the most preferred field with 112 publications (28.28%). Psychology Applied ranks second with 75 publications (18.94%). This field suggests that organizational attractiveness is examined on issues such as the effects of individuals on motivation, job satisfaction, and career choices.

Table 6. Research Fields and Publication Count

Research Area	Number of Publications
Management	112
Psychology Applied	75
Business	69
Industrial Relations Labor	21
Psychology Social	19
Psychology Multidisciplinary	17
Environmental Studies	12
Ethics	10
Economics	9
Green Sustainable Science Technology	8
Hospitality Leisure Sport Tourism	7
Environmental Sciences	6
Communication	5
Public Administration	5
Health Care Sciences Services	4
Operations Research Management Science	4
Computer Science Interdisciplinary Applications	3
Education Educational Research	3
Sociology	3
Computer Science Information Systems	2
Multidisciplinary Sciences	2
Total	396

Source: Table 6 was created by the authors (2024)

Table 7 displays the top 50 affiliations that are prominent in the published works.

According to Table 7, the University of Ghent is far ahead with 28 publications. This shows that the university offers a strong research focus on the issue of organizational attractiveness and is in a leading position in this regard. Looking at Table 7, it is seen that there are many US-based universities such as State University System of Florida (9 publications), University of Texas System (8 publications). The strong presence of USA universities in this field can be explained by the country's leadership in social science research and its vast academic resources.

Table 7. Top 50 Affiliations Highlighted in Published Works

Affiliations	Number of Publications
University of Ghent	28
State University System of Florida	9
University of Missouri Columbia	8
University of Missouri System	8
University of North Carolina	8
University of Texas System	8
Portland State University	7
Purdue University	7
Saarland University	7
University System of Ohio	7
Korea University	6
Technical University of Munich	6
University of Amsterdam	6
Athens University of Economics Business	5
Bowling Green State University	5
Heinrich Heine University Dusseldorf	5
Indian Institute of Management IIM System	5
Instituto Universitário De Lisboa	5
Ku Leuven	5
Texas A&M University College Station	5
Texas A&M University System	5
Universite De Montreal	5
University of Bayreuth	5
University of Gottingen	5
University of Kaiserslautern	5
University of London	5
University of Maryland College Park	5
University System of Maryland	5
California State University System	4
Hec Montreal	4
Inland Norway University of Applied Sciences	4
Justus Liebig University Giessen	4
Mays Business School	4
Michigan State University	4
National Institute of Technology Nit System	4
National Institute of Technology Tiruchirappalli	4
National Yang Ming Chiao Tung University	4
Tata Institute of Social Sciences	4
The ICFAI Foundation for Higher Education (IFHE)	4
University of Arizona	4
University of Munster	4
University of Rome Tor Vergata	4
University of Zürich	4
University System of Georgia	4
Western University	4
York University	4
Auburn University	3
Complutense University of Madrid	3
Erasmus University Rotterdam	3
Florida International University	3

Source: Table 7 was created by the authors (2024)

Table 8. The Ten Leading Publisher by Publication Count

Publisher	Number of Publications
Wiley	84
Emerald Group Publishing	70
Elsevier	40
Springer Nature	37
Taylor & Francis	34
Sage	15
American Psychological Association	14
MDPI	7
Nomos Verlagsgesellschaft MbH & Co Kg	5
Hogrefe Publishing Corp	4

Source: Table 8 was created by the authors (2024)

Table 8 shows the top 10 publishers that stand out in publications on the topic of organizational attractiveness.

According to Table 8, Wiley ranks first with 84 publications. Wiley's wide-ranging portfolio of journals has increased the visibility of the issue of organizational attractiveness in the international arena. Emerald Group Publishing is in second place with 70 publications. The top two publishers, Wiley and Emerald, published about 39% of the total publications (154 publications). World-renowned academic publishers such as Elsevier (40 publications) and Springer Nature (37 publications), have made significant contributions to this field. Table 9 shows the top 10 authors with the most publications in research on organizational attractiveness.

According to Table 9 Van Hoyer, Greet (19 publications) and Lievens, Filip (16 publications) are at the top of the list. These two authors are by far the

most published researchers. In addition, when we look at the authors in Table 9, it is understood that academicians from different regions contributed. This shows that organizational attractiveness research is gaining international attention.

Co-Author Analysis

Authors prefer co-authorship on papers with the desire to increase their scientific productivity in terms of both quantity and quality (Clark et al., 2006).

Table 10 shows the results of co-author bonds, which show the collaboration between the authors.

According to Table 10, Van Hoyer is the author with the most publications, with 19 publications. At the same time, the total connection power of 26 shows that it plays a strong role in collaborations. Lievens, Filip holds the record for the highest number of

Table 9. Ten Leading Authors by Number of Publications

Authors	Number of Publications
Van Hoyer, Greet	19
Lievens, Filip	16
Baum, Matthias	9
König, Cornelius J.	6
Bauer, Talya	6
Froese, Fabian Jintae	6
Langer, Markus	6
Highhouse, Scott	6
Turban, Daniel B.	5
Carpentier, Marieke	5

Source: Table 9 was created by the authors (2024)

Table 10. Co-Author Links Demonstrating Collaboration between Authors

Author	Documents	Citations	Total Link Strength	h-index
Van Hoyer, Greet	19	634	26	25
Lievens, Filip	16	2050	30	25
Baum, Matthias	9	145	17	30
Koenig, Cornelius J.	6	187	16	36
Langer, Markus	6	193	15	19
Kabst, Ruediger	5	115	12	28
Carpentier, Marieke	5	119	11	6
Bernerth, Jeremy B.	3	135	10	22
De Witte, Karel	3	61	10	14

Note: The h-index values were obtained from the authors' Web of Science (WoS) profiles

Source: Table 10 was created by the authors (2024)

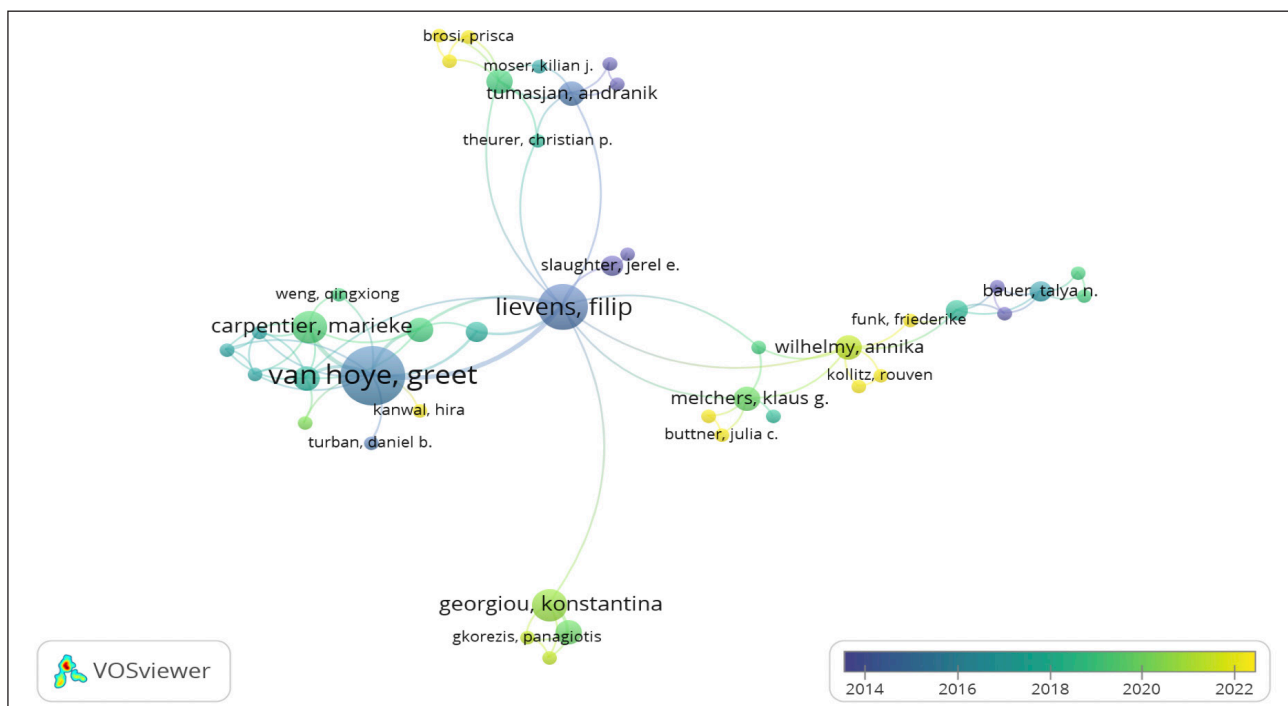
citations, totaling 2,050 citations. In this context, Table 10 provides important information to compare the authors' collaborative tendencies and influences in the academic field. Academic collaborations should be evaluated not only by the number of publications and citations, but also by the strength and quality of collaborations (Guan et al., 2017:407). Figure 2 presents the network map of the co-authorship analysis, consisting of 43 units, 9 clusters, 81 links, and a total of 100 connections, based on the condition that each author has at least one publication and one citation. This map helps in identifying the authors with the most connections within the field. This network map is designed to visualize collaboration dynamics,

connection density, and academic impact among authors.

The h-index is an indicator that evaluates academic impact without focusing only on the number of publications or total citations (Akhtar, 2024:1). In this regard, Koenig, Cornelius J. has a fairly high h-index of 36 with 6 publications. This shows that despite the small number of publications, each of his studies is heavily cited and has a high impact.

Authors' Citation Analysis

Markscheffel and Schröter (2021:365) emphasized that the visualizations created with VOSviewer are clearer and more user-friendly, and stated that the use of VOSviewer

**Figure 2:** Co-Author Network Map Illustrating Collaborative Connections between Authors

Source: Figure 2 was created by the authors (2024)

Table 11. Authors’ Citation Analysis

Author	Documents	Citations	Total Link Strength
Greening, Daniel W.	2	2802	348
Turban, Daniel B.	5	2391	859
Lievens, Filip	16	2050	1026
Highhouse, S.	5	1207	884
Johnson, R. A.	1	1039	6
Van Hoyer, Greet	19	634	517
Sinar, E. F.	1	473	428
Jones, David, A.	1	421	176
Madey, Sarah	1	421	176

Source: Table 11 was created by the authors (2024)

is a suitable software for the creation and visualization of bibliometric networks based on citations. It was found that there are 10,271 connection strength and 13,030 total connection power across 26 clusters in 800 observation units, which were identified as connected, provided they met the criteria of having at least one publication and one citation.

Table 11 shows the citation analysis created to analyze the academic impact and citation performance of the authors.

According to Table 11, Greening shows a high academic impact with 2802 citations in Daniel W. 2 publications, but the total linking power of 348 indicates that collaborations are relatively limited. Turban, Daniel B. and

Lievens, Filip stand out both in terms of the number of publications and the total connection strength. Madey, Sarah, & Jones, David, A., 421 citations, although they make a notable impact, their linkage strength values are moderate (176). In this context, it can be said that Table 11 emphasizes the importance of the network effect beyond measuring academic achievement.

Citation Analysis of Countries

In order for a country to be included in the analysis, at least one academic study must have been produced from that country and it must have been cited at least once by other studies. The aim is to understand the country-based productivity and impact of studies and to reveal the differences between countries (Andrés,

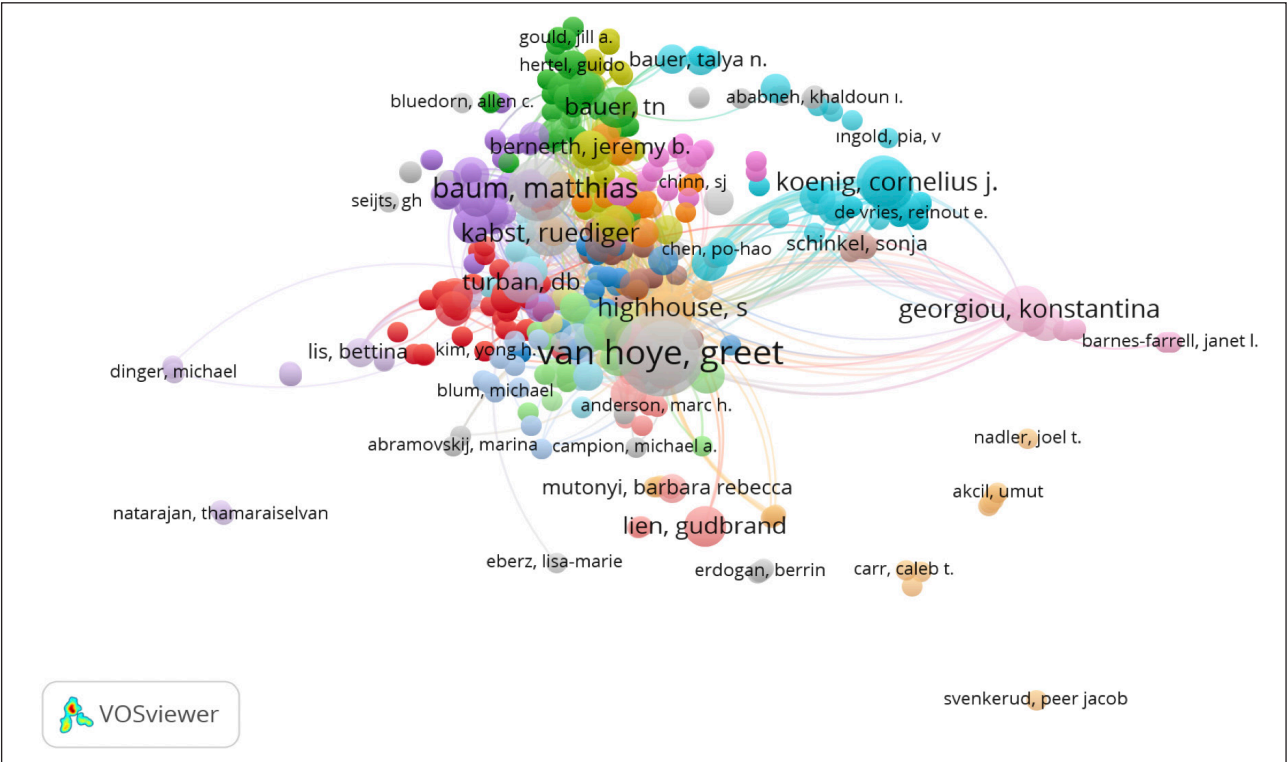


Figure 3: Network Map of Authors’ Citation Links

Source: Figure 3 was created by the authors (2024)

2009:1). This analysis is an important approach to evaluate the geographical spread of scientific production in the literature and the impact of cross-country collaborations.

Table 12 shows the total number of publications, number of citations, and total connection strength values for each country.

As shown in Table 12, the USA leads significantly in both the number of publications and citations, with 64 publications and 6965 citations. Belgium stands out with 2424 citations and a total link strength of 831, despite having relatively few publications with

22 publications. This shows that their publications are highly influential and occupy an important place in collaboration networks. Türkiye exhibits a moderate level of productivity with a total of 11 publications and 142 citations. Countries such as Brazil, Chile, Bangladesh are among the countries that receive high citations (e.g. Chile: 45 citations) with a single publication.

Figure 4 illustrates the clustering of nodes, with each color representing a different group. Furthermore, a thicker line suggests a higher frequency of collaboration between the two countries on publications (Tao and Chao, 2023: 6).

Table 12. Analysis of Countries

Country	Documents	Citations	Total Link Strength
USA	64	6965	1381
Germany	35	1314	708
Belgium	22	2424	831
Canada	21	1072	280
England	20	544	199
China	20	294	199
India	17	347	230
Netherlands	15	405	132
France	14	282	165
Australia	13	265	138
Spain	12	500	77
South Korea	11	142	143
Taiwan	10	183	113
Switzerland	10	159	109
Türkiye	11	142	86
Portugal	8	191	124
Malaysia	7	69	49
Japan	6	79	56
Italy	6	33	31
Singapore	5	155	69
Greece	5	65	47
Norway	5	43	13
Bangladesh	4	37	45
U Arab Emirates	4	15	14
Lithuania	4	3	10
New Zealand	3	43	18
Denmark	3	34	29
Finland	2	70	14
Pakistan	2	30	17
Romania	2	25	4
Indonesia	2	24	2
Vietnam	2	21	23
Croatia	2	21	15
Czech Republic	2	21	12
Thailand	2	15	5
Sweden	2	13	27
South Africa	2	9	16
Austria	2	7	24
Saudi Arabia	2	5	8
Chile	1	45	21
Brazil	1	32	14
Bahrain	1	30	11
Ghana	1	30	2
Egypt	1	29	18
Philippines	1	17	22
Scotland	1	11	2
Israel	1	10	3
Iran	1	7	0
Morocco	1	6	11
Cyprus	1	2	2
Bulgaria	1	2	1
Serbia	1	0	2
North Macedonia	1	1	4
Ireland	1	1	4

Source: Table 12 was created by the authors (2024)

Analysis of Bibliometric Connections Among Affiliations

Antunes and Veríssimo (2024:6) consider this analysis as important analytical variables that indicate the contribution and performance of different regions or institutions in this field of research. The analysis, conducted using 475 observation units that were found to be interconnected revealed 22 clusters, a connection strength of 4740, and a total connection strength of 6345 in the bibliometric matching analysis of the institutions.

Keyword Analysis

Ullah et al. (2023:1) explain that keywords are terms selected by authors to accurately represent the core aspects of their research. In the study, the most used keywords that are related to each other at least 2 times were analyzed in terms of 172 units, 19 clusters, 743 connections, 1014 total connection strengths.

Table 13 shows the most used keywords in the domain, frequency of use, and total link strength.

According to Table 13, “organizational attractiveness” has the most repetition (147) and connection

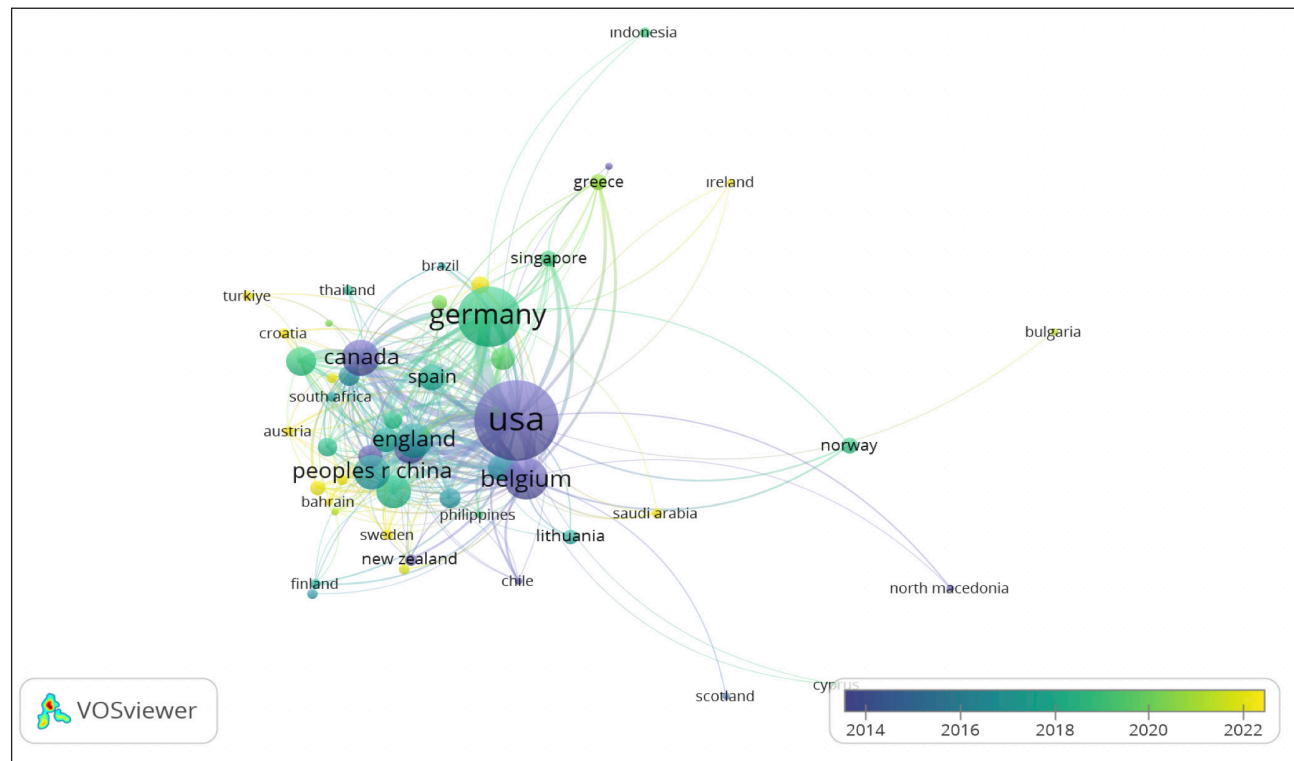


Figure 4: Stratification of Countries' Citation Links by Years

Source: Figure 4 was created by the authors (2024).

Table 13. Keyword Analysis

Keyword	Occurrences	Total link strength
organizational attractiveness	147	309
recruitment	65	158
employer branding	32	70
corporate social responsibility	22	55
signaling theory	21	58
applicant reactions	16	30
person-organization fit	12	36
applicant attraction	12	30
employer attractiveness	12	26
human resource management	10	30
social media	9	34
job seekers	9	25
employer brand	9	22
gender	9	19
diversity	8	18
attractiveness	8	14
job pursuit intentions	7	19
recruiting	7	17

Source: Table 13 was compiled by the authors (2024)

strength (309). This suggests that there is a fundamental issue that is at the heart of the study.

"Recruitment" is in second place with 65 repetitions and 158 connection strengths. Accordingly, it is understood that recruitment processes have a strong connection with organizational attractiveness. "Employer Branding" (32

reps, 70 links) is another important concept associated with organizational attractiveness.

"Corporate social responsibility" (CSR) (22 reps, 55 links) shows that the social responsibility of companies plays an important role in the attractiveness of organizations.

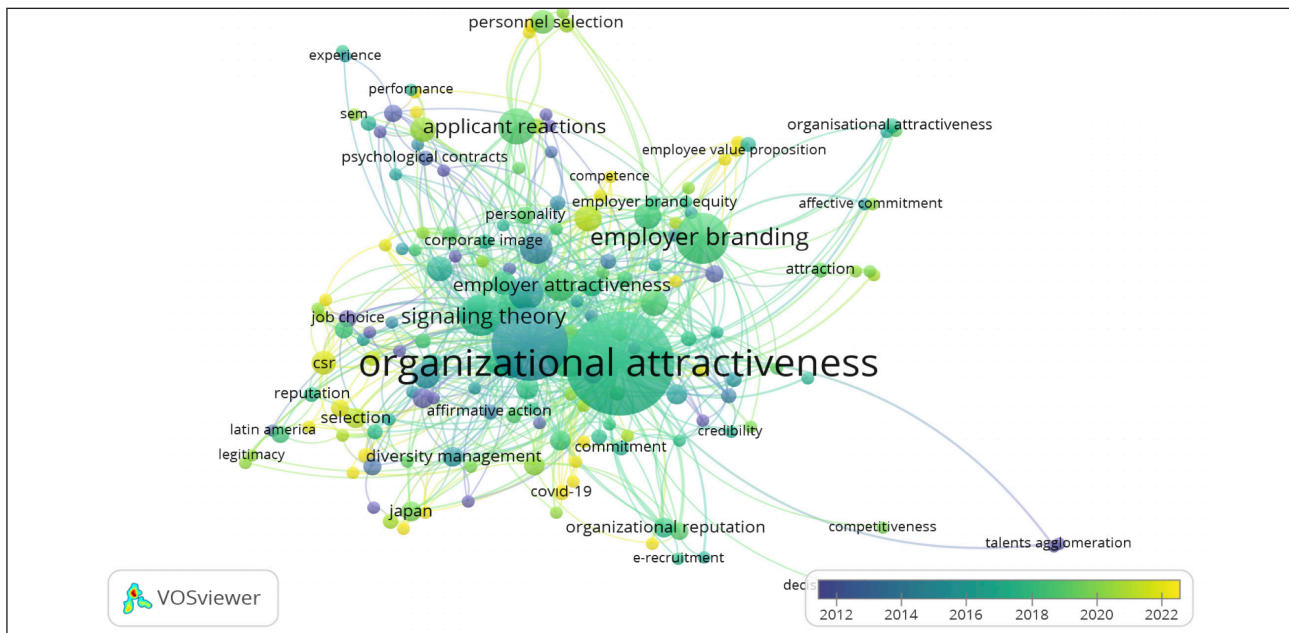


Figure 5: Annual Breakdown of the Most Commonly Used Keyword Connections

Source: Figure 5 was created by the authors (2024)

Table 14. Analysis of Bibliometric Matches in Documents

Document	Citations ▼	Total link strength
Turban (1997)	1763	747
Johnson (1999)	1039	180
Highhouse (2003)	473	685
Lievens (2003)	447	850
Jones (2014)	421	1840
Turban (1993)	315	312
Marin (2007)	255	683
Suazo (2009)	206	447
Lievens (2016)	194	2361
Turban (2001b)	193	1039

Source: Table 14 was created by the authors (2024)

Figure 5 illustrates the annual stratification of the most commonly used keyword connections. The lines in the figure express the connections between keywords and the extent to which these concepts are related. Each keyword is represented as a node in a network graph. The number of times the keyword appears in an article collection (frequency of occurrence) determines the size of the node. That is, the more often a keyword is used, the larger its node is shown in the graph. This helps to visually highlight the prevalence of a particular keyword in the research area (Antunes and Veríssimo, 2024:4). The clusters shown in different colors in Figure 5 represent groups of concepts that are close to each other. At the bottom right of the map, the stratification status by timeline, which shows how keywords are distributed by year, shows their spread and concentration trends between 2012 and 2022.

Analysis of Bibliometric Matches in Documents

Bibliographic matching of texts refers to the situation where two different publications refer to the same third source (Kessler, 1963). In Table 14, the results of bibliometric match analysis of academic texts are listed in terms of number of citations and total link strength. These data help to determine the impact of certain studies on organizational attractiveness and to analyze the relationship network of these studies with other research.

According to Table 14, Turban (1997) is by far the most cited study with 1763 citations and 747 total link strength. Lievens (2016) has the highest value with 2361 in terms of total connection strength.

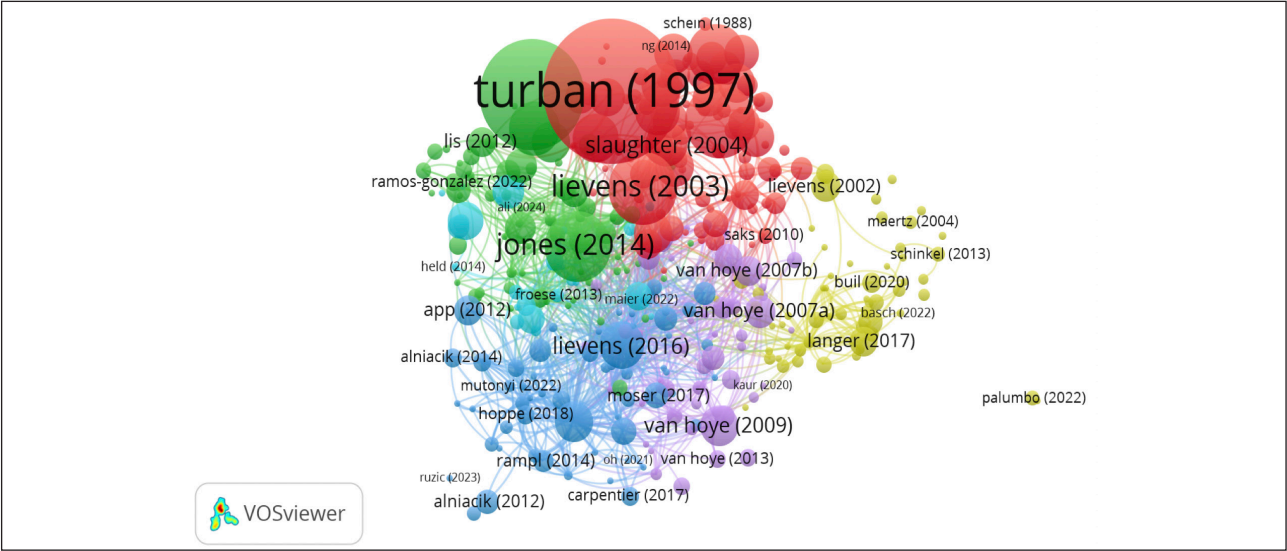


Figure 6: Bibliometric Matching Links of Documents

Source: Figure 6 was created by the authors (2024)

Table 15. Bibliometric Match Analysis of Authors

Author	Documents	Citations	Total Link Strength
Van Hoyer, Greet	19	634	36024
Lievens, Filip	16	2050	47345
Baum, Matthias	9	145	31947
Kabst, Ruediger	5	115	21491
Welppe, Isabell M.	3	211	15876
Tumasjan, Andranik	3	219	14868
George, Esther Princess	3	20	11972
Georgiou, Konstantina	5	65	11414
Gomes, Daniel Roque	3	30	10738
Wehner, Marius Claus	3	42	10196
Slaughter, Jerel E.	2	239	10138
Hoppe, Daniel	3	38	10032
Highhouse, Scott	5	1207	9923
Langer, Markus	6	193	9827
Carpentier, Marieke	5	119	9484
Koenig, Cornelius J.	6	187	9143
Bernerth, Jeremy B.	3	135	9143
Feild, Hubert S.	3	135	9143
Walker, H. Jack	3	135	9143

Source: Table 15 was created by the authors (2024)

Figure 6 shows the map for bibliometric match analysis. In the center of the map is the study of Turban (1997) and is represented by the largest node.

Bibliometric Match Analysis of Authors

In the bibliometric match analysis, authors with at least one publication and one citation were included to ensure a broad and inclusive representation of the scholarly landscape. This minimal threshold is commonly adopted in bibliometric studies of emerging or multidisciplinary

fields, where citation distributions are often skewed and setting higher thresholds could lead to the exclusion of early-career or less-cited but relevant contributors (van Eck & Waltman, 2014: 296-297). Based on this inclusion criterion, the analysis identified 817 authors grouped into 8 clusters, with 22,669.2 connections and a total link strength of 1,077,741, reflecting the collaborative structure and citation dynamics within the field.

Table 15 shows the bibliometric match analysis to show the academic impact of the authors.

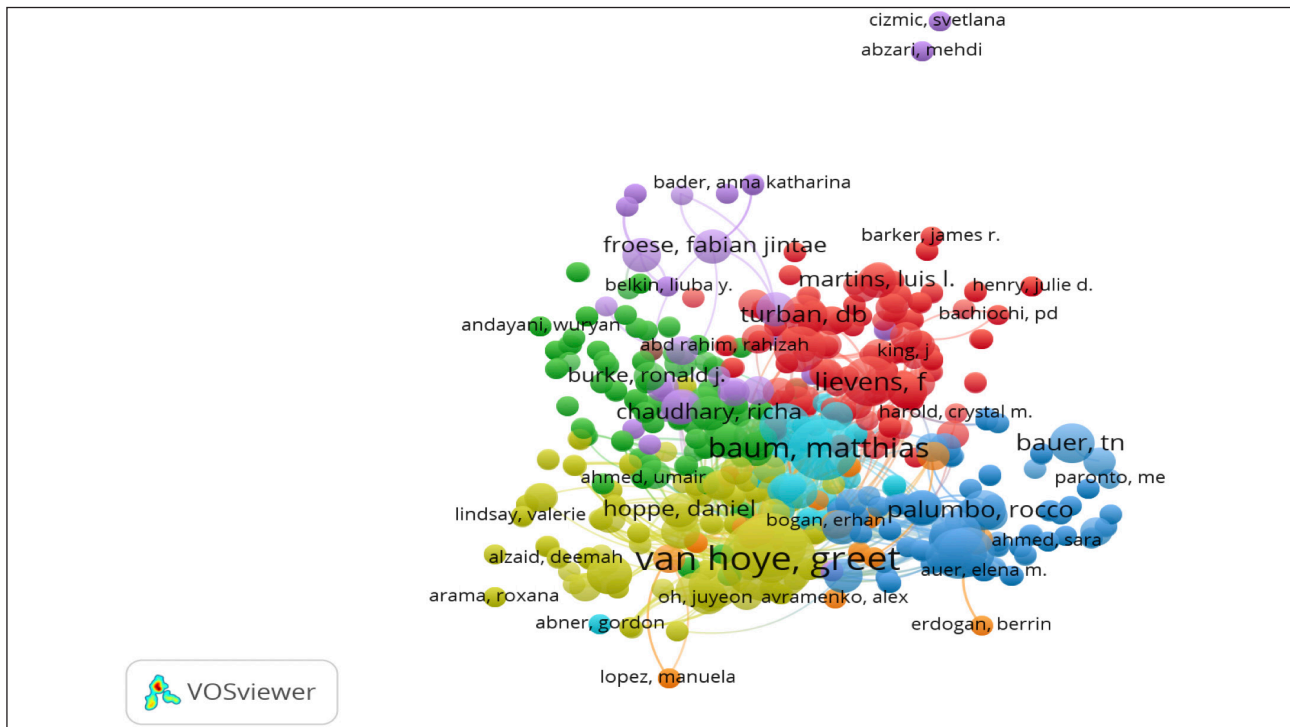


Figure 7: Stratification of Authors' Bibliometric Matching Links by Years

Source: Figure 7 was created by the authors (2024)

According to Table 15, Van Hoya, Greet has the highest total bond strength (36,024) and also the most publications (19). This shows that Van Hoya had a wide network of collaborators and made an influential scientific impact through his work.

The Impact of Bibliometric Trends on the Theoretical Landscape

Bibliometric analysis embodies the changes that occur in the theoretical landscape of the literature by reflecting not only the number of publications and keywords, but also the continuity, expansion, and transformation of concepts over time (Cobo et al., 2012: 1619).

In this context, a three-period analysis of the concept of organizational attractiveness was revealed with the Overlapping Map.

Overlapping Map

The overlap map reveals how concepts in a given field evolve and follow each other over time (Cobo et al., 2012: 1619). Figure 8 shows how the concept of "organizational attractiveness" has evolved between 1988 and 2023 in 3 periods.

When the 1st period (1988-1999) is examined, it is seen that there are a total of 18 concepts. It is understood that 14 of the concepts in this period have passed into the 2000-2010 period, and the conceptual continuity is quite strong, with a transition rate of 0.78. On the other hand, it seems that 4 concepts remain only in this period. This period can be considered as an initial process in which the basic concepts in the field of organizational attractiveness are shaped, the literature is structured and the theoretical foundations are laid.

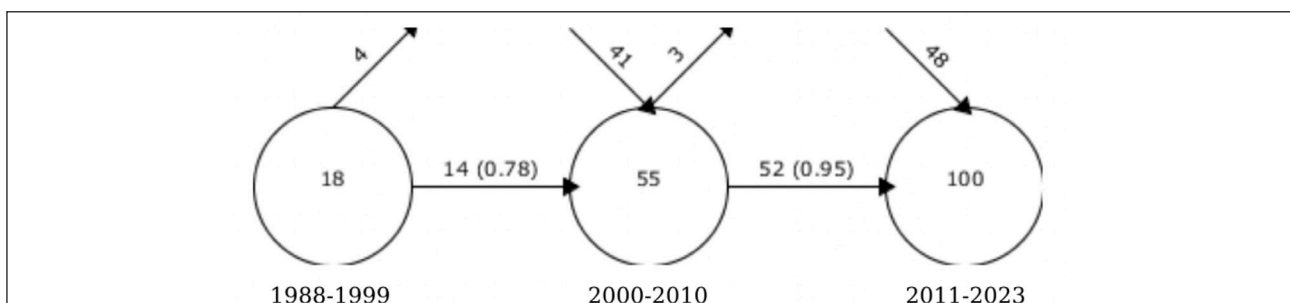


Figure 8: Overlap Map of the Number of Conceptual Clusters

Source: Figure 8 was created by the authors (2025)

When the 2nd period (2000-2010) is considered, it is seen that there are a total of 55 concepts. It is understood that during this period, 14 concepts were carried over from the previous period and 41 new concepts were added. This shows that there is both high conceptual integrity and significant innovation and expansion in the field of organizational attractiveness.

The 3rd period (2011-2023) is a period in which a total of 100 concepts are included, 52 concepts from the previous period are transferred and 48 new concepts are included in the literature. The pass rate is as high as 0.95, indicating that conceptual continuity continues strongly. The high

number of new concept entries observed in this period reveals that the concept of organizational attractiveness has been reshaped. In this regard, the recent period reflects a steady process of development and maturation in the field. The biggest conceptual breakdown and innovation took place between 2000 and 2010, which was the second period, and the first period offered a conceptual basis and the last period offered a mature structure that integrated with current developments. In general, the first period symbolizes conceptual building blocks, the second period symbolizes innovation and diversification, and the third period symbolizes stable growth and current harmony.

Table 16. Core Concepts, Influential Authors, and Theoretical Integration of Organizational Attractiveness by Period

Period	Basic Concepts	Associated Authors
1988-1999	Studies conducted during this period focused on developing baseline scales to measure organizational attractiveness and identifying organizational characteristics that influence individual decisions. Although the theoretical background is limited, the conceptual basis has been established.	Attraction: Matthias Baum Reputation: Daniel B. Turban Job Attributes: Scott Highhouse; Koenig Cornelius J.; George, Esther Princess; Konstantina Georgiou; Daniel Roque Gomes Employer Image: Lievens Filip; Daniel Hoppe
2000-2010	Signaling Theory (Spence, 1973: 355) explains how the symbolic and tangible signs that employers offer to candidates affect candidates' perceptions of the organization and their application decisions. In this period, organizational attractiveness was associated with the characteristics of the organization; The language, message structure and symbolic connotations of the job postings used in the recruitment process have come to the fore.	Signaling Theory: Daniel B. Turban; Greening, Daniel W.; Van Hoya Greet; Carpentier, Marieke Job Choice: Scott Highhouse; Koenig Cornelius J.; Konstantina Georgiou; Daniel Roque Gomes; Slaughter, Jerel E.; Bernerth, Jeremy B. Corporate Image: Daniel Hoppe Employer Attractiveness: Lievens Filip; Daniel Hoppe Selection: Lievens Filip; Konstantina Georgiou; Daniel Roque Gomes; Daniel Hoppe; Carpentier, Marieke; Walker, H. Jack Applicant Reactions: Van Hoya Greet; Daniel B. Turban E-Recruitment: Van Hoya Greet; Konstantina Georgiou; Daniel Roque Gomes; Slaughter, Jerel E.; Carpentier, Marieke; Feild, Hubert S.
2011-2023	Social Identity Theory (Tajfel & Turner, 1986: 7) states that individuals' levels of identification with the organization affect their perception of organizational attractiveness and their intention to apply. Person-Organization Fit (Kristof, 1996:1) argues that candidates' alignment with organizational values shapes their preferences. Employer Branding (Backhaus & Tikoo, 2004:501) emphasizes that employer branding plays a strategic role in attracting talented candidates. Organizational attractiveness in this period; beyond individual benefit, it is handled in the context of corporate reputation, ethical responsibility and strategic positioning; The concept has been associated with social identity, employer image, and candidate behavior.	-Employer Branding: Lievens Filip; Van Hoya Greet; Daniel B. Turban -Person-Organization Fit: Koenig Cornelius J.; Markus Langer; -Social Identity Theory: Daniel B. Turban; Greening, Daniel W. -HRM: Markus Langer; Rüdiger Kabst; Isabell M. Welp; Andranik Tumasjan; Daniel Roque Gomes; Slaughter, Jerel E.; Feild, Hubert S. -Green HRM: Rüdiger Kabst -Technology: Markus Langer; Isabell M. Welp; Andranik Tumasjan; Marius Claus Wehner -CSR: Daniel Roque Gomes -Diversity: Bernerth, Jeremy B.; Feild, Hubert S.; Walker, H. Jack -Applicant Attraction: Rüdiger Kabst; Marius Claus Wehner -Social Media: Van Hoya Greet; Carpentier, Marieke

Source: Table 16 was created by the authors (2025)

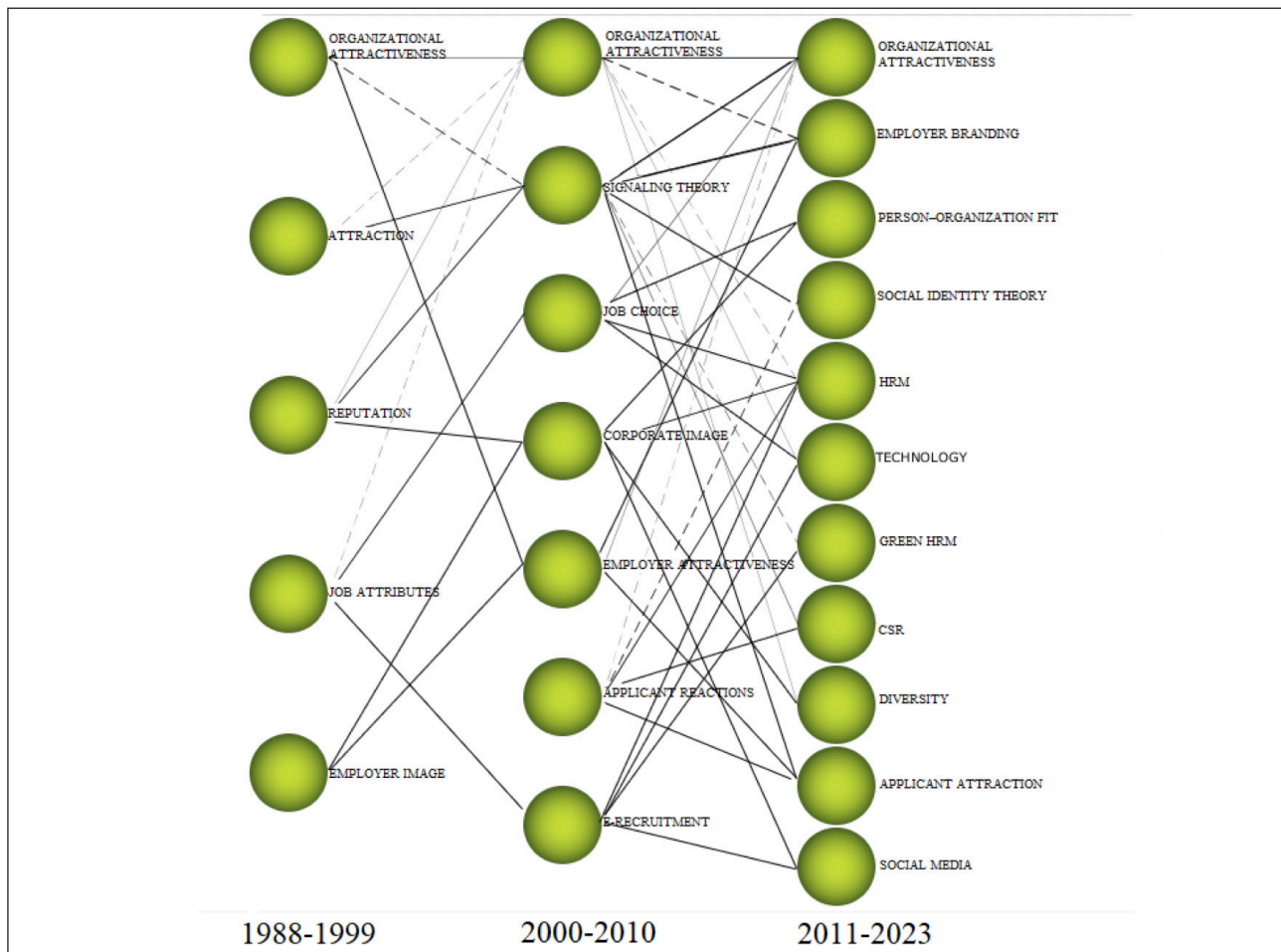


Figure 9: Evolutionary Map of Conceptual Sets

Source: Figure 9 was created by the authors with SciMAT v1.1.06 software (2025).

Table 16 shows the theoretical integration of basic concepts, effective authors, and organizational attractiveness by period.

The periodic evolution map of the conceptual sets is shown in Figure 9.

Figure 9 reveals the relationships (shown by lines) of the key concepts used in the three periods with each other. Thick lines indicate stronger relationships, dashed lines indicate weaker thematic transitions. Nodes (circles) represent the concepts that come to the fore in each period (atif). The 1988-1999 period shows that conceptual diversity was low in this period, but the foundations of core concepts were laid. While there are strong connections with the basic concepts of 1988-1999, more behavioral themes such as applicant reactions have now come into play. The 2011-2023 Period contains much more intense conceptual connections compared to previous periods. Organizational Attractiveness started with basic definitions in 1988-1999, strengthened with theoretical models in 2000-2010, and gained a broad interdisciplinary structure after 2011. In this context, it

is seen that the concept of organizational attractiveness has expanded from the micro level (perceptions and individual preferences) to the macro level (corporate strategies, social values and technology) over time and is increasingly handled with a more holistic approach.

Table 17, Table 18 and Table 19 show the cluster information of the concepts.

Table 17. For the Period 1988-1999 (1. Period) Cluster Information

Name	Centrality	Density
Attraction	2	65
Reputation	1,7	60
Job Attributes	1,6	58
Employer Image	1,4	55

Source: Table 17 was created by the authors (2025)

Centrality is the power of connection of a term with other terms; density shows how strongly the concepts in the set are connected to each other and reflects the conceptual integrity (Cobo et al., 2012: 1617-1618).

Table 18. For the Period 2000-2010 (2. Period) Cluster Information

Name	Centrality	Density
Signaling Theory	2,3	68
Job Choice	2,1	66
Corporate Image	2	64
Employer Attractiveness	1,8	63
Applicant Reactions	1,7	60
E-Recruitment	1,6	58

Source: Table 18 was created by the authors (2025)

Table 19. For the Period 2011-2023 (3. Period) Cluster Information

Name	Centrality	Density
Employer Branding	2,5	72
Person-Organization Fit	2,4	70
Social Identity Theory	2,2	68
HRM	2	65
Technology	1,9	63
Green HRM	1,7	60
CSR	1,6	58
Diversity	1,5	56
Social Media	1,3	55

Source: Table 19 was created by the authors (2025)

According to Table 17, "Attraction" is the concept with the highest centrality and density. This suggests that it is both the most connected and the most inclusive core concept in the literature. The concepts of "Reputation" and "Job Attributes" have also created clusters that are both link-rich and strong in terms of meaning. The "Employer Image" has lower centrality and density than other concepts for this period.

"Signaling Theory" in Table 18 is the most dominant theme of this period. The fact that this theme has the highest values of centrality and density shows that the concept establishes strong relationships with other themes and is placed at the theoretical center of the field. This reflects that the importance of the signals used by candidates in choosing an employer has been studied intensively during this period. "Job Choice" and "Corporate Image" are concepts that draw attention with their high centrality and density values. This shows that corporate image and individual decision-making processes gain importance in the job selection process. "Employer Attractiveness" has become more and more central in the literature, establishing more connections in this period than in the previous period (from 1.4 to 1.8). "Applicant Reactions" and "E-Recruitment", although at a lower level in terms of centralization and density, reflect that adaptation to the digitalized labor market and candidate behaviors have started to find an important place in the literature.

"Employer Branding" in Table 19 stands out as the concept with the highest value in terms of both centrality and density. This suggests that employer branding plays a central role in determining organizational attractiveness and is often worked in conjunction with other concepts. The high value of centrality and density shows that harmony comes to the fore, especially in recruitment processes. "Social Identity Theory" has been especially associated with the concepts of employee engagement, belonging, and attractiveness. "Human Resources Management (HRM)", as one of the basic structural concepts, has high values, but indicates that a more institutional and system-oriented approach is dominant compared to previous periods.

Table 20 shows the Pearson correlation analysis between conceptual centrality and density in three periods.

Table 20. Pearson Correlation Analysis Between Conceptual Centrality and Density in Three Periods

Periyod		
1988-1999	r	0.991
	p	0.001
2000-2010	r	0.977
	p	0.001
2011-2023	r	0.995
	p	0.001

**p<0.001, *p<0.05 significant correlation, Correlation coefficients are based on Pearson's r.

As shown in Table 20, a very strong and significant positive relationship was observed between the centrality and density of concepts in all three periods.

According to Table 21, a very strong positive and statistically significant relationship was found between co-authorship power and citation effect ($p < 0.001$).

In Table 22, simple linear regression analysis was applied on the number of publications per year in order to examine the publication productivity between 1988-2023 in terms of time. As a result of the significance test of the model, it was determined that the established model was statistically significant ($F = 103.965$, $p < 0.001$). The explanatory level of the regression model is high, and the variables of years explain 86.4% of the total variance in the number of publications ($R^2 = 0.864$).

Table 21. Correlation Results Between Co-Authorship Power and Citation Effect

Variable 1	Variable 2	r	p
Total Link Strength	Citations	0.994	< 0.001

**p<0.001, *p<0.05 significant correlation, Correlation coefficients are based on Pearson's r.

Table 22. Model 1: Simple linear regression results for the effect of time on the number of publications between 1988 and 2023

Dependent Variable	Independent Variable	Beta (β)	t	p	R ²	F
Number of Publications	Year	1.363	10.196	< 0.001	0.864	103.965

There was a significant effect of $0.05 < p$. Simple linear regression analysis.

Table 23. Model 2: Simple Linear Regression Analysis of the Relationship Between Year of Publication and Number of Citations

Dependent Variable	Independent Variable	Beta (β)	t	R ²	F
Number of Citations	Year of Publication	1.189	5.986	0.066	35.831

In Table 22, simple linear regression analysis was applied on the number of publications per year in order to examine the publication productivity between 1988-2023 in terms of time. As a result of the significance test of the model, it was determined that the established model was statistically significant ($F = 103.965$, $p < 0.001$). The explanatory level of the regression model is high, and the variables of years explain 86.4% of the total variance in the number of publications ($R^2 = 0.864$).

As a result of the simple linear regression analysis applied to test the relationship between the year of publication and the number of citations, it was seen that the model was significant ($F = 35.83$, $p < 0.001$). Looking at the explanatory level of the model, the publication year variable explains approximately 6.6% of the total variance on the number of citations ($R^2 = 0.066$). When the regression coefficient is examined, there is a significant and positive relationship between the year of publication and the number of citations ($\beta = 1.189$, $t = 5.99$, $p < 0.001$). This result shows that the number of citations received by the relevant studies increases on average as the publication year progresses. The increase in interest in time-related issues in the academic literature and the increase in the visibility of published studies support this relationship.

DISCUSSION

This bibliometric study provides a comprehensive overview of the evolution, thematic focus, and scholarly impact of research on organizational attractiveness (OA) between 1988 and 2023. One of the most striking findings is the dominance of English-language publications; all 396 studies were published in English, indicating a linguistic limitation that restricts the global representativeness of the field. This orientation is also reflected in the geographical distribution of publications, where countries such as the USA (64), Germany (35), and Belgium (22) dominate in both quantity and impact. This finding echoes Dauth et al. (2023:9), who emphasized that diversity in top management teams significantly enhances organizational appeal, particularly for international job seekers in European contexts.

A major empirical finding of this study is the predominance of research articles (87.88%), with a disproportionately low number of reviews (only 2.5%). This reinforces the argument by Aboul-Ela (2016:154) that the field lacks foundational theoretical models. This analysis confirmed this through regression results, which revealed a statistically significant increase in the number of publications over time, indicating growing academic interest. However, this quantitative growth has not been matched by theoretical consolidation. Moreover, the second regression confirmed a significant

but weaker association between year of publication and citation count, suggesting that recent studies may not yet have achieved broad scholarly influence.

Keyword analysis underscored “organizational attractiveness,” “organizational image,” “employer brand” as core themes, reaffirming findings from Van Hoya and Saks (2011:311) and Backhaus and Tikoo (2004:501). The strong co-occurrence of “signaling theory” and “CSR” also supports the multidimensional nature of OA, aligning with findings by Kim and Park (2011:639). Yet, concepts such as “technology,” “diversity,” and “green HRM” have only recently emerged, indicating new theoretical frontiers that remain underexplored. The stratification of keywords by year revealed a shift in thematic focus from traditional employer characteristics to broader identity and social responsibility dimensions, consistent with Tajfel and Turner’s (2004:276) social identity theory and Kristof’s (1996:1) person–organization fit.

This research’s conceptual evolution analysis across three time periods revealed that foundational terms such as “attraction” and “reputation” (1988–1999) transitioned to more complex themes like “signaling theory” and “corporate image” (2000–2010), culminating in “employer branding,” “diversity,” and “social identity” (2011–2023). This pattern confirms Cobo et al.’s (2012:1617–1618) proposition that bibliometric mapping reflects theoretical maturation. Pearson correlation analyses between centrality and density values across all periods showed very strong and statistically significant relationships suggesting that core themes have become both conceptually dense and central to the literature.

Another significant contribution of this study is the correlation between collaboration intensity and academic impact. Co-authorship strength was found to be highly correlated with citation counts, supporting previous findings by Guan et al. (2017:407) that collaborative networks amplify scholarly visibility. Authors such as Van Hoya, Lievens, and Turban emerged as central figures not only in publication volume but also in citation strength and bibliometric network influence.

Institutional and publisher analysis showed that Ghent University, State University System of Florida, and University of Missouri Columbia are among the most prolific institutions, while Wiley and Emerald Group Publishing are leading publishers. This concentration of institutional productivity underscores the potential for academic clustering and the need for broader institutional diversity.

Despite the significant empirical insights, the field still lacks theoretical integration. For example, although signaling theory, social identity theory, and person–organization fit are frequently cited, they are rarely synthesized into comprehensive models that explain OA across individual, organizational, and societal levels. This research’s findings confirm this view by showing that most studies still focus narrowly on job seekers, overlooking perspectives from customers, communities, or even regulators.

In conclusion, this discussion reveals a growing but fragmented field. While the number of publications and thematic sophistication have increased over time, there is still a need for integrative frameworks that consolidate the diverse concepts identified. Future studies should aim to link traditional HRM perspectives with emerging societal, technological, and cultural Dynamics ideally through interdisciplinary collaboration and inclusion of underrepresented regions. Doing so will enhance both the academic richness and practical relevance of organizational attractiveness research.

CONCLUSION AND THEORETICAL IMPLICATIONS

This bibliometric analysis identified major patterns and conceptual shifts in the organizational attractiveness (OA) literature, offering both empirical insights and theoretical reflections. The upward trend in publication output culminating in a peak of 38 articles in 2023 demonstrates the growing relevance of OA in organizational studies. The literature is predominantly empirical (87.88%), and contributions are geographically concentrated in countries such as the United States, Belgium, and Germany. Institutions like Ghent University, and publishers such as Wiley and Emerald, have played significant roles in shaping the field’s scholarly visibility.

Keyword co-occurrence patterns indicate that organizational attractiveness constitutes the conceptual nucleus of this literature, closely aligned with human resources-related themes such as recruitment, employer branding, and applicant attraction. Frequently cited works (e.g., Turban, 1997) have laid the theoretical foundation, while influential scholars including Van Hoya and Lievens have contributed significantly to framing OA from interdisciplinary perspectives, incorporating psychological, sociological, and managerial viewpoints.

The evolution of research themes from early emphases on job characteristics and employer image to broader constructs such as CSR, diversity, and sustainability reveals a transition toward more integrated theoretical

paradigms. This shift suggests the convergence of previously distinct frameworks, particularly Signaling Theory, Social Identity Theory, and Person-Organization Fit Theory. Organizational attractiveness may thus be better understood as a multidimensional construct shaped simultaneously by symbolic organizational cues, value alignment, and social identity processes.

Despite the richness of empirical studies, the field still lacks comprehensive theoretical integration. Few studies attempt to develop holistic frameworks connecting employer branding, perceived organizational image, and candidate decision-making processes. There is a need for conceptual models that bridge human resource management, organizational behavior, and applied psychology while accounting for moderating factors such as digital transformation, cultural variation, and labor mobility. In this context, interdisciplinary research collaborations as exemplified by scholars like Lievens and Van Hove may facilitate the development of more robust theoretical explanations.

The dominance of empirical approaches and the scarcity of theoretical reviews (only 2.5%) underscore a pressing need to expand beyond descriptive analyses and engage in active theory development. Future research should focus on constructing and validating theoretical models that reflect the complexity and evolution of organizational attractiveness in contemporary contexts.

Lastly, a key limitation of this study is its reliance solely on the Web of Science database. While WoS provided reliable bibliometric data, it lacks certain advanced indicators most notably the Field-Weighted Citation Index (FWCI), which enables citation impact to be evaluated relative to disciplinary norms. FWCI, available only via Scopus/SciVal, normalizes citations by year, field, and document type, providing a more nuanced view of scholarly influence. Therefore, future studies are encouraged to include FWCI in cross-database comparisons to enhance impact analysis.

In summary, this study not only synthesizes past research trends but also calls for a shift toward integrative, theory-driven approaches that reflect the multidimensional nature of organizational attractiveness in the face of cultural, technological, and generational change.

REFERENCES

- Aboul-Ela, G. M. B. E. (2016). "Employer branding: What constitutes an Employer of choice?". *Journal of Business and Retail Management Research*, 11(1): 154-166. <https://doi.org/10.24052/JBRMR/251>
- Akhtar, M.K. (2024). "The H-index is an unreliable research metric for evaluating the publication impact of experimental scientists". *Front. Res. Metr. Anal.*, 9, 1-5. <https://doi.org/10.3389/frma.2024.1385080>
- Albinger, H. S. ve Freeman, S. J. (2000). "Corporate social performance and attractiveness as an employer to different job seeking populations". *Journal of Business Ethics*, 28, 243-253. <https://doi.org/10.1023/A:1006289817941>
- Andrés, A. (2009). "Introduction. Measuring Academic Research, How to Undertake a Bibliometric Study", Ana Andrés (eds), Chandos Publishing, 1-12, <https://doi.org/10.1016/B978-1-84334-528-2.50001-1>
- Antunes, I. F. S. ve Veríssimo, J. M. C. (2024). "A bibliometric review and content analysis of research trends in sensory marketing". *Cogent Business & Management*, 11(1): 1-22, <https://doi.org/10.1080/23311975.2024.2338879>
- Arruda, H., Silva, E.R., Lessa, M., Proença, D. Jr., ve Bartholo, R. (2022). "VOSviewer and Bibliometrix". *Journal of the Medical Library Association*, 110(3): 392-395. <https://doi.org/10.5195/jmla.2022.1434>
- Backhaus, K. ve Tikoo, S. (2004). "Conceptualizing and researching employer branding". *Career Development International*, 9(5): 501-517. <https://doi.org/10.1108/13620430410550754>
- Balcı, A. (1989). "Eğitimsel Araştırmanın Eğitimsel Sorunların Çözümüne Uygulanması". *Ankara University Journal of Faculty of Educational Sciences (JFES)*, 22(1): 411-420. https://doi.org/10.1501/Egifak_0000000868
- Cable, D. M. ve Graham, M. E. (2000). "The determinants of job seekers' reputation perceptions". *Journal of Organizational Behavior*, 21(8): 929-947. [https://doi.org/10.1002/1099-1379\(200012\)21:8%3C929::AID-JOB63%3E3.0.CO;2-O](https://doi.org/10.1002/1099-1379(200012)21:8%3C929::AID-JOB63%3E3.0.CO;2-O)
- Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2012). "SciMAT: A new science mapping analysis software tool". *Journal of the American Society for Information Science and Technology*, 63(8): 1609-1630. <https://doi.org/10.1002/asi.22688>
- Clark, T., Floyd, S. W. ve Wright, M. (2006). "On the review process and journal development". *Journal of Management Studies*, 43(3): 655-664, <https://doi.org/10.1111/j.1467-6486.2006.00617.x>
- Dauth, T., Schmid, S., Baldermann, S. ve Orban, F. (2023). "Attracting talent through diversity at the top: The impact of TMT diversity and firms' efforts to promote diversity on employer attractiveness". *European Management Journal*, 41(1): 9-20. <https://doi.org/10.1016/j.emj.2021.10.007>
- Devendorf, S. A. ve Highhouse, S. (2008). "Applicant-employee similarity and attraction to an employer". *Journal of Occupational and Organizational Psychology*, 81(4): 607-617. <https://doi.org/10.1348/096317907X248842>
- Ellegaard, O. ve Wallin, J.A. (2015). The bibliometric analysis of scholarly production: How great is the impact? *Scientometrics*, 105(3): 1809-1831, <https://doi.org/10.1007/s11192-015-1645-z>
- Evertz, L. ve Süß, S. (2017). "The importance of individual differences for applicant attraction: A literature review and avenues for future Research". *Management Review Quarterly*, 67(3): 141-174. <https://doi.org/10.1007/s11301-017-0126-2>
- Guan, J., Yan, Y., Zhang, J. J. (2017). "The impact of collaboration and knowledge networks on citations". *Journal of Informetrics*, 11(2): 407-422, <https://doi.org/10.1016/j.joi.2017.02.007>
- Fombrun, C. ve Shanley, M. (1990). "What's in a name? Reputation building and corporate strategy". *Academy of Management Journal*, 33(2): 233-258. <http://dx.doi.org/10.2307/256324>
- Huang, C., Ye, Y., Jin, Y. ve Liang, B. (2023). "Research Progress, Hotspots, and Evolution of Nighttime Light Pollution: Analysis Based on WOS Database and Remote Sensing Data". *Remote Sensing*, 15(9): 2305. <https://doi.org/10.3390/rs15092305>
- IBM Corp. Released (2020). IBM SPSS Statistics for Windows, Version 27.0. Armonk, NY: IBM Corp.
- Jiang, T. ve Iles, P. (2011). "Employer-brand equity, organizational attractiveness and talent management in the Zhejiang private sector, China". *Journal of Technology Management in China*, 6(1): 97-110. <https://doi.org/10.1108/17468771111105686>

- Keller, K. L. (1993). "Conceptualizing, measuring, and managing customer-based brand equity". *Journal of marketing*, 57(1), 1-22.
- Kessler, M. M. (1963). "Bibliographic coupling between scientific papers". *Wiley American Documentation*, 14(1): 10-25, <https://doi.org/10.1002/asi.5090140103>
- Kim, S.Y. ve Park, H. (2011). "Corporate social responsibility as an organizational attractiveness for prospective public relations practitioners". *Journal of Business Ethics*, 103:639-653. <https://doi.org/10.1007/s10551-011-0886-x>
- Kristof, A.L. (1996). "Person-organization fit: An integrative review of its conceptualizations, measurement, and implications". *Pers Psychol* 49:1-49. <https://doi.org/10.1111/j.1744-6570.1996.tb01790.x>
- Krys, S. ve Konradt, U. (2022). "Losing and regaining organizational attractiveness during the recruitment process: A multiple-segment factorial vignette study". *Revista de Psicología del Trabajo y de las Organizaciones*, 38(1): 43-58. <https://doi.org/10.5093/jwop2022a4>
- Markscheffel, B. ve Schröter, F. (2021). "Comparison of two science mapping tools based on software technical evaluation and bibliometric case Studies". *COLLNET Journal of Scientometrics and Information Management*, 15(2): 365-396. <https://doi.org/10.1080/09737766.2021.1960220>
- Milojević, S. (2020). "Practical method to reclassify Web of Science articles into unique subject categories and broad disciplines". *Quantitative Science Studies*, 1(1): 183-206. doi: https://doi.org/10.1162/qss_a_00014
- Rynes, S. L. ve Barber, A. E. (1990). "Applicant attraction strategies: An organizational perspective". *Academy of Management Review*, 15(2): 286-310. <https://doi.org/10.2307/258158>
- Rynes, S.L. (1991). "Recruitment, job choice, and post-hire consequences: a call for new research directions". In *Handbook of Industrial/Organizational Psychology*, 2, Dunnette M, Hough L (eds). Consulting Psychologists Press: Palo Alto, CA; 399-444.
- Sipahi Döngül, E. (2024). Örgütsel İnovasyon Üzerine Yapılan Çalışmaların Bibliyometrik Analizi. *İktisadi İdari ve Siyasal Araştırmalar Dergisi*, 9(23):117-132. <https://doi.org/10.25204/iktisad.1359997>
- Sipahi Döngül, E. ve Skica, T. (2023). "Bibliometric Analysis of Studies On the Concept of Financial Literacy". *Journal of Finance and Financial Law*, 31-51
- Spence, M. (1973). "Job market signaling", *Quarterly Journal of Economics*, 87(3), 355-74. <https://doi.org/10.2307/1882010>
- Tajfel, H. ve Turner, J.C. (1986). "The social identity theory of intergroup behavior", in Worchel, S. and Austin, W.G. (Eds), *Psychology of Intergroup Relations*, 7-24.
- Tajfel, H. ve Turner, J. C. (2004). The Social Identity Theory of Intergroup Behavior. In J. T. Jost & J. Sidanius (Eds.), *Political psychology: Key readings* (pp. 276–293). Psychology Press. <https://doi.org/10.4324/9780203505984-16>
- Tao, Z., Chao, J. (2023). "A bibliometric and visualized analysis of research on green finance and energy in a global perspective". *Research in Globalization*, 7, 1-20, <https://doi.org/10.1016/j.resglo.2023.100156>
- Tsilika, K. (2023). "Exploring the Contributions to Mathematical Economics: A Bibliometric Analysis Using Bibliometrix and VOSviewer". *Mathematics*, 11(22): 1-21, <https://doi.org/10.3390/math11224703>
- Ullah, R., Asghar, I. ve Griffiths, M. G. (2023). "An Integrated Methodology for Bibliometric Analysis: A Case Study of Internet of Things in Healthcare Applications". *Sensors*, 23(1): 1-28 <https://doi.org/10.3390/s23010067>
- Van Hove, G. ve Saks, A. M. (2011). "The instrumental-symbolic framework: Organisational image and attractiveness of potential applicants and their companions at a job fair". *Applied Psychology*, 60(2): 311-335. <https://doi.org/10.1111/j.1464-0597.2010.00437.x>
- Van Eck, N. J. ve Waltman, L. (2023, 23 January). "VOSviewer manual". (accessed on August, 25, 2024) https://www.vosviewer.com/documentation/Manual_VOSviewer_1.6.19.pdf
- Van Hove, G. ve Saks, A. M. (2011). "The instrumental-symbolic framework: Organisational image and attractiveness of potential applicants and their companions at a job fair". *Applied Psychology*, 60(2):311-335. <https://doi.org/10.1111/j.1464-0597.2010.00437.x>

- Yan, L. ve Zhiping, W. (2023). "Mapping the Literature on Academic Publishing: A Bibliometric Analysis on WOS". *Sage Open*, 13(1): 1-16 <https://doi.org/10.1177/21582440231158562>
- Yang, Q., Yang, D., Li, P., Liang, S. ve Zhang, Z. (2021). "Resilient City: A Bibliometric Analysis and Visualization". *Hindawi Discrete Dynamics in Nature and Society*, 1-17, 5558497, <https://doi.org/10.1155/2021/5558497>
- Williamson, I. O., King Jr, J. E., Lepak, D., ve Sarma, A. (2010). "Firm reputation, recruitment web sites, and attracting applicants". *Human Resource Management*, 49(4): 669-687.<https://doi.org/10.1002/hrm.20379>

Understanding Suicide in Türkiye: The Role of Income, Unemployment, Consumer Loans, Cost of Living, and Health Expenditure

Gökçen AYDINBAŞ¹ , Merve ÜNLÜOĞLU² 

ABSTRACT

A healthy and fulfilling life is essential for individuals to engage effectively and productively within society. The absence of these conditions can increase vulnerability to mental health issues and, in severe cases, lead to suicidal behavior. Suicide is a complex and pressing social issue that reflects not only individual suffering but also broader socioeconomic challenges. Individuals experiencing economic hardship, social isolation, or unmet basic needs are at a heightened risk for suicide, highlighting the need for a comprehensive public health response. It is essential to understand the key contributing factors to develop effective prevention strategies and inform sound social policy. This study aims to investigate the relationship between suicide and various socio-economic factors — including income, unemployment, consumer loans, cost of living, and health expenditure — in Türkiye over the period 1993–2023, using the ARDL bounds testing approach. According to the cointegration test, it is inferred that there is a long-run relationship among the variables. Long-run coefficients show that increases in income and health expenditure reduce suicide cases, while increases in consumer loans increase suicide cases. The coefficient of the error correction term is negative and statistically significant as anticipated. In addition, the results were tested using the FMOLS method, and similar to the ARDL model, the negative relationship between income and the dependent variable and the positive relationship between consumer loans and the dependent variable were found. The causality relationship is investigated by the Toda-Yamamoto test. The findings obtained from this test show that GDP per capita and consumer loans are Granger causes of suicide.

Keywords: Suicide, Gross Domestic Product, Consumer Loans, Unemployment, ARDL Bounds Testing Approach.

JEL Classification Codes: C22, E24, I18

Referencing Style: APA 7

INTRODUCTION

Throughout human history, it has been witnessed that some people may attempt suicide at a certain point in their life journey and that these attempts may even end in death from time to time. While suicide is fundamentally a personal act, it is profoundly influenced by societal factors and, in turn, has significant implications for societal well-being. Currently, it ranks as one of the leading causes of death, as noted in research (Machado et al., 2015). Given its serious nature as a social phenomenon that poses a threat to social stability, suicide has been the subject of extensive research across multiple disciplines, including medicine, psychology, sociology, anthropology, and economics.

According to estimates from the World Health Organization (WHO), approximately 800,000 individuals die by suicide each year globally, translating to one death every 40 seconds. In 2019, the recorded number of suicides was 703,000. Suicide represents 1.4% of all global deaths. It is important to note that over 77% of these cases occur in low- and middle-income countries,

and suicide is the fourth leading cause of death among individuals aged 15 to 29 (WHO, 2021). Furthermore, the WHO estimates that there are more than 20 suicide attempts for every completed suicide (Mathieu et al., 2022). The annual global prevalence of self-reported suicide attempts is approximately 3 per 1,000 adults (Nock et al., 2008; Borges et al., 2010).

As of 2019, the global average suicide rate stands at 9.0 per 100,000 individuals. Certain regions report higher rates, with Africa at 11.2, Europe at 10.5, and Southeast Asia at 10.2, all exceeding the world average (WHO, 2021). Within Europe, the countries with the highest suicide rates include France, Lithuania, Latvia, Slovenia, and Estonia (WHO, 2018).

Suicide rates exhibit significant variations due to a range of factors, including gender, socioeconomic status, occupation, age group, and geographical location. Notably, the incidence of suicide is higher among men compared to women. Research highlights unemployment as a crucial contributing factor, with an estimated 45,000 individuals annually taking their

¹ Asst. Prof. Dr., Istanbul Okan University, Faculty of Business and Administrative Sciences, gkcaydnbas@gmail.com

² Lecturer Dr., Eskişehir Osmangazi University, mkoyunbakan@ogu.edu.tr

own lives due to joblessness (Nordt et al., 2015). Young people are particularly vulnerable to the effects of unemployment, resulting in elevated suicide rates within this demographic. Data obtained from the Turkish Statistical Institute (TURKSTAT) indicates that in 2023, a total of 4,061 individuals lost their lives to suicide in Türkiye. Among these cases, approximately 75% were men, while 25% were women. The primary reasons for suicide include unspecified causes (27.9%), other contributing factors (31.3%), and health-related issues (26.4%) (TURKSTAT, 2024). When examining suicide rates by province in Türkiye, it is observed that the highest rates occur in large and populous cities such as Istanbul, Izmir, and Ankara. However, when suicide rates are examined according to population, it is seen that provinces such as Tunceli, Ardahan, Burdur, Aydın and Edirne are more prominent (Socio-Political Field Research Centre, 2020).

In conclusion, suicide—regardless of whether it results in death or not—remains a significant public health issue affecting individuals, communities, and healthcare systems across the globe. Despite advancements in medical and psychological interventions, suicide continues to account for a substantial number of deaths worldwide. Importantly, it should be acknowledged that some individuals may experience ambivalence or a renewed desire to live following a suicide attempt. Research indicates that individuals who attempt suicide typically present to emergency departments within approximately three hours, making emergency services the first point of contact for medical intervention. At this critical stage—referred to as the early post-attempt period—individuals often require not only immediate medical care but also social and psychological support (Harmancı, 2015).

This study aims to analyze the economic and social factors determining suicide in Türkiye with data for the period 1993-2023. In this context, the effects of per capita income, unemployment rate, consumer loans, cost of living, and health expenditures on suicide are investigated and the long-run relationships between these variables are analyzed using the Autoregressive Distributed Lag (ARDL) bounds testing approach. The relationship between suicide and socioeconomic factors is shaped not only by short-term economic fluctuations but also by long-term trends that develop over time. To align with the primary objective of this study, it is essential to employ a method that can analyze both short-term and long-term equilibrium relationships between these variables. In this context, the ARDL model has been selected, as it facilitates the assessment of both short-term and long-term dynamics within a unified framework.

The main research question of the study is whether these macroeconomic variables have a significant long-run effect on suicide in Türkiye. The findings indicate that there is a long run cointegration relationship between the variables. According to the long-run coefficients, an increase in income and health expenditures decreases suicide, while an increase in consumer loans increases suicide. In addition, the long-run coefficients obtained with the FMOLS method are consistent with those from the ARDL model for income and consumer loans variables in terms of sign and statistical significance.

This article is structured as follows: First, the phenomenon of suicide was examined with its theories and causes. Subsequently, an assessment was made specifically for Türkiye. The literature review evaluated existing national and international studies and identified areas where the study could contribute. In the applied section, the main factors affecting suicide in Türkiye were analyzed using an econometric model created with selected variables. Recommendations for policymakers were developed based on the findings.

SUICIDE: THEORETICAL INVESTIGATION OF THE CONCEPT AND ITS CAUSES

The origin of the word suicide has been shaped by different meanings in different languages. While the Arabic word “Nahr” means to cut or kill a living being, in Latin the roots “Se or suus” (own) and “caedere” (to kill) came together to form a term meaning “to kill oneself”. This term was transferred to Western languages as ‘suicide’ in English as of the mid-17th century and in French in the early 18th century. In Turkish, it was first introduced as ‘self-murder’ and then as ‘suicide’ with the Tanzimat period. When we look at the first use of the word suicide, it is known that it was first used linguistically in the dictionary written by François à Mesgnien Meninski and as a term in the work *Religio Medici* written by Sir Thomas Browne in 1642 (Kızılkaya & Kuzucu, 2022).

Throughout their lives, people encounter emotional triggers arising from internal or external factors. Suicide is a situation in which an individual punishes himself/herself and intentionally ends his/her life and is generally defined as a state of aggression associated with the feeling of anger directed inwards. This level of behavior constitutes a serious situation as an indicator of emotional and communicative problems and can occur as an important symptom of the difficulties experienced by an individual. WHO defines suicide as “conscious self-harm with varying degrees of lethal intent” (Weis, 1974). The deaths that occur as a result of this action deeply affect not only

the deceased person but also the individuals in his/her close environment. Considering the psychological pain and losses experienced by the relatives, it is emphasized that suicide is a situation that affects the society at large. Therefore, WHO considers suicide as a preventable public health problem (Ministry of Health, 2018).

According to Emile Durkheim (1897), suicide refers to any death that occurs as a direct or indirect result of a deed that the deceased performs even though he/she knows that it will result in death. Adler, on the other hand, defines suicide as an act of revenge. According to him, suicide aims to affect the person's relatives or relatives and is an action taken to ensure the recovery of what has been lost. From this perspective, Adler (1997) sees and defends suicide as a means of communication.

In recent years, WHO categorizes suicide in two groups: suicide act and suicide attempt. Real suicides result in death. However, sometimes suicide can remain in the thought stage or be stopped before death occurs. In this case, suicide attempts or thoughts are in question. Suicidal ideation is considered to be the state of an act before it turns into action. Suicide attempt, on the other hand, refers to actions that a person takes with the intent of taking his/her own life but do not result in death. As a matter of fact, suicide attempts include behaviors such as self-harm, self-murder, poisoning, as well as all non-fatal attempts to punish society, to send a message, to get their wishes accepted or to request help (Durkheim, 1897).

Theories of Suicide

Suicide is a topic that has garnered attention from various disciplines throughout history and continues to be of significant concern today. Notably, Sigmund Freud (1953), a pivotal figure in psychology, presented two key hypotheses regarding suicide. The first suggests that individuals may resort to suicide as a way to cope with profound loss or hatred, especially when experiencing severe depression. The second hypothesis posits that self-destructive behavior can arise from heightened internal aggression. In his influential work, "Man Against Himself", Karl Menninger (1938) defined suicide as a manifestation of self-directed aggression, where an individual's anger towards others is redirected inward. Menninger (1938) identified three primary motives that drive suicidal thoughts: the desire to kill, the desire to be killed, and the desire to die. He further indicated that individuals who complete suicide often possess an underlying desire to end their lives, whereas those who attempt suicide may have a stronger, subconscious

inclination to continue living. Additionally, Ringel (1976) introduced the concept of "Presuicidal Syndrome", which he described as a clinical condition present in individuals exhibiting suicidal tendencies. Feelings of inadequacy, hopelessness, negative self-evaluation, and social withdrawal characterize this syndrome. As the intensity of death-related thoughts increases, there is a potential for these suicidal ideations to escalate into actionable plans (Harmancı, 2015).

Suicide represents a significant social phenomenon that poses a threat to social health and order, both historically and in contemporary society. This critical issue has attracted substantial attention from sociologists. In particular, Émile Durkheim (1897) conducted thorough studies that examined the relationship between social changes and suicide rates. He analyzed the evolving economic and social structures following the French Revolution and industrialization, focusing on the influence of religion on social integration and morality as they relate to the phenomenon of suicide (Kızılkaya & Kuzucu, 2022). Subsequent research has continued to explore suicide within a social context, particularly in relation to economic changes and their impact on suicide rates. For example, in their 1954 work "Sex and Suicide", Henry and Short introduced the "Balancing Theory", which posits that suicide rates tend to increase during periods of economic stagnation while decreasing during times of economic growth. Additionally, the "Cyclical Theory," articulated by Ginsberg in 1966, suggests that as individual satisfaction rises during periods of economic prosperity, there exists an inverse relationship between this satisfaction and suicide rates. (Lester, 2001; Kızılkaya & Kuzucu, 2022).

Economists Hamermesh and Soss (1974) conducted one of the earliest empirical studies exploring the link between unemployment and suicide, providing evidence that economic downturns may significantly impact mental health outcomes. Their study focused on the effects of regular income on individuals' well-being and the potential consequences of unemployment on suicidal behavior. The findings revealed that the decline in economic activity following the Second World War contributed to an increase in suicide rates. Furthermore, the researchers identified that social living conditions, unemployment, and personal expectations significantly influence suicidal behavior. The study concluded that suicide would occur when the sum of an individual's lifetime earnings and enjoyment of life is equal to zero (Hamermesh & Soss, 1974). According to the theoretical framework established by Hamermesh and Soss, a

decrease in perceived happiness below a specific threshold corresponds with an increased likelihood of suicide. They posited that individuals must maintain a certain minimum level of happiness—both in the present and their anticipated future—to derive enjoyment from life and possess the desire to continue living. Thus, adverse life events such as financial strain, bereavement, social isolation, interpersonal conflicts, and work-related stressors may lead to elevated suicide rates.

Causes of Suicide

Suicide should be considered as a multidimensional and complex phenomenon. This event is shaped by the interaction of socioeconomic, psychological, sociological, environmental, physical, religious and many other factors. Therefore, it is not possible to understand or analyze suicides that occur for only one reason. Changes and transformations in the social structure cause differences in the rate of suicide cases and can affect this phenomenon.

Early theorists argued that economic stagnation may increase suicide rates, which may be caused by factors such as stress and distress caused by poverty (Brenner, 1979; Stack, 1981) and loss of social status and commitment (Durkheim, 1897; Mann & Metts, 2017). Durkheim categorized suicides into four categories according to the reasons for their occurrence. These are altruistic suicide, fatalistic suicide, selfish suicide, and anatomical suicide. Altruistic suicide refers to the individual's self-sacrifice for the sake of social values and the glorification of virtues such as loyalty and self-sacrifice. Fatalistic suicide is the result of the despair of individuals who strictly adhere to the rules and authority set by society due to the pressures of society. Selfish suicide, on the other hand, occurs when a person breaks ties with society, where individual freedoms and individualism are overemphasized. Anatomical suicide, on the other hand, occurs due to social disintegration and lack of order; here, the weakening of social norms and rules causes individuals to be out of harmony with society. Durkheim states that anatomical suicides are caused by social disruption. Factors such as economic contractions, business failures, bankruptcies and unemployment can put great psychological pressure on individuals and increase suicide rates (Durkheim, 1897). On the other hand, Marx (1846) and Peuchet (1838), drew attention to the economic negativities of capitalism, problems such as low wages, unemployment, and misery as the cause of suicide, and drew attention to non-economic social injustices that affect the private lives of non-working-class individuals. According to Marx, "Man, in his desire

for something better, realises that suicide is the last resort against the evils of private life" (Marx, 1846).

Generally, the causes of suicide are socio-economic problems caused by economic crises (divorce, unemployment, weakened social interaction, debt repayment difficulties, work stress, increased alcohol and tobacco use, mental illness, cuts in public mental health budgets, etc.). Social changes and mobilizations also have a significant impact on suicide. As a matter of fact, suicide can be associated with many economic factors such as unemployment, income level and poverty. For example, wars, migrations, diseases, and technological developments that deeply affect a society are some of these factors. Undoubtedly, mechanization and technological advances play a major role in facilitating human life. However, increasing mechanization reduces the need for human labor and leads to alienation of the individual from his/her own labor. This alienation may result in dissatisfaction with work and its results, loneliness, and consequently increased risk of suicide. In addition, increasing air pollution and diminishing clean water resources lead to significant deterioration in human health. These factors may cause a decrease in the standard of living, leading to pessimism and may have an effect that may lead to suicide. Other factors affecting suicide are religions and sects, wars, epidemics, natural disasters, modern society and urbanization structure, seasonality, races and cultures, family situations, age, gender, geography.

TURKSTAT categorizes the reasons for suicide as follows: "Illness", "Family discord", "Difficulty making a living", "Commercial failure", "Sensual relationship and not being able to marry the person of his/her choice", "Failure to learn", "Other", "Unknown situations" (TURKSTAT, 2024).

Suicide has a profound impact on all societies, regardless of the cause. Not only mental illness but also physical illness (such as AIDS, cancer) can lead to suicide. The view of suicide also differs between cultures (Moscicki, 1995). While in Japan suicide is a behavior that honors the individual, in India it is an illegal phenomenon (Durgun & Durgun, 2017).

As a result, although human beings have the ability to adapt to all kinds of conditions, needs such as happiness, harmony, love and freedom are inherent in their nature. These needs exist as variable factors in the historical process and tend to lead to psychological reactions when they are blocked. These situations may cause individuals to choose a phenomenon such as suicide as one of their psychological reactions.

Table 1. Suicide Rates by Causes (2024)

Cause of Suicide	Percentage (%)
Other	36.8
Illness	25.2
Unknown	21.8
Economic problems	9
Family incompatibility	4.3
Emotional relationship and not marrying the person wanted	2.6
Educational failure	0.2
Business failure	0.1

Source: TURKSTAT, Population and Demography Database

Suicide in Türkiye

Suicide is a complicated phenomenon and a major public health problem that has a profound impact on public health and psychological well-being both in the world and in Türkiye. According to the country ranking in suicide incidents, the top five countries are Lithuania, Russia, Guyana, South Korea, and Belarus, while Türkiye ranks 94th in this list (World Population Review, 2025). When we look at the records on suicide worldwide, we see the following figures:

Suicide incidents in Türkiye started to be included in the Justice Statistics Yearbook in the form of short information in 1963, and after 1974, they started to be published as official data under the name of "Suicide Statistics" (Harmancı, 2015). While illness is the main cause of suicide, family unrest and financial difficulties are the second and third leading causes of suicide. Failure in education has the lowest rate among the reasons for suicide (TURKSTAT, 2020).

Table 1 presents data on the reasons for suicide. According to the findings in the table, the highest proportion of suicides is attributed to health problems, while the lowest proportion is associated with reasons such as education and business failure. However, the reasons categorized under "other" and "unknown"

categories also constitute a significant proportion. It can be said that economic problems have a significant place in these groups.

This situation reveals the direct impact of economic stress on individuals' mental health. It is understood that especially economic difficulties such as job loss, debt burden and general financial difficulties are powerful triggers that can lead individuals to suicide. Analyzing the data obtained in this context is of great importance in terms of understanding the impact of economic crises, unemployment rates and social security mechanisms on suicide rates.

One of the two basic variables used to understand suicide, the total number of suicides, refers to the absolute number of suicides that occur in a country during a given period, while the other, the crude suicide rate, refers to the number of suicides per 100,000 population per year. This ratio makes it possible to measure the relative intensity of suicidal tendencies by balancing out the population effect. These indicators are quite important for the effective planning of public policies, the guidance of healthcare services, and the development of robust crisis response mechanisms. Number of suicides and crude suicide rate for Türkiye between 2020 and 2024 are given in Table 2. The increase in the crude suicide rate over time during the period in question indicates that

Table 2. Crude Suicide Rate and Number of Suicides in Türkiye, 2020-2024

Year	Crude Suicide Rate (per 100,000 population)	Number of Suicides
2020	4.45	3,710
2021	4.98	4,194
2022	4.96	4,218
2023	4.79	4,089
2024	5.22	4,460

Source: TURKSTAT

Table 3. Suicides in Türkiye by Type of Actualization (2002-2024)

Type of Suicide	Total	
	Number	Rate (%)
By hanging	35,347	47.66
Using Firearms	19,025	25.65
Throwing from a high place	8,192	11.05
Taking chemicals	5,963	8.04
Other	2,379	3.21
By drowning	1,252	1.69
Using a sharp instrument	1,061	1.43
Throwing off a train or another motorized vehicle	345	0.47
Using natural gas or lpg. etc.	307	0.41
By burning	295	0.40
Total	74,166	100.00

Source: TURKSTAT**Table 4.** Crude Suicide Rate and Number of Suicides by Province, 2024

Province	Crude Suicide Rate (per 100,000 population)	Province	Number of Suicides
Karaman	11.01	İstanbul	631
Bartın	9.18	Ankara	300
Aydın	8.08	İzmir	265
Tunceli	7.96	Adana	170
Burdur	7.95	Antalya	168

Source: TURKSTAT

the tendency to commit suicide has become widespread at the social level. The observed increase may be due to improvements in statistical recording systems, as well as psychological processes associated with socioeconomic vulnerabilities. In any case, this situation represents a considerable risk to public health, underscoring the need to address the underlying structural, economic, and cultural dynamics comprehensively.

Table 3 presents the methods of total suicide cases occurring from 2002 to 2024 in Türkiye. In this table, it is seen that suicide by hanging is the most common type of suicide in Türkiye. Suicide by burning is less common.

Table 4 presents information on the number of suicides and crude suicide rate by province for 2024. In this table, the first 5 provinces with the highest and lowest number of suicides and crude suicide rate are shown. According to 2024 data, İstanbul has the highest number of suicides, while Karaman has the highest crude suicide rate.

In conclusion, The World Suicide Prevention Day (WSPD), established in 2003 by the International Association for Suicide Prevention (IASP) in collaboration with WHO, aims to raise awareness and reduce stigma surrounding suicide. Celebrated annually on September

10th, the day promotes the message that suicides are preventable. The theme for 2024-2026, "Changing the Narrative on Suicide" encourages a shift from a culture of silence and stigma to one of openness, understanding, and support. It emphasizes the importance of prioritizing mental health and suicide prevention in policymaking, advocating for increased access to care and support for those in need (WHO, 2024).

LITERATURE

The phenomenon of suicide is examined through a multidisciplinary lens. Many studies in the literature suggest that suicide can be understood through social factors, such as social capital, divorce, and marriage, as well as economic factors like income level and unemployment.

Income level is frequently regarded as a significant factor in studies examining the economic determinants of suicidal behavior. While higher income is generally believed to enhance life satisfaction by improving individual well-being, it's essential to recognize that this relationship is often relative and contextual rather than absolute. Although it may vary depending on the social security structure, health systems, cultural factors and

income inequality level of the countries, studies mostly reveal a negative long-term relationship between income level and suicide. Neumayer (2003) conducted a panel data analysis involving 68 countries and found that per capita income had a negative and statistically significant impact on suicide rates. Additionally, he identified correlations between suicide rates and various factors such as unemployment, divorce, birth rates, and alcohol consumption, which align with theoretical expectations. In a study conducted by Sher (2006), the relationship between per capita income and suicide rates in 34 European countries based on 2003 data was analyzed by intergroup correlation analysis. The study highlighted that low-income levels are a contributing factor to suicide. In a study conducted by Chang et al. (2009), researchers analyzed the relationship between economic crises and suicide rates in Japan, Hong Kong, South Korea, Taiwan, Singapore, and Thailand. The study utilized a time series analysis covering the period from 1985 to 2006. The findings revealed that an increase in income was associated with a decrease in suicide rates, while an increase in unemployment rates was linked to a rise in suicide rates. Chen et al. (2009) examined the socio-economic determinants of suicide rates in OECD countries between 1980 and 2003 using panel data analysis and investigated how Japan's suicide dynamics differed from those of other countries. Suicide rates disaggregated by age and gender, as well as economic (real GDP per capita, growth, income inequality) and social indicators (divorce, birth, female labor force participation, alcohol consumption) were included in the model. The findings showed that high income and economic growth reduced suicide rates, while income inequality increased them. Suicide rates are more sensitive to economic indicators than to social indicators. In Japan, the impact of socio-economic factors is more pronounced compared to other OECD countries, particularly the positive relationship between women's labor force participation and suicide rates, which is explained by household economic pressures. Okada and Samreth (2013), using a panel ARDL approach, conducted a study of 13 European OECD countries, and their findings on the relationship between income and suicide support other studies. Findings indicate that in nine of the countries studied, divorce rates positively affect suicide rates, while GDP per capita negatively affects them.

Madianos et al. (2014), in their study on Greece, unlike other studies, aimed to investigate trends in suicide rates and their possible relationships with macroeconomic and behavioral factors. The findings

reveal a significant annual increase in suicide mortality rates in Greece following the onset of the financial crisis in 2008. The results demonstrate a strong relationship between unemployment rates and suicide rates, emphasizing the complex interplay between economic conditions and mental health outcomes. Erdem and Dinç (2022) conducted a comprehensive study examining the relationship between suicide rates and various socioeconomic factors. In their analysis, they classified suicide rates into four distinct groups: age-adjusted, male, female, and young individuals. The study utilized panel data from 47 countries, covering the period from 1996 to 2015. The results of the study demonstrated that the relationship between socioeconomic factors and suicide rates varied across the different groups. Consistent findings indicated that alcohol consumption positively influences suicide rates, while fertility rates negatively affect them. Furthermore, divorce was associated with increased suicide rates in all groups, except for the 15-29 age group. The analysis also revealed a negative correlation between GDP and female suicide rates, while a positive relationship was observed in other groups. Additionally, the study found a positive relationship between unemployment and both age-adjusted suicide rates and the 15-29 age group. An increase in household debt was linked to a rise in age-adjusted suicide rates. Notably, the study highlighted that women's participation in the labor force has a positive effect on female suicide rates, which can be attributed to the stress encountered in professional environments. Kızılkaya and Kuzucu (2022) explored the relationship between suicide rates and selected economic factors in 44 countries using panel data analysis. In their study from 2000 to 2019, they included variables such as unemployment, inflation, and female labor force participation rates in the model alongside the suicide rates for both genders. The analysis yielded the following results: a 1% increase in unemployment leads to a 2% increase in female suicides and a 4% increase in male suicides. Furthermore, a 1% increase in women's labor force participation rate results in a 10% increase in female suicides and a 16% increase in male suicides. Furthermore, an increase in the inflation rate leads to higher suicide rates for both males and females. Given the findings related to unemployment, the authors emphasize the importance of providing direct or indirect support to individuals through social support programs during periods of rising unemployment. Collins et al. (2021) contend that relying solely on traditional economic indicators does not provide a complete understanding of the

relationship between economic crises and suicide rates. To address this gap, they sought to analyze these impacts more comprehensively by integrating the variable of consumer sentiment index into their model, thereby capturing subjective perceptions of the economy. Findings from this US state-level study indicate that consumer confidence is more effective than traditional indicators in explaining suicide rates, and this effect is more pronounced among women. Baskak (2023) explored the relationship between suicide and unemployment in OECD countries using Panel VAR analysis and Panel Causality analysis. The study analyzed two independent variables: the female suicide rate and the male suicide rate, covering the period from 2000 to 2019 with annual frequency data. The findings indicate a unidirectional causality between unemployment and male suicide rates. The study emphasizes the importance of creating job opportunities to prevent suicides associated with unemployment, as well as the need for psychological support for unemployed individuals to help them navigate this difficult period.

When examining studies conducted specifically for Türkiye, it is noteworthy that the research by Altınanahar and Halicioğlu (2009) included various variables such as divorce, urbanization, and liquidation, in addition to the income variable within its analytical model. In the study covering 1974-2007, the ARDL bounds test approach was preferred to determine the relationship between the respective variables. The results show that the most dominant variable in explaining the suicide phenomenon is urbanization. The positive sign of this relationship indicates that unplanned urbanization in big cities in Türkiye may have significant effects on suicide cases. The long-term coefficients of other variables, income, liquidation, and divorce were found to be negative, positive, and positive, respectively, and the authors emphasize that these signs are consistent with expectations. Durgun and Durgun (2017) examined the relationship between suicide rates and income in Türkiye from 1975 to 2015. They used crude suicide rates and GDP per capita as variables in their analysis. To investigate this relationship, they applied the Hatemi-J cointegration test and the Granger causality test based on the Vector Error Correction Model (VECM). The results from the causality test, conducted after identifying a cointegration relationship, indicated a unidirectional causality from GDP per capita to the crude suicide rate. This finding suggests that income levels influence suicide rates. The idea that lower levels of social integration, such as rising unemployment, may lead to increased suicide rates is supported by recent empirical studies.

Dilber and Uysal (2020) examined the relationship between suicide and unemployment in Türkiye using the Granger causality test. The study analyzed quarterly data from 2005 to 2018, focusing on the ratio of suicides attributed to livelihood and commercial difficulties compared to the total number of suicides. The results indicated a unidirectional causality relationship, where an increase in the unemployment rate was found to lead to a rise in the suicide rate. The authors emphasized that prolonged periods of unemployment can drive individuals to depression by instilling a sense of helplessness. Karul (2025), who emphasized that suicide deaths are one of the best indicators of mental health, conducted a study examining the relationship between health expenditures and suicide rates. As a result of analyses using Fourier-based stationarity and cointegration tests and Dynamic Ordinary Least Squares method, a long-run relationship between health expenditure and total, male, and female suicide rates was found. The findings show that an increase in health expenditure reduces suicide rates in a statistically significant way. Finally, in Kavaklı's (2023) study, the relationship between suicide rates and socio-economic variables in Türkiye was analyzed for 26 regions covered by Nomenclature of Territorial Units for Statistics (NUTS) 2 Level for the period 2004-2019. The study utilized the Generalised Method of Moments (GMM) developed by Arellano and Bond (1991) based on dynamic panel data analysis, and socio-economic determinants that could influence suicide were evaluated using models structured according to gender. Within this framework, a total of six models were estimated, including, and excluding the per capita Gross Domestic Product (GDP) variable. The analysis results revealed that the marriage rate, labor force participation rate, and per capita GDP had a statistically significant and negative effect on suicide rates. In contrast, the divorce rate and the suicide rate from the previous period had a positive effect on the current period's suicide rates. Additionally, it was determined that there are significant differences in effects based on gender, and that men, in particular, exhibit more sensitive reactions to social variables such as divorce. The study findings indicate that rising unemployment rates during economic crises also have an upward effect on suicide rates.

ECONOMETRIC MODEL AND DATA

Suicide, while primarily an individual act, is regarded as a social phenomenon that can disrupt societal stability. The increasing prevalence of suicide across different communities raises important questions regarding its

Table 5. Variables Used in the Analysis

Abbreviation	Log Transformation	Description	Source
SUI	LSUI	Number of suicides	TURKSTAT
GDP	LGDP	Gross domestic product per capita	World Bank
CL	LCL	Consumer loan	CBRT (Central Bank of the Republic of Türkiye)
UNP	-	Unemployment, total (% of total labor force)	World Bank
CoL	-	Cost of Living	Authors' calculation
HE	-	Health expenditure (% of GDP)	OECD (Organisation for Economic Co-operation and Development)

Source: Compiled by Authors.

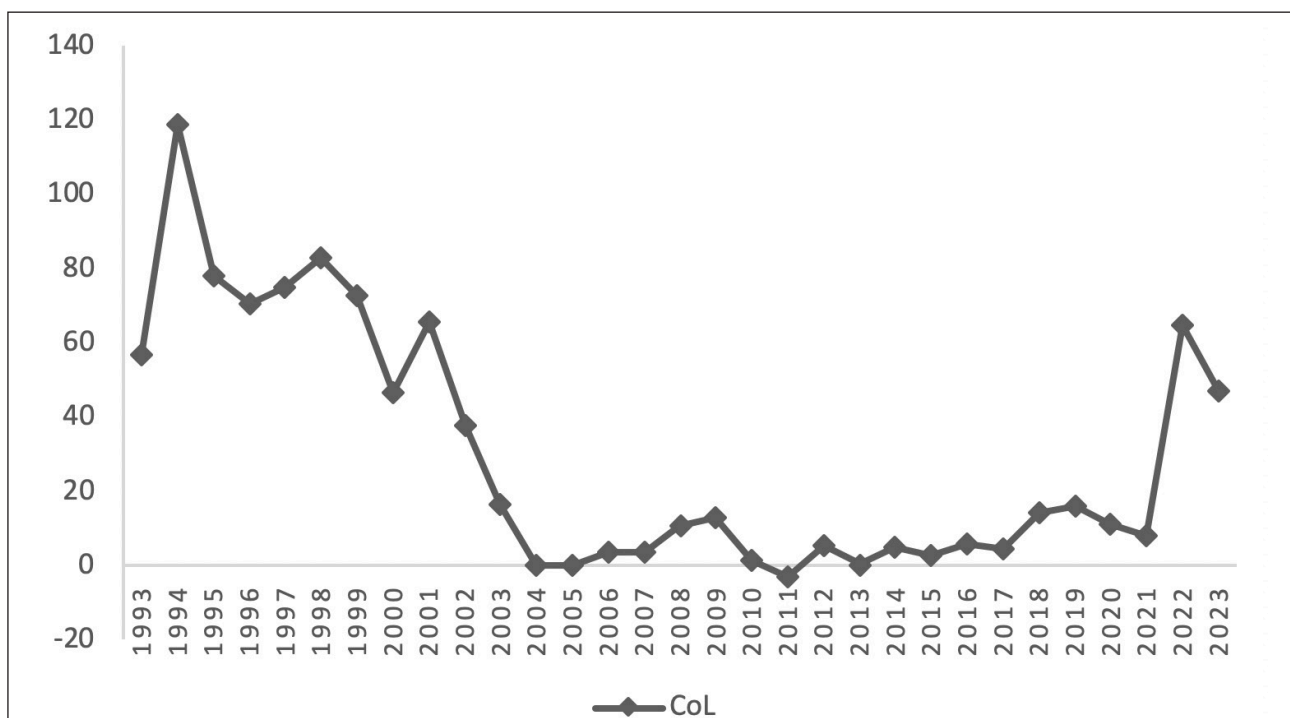
underlying causes. This research aims to explore the relationship between suicide and specific variables within Türkiye. The analysis utilizes annual data spanning from 1993 to 2023, taking into account the availability of relevant data. A comprehensive overview of the variables, including their corresponding abbreviations, is presented in Table 5.

Reasons such as unemployment, low income, and debt burden can be associated with suicide in terms of creating psychological problems such as hopelessness and depression. Additionally, people may face significant challenges in meeting their basic needs due to the rising cost of living and financial stress. This struggle can lead to serious emotional and psychological problems. As more individuals find it difficult to cope with these situations and fall into despair, the incidence of suicide in society may rise. Cost of living, which indicates that the rate of

increase of the income earned falls behind inflation, is not only an economic indicator but also an important criterion in terms of social justice and quality of life, and since there is no data set for it, it was measured using the following formula:

$$\text{Cost of Living Rate} = (1 + \text{Annual Inflation Rate}) / (1 + \text{Annual Rate of Increase in Per Capita Income}) - 1 \quad (1)$$

The concept of cost of living, which is often confused with inflation, also includes income, and as can be seen from the formula above, if the increase in inflation in a country is faster than the increase in income, it will be correct to talk about cost of living in that country (Eğilmez, 2022). Figure 1 shows cost of living rates calculated for the relevant years. It is observed that cost of living ratios calculated by considering the inflation rate and per capita income have positive values except for 2011. Positive values of the

**Figure 1.** Calculated Cost of Living Rates (%)

Source: Authors' calculations.

result indicate that inflation increases more than income. This situation shows that inflation has increased more than income, in other words, people are faced with cost of living. Peaking in 1994, cost-of-living rates fluctuated in the following years and entered a downward trend. While it remained at low levels between 2004-2015, it is observed that it started to increase in the following years.

In the study where annual data are used, the literature is first analyzed, and the variables of cost-of-living rate and consumer loans are integrated into the model to ensure originality. The natural logarithm of the number of suicides, GDP per capita, and consumer loans variables in the model is taken and the model formulated to examine the cointegration relationship between suicide and other variables is as follows:

$$LSUI = \beta_0 + \beta_1 LGDP + \beta_2 LCL + \beta_3 UNP + \beta_4 CoL + \beta_5 HE + \mu_t \quad (2)$$

where b_0 is constant term, μ_t is the error term of the model. The descriptive statistics for all variables are outlined in Table 6. The analysis covers a sample period of 31 annual observations, ranging from 1993 to 2023. The normality test, developed from the framework established by Jarque and Bera (1987), offers a statistical method to determine whether a data series follows a normal distribution. The null hypothesis of the test is that the data is normally distributed. If the p-value obtained is greater than 0.05, the null hypothesis cannot be rejected, so it is concluded that the series is suitable for a normal distribution. Based on the probability values from the Jarque-Bera test, all series in this analysis are found to be normally distributed.

METHODOLOGY AND MODEL ESTIMATION

The dataset utilized in this study comprises 31 annual observations. In time series analysis, a limited number of observations may diminish the statistical power of the model, particularly in traditional cointegration tests.

Table 6. Descriptive Statistics

	LSUI	LGDP	LCL	UNP	CoL	HE
Mean	7.881545	8.820658	16.96670	9.943581	30.27837	4.293839
Median	7.943073	9.106423	18.21046	10.28500	13.18691	4.444000
Maximum	8.347116	9.480799	21.08133	14.02600	119.0389	5.494000
Minimum	7.113956	7.685372	10.08568	6.495000	-2.836273	2.446000
Std. Dev.	0.315601	0.567932	3.280371	1.948337	33.47940	0.828277
Skewness	-0.700975	-0.577568	-0.720418	0.040799	0.902543	-0.883614
Kurtosis	2.760048	1.771577	2.274620	2.704103	2.653776	2.847658
Jarque-Bera	2.613091	3.672676	3.361155	0.121692	4.363516	4.063974
Probability	0.270754	0.159400	0.186266	0.940968	0.112843	0.131075

Source: Authors' calculations.

Therefore, it is crucial to select alternative methods that have been shown to be valid in the literature for handling small sample sizes. In this context, the ARDL approach stands out because it can be worked with a relatively small number of observations. Narayan (2005) provides bounds test critical values that are specifically tailored for small sample sizes, thereby validating the use of the ARDL approach for time series consisting of 30 observations. Another important difference of the ARDL bounds test developed by Pesaran et al. is that it can be applied to series with different degrees of stationarity. Another noteworthy distinction of this cointegration test is that it can be applied to series with different degrees of stationarity. In other words, it can be applied regardless of whether the series are stationary at level or stationary at first difference. Since there are no appropriate table critical values when the variables included in the analysis are stationary in their second differences, the cointegration relationship between the variables cannot be examined with this test (Pesaran et al., 2001; Narayan, 2005). Therefore, the stationarity of the series should first be examined by unit root tests.

As a first step, if the series possess unit roots, and if so, at which level they are stationary are analyzed with the conventional unit root tests Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests. ADF test, developed by Dickey and Fuller (1979), along with PP test, introduced by Phillips and Perron (1988), both serve to evaluate the presence of a unit root in a time series. The null hypothesis (H_0) for these tests posits that the series possesses a unit root. To establish that the series is stationary—indicating that it does not contain a unit root—it is necessary to reject the null hypothesis. This rejection requires that the calculated test statistic exceeds the critical values in absolute terms. The KPSS test, as developed by

Table 7. Unit Root Tests

Variables		Level		Δ	
		Int	Int+Trend	Int	Int+Trend
LSUI	ADF	-1.7744	-3.8789**	-8.5574***	-8.6231***
	PP	-2.6447*	-3.8789**	-9.5841***	-11.721***
	KPSS	0.7112**	0.1772**	0.3306***	0.146436**
LGDP	ADF	-0.9832	-1.5500	-5.9429***	-6.0919***
	PP	-0.9683	-1.6696	-5.9429***	-6.0127***
	KPSS	0.7477	0.1769*	0.1048***	0.0873***
LCL	ADF	-2.2155	-1.3509	-3.6175**	-4.9016***
	PP	-3.5637**	-1.1165	-5.1943***	-6.6005***
	KPSS	0.8353	0.2186	0.3936**	0.0727***
UNP	ADF	-2.1602	-2.8588	-4.4687***	-4.4168***
	PP	-1.8579	-2.3151	-4.5480***	-4.7330***
	KPSS	0.5257**	0.0947***	0.0989***	0.0806***
CoL	ADF	-1.7556	-1.6971	-8.4924***	-9.9543***
	PP	-1.7556	-1.5097	-8.2284***	-15.5096***
	KPSS	0.4938*	0.2086*	0.2208***	0.1224**
HE	ADF	-2.0450	-1.4884	-4.2957***	-4.7038***
	PP	-2.0497	-1.4884	-4.3005***	-4.6770***
	KPSS	0.2464	0.1679	0.2921***	0.0903***

Note: Significant at 10% (*), 5% (*), and 1% (***). Unlike the ADF and PP tests, the null hypothesis of KPSS is that the data are stationary. D is the difference operator.

Source: Authors' calculations.

Kwiatkowski et al. (1992), is distinguished from other unit root tests by its null hypothesis, which asserts the absence of a unit root. In this methodology, the Lagrange Multiplier (LM) test statistic is compared against predetermined critical values. Should the LM test statistic fall below these critical values, the null hypothesis cannot be rejected, indicating that the series is stationary and does not exhibit a unit root. The outcomes of each unit root test for all series are detailed in Table 7.

Upon analyzing the unit root test results presented in Table 7, it is noted that the ADF and PP tests yield similar findings regarding the level values of the series, whereas the KPSS test displays slight discrepancies. The series, which are non-stationary at their level values (not $I(0)$), may become stationary when their first differences are taken. Therefore, the unit root tests were repeated using the first differences of the series. The results from the ADF and PP unit root tests indicate that the null hypothesis can be rejected at the 5% significance level. Conversely, according to the KPSS test, the null hypothesis stating that the series are stationary cannot be rejected at the same significance level. Overall, all test results suggest that the series are integrated of order one, indicating they are stationary at the first difference. These findings fulfill the prerequisites for the ARDL bounds test approach, which stipulates that the series should not be integrated at the second order ($I(2)$).

The ARDL bounds testing approach comprises three distinct stages. The first stage consists of determining whether a long-run relationship exists among the

variables included in the model. After establishing this relationship, the next steps involve estimating the long-run and short-run elasticities (Narayan & Smyth, 2006). The ARDL model derived from Equation 2 is as follows:

$$LSUI_t = \alpha_0 + \sum_{i=1}^p \alpha_{1i} LSUI_{t-i} + \sum_{j=0}^{q_1} \alpha_{2j} LGDP_{t-j} + \sum_{k=0}^{q_2} \alpha_{3k} LCL_{t-k} + \sum_{l=0}^{q_3} \alpha_{4l} UNP_{t-l} + \sum_{r=0}^{q_4} \alpha_{5r} CoL_{t-r} + \sum_{s=0}^{q_5} \alpha_{6s} HE_{t-s} + \varepsilon_t \quad (3)$$

Where p , q_1 , q_2 , q_3 , q_4 , and q_5 denote the maximum lag values associated with each variable, while ε_t represents the error term. Equation 4 is formulated to assess the presence of cointegration among the variables, outlined as follows

$$\Delta LSUI_t = \beta_0 + \gamma_1 LSUI_{t-1} + \gamma_2 LGDP_{t-1} + \gamma_3 LCL_{t-1} + \gamma_4 UNP_{t-1} + \gamma_5 CoL_{t-1} + \gamma_6 HE_{t-1} + \sum_{i=1}^{p-1} \beta_{1i} \Delta LSUI_{t-i} + \sum_{j=0}^{q_1-1} \beta_{2j} \Delta LGDP_{t-j} + \sum_{k=0}^{q_2-1} \beta_{3k} \Delta LCL_{t-k} + \sum_{l=0}^{q_3-1} \beta_{4l} \Delta UNP_{t-l} + \sum_{r=0}^{q_4-1} \beta_{5r} \Delta CoL_{t-r} + \sum_{s=0}^{q_5-1} \beta_{6s} \Delta HE_{t-s} + \varepsilon_t \quad (4)$$

Equation 4 is used to test whether there is a long-term cointegration relationship between the variables. The hypotheses derived using equation (4) are as follows:

$$H_0: \gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = \gamma_6 = 0$$

$$H_1: \gamma_1 \neq \gamma_2 \neq \gamma_3 \neq \gamma_4 \neq \gamma_5 \neq \gamma_6 \neq 0$$

In the ARDL bounds testing, the null hypothesis is tested using the F-test to investigate the existence of a long-run relationship between variables. As can be seen from the hypothesis, the F-test analyzes the joint significance of the coefficients on the lagged values of the variables. When the calculated F statistic value is compared with the critical

values, it is possible to make a definite decision regarding cointegration if it is outside the critical limits. To reject the null hypothesis that there is no cointegration, this statistic value should be higher than the upper bound of the critical values (Narayan and Narayan, 2005).

The error correction model to be estimated to obtain short-term dynamics, which expresses how much the series deviate from the long-term equilibrium value and to what extent this deviation will be corrected in the next period, is as follows:

$$\Delta LSUI_t = \theta_0 + \sum_{i=1}^{p-1} \lambda_{1i} \Delta LSUI_{t-i} + \sum_{j=0}^{q_1-1} \lambda_{2j} \Delta LDGP_{t-j} + \sum_{k=0}^{q_2-1} \lambda_{3k} \Delta LCL_{t-k} + \sum_{l=0}^{q_3-1} \lambda_{4l} \Delta UNP_{t-l} + \sum_{r=0}^{q_4-1} \lambda_{5r} \Delta CoL_{t-r} + \sum_{s=0}^{q_5-1} \lambda_{6s} \Delta HE_{t-s} + \phi ECM_{t-1} + \varepsilon_t \quad (5)$$

where ϕ is the adjustment coefficient indicating the extent to which the balance deviation in the past period is corrected in the current period. Initially, the results of the bounds test, along with the relevant diagnostic tests, are detailed in Table 8. Moreover, the findings of the ARDL (1,2,1,0,0,0) model are detailed in the appendix of the study (Appendix-Table A1).

While the appropriate lag length can be determined according to different information criteria, for this study, it is determined using the Akaike Information Criterion

(AIC), and the maximum lag length is taken as 2. The calculated F statistic is higher than table critical upper bound values at 1% significance level, this result indicates that there is a cointegration relationship between the variables. When the results of the Breusch-Godfrey Serial Correlation LM test are analyzed first among the diagnostic tests in Table 8, it is observed that the probability value is greater than 0.05. In this case, the null hypothesis of no serial correlation cannot be rejected. Similarly, the probability value of the Breusch-Pagan-Godfrey (heteroskedasticity) test is greater than 0.05, so the null hypothesis for this test is that the error variances are all equal cannot be rejected. It is observed that the probability value of the Ramsey RESET test performed to investigate whether there is a specification error in the model is higher than 0.05. In this case, the null hypothesis of correct specification of the Ramsey RESET test fail to reject, this shows that the functional form is correct, there is no specification error in the model. The Jarque-Bera test results confirm that the series in the model are normally distributed. In addition to all these, when CUSUM and CUSUMQ graphs (Appendix-Figure A1) are analyzed, it is observed that the test statistics remain inside the 5% confidence interval, which indicates that the estimated coefficients are stable.

Table 8. Bounds Test Results for Cointegration in the Specified ARDL Model

F-statistics	Significance Level	Critical Value	
		I(0)	I(1)
5.799561***	10%	2.407	3.517
	5%	2.91	4.193
	1%	4.134	5.761
Diagnostic Tests			
		Statistic	Prob
LM Test		0.9730	0.6148
Heteroskedasticity Test		0.4591	0.8841
Ramsey-RESET Test		0.1054	0.7492
Jarque-Bera		1.0889	0.5802
CUSUM		Stable (Appendix-Figure A1)	
CUSUMQ		Stable (Appendix-Figure A1)	

Note: Null hypothesis for cointegration test: "There is no cointegration". (***) indicate that the null hypothesis is rejected at 1% significance level.

Source: Authors' calculations.

Table 9. Estimated Long-Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP	-0.399968	0.114130	-3.504499	0.0024***
LCL	0.146231	0.018065	8.094519	0.0000***
UNP	0.012814	0.010930	1.172331	0.2556
CoL	-0.000789	0.000952	-0.829148	0.4173
HE	-0.060920	0.027835	-2.188606	0.0413**
C	9.118228	0.865231	10.53849	0.0000

Note: Significant at 10% (*), 5% (*), and 1% (***).

Source: Authors' calculations.

The ARDL (1,2,1,0,0,0) model was estimated by determining the lag length according to the AIC criteria, and Table 9 demonstrates the long-term coefficients of the relevant model. Since some variables are incorporated in the model by taking their logarithms, the coefficients of these variables are also interpreted as the elasticity coefficients of the variables. The coefficients for the LGDP, LCL, and HE demonstrate statistical significance and are in line with anticipated outcomes. The coefficient of the LGDP variable is estimated at -0.399968 and is statistically significant at the 1% level ($p = 0.0024$). This result implies that a 1% increase in GDP leads to an approximate 0.40% decrease in the dependent variable in the long run. The negative and significant relationship suggests that GDP exerts a dampening effect on the dependent variable over time. The coefficient associated with LCL is 0.146231 and is highly statistically significant ($p = 0.0000$). A long-term increase of 1% in consumer loans is statistically associated with an average increase of 0.146% in suicide cases. The estimated coefficient for HE, which represents the share of health expenditure in GDP and is included in level form, is -0.060920 with a p -value of 0.0413, indicating

Table 10 presents the estimation results of the error correction model. A coefficient of the error correction term between 0 and -1 indicates a convergence to the long-run equilibrium state, while a positive value indicates a divergence from the equilibrium state (Pata et al., 2016). In other words, the coefficient of ECM_{t-1} , which is the one-period prior value of the residual series obtained from the long-run ARDL model, indicates how much of the short-run imbalance can be corrected in the long-run (Nkoro & Uko, 2016). The coefficient of the error correction term (ECM) is estimated at -1.008211 and is statistically significant, indicating the presence of a stable long-run relationship between the variables. The negative sign of the ECM is consistent with the theoretical expectation, suggesting that any short-run disequilibrium is corrected toward the long-run equilibrium. The magnitude of the coefficient implies that approximately 100.8% of the deviation from long-run equilibrium is corrected within one period, meaning that the adjustment is very rapid, and the system overshoots the equilibrium slightly in the subsequent period.

Table 10. Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Δ (LGDP)	-0.015677	0.093983	-0.166810	0.8693
Δ (LGDP(-1))	0.283874	0.069044	4.111463	0.0006***
Δ (LCL)	-0.014386	0.026899	-0.534814	0.5990
ECM_{t-1}^*	-1.008211	0.137947	-7.308694	0.0000***

Note: Significant at 10% (*), 5% (*), and 1% (***).

Source: Authors' calculations.

statistical significance at the 5% level. This means that a one-unit increase in the share of health expenditures (i.e., a 1 percentage point increase) is associated with a decrease of about 6.1% in the dependent variable in the long run. The negative and significant coefficient suggests that increasing health expenditure shares may have a reducing effect on suicide, which is the dependent variable over time. The findings obtained in this study regarding the relationship between suicide and health expenditures are consistent with the results reported by Karul (2025). On the other hand, the results on the relationship between suicide and income level are in line with the findings of Altınanahtar and Halıcıoğlu (2009) and Kavaklı (2023) in the national literature. This situation reveals that the current analyses are both up-to-date and consistent with previous studies and make an important contribution to the related literature.

After confirming a cointegration relationship among the variables, the Fully Modified Ordinary Least Squares (FMOLS) method was used to estimate the long-run coefficients. The FMOLS estimation addresses both serial correlation and endogeneity in the regressors, resulting in reliable estimates of the long-run parameters. According to the FMOLS estimation results in Table 11, a 1% increase in the GDP variable reduces the dependent variable by approximately 0.22% in the long run. This indicates a statistically significant negative relationship. 1% increase in the CL variable results in an approximately 0.12% increase in the dependent variable. This relationship is positive and quite strong. A comparison of the long-run coefficient estimates derived from the ARDL model and those obtained through the FMOLS method indicates that the GDP and CL variables exhibit consistent coefficient signs and significance levels across both models. These

Table 11. FMOLS Long-Run Coefficient Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP	-0.223029	0.081265	-2.744460	0.0113**
LCL	0.123963	0.014261	8.692562	0.0000***
UNP	0.012802	0.009479	1.350666	0.1894
CoL	0.000521	0.000780	0.667959	0.5105
HE	-0.010713	0.023678	-0.452465	0.6550
C	7.648461	0.585136	13.07126	0.0000

Note: Significant at 10% (*), 5% (*), and 1% (***).

Source: Authors' calculations.

results underscore the reliability of the estimates for the GDP and CL variables and affirm the stability of the long-run relationships identified in the analysis.

In conclusion, the presence and direction of the causal relationships among the variables were analyzed using the Granger causality test based on the Toda-Yamamoto method. Toda and Yamamoto (1995) critically evaluated the validity of the F-statistic employed in the Granger causality test, highlighting its lack of a standard distribution when the series within the system are non-stationary. In response to this limitation, they proposed an innovative methodology—now referred to by their names—that facilitates the estimation of a Vector Autoregressive (VAR) model using the level values of the series, even in the presence of non-stationarity. This development allows for the application of the standard Wald test, thereby enhancing the robustness of the analysis. This methodology does not consider the degree of integration of the series or the potential cointegration relationships that may exist between them. To accurately estimate the VAR model for this test, it is imperative first to establish the lag length (k) and the maximum degree of integration of the series (d_{\max}). Following the determination of these parameters, the VAR model of degree $[k + d_{\max}]$ can be estimated. The formulation of the VAR ($k + d_{\max}$) model utilized in the Toda and Yamamoto test is as follows (Dritsaki, 2017):

$$Y_t = \lambda_1 + \sum_{i=1}^{k+d_{\max}} \beta_{1i} Y_{t-i} + \sum_{i=1}^{k+d_{\max}} \phi_{1i} X_{t-i} + e_{1t} \quad (6)$$

$$X_t = \lambda_2 + \sum_{i=1}^{k+d_{\max}} \beta_{2i} Y_{t-i} + \sum_{i=1}^{k+d_{\max}} \phi_{2i} X_{t-i} + e_{2t} \quad (7)$$

In the first model, the null hypothesis $H_0: \phi_{1i}=0$, which states that variable x is not the Granger cause of variable y , is tested with the Wald test, which conforms to a χ^2 distribution with k degrees of freedom, against the alternative hypothesis, which states that it is the Granger cause. Similar remarks can be made about the second model. The Wald test is applied to the first k coefficients of the coefficient's matrix, i.e., additional terms (d_{\max}) are

not included in the restriction (Yılancı & Özcan, 2010). The results of the Granger causality test based on the Toda-Yamamoto method are presented in Table 12.

As can be seen from Table 12, the null hypothesis that GDP per capita is not the Granger cause of suicide and the null hypothesis that consumer loans are not a Granger cause of suicide are rejected at the 5% significance level. In contrast, the null hypotheses suggesting that cost of living, unemployment, and health expenditures do not Granger-cause suicide cannot be rejected at the 5% significance level.

CONCLUSION AND RECOMMENDATIONS

Suicide, while often viewed as an individual concern, represents a serious global issue that transcends national boundaries and welfare disparities. It is essential to recognize it as a significant social problem. The factors contributing to suicide are complex and multifaceted, encompassing psychological, social, genetic, and biological dimensions. Notably, individuals who attempt suicide frequently exhibit mood disorders, with depression being the most common. Depression is characterized by a pervasive sense of sadness, feelings of grief, diminished pleasure in life, and low energy levels. Additionally, risk factors for depression may include past traumatic experiences, individual psychological attributes, and sociocultural elements such as low socioeconomic status, unemployment, and marital separation. Addressing these underlying factors is crucial for effective prevention and intervention strategies.

This study examines the relationship between suicide in Türkiye and various socioeconomic factors, including income levels, unemployment, consumer loans, cost of living, and health expenditures. Drawing on annual data from 1993 to 2023, this study incorporates consumer loans and cost of living variables into the model, thereby differentiating it from the existing body of literature on the

Table 12. Causality Test Results

H ₀	k+d _{max}	Chi-sq	p-values	Decide
LGDP=>LSUI	3	10.164	0.0062	Causality
LCL=>LSUI	3	21.705	0.0000	Causality
UNP=>LSUI	3	1.7122	0.4248	No Causality
CoL=>LSUI	3	0.8648	0.6489	No Causality
HE=>LSUI	3	2.8778	0.2372	No Causality
LSUI=>LGDP	3	29.933	0.0000	Causality
LCL=>LGDP	3	19.628	0.0001	Causality
UNP=>LGDP	3	5.9079	0.0521	No Causality
CoL=>LGDP	3	3.9712	0.1373	No Causality
HE=>LGDP	3	7.0327	0.0297	Causality
LSUI=>LCL	3	10.112	0.0064	Causality
LGDP=>LCL	3	20.953	0.0000	Causality
UNP=>LCL	3	2.9585	0.2278	No Causality
CoL=>LCL	3	1.6346	0.4416	No Causality
HE=>LCL	3	1.8174	0.4031	No Causality
LSUI=>UNP	3	16.734	0.0002	Causality
LGDP=>UNP	3	3.3796	0.1846	No Causality
LCL=>UNP	3	2.5542	0.2788	No Causality
CoL=>UNP	3	5.7348	0.0568	No Causality
HE=>UNP	3	4.8372	0.0890	No Causality
LSUI=>CoL	3	6.5895	0.0371	Causality
LGDP=>CoL	3	7.3247	0.0257	Causality
LCL=>CoL	3	1.8006	0.4064	No Causality
UNP=>CoL	3	24.052	0.0000	Causality
HE=>CoL	3	37.188	0.0000	Causality
LSUI=>HE	3	52.411	0.0000	Causality
LGDP=>HE	3	9.8000	0.0074	Causality
LCL=>HE	3	39.565	0.0000	Causality
UNP=>HE	3	7.6276	0.0221	Causality
CoL=>HE	3	40.842	0.0000	Causality

Note: The decisions in the table were made based on the 5% significance level.

Source: Authors' calculations.

subject. Individuals may experience feelings of hopelessness and despair due to economic stress, particularly when they face challenges in meeting necessities such as food, shelter, and healthcare. These challenges are often exacerbated during periods of economic crisis characterized by persistent price increases and an expanding gap between income and expenditures. Consequently, individuals enduring prolonged economic difficulties and financial uncertainty may find themselves losing their zest for life and commitment to well-being. When income growth fails to match inflation rates, individuals become increasingly vulnerable to the rising cost of living. This diminishment in purchasing power has the potential to induce feelings of depression and diminish motivation. Furthermore, the relationship between consumer loans and suicide can be attributed to the psychological effects of financial issues faced by individuals. Factors such as inflation and elevated living costs may make borrowing an appealing option for those unable to meet basic needs with their current income, particularly in times of crisis. However, high interest rates and the unsustainable nature of debt accumulation can create a burdensome cycle, resulting in significant stress, anxiety, and psychological pressure for affected individuals.

The relationship between suicide and these variables is analyzed with the ARDL bounds testing approach. Primarily, all series are tested for unit roots using three different unit root tests (ADF, PP, KPSS) and all of them are stationary at most in their first difference. Since the F statistic value estimated according to the result of the subsequent cointegration test is greater than the critical upper bound value at 5% significance level, it is confirmed that there is a cointegration relationship between the variables. In the long-term results of the ARDL model, several independent variables are found to have statistically significant effects on the dependent variable. Specifically, GDP per capita and health expenditure variables have significant negative coefficients, indicating that increases in these variables lead to a reduction in the dependent variable over the long term. These findings suggest that changes in these explanatory factors exert a constraining influence on the dependent variable within the scope of the model. In contrast, the consumer loans variable shows a statistically significant positive effect, indicating that increases in this variable lead to an increase in the dependent variable, suicide, in the long run. In addition, the error correction term is negative and statistically significant. To test the

consistency of the long-term relationship, the FMOLS method was also applied in addition to the ARDL model. The results generally support the ARDL findings. Indeed, variables LGDP and LCL were found to be statistically significant, negatively, and positively, respectively, in both models. These findings demonstrate that these variables have consistent long-term effects on the dependent variable. Finally, the causality relationship between the variables was analyzed using the Toda-Yamamoto test. The results indicate that both income and consumer loans are Granger causes of suicide at a 5% significance level. However, no causal relationships were found between unemployment, the cost of living, or health expenditure and suicide.

Suicide is intricately linked to an individual's psychological well-being. Recognizing this issue is the pivotal first step for both the individual and their family. Practical strategies for addressing mental health challenges include abstaining from alcohol and drugs, engaging in fulfilling hobbies that enhance motivation, seeking support from healthcare professionals, spending time in nature, and establishing small, achievable goals that reinforce a sense of purpose in life. While consumer loans can serve as a valuable resource for addressing immediate financial needs, individuals who enter into such agreements without careful consideration may encounter significant stress and feelings of helplessness. In this respect, economic solutions alone are insufficient in the fight against debt; the simultaneous provision of psychological support and debt management services plays a crucial role.

To begin with, individuals should enhance their financial literacy to the point where they can create their own budget plans. Institutions must conduct thorough analyses of individuals' repayment capabilities before approving loans. For those who are unable to repay due to unemployment and other factors, debt restructuring, and support funds should be offered as viable options. Per capita income is recognized as one of the most important indicators of a nation's welfare. In countries with low per capita income or significant income inequality, individuals may lose hope for their future. When long-term unemployment is added to this situation, it becomes inevitable for individuals to feel trapped, inadequate, and insecure. During this period, the state must provide free, accessible, and effective mental health services, and gather feedback on the positive effects of these services on individuals. Policies aimed at ensuring fairness in income distribution, reducing poverty, and setting the minimum wage above the poverty line are

essential. These measures are necessary not only to minimize suicide rates but also to create a sustainable quality of life throughout society, reduce crime rates, prevent brain drain, and improve overall well-being. As part of a long-term strategy to combat unemployment, projects that enhance employment opportunities should be developed, and social assistance programs should be strengthened. This support is vital to help individuals navigate the challenges of unemployment, especially during times of crisis.

Policies to be developed should be addressed with a holistic approach, considering the multidimensional causes of suicide. Suicide is a preventable public health issue, requiring early intervention and ongoing psychological support mechanisms. In this context, the expansion of mental health centers not only supports the well-being of individuals, but also enables more sustainable and cost-effective spending in the healthcare system by investing in preventive services rather than curative services. Educational campaigns play a crucial role in increasing public awareness about available support methods. These initiatives are essential for informing individuals about the resources and assistance that can be accessed, ultimately fostering a more informed and supportive community. The role of media in addressing the issue of suicide is critical, and it is essential to implement media policies that frame suicide as a preventable and manageable crisis. It is important to understand that reporting on suicide in a detailed and sensational manner can have a detrimental impact on vulnerable individuals, potentially triggering suicidal behaviors. Consequently, such news stories must be presented by established ethical standards. The underlying causes and risk factors of suicide cases in society should be examined in detail, and policies should be developed in light of these factors. It should not be forgotten that a strong social capital, which both enhances the level of social welfare and strengthens the ties between individuals and their lives, is an essential element of sustainable development, not only sociologically but also economically and politically.

REFERENCES

- Adler, A. (1997). Psikolojik aktivite, Çev. Belkıs Çorakçı, 3. Baskı, İstanbul: Say Yayınları.
- Altınanahtar, A. & Halicioğlu, F. (2009). A dynamic econometric study of suicides in Turkey. MPRA Paper No. 15568. <https://mpra.ub.uni-muenchen.de/15568/>
- Baskak, T. E. (2023). OECD ülkelerinde işsizlik ve intihar girişimleri ilişkisi: Panel Var analizi ve Panel Granger nedensellik analizi. *İşletme Araştırmaları Dergisi*, 15(1), 437-451. <https://doi.org/10.20491/isarder.2023.1596>
- Borges, G., Nock, M. K., Haro Abad, J. M., Hwang, I., Sampson, N. A., Alonso, J., Andrade, L. H., Angermeyer, M. C., Beautrais, A., Bromet, E., Bruffaerts, R., de Girolamo, G., Florescu, S., Gureje, O., Hu, C., Karam, E. G., Kovess-Masfety, V., Lee, S., Levinson, D., Medina-Mora, M. E., Ormel, J., Posada-Villa, J., Sagar, R., Tomov, T., Uda, H., Williams, D. R., & Kessler, R. C. (2010). Twelve-month prevalence of and risk factors for suicide attempts in the World Health Organization World Mental Health Surveys. *The Journal of Clinical Psychiatry*, 71(12), 1617-1628. <https://doi.org/10.4088/JCP.08m04967blu>
- Brenner, M. H. (1979). Mortality and the national economy. A review, and the experience of England and Wales, 1936-76. *The Lancet*, 314(8142), 568-573.
- Chang, S., S. Gunnell, D., Sterne, J. A. C., Lu, T. H., & Cheng, A. T. A. (2009). Was the economic crisis 1997-1998 responsible for rising suicide rates in east/southeast asia? A time-trend analysis for Japan, Hong Kong, South Korea, Taiwan, Singapore and Thailand. *Social Science and Medicine*, 68(7), 1322-1331. <https://doi.org/10.1016/j.socscimed.2009.01.010>
- Chen, J., Choi, Y. J., & Sawada, Y. (2009). How is suicide different in Japan? *Japan and the World Economy*, 21(2), 140-150. <https://doi.org/10.1016/j.japwor.2008.06.001>
- Collins, A., Cox, A., Kizys, R., Haynes, F., Machin, S., & Sampson, B. (2021). Suicide, sentiment and crisis. *The Social Science Journal*, 58(2), 206-223.
- Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74(366), 427-431.
- Dilber, T., & Uysal, D. (2020). İşsizlik ve intihar arasındaki ilişki: Türkiye örneği. *Uluslararası Yönetim İktisat ve İşletme Dergisi*, 16(3), 729-744. <http://dx.doi.org/10.17130/ijmeh.798469>
- Dritsaki, C. (2017). Toda-Yamamoto Causality Test between Inflation and Nominal Interest Rates: Evidence from Three Countries of Europe. *International Journal of Economics and Financial Issues*, 7(6), 120-129.
- Durgun, F., & Durgun, B. (2017). Suicide - income relationship: Causal analysis for Turkey. *Dicle University Journal of Economics and Administrative Sciences*, 7(14), 398-416.
- Durkheim, E. (1897). *Le suicide*. Paris, Fransa: F. Alcan.
- Eğilmez, M. (2022). Hayat pahalılığı ve enflasyondan farkı. <https://www.mahfiegilmez.com/2022/08/hayat-pahalig-ve-enflasyondan-fark.html>. (25.02.2025).
- Erdem, C., & Dinç, M. (2022). The socioeconomic determinants of suicide: A panel data analysis. *Yıldız Social Science Review*, 8(1), 1-12. <https://doi.org/10.51803/yssr.1146860>
- Freud, S. (1953). Mourning and Melancholia, in: J. Strachey, Ed., *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, 14, London: Hogarth Press.
- Harmancı, P. (2015). Dünya'daki ve Türkiye'deki intihar vakalarının sosyodemografik özellikler açısından incelenmesi. *Hacettepe University Faculty of Health Sciences Journal*.
- Hamermesh, D., & Soss, M. N. (1974). An economic theory of suicide, *Journal of Political Economy*, 82(1), 83-98. <https://doi.org/10.1086/260171>
- Jarque, C. M., & Bera, A. K. (1987). A test for normality of observations and regression residuals. *International Statistical Review / Revue Internationale de Statistique*, 55(2), 163-172.
- Karul, Ç. (2025). The Impacts of Health Expenditures on Suicidal Deaths: The Case of Türkiye. *The International Journal of Economic and Social Research*, 21(1), 83-97.
- Kavaklı, M. (2023). Türkiye'de intiharın sosyo-ekonomik ve sosyo-psikolojik belirleyicileri: Düzey 2 için bir panel veri çözümlemesi. *Bursa Uludağ Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 42(1), 55-71.

- Kızılkaya, O., & Kuzucu, H. (2022). The relationship between suicide cases and economic factors: Panel data analysis. *Karamanoğlu Mehmetbey Üniversitesi Sosyal ve Ekonomik Araştırmalar Dergisi*, 24(42), 62-80.
- Kwiatkowski, D., Phillips, P. C. B., Schmidt, P., & Shin, Y. (1992). Testing the null hypothesis of stationarity against the alternative of a unit root. *Journal of Econometrics*, 54(1-3), 159-178.
- Lester, B. Y. (2001). Learnings from Durkheim and Beyond: The economy and suicide. *Suicide and Life-Threatening Behavior*, 31(1), 15-31.
- Machado, D. B., Rasella, D., & Dos Santos, D. N. (2015). Impact of income inequality and other social determinants on suicide rate in Brazil. *PLOS ONE*, 10(4), e0124934. <https://doi.org/10.1371/journal.pone.0124934>
- Madianos, M. G., Alexiou, T., Patelakis, A., & Economou, M. (2014). Suicide, unemployment and other socioeconomic factors: Evidence from the economic crisis in Greece. *European Journal of Psychiatry*, 28(1), 39-49. <https://dx.doi.org/10.4321/S0213-61632014000100004>
- Mann, J. J., & Metts, A. V. (2017). The economy and suicide: An interaction of societal and intrapersonal risk factors [Editorial]. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*, 38(3), 141-146. <https://doi.org/10.1027/0227-5910/a000487>
- Marx, K. (1846). Peuchet on suicide. In D. Fernbach (Ed.), *Karl Marx: Surveys from Exile* (trans. C. B. Macpherson, pp. 197-202). London: Penguin Books, 1973.
- Mathieu, S., Treloar, A., Hawgood, J., Ross, V., & Kölves, K. (2022). The role of unemployment, financial hardship, and economic recession on suicidal behaviors and interventions to mitigate their impact: A review. *Frontiers in Public Health*, 10, 907052. <https://doi.org/10.3389/fpubh.2022.907052>
- Moscicki, E. K. (1995). Epidemiology of Suicide, North American Perspectives. *International Psychogeriatrics*, 7(2), 137-148.
- Menninger, K. A. (1938). *Man against himself*. Harcourt, Brace.
- Ministry of Health (2018). <https://khgm.saglik.gov.tr/TR,46896/10-eylul-dunya-intihari-onleme-gunu.html> (25.02.2025).
- Narayan, P. K. (2005). The saving and investment nexus for China: evidence from cointegration tests. *Applied Economics*, 37(17), 1979-1990. <http://dx.doi.org/10.1080/00036840500278103>
- Narayan, S., & Narayan, P. K. (2005). An empirical analysis of Fiji's import demand function. *Journal of Economic Studies*, 32(2), 158-168. <https://doi.org/10.1108/01443580510600931>
- Neumayer, E. (2003). Are socioeconomic factors valid determinants of suicide? Controlling for national cultures of suicide with fixed-effects estimation. *Cross-Cultural Research*, 37(3), 307-329. <https://doi.org/10.1177/1069397103253708>
- Nkoro, E., & Uko, A. K. (2016). Autoregressive distributed lag (ARDL) cointegration technique: Application and interpretation. *Journal of Statistical and Econometric Methods*, 5(4), 63-91.
- Nock, M. K., Borges, G., Bromet, E. J., Alonso, J., Angermeyer, M., & Beautrais, A. (2008). Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *The British Journal of Psychiatry*, 192(2), 98-105. <https://doi.org/10.1192/bjp.bp.107.040113>
- Nordt, C., Warnke, I., Seifritz, E., & Kawohl, W. (2015). Modelling suicide and unemployment: A longitudinal analysis covering 63 countries, 2000-11. *The Lancet Psychiatry*, 2(3), 239-245. <https://doi.org/10.1016/j.eurpsy.2015.03.003>
- Okada, K., & Samreth, S. (2013). A study on the socio-economic determinants of suicide: Evidence from 13 European OECD countries. *The Journal of Socio-Economics*, 45(Supplement C), 78-85. <https://doi.org/10.1016/j.socsc.2013.04.009>
- Pata, U. K., Yurtkuran, S., & Kalça, A. (2016). Energy consumption and economic growth in Turkey: ARDL bounds test approach. *Marmara Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 38(2), 255-271. <https://doi.org/10.14780/muiibd.281411>
- Pesaran, M. H., Shin, Y., & Smith, R. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289-326.
- Peuchet, J. (1838). *Mémoires tirés des archives de la police de Paris*. Paris: Chez l'Éditeur.
- Phillips, P. C. B., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, 75(2), 335-346.
- Ringel, E. (1976). The presuicidal syndrome. *Suicide and Life-Threatening Behavior*, 6, 131-149.

- Sher, L. (2006). Per capita income is related to suicide rates in men but not in women. *The Journal of Men's Health & Gender*, 3(1), 39-42. <https://doi.org/10.1016/j.jmhg.2005.04.016>
- Socio-Political Field Research Centre (2020). <https://www.sahamerkezi.org/wp-content/uploads/2020/11/intihar-1.pdf>. (25.02.2025).
- Stack, S. (1981). Divorce and suicide: A time series analysis, 1933-1970. *Journal of Family Issues*, 2(1), 77-90. <https://doi.org/10.1177/0192513X8100200106>
- Toda, H. Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of Econometrics*, 66(1-2), 225-250. [https://doi.org/10.1016/0304-4076\(94\)01616-8](https://doi.org/10.1016/0304-4076(94)01616-8)
- TURKSTAT (2020). Ölüm ve ölüm nedeni istatistikleri, 2015-2019 [Veri seti]. <https://data.tuik.gov.tr>
- TURKSTAT (2024). <https://data.tuik.gov.tr/Bulten/Index?p=Olum-ve-Olum-Nedeni-Istatistikleri-2023-53709>. (25.02.2025).
- Weis, M. A. (1974). Suicide. A handbook of psychiatry, (Ed.) S Arieti, New York. Basic books Inc. Publishers, 743-65.
- WHO (2018). Global health estimates 2016: deaths by cause, age, sex, by country and by region, 2000-2016.
- WHO (2021). Suicide world wide in 2019 global health estimates. <https://www.who.int/publications/i/item/9789240026643>. (25.02.2025).
- WHO (2024). <https://www.who.int/campaigns/world-suicide-prevention-day/world-suicide-prevention-day-2024>
- World Population Review (2025). <https://worldpopulationreview.com/>
- Yılcı, V., & Özcan, B. (2010). Analyzing the relationship between defense expenditures and GNP for Turkey under structural breaks. *C.Ü İktisadi ve İdari Bilimler Dergisi*, 11(1), 21-33.

Appendix-1

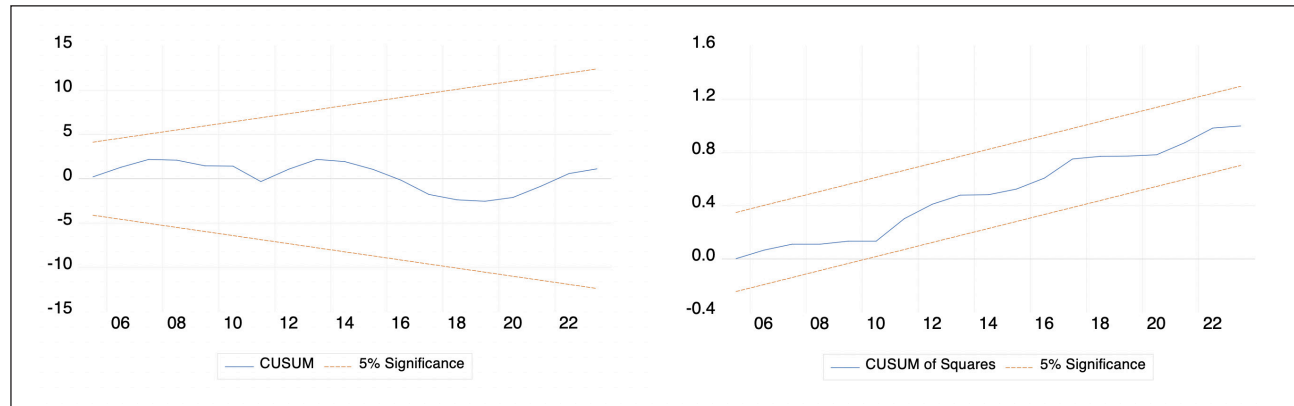


Figure A1. Graph of CUSUM and CUSUMQ

Table A1. ARDL (1,2,1,0,0,0) Model Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LSUI(-1)	-0.008211	0.229022	-0.035852	0.9718
LGDP	-0.015677	0.143030	-0.109608	0.9139
LGDP(-1)	-0.103701	0.159308	-0.650946	0.5229
LGDP(-2)	-0.283874	0.088268	-3.216057	0.0045***
LCL	-0.014386	0.043790	-0.328521	0.7461
LCL(-1)	0.161817	0.046972	3.444981	0.0027***
UNP	0.012919	0.011828	1.092264	0.2884
CoL	-0.000796	0.000903	-0.880707	0.3895
HE	-0.061420	0.026835	-2.288784	0.0337**
C	9.193098	1.702561	5.399569	0.0000***

Note: Significant at 10% (*), 5% (*), and 1% (***).

Source: Authors' calculations.