



**KAFKAS ÜNİVERSİTESİ
İKTİSADİ ve İDARİ BİLİMLER FAKÜLTESİ**

*KAFKAS UNIVERSITY
FACULTY OF ECONOMICS and ADMINISTRATIVE SCIENCES*



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THE SOCIOECONOMIC DETERMINANTS OF SUICIDE IN OECD COUNTRIES ¹



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ABSTRACT

In addition to the sociological, economic, and demographic determinants, this study aims to examine the impact of informal employment on suicide rates through the rate of wage and salaried workers, which distinguishes it from existing literature. The study is estimated using the Fixed Effects Estimator (with Driscoll Kraay robust standard errors) with 2007-2020 annual data for 30 OECD countries. Results indicate that increase in GDP per capita, inflation, wage and salaried worker, and female labor participation rate contribute to the decrease in suicide rates. No significant relationship has been found between unemployment and suicide; however, unemployment benefits are effective in preventing suicide. Besides, a positive relationship has been observed between the increase in the level of education and suicide rates. Marital status were found to be unrelated, but parenthood was determined to have a diminishing effect on suicide. Alcohol addiction and densely populated urban areas trigger suicide has been reached.

Keywords: *Suicide, socioeconomic factors, mental health, informal employment*

JEL Codes: *C23, I15, I31*

Scope: *Economics*

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¹ It has been declared that the relevant study complies with ethical rules.

OECD ÜLKELERİNDE İNTİHARIN SOSYOEKONOMİK BELİRLEYİCİLERİ



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ÖZ | Bu çalışmada intihar vakalarının sosyolojik, ekonomik ve demografik belirleyicilerinin yanında literatürden farklı olarak ücretli ve maaşlı çalışanların oranı üzerinden kayıt dışı istihdamın, intihar üzerindeki etkisi incelenmektedir. Çalışma, 30 OECD ülkesinin 2007-2020 yıllık verileri kullanılarak Sabit Etkiler (Driscoll Kraay dirençli standart hataları) ile tahmin edilmiştir. Kişi başına düşen milli gelir, enflasyon ve kadınların işgücüne katılımındaki iyileşmelerin intihar oranlarını düşürdüğü tespit edilmiştir. Kayıtlı istihdamın önemli bir göstergesi olan ücretli ve maaşlı çalışma şeklinin yaygınlaşmasının intihar oranlarını düşürdüğü bulgusuna ulaşılmıştır. İşsizlik ile intihar arasında anlamlı bir ilişkiye rastlanılmamış, ancak işsizlik ödeneklerinin intiharı önlemede etkin olduğu tespit edilmiştir. Bununla birlikte eğitim düzeyindeki artış ile intihar oranları arasında pozitif yönlü ilişki bulunmuştur. Medeni durumdaki değişimin intihar ile ilişkisiz olduğu, ancak çocuk sahipliğinin intiharı azalttığı tespit edilmiştir. Alkol bağımlılığı ile yoğun kent nüfusunun intiharı tetiklediği bulgusuna ulaşılmıştır.

Anahtar Kelimeler: İntihar, sosyoekonomik faktörler, zihin sağlığı, kayıt dışı istihdam

JEL Kodları: C23, I15, I31

Alan: İktisat
Türü: Araştırma

1. INTRODUCTION

According to the World Health Organization (WHO), global suicide rates have declined from 800,000 to 700,000 over the past two decades. Despite the decrease in suicide rates, the European Region has the highest suicide rate at 12.8 per 100,000 population. Studies attempting to explain the temporal and regional variations in suicide rates have revealed that understanding the phenomenon of suicide cannot be solely evaluated from an individual perspective, independently of its societal, economic, and public dimensions. Factors deeply influencing an individual's choice between life and death can include societal norms and values, cultural elements, economic well-being, equitable access to public services, the establishment of law and justice in society, and political stability.

Suicide, a significant issue both for individuals and consequently for society, has also gathered considerable attention in social sciences. Émile Durkheim, with his 1897 study, contributed to the subject's more systematic and comprehensive examination in the following years when he analyzed the societal causes and types of suicide. Durkheim noted that individuals may view suicide as an option due to reasons such as social isolation, alienation from societal norms, and prioritizing societal well-being over their own (Johnson, 1965, p. 883). Following Durkheim's work, the topic of suicide has become an interdisciplinary subject in academic literature, involving fields such as psychology, medicine, economics, law, politics, and environmental science.

The first comprehensive study on the economic dimension of suicide was conducted by Hamermesh & Soss, (1974), who discussed suicide from the perspective of rational behaviors, aimed at maximizing their utility of life. According to their work, people compute the benefit and cost of their lives, and those who choose suicide do not believe they can change their socioeconomic condition before the end of their lives. Since Hamermesh and Soss's work, the issue of suicide has been studied from different economic aspect for a large number of countries across various time series. There is a substantial literature suggesting that deteriorations in macroeconomic variables such as economic development, inflation, unemployment, income inequality and consumer confidence, minimum wage trigger suicide cases. Economic fluctuations and unemployment are among the economic factors that have a substantial impact on suicide deaths across a variety of countries and times.

The effect of unemployment benefits, which are provided to compensate for the loss of income of individuals and households during periods of unemployment, on suicidal behavior is another issue addressed in the literature (Antonakakis & Collins, 2015; Cylus, Glymour & Avendano, 2014). Another dimension addressed in the literature is the impact of increased visibility of

women in the public sphere on individual and social economic progress and its effects on suicide cases (Chen, Chen, Lui & Yip, 2017; Cutright, 1998; Fernquist & Davis, 1981; Stack, 1978). Moreover, the effect of the average education level of the society, which is considered as an economic indicator, on suicide cases has taken its place in the discussions in the literature (O. Monak, Arroyave & Cardona, 2021; Phillips & Hempstead, 2017; Pompili et al., 2013).

The assessment of suicide cases cannot be conducted independently of sociological indicators in conjunction with the economic dimension. Within the literature, studies suggest that individuals marital and parenthood status or loneliness influence suicide cases (Andres, 2005; Choi, Sempungu, Lee, Chang & Lee, 2022; Cook, 2019; De Bruin, Agyemang & Chowdhury, 2020; Næss, Mehlum & Qin, 2021; Yang, Liu & Li, 2023). Additionally, there is literature indicating that alcohol, substance, or drug addiction can lead individuals towards suicide by isolating them from social life, as demonstrated by studies conducted by Lau, Hamzah, Tan, and Simonetti, (2017); Merrill, Milner, Owens, and Vale, (1992); Razvodovsky, (2011). Furthermore, another factor in the literature affecting individual loneliness is the population density of cities. In densely populated cities, challenges in transportation, access to healthcare, nutrition, and living conditions may negatively impact individuals' quality of life, potentially triggering suicidal thoughts (Bussu, Detotto, & Sterzi, 2013; Kurbin & Weitzer, 2003).

The indicator of the rate of wage and salaried workers among the total employed, provides information about the economic development dynamics of a society. While a high proportion of wage and salaried workers can be interpreted as an indicator of advanced economic development, a high proportion of self-employed workers is considered as an indicator of the agricultural sector and high informal employment in the economy (World Bank, 2023h)².

Self-employed and informal employment, have a temporary, irregular, and precarious working conditions. These workers are generally low-educated and earn below the minimum wage in temporary jobs. Besides, informal employees, who have no job security are constantly at risk of unemployment. Another major issue encountered by informal workers is the lack of social health insurance. This group, who often work long hours in physically challenging jobs

² The high proportion of workers in family businesses, often informal, unpaid and uncompensated, points to weak development and large rural economies. Although each type of employment carries its own risks, family workers and own-account workers are the most vulnerable and at the highest risk of falling into poverty. They are the least likely to have social safety nets to protect them from economic shocks and often lack the ability to save enough to avoid these shocks (World Bank, 2023h).

under unhealthy conditions, is exposed to serious health risks. Moreover not only the informal worker but also other family members remain without health insurance. Under such adverse circumstances, this group, which is economically, socially, and legally insecure, struggles with weakened resilience in dealing with psychological issues.

Individuals or households engaged in informal employment may experience health, economic, and legal difficulties that could lead them to self-harm. Therefore, this study primarily seeks to answer whether type of employment has an impact on suicide cases. While the relationship between unemployment and suicide has been frequently addressed in the literature, no study has been found that examines the link between wage and salaried workers and suicide. In this respect, our study distinguishes itself from the existing literature on the socioeconomic determinants of suicide.

As the level of development of countries increases, the size of the informal economy decreases. This is indirectly related to the education level of society as well. Individuals with a high level of education tend to work in qualified, high-paying, and especially socially secured jobs. On the other hand, individuals with a low level of education may struggle to compete in the labor market and may be forced to prefer informal employment in order to avoid unemployment. Low education levels, unskilled jobs, low wages, and the harsh living conditions associated with informal employment can negatively affect individuals' mental health, leading them to harm themselves.

There are many studies in the literature that examine the relationship between education level, educational attainment, or human development index and suicide. The studies in the literature have explored the relationship between literacy rates, primary or secondary school graduates, and suicide rates (Bálint, Osváth, Rihmer & Döme, 2016; O. Monak et al., 2021; Phillips & Hempstead, 2017; Pompili et al., 2013). In particular, education levels in the countries of the Organisation for Economic Co-operation and Development (OECD) have significantly increased over the past thirty years. In these countries, literacy rates and the completion rates of primary or secondary school are quite high. However, the enrollment rate in higher education, which represents a significant part of human capital in society, is still limited, even in developed countries. This study seeks to answer the question of how suicide rates follow a pattern as education levels increase, in addition to the level of economic development. This study is the first analysis to examine the effect of higher education enrollment on suicide behavior in OECD countries. In this regard, the study is expected to make a new contribution to the literature.

The remainder of this study is scheduled as follows: the next section discusses socioeconomic background of suicide section 3 explore literature review, section 4 defines methodology, section 5 defines data, section 6 explore empirical findings, sections 7 discussion of the empirical findings, section 8 includes concluding remarks and recommendations.

2. SOCIOECONOMIC BACKGROUND OF THE SUICIDE

Durkheim proposed that suicide in a society stems from four fundamental reasons: egoistic, anomic, altruistic, and fatalistic (Durkheim, 2013, p. 187). Egoistic suicide stems from the weak social relations and individual feel become lonelier in their private and social life. Anomic suicide occurs when old traditions are no longer accepted and new traditions have not yet gained a strong position in society, as a result of individuals' alienation from society due to the loss of their sense of belonging. Altruistic suicide arising from prioritizing the welfare of society over its own welfare. In terms of fatalistic suicide, the expectation of future life has vanished due to the significant changes in individual lives (Johnson, 1965, p. 878)

Durkheim argued that social isolation could trigger feelings of loneliness, depression, and an increased risk of self-harm. Therefore, factors such as marriage, divorce, and fertility can affect an individual's social integration and subsequent life decisions. Durkheim's concept of anomic and egoistic suicide suggests that marriage strengthens an individual's social integration and promotes psychological well-being, resulting in a negative relationship between marriage and suicide. Conversely, divorce can result in feelings of loneliness and depression, which can heighten the risk of suicide (Durkheim, 2013, p. 275, 285).

The concept of individual loneliness on suicide has also been discussed in urban sociology literature. In densely populated cities, individuals may experience a heightened sense of loneliness and depression, potentially leading to self-destructive behavior. Additionally, according to Social Disintegration Theory proposed by Kurbin and Weitzer (2003), rapid urbanization can lead to family or social disintegration, which is considered a primary cause of urban suicide.

Excessive alcohol use may also trigger a sense of loneliness by distancing individuals from social environments and may increase the risk of depression (Merrill et al., 1992, p. 84). In addition, heavy alcohol use leads to distraction and negatively affects the quality of life of the individual in private and professional life (Field, Claassen & O'Keefe, 2001, p.13). High levels of alcohol consumption are known to be detrimental to psychological health, leading to an increase in anxiety, depression, and suicidal tendencies (Caces & Harford, 1998; Roy, 2003).

In addition to social reasons, economic reasons affecting suicide are as follows: There are two different viewpoints in the literature about the relationship between income and suicidal behavior. According to Ginsberg (1967), there is a positive relationship between economic growth and suicide rate. He argues that during the economic downturn, individuals' expectations of consumption worsen, which leads to a decrease in suicide rates. Conversely, during an economic expansion, individuals' demand and expectations become more optimistic, and if these expectations are not met despite economic growth, suicidal behavior may increase. However, Henry and Sort (1954) present a different argument, stating that people in high economic positions may be more likely to commit suicide if they lose their status during an economic recession.

Employment takes up most of individual's time specializing them in particular field (DeFina & Hannon, 2014, p. 218). Over time, the work an individual performs permeates their character, social status, and network. Moreover, it influences their consumption and investment decision, as well as how and where they spend their leisure time. In contrast, prolonged unemployment may lead to loss of self-confidence and social status, while also causing the erosion of various habits related to consumption and the use of leisure time. During economic crisis or unemployment, individuals live financial strain and psychological distress, this fact potentially leading to suicide. Governments provide unemployment benefits to support individuals who have lost their jobs, offering both financial assistance and psychological comfort (Burgard, Brand & House, 2009, p. 778). On the other hand, high inflation reduces the purchasing power of households, resulting in income loss, and limiting both compulsory and luxury consumption. During times of high inflation, consumption expenditures of individuals may decrease potentially leading to an increase in suicide rates (C. Nelli & Priebe, 2011, p. 980).

There are two prevalent perspectives on the relationship between female education and labor force participation. The first is the Status Integration Theory, which posits that an increase in the female labor force participation (FLFP) rate enhances their economic and psychological power. However, this may lead to a conflict between work and family responsibilities, as well as a fear of losing status among men, potentially triggering suicidal behavior in both men and women (Stack, 1978, p. 645). According to the Accumulation/Expansion Theory, the increase in household income resulting from female's participation in the labor force facilitates access to expenditures such as clean food, housing, quality education, and healthcare. This situation brings about an increase in welfare at the individual, household, and societal levels, ultimately leading to economic

development. These positive externalities provided by women's involvement in the labor market will help reduce suicide rates (Sieber, 1974, p. 577).

In addition to women's participation in the labor force, another significant factor that affects suicide rates is the average level of education within a society. Studies have found that increases in literacy rates and participation in primary and secondary education contribute to protecting individuals' mental health and improving their quality of life, thereby reducing suicide rates (Bálint et al., 2016; Phillips and Hempstead, 2017; Næss et al., 2021). However, there are also studies suggesting that higher levels of education, by increasing individuals' awareness of societal issues, may have differing impacts on suicide rates across genders (Pompili et al., 2013).

In summary, the combination of one or more problems such as economic problems experienced by households or the broader economy, rapid urbanization, alcohol or drug addiction, problems in an individual's marital status, and loneliness can negatively affect an individual's mental health (Erdem et al., 2019). Economic, social or environmental problems experienced by the individual or the society as a whole can lead to a loss of joy and hope in life. The next level of this situation may result in mental illness or self-harm (Gültekin & Emsen, 2023).

3. LITERATURE REVIEW

In this section, studies in the literature are summarized based on socioeconomic background of suicide. The summary of studies in the literature is presented in Table 1. It is observed that macroeconomic variables such as economic size, unemployment, social welfare policies, income inequality and household debt ratio are commonly used as the economic determinants of suicide. On the other hand, Durkheim's seminal work, which the first study is to systematically and comprehensively address the issue of suicide, it is argued that social phenomena lead individuals to suicide (Stack, 1978, p. 647). In this context, there is a widespread literature suggesting that, gender, marital status or factors leading to individual isolating from society may be associated with suicide.

As can be seen in Table 1, it is realized that the most common macroeconomic variable among the economic determinant of suicide is economic size. Contrary to Ginsberg (1964) argument, it is widely observed that economic development commonly reduce suicide rates. On the other hand, the impact of inflation on suicide mortality is mixed in the literature. C. Nelli and Priebe (2011) found negative relationship, Akyuz and Karul (2022), Lari and Sefiddashti (2023) found a positive relationship between inflation and suicide.

After economic size, another macroeconomic variable frequently

discussed in the suicide literature is unemployment rate. There is a wide literature suggesting that unemployment trigger suicide as can be seen in Table 1. However, the literature presents diverse conclusions on the relationship between unemployment and suicidal behavior, which can depend on factors such as the period, age, gender, and geography. The variation in the impact of unemployment on suicide is may be due to the unemployment benefits provided by government during periods of unemployment. Antonakakis and Collins (2015), and Cylus et al. (2014) found that unemployment benefits prevent suicide, while Reeves et al. (2015) and Stuckler (2009) did not found a significant relationship.

The impact of FLFP on suicide is another indicator frequently discussed in the literature. As can be seen in Table 1, Davis (1981); Erdem and Dinc (2022); Fernquist and Cutright (1998) found positive relation; Chen et al. (2017); Inagaki (2010) observed negative relation, Lari and Sefiddashti (2023) found insignificant relation between them.

Table 1: Empirical Literature on the Socioeconomic Determinants of Suicide

Author/s Year	Sample Period	Method	Results
Hamermesh and Soss (1974)	USA 1947-1967 By age	POLS	Unemployment and loss of income trigger suicide among older individuals.
Stack (1978)	45 Nations 1970	Pearson Corr.	FLFP is most closely related with male suicide.
Minoiu and Andres (2008)	USA 1982-1997	SGMM	Public health and welfare consumptions are related with suicide, while income equality and unemployment lack of robust impact on suicide.
Altinanahtar and Halicioglu (2009)	Türkiye 1974–2007	ARDL	Urbanization, real income and liquidity are associated with suicide.
Stuckler (2009)	26 EU 1970-2007	Multiv. Regres.	Unemployment trigger suicide younger than older. Active labor market investment reduce suicide.
Inagaki (2010)	Japan 1951-2007	DOLS FMOLS	Income equality and unemployment have a positive effect on suicide, while FLFP has a negative effect.

Andres, Halicioglu, and Yamamura (2011)	15 OECD 1970-2004	ARDL	Unemployment and divorce lead to suicide.
Razvodovsky (2011)	Russia 1980-2005	ARIMA	Alcohol consumption effect suicide in both genders.
Amin M. Cheraghlou (2013)	USA 1979-2004	FE	Unemployment causes suicide in 35-64 age group.
Bussu et al. (2013)	Italy 1996-2005	GMM, D. spatial panel data	Social conformity, alcohol cons. and population density increase suicide.
Okada and Samreth (2013)	13 OECD Countries	Times series ARDL	Divorce, alcohol and loss of income trigger suicide in a small number of countries. Fertility reduces suicide in only 4 countries (Different times for each country).
Pompili et al. (2013)	Italy 2006-2008	Pearson Log. Reg.	Suicide rate increasing as the level of education increase.
Cylus et al. (2014)	USA 1968-2008	Fixed Effect	The effect of unemployment rate on suicide is suppressed by unemployment benefits.
Antonakakis and Collins (2015)	5 EU Count. 1968-2012	Fixed Effect	Fiscal austerity prevent suicide among men aged 65-89.
Reeves et al. (2015)	20 EU Countries 1981-2011	Multivariate statistical models	Unemployment and indebtedness have an impact on male suicide, while unemployment benefits and total social protection do not prevent suicide.
Bálint et al. (2016)	Hungary 1980,1990, 2001, 2011	Negative binomial regression	Being female, young age, higher educational level and marriage were significantly associated with a reduced risk of suicide.
Chang and Chen (2017)	USA 1928-2013	ARDL NARDL	Unemployment and economic situation effect suicide by age group.

Lau et al. (2017)	Canada 1978-2008	VAR	Economic status, unemployment, alcohol consumption and fertility affect suicide for both genders.
Chen et al. (2017)	70 Countries 2012	Bayesian information criteria	The lower ratio of human development index to FLFP were associated with higher suicide rate.
Phillips and Hempstead (2017)	USA 2000-2014	Poisson distribution	Suicide rate decreasing as the education level increases.
Erdem, Demirel and Erkan (2019)	Türkiye /12 statistical region 2005-2013	Fixed Effect	Youth unemployment has no impact on suicide.
Mattei and Pistoressi (2019)	Italy 1977-2015	Cointegration	Unemployment benefits are effective in weakening the impact of unemployment on suicide.
De Bruin et al. (2020)	17 Countries 1990-2015	Fixed Effect	Lower voice and accountability and political stability is associated with suicide.
Næss et al. (2021)	Norway 1992-2012	Conditional regression	Suicide is higher among unmarried, divorced, widowed people, or those with low education and those who have never been married.
O. Monak et al. (2021)	Colombia 1998-2015	Poisson regression	Educational inequalities increase suicide.
Saraçoğlu & Gültekin (2021)	Türkiye 26 statistical region 2008-2018	Cointegration	There is a Kuznets Curve (U) effect of income level on suicide.
Choi et al. (2022)	South Korea 2008-2017	Conditional log. reg.	Low education, singleness, economic status and unemployment were associated with suicide.
Erdem and Dinc (2022)	47 Countries 1995-2015	Panel ARDL	Unemployment, fertility, alcohol consumption, divorce were

			associated with suicide.
Akyuz and Karul (2022)	Türkiye 1988-2018	F.Coint. DOLS	Industrial production and investment developments and inflation effect suicide.
Kızılkaya & Kuzucu (2022)	44 countries 2000-2019	GMM	Increases in unemployment, FLFP and inflation increase suicide for both gender.
Yang et al. (2023)	China 1987-2017	Cointeg., Lineer regression	Marriage, divorce and economic status affect suicidal behavior according to the gender of those living in rural and urban areas.
Lari and Sefiddashti (2023)	17 Count. 1990-2019	Random Effect	Suicide rates was associated with inflation, unemployment, mental disorders, urbanization, and internet using.
Kavaklı (2023)	Türkiye Level-2 2004-2019	GMM	Economic recovery and marriage negatively affect suicide.

Besides economic factor, reasons such as individual's isolation from society, resulting in alienation and deteriorating future prospects as Durkheim suggested, can trigger mental illness (Gültekin & Emsen, 2023). Based on the Durkheim's suicide theory, there are numerous studies in the literature suggesting that factors leading social isolation may trigger suicide. These studies emphasize on factors such as marital status, parenthood, and population density. Among these studies Choi et al. (2022); De Bruin et al. (2020); Næss et al. (2021); Okada and Samreth (2013), revealed that suicide risk is significantly higher for individuals who are never married, separated, divorced, or widowed than for those who are married. So that Andres et al. (2011), found that sociological aspects, such as divorce and fertility rate, had a greater effect on suicide risk than economic aspects such as GDP or unemployment.

However, there are other studies that have found insignificant relationship between marriage/divorce and suicide. Yang et al. (2023), have not reached a significant relationship between marriage/divorce and suicides among urban residents in China. Yang et al. (2023), associates this situation with the notion that urban women, being economically and psychologically independent, marriage and divorce decision cover a small part of their lives. Nevertheless, having children can strengthen family ties and increase parental the responsibilities, which may motivate parents to strive for survival despite

difficulties, thereby reducing the suicide risk in families with children (Andres, 2005; Lester & Yang, 1992; Neumayer, 2003).

A review of the literature on the socioeconomic determinants of suicide reveals that the most prominent macroeconomic variables are economic size and unemployment. Though, the impact of unemployment on suicide is controversial in the literature. One possible reason for this uncertainty could be attributed to the unemployment benefits provided by governments.

Besides economic size and unemployment, the ratio of wage and salaried workers in a society, provides crucial information about both the economic development level and distribution of employment. A low ratio of wage and salaried workers often accompanies an underdeveloped or developing countries, characterized by precarious employment conditions and a lack of social protections.

As the level of development of countries progresses, the number of large-scale corporate companies expands and the proportion of self-employed workers shrinks. However, in less developed and developing countries, the self-employment rate is relatively high due to the lack of factors such as capital, quality education, and job security, as well as the reliance on traditional production methods. The lack of adequate protection of social security rights of employees in underdeveloped or developing countries leads to unregistered employment. Since formal employment has job, wage and health security, it is less affected by a sectoral or economy-wide shock than informal employment. On the other hand, those who are employed informally or self-employed in small family enterprises are in an invisible employment without economic, health, social and legal security. This fact may make it difficult for employees to protect their mental health in times of economic crisis by being deprived of any job security (Gültekin & Emsen, 2023). Therefore, a low ratio of wage and salaried workers may trigger crime and suicide rate in a society. No study has been found in the literature that specifically highlights the relationship between suicide and wage and salaried workers, which include both economic development and employment. Our study differs from the empirical literature in this regard.

The other socioeconomic variable whose effect on suicide is controversial is the level of education. Pompili et al. (2013) in Italy and Lusyne and Page (2008) in Belgium found a positive relationship between education level and suicide. However, Bálint et al. (2016) in Hungary, O. Monak et al. (2021) in Colombia, and Phillips and Hempstead (2017) in the USA identified a negative relationship. Dündar & Sağır (2022) identified that the impact of economic factors on suicidal behaviors among university graduates in Turkey varies based on gender. No study has been found examining the impact of higher education

level on suicide for OECD countries. This study distinguishes from other studies in the literature in this respect.

As evidenced by the extensive literature attempting to elucidate the socioeconomic roots of suicide, an individual's propensity towards suicidal behavior is rooted in the intricate mental, social and cultural struggles they confront both within themselves and their larger community, often spurred by economic circumstances. In the next part we define the data and method used in research.

4. METHODOLOGY

Classical panel data models consist of Pooled Ordinary Least Square (OLS), fixed effects, and random effects models. In the pooled OLS model, unit and/or time effects are not included within the model. In the fixed effects model, while slope of coefficients remain constant, the cross-sectional units and/or time periods exhibit variations. In the fixed effects (FE) model, dummy variables are included in the model for observed and unobserved individual effects. Thus, differences between cross-sectional units can be observed (Asteriou & Hall, 2021, p. 357). In the random effects (RE) model, changes in cross-section units or cross-section units and time are included in the model as a component of the error term. Thus, the loss of degrees of freedom encountered in the fixed effects model is prevented (Baltagi, 2005, p. 17).

Pooled, fixed effects, and random effects models used in panel data analyses accept the existence of correlation between error terms and the presence of heteroscedasticity, but ignore cross-sectional dependence. In this case, the estimates obtained as a result of regression lose their efficiency and lead to unreliable results. The Driscoll-Kraay standard errors estimator produces estimators that are robust to models in which error terms have heteroscedasticity, autocorrelation and errors are correlated across groups (Hoechle, 2007, p. 310). We utilized the Fixed Effect estimator with Driscoll-Kraay standard errors, which can handle missing values and can be utilized to both balanced and unbalanced panels. This approach is not restricted by the number of panel observations and is not affected by heteroscedasticity, autocorrelation, and cross-sectional dependence (Hsiao, 2003, p. 331). The Driscoll Kraay standard errors is a variation of the Newey-West (1987) test, which involves averaging the explanatory variables and residual terms before applying them to the data. These data are then used to generate standard errors for the weighted HAC (Heteroskedasticity and Autocorrelation Consistent) estimator, which is not robust to cross-sectional dependency (Baltagi, 2005, p. 213). In this method, the autocorrelation problem is solved by taking into account the variance and

covariance of the model's error terms. On the other hand, the Driscoll Kraay estimator uses the Weighted Least Square method to deal with the problem of heteroscedasticity. This method gives a different weight to each observation by taking into account the change in the variance of each error term. Lastly, in the Driscoll Kraay method, the common effects in the model are estimated by adjusting the weights assigned to the common observations arising from each cross-section. (Wooldridge, 2010, p. 288-293).

5. DATA

This study empirically examine for 30 OECD country from 2007-2020 annual data. A dataset composed of OECD countries provides an opportunity to identify not only the economic but also demographic, sociological and political determinant of suicide. Moreover, since OECD countries have similar level of development in terms of education and economic standarts, they have been chosen as the sample for this study. The basic empirical model in Eq. (1) is used to investigate the socioeconomic cause of suicide.

$$Suicide_{it} = \alpha_i + \beta_k EC_{it} + \gamma_f S_{it} + \delta_m EN_{it} + v_i + \mu_t + \varepsilon_{it} \quad (1)$$

Where i indicates the country ($i=1, \dots, N$) and t indicates time period ($t=1, \dots, T$). Where the dependent variable is that $Suicide_{it}$ stands for the total suicide rate per 100,000 person for i country at the end of the period t . In Eq. (1) the vector of EC_{it} is economic variables, S_{it} sociological variables, EN_{it} environmental variable hypothesized to affect of suicide rate. v_i are country specific effects, μ_t are period specific effects and, ε_{it} is the error term.

Table 2 provides a summary of the definitions, sources and the expected sign of variables used in this study. In this study, GDP per capita is logarithmic and other variables are used at their level values. The following economic variables will be employed in the empirical analysis of this study: *Lgdppc* is the level of GDP Per capita, *Inf* is the inflation rate derived from the consumer price index, *unemp* is the unemployment rate, *benefit* is the ratio of income earned during the unemployment period to income earned during the working period, *wage* is the rate of salaried and waged workers, *female* is the female labor force participation rate, *tertiary* refers to the level of tertiary education enrolment rate. S_{it} constituted from marriage (*marriage*), divorce rate (*divorve*), fertility rate (*fertility*) and alcohol consumption rate (*alcohol*). These factors, as identified by Durkheim in his theories on anomic and egoistic suicide, can affect an individual's sense of loneliness, which in turn can influence their decision to commit suicide. Developments such as economic growth, education and employment may encourage individuals to migrate from their region to larger cities. The shrinking family population within the growing urban population may cause the individual to live an isolated life. Finally, the *density* data used in the study represents population density of

countries. For missing data points in the suicide and tertiary variables, linear interpolation³ was used. The data was collected from the World Bank and OECD statistics.

Table 2: Variable Definition and Data Sources

Variable	Definition	Source	Expected Sign
Suicide	Suicide rate (total) Per 100,000 person	OECD	
Lgdppc	Log of GDP per capita (constant 2015 US\$)	World Bank	-
Infl	Inflation, consumer prices (annual %)	World Bank	+
Unemp	Unemployment, total (% of total labor force)	World Bank	+
Benefit	Net replacement rate in unemployment	OECD	-
Female	Labor force participation rate, female (% of female population ages 15+)	World Bank	+/-
Wage	Wage and salaried workers, total (% of total employment)	World Bank	-
Tertiary	School enrollment, tertiary (% gross)	World Bank	+/-
Marriage	Crude marriage rate (marriages per 1000 people)	OECD	-
Divorce	Crude divorce rate (divorces per 1000 people)	OECD	+
Fertility	Fertility rate, total (births per woman)	World Bank	-
Alcohol	Alcohol consumption	OECD	+
Density	Population density (people per sq. km of land area)	World Bank	+

Note: The fact that the expected sign is + or - indicates that there are two different common findings in the literature.

6. EMPIRICAL FINDINGS

Figure 1 shows the mean suicide rates of countries between 1990 and 2020. Türkiye, Greece, Mexico, Colombia and Italy have the lowest rates, while Lithuania, Hungary, Latvia and Estonia have the highest rates over the last three decades. These countries have 50% higher suicide rates than the overall European average. According to the OECD report, the high suicide rates in these countries are due to rapid socioeconomic change, increasing psychological and social insecurity, and the lack of a national suicide prevention strategy (OECD, 2020).

³ The interpolation procedure for a series fills in missing or NA observations based on available values (Eviews12, 2020).

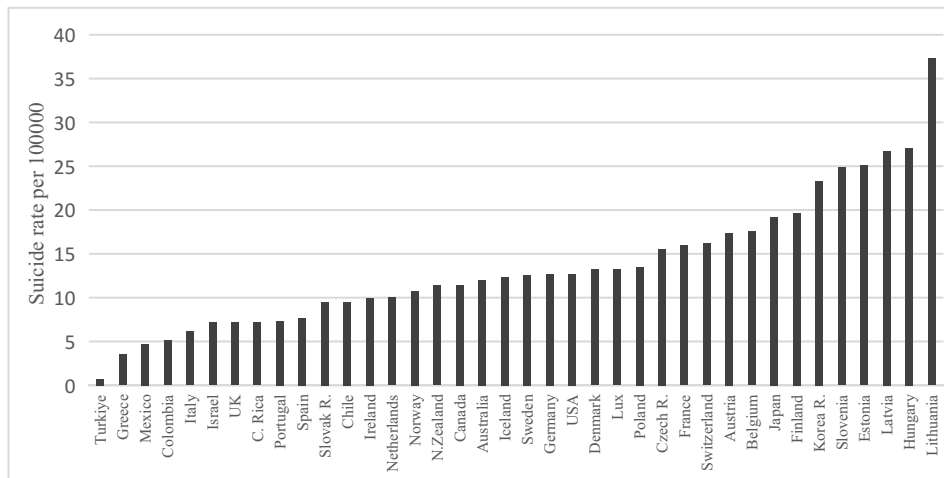


Figure 1: Mean suicide rates of countries between 1990 and 2020

Source: World Bank, 2023f.

Table 3 presents the descriptive statistics of the variables used in the study. The highest suicide rate during the study period was observed in Lithuania in 2013 with 35,4 per 100,000 individuals. In contrast, Greece had the lowest suicide rate, with 3,1 suicides per 100,000 individuals in 2007. The years with the most negative observations for the macroeconomic variables were those corresponding to periods of economic crisis. The countries with the highest marriage rates were Korea, the United States, The Republic of Korea, Lithuania, and Mexico, while the highest divorce rates were observed in the United States, Lithuania, and Latvia in generally.

Table 3: Descriptive Statistics

	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	J-B
Suicide	13,7526	35,4	3,1	6,3505	1,1868	4,6436	123,299***
Lngdppc	10,2931	11,2335	9,1832	0,5282	-0,3523	1,9077	24,9915***
Infl	1,8605	15,4023	-4,4781	1,879	1,9472	13,2084	1765,797***
Unemp	7,9437	27,47	2,01	4,5218	1,8358	7,024	438,9231***
Benefit	69,5859	88,0	44,0	10,2426	-0,324	2,3857	11,7943***
Wage	84,8527	93,91	63,01	6,0758	-1,444	5,4119	209,4221***
Female	53,5946	64,665	37,945	5,2231	-0,662	3,3719	27,9735***
Marriage	4,8849	7,6	3,0	1,0537	0,4531	2,6882	13,5857***
Divorce	2,1361	4	0,6	0,6222	0,0022	3,3926	2,2803
Fertility	1,6528	3,11	0,918	0,3548	1,9126	8,5731	675,8688***
Tertiary	75,2402	143,93	45,3672	17,3264	1,2563	4,9536	149,8302***
Alcohol	9,7458	14,8	2,6	2,1499	-0,9613	4,9315	109,8643***
Density	152,7308	530,377	2,7111	143,9556	1,2421	3,5027	95,0255***

Note: *** indicates 1% level of significance.

The problem of multicollinearity occurs when two or more variables in the model are highly correlated with each other. The correlation values between the variables used in the analysis are presented in Table 4. According to Kennedy, a correlation coefficient of 90% or higher indicates the presence of multicollinearity (Asteriou & Hall, 2021, p. 85). The study found that the variables of *wage* and *female* had the highest correlation coefficient, at 0.53. Based on the threshold mentioned above, it can be concluded that there is no multicollinearity in the model.

Table 4: Correlation Matrix

Prob.	Suicide	Lngdppc	Infl	Unemp	Benefit	Wage	Female	Mar	Div	Fert	Tert	Alch	Den
Suicide	1												
Lgdppc	-0,3532 [0,0000]	1											
Infl	0,2314 [0,0000]	-0,1996 [0,0002]	1										
Unem	-0,1804 [0,0006]	-0,3691 [0,0000]	-0,1523 [0,004]	1									
Benefit	-0,0509 [0,3391]	0,1785 [0,0007]	-0,0919 [0,0837]	-0,0997 [0,0607]	1								
Wage	0,1127 [0,0337]	0,2825 [0,0000]	0,0654 [0,219]	-0,3178 [0,0000]	0,2460 [0,0000]	1							
Female	-0,1159 [0,029]	0,5244 [0,0000]	-0,0424 [0,4262]	-0,3141 [0,0000]	0,1254 [0,0181]	0,5303 [0,0000]	1						
Mar.	0,3165 [0,0000]	-0,0408 [0,443]	0,1578 [0,0029]	-0,2593 [0,0000]	-0,3031 [0,0000]	0,1754 [0,0009]	0,2201 [0,0000]	1					
Div.	0,3920 [0,0000]	-0,1024 [0,0539]	0,2151 [0,0000]	-0,0776 [0,1446]	-0,0618 [0,2452]	0,4373 [0,0000]	0,2556 [0,0000]	0,4670 [0,0000]	1				
Fert.	-0,2959 [0,0000]	0,4283 [0,0000]	-0,0290 [0,586]	-0,2173 [0,0000]	0,1093 [0,0396]	0,3764 [0,0000]	0,5150 [0,0000]	0,2564 [0,0000]	-0,0271 [0,6103]	1			
Tert.	0,0955 [0,0722]	0,1726 [0,0011]	0,0382 [0,4735]	0,1188 [0,0252]	-0,1399 [0,0083]	-0,3503 [0,0000]	0,1820 [0,0006]	0,1614 [0,0023]	0,0363 [0,4957]	-0,0195 [0,7139]	1		
Alch.	0,3869 [0,0000]	-0,3707 [0,0000]	0,2384 [0,0000]	0,0687 [0,1965]	-0,0767 [0,1493]	0,089 [0,0941]	-0,1358 [0,0104]	-0,0890 [0,0942]	0,2534 [0,0000]	-0,4438 [0,0000]	-0,1053 [0,0474]	1	
Dens.	0,0796 [0,1344]	0,1291 [0,0149]	-0,0957 [0,0716]	-0,2859 [0,0000]	0,1751 [0,0009]	-0,2336 [0,0000]	-0,1645 [0,0019]	-0,0635 [0,2324]	-0,1707 [0,0012]	0,0116 [0,8278]	-0,1647 [0,0018]	-0,3257 [0,0000]	1

Note: Values in parentheses indicate the probability value of the correlation coefficients.

Variance inflation factor (VIF) is another test that provides information about multicollinearity. If the value of VIF is higher than 10, it is concluded that there is a multicollinearity problem (David, Lawrence & Keith, 1988). In Table 5, (VIF) values of the variables used in the model are shown to be less than 5, indicating that there is no issue of multicollinearity among the variables.

Table 5: Multicollinearity Test

Variable	wage	lngdppc	female	ter	unemp	mar	div	fer	dens	alch	benefit	infl	Mean VIF
VIF	3,42	2,2	2,12	2,06	1,91	1,8	1,78	1,67	1,63	1,43	1,32	1,21	1,88
1/VIF	0,2922	0,4552	0,4727	0,4858	0,5226	0,5541	0,5618	0,5971	0,6124	0,6988	0,7576	0,8263	

Figure 2 displays the scatter plot depicting the relationship between the dependent and explanatory variables. The pattern of the scatter plot provides insights regarding the pattern of the relationship between the dependent and independent variables. The scatter plot pattern of lngdppc, inflation, benefit, female, divorce, fertility, alcohol, and density is in line with our expectations. The scatter plot implies that a strong relationship between inflation, divorce, birth rate, alcohol consumption and suicide rates. However, the scatter plot pattern of

unemp, wage, and marriage differs from our anticipated pattern. Table 6 presents the Fixed Effect estimator with Driscoll Kraay standard error results to obtain a more comprehensive estimation of the model.

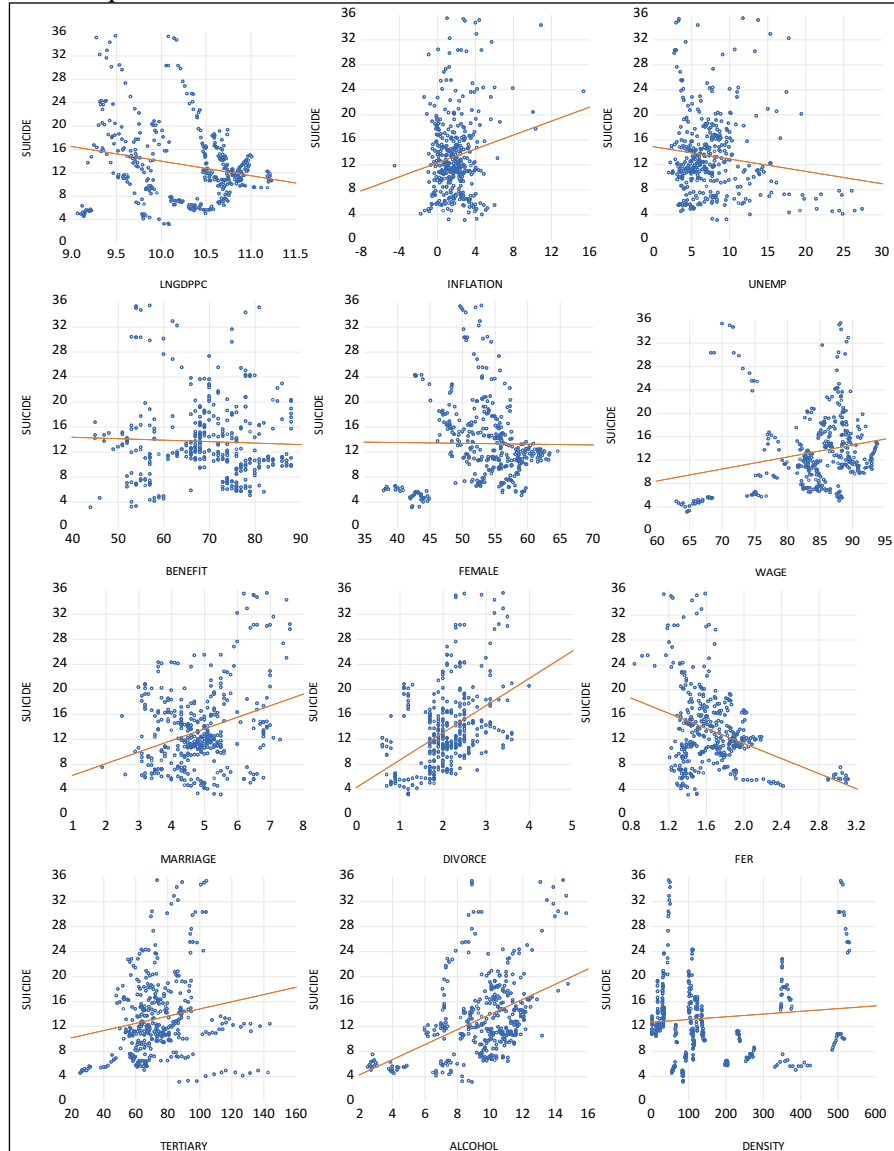


Figure 2: Scatter Graph between Dependent and Independent Variable

Table 6 presents the results of Pooled OLS, Fixed Effect (FE), Random Effect (RE) and Driscoll-Kraay standard errors. According to the F-test result asserting the absence of unit effects and the validity of the classic model, the null hypothesis is rejected. The F test of the FE model shows that cross-country effects are significant, indicating that the FE model is stronger than the pooled OLS model. On the other hand, the Breush Pagan LM test, which tests the existence of individual heterogeneity based on the random effects model, rejects the null hypothesis that the variance of random unit effects is zero. Hence, it can be concluded that the random effects model is preferred over the classic model. To determine the appropriate model between FE and RE, the Hausman test was used. The null hypothesis, which posits no correlation between explanatory variables and unit effects, is rejected based on the Hausman test. In other words, as there is a correlation between explanatory variables and unit effects, the fixed effects model is deemed superior to the random effects model.

To obtain efficient estimates in the fixed effect model, the model must be devoid of heteroscedasticity, autocorrelation and cross sectional dependence. In the study, the Wald test developed by Green was employed to detect the presence of the heteroscedasticity among groups. According to this result, the null hypothesis claiming absence of heteroscedasticity in the model was rejected, leading to this conclusion that there is heteroscedasticity in the model. In the fixed effect model estimated with the within-group estimation method, an autocorrelation problem may be encountered among the error terms due to the difference in unit averages over time (Tatoğlu, 2012, p. 238).

The Durbin-Watson test statistic, whose null hypothesis states that there is no relationship between the error terms, was used to test for autocorrelation in the model. As can be seen in the Table 6, test result less than 2, indicates the presence of autocorrelation problem in the model. Another assumption of classic panel data model is that there is no relationship between cross sectional units. Since the cross-sectional (CD) dimension is higher than the time dimension, the cross-section dependence test developed by Pesaran was used in this study. According to the C-D test results in Table 6 there is cross-sectional dependence in the model. These three test results show that there are autocorrelation, heteroscedasticity, and cross-section dependence in the model. Fixed Effect estimator with Driscoll-Kraay standard errors is used to generate consistent and robust coefficient estimates towards these problems (Driscoll & Kraay, 1998, p. 558).

Table 6: Results of OLS, FE, RE and Driscoll Kraay Standard Errors				
Variables	OLS	FE	RE	FE (Driscoll Kraay SE's)
Lngdppc	-4,6834*** (0,6326)	-9,1434*** (1,823)	-6,0615*** (1,4548)	-9,1434*** (2,3471)
Wage	0,4937*** (0,0683)	-0,2080** (0,0734)	-0,0886 (0,071)	-0,208*** (0,0526)
Inflation	0,0109 (0,1354)	0,16104*** (0,046)	0,1831*** (0,0474)	0,161** (0,0578)
Unemp	-0,2535*** (0,0668)	0,0193 (0,05)	0,07 (0,0457)	0,0193 (0,0701)
Benefit	0,0101 (0,0257)	-0,0797*** (0,0175)	-0,0838*** (0,0185)	-0,0797*** (0,013)
Female	-0,1932*** (0,0674)	-0,4046*** (0,0803)	-0,3078*** (0,077)	-0,4046*** (0,1011)
Tertiary	0,156*** (0,0182)	0,01836* (0,0095)	0,0255* (0,0099)	0,0183** (0,0069)
Marriage	1,3264*** (0,304)	-0,1998 (0,22)	-0,1764 (0,2177)	-0,1998 (0,1459)
Divorce	0,3904 (0,5278)	-0,2673 (0,3529)	0,31722 (0,3614)	-0,2673 (0,2249)
Fertility	-3,5939*** (0,9291)	-1,8281* (0,974)	-1,9109* (0,9807)	-1,8281* (1,0046)
Alcohol	0,7896*** (0,1407)	0,5331*** (0,1473)	0,5711*** (0,1482)	0,5331*** (0,1524)
Density	0,0150*** (0,002)	0,0381** (0,0132)	0,0135** (0,006)	0,0381*** (0,0089)
Dum2009	1,7134** (0,8434)	0,7487** (0,2635)	0,9737*** (0,2734)	0,7487*** (0,2348)
Cons	8,468 (7,5756)	144,4042*** (18,1157)	98,8334*** (14,809)	144,4042*** (34,962)
Observation	355	355	355	355
LM			387,23***	
F test		139,65***		
R2	0,5612	0,6057	0,5866	0,6057
Hausman Chi(2)			108,48***	
Wald test		870,86***		
D-W		0,8345		
C-D		10105,402***		

The brackets represent the standard errors, *** 1%, ** 5%, * 10% indicates significance level.

In Table 6, socioeconomic and demographic causes of suicide in 30 OECD countries between 2007 and 2020 are modeled with Fixed Effect estimator with Driscoll-Kraay standard errors. The impact of per capita income (lngdppc) on suicide rate is negative and significant at the 1% level, which is as expected.

An increase of 1% in *lngdppc* is found to decrease the suicide rate by 0.09 per 100,000 population. High level of wage and salaried workers gives an insight into the level of economic development of a society. On the other hand, the ratio of wage and salaried workers also provides information on the extent to which employment is registered. This study found that increase of 1% rate of *wage* reduced suicide by 0,28 per 100,000 people. High inflation weakens the purchasing power of households and leading to reel income loss and decreased individual's consumption expenditure. In Table 6, *inflation* is found to be positive and significant at %1 level. An increase of 1% in *inflation* is associated with a 0,61 per 100,000 person increase in suicide rate.

The relationship between unemployment and suicide rate has been frequently discussed in the literature. However, there are various findings regarding the direction and significance of this relationship. In this study, no significant impact of *unemployment* on suicide rate has been observed. On the other hand, the effect of social benefit payment to the *unemployed* on suicide, as expected, is found to be negative and significant. Increase of 1% in *benefit* decreases suicide by 0,7 per 100,000 people. Another variable that we found to be significantly related to suicide rate is female labor force participation rate. Our results indicate that higher female labor force participation is associated with lower suicide rates. An increase of 1% in *female* decrease suicide 0,4 per 100,000 people. Another variable that assumed to effect suicide is tertiary education enrollment rate which is an essential indicator of human capital. This study found that the increase in tertiary education rates has a positive, but weak effect on suicide rate as expected. Increase of %1 in *tertiary* increases suicide rates by 0,4 per 100,000 people.

According to Durkheim's sociological theory of suicide, marital status and child ownership can be used to detect the effect of loneliness on self-harm. In this study no significant relationship was found between *marital status* and suicide. In addition to the marital status, it is frequently studied in the literature that having children affect the individual's sense of loneliness and responsibility and that this may affect on suicidal behavior. Our study found a negative and significant impact of fertility rates on suicide rates, it is found that an increase of %1 in *fertility rate*, decreases suicide rate by 1,81 per 100,000 people.

Heavy alcohol use may cause individuals to withdraw from their social environment, disruptions in their professional and personal lives, depression and suicide. In this study, it was found that a one unit increase in the rate of *alcohol consumption* per capita increased suicide by 0,53 per 100,000 people. Intense urbanization, high population density, and living in a small and narrow houses may isolate individuals and trigger depression and that may be trigger suicidal

ideation. This study found an increase of %1 in *density* rate leads to increase in suicide 0,038 per 100,000 people.

7. DISCUSSION

Economic development and increase in the level of well-being, facilitate the public's access to education, health, goods, and services. It is believed that this increase in well-being in the quality of life, distances individuals from suicidal thoughts. Contrary to economic expansion periods, during the economic recession, individuals may commit suicide if they experience a decline in their income level. This result is parallel with the Henry and Sort (1954)'s economic downturn and suicide argument. On the other hand, our result is similar to findings by Branas et al. (2015); Corcoran, Griffin, Arensman, Fitzgerald and Perry, (2015); De Bruin et al. (2020); L. Bernal, Gasparrini, Artundo, and Mckee, (2013); Kavaklı (2023); Okada and Samreth (2013).

Another macroeconomic indicator that provides considerable information on the economic performance of countries is the level of registered employment. In informal employment, workers are employed in low-paid, temporary jobs without social and health insurance. As capital accumulation deepens, the ability of precarious and informal workers, who occupy the lowest rung of the income distribution, to cope with economic hardships is progressively weakening. With the addition of poor and unhygienic working conditions to this situation, the health status of workers without social security is endangered. In addition to these unfavorable working conditions, working hours in informal employment may exceed national or international standards⁴. Similar working conditions also prevail for self-employed workers. All of these reasons exploit the livelihood of those who are self-employed or informally employed. In this study, it has been observed that increase in the rate of wage and salaried workers decreases suicide rates, as expected. The effect of wage and salaried workers on suicide rate has not been examined in previous studies. This study differs from the literature in this respect.

The inflation rate provides a significant information about the macroeconomic outlook of the country. In countries experiencing high inflations, the purchasing power and real income of household tend to weaken, leading to increased uncertainties regarding the future. In this inflationary environment, the repayment of debts incurred through goods and foreign exchange rates become more challenging, potentially pushing individuals into a deadlock. In this study,

⁴ According to the International Labour Organization Convention No. 48, weekly working hours should not exceed 48 hours (ILO, 2022).

it was revealed that suicide rates increase during the inflationary periods, as Akyuz and Karul, (2022); Kızılkaya and Kuzucu (2022); Lari and Sefiddashti (2023)'s findings.

There is a substantial body of literature suggesting that a positive relationship between suicide and unemployment. Unemployment is a multifaceted social issue that can lead individuals to lose their income and social status and social environment. The various problems caused solely by unemployment can push individuals towards depression, loneliness and helplessness, potentially undermining their position within the family. While there are studies in the literature supporting the idea that unemployment triggers suicide, there are also studies claiming that unemployment has no effect on suicide. This study has determined that there is no relationship between unemployment and suicide rate. This finding aligns with the results of Kunce and Anderson (2002); Minoiu and Andres (2008); VANDOROS, Avendano and Kawachi, (2019) in the literature.

In this paper, another reason for the absence of a significant relationship between unemployment and suicide may be the preventive effect of unemployment benefit provided by governments to the unemployed. The allowances of financial support in order to prevent income losses of individuals during the periods of unemployment may have a relieving effect on the economic situation of individuals or families. This may protect the unemployed individual from self-harm. As a matter of fact, the findings that unemployment benefit prevents suicidal behavior strengthens our predictions. This finding is consistent with the results of Antonakakis and Collins (2015); Burgard et al. (2009); Cylus et al. (2014).

Our results indicate that higher FLFP is associated with lower suicide rates, which is in line with the accumulation theory. This theory suggests that women's participation in the labor force will expand women's social networks and help them overcome individual isolation. In addition, it points out that women's participation in the labor force will increase household income and make it possible to provide for consumption needs more feasibly, which in turn will reduce suicide rates. Our results are supported by previous studies, including Burr, McCall, and P. Griner, (1997); Chen et al. (2017); Inagaki (2010).

Increasing in enrollment rate of tertiary education may require moving to another city or country and living alone. Similarly, participation in the labor market following the completion of higher education may again necessitate mobility and living alone. In addition, participation in education and labor market may postpone the age of marriage and cause them to live alone. On the other hand, the increase in the level of education may increase the individual's sensitivity and

awareness of social problems and trigger unhappiness in the individual. This may lead to isolation of individual and committing egoistic suicide as suggested by Durkheim. This study concludes that the increase in tertiary education enrollment rate increases in suicide rate. The result obtained in this study is in line with the studies of Lusyne and Page (2008); Pompili (2013) which assert that suicide rates tend to rise with higher levels of education.

In existing literature, studies suggest that establishing a family creates a supportive and trusting environment for couples, leading to happiness and consequently reducing suicidal tendency. On the contrary, research indicates that individuals who are divorced establish a solitary life by leaving their partner and homes and social lives, and this situation triggers suicide (Choi et al., 2022; Denney, Wadsworth, Rogers & Pampel, 2015; Næss et al., 2021). In this study, no significant relationship was encountered between marriage/divorce and suicide. The reason for that might be that marriages do not necessarily guarantee solidarity, togetherness, and happiness. Conversely, ending unhappy marriages may liberate individuals, potentially distancing them from suicidal thoughts.

Marital status may carry less significance in developed and developing countries that constitute the sample this study compared to countries with traditional societal structures. The result obtained from this study is consistent with conducted by Cook (2019); Yang et al. (2023). In contrast to divorce, having a child increases the responsibilities of the parents to each other and to the child, which may lead to a decrease in suicide rates in families with children. There is a widespread literature suggesting that suicide rate decrease in family with child. Our study found a negative and significant impact of fertility rates on suicide rates, which is consistent with studies by Andres and Halicioglu (2011); Breuer (2015); Neumayer (2003); Okada and Samreth, (2013).

Intense alcohol consumption may trigger feelings of loneliness and depression in individuals. Additionally, heavy alcohol use may lead to attention deficit and deterioration of quality of life in private and formal life. These problems may trigger suicidal thoughts in individuals with heavy alcohol use. This study has revealed a positive relationship between alcohol consumption and suicide cases. This result is in accordance with the studies of Bussu et al. (2013); Lau et al. (2017); Razvodovsky (2011) in the literature.

Economic development brings about urban and environmental problems. High level of urbanization make it necessary for individuals to live and work in cramped and crowded dwellings, leading to increased commuting times between home and workplace. Additionally, migration, which is sometimes necessary for work and education, may result in individuals experiencing loneliness and isolation in city life. For this reasons, urbanization may push individuals to

suicide. This study has determined that increase in urban population density is associated with an increase in suicide in parallel with Social Disintegration Theory proposed by Kurbin and Weitzer (2003).

8. CONCLUDING REMARKS

While there has been a decrease in suicide rates worldwide over the past 20 years, European countries continue to be the highest suicide rates. This study examines the economic, sociological and environmental causes of suicide rates in 30 OECD countries, mostly consisting of European developed and developing countries. In the study, annual data from 2007 to 2020 was analyzed using the Fixed Effect estimator with Driscoll-Kraay standard errors. This study differs from the existing literature in taking into account the effect of wage and salaried employees, which is an important indicator of formal employment, on the suicide rate. This study, compared to the existing literature, stands out by comprehensively addressing multiple indicators explaining the socioeconomic causes of suicide in a single study.

In this study, improvements in economic indicators such as the per capita income, FLFP, inflation, wage and salaried workers and unemployment benefit are observed to enhance societal well-being and suppress suicide rates. From this point of view, we can infer that the deterioration in economic indicators may negatively impact societal welfare, potentially leading individuals towards suicide. Therefore, worsening economic indicators should not be viewed solely as a loss of economic well-being for households, governments and firms, but also as potential creators of social problems.

This study identifies economic development level as the most significant determinant of suicide, with an increase in income level being the dominant factor in preventing suicide. We can infer that economic welfare has positive effects on psychological health by increasing the quality of life of individuals. The presence of a high proportion of wage and salaried workers in a society is directly related to the development of its institutional structure and the breadth of its social security networks. A high rate of wage and salaried workers, provides individuals to benefit from social security opportunities, health insurance and unemployment benefit in case of unemployment. This situation may prevent individuals from harming themselves in times of economic recession. The opportunities and social support provided by the level of economic development play a leading role in ensuring societal well-being. However, self or informal employed individuals face greater challenges in overcoming economic difficulties and associated traumas due to the significant responsibility resting on their shoulders.

Besides the level of economic development, recovery in inflation rate reduce uncertainty, preserving the real purchasing power of households and firms and maintaining the value of the local currency. In a low inflation environment, the wage level earned by the workforce also maintains its real value. This will minimize uncertainty in individuals' consumption, investment, savings or borrowing decisions. This economic confidence contributes to the establishment of individual and societal peace. Based on these developments, the finding that suicide rates decrease in a low inflation environment emphasizes the importance of economic improvements in protecting social welfare and individual mental health.

Women's participation in the labor force, on the one hand, increases their productivity, socialization and personal development by breaking away from the stagnant living conditions imposed by the home environment, and on the other hand, it helps to ensure gender equality. Thus, while household income increases, it contributes to the increase of national income and public revenues through taxes by mobilizing inactive labor force. These positive psychological and economic consequences may prevent individuals from harming themselves and contribute to increased peace within the family. In this regard, it will be particularly impactful for governments in developing economies to undertake various responsibilities in terms of education and vocational training to increase women's participation in the workforce. This can play a significant role in mitigating societal issues.

On the other hand, no significant impact of unemployment rates on suicide has been identified. However, it has been determined that unemployment benefit are effective in preventing suicide. The lack of a significant relationship between unemployment and suicide could be attributed to the partial compensation of income loss by unemployment benefit. In this context, unemployment benefits should not be set at a level that would encourage individuals to refrain from seeking employment. Simultaneously, these benefits should be sufficiently high to prevent individuals from being pushed into social problems due to the lack of income.

Findings from Durkheim and numerous studies in the literature show that marriage prevents suicide, while divorce triggers it. However, this paper did not yield evidence supporting the association between marriage/divorce and suicide. This fact implies that the perception of that marriage prevents loneliness and divorce inevitably causing unhappiness may be invalid. Single individuals can engage in education, work, various sports and artistic activities, thereby socializing and distancing themselves from self-harm thoughts. Besides, becoming a parent and taking on the responsibility of a child may deter

individuals from contemplating suicide. In other words, being a parent may serve as a preventive factor against suicidal ideation (Yang, 2023).

Another factor influencing the individual's solitude, alongside the cohesion of family unity, is alcohol addiction. Alcohol addiction may reach a dimension that a level of that disrupts social and professional life of individual. This situation may lead to suicide by diminishing the quality and joy of life of the individual. This study, it has been identified that an increase in alcohol consumption, consistent with expectation, triggers suicide. Governments have a responsibility to ensure the availability of clinics that can be easily accessible to individuals with alcohol consumption.

Urbanization can increase social isolation by increasing population density, leaving individuals feeling alone in crowds. Living in densely populated cities can also increase psychological stress and anxiety. However, urban areas offer more job opportunities, social services, education, and healthcare options. Therefore, the impact of urbanization on suicide rates can vary depending on various factors. In this study, it was found that urban population density increases the likelihood of suicidal behavior. Urbanization in modern society, emerges as a multifaceted phenomenon, presenting both significant challenges and substantial opportunities. Governments have various responsibilities to create more livable cities, such as preserving green and natural spaces, ensuring that residence are spacious and comfortable, facilitating easy and accessible transportation, and ensuring easy access to social, sports and artistic activity centers in neighborhoods.

Due to the narrow time span of some variables in the panel data set of this study, which includes various socioeconomic observations, the time dimension of our study had to be restricted. As data compilation techniques develop, it will be possible for future researchers to conduct long-term, spatial and regional analyses. Moreover in this study, determinants of suicide by age and gender were sought, but explanatory variables could not be obtained for age and gender within the relevant time period for OECD countries. On the other hand, indicators such as consumer confidence index, household debt ratio, poverty rate, and so on have mostly been studied for a single country in the literature. Since these observations are incomplete for OECD or European Countries, they could not be used in this study. If these relevant observations can be obtained in the future, further comprehensive investigations can be carried out by future researchers. In case reliable data are available, it is recommended to examine the socioeconomic dimension of suicide cases in underdeveloped and developing country groups.

Suicidal behavior implies that the individual has lost any hope regarding life and sees death as a better option than staying alive. This study aims to investigate the socioeconomic reasons that lead individuals to attempt suicide due to this sense of hopelessness. Eliminating or alleviating these issues that have been identified as leading to suicide is among the responsibilities of public authorities.

9. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

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No funding or support was used in this study.

11. AUTHOR CONTRIBUTIONS

The entire study was conducted by a single author.

12. ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS

There has been no situation requiring permission within the framework of ethics committee approval, intellectual property and copyrights.

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AUTONOMOUS WEAPON SYSTEMS: A LEGAL CHALLENGE FOR INTERNATIONAL HUMANITARIAN LAW¹



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ABSTRACT | The increasing deployment of artificial intelligence (AI) technologies has highlighted the need for the adaptation of legal frameworks and the rectification of regulatory deficiencies. The implementation of these technologies in the military domain and the diminishment of human oversight over weaponry given rise to a multitude of debates, particularly in the realms of law and ethics. There has been considerable worldwide resistance to the dehumanization of individuals into objects, stereotypes, and data points by lethal robots aimed at humans. This study will examine the novel security dangers presented by artificial intelligence driven military technology and autonomous weapon systems (AWS) within the framework of Ulrich Beck's Risk Society theory and International Humanitarian Law. In conclusion, the increasing deployment of AI technologies in civilian and military contexts presents both opportunities and risks that demand attention, particularly given the ethical concerns and debates surrounding autonomous weapons systems (AWS) due to the current deficiencies in international legal regulations.

Keywords: Artificial intelligence (AI), autonomous weapon systems (AWS), International Humanitarian Law, Killer Robots, Risk Society

JEL Codes: F50, F55, F59

Scope: International relations

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OTONOM SİLAH SİSTEMLERİ: ULUSLARARASI İNSANCIL HUKUK İÇİN HUKUKİ BİR ZORLUK



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ÖZ | Yapay zeka (AI) teknolojilerinin giderek yaygınlaşması, yasal çerçevelerin uyarlanması ve düzenleme eksikliklerinin giderilmesi ihtiyacını ortaya çıkardı. Bu teknolojilerin askeri alanda uygulanması ve silahlar üzerindeki insan denetiminin azalması, özellikle hukuk ve etik alanlarında çok sayıda tartışmaya yol açtı. İnsanların ölümcül robotlar tarafından nesnelere, stereotiplere ve veri noktalarına indirgenmesine karşı dünya çapında önemli bir direnç oluştu. Bu çalışma, yapay zeka destekli askeri teknoloji ve otonom silah sistemlerinin (AWS) yarattığı yeni güvenlik tehditlerini Ulrich Beck'in Risk Toplumu teorisi ve Uluslararası İnsani Hukuk çerçevesinde inceleyecektir. Sonuç olarak, AI teknolojilerinin sivil ve askeri bağlamlarda giderek daha fazla kullanılması, özellikle uluslararası yasal düzenlemelerdeki mevcut eksiklikler nedeniyle otonom silah sistemleri (AWS) etrafındaki etik kaygılar ve tartışmalar göz önüne alındığında, dikkat gerektiren hem fırsatlar hem de riskler sunmaktadır.

Anahtar Kelimeler: Yapay Zeka (AI), otonom silah sistemleri (AWS), Uluslararası İnsani Hukuk, Katil Robotlar, Risk Toplumu

JEL Kodları: F50, F55, F59

Alan: Uluslararası ilişkiler

Türü: Araştırma

1. INTRODUCTION

Artificial intelligence (AI) technologies are increasingly adopted in a variety of fields, both horizontally (across different sectors) and vertically (with greater intensity of use). Studies on the application of artificial intelligence technologies in military defense and security fields have brought to the agenda both the transformation that this technology can create in the nature of war and the ethical problems that can arise from the use of this technology ((Scharre, P. (2018), (Bartneck et al., 2020), (Raska & Bitzinger, 2023)). In different studies conducted in the context of international law, the responsibility of states has been addressed ((Schraagen, 2023) (Boutin, 2022) (Sati, 2023)). The emergence of Autonomous Weapons Systems (AWS) in military technology is becoming more obvious, given its potential use in armed conflicts, which generate fierce competition among nations. This situation has also sparked various discussions in the fields of international humanitarian law, international human rights law, and accountability. As a result, it is critical to address the legal issues involved with the use of such devices in armed circumstances. However, studies carried out within the framework of international humanitarian law and the issue of accountability have not been emphasized sufficiently. Furthermore, investments in this area are increasing in both civilian and military sectors. The opportunities provided by this technological advancement have brought along various discussions about the risks it has created as well. The use of this technology, particularly in the military field, and the emergence of lethal autonomous weapons have raised serious concerns, especially regarding law and ethics. The absence of international regulations and legal frameworks regarding the use of artificial intelligence technologies in the military field, and the decrease or complete elimination of human control over weapon systems, make it debatable who will be responsible, especially when such technologies are used. The transfer of decisions about a person's life to a machine has also raised concerns about human rights. In this context, a social movement comprising numerous civic organisations has emerged, advocating for the cessation of lethal autonomous weapons systems under the slogan "Stop Killer Robots!". This movement aims to reduce the autonomy of lethal autonomous weapon systems (LAWS) developed with the support of AI and to address the lack of regulation in this area under international law, focusing on the ethical concerns raised by AI technologies. These technologies not only raise ethical concerns but also social risks. In this context, the new types of uncontrollable and unpredictable risks created by modern technologies and scientific developments will be evaluated within the framework of Ulrich Beck's concept of the Risk Society.

This study examines the extent to which current legal restrictions can

address the ethical challenges and issues presented by autonomous weapon systems. What factors require enhancement and should not be overlooked in formulating international legislation concerning the utilization of these military systems?

Beck's theory is useful in understanding the technological risks created by autonomous weapons systems. Because, thanks to this approach, it can be clearly demonstrated that lethal autonomous weapons systems, which are a risk created by technological development, are a risk factor on a global scale. In addition, this approach, which states that individuals should take more responsibility in decision-making processes in risk societies, contributes to the highlighting of the human factor. Thus, the emphasis on both the risks created by this technology and the need to take responsibility for limiting these risks supports the basic approach of this study.

In the first section of the study, a conceptual framework regarding AWS and the degrees of autonomy among these systems will be presented without delving too deeply into technical details. The second section will focus on the rise of AI technology and the various issues that have arisen alongside this rise, particularly ethical concerns. In the third section of the study, the issues arising from the lack of regulation regarding AWS will be evaluated in the context of international humanitarian law.

2. CONCEPTUAL FRAMEWORK

The Risk Society, proposed by German sociologist Ulrich Beck, suggests that modern societies face risks that are more complex and global in nature, unlike traditional risks. In traditional societies, risks were primarily focused on natural disasters or individual issues, whereas in modern societies, risks are related to global threats created by technological advancements and industrialization (such as nuclear disasters, environmental pollution, climate change, biotechnology, and genetic engineering). The risks faced by modern societies are of a nature that transcends borders and affects not just a specific region or group, but all of humanity. To illustrate, incidents such as nuclear leaks or global warming can have adverse effects on communities in disparate geographical locations. In this context, a social dynamic is also being activated that transcends borders and cannot be framed by class categories, alongside the globalization of risks (Beck, 1992, pp.39-40). Moreover, the risks brought about by modernization hit back at those who produce it or benefit from it, much like a boomerang (Beck, 1992, p.23).

The risk society is a period in which individuals need to take on more responsibility in their decision-making processes. This is a situation that arises

with the diminishing function of the social structure to safeguard the individual. Moreover, most modern risks are unpredictable and uncertain. According to Beck, once the state begins to lose its capacity to prevent or manage risks, modern institutions such as science and technology, society starts to evolve from an industrial society to a risk society. The issue of regulatory inadequacy in industrial society is a significant factor in the emergence of these concerns (Beck, 1992, pp.48-49).

Beck emphasizes the dual role of science and technology in both providing solutions to problems and creating new risks. It emphasizes that science and technology are indispensable for the advancement of modern society, while also noting that they bring along unforeseen new risks. (Beck, 1992, p.59). In this context, it can be observed that one of the latest advancements in technology today, AI-based technologies, also brings unpredictable risks. The movement to Stop Killer Robots has emerged as a global social movement to draw attention to the increasing risks in a situation where unpredictability and incalculability rise with the removal of the human factor from the equation of AWS (Monroy, 2023).

One of the key areas of technological advancement in the 21st century is AI-supported technologies. AI technologies, which are increasingly widespread and intensifying in their applications today, bring along potential risks in addition to the benefits they provide. In this context, it can be posited that AI technologies have the potential to be both an opportunity for the advancement of humanity and a serious threat. Consequently, it seems that the technological developments in question have led to the emergence of new discussions. While there are numerous discussion topics due to the extensive range of applications of AI technologies and their dual-use nature (being used for both civilian and military purposes), this study will focus more on the use of AI technologies specifically in the military field and the ethical debates it generates.

The use of AI-supported technologies in the military field is becoming increasingly widespread. It is observed that major powers, especially those looking to increase their activities on a global scale, are investing more in AI technologies and developing strategies to advance these technologies (Madiaga & Ilnicki, 2024). AI investments are increasing rapidly within the spending of the US Department of Defense, and the contract amount, which was \$190 million in 2022, approximately tripled (\$557 million) by August 2023 (Henshall, 2024). The Russian Defense Ministry, which has established a special department for the development of artificial intelligence and allocated a special budget for it, has not yet given a figure for the amount of spending. However, there is a strong possibility that the level of 650 billion rupees (about \$7.3 billion) that the artificial

intelligence market in Russia will reach in 2023 and the share of AI-based military technologies in the market will increase in the future (Starchak, 2024).

Despite the increasing demand from states for AI-supported systems, it has been observed that they remain indifferent to regulations regarding the conceptualization of these AI-supported systems. This situation give rise to discussions regarding the purpose and nature of the normative framework to be established. For this reason, it becomes essential to distinguish the concept/system of autonomy from the concepts that are directly or indirectly related to it. In this regard, a conceptual framework will initially be identified, a conceptual description will be made, and ultimately, an analysis of the political and normative structure will be made possible. In this context, the first concept to be addressed is "automatic." According to the definition in the Oxford English Dictionary, "automatic" refers to a mechanism that is operated by mechanical means or a self-regulating mechanism, an action performed without consciousness, in other words, without will (Oxford English Dictionary, n.d.). The second concept is the term "automated." The concept of automation refers to a structure designed to consistently and logically follow a predefined and categorized set of rules in response to inputs from one or multiple sensors, with the aim of achieving a specific outcome. (Williams & Scharre, 2015b, p. 32). The third one is "autonomous/autonomy." Both concepts, which are interrelated with each other, express the freedom to make decisions and demonstrate the ability to execute without any external intervention. (Scharre, 2018, pp. 27-28). The physical manifestation of the concepts of autonomy/autonomous is autonomous systems. Generally, autonomous systems based on AI can act independently by focusing on stimuli from sensors in order to achieve predetermined goals and carry out the necessary actions and behaviors in that direction. (Cardon & Itmi, 2016: 5).

Despite the aforementioned conceptual differences, a definitive definition of autonomous systems remains elusive. The definitions in the literature have been shaped around four main aspects: these include definitions expressed around the nature of the human-machine command and control relationship; definitions based on capability parameters; definitions structured within a legal framework that emphasize the nature of the tasks performed by the system; and definitions that address complex parameters (Özer, 2022, pp. 89-93). On the other hand, the shortcomings in the definition of autonomous systems are similarly reflected in their classification. There are different classifications by both international organizations and states on this matter. Indeed, the table below confirms the situation in question.

Table 1: Classification of Autonomous Systems (Özer, 2022: 95)

	Category I	Category II	Category III
United States Department of Defense	Semi-Autonomous Systems	Human-Controlled Systems	Autonomous Systems
Human Rights Watch	Human-In-Loop Systems	Human-On-Loop Systems	Human-Outside-Loop Systems
International Red Cross	Remote Controlled Systems	Automated Systems	Autonomous Systems

Although systems have varying degrees of autonomy, fundamental characteristic elements can facilitate the differentiation of systems. Accordingly, the semi-AWS in the first category are those that can select targets by a human operator and apply force only at the command of a human. In such systems, human operators have absolute control at any stage, including the selection of targets, the prioritization of selected targets, determining when to engage with the target, and the ability to deactivate the system. (Washington Headquarters Services, 2012). Automated systems that operate without the influence of a human operator after being deployed are systems capable of detecting, selecting, and striking targets under the supervision of a human operator who can override their actions. Additionally, the force to be applied in automated systems takes shape through the loading of specific software into the algorithmic system before deployment. Autonomous systems can adapt to changing conditions without human control. Humans are absolutely outside of the cycle. Once activated, such systems can operate autonomously in achieving targets, meaning they can determine, identify, select, and engage with objectives without human oversight and control. (Wagner, 2016).

3. THE RISE OF AWS EQUIPPED WITH AI AND THE EMERGENCE OF A POTENTIAL THREAT

3.1. The Application of AI in the Civil Sector

It is observed that technologies supported by AI are increasingly being applied in a variety of fields. Smart city applications are increasingly being used in the civil sector for various purposes, including the development of customized learning programs in education, enhancing efficiency, creating innovative

solutions for businesses, and improving decision-making processes. The rise of AI-supported technologies, utilized in various sectors such as finance, education, medicine, commerce, transportation, and agriculture, has increased the interest of investors who see significant investment opportunities and profit potential in this field. By the year 2025, investments in AI, machine learning, and robotics technologies are expected to reach 232 billion dollars. (Mascellino, n.d.). The expected global investment amount in AI in 2025 is approximately 158 billion dollars. (Statista, 2023). In short, technological advancements in areas such as AI technologies, software, and robotics are expected to accelerate, creating profit opportunities for investors.

There is no significant societal reaction regarding the development of AI technologies and autonomous systems used in civil areas. However, there are concerns regarding digital dehumanization. One of the messages emphasized in the campaign to stop killer robots is that it is unacceptable to regard humans merely as data in terms of machines. Digital dehumanization refers to the process where individuals are reduced solely to data, leading to decisions and actions that negatively impact human life. This process undermines human dignity and diminishes the human qualities of individuals. (Automated Decision Research, 2023, p.2).

3.2. Military Use of Artificial Intelligence: Technologies and Ongoing Debates

The development of military technologies and/or the implementation of new technologies in the military domain also contributes to transformation in this area. The United States' endeavours to adapt and integrate the technological advancements of the late 1970s and 1980s into the military sphere, with the objective of transforming the manner and character of warfare, are designated the Military Technical Revolution (MTR). The technological developments based on information technologies that came to the forefront during this period and the opportunities they provided have enhanced the success of the U.S. military on the battlefield. The success brought about by the application of the opportunities provided by information technologies (or, in other words, the communication revolution) in the military field (especially the success of the United States in the Gulf War) has led to the frequent use of the concepts of MTR or Revolution in Military Affairs (RMA) in the 1990s. (Sloan, 2008, pp. 1-2, Hynek & Solovyeva, 2022, pp. 9-14).

The Military Revolution led by Western powers, particularly the United States, or alternatively referred to as the IT-driven Revolution in Military Affairs, continued to exist until the 2010s. During the period between 1970 and 2010,

which saw the United States and the West at the vanguard of military technology research and development, these technologies were disseminated to allies and strategic partners, particularly small and medium-sized states in Europe and East Asia. However, for the first time since the 2010s, a strategic competitor has emerged that challenges the military technological leadership of the United States, possessing its own developed military technologies and supported by new technologies: China. (Raska & Bitzinger, 2023, p.1). In short, the impact of the spread of AI technologies is fundamentally different from the spread of Information Technologies in the field of defense technologies during the period roughly between 1970 and 2010. The spread of AI technologies in the field of military defense could lead to the emergence of a new revolution in military technology.

There are various approaches to the application of AI technology in the military field. Attitudes towards the application of this technology in the military field can generally be divided into three groups: Enthusiasts (Like P.W. Singer), Pragmatists (Like Paul Scharre, James Manyika), and Deniers (Skeptics) (Like Stuart J. Russell, Noel Sharkey). Those who enthusiastically support the use of AI in the military often believe that AI will revolutionize the art of war by drastically altering the character and conduct of combat. They claim that AI technology will transform the nature of wars, as well as the reasons for their emergence. Those who approach the use of AI in the military from a pragmatic standpoint feel that, while not as revolutionary, it will result in substantial improvements in battle, notably in operational and tactical aspects, making war easier. Pragmatists claim that this technology will provide an advantage for countries that possess it by making military operations easier and more efficient, asserting that AI technologies will be increasingly utilized in military fields over time. Skeptics, while acknowledging the advancements in AI, raise criticisms regarding the various issues that could arise from the application of these technologies in the military field. The focus of his criticisms is that the military fields where AI is applied are not controlled and well-structured environments. Due to this characteristic, AI applications in military fields will not be able to realize their potential and will face various obstacles (technological, socio-political, organizational, ethical, and legal). Skeptics who believe that AI can influence the character of war acknowledge that this technology represents a technological advancement in warfare. (Raska & Bitzinger, 2023, p.13).

3.2.1. AWS as a potential threat

In a public opinion survey conducted by Human Rights Watch at the end of 2018, involving participants from 26 countries and carried out by Ipsos, respondents were asked about their views on fully autonomous weapons. According to the research findings, 6 out of every 10 people (61%) expressed their opposition to lethal autonomous weapons. This rate shows that the opposition to lethal autonomous weapons, which was recorded at 57% in a similar study conducted in 2017, continues and even has increased. (Deeney, 2019). According to the findings of the 2019 study, the countries with the highest support for lethal AWS were India (50%) and Israel (41%), while the countries with the highest opposition to these weapons were Turkey (78%), South Korea (74%), and Hungary (74%) (Deeney, 2019). Additionally, according to the findings in the same study, 66% of those opposing the mentioned weapons stated that these weapons cross a moral boundary and that machines should not be allowed to kill, while 54% cited the lack of accountability of machines as their primary reason for opposition. (Deeney, 2019). Ipsos, which conducted similar research at the beginning of 2021, has reached alike results in its recent public opinion survey conducted in 28 countries; the countries with the highest opposition are Sweden (76%), Turkiye (73%), and Hungary (70%), while the country with the highest support for autonomous weapons is again India (56%). This research shows that opposition to autonomous weapons is high among both men (60%) and women (63%), but on the other hand, it indicates that support for AWS is higher among men (26%) compared to women (17%). (Ipsos, 2021). The distribution of support for or opposition to autonomous weapons across specific age groups has also been included in the analysis of the same study. According to this, 54% of participants under the age of 35 are opposed to autonomous weapons, while among participants over the age of 50, this rate increases to 69%. (Ipsos, 2021). In sum up, opposition to lethal autonomous weapons continues to exist to a certain extent. The attitude that has found a certain degree of resonance among the public needs to be translated into democratic demands in the political arena, and social movements play a significant role in alleviating the concerns that this technology, which has not yet been clearly regulated, has generated among the people. The phrase "Killer Robots," which often sounds like a quote from a science fiction movie when mentioned in daily life, has also inspired a social movement. The Stop Killer Robots campaign, which serves as a type of umbrella organization where many national/international social movements collaborate, represents a global social movement. However, it would not be entirely accurate to evaluate this campaign as one of the classic social movements. In this context, the concept of "movement network" proposed by Alberto Melucci (Melucci, 1985, p. 799)

appears to be more functional in defining the relevant campaign. The fact that individuals within the movement network can engage in multiple activities simultaneously contributes to the formation of a network by facilitating the circulation of people and information among the groups that make up the network. (Melucci, 1985, p. 800). The structure of groups within the network that allows for multiple memberships is one of the fundamental characteristics of today's social movements, where emotional solidarity is a desired condition for participation.

The movement against AWS has also benefited from the wide opportunities offered by today's communication technologies. Thus, it has become possible for hundreds of groups that come together for very different purposes to act in cooperation on a specific common ground. In addition to groups generally opposed to armament, the campaign also includes movements against AWS like Article36, as well as efforts like Encode Justice that strive for AI technologies to be human-centered. Moreover, a number of groups promoting specific technological developments have also formed a unified front in order to address the ethical concerns associated with these developments. This movement, which is not fundamentally opposed to technological developments, focuses on the ethical concerns arising from the process of dehumanization caused by technology. The concept of dehumanization used here refers not to the notion of dehumanization that opens the door to racist approaches, but rather to the weakening and/or elimination of people's control over technological tools in a digital context. The elimination of human control creates ambiguity regarding who will be held responsible for potential harms. Moreover, the fact that essential life-and-death decisions in conflict/war zones are made by machines devoid of human emotions can lead to moral shortcomings. (Docherty, 2012, p. 38). The responsibility gap created by fully AWS will complicate the deterrence of national/international law violations and the provision of justice, as there are significant challenges in legally holding a commander, the manufacturing company, or the programmer accountable for the actions of a robot. One of the main mottos of the "Stop Killer Robots" campaign, "Less Autonomy, More Humanity," reflects the concerns at hand. (Stop Killer Robots, n.d.). Therefore, action must be taken before AWS, which pose a significant potential threat, turn into 'killer robots' in the near future (Ban 'Killer Robots' Before It's Too Late, 2022). In order to effectively address an imminent global threat, it is necessary to implement a global movement and a system of global governance.

3.2.2. AWS as an 'opportunity' for humanity

Just as those opposed to AWS have their own justifications, there are also various reasons put forth by supporters of such weapons. They believe that AI-supported technologies will revolutionize the way and nature of warfare, and as a result of this revolution, future conflicts will be waged between robotic entities and AWS. They also think that in the near future, there will be a divide between those who adapt AI to their military strategies and those who cannot adapt such technologies to their military strategies; therefore, AI-supported technologies should be regarded as an opportunity. (Raska & Bitzinger, 2023, p. 14). In addition, AWS can reduce the risks faced by human soldiers, lead to fewer human casualties, make quick decisions and take action due to very high information processing speeds. Thanks to its technological advantages, it can ensure that military operations are carried out with precision and help prevent human errors, reducing collateral damage (deaths and injuries of non-combatants, etc.) (Nasu & Korpela, 2022). In addition, it is expected that the materials used in military operations will be consumed more efficiently and effectively. Due to their capabilities in close-range combat, banning lethal autonomous weapons will hinder military technological advancements aimed at reducing civilian casualties, as they can lower secondary damage to a lesser extent. (Nasu & Korpela, 2022). It is also claimed that AWS could provide significant advantages to countries possessing this technology in terms of deterrence. This way, it can contribute to the reduction of potential conflicts and to international peace (in the sense of conflict-free). As can be seen, the priority of groups advocating for the use of lethal autonomous weapons is also "human." The argument that advocates of autonomous weapons emphasize the most is that human soldiers are at less risk and, due to operational precision, civilians suffer less harm from conflicts. As the objective of this study is to examine the "Stop Killer Robots" campaign, rather than to evaluate the relative merits and drawbacks of the technologies under discussion, these sections have been presented in a concise manner. A plethora of sources exists regarding the impact of AI-supported technologies on military technologies and war doctrines, particularly since 2010.

3.3. AWS and International Law

The revolutionary advancements in AI are shaping not only states, individuals, and institutions today but also legal norms. Particularly in the context of military technology, the emergence of AWS is becoming increasingly evident due to their potential use in armed conflicts, paving the way for fierce competition among states. This situation also brings various discussions in the fields of international humanitarian law, international human rights law, and

accountability. Therefore, it is necessary to address the legal issues arising from the use of such systems in armed conflicts.

3.3.1. AWS and international humanitarian law

The discussions related to AWS are centered around international humanitarian law. Therefore, the willingness to use or the existence of the use of AWS in armed conflicts establishes international humanitarian law as a valid normative framework in the evaluation of AWS. In this context, determining the compliance of AWS with international humanitarian law rules will not only provide legitimacy for the use of these systems but also serve as a legal basis.

In the context of international humanitarian law, there is no specific regulation that explicitly addresses the issue of AWS. This absence of clear guidance reflects the multifaceted and contentious nature of this subject. To illustrate, in his work entitled "A Legal Perspective: Autonomous Weapon Systems under International Humanitarian Law," Davinson posits that the deliberations in the extant literature regarding the deployment of AWS under international humanitarian law are superfluous. He advances the argument that the determination and supervision of compliance with international humanitarian law reside with the state that develops and utilises the system (Davinson, 2018, p. 7). With this emphasis, Davinson highlights the necessity for all weapon systems, including AWS, to comply with international humanitarian law during armed conflicts.

On the other hand, those who design and intend to develop and use AI-extended AWS in armed conflicts must conduct studies on two aspects of international law in this context. The first of these examinations is to determine whether the weapon or system is legal. Currently, there is neither any agreement nor any customary law rule that prohibits or restricts AWS. The second review is to determine whether the use of the existing weapon or system is prohibited. As a result of these reviews, the inability to identify any findings regarding the weapon systems reveals the potential for legitimacy in their use.

In essence, the probability of AWS infringing upon international humanitarian law on an individual basis is minimal. Nevertheless, the question of whether international humanitarian law can reasonably establish trust regarding the utilisation of such systems is becoming increasingly evident. In fact, the question raised necessitates a detailed and comprehensive examination of the principles of distinction, proportionality, military necessity, and precaution, which are fundamental cornerstones of international humanitarian law.

One of the most important obligations regarding the legality of new types of weapons, such as AWS, is the principle of distinction. The principle of distinction requires differentiation between civilians and combatants, as well as

between civilian objects and military objects. The principle of non-discrimination, which necessitates an examination centered on sensory input, is approaching the capacity to distinguish between humans and non-human entities at certain standards due to technological advancements. However, the ability of AWS to distinguish between combatants and civilians, as well as military objects and civilian objects during armed conflicts, points to a problematic area. Although AWS possess advanced technology in terms of hardware and equipment, the changing nature of warfare, the need to revise the data flow in real-time decision-making, the transformation of wars into unconventional dimensions such as urban and guerrilla warfare, and the blurring of distinguishing symbols regarding the distinction between civilians and combatants complicate the applicability of the principle of distinction in armed conflicts, and may even eliminate it altogether. (Chengeta, 2015b, p. 93).

The principle of proportionality forms the most complex normative framework of international humanitarian law. As emphasized in the principle of non-discrimination, the distinction between civilian-combatant and civilian-object – military-object emerges as an issue that must be observed. However, sometimes an attack aimed at a legitimate target can cause collateral damage to civilians and civilian objects. In this regard, the principle of proportionality is manifested. The mental process required under the principle of proportionality involves making complex, value-based decisions that must be measured within the integrity of the conditions (Özer, 2022, pp. 179-180). If the attack to be carried out, in terms of conditions, represents an excess regarding the scope and nature of the principle of proportionality, then the attack should either be canceled, suspended, or revoked. The principle of proportionality points to a subjective area as a flat phenomenon, involving military and legal experience and the knowledge that arises during decision-making, and it requires human judgment. On the other hand, the principle of proportionality prioritizes qualitative data over quantitative data during armed conflict. AWS can clearly determine the expected military advantage of a limited attack within well-defined areas, over a limited time frame, and at specific tactical levels. Nevertheless, quantifying and assessing the military advantage of AWS in a dynamic environment is difficult, if not impossible.

The primary aim in armed conflicts is to achieve political and military objectives. However, the aim of achieving goals does not provide the warring parties with unlimited space. In accordance with the principle of military necessity, actions and behaviours that can be deemed reasonable and necessary for the parties to gain superiority over each other in the conduct of hostilities are considered to be militarily necessary. In other words, the principle of military necessity emerges as the concept of legitimizing and legally using a specific type

and degree of force that is necessary solely to defeat the enemy. (Sehrawat, 2017, p. 20). Like other principles of international humanitarian law, the principle of military necessity also requires human judgment and situational awareness. However, AWS are not only distant from human values and situational awareness, but they also lack the sufficient and necessary equipment and will to determine what is militarily necessary in armed conflicts.

Another important principle of international humanitarian law is the principle of precaution in attacks. The primary purpose and goal of the principle of precaution is to protect civilians and civilian objects from the effects of armed conflicts. However, the ambiguity of battlefields, along with the lack of human judgment and situational awareness that is essential for the adherence of AWS to the principle of precaution in attacks and the requirements of that principle, which include the principles of distinction and proportionality, poses an obstacle to their use in armed conflicts (Turner, 2013).

Ultimately, the principles and rules of international humanitarian law are closely interconnected. In this context, any violation of a principle of international humanitarian law will inevitably lead to the violation of its other principles, which are interconnected. On the other hand, the issues raised by AWS in terms of international humanitarian law also bring to the forefront the topics of international human rights law, which is directly connected to international humanitarian law, and accountability.

3.3.2. AWS and international human rights law

The demilitarization of wars has negative effects on international human rights law, just as it does in international humanitarian law. Particularly, the use of AWS in armed conflicts significantly impacts many fundamental values of international human rights law, such as human dignity, the right to life, the right to privacy, the right to a fair trial, the right to effective legal remedy, and the right to be free from torture and inhumane treatment. In this context, it is necessary to answer the question of what type and extent AWS will affect the aforementioned rights: One of the main arguments put forward for the prohibition of AWS is based on the notion of human dignity, which is grounded in the value inherent to being human. Human dignity is the most fundamental and defining conceptual framework present at all stages and layers of international human rights law. The killing of a person by an autonomous weapon system, devoid of human emotions and values, undermines human dignity. Because those AWS, which are far from human empathy and devoid of emotion, are unable to grasp the value of individual life or the significance of the loss of human life (Özer, 2022, pp. 262-263).

The right to life stands out as one of the most fundamental rights, as the existence of other rights is only possible with the individual's life. Whether

depriving someone of the right to life in the conduct of hostilities is arbitrary and, consequently, its compliance with international law is determined by reference to international humanitarian law. The use of AWS in conducting hostilities and the subsequent violation of international humanitarian law rules leads to the infringement of the right to life.

In parallel with technological developments, data constitutes a fundamental component of the right to privacy, which is one of the human values and human rights currently under threat. The ways in which data is obtained are actively carried out not only through technology companies but also by governments. The surveillance, listening, and data collection capabilities of states are emerging as the greatest fear of individuals in the digital age. The characteristic structure of AWS has the potential to interfere with the exercise of that right. Because systems equipped with AI lack human sensitivity, they openly reveal situations such as detailed surveillance and data recording through existing sensors and cameras, rapid processing of the obtained data, and detection and tracking of targets or individuals through facial recognition systems, thereby violating the right to privacy (Singer, 2009, p. 322).

One of the issues raised by AWS is related to fair trial rights. The emphasis on equality stemming from human rights in the right to a fair trial can only be realized through humans, not through robots, machines, and autonomous systems. For this reason, it is not possible to attribute equality to AWS. Additionally, targeting carried out by AWS allows for the destruction of a target without giving the individual the opportunity to defend themselves. For this reason, the use of AWS in armed conflicts undermines the presumption of innocence and also infringes upon a person's right to effective legal recourse.

3.3.3. AWS and accountability

Penalties are corrective and restorative in nature. Penal practices have functions such as punishing criminals, preventing re-committing crimes, and deterrence. The use of AWS in armed conflicts is a subject of some discussions in international humanitarian law and international human rights law, as well as in accountability. In other words, the characteristic structure of AWS can cause significant difficulties in attributing responsibility arising from these systems. The potential of AWS to commit international crimes without meaningful human control brings the responsibility of robots, manufacturers, software developers, military commanders, and political decision-makers/civilians to the agenda in accountability discussions.

One of the prominent questions in these discussions is whether the system, namely the robot, can be held responsible for the actions taken. The existence of punishment only necessitates the occurrence of intentional and

unlawful actions. For this reason, AWS, having an algorithmic decision level and not having will, renders the system/robot void within the scope of criminal liability (Kangal, 2021, p. 65). On the other hand, if the manufacturer detects an error or defect in the product produced and does not notify those who buy and use these systems, criminal liability may be in question. However, the changing conditions of war and the lack of meaningful human control in such systems make it impossible to hold the manufacturer/seller criminally liable. Another debate in the literature is about whether responsibility will be attributed to the software developer. Software plays an important role in the mobility and decision-making mechanisms of AWS. If the software developer can establish an algorithmic order that centers on basic values, liability will be eliminated in this sense. However, the unpredictability of the actions of autonomous weapon systems and their ability to adapt to changing conditions, that is, their ability to make decisions on their own, allow these weapon systems to go beyond the algorithmic order created by the software developer. This eliminates the responsibility of the software developer (Okur, 2021, p. 38). On the other hand, the software process represents millions of algorithmic mechanisms and represents a system created by hundreds of software developers. Therefore, it becomes difficult to determine who is responsible.

Another debate focuses on political decision-makers and civilians (Allhoff et al., 2013, p. 356). The fact that political decision-makers allow the use of autonomous weapons systems in the conduct of hostilities brings up the issue of responsibility of politicians. However, the criminal responsibility of politicians for the decisions they have taken has not been recognized within the scope of either national or international mechanisms. The debate about the attribution of responsibility to civilians stems from the fact that they are the main actors in the selection of political decision-makers. However, such a claim is not very realistic.

Finally, the issue of the criminal responsibility of military commanders is raised. The military commander can be held responsible for the crimes committed by his subordinate, including the use of war tools and methods in armed conflicts (Henckaerts et al., 2005, p. 622). Furthermore, the military commander bears the responsibility of preventing a crime if he/she has reason to believe that it will be committed. This situation emerges as a *sui generis* responsibility. If an autonomous weapon system knows that such systems will commit a crime and does not take precautions against it, criminal liability may arise. However, the lack of meaningful human control in AWS and their ability to act on their own eliminates the responsibility of the military commander. In general, the use of AWS in armed conflicts creates a gap in various areas of international law, namely international humanitarian law, international human

rights law and accountability mechanisms. This allows for violations of basic principles and the normative order to occur.

4. CONCLUSION

The use of AI-based technologies in the military field reveals risks that are much more complex and uncertain than traditional dangers, confirming the ideas in Ulrich Beck's Risk Society approach. Autonomous weapon systems, where the human factor is excluded from the decision-making mechanism, are likely to cause irreversible errors, especially in unexpected and rapidly changing war scenarios. In such cases, it is very difficult to predict and control the risks in advance. In addition, the asymmetric relationship between countries with the technology in question and underdeveloped countries may cause these countries to feel threatened and attempt to achieve balance by using asymmetric methods such as cyber attacks. Global insecurity may escalate the arms race and the possibility of conflict. Beck notes that the risks are not just a technical issue, but also have social and ethical dimensions. The use of AI-based autonomous systems on the battlefield raises ethical questions.

It is seen that technological advances in fields such as AI and robotics have serious potential to both benefit humanity and pose threats that may harm it. Preventing and/or eliminating the dangers that may arise from the dual use of these technologies before they emerge will ensure that the destructive effects that may arise after they emerge will be avoided. However, it is not easy to convince people to take precautions against a danger that does not actually exist yet. The serious lack of accountability for AWS and the inadequacy of international legal regulations show that the claims put forward by social movements opposing AWS are not out of the question. In short, it is possible to say that the Stop the "Killer Robots" campaign, which was put forward to attract attention against a possible danger, is not a complete fantasy, and that if technological advancement continues at this pace, it has the possibility of becoming a reality in the medium term.

The process of creating international legal texts regarding the use of lethal autonomous weapons systems will be possible if the support of major powers that have made serious investments in these technologies can be obtained. The fact that international regimes have been established for very serious lethal threats such as weapons of mass destruction supports optimism about the use of autonomous weapons systems under a certain regime of international control, even if competition among global powers makes such governance very difficult to achieve in the short or medium term.

Risk society theory predicts that technological developments may create

new problems that have not been addressed in terms of law and ethics. In this context, the question of who will be held responsible when autonomous weapons make a mistake becomes important. The developer, the user country, or the system itself? According to Beck's theory, modern risks transcend notions of individual responsibility and create situations for which global actors cannot be held accountable. To guarantee responsibility, the existing regulatory void in international law must be addressed, and international collaboration and governance must be secured, particularly among the major countries.

This study draws attention to the risks that may arise from the use of artificial intelligence-based technologies in the military field in the context of Beck's approach. Because these risks are more complex and unpredictable than traditional threats and can have transboundary and global effects. In addition to the limited number of studies that draw attention to the risk in question in the context of international humanitarian law, this study contributes to the literature by presenting a theoretical approach through the concept of Risk Society.

Systematic management, global legislation, and research on establishing ethical frameworks are crucial for mitigating the hazards associated with the use of artificial intelligence in military applications, hence enhancing the existing literature.

5. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

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7. AUTHOR CONTRIBUTIONS

The authors' contributions to the study are equal.

8. ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS

The study complied with the ethics committee principles and required permissions were obtained in accordance with the principle of intellectual property and copyright.

9. REFERENCE

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HOW DOES CIVIL WAR AFFECT FOOD SECURITY? A CASE OF YEMEN¹¹



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ABSTRACT

This article aims to examine the impact of the ongoing civil war in Yemen on severe food insecurity. The conflicts in Yemen have deepened food security issues through economic collapse, loss of agricultural production, and the destruction of infrastructure. The war economy has diverted resources away from civilian needs, prioritizing conflict-related expenditures. Rising inflation and currency devaluation have increased food prices and further deepened poverty. Humanitarian efforts, however, face numerous challenges such as limited access, political interference, and lack of funding. The article suggests long-term solutions, such as increasing humanitarian aid, rebuilding agricultural capacity, and restoring economic stability, while highlighting the particular needs of vulnerable groups, including women and children. Emphasizing the importance of international cooperation, it calls for coordinated efforts to address Yemen's food crisis.

Keywords: Yemen, food security, civil war, conflict, humanitarian crisis

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İÇ SAVAŞ GIDA GÜVENLİĞİNİ NASIL ETKİLER? YEMEN ÖRNEĞİ



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ÖZ | Bu makale, Yemen'deki iç savaşın şiddetli gıda güvensizliği üzerindeki etkilerini incelemeyi amaçlamaktadır. Yemen'deki çatışmalar, ekonomik çöküş, tarımsal üretim kaybı ve altyapı tahribatı ile gıda güvenliği sorunlarını derinleştirmiştir. Savaş ekonomisi, kaynakları sivilin ihtiyaçlarından uzaklaştırarak çatışma harcamalarını öncelik haline getirmiştir. Enflasyonun artması ve para birimi değer kaybı, gıda fiyatlarını yükseltmiş ve yoksulluğu daha da derinleştirmiştir. İnsani yardım çabaları ise sınırlı erişim, siyasi müdahaleler ve finansman eksiklikleri ile karşı karşıyadır. Makale, insani yardımların artırılması, tarımsal kapasitenin yeniden inşa edilmesi ve ekonomik istikrarın sağlanması gibi uzun vadeli çözümler önererek, özellikle kadınlar ve çocuklar gibi savunmasız grupların ihtiyaçlarına dikkat çekmektedir. Uluslararası iş birliğinin önemine vurgu yaparak, Yemen'deki gıda krizinin çözülmesine yönelik koordinasyon çağrısı yapmaktadır.

Anahtar Kelimeler: Yemen, gıda güvenliği, iç savaş, çatışma, insani kriz

JEL Kodları: Q18, D74, F35

Alan: Uluslararası ilişkiler

Türü: Araştırma

1. INTRODUCTION

According to the 1996 World Food Summit, food security is achieved when every individual has constant and unrestricted availability of sufficient nutritious and secure food that meets their nutritional needs and preferences, enabling them to lead an active and healthy life (FAO, November 1996). Food security includes four main dimensions: the presence of food, the ability to afford and physically obtain food, the proper utilization of food, and the overall stability of these factors. In order to achieve food security objectives, all four aspects must be fulfilled simultaneously (World Bank, 2023).

Conflict is seen in many reports (FAO et al. 2017, 2021) as one of the main drivers of food insecurity. According to United Nations (1993), conflict frequently undermines the capacity to produce, trade, and obtain food. Food security frequently turns into a weapon and a victim during armed conflict. Millions of people's everyday lives are disrupted by wars, not just because of the violence but also because they target the food supplies that are essential to human survival. Conflict zones are characterized by despair and starvation, whether as a result of direct military action, economic blockades, or the collapse of local infrastructure. One terrible and much ignored aspect of the larger drama of war is the story of food shortages in conflict areas.

Previous academic studies also reveal a relationship between conflicts and food insecurity. According to Messer and Cohen (2017), conflict increases food insecurity by reducing food availability and access through disruptions in food production, markets, and infrastructure. Koren and Bagozzi (2016) empirically demonstrate a systemic relationship between conflict and food security at both global and local levels. In their study, they show that food insecurity, as measured by highly fragmented agricultural landscapes, significantly impacts the frequency of both inter- and intra-state armed conflicts worldwide. Scanlan and Jenkins (2001) found that conflicts often lead to increased military expenditures (especially arms imports), which crowd out other social expenditures and lead to food insecurity and child hunger. Hendrix and Brinkman (2013) highlight in their study that violent conflict is a major driver of acute food insecurity. Mitchell et al. (2015) suggest that food insecurity is a multiplier, or facilitator, of the opportunities for and benefits from conflict. It has been observed that during conflicts, food frequently turns into a strategic weapon that is used to impose control or cause suffering. Food security is severely compromised by the devastation of agricultural infrastructure, extensive deforestation, and the placement of land mines. The International Committee of the Red Cross demonstrates how conflict-related crises force millions of people into severe food insecurity by upsetting food supply networks and utilizing

strategies like blockades and sieges that keep people from getting food. Furthermore, the devastation of vital infrastructure brought about by conflict has a permanent impact on food delivery and agricultural productivity, making recovery a difficult and drawn-out process (Zeith, 2023). Moreover, the 65% of people experiencing acute food insecurity live in fragile or conflict-affected countries, with a 40% increase in conflict by 2023 compared to 2020 (WFP, n.d.).

In their study assessing the impact of Boko Haram attacks on food security in Nigeria, George, Adelaja, and Weatherspoon (2019) combined general household survey (GHS) data with data on Boko Haram terrorist incidents. Their findings show that higher conflict intensity, measured by fatalities, leads to more days when households have to (1) rely on less preferred foods, (2) reduce food variety, and (3) cut back on meal portion sizes. In summary, they concluded that the food insecurity resulting from conflict is primarily driven by shocks to agricultural inputs and household income. Rudolfsen, Bartusevičius, Leeuwen, and Østby (2024) found that one in three Ukrainians reported being food insecure in their study conducted during the early stages of the Russian invasion of Ukraine in 2022. Both direct exposure to military attacks and indirect exposure—such as attacks on family members, acquaintances, or local municipalities—were linked to increased food insecurity. According to Islam, Kokash, Babar, Uday, Hasan, Rackimuthu, Essar, and Nemat (2021) Afghanistan, long plagued by war and conflict, has faced significant challenges, particularly in terms of food security. War and conflict, the COVID-19 pandemic, combined with political instability and reliance on neighboring countries for food imports, has worsened food shortages. The economic recession and rising poverty have further compounded the problem, making it difficult for people to access basic provisions.

The Food and Agriculture Organization of the United Nations (FAO) and the World Food Programme (WFP) have issued a warning that acute food insecurity is expected to worsen in 18 high-risk areas. One of these, Yemen is ranked among the 2024 “hunger hotspots” of very high concern by the World Food Programme and Food and Agriculture Organization (WFP and FAO, 2024). As of 2024, hunger and food insecurity in Yemen continue to be a serious humanitarian crisis. The United Nations (UN) and other international organizations have described the hunger crisis in Yemen as one of the largest humanitarian crises in the world. In Yemen, 17.6 million people are food insecure, a crisis affecting more than half of the population of 33.7 million (WFP, n.d.). Food insecurity in Yemen has been worsening since the civil war began in 2014. Burke, Hsiang, and Miguel (2009) have noted that armed conflicts within nations have had catastrophic humanitarian consequences across much of the

world. Food insecurity is one of these devastating consequences.

In this respect, the objective of this article is to examine the Yemeni Civil War and its effect on the country's food insecurity. The scope of the study is restricted to examining the effects of the civil war in Yemen on the food security of the Yemeni population. The impact of civil war on food security is analyzed in the specific case of Yemen. This analysis focuses exclusively on the time frame between 2014 and 2024, which encompasses the onset of the civil war and its subsequent escalation up until the present. Due to the difficulties associated with collecting data in areas affected by conflict, this study exclusively relies on secondary data. The study used a qualitative methodology to obtain comprehensive understanding of the complex effects of the ongoing conflict on food security in Yemen. The research was designed as a case study to explore the complex and context-specific phenomena associated with the impact of war on food security. The study employs secondary data from various sources, including academic literature, reports from international organizations, government publications, news coverage, NGOs, and UN reports and assessments, to ensure a thorough and comprehensive analysis.

The originality of this research lies primarily in its focus on the specific relationship between civil war and food insecurity, particularly in the context of Yemen. While the topic of food insecurity in conflict zones is not new, the approach of this article provides an in-depth, case-specific analysis of how the Yemeni Civil War has exacerbated food insecurity. The article narrows the broader issue of food insecurity in conflict zones to the specific case of Yemen, offering a targeted exploration of how the Yemeni Civil War (2015-2024) has directly impacted food security. This localized analysis adds value to existing global studies by providing a detailed case study that explores the dynamics of war and food security in one of the world's most severe humanitarian crises.

This article is structured into four chapters. The first chapter examines the dynamics of civil war in Yemen. The second chapter explores the consequences of civil war, particularly highlighting economic instability, disruptions to agriculture, the collapse of the healthcare system, and the displacement of people. The third chapter focuses on the effect of civil war on food security in Yemen. Finally, the fourth chapter evaluates role of humanitarian assistance in addressing food insecurity, while also presenting the challenges encountered in delivering aid.

2. UNDERSTANDING YEMEN CIVIL WAR DYNAMICS

Since 2011, Yemen has faced intense political upheaval and conflict. The Arab Spring sparked mass protests against President Ali Abdullah Saleh's 33-year rule, leading to his resignation in 2012. His vice president, Abd Rabbuh Mansur Hadi, took over but struggled with numerous challenges, including political instability, economic problems, and the resurgence of the Houthi movement (Mounassar, 2012). In 2014, the Houthi rebels, capitalizing on widespread dissatisfaction with the government, seized the capital, Sanaa, and later forced Hadi into exile (Amnesty International, 2014). This escalation prompted a Saudi-led coalition to intervene in 2015, aiming to restore Hadi's government (ACLED, 2024). This intervention was in response to a joint request from Yemeni President Abd Rabbuh Mansur Hadi, aimed at pushing back the Houthis forces and preventing them from taking control of Aden city. The conflict in Aden involved the Houthis and Yemen Army forces aligned with previous president Ali Abdullah Saleh on one side, and Yemen Army units aligned with Abd Rabbuh Mansur Hadi backed by Saudi Arabia and Southern Movement militias backed by the United Arab Emirates on the other side (Mukhashaf, 2015). The alliance achieved victory by seizing control of Aden and halting the Houthis' progress. Although the alliance achieved success in Aden, the situation in northern Yemen continued to present difficulties. Additionally, in late 2016, Yemen saw the most severe occurrence of cholera ever recorded (WHO, 2016). In late 2017, Saleh severed ties with the Houthis by expressing his willingness to engage in negotiations with the Saudi-led coalition in order to bring an end to the war. The Houthis expelled the pro-Saleh forces from Sanaa, and on December 4th, they assassinated Saleh near his residence in Sanaa (Robinson, 2023).

The ensuing conflict has caused widespread destruction, a severe humanitarian crisis, and significant civilian casualties. In December 2018, a cease-fire was facilitated by the United Nations (UN) as part of the Stockholm agreement, with the objective of enabling aid monitoring (Robinson, 2023). However, the situation remained delicate and unstable. In April 2020, the Southern Transitional Council (STC) backed by the UAE following its establishment in 2017 declared self-rule in the south of Yemen taking Aden as its capital till present day. In April 2020, Saudi Arabia declared a unilateral ceasefire during the global COVID-19 outbreak, but the conflict in Yemen continued. The Houthis intensified their efforts to control Marib, a key city with significant oil resources and historical importance in Yemen's unification. Their advance faced strong resistance (Guardian, 2020). A hopeful development occurred in April 2022 with a ceasefire that brought the lowest levels of political violence since January 2015 (Roy, 2022). On April 7, 2022, the Presidential Leadership Council

(PLC) was formed, replacing President Hadi (Salem & Kolirin, 2022). Led by Rashad Muhammad Al-Alimi, the PLC includes eight members, with four representing the Southern Transitional Council (STC).

The ceasefire was extended but eventually expired in October 2022. Despite this, no large-scale offensives have resumed. In 2023, Saudi Arabia began direct negotiations with the Houthis, focusing on the contentious issue of Yemen's oil revenue. In September, Houthi representatives visited Saudi Arabia for face-to-face talks, with oil money distribution remaining unresolved (Aljazeera, 2023). However, progress was disrupted on October 7, 2023, by the outbreak of war between Hamas and Israel. In response, the Houthis launched missile and drone attacks on Israel and increased assaults on ships in the Bab El-Mandeb Strait, asserting their dominance in Yemen and regional affairs. The United States (US), along with the UK, Bahrain, and other Western allies, conducted airstrikes against the Houthis in January 2024, targeting their attacks on ships that disrupted global trade (Reuters, 2024). Historically, the Houthis had been designated as a Foreign Terrorist Organization (FTO) and Specially Designated Global Terrorists (SDGT) by the U.S. in January 2021. President Biden revoked these designations shortly after taking office but re-listed the Houthis as SDGT in January 2024 due to their continued attacks on commercial shipping (U.S. Department of State, 2024).

The ongoing hostilities between the Houthis and the U.S./Israel, combined with military tensions and disrupted peace negotiations with Saudi Arabia, leave Yemen's future stability uncertain. As of 2024, Yemen remains fragmented, with key factions such as the Houthis (DAF), the Internationally Recognized Government (IRG), and the STC controlling different regions.

3. THE CONSEQUENCES OF CIVIL WAR IN YEMEN

3.1. Economic Instability

In conflict settings, the existence of armed conflict does not eradicate economic activity; instead, it frequently alters economic behaviors in manners that might exacerbate harm to the state, while simultaneously favoring specific actors (Huddleston, 2021). The accumulation of long-standing economic grievances and conflicts in Yemen has fostered an environment conducive to the emergence of a thriving war economy. This economy is characterized by complex networks of participants competing for economic power and influence. The fundamental emphasis of Yemen's war economy is on the allocation, coordination, and deployment of resources, mostly targeted at maintaining the conflict. Consequently, the act of making excessive profits from war and taking advantage of different facets of the conflict have prolonged the war and impeded

the achievement of long-lasting peace and stability. Furthermore, the pervasive impact of the war economy has been transforming the country's physical and socioeconomic structure in intricate ways (Wennmann & Davies, 2020).

Furthermore, the conflict has had a profound effect on the country's economy, including disruptions in trade routes, infrastructure destruction, and a substantial decrease in foreign investments. The effects encompass extensive forced migration and a reduction in domestic agricultural output and economic efforts. Despite the current ceasefire between the warring factions, the situation remains volatile and continues to negatively impact people's livelihoods, decrease incomes, and severely impede the country's economy (Aghajanian & Mele, 2023). The COVID-19 pandemic in 2020 worsened the existing catastrophe, overwhelming rural households and significantly increasing the demand for humanitarian assistance (Rahmat, Zarmina Islam, & Parvathy Mohanan, 2022).

The ongoing conflict in Yemen has severely impacted food security due to economic disturbances that have led to the creation of two separate economies in the Northern and Southern regions. Key features of Yemen's war economy include dual tariffs and customs charges, distinct currency exchange rates, oil income disputes, divergent aid distribution, and reliance on extractive industries. The Internationally Recognized Government (IRG) relocated the Central Bank to Aden in 2016, facing challenges from inadequate foreign exchange reserves. Meanwhile, Sanaa, controlled by the Houthis (DFA), benefited from increased remittances and foreign aid (Aghajanian & Mele, 2023). A temporary stabilization of the Yemeni rial in 2019 due to a Saudi deposit was followed by the depletion of reserves, leading Sanaa to reject new IRG-printed banknotes and resulting in inconsistent monetary policies. This division created a parallel economy with contrasting exchange rates between IRG and DFA-controlled areas. The continued issuance of banknotes by both factions has led to a significant decrease in the rial's value in IRG regions (Favari, Krishnaswamy, Tandon, Aghajanian, & Almoayad, 2023, p. 41).

The below time window (Figure 1) provided by the World Bank shows the affect since the currency split (Favari et al., 2023). The figures illustrate the severe economic impact of Yemen's conflict, particularly the 2019 currency split between IRG and Houthi-controlled regions. Before the split, the Yemeni rial experienced gradual depreciation, with a sharp decline during the 2018 currency crisis, temporarily stabilized by a Saudi deposit. After the split, two parallel economies emerged: the IRG-controlled regions saw rapid depreciation due to continued issuance of new banknotes, while the Houthi-controlled regions maintained a more stable exchange rate by banning these notes. This monetary

division exacerbated food insecurity, increased import costs, and deepened economic disparities across Yemen.

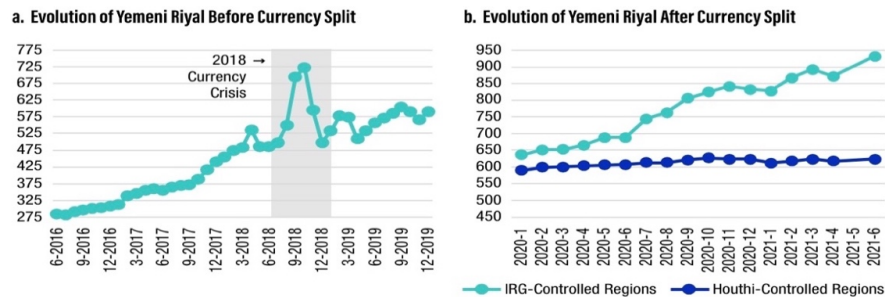


Figure 1: Evolution of Yemeni Riyal Before and After the Currency Split.

Source: (Favari et al., 2023).

The macroeconomic conditions have caused severe microeconomic consequences. Since 2015, the average cost of essential food products has significantly risen in all districts. However, the various monetary policies have led to economic disparities, such as price divergence, between territories controlled by the IRG and the DFA, as shown in Figure 2 below (Aghajanian & Mele, 2023). It illustrates the increasing cost of essential food products in Yemen from 2017 to 2021, highlighting the economic disparities between IRG-controlled and DFA (Houthi-controlled) regions. Both areas experienced rising food prices due to macroeconomic instability, but the divergence became more pronounced after the 2019 currency split. In IRG areas, the sharp depreciation of the rial led to steeper price increases, while in DFA regions, monetary restrictions helped maintain relatively more stable prices. This disparity has worsened food insecurity, making basic goods unaffordable for many Yemenis, especially in IRG-controlled territories.

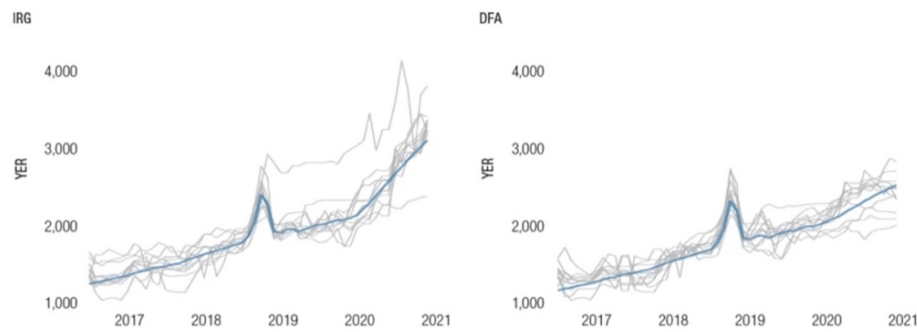


Figure 2: Cost of Food Products in DFA And IRG Controlled Area (From 2017 To 2021).

Source: (Aghajanian & Mele, 2023).

The industrial sector of the country has been severely damaged, resulting in a significant loss of jobs in the private sector for many Yemenis. Those employed in the public sector are facing irregular and inadequate compensation. Additionally, the value of the currency is continuously declining, making it difficult for many Yemenis to afford essential food products. Based on a study conducted by R. Joseph Huddleston, out of the 801 homes examined, 62% of the participants had resorted to selling their belongings in order to finance basic necessities such as food and water since 2015 (Huddleston, 2021).

3.2. Agriculture Disruptions

Prior to the conflict, agriculture accounted for 18 to 27% of the country's gross domestic product and the sector serves as a primary means of generating money for over 50% of Yemen's population (Direct or Indirect) and is a crucial foundation of the country's economy (FAO, 2018). However, the humanitarian crisis has severely impacted agricultural livelihoods, resulting in a significant decline in cereal and livestock production compared to levels before the crisis. The contributing issues encompass a workforce that is emigrating, displacements, a scarcity of public resources allocated to the agriculture sector, poor research and extension services, and restricted availability of high-quality inputs and services (FAO, 2019). The conflict has directly impaired crucial agricultural infrastructure, such as irrigation systems, storage facilities, and rural transit routes, rendering farming activities difficult to execute. In addition to the existing complexities, some fields remain uncultivated, scattered with land mines and unexploded ordnance, which present life-threatening hazards to farmers and

restrict the amount of land available for use.

The economy's volatility has resulted in widespread inflation, impacting both the prices of raw materials and the market values of agricultural goods. Markets are frequently inaccessible as a result of persistent war and blockades, which hinder farmers from selling their agricultural products and purchasing essential supplies. Domestic food production accounts for 30% of Yemen's total supply, with grain crops being the most affected. Despite this, 73% of Yemenis rely on agriculture and fisheries for their livelihoods. The price of locally produced wheat is higher than imported wheat, making it difficult for farmers to compete. This reduces their income while making domestic food less affordable for consumers. Additionally, water scarcity—exacerbated by climate change and conflict over water sources—limits irrigation, forcing many farmers to abandon their land. Humanitarian aid, covering 10% of total food imports, is a critical lifeline. A survey found that 65% of recipients could only meet some basic needs without assistance. Food insecurity is primarily driven by reduced purchasing power, with the Minimum Food Basket cost increasing by 483% in IRG areas and 188% in DFA areas (in Yemeni rials) due to currency depreciation, inflation, and global price shifts (FAO, IOM, ark, Acaps, & Join SDG-fund, 2023). In addition, the conflict has caused the displacement of a large number of agricultural workers, resulting in labor shortages that further decrease the productivity of the sector. Exacerbating these difficulties are heightened occurrences of pests and diseases, which proliferate unhindered as a result of the breakdown of agricultural assistance services.

The water scarcity situation in Yemen is one of the most severe globally, and the ongoing conflict has exacerbated the problem of accessing water. The destruction of infrastructure and the scarcity of fuel, which is essential for operating water pumps, severely impede irrigation, a crucial lifeline for agriculture in Yemen's dry terrain. Moreover, the diminished supply chains have resulted in a scarcity of crucial farming inputs such as seeds and fertilizers, causing a rise in expenses and a decline in agricultural production.

Following 2015, the war significantly exacerbated the problems faced by the agricultural industry. Agricultural areas and infrastructure were frequently targeted in conflicts, particularly in regions such as Sa'dah Governorate. The war resulted in a 50% decrease in the number of agricultural laborers and substantial migration from rural areas. The devastation of the food production infrastructure severely incapacitated the sector, intensifying dependence on imports and leading to Yemen experiencing the most severe food crisis in the world (Mundy, 2017).

3.3. Forced Displacement

The continuous conflict has not only resulted in extensive damage to infrastructure but has also sparked widespread fear and instability, forcing millions of people to flee their homes. As the conflict has decimated the economy, resulting in rampant inflation, widespread unemployment, and the complete breakdown of governmental services, a significant number of Yemenis, who were already experiencing extreme poverty, have been compelled to abandon their residences in pursuit of improved economic prospects and basic needs elsewhere, frequently ending up in equally unstable circumstances. Many families frequently have to relocate several times in order to obtain the necessary resources for their survival (Anaam, 2021). By December 2015, there were approximately 2.5 million internally displaced people (IDPs), marking an eightfold increase since the conflict began (IOM, 2015). The displacement crisis has persisted, as of March 2024, there are almost 4.5 million people in Yemen are internally displaced (WFP, 2024). In 2022 alone, there were 234,000 new displacements, underscoring the ongoing severity of the situation (UNHCR, 2024).

Moreover, the occurrence of disease outbreaks such as the widespread COVID-19, cholera, and diphtheria has significantly increased due to the breakdown of sanitary systems and healthcare services. As a result, many individuals have been forced to move in order to seek medical treatment and find safer living conditions. These health emergencies highlight the severe circumstances in displacement camps and other improvised shelters, where a significant number of Yemeni individuals who have been displaced ultimately reside (Abdullah et al., 2020).

3.4. Collapse in Healthcare System

On top of all, the healthcare system in the country is on the brink of collapse as a result of ongoing violence, an ongoing economic crisis, escalating food insecurity, and recurring disease outbreaks such as COVID-19 (NRC, July 2020), and Cholera (Lopour, 2017), all of which are worsened by climate-related incidents. Prior to the war, Yemen's healthcare system, despite its inherent weaknesses, was far superior to its current state. The infrastructure exhibited greater functionality, while health metrics, including immunization rates, child nutrition, and maternal health, demonstrated comparatively superior performance (Central Statistical Organization, The Pan Arab Program for Family Health, & ICF International, 2015). Examining a brief timeframe prior to and following the conflict, research has indicated that the occurrence of underweight children rose from 39% to 45%, while wasting increased from 16.3% to 20.4% between 2013

and 2016. Additionally, the proportion of children under the age of 5 who experienced recent diarrhea escalated from 31.2% to 42.7%. Moreover, the percentage of children aged 12-23 months who received complete vaccinations decreased from 38.2% to 22.4% during the same period (Bcheraoui, 2018).

The situation in Yemen has been deteriorating on all aspects including the health system and the response. The Yemen Health Cluster Bulletin for May and June 2023 emphasizes the critical state of the country's health sector, which is burdened by a multitude of issues. With the ongoing conflict, the healthcare infrastructure in Yemen is deteriorating, with a mere 56% of health facilities operating at full capacity and an additional 39% functioning partially (HeRAMS, 2023). This is primarily due to limitations in staff, funds, and power, as well as a lack of drugs, supplies, and equipment. This deterioration is exacerbated by severe funding shortages; in 2022, the system received only 25.8% of the required \$398 million, resulting in inadequate resources and excessive strain. The problems are exacerbated by economic volatility. The inflation of the Yemeni Rial has had a substantial influence on the economy, further complicating the ability of the delicate health system to operate efficiently. Although fuel is present in the market, exorbitant prices hinder the ability to obtain healthcare, especially in remote and conflict-ridden regions (Yemen Health Cluster, 2023).

4. THE EFFECT OF CIVIL WAR ON FOOD SECURITY IN YEMEN

Since the onset of the ongoing Yemeni Civil War, the conflict has caused extensive damage to civil infrastructure, resulting in the displacement of millions of people, disrupting the agricultural system, worsen the health system, and triggering an economic crisis. Consequently, there has been a widespread and severe shortage of food, leading to acute food insecurity. Yemen's economy has been severely damaged by the war, resulting in rampant inflation and high levels of unemployment. The Yemeni Rial has experienced a significant decline in its value, resulting in challenges for families to afford essential items. Economic system failures have direct repercussions on the accessibility and cost of food (Lackner, 2019). According to data from the World Food Programme (WFP) in 2024, approximately 18.6 million people require humanitarian assistance. Out of this number, around 17 million people, which is approximately 60% of the population, are experiencing food insecurity. They are classified as being in Crisis (IPC Phase 3) or worse (WFP, 2024). Approximately 16 million Yemenis lack access to clean water sources, with rural regions experiencing the greatest impact (OXFAM, 2024).

The consequences of the civil war have been severe on children and

women. Currently, there is a total of 9.8 million children that require humanitarian aid. Out of this number, 2.7 million children are experiencing acute malnutrition, with hundreds of thousands of them suffering from severe acute malnutrition, which is a critical condition that requires immediate treatment to prevent loss of life (UNICEF, 2024). Based to the 2022 UNFPA Humanitarian Response in Yemen report (UNFPA, 2022), over 77% of the 4.3 million displaced individuals in Yemen are women and children. Almost 26% of households that have been forced to leave their homes were led by women. This is a significant increase compared to the 9% of households headed by women before the violence intensified in 2015. Reported malnutrition in pregnant and breastfeeding mothers had significant consequences. The consequences included elevated rates of maternal and newborn death, reduced birth weight, and enduring developmental challenges for children. Reports indicate that a large number of Yemenis, including a significant proportion of children under the age of five and pregnant or lactating mothers, are experiencing severe malnutrition. The cause of this situation can be attributed to a confluence of factors including violence, economic instability, and insufficient humanitarian assistance, all of which have a detrimental impact on both the availability of food and the ability to address and control malnutrition and its related health issues (UNICEF, 2022).

The Saudi-led coalition's military action in Yemen against the Houthis resulted in a blockade of key ports in Yemen, which greatly contributed to the worsening of the country's humanitarian catastrophe. Commenced in 2017, this embargo was an integral component of the coalition's military strategy against the Houthis, with the objective of severing their supply routes. Nevertheless, the embargo has had extensive consequences on the civilian population, significantly impeding the distribution of food, fuel, medical supplies, and other vital commodities (Ratcliffe, 2017). As of early 2022, the United Nations estimated that the ongoing conflict in Yemen, which had been raging since 2015, had resulted in over 377,000 deaths, with approximately 60% of those fatalities attributed to indirect factors such as hunger, inadequate healthcare, and lack of access to clean water (BBC, 2023). In addition, as of December 2020, the war had already caused over 130,000 deaths due to similar indirect causes, including food shortages and the collapse of infrastructure (UN, 2020). Furthermore, Save the Children (Kara Fox, November 2018) had previously reported that nearly 85,000 children under the age of 5 had died from acute malnutrition between April 2015 and October 2018, highlighting the devastating impact of the conflict on the youngest and most vulnerable populations.

The extended war has inflicted significant harm on the country's economy. This led to a considerable decrease in household earnings and an

increase in joblessness. In the past, families that were able to maintain a comfortable standard of living with their salary are now seeing challenges in being able to acquire basic necessities such as flour and rice. In 2018, the price of a food basket in Yemen witnessed an increase of 60%, resulting in average food prices that are now 150% higher compared to the pre-conflict period. A significant proportion of the population, specifically 67%, face challenges in consistently obtaining an adequate amount of food due to either limited access or financial constraints (Imperial War Museums, 2018). High inflation rates present difficulties for persons who lack a source of income, as it amplifies the struggle of affording many expenses. Consequently, the increasing expense of living is leading to a rise in needs (Hassan, 2024).

Food insecure families employ various coping mechanisms to address food insecurity, these mechanisms range from reducing food intake to selling assets. Several households decide to decrease the frequency of meals and give priority to more affordable, but less nourishing, food options. This is a typical immediate reaction to a shortage of food and increased food costs (FAO, IOM, ark, Acaps, & Join SDG-fund, 2023). Many families frequently turn to borrowing money or food from their family, neighbors, or nearby stores. This establishes a recurring pattern of indebtedness that can prove challenging to break free from (Oxfam, 2021). In order to get food, families resort to selling their assets such as livestock, land, jeweler, and household items. While this may offer momentary relief, it poses a risk to one's long-term financial security (FAO, IOM, ark, Acaps, & Join SDG-fund, 2023; FAO, 2020).

Occasionally, children are employed to help improve the family's financial resources. In addition, early marriage is occasionally perceived as a means to decrease the number of individuals that a family is responsible for providing sustenance to (OXFAM, 2019). Families relocate to different regions, either inside Yemen or to neighboring countries, in pursuit of improved living circumstances and more reliable food provisions (FAO, 2020). A significant number of Yemenis heavily depend on food aid provided by international organizations such as the World Food Programme (WFP) and other non-governmental organizations (NGOs). This assistance is crucial, however sometimes inadequate as a result of funding deficits and accessibility challenges (FAO, IOM, ark, Acaps, & Join SDG-fund, 2023). Many families frequently reduce non-essential expenses, such as education, healthcare, and other fundamental services, in order to allocate additional cash to food (FAO, 2020).

These coping mechanisms reflect the critical circumstances in Yemen, where millions of people are experiencing acute food poverty and are compelled to make challenging decisions in order to stay alive. The ongoing humanitarian

response remains crucial in mitigating certain acute demands; however, it is imperative to implement long-term solutions to tackle the underlying causes of food insecurity in the region.

5. RESPONDING TO THE CRISIS: HUMANITARIAN EFFORTS AND CHALLENGES

Yemen was already among the most impoverished nations in the Arab region, struggling with persistent problems such as limited access to water, lack of food security, and inadequate economic progress. Humanitarian non-governmental organizations (NGOs) have been operating in Yemen since the 1920s, although their numbers have significantly increased in the last thirty years. Prior to 2014, humanitarian aid mainly concentrated on providing developmental assistance, healthcare initiatives, and emergency relief in response to occasional conflicts and natural calamities such as floods (Elayah & Matilda, 2021). Based on the 2014 Yemen Humanitarian Needs Overview report, which was published in late 2013, around 14.7 million individuals, accounting for 58% of Yemen's population, are involved in a humanitarian crisis and are in need of help. The origins of this susceptibility can be attributed to a combination of factors including inadequate economic progress, ineffective governance, environmental strains, population pressures, and persistent political instability. Severe destitution, worsened by a lack of chances for earning a living, leads to a pervasive lack of access to food and malnutrition affecting people of all ages. Among the individuals experiencing food shortages, 4.5 million are categorized as food insecure. Furthermore, over 1 million Yemeni children under the age of five were suffering from acute malnutrition, and out of these cases, 279,000 were classified as severe (OCHA, 2014).

International efforts to address the food insecurity crisis in Yemen are multifaceted, involving numerous organizations and strategies to mitigate one of the world's most severe humanitarian challenges. These efforts are recorded in diverse papers that offer valuable perspectives on both the efficacy and the obstacles of these initiatives. The humanitarian assistance initiatives aimed at alleviating the food insecurity situation in Yemen are vast and involve a wide range of foreign and local organizations. These efforts are of utmost importance considering the magnitude of the situation. During the second half of 2022, humanitarian food assistance has increased following the improved access facilitated by the truce (FAO, 2023), however, the humanitarian actors faced and continue to face daily hurdles such as access limits, bureaucratic impediments, and insecurity. The imposition of specific limitations on the mobility of female humanitarian workers significantly impedes the effective distribution of

assistance (European Commission, 2024). The delivery of humanitarian aid in Yemen is hindered by numerous constraints, greatly affecting the efficiency of missions. The issues stem from a confluence of persistent war, limitations on access, financial constraints, political intricacies, and logistical obstacles.

The ongoing conflict and frequent changes in control of territories hinder access to many areas. Airstrikes, ground battles, and blockades make it hard for those in need to receive aid. In addition, humanitarian workers face significant dangers, including kidnappings and assaults, which obstruct their efforts (NRC, 2024). In 2023, 3,300 incidents negatively affected aid distribution to over 5 million people, often due to bureaucratic delays, especially in Houthi-controlled regions (OCHA, January 2023). Indiscriminate attacks on civilian infrastructure and blockades worsen the crisis, making aid delivery challenging (ACF, 2019). Political constraints and safety risks further hinder the effectiveness of aid (Harvey, Stoddard, Czwarno, & Breckenridge, March 2022), while ongoing violence, including targeted attacks on health workers and abductions by groups like AQAP, exacerbate the situation (Reuters, August 2023). Weak governance and political interference also delay aid efforts and increase risks for humanitarian staff (United Nations, 2023).

The funding situation for tackling food insecurity in Yemen has been dire and frequently inadequate to adequately address the extensive demands of the population. Insufficient finance is a major obstacle that hampers the size and efficiency of humanitarian aid efforts, notwithstanding the severity of the crisis.

In 2023, there has been a huge change in the landscape of humanitarian aid for Yemen, as big donors have significantly reduced their commitments (Save The Children, September 2023). Indeed, other worldwide conflicts have had an impact on the financial resources allocated to humanitarian efforts in Yemen. The escalating worldwide problems, such as the COVID-19 pandemic and the conflicts in Syria, Ukraine, Sudan, and Gaza, have resulted in a reallocation of monies that were previously designated for Yemen. The emergence of these new emergencies has diverted international attention and resources from Yemen, further worsening its funding challenges (Al-Qaoud, 2024).

Yemen's humanitarian aid has experienced a reduction of 62% within a span of five years (Save The Children, 2023). The consequences of these funding constraints are immediate and severe: in the absence of adequate financial backing, food distribution programs are unable to function at their maximum capacity, potentially resulting in reduced food rations or complete lack of help for millions of individuals. Examining the 2024 Humanitarian Response Plan (UNOCHA, 2024), and comparing it with 2023 plan, we notice that the total number of people in need in the food security and agriculture sector has increased

from 17.4M to 17.6M, while the total number of people targeted has reduced from 14.8M to 12.8M, and consequentially the financial requirement reduced by 38% from 2.2B USD in 2023 to 1.36 M USD in 2024.

The below figure presents the humanitarian response plan trends within the timeframe from 2019 to 2023, in addition, the funding requirements and received (UNOCHA, 2024).

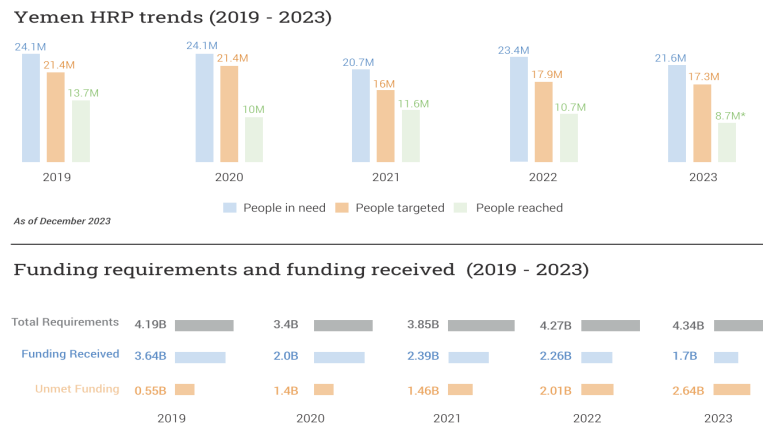


Figure 3: The Humanitarian Response Plan Trends and Funding Status from 2019 to 2023.

Source: (UNOCHA, 2024).

Humanitarian aid has generated widespread skepticism and cynicism globally due to the frequent failure of humanitarian organizations to accomplish their objectives and assist both vulnerable citizens and relief workers. Humanitarian aid is often seen as a readily available resource that may be used to provide financial support to different groups involved in conflicts in unstable countries. This can inadvertently contribute to the establishment of war economies, where the charity money ends up funding combat activities and supporting the front lines of these conflicts (Findley, 2018). The UN Inter-Agency Humanitarian Evaluation Steering Group conducted a report in July 2022 that provided a negative assessment of the humanitarian response in Yemen. The report emphasized that the quality of aid provided was frequently deemed unacceptable. Yemeni individuals who were impacted expressed a lack of clarity regarding the methods to obtain aid and the procedures required to be included in the assistance program. The widespread discontent has been expressed through a social media movement using the hashtag #WhereIsTheMoney, in which

Yemenis have called for increased openness and raised doubts about the effectiveness of the relief provided. All of this criticism suggests that in order to actually reduce human suffering in Yemen, the international humanitarian community must address a number of major problems. A weak approach that prioritizes short-term solutions, unhelpful neutrality and impartiality positions, a reluctance to speak out against the mistreatment of relief and humanitarian workers by warring parties, and insufficient participation of Yemeni professionals are among the issues (Nasser, 2022).

6. CONCLUSION

The conflict in Yemen has severely damaged the country's agriculture sector, economy, and overall welfare, leading to one of the world's worst humanitarian crises. The war has devastated agricultural infrastructure, reduced productivity, and displaced many farmers, exacerbating food insecurity. Yemen's economy, already fragile before the war, has deteriorated significantly. Destruction of infrastructure disrupted trade, and loss of foreign investment have caused inflation and devaluation of the Yemeni Rial. The conflict has split Yemen into two separate economies, increasing living costs and deepening poverty. Now, there are around 4.5 million Yemenis are internally displaced, struggling to access food, water, sanitation, and healthcare. Many rely on coping mechanisms like reducing food intake, borrowing, or selling assets, which undermine long-term stability. The war has also crippled the healthcare system, leading to malnutrition and worsening food insecurity, particularly among vulnerable groups such as mothers and children. Humanitarian efforts are hampered by restricted access, political interference, and reduced international funding, limiting aid distribution and aggravating food insecurity. It's critical to highlight the severe economic damage that the war has caused, noting that it has destroyed vital infrastructure needed for trade and agricultural productivity and has ultimately affected food supplies directly. Although aid provides temporary relief for certain aspects of food insecurity and that's what the actors have been focusing on in the past period, however, now it is essential to implement durable solutions that target the root causes of the problem.

To address the pressing food security crisis in Yemen and in similar context, policymakers and humanitarian aid workers should consider the following recommendations:

- Enhance Humanitarian Funding: International donors should augment and guarantee the consistency of humanitarian funding. Sufficient and prompt funding is essential for the sustenance and development of food assistance programs.

- Improve Access to Aid: It is critical to engage in negotiations with all parties implicated in the conflict, aiming to secure unrestricted access to humanitarian supplies. Streamlining bureaucratic and logistical impediments is crucial for efficient aid delivery. To promote agricultural recovery, it is crucial to invest in the restoration of agricultural infrastructure and provide farmers with essential resources, including seeds, tools, and irrigation equipment. These measures will contribute to the revival of food production. Efforts to enhance agricultural techniques should prioritize the implementation of training programs.
- Address Economic Stability: It involves implementing measures to limit inflation and boost the value of the currency. The primary objective of economic policies should be to prioritize the creation of employment opportunities and enhance household incomes.
- Promote Long-term Solutions: While providing immediate humanitarian assistance is crucial, it is necessary to implement longer-term strategies to tackle the underlying causes of food insecurity. This includes the promotion of sustainable farming methods, improvement of water management, and cultivation of economic resilience.
- Safeguarding Vulnerable Populations: Particular emphasis should be placed on addressing the requirements of vulnerable populations, such as women and children. Programs targeting the prevention of hunger, enhancement of healthcare accessibility, and guaranteeing uninterrupted schooling are crucial for these populations.

Beyond these efforts, however, the successful conclusion of negotiations is of great importance in order to achieve a lasting peace in the country. Various international initiatives have been launched to end the civil war that began in 2014. Despite the Geneva Conferences held in 2015 and the Kuwait Talks in 2016, a permanent ceasefire could not be achieved. Although an initial agreement was reached between the Yemeni government and the Houthi rebels within the scope of the Stockholm Agreement in 2018, the process failed once again. Ongoing conflicts and external interventions have emerged as the main factors complicating the peace process. At this stage, the inclusion of Saudi Arabia and Iran, as the most important external actors in the conflict and who provide military and political support to groups in Yemen in line with their own strategic interests, in the peace talks could be an important step in resolving the civil war.

7. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

8. FINANCIAL SUPPORT

No funding or support was used in this study.

9. AUTHOR CONTRIBUTIONS

Z.A.A., P.A.: Conceptualization; 50%-50%

Z.A.A., P.A.: Design; 50%-50%

Z.A.A., P.A.: Supervision; 50%-50%

Z.A.A., P.A.: Data collection and/or processing; 50%-50%

Z.A.A., P.A.: Analysis and/or interpretation; 50%-50%

Z.A.A., P.A.: Literature review; 50%-50%

Z.A.A., P.A.: Writing; 50%-50%

Z.A.A., P.A.: Critical review; 50%-50%

10. ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS

Ethics committee approval is not required for the article.

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DOES CORPORATE GOVERNANCE MATTER FOR INSTITUTIONAL INVESTORS? INSIGHTS FROM INTERNATIONAL EVIDENCE¹



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ABSTRACT

We examine the impact of firms' board structure, as a significant provision of firm-level corporate governance mechanism, institutional investors' investment decisions. The results show that firms with independent board members, a higher representation of women on their boards, and a separation between CEO and chairman roles share characteristics that attract institutional investors, encouraging them to invest in these firms' shares. Furthermore, the number of board members does not have a effect on the investment decisions of institutional investors. Similar results are observed for domestic and foreign institutional investors, indicating that these sub-groups share common factors influencing their investment decisions, except for the factor of CEO duality. The findings are robust to several sensitivity tests, including alternative measures of firm-level corporate governance, controlling for country fixed effects, and including additional control variables.

Keywords: Institutional investor, corporate governance, board structure

JEL Codes: G34, L25, M41

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KURUMSAL YÖNETİM KURUMSAL YATIRIMCILAR İÇİN ÖNEMLİ Mİ? ULUSLARARASI KANITLARDAN ÇIKARIMLAR



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ÖZ

Bu çalışma, firmaların yönetim kurulu yapısının, kurumsal yönetim mekanizmasının önemli bir unsuru olarak, kurumsal yatırımcıların yatırım kararları üzerindeki etkisini incelemektedir. Bulgular, bağımsız yönetim kurulu üyelerine sahip olan, yönetim kurullarında kadın temsili daha yüksek olan ve CEO ile yönetim kurulu başkanı rollerinin ayrıldığı firmaların, kurumsal yatırımcıları çekme ve bu firmaların hisselerine yatırım yapmaya teşvik etme özelliklerine sahip olduğunu göstermektedir. Ek olarak, firma yönetim kurulu üye sayısının kurumsal yatırımcıların yatırım kararları üzerinde benzer bir etkisi bulunmamaktadır. Yerli ve yabancı kurumsal yatırımcılar için benzer sonuçlar gözlemlenmiş olup, CEO'nun çift rol üstlenmesi (CEO duality) faktörü dışında bu alt grupların yatırım kararlarını etkileyen ortak faktörlere sahip olduğu görülmüştür. Elde edilen bulgular firma düzeyinde kurumsal yönetimin alternatif ölçümlerini kullanarak, ülke sabit etkilerini kontrol ederek ve ek kontrol değişkenlerini dahil ederek güvenilirliği test edilmiştir.

Anahtar Kelimeler: Kurumsal yatırımcı, kurumsal yönetim, yönetim kurulu yapısı

JEL Kodları: G34, L25, M41

Alan: İşletme

Türü: Araştırma

1. INTRODUCTION

The number of shares held by groups of investors around the world has changed significantly in recent years. Specifically, institutional shareholdings has raised, while individual shareholdings has declined. This shift is particularly notable in the United Kingdom (UK). As of 2018, individual investors' shareholdings had declined to 13.5%, while institutional investors, such as insurance companies and pension funds, emerged as the dominant shareholders. Similarly, in Japan, the proportion of shares held directly by individual investors dropped from approximately 30% in 1980 to 18% in 2021. A comparable trend has been observed in the United States (US), where individual investors, who were dominant shareholders in publicly listed companies until the 1980s, have been increasingly replaced by institutional investors. In Turkey, by the end of 2020, institutional investors accounted for only 9% of corporate ownership structures (Medina, De La Cruz & Tang, 2022).

One of the reason of increasing shareholdings held by institutional investors lies in the imperfections of financial markets. In a perfect market, all information is freely accessible, securities can be traded in any desired quantity and volume, and transaction costs do not exist (Fama, 1970). However, in the real world, these ideal conditions are not met, and institutional investors can serve to mitigate the resulting market inefficiencies (Dağlar, 2007). For example, institutional investors play a crucial role in ensuring the proper functioning of the financial system. They are specialized financial institutions that raise savings from small investors and manage these funds with acceptable risk levels, aiming for return maximization and maturity matching (Aras, 2003). In addition, institutional investors play a pivotal role in shaping modern publicly traded companies through three core functions: acting as informed investors, monitoring management, and providing advisory services. Their ability to collect and utilize information significantly contributes to the development of capital markets by promoting efficient transactions, enabling accurate risk assessments, and supporting governance systems (Gillan & Starks, 2003; Gillan & Starks, 2007). Furthermore, institutional investors also play a significant role in capital markets through their substantial holdings. Their large shareholdings incentivize them to monitor and discipline corporate managers, actively gather information and counteract stock mispricing. As a result, firms with high proportions of institutional ownership often demonstrate improved information efficiency and a lower likelihood of stock mispricing (Boehmer & Kelley, 2009). Research suggests that companies with greater institutional investor participation are less likely to experience stock return irregularities, including those related to accrual-based anomalies (Collins, Gong & Hribar, 2003; Green, Hand & Soliman, 2011),

momentum effects (Hanson & Sunderam, 2013) and post-earnings announcement drift (Bartov, Radhakrishnan & Krinsky, 2000; Ali, Durtschi, Lev & Trombley 2004; Ke & Ramalingegowda, 2005). Previous studies also show that institutional ownership increases firm market value (Ferreira & Matos, 2008), reduces the cost of debt (Elyasiani, Jia & Mao, 2010), promotes better information disclosure (Bird & Karolyi, 2016), and improves governance standards in countries with weaker investor protections (Aggarwal, Erel & Matos, 2011).

In the light of aforementioned benefits of institutional investors to both firm and capital markets, understanding their preferences is of critical importance. In other words, the questions to address are: which companies do institutional investors prefer, and what are the characteristics of these companies? Extant literature provides useful insights about these questions. For example, Velte (2023) highlights that institutional investors are heterogeneous, and differences in investor categories (e.g., long-term sustainable investors, foreign institutional investors, or independent institutions) can significantly influence investment decisions. Supporting this view, Drobetz, El Ghoul, Fu and Guedhami (2023) and Hong and Shore (2023) argue that long-term investors, such as pension funds and university endowments, often prioritize social norms. In contrast, hedge funds and other short-term-oriented institutional investors primarily focus on financial gains. Additionally, empirical evidence indicates that ESG (Environmental, Social, and Governance) factors matter for institutional investors in their portfolio management activities (Amel-Zadeh & Serafeim, 2017; Barko, Cremers, & Renneboog, 2018; Eccles, Serafeim, & Krzus, 2011; Hanson, Lyons, Bender, Bertocci & Lamy, 2017). Moreover, institutional investors can be grouped as domestic and foreign institutional investors and previous studies document that these two groups may have different preferences in their investment decision process, too. For example, Ferreira and Matos (2008) mentioned that foreign and domestic institutions exhibit differing stock preferences, with foreign institutions showing a preference for stocks that are both cross listed on U.S. exchanges and part of the Morgan Stanley Capital International All Country World Index (MSCI ACWI). Aggarwal et al. (2011) highlight that foreign institutional investors tend to favor firms with similar characteristics, such as strong governance. Yıldız, Karan and Ozkan (2019) observe that foreign institutional investors tend to favor firms with larger boards and lower insider ownership when making investment decisions. Conversely, domestic investors, utilizing their knowledge advantage, are more inclined to invest in smaller firms and companies operating within the local market (Coval & Moskowitz, 1999). Foreign institutional investors are expected to uphold strong corporate governance practices to secure their investments. Unlike domestic institutional investors, who often have close

business relationships with local companies, foreign institutional investors generally have fewer local connections (Ferreira & Matos, 2008). Wahab, How and Verhoeven (2008) mentioned that institutional investors investments are positively and significantly related to corporate governance. Al-Najjar (2010) suggests that institutional investors are more likely to invest in firms with good corporate governance. McCahery, Sautner and Starks (2016) observe that one of the most important factors for institutional investors' decision is corporate governance practices like board independence. Shahid and Abbas (2019) mentioned that good corporate governance practices positively effects investor confidence and investment decisions. Considering these differences, understanding how firms' corporate governance structures influence the preferences of foreign and domestic institutional investors represents a key focus for academic research.

This study investigates whether firms' board structure, as a significant provision of firm-level corporate governance mechanism, attracts institutional investors, using 12,252 firm-year observations from 44 countries. The results indicate that firms with more independent board members, more women members on their boards, and separated CEO and chairman positions attract institutional investors' attention and encourage them to invest in their shares. On the other hand, the number of board members in firms does not influence institutional investors' investment decisions. Similar results are observed for domestic and foreign institutional investors, except for the factor of CEO duality, suggesting that these sub-groups share common factors influencing their investment decisions. The findings are robust to several sensitivity tests. Specifically, we perform robustness checks using alternative measures of firm-level corporate governance, controlling for country fixed effects, and incorporating additional control variables.

This study contributes to literature in several ways. First, it differs from previous studies focusing on a single country context by providing international evidence based on a large data set. This provides a more comprehensive understanding of the relationship between firm-level corporate governance practices and institutional investors across countries. Second, the study employs three distinct measures to represent institutional investors: total institutional investors, domestic institutional investors, and foreign institutional investors. By focusing on these different institutional investor groups, this study provides useful insights about whether the impact of firm-level corporate governance differs between these institutional investor groups. Third, corporate governance is proxied and examined through firm' board structure, which is directly responsible for firm management, with four variables: board size, the rate of

independent directors among all directors, the rate of female directors among all directors and whether the CEO also serves as the board chair.

The structure of the study is as follows. In the second section, the relationship between corporate governance practices and institutional investor preferences is discussed and the hypotheses are presented. In section three, the data and methodology are explained. In section four, we provide the results of the analysis. The study concludes with section five.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Corporate governance provisions can enhance institutional investors' confidence, contributing to the sustainable success of firms. The relationship between firms' corporate governance provisions and institutional investors' attention to firms' shares can be discussed under several theoretical frameworks encompassing stakeholder theory, resource based view, and agency theory. Specifically, stakeholder theory suggests that effective corporate governance ensures the protection of all stakeholders' rights, including investors, thereby fostering long-term value creation. From the perspective of the resource based theory, a strong governance structure serves as a valuable internal resource that provides a competitive advantage. Similarly, agency theory suggests that strong corporate governance mechanisms mitigate agency conflicts by aligning the interests of managers and institutional investors, reducing opportunistic behavior, and enhancing accountability. Thus, by employing strong firm-level governance provisions, firms can attract more attention from institutional investors. Regarding board characteristics, board independence strengthens oversight and reduces agency conflicts, female board representation enhances diversity and decision-making quality, and CEO duality may either consolidate leadership efficiency or pose risks related to excessive power concentration.

Given that the corporate governance system provides protection for shareholders, effective governance can boost investor confidence, leading to an increase in stock prices. Consequently, firms can raise additional capital, providing more funds for corporate investments. In addition, strong corporate governance attracts cross-border investors to purchase shares in domestic companies (Shahid & Abbas, 2019). Since empirical findings demonstrate the significant influence of corporate governance practices on investment decisions, it is reasonable to expect institutional investors to place emphasis on firm corporate governance when making investment decisions. As stated in Leuz, Lins and Warnock (2009), corporate governance factors should be considered by institutional investors when making investment decisions. Similarly, Gillan and

Starks (2007) demonstrate that institutional investor activism in the US has concentrated on corporate governance matter since 2000, underscoring the importance of corporate governance on the firm-level to institutional investors. Furthermore, previous work shows that investors with a preference for growth tend to allocate their portfolios toward firms with "stronger" board features, highlighting that investors' perceptions of board-level governance provisions are essential for companies with significant growth prospects (Bushee, Carter & Gerakos, 2014). Relatedly, in a recent study, Feng et al. (2024) report that firms with enhanced governance mechanism regarding sustainability related issues attract more cross-border equity investment, suggesting foreign institutional investors take firms' sustainability related governance mechanisms into account. They underline that information asymmetry and corporate reputation are the two factors through which firms influence foreign institutional investors' decisions.

Relatedly, Schnatterly and Johnson (2014) suggest that institutional investors assess a firm's governance characteristics to decide whether to add it to their portfolios, as these characteristics can significantly influence performance. McCahery et al. (2016) use a straightforward approach to investigate institutional investors' preferences by conducting a survey among long-term-focused institutional investors, examining corporate governance both perspectives from firm and country. Their results reveal that the most important factors for institutional investors include equity-based compensation, management equity ownership, accountability, high free float and board independence. De La Hoz, Pombo and Taborda (2018) suggest that institutional investors (like pension funds and insurance companies) prioritize corporate governance mechanisms that align with the agency theory perspective, whereas independent investors concentrate on business opportunities in accordance with the resource-based view of the board of directors. Bansal and Themnozhi (2019) indicates that institutional investors favor the norm of board independence and reward affected firms by increasing their investments during the post-mandate period. Therefore, results indicate a positive association between a higher presence of independent directors and greater institutional ownership. Pombo and De La Hoz (2021) investigates institutional investors' preferences for board attributes in emerging markets with low investor protection and finds that grey investors (e.g., pension funds, insurance companies) prefer directors with graduate degrees and diverse demographics, while independent investors (e.g., mutual funds, investment firms) place emphasis on managerial and entrepreneurial experience. The results highlight investor heterogeneity in board composition preferences.

In addition to these studies, previous work also focuses on different types of institutional investors (e.g. domestic vs foreign) and provides useful insights

to better understand the factors that may affect their investment decision. Domestic institutional investors have extensive knowledge of the local business environment, regulatory framework, cultural dynamics, local potential, and opportunities at the national level (Taran & Mironiuc, 2018). It is widely argued that domestic institutional investors have a strong motivation to recover their investments and earn dividend income (Iwasaki & Mizobata, 2018). Domestic institutional investors possess a significant information advantage over foreign investors in emerging markets. Unlike foreign institutional investors, domestic institutional investors experience lower monitoring costs because they are not hindered by the liabilities of foreignness. Moreover, domestic institutional investors benefit from informal networks that enable rapid information transmission, in contrast to the slower, formal channels such as analyst reports and business media (Caixe, Pavan, Maganini & Sheng, 2024). As for foreign institutional investors, extant literature shows that they tend to diversify their holdings across broad portfolios due to higher levels of information asymmetry (Cai, Lee, Xu & Zeng, 2019). To oversee managerial actions, they implement control measures like regular reporting systems and oversight mechanisms (Abor & Biekpe, 2007; Lu & Li, 2019). In addition, foreign institutional investors promote awareness of international corporate governance standards among managers (Nguyen, Pham, Dao, Nguyen & Tran, 2020), cultivating a culture of effective governance within the organization, which in turn, motivates managers to act ethically, make sound investment decisions, and ultimately improve the company's overall performance (Bhatia & Kumari, 2024).

There are two views in the literature regarding the differences between domestic and foreign institutional investors. On the one hand, it is argued that foreign institutional investors are more experienced compared to their domestic counterparts (Grinblatt & Keloharju, 2000). On the other hand, an alternative view suggests that both groups are equally experienced, though foreign investors may be less well-informed than domestic investors (Covrig, Lau & Ng, 2006). However, despite potential differences in information access, both types of investors may target companies with similar characteristics (Liu, Bredin, Wang & Yi, 2014). Specifically, previous studies suggest that foreign and domestic institutional investors may exhibit similar investment preferences (Kang & Stulz, 1997, Grinblatt & Keloharju, 2000, Covrig, et. al., 2006, Chang, 2010).

Another strand of the literature shows that domestic and foreign institutional investors share several common investment preferences, despite exhibiting some differences (Ferreira & Matos, 2008). For example, Aggarwal et al. (2011) suggest that foreign institutional investors possess greater experience in international markets compared to domestic institutional investors, making

them more informed and aware of the importance of stronger corporate governance practices. Also, Liu et. al., (2014) examines the differences in investment preferences between domestic and foreign institutional investors in China. The results indicate that domestic institutional funds prioritize basic financial indicators in their investment decisions, while foreign institutional investors focus more on corporate governance aspects, such as management compensation. In addition to the above literature, studies show that foreign and domestic institutional investors both play a role in monitoring investee firms, while foreign institutional investors are generally more active in demanding changes to corporate governance. This difference arises because domestic institutional investors often maintain stronger business relationships with investee firms, which can lead to a greater sense of loyalty to management (Ferreira & Matos 2008; Gillan & Starks, 2003).

In line with previous studies, therefore, we posit that institutional investors (and its sub-groups, namely domestic and foreign) place significant emphasis on firm corporate governance provisions, which is proxied by firm board structure. We formulate our testable hypotheses as follows:

H1: Institutional investors (total, domestic and foreign) prefer to invest in firms with strong board structure.

3. DATA AND METHODOLOGY

3.1. Data and Research Sample

We start with all publicly available non-financial firms available on Refinitiv. We use Refinitiv as the primary data source due to its comprehensive coverage of firm-level governance and financial information. The sample of the study covers the period from 2010 to 2020. Firms with missing values for total institutional investors, domestic institutional investors, or foreign institutional investors are excluded to ensure data completeness and consistency. After removing firms with incomplete or missing information, the final sample includes 12,252 firm-year observations from 44 countries (these are the countries with firms having information of the key variables of the study). Firm-level total institutional investors, domestic institutional investors, foreign institutional investors, corporate governance score and firm-level financial data is obtained from Refinitiv. Last, county-level GDP and GDP growth are obtained from the World Bank. The sample distribution by country is documented in Table 1.

Table 1: Distribution of Sample, Institutional Investors and Board Structure Measures

	Number of obs.	Total Institutional Investors	Domestic Institutional Investors	Foreign Institutional Investors	Board size	Board independence	Board gender	CEO duality
Argentina	8	0.182	0.000	0.182	15.500	31.108	11.779	0.375
Australia	1535	0.129	0.027	0.102	6.371	59.896	13.539	0.130
Austria	56	0.115	0.022	0.094	12.286	58.372	18.996	0.000
Belgium	86	0.220	0.023	0.197	12.093	39.880	22.313	0.326
Brazil	100	0.192	0.060	0.132	10.110	29.941	6.407	0.220
Canada	338	0.341	0.143	0.198	8.456	71.444	10.421	0.432
Chile	12	0.094	0.013	0.081	8.250	27.539	0.000	0.167
China	625	0.073	0.058	0.015	9.426	38.269	13.375	0.214
Colombia	17	0.062	0.000	0.062	8.353	47.888	20.278	0.000
Denmark	44	0.315	0.034	0.281	10.273	56.115	26.219	0.068
Finland	11	0.245	0.049	0.196	6.636	98.990	26.843	0.000
France	292	0.250	0.057	0.192	13.195	53.537	33.598	0.640
Germany	191	0.254	0.046	0.208	13.770	44.065	23.430	0.115
Greece	7	0.429	0.005	0.424	8.286	39.886	25.566	0.000
Hong Kong	1020	0.140	0.015	0.125	10.798	38.103	11.059	0.377
India	469	0.178	0.053	0.125	11.143	51.189	10.186	0.299
Indonesia	126	0.119	0.005	0.114	6.603	40.386	4.935	0.119
Ireland	18	0.429	0.006	0.422	11.778	60.149	15.572	0.056
Israel	49	0.095	0.021	0.074	9.265	40.707	17.109	0.204
Italy	102	0.213	0.026	0.187	12.176	58.144	25.365	0.176
Japan	1474	0.168	0.058	0.109	12.593	17.878	3.447	0.349
Korea	490	0.135	0.008	0.127	9.606	52.539	1.364	0.396
Malaysia	325	0.090	0.010	0.080	9.068	48.650	15.995	0.138
Mexico	65	0.140	0.021	0.119	12.677	47.965	2.694	0.462
Netherlands	80	0.306	0.022	0.284	7.088	78.707	24.526	0.075
New Zealand	173	0.129	0.027	0.102	6.792	76.696	24.413	0.029
Norway	12	0.184	0.090	0.094	8.667	32.727	38.007	0.167
Peru	24	0.185	0.135	0.050	9.125	34.627	10.210	0.292
Philippines	125	0.134	0.001	0.133	9.832	27.618	7.290	0.552
Poland	20	0.185	0.126	0.059	8.600	29.274	22.291	0.000
Portugal	31	0.186	0.008	0.178	14.000	45.754	17.123	0.516
Qatar	14	0.032	0.001	0.031	9.000	22.277	0.000	0.000
Russia	108	0.109	0.001	0.109	11.481	32.669	5.970	0.222
Saudi Arabia	27	0.006	0.001	0.006	9.111	31.335	1.211	0.037
Singapore	228	0.129	0.028	0.101	9.868	60.759	11.014	0.162
South Africa	515	0.212	0.053	0.159	11.678	57.624	22.244	0.126
Spain	94	0.225	0.034	0.191	13.181	45.561	16.225	0.564
Sweden	21	0.386	0.192	0.194	8.429	77.793	28.589	0.286
Switzerland	158	0.267	0.086	0.180	8.044	41.734	11.167	0.209
Taiwan	398	0.120	0.009	0.112	10.440	21.470	12.115	0.324
Thailand	28	0.050	0.002	0.049	12.536	45.308	13.071	0.036
Türkiye	28	0.095	0.001	0.094	11.821	27.968	24.679	0.107
UK	1333	0.421	0.228	0.193	8.623	56.682	19.033	0.098
US	1375	0.609	0.533	0.076	8.233	73.891	12.908	0.508
Total	12,252							

Total 12,252

As reported in Table 1, Australia has the largest number of observations (1,535), followed by Japan (1,474), the UK (1,335), and the US (1,333) firm-year observations, respectively. Regarding total institutional investors, Greece and Ireland exhibit the highest values over the sample period. In terms of domestic institutional investors, the US records the highest value (0.533), while Greece has the highest foreign institutional investors values (0.424). Firms in Saudi Arabia

have the lowest value for total institutional investors (0.006). Argentina shows the lowest value for domestic institutional investors (0.000), followed closely by Qatar, Russia, Saudi Arabia, and Türkiye (0.001). Saudi Arabia (0.006) also records the lowest value for foreign institutional investors. Regarding the board structure, Argentina (15.500), Finland (98.990), Norway (38.007) and France (0.640) have the highest board size, board independence, board gender and CEO duality over the sample period, respectively. On the other hand, firms in Australia (6.371), Japan (17.878), Chile (and Qatar) (0.000) and Australia (and Colombia, Finland, Greece, Poland, Qatar) (0.000) have the lowest board size, board independence, board gender and CEO duality over the sample period, respectively.

3.2. Methodology

As the sample of the study consists of the observations with both a time dimension (2010–2020) and a cross-sectional dimension (firms from 44 countries), a panel data regression analysis is employed. This approach allows us to control for unobserved heterogeneity, capture both firm-specific and time-specific effects, and improve estimation efficiency compared to cross-sectional or time-series models. During the initial stage of our analysis, we test whether firm-level board structure affects institutional investors participation by using the following model:

$$\text{Institutional Investors}_{it} = \text{Board Structure}_{it} + X_{it} + Y_{it} + \varepsilon_{i,t}(1)$$

In Equation 1, X and Y denote firm- and country-specific variables, respectively. Subscripts i and t represent the firm and year, respectively. In line with earlier studies, we control for firm size (*Firm size*), leverage (*Leverage*), tobin q (*Tobin Q*), foreign sales (*Foreign sales*), return on assets (*ROA*), dividend (*Dividend*) as firm-specific variables. Regarding the country-specific factors, we control GDP per capita (*GDP*) and GDP growth rate (*GDP growth*). We also include year and industry fixed effects in all estimations. To minimize the effects of outliers, we winsorize *firm-level financial variables* at the 1% and 99% levels. The standard errors are robust to heteroscedasticity and clustered at a firm level for autocorrelation (Chen, Han, Li, Megginson & Zhang, 2022).

3.3. Definitions of Variables

The variables included in the models used in the study, along with their definitions and sources, are presented in Table 2.

Table 2: Variable Definitions and Data Sources

Variable	Definition	Source
Total Institutional Investors	The percentage of shares held by total institutional investors at time t	Refinitiv
Domestic Institutional Investors	The percentage of shares held by domestic institutional investors at time t	Refinitiv
Foreign Institutional Investors	The percentage of shares held by foreign institutional investors at time t	Refinitiv
Firm size	Natural logarithm of total assets	Refinitiv
Leverage	Total Debt divided by Total Assets.	Refinitiv
Tobin Q	The market value of assets divided by the book value of assets.	Refinitiv
Foreign sales	Foreign Sales divided by Total Sales.	Refinitiv
ROA	Net Income divided by Total Assets.	Refinitiv
Dividend	Dividends paid divided by Net Income.	Refinitiv
Board size	Total number of board members.	Refinitiv
Board independence	Independent Board Member/Total Board Member	Refinitiv
Board gender	Female Board Member/Total Board Member	Refinitiv
CEO duality	If the CEO is the Chairman of the Board, 1, otherwise 0	Refinitiv
Governance score	Refinitiv ESG's G-score	Refinitiv
Anti-self-dealing index	The measure shows legal protection of external and minority shareholders against expropriation by insiders. Higher values of the index show stronger protection for outside investors.	Djankov et. al. (2008)
GDP	Gross domestic Product per capita.	World Bank
GDP growth	Annual percentage change in GDP per capita.	World Bank

4. RESULTS

4.1. Summary Statistics

Table 3 presents the summary statistics of the variables used in the analyses.

Table 3: Summary Statistics

Variable		Obs	Mean	Std. Dev.	Min	Max
Total Institutional Investors		12,252	0.239	0.216	0.000	1.000
Domestic Institutional Investors		12,252	0.115	0.197	0.000	0.998
Foreign Institutional Investors		12,252	0.124	0.116	0.000	1.000
Firm size		12,252	9.426	0.754	4.623	12.024
Leverage		12,252	0.241	0.187	0.000	0.914
Tobin Q		12,252	1.688	1.867	0.309	13.773
Foreign sales		12,252	0.302	0.352	0.000	1.000
ROA		12,252	0.029	0.149	-1.081	0.326
Dividend		12,252	0.025	0.028	0.000	0.167
Board size		12,252	0.097	0.036	0.010	0.290

Board independence	12,252	0.491	0.241	0.000	1.000
Board gender	12,252	0.131	0.130	0.000	0.750
CEO duality	12,252	0.276	0.447	0.000	1.000
Governance score	12,252	0.468	0.222	0.003	0.985
Anti-self-dealing index	12,211	3.822	1.062	1.000	5.000
GDP	12,252	12.284	0.584	11.166	13.331
GDP growth	12,252	0.033	0.076	-0.338	0.399

As reported in Table 3, the mean values of the institutional investors indicators; total institutional investor, domestic institutional investors, and foreign institutional investors are 0.239, 0.115, and 0.124, respectively. Regarding the performance indicators, size, leverage, Tobin's Q, foreign sales, ROA and dividend have the mean value of 9.426, 0.241, 1.688, 0.302, 0.029 and 0.025, respectively. As for firms' board structure variables, the mean value of the variables board size, board independence, board gender, CEO duality, and governance score are 0.097, 0.491, 0.131, 0.276, and 0.468, respectively. Last, the country-level variables anti-self-dealing index, GDP and GDP growth have mean values of 3.822, 12.284 and 0.033, respectively.

4.2. Correlation Analysis

The relationships between the variables used in the study are presented, using correlation analysis. The results of the correlation analysis are presented in Table 4.

Table 4: Correlation Analysis

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) Total Institutional Investors	1.000															
(2) Domestic Institutional Investors	0.847**	1.000														
(3) Foreign Institutional Investors	0.425**	-0.120**	1.000													
(4) Firm size	-0.011	-0.020**	0.183**	1.000												
(5) Leverage	-0.047**	0.031**	-0.035**	0.084**	1.000											
(6) Tobin Q	0.083**	0.073**	0.030**	0.025**	-0.211**	1.000										
(7) Foreign Sales	0.093*	-0.000	0.268*	0.151*	0.007	-0.000	1.000									

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4.3. Main Results

Table 5 documents the estimation results for the impact of firms' board structure on the level of institutional investors.

Table 5: Regression Analysis of Main Model

Variables	(1) Total Institutional Investors	(2) Domestic Institutional Investors	(3) Foreign Institutional Investors
Firm size	0.005* (0.003)	-0.004** (0.002)	0.009*** (0.003)
Leverage	-0.012 (0.019)	0.010 (0.017)	-0.022** (0.011)
Tobin Q	-0.000 (0.002)	-0.002 (0.002)	0.002 (0.002)
Foreign Sales	0.066*** (0.010)	-0.000 (0.008)	0.066*** (0.008)
ROA	0.075** (0.029)	0.035 (0.028)	0.040*** (0.015)
Dividend	-0.265** (0.106)	-0.088 (0.092)	-0.177*** (0.059)
Board size	0.009 (0.115)	-0.104 (0.087)	0.112 (0.098)
Board independence	0.340*** (0.018)	0.256*** (0.015)	0.085*** (0.012)
Board gender	0.102*** (0.026)	0.043** (0.022)	0.059*** (0.017)
CEO duality	0.018** (0.007)	0.027*** (0.007)	-0.009* (0.005)
GDP	0.161*** (0.007)	0.180*** (0.007)	-0.019*** (0.005)
GDP growth	-0.150*** (0.027)	0.009 (0.021)	-0.159*** (0.018)
Constant	-1.993*** (0.105)	-2.124*** (0.099)	0.131* (0.078)
Observations	12,252	12,252	12,252
R-squared	0.368	0.429	0.154
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes

As reported in Table 5, the results demonstrate that firms' board structure variables are positively related to the level of institutional investors (except for board size), supporting H1. Specifically, in Column 1, the results suggest that board independence ($\beta=0.340$, $p<0.01$), board gender diversity ($\beta=0.102$, $p<0.01$) and CEO duality ($\beta=0.018$, $p<0.05$) have significant effects on the level of total institutional investors, which is evident by positive and significant coefficients. In other words, institutional investors are more likely to invest in firms with more independent and women members on their board and with CEO is the chairman of the board. These results show that board-level governance provisions are important factors in explaining the investment preference of institutional investors. The insignificant coefficient of board size on institutional ownership suggests that increasing the number of directors does not necessarily

enhance perceived governance effectiveness by institutional investors. This may be due to potential coordination challenges, slower decision-making, or the presence of free-riding among board members, which can dilute the board's overall impact on firm performance and investor perceptions. Regarding firm-level control variables, firm size, the ratio of foreign sales to total sales, and return on asset have positive and significant impact on the level of total institutional investors, while dividend ratio has negative and significant effect on the level of total institutional investors. As for country level control variables, GDP per capita has positive and significant impact on the level of total institutional investors, while its growth rate has negative and significant effects. The same inferences are valid for the level of domestic and foreign institutional investors (except for CEO duality), demonstrating that sub-groups of total institutional investors share similarities regarding the factors affecting their investment decisions. Overall, our results support our hypothesis arguing that firms' board structure has significant effects on the level of total institutional investors (except or board size). In addition, it should be noted that CEO duality has different impact on total and domestic institutional investors than foreign institutional investors, showing that domestic and foreign institutional investors have different preferences regarding the CEO and chairman positions. As documented in previous literature, the separation of CEO and chairman positions is seen as a strong governance provision as the separation of these positions enhances the monitoring role of the firms' board of directors (Finkelstein & D'aveni, 1994). In line with this, the negative coefficient of CEO duality (in column 3) is consistent with the expectation and previous studies. On the other hand, institutional investors may perceive a dual CEO-Chair structure as a sign of strong leadership and decisive governance, leading to greater investment stability and commitment.

4.4. Robustness Checks

The results reported in Table 5 show that firm-level board structure matters for institutional investors. To test the sensitivity of our results, we employ several robustness checks including one year lagged models, controlling for country fixed effects, alternative measure of firms-level governance quality, and controlling for country-level governance environment.

4.4.1. One-year lagged model results

So far, we examine the relationship between firms' board structure and the level of institutional investors in order to the effects of firms' board structure on the level of institutional investors. However, the effects of firms' board structure on the level of institutional investors may be observed in the following

years, suggesting a delayed effect. In addition, previous work suggests that the use of lagged firms' board structure variables is a way to mitigate potential reverse causality problem (Gull, Hussain, Akbar Khan, Nadeem, & Mansour Zalata, 2023). Considering the delayed effects of firms' board structure on the level of institutional investors and to mitigate the reverse causality, following previous studies (Harjoto, Jo & Kim, 2017), we use one-year lagged values of the independent variables introduced in Equation 1. Table 6 reports the estimation results.

Table 6: One-Year Lagged Estimation Results

Variables	(1) Total Institutional Investors	(2) Domestic Institutional Investors	(3) Foreign Institutional Investors
Firm size	0.006** (0.003)	-0.004* (0.002)	0.009*** (0.003)
Leverage	-0.006 (0.020)	0.018 (0.018)	-0.023** (0.012)
Tobin Q	0.003 (0.002)	-0.001 (0.002)	0.004** (0.002)
Foreign Sales	0.066*** (0.011)	-0.002 (0.009)	0.068*** (0.008)
ROA	0.094*** (0.032)	0.038 (0.030)	0.056*** (0.017)
Dividend	-0.197* (0.111)	0.007 (0.096)	-0.205*** (0.065)
Board size	-0.108 (0.117)	-0.151* (0.090)	0.043 (0.097)
Board independence	0.315*** (0.018)	0.235*** (0.015)	0.079*** (0.012)
Board gender	0.098*** (0.028)	0.038* (0.020)	0.059*** (0.018)
CEO duality	0.013* (0.008)	0.024*** (0.007)	-0.011** (0.005)
GDP	0.174*** (0.008)	0.185*** (0.007)	-0.011** (0.005)
GDP growth	-0.189*** (0.027)	-0.030 (0.021)	-0.159*** (0.018)
Observations	10,124	10,124	10,124
R-squared	0.388	0.432	0.148
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes

As in Table 5, Table 6 documents the estimation results of total institutional investors in column 1, while column 2 and 3 reports the estimation

results of domestic and foreign institutional investors, respectively. As reported in Table 6, the results are qualitatively the same as those in Table 5, supporting our hypothesis. These results give us further confidence that our results are not driven by delayed effects of firms' board structure on the level of institutional investors and reverse causality.

4.4.2. Controlling for country-fixed effects

Existing studies suggest that the effects of firms' board structure on firms' outcomes are contingent on country-level factors (Abu Alia et al., 2024). Our second robustness test aims to control for unobserved country-level factors that may affect our results. Specifically, we incorporate country-fixed effects to mitigate the effects of unobserved country-level factors. Table 7 presents the results of the estimation.

Table 7: Controlling for Country-Fixed Effects

Variables	(1) Total Institutional Investors	(2) Domestic Institutional Investors	(3) Foreign Institutional Investors
Firm size	0.005* (0.003)	-0.005** (0.002)	0.009*** (0.003)
Leverage	-0.006 (0.020)	0.010 (0.017)	-0.015 (0.011)
Tobin Q	-0.001 (0.002)	-0.003** (0.002)	0.002 (0.002)
Foreign Sales	0.064*** (0.011)	0.001 (0.009)	0.063*** (0.008)
ROA	0.070** (0.029)	0.035 (0.027)	0.036** (0.015)
Dividend	-0.251** (0.105)	-0.086 (0.091)	-0.165*** (0.059)
Board size	0.050 (0.116)	-0.097 (0.089)	0.146 (0.099)
Board independence	0.344*** (0.017)	0.257*** (0.015)	0.087*** (0.011)
Board gender	0.099*** (0.025)	0.036* (0.021)	0.063*** (0.017)
CEO duality	0.016** (0.007)	0.025*** (0.007)	-0.009** (0.005)
GDP	0.160*** (0.007)	0.178*** (0.007)	-0.017*** (0.005)
GDP growth	-0.149*** (0.027)	0.009 (0.021)	-0.157*** (0.018)
Constant	-2.001*** (0.107)	-2.089*** (0.099)	0.088 (0.080)

Observations	12,252	12,252	12,252
R-squared	0.371	0.434	0.166
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes

As reported in Table 7, firms' board structure appears to play a prominent and significant role in attracting institutional investors' participation, which is evident by significant coefficients reported in column 1 to 3. These results give us further confidence that our main results are not driven by unobserved country-level factors.

4.4.3. Alternative measure of firm-level governance quality

Our third robustness check aims to test the sensitivity of our main results in terms of alternative measures of firm-level corporate governance. To do this, we use firms' governance score, which is a pillar of firms' aggregate ESG score, from Refinitiv. The higher the governance score the stronger the firm level governance. Table 8 presents the results of this analysis.

Table 8: Alternative Measure of Firm-Level Governance

Variables	(1) Total Institutional Investors	(2) Domestic Institutional Investors	(3) Foreign Institutional Investors
Firm size	-0.003 (0.002)	-0.010*** (0.002)	0.007** (0.003)
Leverage	-0.020 (0.022)	-0.001 (0.019)	-0.018* (0.011)
Tobin Q	0.003* (0.002)	-0.000 (0.002)	0.004** (0.001)
Foreign Sales	0.084*** (0.011)	0.018** (0.009)	0.066*** (0.008)
ROA	0.037 (0.030)	0.012 (0.028)	0.025* (0.015)
Dividend	-0.198* (0.112)	-0.034 (0.094)	-0.164*** (0.060)
Governance score	0.168*** (0.017)	0.057*** (0.015)	0.111*** (0.011)
GDP	0.172*** (0.008)	0.186*** (0.008)	-0.014*** (0.005)
GDP growth	-0.015 (0.030)	0.108*** (0.024)	-0.123*** (0.018)
Constant	-1.906*** (0.119)	-2.007*** (0.112)	0.100 (0.073)

Observations	12,252	12,252	12,252
R-squared	0.252	0.341	0.168
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes

As documented in Table 8, firms' governance score has positive and significant coefficients through column1 to 3, demonstrating that institutional investors (total, domestic and foreign) tend to weigh more firms with higher governance score. Overall, this result demonstrates that our main results remain the same when using alternative measures of firm-level governance.

4.4.4. Controlling for country-level governance environment

Previous studies show that whether the country has investor-friendly environment matters for institutional investors (Döring, Drobetz, El Ghouli, Guedhami & Schröder, 2021). Thus, our last robustness check investigates whether the nexus between firm-level corporate governance and institutional investors is impacted by country-level governance (investor protection) environment because institutional investors tend to invest more in countries with strong governance environment. To control country-level governance environment, we include an additional control variable, namely *Anti-self-dealing index*, which measures the quality of country-level governance environment (Djankov, La Porta, Lopez-de-Silanes & Shleifer, 2008). The results are reported in Table 9.

Table 9: Controlling for Country-Level Governance Environment

Variables	(1) Total Institutional Investors	(2) Domestic Institutional Investors	(3) Foreign Institutional Investors	(1) Total Institutional Investors	(2) Domestic Institutional Investors	(3) Foreign Institutional Investors
Firm size	0.007** (0.003)	-0.003 (0.002)	0.010*** (0.003)	-0.000 (0.002)	-0.008*** (0.002)	0.007*** (0.003)
Leverage	-0.007 (0.019)	0.013 (0.017)	-0.020* (0.011)	-0.023 (0.021)	-0.000 (0.018)	-0.023** (0.011)
Tobin Q	-0.001 (0.002)	-0.003** (0.002)	0.002 (0.002)	0.003 (0.002)	-0.000 (0.002)	0.003** (0.001)
Foreign Sales	0.065*** (0.010)	-0.001 (0.008)	0.065*** (0.008)	0.082*** (0.011)	0.016* (0.009)	0.066*** (0.008)
ROA	0.062** (0.029)	0.026 (0.027)	0.036** (0.015)	0.021 (0.031)	-0.003 (0.029)	0.024 (0.015)
Dividend	-0.155 (0.102)	-0.008 (0.089)	-0.147** (0.060)	-0.070 (0.107)	0.068 (0.091)	-0.138** (0.060)
Board size	-0.028 (0.118)	-0.121 (0.087)	0.094 (0.100)			
Board	0.305***	0.231***	0.074***			

independence						
	(0.018)	(0.015)	(0.012)			
Board gender	0.108***	0.050**	0.058***			
	(0.025)	(0.021)	(0.016)			
CEO duality	0.022***	0.030***	-0.009*			
	(0.007)	(0.007)	(0.005)			
Governance score				0.142***	0.036**	0.106***
				(0.017)	(0.015)	(0.011)
Anti-self-dealing index	0.050***	0.036***	0.014***	0.061***	0.046***	0.015***
	(0.004)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)
GDP	0.208***	0.215***	-0.007	0.230***	0.232***	-0.002
	(0.009)	(0.008)	(0.006)	(0.010)	(0.009)	(0.005)
GDP growth	-0.091***	0.052**	-0.143***	0.040	0.150***	-0.109***
	(0.026)	(0.020)	(0.018)	(0.030)	(0.024)	(0.018)
Constant	-2.809***	-2.718***	-0.091	-2.915***	-2.804***	-0.111
	(0.136)	(0.119)	(0.098)	(0.146)	(0.134)	(0.091)
Observations	12,211	12,211	12,211	12,211	12,211	12,211
R-squared	0.407	0.454	0.165	0.307	0.373	0.172
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

We document the estimation results of the effects of firms' board structure on the level of institutional investors (through column 1 to 3), while column 4 to 6 report the results of the estimations using alternative measure of firm-level governance. Controlling for country-level governance environment, our reported results in Table 9 (through column 4 to 6) are qualitatively similar to those reported in Table 5, suggesting that our main results are robust when we control for country-level governance environment. Importantly, country-level governance environment (Anti-self-dealing index) has positive and significant impact on the level of institutional investors, which is in line with the previous studies and suggest that institutional investors place emphasis on countries' governance environment (Saona & Martin, 2016, Matemilola, Bany-Ariffin & Nassir, 2018, Wu, 2021, Ghabri, 2022, Phan, 2024). Overall, the results reported in Table 9 show that our main findings are held after controlling for country-level governance environment and using alternative measure of firm-level governance.

5. CONCLUSION

Given the benefits that can be derived from institutional investors' participation in capital markets and firms, scholars have devoted much effort to better understanding the preferences and factors that influence institutional investors' investment decisions (Park & Jang, 2021; Lotto, 2023). Corporate governance, which is seen as a significant performance indicator in developed

markets, has also gained prominence in emerging markets in recent years. This study investigates how corporate governance influences institutional investors' decisions using an international large dataset. The aim of the study is to provide useful insights for firms on how to attract institutional investment by strengthening their internal governance mechanisms.

Considering the types of institutional investors, the study classifies institutional investors as total, domestic, and foreign institutional investors. Our main model examines the impact of firms' board structures on the decision-making processes of institutional investors. Controlling for other factors that might influence total institutional investors' decisions, the findings reveal that companies with a higher proportion of independent and female board members, and where the CEO also serves as the board chair, are more likely to attract institutional investments. In addition, these results, except for the CEO duality, are valid for both domestic and foreign institutional investors. Furthermore, the results highlight differences in preferences regarding the CEO-chair duality: domestic institutional investors tend to prefer firms where the CEO and board chair are the same individual, whereas foreign institutional investors favor a separation of these roles. Importantly, our results are robust for a battery of tests. Overall, the findings confirm the hypothesis that board structures, excluding board size, significantly impact the total level of institutional investment. These results align with prior studies, including those by Bushee et al. (2014), McCahery et al. (2016), and Pombo and Hoz (2021).

The results offer several implications for firms, managers, and regulatory bodies. First, firms aiming to attract institutional investors should optimize their board structures and strengthen their internal governance mechanism through board of directors as firms' strong internal governance mechanism matters for institutional investors. Second, the results are useful for corporate managers aiming to attract more institutional investor participation. Third, the study provides useful insights for regulatory bodies of countries that want to attract more equity capital from institutional investors. Specifically, countries with firms having relatively weak internal governance provisions can benefit from the results of this study in strengthening firms' internal governance provisions, which in turn attract more institutional investors' attention. Last but not least, as institutional investors become increasingly sensitive to ESG factors, firms should adopt transparent and proactive sustainability strategies to align with investor expectations and enhance long-term investment appeal.

The study is not free from limitations like other studies and leaves room that future studies may address. The sample of the study, which is subject to data availability, is the main limitation of the study. Future studies may employ

different sample structures and approaches to better understand the factors influencing institutional investors' decisions. More precisely, detailed analyses of specific subgroups of institutional investors (e.g., hedge funds, pension funds) would shed more light on the issue. In addition, industry-specific analyses could explore the importance of board structures across various sectors. Cultural and regional differences in institutional investors' preferences could also be investigated in detail. Such research would not only enrich the theoretical literature but also help firms and investors shape more effective strategies.

6. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

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No funding or support was used in this study.

8. AUTHOR CONTRIBUTIONS

HT: Idea.

HT, İHU: Design.

HT: Supervision.

İHU, HT: Collection and/or processing of sources.

HT: Analysis and/or interpretation.

İHU: Literature review.

İHU, HT: Writing the manuscript.

HT: Critical review.

9. ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS

The ethics committee principles were followed in the study and the necessary permissions were obtained in accordance with the intellectual property and copyright principles.

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İKLİM KRİZİNİN YENİ YÜZÜ: KÜRESEL GÖÇ DİNAMİKLERİNDE İKLİM MÜLTECİLİĞİNİN ROLÜ¹



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ÖZ

İklim mülteciliği, uluslararası hukuki çerçevede belirsiz bir statüye sahiptir. Birçok ülke, iklim değişikliği nedeniyle yerinden edilen kişileri mülteci olarak tanımamaktadır ve bu bireylerin haklarını güvence altına alacak özel düzenlemeler yapılmamaktadır. Çalışmada, iklim değişikliğinin göç hareketleri üzerindeki etkisi, iklim mülteciliğinin hukuki ve siyasi boyutları, bu bireylerin karşılaştığı zorluklar ve uluslararası toplumun geliştirdiği çözümler üzerine derinlemesine bir anlayış geliştirilmesi hakkında yorum yapabilmek için doküman analizi tekniği kullanılmıştır. Çalışmanın amacı, iklim değişikliğinin göçü tetikleyen bir faktör olarak daha fazla tanınmasına ve bu tür göçmenlerin haklarını korumak için uluslararası düzeyde daha etkili ve bütüncül çözümler geliştirilmesine katkıda bulunmaktır. Çalışmanın bulgularına göre iklim mültecileri, sadece yerinden edilmekle kalmaz, aynı zamanda göç ettikleri bölgelerde entegrasyon, barınma, sağlık ve çalışma gibi sorunlarla da karşılaşmaktadır. Bu zorlukların aşılması için uluslararası iş birliği ve daha etkili politikalar geliştirilmesi gerekmektedir. Çalışma, iklim değişikliğinin göçü tetikleyen bir faktör olarak tanınmasını ve iklim mültecilerinin haklarının korunmasını sağlamak için küresel düzeyde bütüncül çözümler geliştirilmesini önermektedir. Bu bağlamda, iklim değişikliğine karşı alınacak önleyici tedbirler ve göç politikaları, gelecekteki göç hareketlerinin daha sürdürülebilir bir şekilde yönetilmesini sağlayabilir.

Anahtar Kelimeler: İklim değişikliği, göç, iklim mültecileri

JEL Kodları: Y92, H83, Z00

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THE NEW FACE OF THE CLIMATE CRISIS: THE ROLE OF CLIMATE REFUGEES IN GLOBAL MIGRATION DYNAMICS



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ABSTRACT

Climate refugees have an ambiguous status in the international legal framework. Many countries do not recognise people displaced by climate change as refugees and there are no specific regulations to guarantee the rights of these individuals. In the study, document analysis method is used to comment on the impact of climate change on migration movements, the legal and political dimensions of climate refugees, the challenges faced by these individuals and the solutions developed by the international community. The aim of the study is to contribute to the increased recognition of climate change as a factor triggering migration and to the development of more effective and holistic solutions at the international level to protect the rights of such migrants. According to the findings of the study, climate refugees are not only displaced, but also face problems such as integration, housing, health and labour in the regions they migrate to. In order to overcome these challenges, international co-operation and more effective policies need to be developed. The study recommends recognising climate change as a driver of migration and developing holistic solutions at the global level to ensure that the rights of climate refugees are protected. In this context, preventive measures against climate change and migration policies can ensure more sustainable management of future migration movements.

Keywords: Climate change, migration, climate refugees

JEL Codes: F22, Q54, Q58, Q59

Scope: Political science and public administration

Type: Research

1. GİRİŞ

Son yıllarda küresel göç dinamiklerinde önemli bir değişim gözlenmektedir. Bu değişimin temel nedenlerinden biri doğal afetlerin ve çevresel bozulmanın artan etkileridir. İklim değişikliği, dünya genelinde insanların hayatını hem doğrudan hem de dolaylı olarak tehdit eden bir olgu haline gelmiştir. Çölleşme, deniz seviyesinin yükselmesi, seller, kuraklıklar, fırtınalar gibi aşırı hava olayları, biyoçeşitlilik kaybı ve çevresel tahribat gibi sorunlar insanlar için hem yerinden edilme hem de göç gereksinimi yaratmaktadır. Bu durum 'iklim mültecisi' kavramını gündeme getirmiştir.

İklim mülteciliği, geleneksel mültecilik tanımlarından farklı olarak, genellikle belirli bir ülkenin politik, sosyal ya da ekonomik nedenleriyle değil, doğrudan çevresel ve iklimsel faktörlerle ilişkilendirilen bir göç türüdür. Uluslararası göç literatüründe, iklim değişikliğinin, insanların göç etme kararlarını şekillendiren önemli bir itici güç olduğu giderek daha fazla kabul edilmektedir. Ancak, iklim mülteciliğinin hukuki statüsü ve koruma önlemleri hâlâ belirsizliğini korumaktadır. Birçok ülke, iklim değişikliği nedeniyle yerinden edilen kişileri mülteci olarak tanımamakta ve bu bireylerin haklarını güvence altına alacak özel bir çerçeve oluşturmamaktadır.

Nitekim çalışmada, küresel göç dinamikleri bağlamında iklim mülteciliğinin rolü ortaya koyulmaya çalışılmıştır. Bu kapsamda iklim değişikliğinin göç üzerindeki uzun vadeli etkileri ve geleceğe yönelik politikaları ile iklim mültecilerinin karşılaştığı zorluklar ve uluslararası toplumun bu soruna geliştirdiği çözümler tartışılmıştır.

2. TEORİK ARKA PLAN

2.1. İklim Değişikliğinde Tarihsel Sorumluluk: Geçmişin Etkileri ve Günümüze Yansımaları

Küresel iklim kalıpları özellikle son yüzyılda önemli şekilde değişmiş ve kasırgalar, sıcak hava dalgaları ve kuraklıklar gibi daha aşırı nitelikteki hava olaylarını tetiklemiştir. Hükümetlerarası İklim Değişikliği Paneli (Intergovernmental Panel on Climate Change - IPCC), geleceğe bakıldığında, mevcut oranda küresel sıcaklıkların 2030 ile 2052 arasında bir noktada sanayi öncesi seviyelerin ortalama 1,5°C üzerinde olmasının muhtemel olduğunu öngörmektedir. Günlük değişkenlik aralığında olan bu öngöründe mütevazı bir artış bile, gezegenin tüm kara yüzeyine yayıldığında yaşanabilirliği temelden değiştirecek, buz tabakaları, ekosistemler ve üretim sistemleri üzerinde kademeli etkilere neden olacaktır (Sherbinin, 2020).

İklim değişikliği, küresel bir sorun olmasının ötesinde, tarihin belirli bir döneminde özellikle endüstriyel devrimle hız kazanan insan faaliyetlerinin bir

sonucu olarak ortaya çıkmıştır. Günümüzde iklim değişikliği ile vurgu yapılmak istenen esas konu, fosil yakıtların kullanımı ile başlayan ve atmosfere sera gazı salımını önemli miktarda artırarak küresel ısınmaya neden olan endüstriyel üretime dayalı süreçler ve sonrasındır. Aslında bu perspektif, iklim değişiminin sorumluluğunun yalnızca günümüzün sanayileşmiş ülkelerine ait olmadığını, geçmişteki üretim ve tüketim biçimlerinin de bu sorun üzerinde önemli bir etkiye sahip olduğunu ortaya koymaktadır.

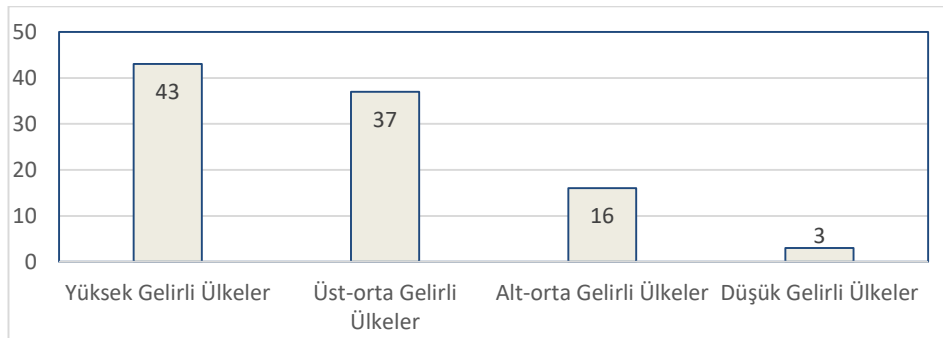
İklim değişikliği konusundaki tartışmalara aynı perspektiften bakıldığında konunun üç gerçeğe dayandığını söylemek mümkün olmaktadır: gelişmekte olan ülkeler iklim değişikliğinden en çok zarar gören ülkelerdir; gelişmiş ülkeler tarihsel olarak en çok sorumlu olan ülkelerdir; ancak gelişmekte olan ülkeler şu anda en büyük emisyon yapımcılarıdır. Bu doğrultuda, iklim değişiminin tarihsel sorumlulukları ile ilgili Küresel Kalkınma Merkezi'nin (Center for Global Development - CGD) 2015 yılında yaptığı² ve 2024³ yılında güncellenen analizlere yer verdiği çalışmasına bakmakta fayda bulunmaktadır. İklim tartışmaları bağlamında en son kanıtları göz önünde bulunduran analizlerde üç temel soru yeniden ele alınmıştır. Bu sorular “iklim değişikliğinden en çok hangi ülkeler etkileniyor? Tarihsel olarak en çok sera gazı salan ülkeler hangileridir? Ve bugün hangi ülkeler en büyük salımcılardır?” şeklinde ortaya konulmuştur. İklim değişikliğinden en çok zarar görenler konusunda yapılan analiz düşük gelirli ülkelerde iklim etkilerine atfedilebilecek gelir kayıplarının yüksek gelirli ülkelerdekinden yaklaşık beş kat daha fazla olduğunu göstermektedir. Emisyonlarla ilgili olarak yapılan analiz ise 1850'den bu yana CO₂ emisyonlarının çoğunu gelişmiş ülkeler üretirken, ‘gelişmekte olan’

² Bu çalışmada gelişmiş ülkeler Avrupa'daki tüm ülkeleri, eski Sovyetler Birliği'ni (Orta Asya'nın büyük bir kısmını), Amerika Birleşik Devletleri ve Kanada'yı, Avustralya, Yeni Zelanda ve Japonya'yı; gelişmekte olan ülkeler ise diğer tüm ülkeleri ifade etmektedir. Çalışmada 1850'den bu yana gerçekleşen karbon salımlarının yaklaşık %79'undan gelişmiş ülkelerin sorumlu olduğu öne sürülmüştür; ancak bunun nedeni, daha büyük ve daha kirlitici bir ülke grubunu ‘gelişmiş’ olarak sayması, yalnızca 2011'e kadar olan emisyonları sayması ve tüm sera gazı emisyonları yerine yalnızca CO₂'yi kapsamasıdır (Busch, 2015).

³ Güncel çalışmada 2022 gelir verilerinden yararlanan 2023/24 yılı için Dünya Bankası gelir eşikleri ve sınıflandırmaları kullanılmakta ve gelişmiş ülkeler Dünya Bankası'nın kategorizasyonunu doğrultusunda ‘yüksek gelirli ülkeler’ olarak tanımlanmakta; gelişmekte olan ülkeler ise tüm üst-orta, alt-orta ve düşük gelirli ülkeleri yansıtmaktadır. Ayrıca tüm sera gazı emisyonlarına odaklanılmıştır, çünkü iklim değişikliği için önemli olan bu kapsamdır ve ülkeler Ulusal Olarak Belirlenen Katkılarında emisyon azaltma hedeflerini belirlerken bu ölçütü kullanmaktadırlar. Ayrıntılı bilgi için bkz. (Beynon ve Wickstead, 2024).

ülkelerin o zamandan bu yana salınan tüm sera gazlarının ve bugünkü emisyonların da çoğundan sorumlu olduğunu ortaya koymaktadır.

Şekil 1’de görüldüğü gibi ülke gruplandırmasında Dünya Bankası’nın kategorizasyonu (World Bank Group, 2024) kullanılarak gelişmiş ülkeler ‘Yüksek Gelirli Ülkeler’ (High-Income Countries -HIC) olarak tanımlanmakta; gelişmekte olan ülkeler ise tüm ‘Üst-Orta Gelirli Ülkeler’ (Upper-middle Income Countries -UMIC), ‘Alt-orta Gelirli Ülkeler’ (Lower-middle Income Countries -LMIC) ve ‘Düşük Gelirli Ülkeler’i (Low-income Countries -LIC) kapsamaktadır. Gelişmiş ülkeler küresel gelirin %63’ünü ve küresel nüfusun % 16’sını oluşturmaktadır. Kişi başına düşen sera gazı emisyonları gelişmekte olan ülkelerin iki katından fazla ve bazı tahminlere göre en yoksul ülkelere dört kat daha fazladır.

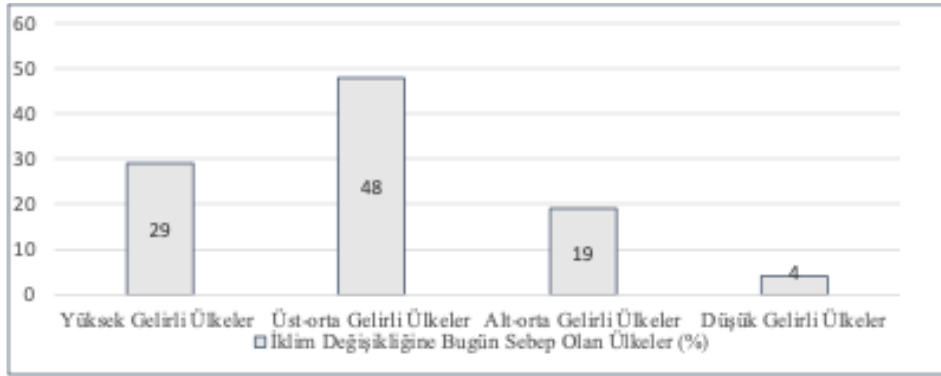


Şekil 1: İklim Değişikliğine Tarihsele Olarak Sebep Olan Ülkeler, 1850-2022

Kaynak: (Our World in Data, 2024a)

Gelişmiş ülkeler (HIC’ler), 1850’den beri iklim değişikliğine neden olan kümülatif sera gazı emisyonlarının en büyük payını yani %43’ünü oluşturmaktadır. Şekil 1 verilerinden de anlaşıldığı üzere UMIC’ler %37, LMIC’ler %16 ve LIC’ler ise emisyonların ortaya çıkmasında sadece %3 paya sahiptir. ABD, 1850’den beri %18,2 oranıyla Çin’in (%12,1), Rusya’nın (%6,8), Hindistan’ın (%4,9) ve Brezilya’nın (%4,5) önünde yer alarak en büyük bireysel sera gazı emisyon yayıcısı olmuştur.

Ancak son yıllarda durum daha karmaşık hale gelmeye başlamıştır. Gelişmiş ülkeler hala büyük miktarda karbon emisyonu üretirken, gelişmekte olan ülkelerin de giderek bunu yapar hale geldiğini aşağıdaki şekil üzerinden söylemek mümkün hale gelmiştir.



Şekil 2: İklim Değişikliğine Bugün Sebep Olan Ülkeler, 2022

Kaynak: (Our World in Data, 2024b)

Gelişmiş ülkeler artık sera gazı emisyonlarının sadece %29'unu oluştururken, UMIC'ler %48, LMIC'ler %19 ve LIC'ler %4'ten azdır (CO₂ emisyonlarının payları ise sırasıyla %34, %47, %15 ve %1'den azdır). Bu durum birçok orta gelirli ülkenin son 30 yılda kaydettiği muazzam ekonomik ilerlemeyi yansıtmaktadır. Ancak, bu ekonomik ilerlemenin beraberinde getirdiği karbon emisyonları gibi tehlikeli yan etkiler, iklim değişikliğiyle mücadeleyi daha da zorlaştırmaktadır.

Çin, şu anda %25,9'luk bir payla dünya genelinde en büyük sera gazı yayıcısı konumundadır ve bu oran, ABD (%11,1), Hindistan (%7,5), Rusya (%4,3) ve Brezilya'nın (%4,2) emisyonlarını geride bırakmaktadır. 2022 yılı itibarıyla düşük gelirli ülkeler, orta gelirli ülkeler, küçük ada gelişen devletleri ve en az gelişmiş ülkeler toplamda %23 oranında sera gazı emisyonuna katkıda bulunmuştur, bunun %16'sı yalnızca CO₂ emisyonlarından kaynaklanmaktadır ve bu payın büyük kısmı orta gelirli ülkelere gelmektedir (Crippa vd., 2023, s. 14).

CGD raporu, iklim değişikliğinin özellikle düşük gelirli ülkelerdeki yoksulluk, gıda güvenliği, sağlık ve su kaynakları gibi temel kalkınma göstergelerini olumsuz bir şekilde etkileyeceğine de dikkat çekmektedir. İklim değişikliğinin ekonomik maliyetlerine ilişkin tahminler hâlâ çokça tartışılırken, son zamanlarda yayınlanan bir çalışma, iklim değişikliğinin ekonomik veya refah etkilerini ölçmeyi amaçlayan çok sayıda çalışmayı gözden geçirmektedir. Nitekim tüm kanıtlar gelişmekte olan ülkelerin iklim değişikliğinin etkilerine karşı daha savunmasız olduğunu göstermektedir. Bunun üç nedeni şu şekilde belirtilmektedir: aşırı hava olaylarına daha fazla maruz kalıyorlar, sağlık ve tarım üzerindeki olumsuz etkilere karşı daha savunmasızlar, zayıf altyapı ve kurumlar

nedeniyle daha az dirençliler ve sınırlı bir uyum kapasitesine sahip olma eğilimindedir. Bu nedenle gelecekteki büyüme ve gelirlerinde daha büyük azalmalarla karşı karşıya oldukları ve düşük gelirli ülkelerdeki ortalama refah kayıplarının, gelişmiş ülkelere göre yaklaşık beş kat daha fazla olduğu tahmin edilmektedir (Tol, 2022, s. 6).

Bu tahmin de az gelişmiş ülkelerin iklim değişikliği kaynaklı zararlarının artacağını göstermektedir. Çünkü iklim değişikliği, sadece çevresel bir kriz değil, aynı zamanda küresel düzeyde sosyal, ekonomik ve siyasal adaletsizlikleri derinleştiren bir sorundur. Gelişmiş ülkeler, tarihsel olarak büyük miktarlarda sera gazı salmışlardır ve bu ülkeler genellikle iklim değişikliğinin en yıkıcı etkilerinden daha az etkilenmiştir. Öte yandan, bu sorunun en fazla mağduru olmasına rağmen gelişmekte olan ya da az gelişmiş ülkeler hem küresel emisyonlara hem de iklim değişikliğine bağlı zararlara daha az neden olmuşlardır.

Ortaya çıkma durumu ülkelere göre farklı nedenlerden kaynaklansa da sera gazlarının atmosferdeki birikimi, küresel ısınmanın ana itici gücü olarak kabul edilmektedir. Bu gazların artan yoğunluğu, dünya iklimini hızla değiştirerek çevresel felaketleri beraberinde getirmektedir. 21. yüzyılda, sera gazlarının birikmesinin devam etmesi durumunda ortaya çıkacak felaketlerin etkileri çok geniş kapsamlı olacak ve insan yaşamını, ekosistemleri ve ekonomik yapıları derinden etkileyecektir.

Söz konusu bu etkilerle başa çıkmanın bir yolu olarak, insanlar yaşadıkları yerleri geçici veya daimî olarak terk etmek zorunda kalmaktadır. Uluslararası Göç Örgütü⁴ (*International Organization for Migration – IOM*) de raporlarında dünya çapında göçü ve yerinden edilmeyi yoğun şekilde etkileyen küresel dönüşümlere genel bir bakış sağlamıştır. Demografik geçişlerle ilgili devam eden değişikliklerin yanı sıra ekonomik ve sosyal dönüşümleri de kabul ederek buna bağlı olarak gerçekleşen gerek iç gerek dış göç hareketlerini bazen derinlemesine şekillendiren büyük jeopolitik, çevresel ve teknolojik dönüşümlerin de hızla yükseldiğini (IOM, 2009, s. 115; IOM, 2024, s. 1) 2000’li yıllardan başlayarak rapor etmektedir.

⁴ 1951 yılında kurulan Uluslararası Göç Örgütü, göç alanında önde gelen hükümetler arası örgüttür ve insani ve düzenli göçün göçmenlere ve topluma fayda sağladığı ilkesine bağlıdır. IOM, göçün değişen dinamiklerine etkili yanıtlar geliştirerek dünya çapında göçmenleri destekler ve bu nedenle göç politikası ve uygulamaları konusunda önemli bir tavsiye kaynağıdır. Ayrıntılı bilgi için bkz.: (IOM, 2024b).

2.2. İklim Değişikliği ve Göç İlişkisi Gerçeğinin Kabulü

Göç karmaşık, çok nedenli ve doğrusal olmayan bir süreçtir. Çevresel olarak deterministik bir yaklaşım, göçte insan faaliyetinin önemini hesaba katmadığında başarısız olur (Foresight, 2011, s. 31). Nitekim göç, insanların karşılaştıkları politik, ekonomik ve insani zorluklarla başa çıkma ve direnme biçimidir. Bu süreç, istemli veya istemsiz, geçici veya kalıcı, mevsimsel veya döngüsel, küçük ya da büyük ölçekli olabilir ve sınırlar içinde ya da sınırlar ötesinde gerçekleşebilir.

Göçün mekânsal dağılımı ve göç akışlarındaki değişiklikler, göçün sadece çevresel değil ekonomik, sosyal, demografik, kültürel ve politik etkilerinin de biçimlenmesini beraberinde getirmektedir. Aynı durum iklim değişikliğinin neden olduğu göç hareketleri için de geçerlidir. Tarihsel olarak, iklim faktörlerinin nüfus hareketlerinde önemli bir rol oynadığına dair bol miktarda kanıt vardır. İklim değişkenliği, MS 476'da Batı Roma İmparatorluğu'nun çöküşünün ardından göçü hızlandırmış ve Maya İmparatorluğu'nun çöküşü sırasında (MS 660 ila 1000) kuraklık etkili olmuştur. Hem yağış eksikliği hem de yağış bolluğu, 13. yüzyılda Avrasya Bozkırı'ndaki daha nemli koşullar tarafından körüklenen Moğolların batıya doğru genişlemesinin de gösterdiği gibi, nüfus hareketlerini teşvik etmiştir. Geçtiğimiz yüzyılda, 1930'lardaki Amerikan Toz Fırtınası ve 1970'ler ve 1980'lerdeki Sahel kuraklıkları, birçok insanı sırasıyla Kaliforniya'ya ve Burkina Faso, Mali, Moritanya ve Nijer gibi ülkelerdeki bölgesel kent merkezlerine göç etmeye yöneltmiştir (Sherbinin, 2020). Bu örneklerin çoğundaki ortak nokta arazinin artık aynı nüfusu destekleyemeyecek hale gelmiş olmasıdır.

Bugün de iklim değişikliğinin olumsuz etkileri dünyanın birçok bölgesindeki insanlar için göç etme gereksinimi yaratmaktadır. İklim değişikliğiyle ilişkili insan göçü, giderek artan bir ilgi ve politika endişesi alanı haline gelmiştir. İklim değişikliği, insan hareketinin baskın nedeni olarak kolayca izole edilemese de göçü teşvik eden temel bir faktör olarak iklim değişikliğinin rolünü göz ardı etmek giderek imkansızlaşmıştır.

2019 yılı sonunda 79,5 milyon, 2022 yılı sonunda 108,4 milyon ve Haziran 2024 itibarıyla ise zulüm, çatışma, şiddet, insan hakları ihlalleri ve kamu düzenini ciddi şekilde bozan olaylar sonucunda dünya çapında 122.6 milyondan fazla insan zorla yerinden edilmiştir (UNHCR, 2024a). Dolayısıyla iklim değişikliği ve ani gelişen iklimsel olaylar, dünya genelinde göç hareketlerini etkileyen önemli faktörlerden biri haline gelmiştir. Özellikle taşkınlar, kuraklık, orman yangınları ve şiddetli fırtınalar gibi olaylar, insanların yaşadıkları bölgelerdeki yaşam koşullarını doğrudan tehdit etmektedir. Bu tür iklimsel felaketler, insanların evlerini terk etmelerine, hatta bazı durumlarda yerinden

edilerek kalıcı bir şekilde göç etmelerine neden olmaktadır.

İstemli veya istemsiz, geçici veya kalıcı, sınırlar içinde veya sınırlar ötesinde vs. gerçekleşebilecek durumda olan göç olgusu, insan kaynaklı iklim değişikliğini önlemek ve etkilerini ve azaltmak için kurulan IPPC'nin 1992 yılında yayınlanan ilk değerlendirme raporuna göre de iklim değişikliğinin ya da 'iklim eylemi başarısızlığının' en kritik tehdit niteliğindeki kısa dönemli etkileri arasında yer almıştır (IPCC, 1992, s. 89).

IPCC'nin 2013 yılında açıklanan 5. Değerlendirme Raporu göstermektedir ki insan ve ekosistem güvenliğini sağlayacak olan yaklaşım, bütüncül biçimde sosyo-ekolojik çatışmaların önüne geçmek ve mevcut çatışmaların çevre boyutunun ciddiye alınmasıdır. İklim değişikliği uzun vadeli bir zorluktur, ancak sera gazlarının atmosferde birikme hızı ve ölçeği ve 2°C'den fazla sıcaklık artışının riskleri göz önüne alındığında acil eylem gerektirmektedir (IPCC, 2013, s. V). Yani raporda iklim değişikliği 'tehdit çoğaltıcı' bir etken olarak görülmektedir. Bu nedenle iklim değişikliğinin göç ve toplumsal çatışmalarla ilişkisi basit bir sebep-sonuç ilişkisinin ötesinde dikkate alınmalıdır.

IPCC'nin 2019 yılında açıklanan özel raporu, iklim değişikliğinin toprağa etkilerini ve çevresel faktörlerin zorunlu göçlere nasıl yol açtığını ele almaktadır. İklim değişikliği, çölleşme, arazi bozulması, sürdürülebilir arazi yönetimi, gıda güvenliği ve karasal ekosistemlerdeki sera gazı akışları hakkındaki bu özel rapor, İklim Değişikliği ve Arazi Özel Raporu (Special Report on Climate Change and Land - SRRCL) olarak bilinmektedir. Rapora göre (IPCC, 2019, s. 16) iklimdeki değişiklikler hem ülkeler içinde hem de sınırlar arasında çevresel olarak tetiklenen göçü artırabilir. Bu durum hareketliliğin ve mevcut adaptasyon önlemlerinin birden fazla itici gücünü yansıtmaktadır. Ayrıca aşırı hava/iklim olayları veya yavaş başlangıçlı olaylar yerinden edilmenin artmasına, gıda zincirlerinin bozulmasına, kaynakların tehdit edilmesine yol açabilir ve çatışma için artan streslere neden olabilir.

IPCC'nin 2023 tarihli son değerlendirme raporunda (IPCC, 2023, s. 15) ise yine göç, artan eşitsizlik ve kentleşme gibi sosyo-ekonomik kalkınma eğilimleri nedeniyle gelecekte iklimsel tehlikelere maruz kalma durumunun küresel olarak artış göstereceği ifade edilmektedir. Rapora göre hem gayri resmi ve hızla büyüyen küçük yerleşimlerde hem de kırsal alanlarda iklime duyarlı geçim kaynaklarına yüksek bağımlılık nedeniyle insani hassasiyet/savunmasızlık artacaktır. Ekosistemlerin hassasiyeti, geçmişteki, şimdiki ve gelecekteki sürdürülemez tüketim ve üretim kalıplarından, artan demografik baskılardan ve toprak, okyanus ve suyun sürekli sürdürülemez kullanımı ve yönetiminden güçlü bir şekilde etkilenecektir. Ekosistemlerin ve bunların hizmetlerinin kaybı, dünya genelinde insanlar üzerinde, özellikle de temel ihtiyaçlarını karşılamak için

ekosistemlere doğrudan bağımlı olan yerli halklar ve yerel topluluklar üzerinde kademeli ve uzun vadeli etkiler ortaya çıkaracaktır.

IPCC raporlarından da anlaşıldığı gibi göç olgusu iklime duyarlılık üzerinden giderek artan bir şekilde etkisini sürdürerek devam edecek boyutlardadır. Zaten Cancun’da gerçekleştirilen BM İklim Değişikliği Çerçeve Sözleşmesi 16. Taraflar Konferansı (COP16)’nda da iklim değişikliği ile bağlantılı olan nüfus hareketleri bu doğrultuda bir tanımlamaya konu olmuştur. Bu hareketler yerinden olmaya bağlı zorla yer değiştirme, göç ve planlı yeniden yerleşimler şeklinde ifade edilmiştir (UNFCCC, 2010).

Böyle bir tanımsal girişim, göç bağlamında iklim etkilerinin doğasının netleştirilmesine de olanak tanımaktadır. Ottawa Üniversitesi’nden Robert McLeman, zorunlu göçün itici güçlerini ‘iklimsel olaylar’ ve ‘iklimsel süreçler’ olmak üzere iki ayrı gruba ayırmaktadır (IOM, 2008, s. 17).

2.2.1. İklimsel olaylar(Hızlı ve ani gelişen)

Ani gelişen olaylara bağlı göçler dünyanın her bölgesinde, ister gelişmiş isterse az gelişmiş ülkeler olsun, ciddi tehditler oluşturmakta ve giderek daha yaygın hale gelmektedir. Jeofiziksel afetlerdekine (depremler, volkanik patlamalar gibi) benzer biçimde, ani gelişen aşırı hava olayları (şiddetli fırtınalar, taşkınlar gibi) ile ortaya çıkan zorunlu kitlesel yer değiştirmeler de tipik olarak geçici niteliktedir. Ağustos ve Eylül 2005’te ABD’nin Körfez kıyılarını vuran Katrina ve Rita Kasırgaları yaklaşık 2 milyon insanı evsiz bırakmış ve insanların geçici olarak yer değiştirmesine sebep olmuştur (IOM, 2008, s. 18). 2010 Haiti depreminden sonra, aynı bölgedeki orman yangınları ve kasırgalar, büyük yerinden edilmelere yol açmıştır.

Ancak ani gelişen olaylar, yalnızca geçici yerinden edilmelere yol açmakla kalmaz, aynı zamanda birbirini takip eden afetler ve yoğun iklimsel değişiklikler nedeniyle kalıcı göçlere de neden olabilir. Bu tür durumlar, afetlerin şiddeti, sıklığı ve sürekli hale gelmesiyle, yerinden edilen kişilerin geri dönüş imkânlarını ortadan kaldırır ve göç, daha uzun süreli veya kalıcı bir çözüm haline gelir. Örneğin, 2019 yılında Mozambik’te yaşanan Idai Tropik Siklonu, bu tür bir dönüşümü net bir şekilde gözler önüne sermektedir. Mozambik, bu tropik siklonun yol açtığı büyük yıkım nedeniyle, özellikle kıyı bölgelerinde büyük bir yerinden edilme dalgasıyla karşı karşıya kalmıştır (Podesta, 2019).

2.2.2. İklimsel süreçler(Yavaş ve kademeli gelişen)

İklim süreçleri, iklim koşullarındaki uzun vadeli ve zamana bağlı değişimlerle ilişkilidir. Bunlar deniz seviyesinin yükselmesi, tarım arazilerinin tuzlanması, çölleşme, biyoçeşitliliğin kaybı, artan su kıtlığı ve gıda güvensizliği gibi yavaş başlayan değişikliklerdir. Yavaş ve kademeli gerçekleşen bu olaylar

toplu olarak geçim kaynaklarını aşındırmakta ve belirli bölgelerde zamanla yaşam ve geçinme koşulları üzerinde olumsuz etkiler yapmaktadır.

İklim değişikliği nedeniyle deniz seviyelerinin yükselmesi, özellikle düşük rakımlı kıyı bölgelerinde yaşayan toplulukları tehdit etmektedir. Bu bölgelerdeki insanlar, yerinden edilmekte ya da diğer bölgelere göç etmeye zorlanmaktadır. Örneğin, Maldivler gibi ada devletlerinde deniz seviyesi yükselmesi nedeniyle yerinden edilme riski büyümektedir (Oğan ve Emekli, 2022, s. 426).

Bir diğer örnek olan Nil Deltası dünyanın en yoğun nüfuslu bölgelerinden biridir ve deniz seviyesinin yükselmesine karşı son derece savunmasızdır. Aynı şekilde Bangladeş'in beşte birinden fazlası, deniz seviyesinde 1 m'lik bir artışla su altında kalabilir, bu da yüzyılın sonuna kadar olası bir durumdur (Stern, 2006, s. VII-VIII). Özellikle tarıma dayalı yaşam biçimlerinin hâkim olduğu bölgelerde de kuraklık ve su kaynaklarının tükenmesi gibi sorunlar, geçim kaynaklarını kaybetmeye yol açarak insanların göç etmelerine neden olabilir. Nitekim Sahra Altı Afrika gibi bölgelerde kuraklık, büyük bir yerinden edilme sebebi olmuştur.

Kanıtlar, hızlı başlangıçlı olayların kısa vadeli yer değiştirmeye ve ardından kaynak alanlara geri dönüşe neden olma olasılığının daha yüksek olduğunu, yavaş başlangıçlı olayların ise kalıcı göçe neden olma olasılığının daha yüksek olduğunu göstermektedir (Sherbinin, 2020). Yani iklim koşulları bir bireyin veya topluluğun göç etme kararını yönlendiren çeşitli faktörlerden biri olarak mevcuttur.

İklim değişikliği kaynaklı göçle ilgili mevcut literatür tartışmalı konularla doludur, ancak belki de hiçbir iklim değişikliğiyle ilgili sorunlara yanıt olarak evlerinden taşınmak zorunda kalanların nasıl etiketlenmesi veya kavramsallaştırılması gerektiği sorusu kadar tartışmalı değildir.

2.3. İklim Mülteciliği: Çevresel Değişim ve Zorunlu Göç

'Çevresel mülteciler' ve 'iklim mültecileri' terimleri zaman zaman neredeyse birbirinin yerine kullanılsa da bir terimin diğerine göre uygunluğu hakkında birleşik bir görüş yoktur (Luetz & Merson, 2020, s. 4). 'Çevre mültecisi' terimi uluslararası hukukta yasal veya resmi olarak tanınmamaktadır. Ancak, 'çevre mültecileri' terimini ilk olarak Lester Brown vd. (1976, s. 39) ortaya atmıştır ve bunu "çevrelerindeki değişiklikler nedeniyle evlerini terk etmek zorunda kalan, refahlarını ve geçim kaynaklarını tehlikeye atan kişiler" olarak tanımlamıştır.

1985 yılında Essam El- Hinnawi tarafından hazırlanan BM Çevre Programı (*United Nations Environment Programme -UNEP*)'nin raporunda (s. 4) ise çevresel mülteciler "yerinden edilen tüm insanlar, kendilerini zarardan

korumak ve/veya daha iyi bir yaşam kalitesine ulaşmak için kendi yaşam alanlarını terk etmek zorunda kalan (veya gönüllü olarak ayrılan)” kişiler olarak tanımlanmıştır. El-Hinnawi’nin bu makalesi ile terimin kullanımı yaygınlaşmaya başlamıştır.

El-Hinnawi’nin makalesi, iklim ve çevre mülteciliği konusuna dikkat çekmekle kalmayıp, aynı zamanda iki önemli tartışmayı gündeme getirmesi bakımından da dikkat çekicidir. İlk olarak, makale iklim ve çevre mültecileri için resmi bir tanım önerirken, ikinci olarak çevresel yerinden edilmenin çeşitliliğine dikkat çekerek, çevresel faktörlerle motive olmuş göçmen tipolojileri geliştirmeye yönelik yaklaşımlar için bir başlangıç noktası sunmuştur. Bu tartışmaların ardından, çevre ve iklim mültecileri üzerine yapılan kavramsal analizlerle desteklenen, iklim ve çevre göçmeni kategorilerini ele alan literatür hızla genişlemiştir.

Örneğin ‘iklim değişikliği mültecileri’ (Docherty & Giannini, 2009, s. 361), ‘mülteciler’ (Hansen, 2008, s. 2), ‘çevresel mülteciler’ (Ehrlich & Ehrlich, 2013, s. 4), ‘çevresel ve iklim değişikliği mültecileri’ (Dupont & Pearman, 2006, s. 55), ‘yerinden edilmiş kişiler’ (Westing, 1992, s. 201), ‘iklim mültecileri’ (McAdam, 2012, s. 186), ‘çevresel olarak yerinden edilmiş kişiler’ (Lopez, 2007: 389), ‘iklim göçmenleri’ (Gibb & Ford, 2012, s. 2), ‘zorunlu göçmenler’ (Brown, 2007, s. 8), ‘iklim değişikliği göçmenleri’ (Shamsuddoha & Chowdhury, 2010, s. 7), ‘eko-göçmenler’ (Wood, 2001, s. 43), ‘iklim değişikliği nedeniyle yerinden edilmiş kişiler’ (McAdam, 2011, s. 18) şeklindeki kavramsallaştırmalar bu doğrultudaki çalışmalarda karşımıza çıkmaktadır.

İklim mültecisi kavramı, Birleşmiş Milletler gibi uluslararası kuruluşlar tarafından da yaygın olarak kullanılmakla birlikte, henüz hukuki bir statüye kavuşmamıştır. Bugüne kadar, Uluslararası Mülteci Hukuku mültecilerin özellikle 1951 BM Mültecilerin Hukuki Durumuna İlişkin Cenevre Sözleşmesi’nde ve Mültecilerin Hukuki Statüsüne İlişkin 1967 Protokolü’nün mevcut hâlinde savaştan, etnik temizlikten veya politik baskılardan kaçan kişiler olarak tanımlanmasına odaklanmıştır. Ancak, iklim değişikliği ve çevresel bozulma nedeniyle yerinden edilen kişiler, mevcut uluslararası hukukun kapsamına girmemektedir.

UNHCR, iklim değişikliği nedeniyle göç eden insanları ‘iklim mültecisi’ olarak tanımlasa da bu insanlar yasal olarak mülteci statüsüne girememektedir. Yani özel olarak yasal statüleri hâlâ netleşmemiştir. Çünkü 1951 Sözleşmesi 1. Maddede ‘mülteci’ teriminin tek bir tanımını onaylar. Bu tanımın vurgusu, kişilerin siyasi veya diğer zulüm biçimlerinden korunmasıdır. Sözleşmeye (UNHCR, 1951, s. 14) göre “mülteci, ırkı, dini, milliyeti, belirli bir sosyal gruba

üyeliği veya siyasi görüşü nedeniyle zulüm görme korkusu nedeniyle menşe ülkesine dönemeyen veya dönmek istemeyen kişi”dir.

1951 Mülteci Sözleşmesi’nde geçen mülteci tanımı, iklim değişikliği ile ilgili nedenlerden dolayı yerlerinden edilmiş kişiler için geçerli değildir; çünkü yer değiştirmeye zorlayan çevresel bozulma, Mülteci Sözleşmesi’nde kullanıldığı şekliyle ‘zulüm’ olarak kabul edilmemektedir. Ayrıca, zulüm olarak kabul edilmeyen bu zorlayıcı nedenler, sözleşmede belirtilen gerekçelerle de ilişkilendirilememektedir. Örneğin (Ilık Bilben, 2019, ss. 339-346), her yıl nehir kıyısındaki erozyon nedeniyle evsiz kalan yaklaşık 200 bin Bangladeşli’nin, başka bir ülkeye yerleşme taleplerinin hukuki başvurularında red kararı alacakları ve temyiz edemeyecekleri anlamına gelmektedir. Benzer şekilde, son yıllarda nüfuslarının en az %10’u göç eden Kiribati, Nauru ve Tuvalu gibi Pasifik’teki küçük ada devletlerinin sakinleri, deniz seviyesindeki yükselişe bağlı olarak giderek kötüleşen çevresel koşullar altında sıkışmış durumdadır. Ancak, bu bireyler de göç ettikleri ülkelerde mülteci olarak kabul edilmemişlerdir/edilmeyeceklerdir.

3. YÖNTEM

Çalışmada nitel araştırma yöntemi olarak doküman analizi kullanılmıştır. Bilimsel yönüyle doküman incelenmesi ile amaçlanan, konu hakkında bilgi içeren yazılı materyallerin analiz edilmesidir. Nitekim doküman analizi, yazılı belgelerin içeriklerinin titizlikle ve sistematik olarak toplanıp incelenmesi ve analiz edilmesine yönelik bir araştırma yöntemidir (Wach, 2013). Elektronik materyallerin analiz edilmesi sürecini de kapsayan bu yöntem, belirli bir konu veya amaca yönelik bilgi elde edilmesini sağlamaktadır.

İklim değişikliği, göç ve mültecilik gibi konularla ilgili çok sayıda rapor, makale, politika belgesi, hükümet açıklamaları ve uluslararası örgütlerin yayınları mevcuttur. Bir araştırma yöntemi olarak doküman analizi de bu türden belgeler ile bir anlam ortaya çıkarmaya, anlayış geliştirmeye ve araştırma sorunuyla ilgili içgörüler keşfetmeye yardımcı olmaktadır (Bowen, 2009).

Doküman analizi sıklıkla diğer yöntemleri tamamlamak için kullanılsa da bazı çalışmalarda olduğu gibi bu çalışmada da tek araştırma yöntemi olarak tercih edilmiştir. Böylece önceden var olan belgeleri kullanarak en iyi veri kaynağına erişim sağlanmaya çalışılmıştır (Morgan, 2022). Nitekim küresel göç dinamiklerinde iklim mülteciliği konusunu ele alırken de literatürdeki geçmiş çalışmalar, uluslararası sözleşmeler, raporlar ve araştırmalar gibi belgeler geçmişteki eğilimleri ve mevcut durumu anlamak için çok önemlidir. Doküman analizi, bu belgelerdeki değişim ve sürekliliği ortaya koyarak konunun evrimini inceleme fırsatı vermektedir. Bu yöntem, iklim mülteciliği gibi karmaşık ve çok

boyutlu bir konuyu anlamak için gerekli olan bağlamsal, politik ve sosyal detayları ortaya çıkarmada etkili olabilir.

Belgeler, bu konudaki argümanları, politikaları, söylemleri ve toplumsal tepkileri inceleyerek, iklim mülteciliğinin farklı yönlerini aydınlatılabilir. Özellikle küresel ölçekte iklim değişikliğinin etkilerine dair raporlar ve analizler, nesnel bulgular içermektedir. Bu tür belgeleri incelemek, iklim mülteciliği konusundaki tezlerin genel geçer doğruluğunu test etmeye yardımcı olmaktadır. Nitekim bu süreç, yalnızca analizin derinliğini artırmakla kalmamakta, aynı zamanda araştırma konusunun genel anlayışını da zenginleştirmektedir (Williams, 2024).

İklim mülteciliği, aynı zamanda hukuki ve politik bir mesele olduğu için, bu alandaki uluslararası sözleşmeler, protokoller ve devletler arası anlaşmalar da önemlidir. Doküman analizi, iklim mülteciliğiyle ilgili hukuki düzenlemeleri inceleyerek, bu mültecilerin hakları ve devletlerin yükümlülükleri üzerine derinlemesine bir anlayış geliştirilmesi hakkında yorum yapabilmek için verilerin kapsamlı bir şekilde incelenmesini sağladığı için bu çalışmada yöntem olarak kullanılmıştır.

Çalışmada IPCC, UN, UNDP (United Nations Development Programme), UNFCCC (United Nations Framework Convention on Climate Change), UNHCR (United Nations High Commissioner for Refugees), IOM, WB gibi uluslararası kuruluşların, sözleşmelerin ya da raporların hem basılı hem de elektronik materyalleri analiz için gereken nicel veri kaynakları olarak kullanılmıştır.

4. BULGULAR

4.1. İklim Değişikliği ve Çevresel Faktörlerin Göç Hareketlerine Yansıması: Eğilimler, Gelecek Öngörüler ve Karşılaşılan Engeller

İklim değişikliği, göç üzerinde doğrudan etkili olabileceği gibi, bireylerin göç kararı almasında sosyal, ekonomik ve kültürel faktörlerin etkisini artıran dolaylı bir faktör de olabilir. Bu dolaylı etki, göç dinamikleri üzerinde bir çoğaltan etkisi yaratabilir. Bugün birçok insan, daha iyi yaşam koşullarına sahip olmak ve kendilerini güvende hissettikleri yerlerde yaşamak için göç etmeyi bir gelecek planı olarak görmektedir. Bu kararlar, genellikle işsizlik ve geçim sıkıntısı gibi ekonomik sebeplerden ya da eğitim, sağlık ve kültürel hizmetlere erişim eksikliğinden kaynaklanmaktadır. Kaynak yetersizlikleri, zamanla din, dil ve ırk gibi toplumsal farklılıkların çatışma unsurları haline gelmesine yol açarak göçü daha da tetikleyen bir motivasyon kaynağı oluşturabilir (Balaban, Özgür, &

Sakar, 2021, s. 48).

Göç eden nüfus, özellikle sınırlı kaynaklara sahip olan bölgelerde yerleştğinde yerel halkla gerilim meydana gelmektedir. Su ve tarım arazisi gibi sınırlı kaynaklar üzerindeki rekabet, şiddetli çatışmalara ve toplumsal huzursuzluklara yol açmaktadır. Dahası ‘göçün gelişigüzel veya plansız olması, toplumsal olarak katlanılmak zorunda kalınan yükleri artırmakta; sosyal, ekonomik ve çevresel’ sorunları beraberinde getirmektedir (Çakır Sümer, 2024, s. 302).

İklim değişikliği ve doğal afetler nedeniyle yerinden edilme (göç) olayları dünya genelinde giderek daha büyük bir soruna dönüşmektedir. Özellikle su kıtlığı, kuraklık, aşırı sıcaklıklar ve deniz seviyesi yükselmesi gibi etkiler, tarım yapan toplulukları zor durumda bırakmakta ve bu kişileri göç etmeye zorlamaktadır.

Göç genellikle olumsuz çevre koşullarında gelir akışlarını çeşitlendirmek ve geçim kaynaklarını güvence altına almak için yapılmaktadır. Örnek olarak ele alınan üç temel savunmasız ekolojik bölgenin analizinden elde edilen sonuçlar şu şekildedir (Foresight, 2011, s. 12-13):

- Kenya’da 2004 ve 2005 yılları arasında yapılan bir vaka çalışması, göçün, zayıf toprak kalitesi ve azalan tarımsal verim yaşayan haneler için önemli bir gelir çeşitlendirme biçimi olduğunu bulmuştur.

- 1970’lerde Burkina Faso’da kuraklığa karşı yaygın ve erken tepkinin, gelirleri çeşitlendirmek için kısa vadeli, kırsaldan kırsala göç etmek olduğu görülmüştür.

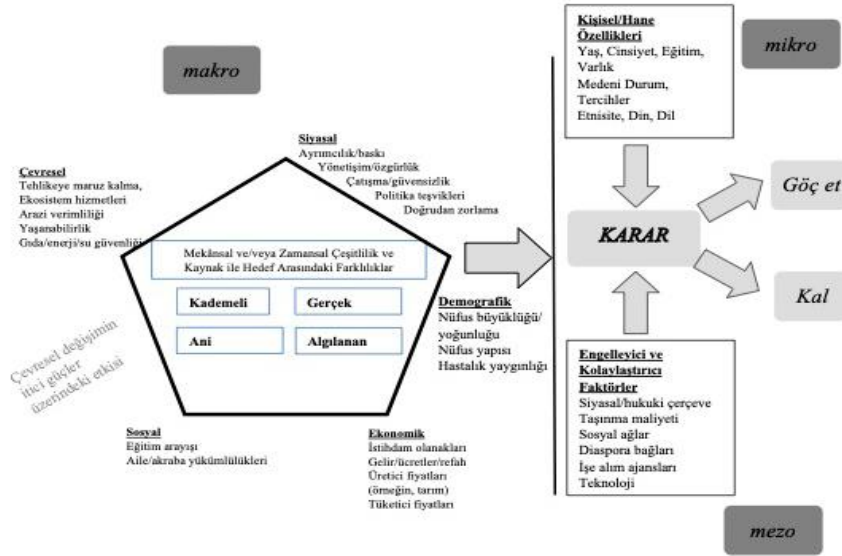
- 1996 ve 2001 yılları arasında Etiyopya yaylalarında yapılan bir çalışma, göçün kuraklık ile başa çıkmanın temel stratejisi olduğunu bulmuştur.

- Vietnam’dan elde edilen kanıtlar, sel baskınlarının mahsulleri yok edip geçim stresine neden olabileceği ve bunun da doğrudan göçe neden olduğu şeklindedir.

Örneklere bakıldığında iklim değişikliğinin, özellikle yavaş başlayan çevresel değişikliklerin (örneğin, kuraklık, deniz seviyesinin yükselmesi, uzun vadeli su kıtlığı gibi) yerinden edilmeyi ve göç hareketliliğini artırdığını söylemek mümkündür. Ancak bu tür hareketliliğin sadece çevresel faktörlerle açıklanması, olayı basite indirgemek olur. Gerçekten de iklim değişikliğine bağlı olarak ortaya çıkan nüfus hareketleri genellikle çok faktörlü bir dinamiği yansıtmaktadır.

Bu kapsamda önemli bir çalışma olan Foresight raporuna (2011, s. 33) göre, göç etme kararı beş geniş ‘itici güç’ kategorisinden etkilenir. Bunlar Şekil 1’de yer alan beşgenin köşelerinde belirtilmiş olan *siyasal* (ayrımcılık/baskı, yönetim/özgürlük, çatışma/güvensizlik, politika teşvikler, doğrudan zorlama),

sosyal (eğitim arayışı, aile/akraba yükümlülükleri), *çevresel* (tehlikeye maruz kalma, ekosistem hizmetleri, arazi verimliliği, yaşanabilirlik, gıda/enerji/su güvenliği) *ekonomik* (istihdam olanakları, gelir/ücretler/refah, üretici fiyatları, tüketici fiyatları) ve *demografik* (nüfus büyüklüğü/yoğunluğu, nüfus yapısı, hastalık yaygınlığı) etmenlerdir. Bu çerçeve, göçün dünyanın çoğu yerinde bu itici güçler sonucunda zaten gerçekleştiğini kabul etmektedir.



Şekil 3: Göç Kararı Almada Çevresel Etkenler

Kaynak: (Foresight, 2011: 12).⁵

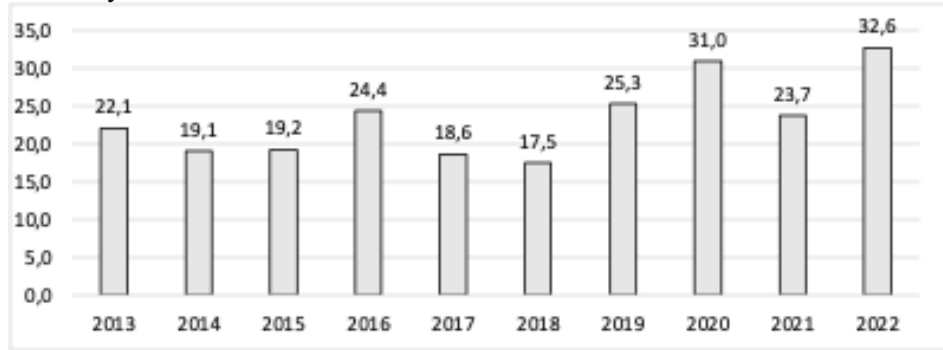
Rapora göre küresel çevresel değişim göçün itici güçlerini etkiler. Yani rapor çevresel (iklimsel faktörler dahil) faktörlerin zaman zaman nüfus hareketleri üzerinde doğrudan etkileri olabileceğini, ancak ara etkenler olan ekonomik, sosyal, demografik ve politik etkenler aracılığıyla işleme olasılığının daha yüksek olduğunu öne sürmektedir (bkz. Şekil 3).

Foresight projesinin önemli bir katkısı, çevresel faktörlerin nadiren izole bir şekilde hareket ettiğini, bunun yerine *makro* (çevresel, sosyal, siyasal, ekonomik ve demografik unsurlar), engelleyici ve kolaylaştırıcı faktörler olarak *mezo* (Siyasal/hukuki çerçeve, taşınma maliyeti, sosyal ağlar, diaspora bağları, işe

⁵ Şekil yazar tarafından Türkçe olarak yeniden hazırlanmıştır.

alım ajansları, teknoloji) ve kişisel ve hanehalkı özellikleri olarak *mikro* (yaş, cinsiyet, eğitim, varlık, medeni durum, tercihler, etnisite, din, dil) düzeydeki etkenlerin daha geniş bir takımı yıldızının parçası olarak var olduğunu vurgulamaktır.

Bu etkenler arasındaki etkileşimlerin kapsamı ve karmaşıklığı, çevresel faktörlerin tek etken olduğu kişileri yani ‘çevresel göçmenler’i ayırt etmenin de nadiren mümkün olacağı anlamına gelmektedir. Ancak çevresel değişimin göç üzerindeki etkisi gelecekte artacaktır. İklim modelleri de bu tür olayların 2030 ve 2060’tan sonra bazı bölgelerde görülme olasılığının daha yüksek olduğunu öngörmektedir (Foresight, 2011, s. 129). Çevresel değişim ayrıca nüfusun doğal tehlikelere maruz kalmasını da değiştirecektir ve göç, birçok durumda buna verilen tek yanıt niteliğindedir. Aşağıdaki şekilde yıllar itibarıyla önemli bir çevresel değişim durumu olan afetler nedeniyle ülke içinde yerinden edilenlerin oranları yer almaktadır.



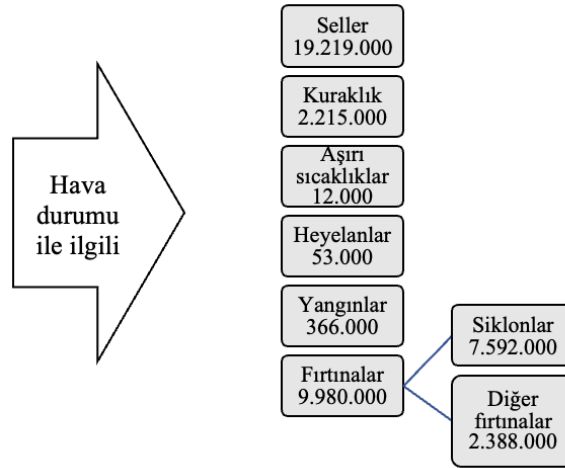
Şekil 4: Afetler Nedeniyle Ülke İçinde Yerinden Edilenlerin Sayısı

Kaynak: (IDMC, 2023, s. 9)

Şekil 4 verilerine göre 2022 yılında 32.6 milyon insan yerinden edilmiştir. Yani 2022’deki afet yer değiştirmeleri, son 10 yılın yıllık ortalamasından %41 daha yüksektir. Afet nedeniyle yerinden edilenlerin %98’i sel, fırtına ve kuraklık gibi hava durumuyla bağlantılı olaylar sonucu göç etmek zorunda kalmıştır. Verilere göre 10 afet yerinden edilmesinin 6’sı sel nedeniyle tetiklenmiş ve 2016’dan bu yana ilk kez fırtınalar yerinden edilme sebepleri içinde geride kalmıştır (IDMC, 2023, s. 9). Bu durum, iklim değişikliğinin hava olaylarını daha yoğun ve sık hale getirdiğini, sel ve suyla ilişkili afetlerin daha sık görülmeye başlandığını göstermektedir. Şekil, afet yer değiştirmeleri ve bu

afetlerin sebeplerinin insan hareketlerinin ve göçlerin iklim değişikliği ile nasıl şekillendiğini açıkça ortaya koymaktadır.

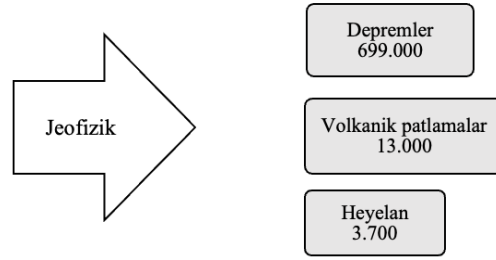
1970'lerden bu yana, iklim değişikliği ve doğal afetlerin etkisiyle yerinden edilme oranlarının önemli ölçüde arttığı gözlemlenmiştir. Yapılan araştırmalar ve veriler, afet kaynaklı yerinden edilme hareketlerinin özellikle hava durumu ile ilgili (iklimsel) ve jeofiziksel tehlikeler tarafından ciddi şekilde etkilendiğini göstermektedir. 2022 verilerine göre hava durumuyla ilgili olaylar nedeniyle 31.845.000 kişi göç etmek zorunda kalmıştır. Bunun kendi içinde olaylara göre dağılımı şu şekildedir (IDMC, 2023, s. 10):



Bu veriler hava durumu kaynaklı afetler içinde özellikle sel ve fırtına kaynaklı olayların yerinden edilme sebepleri arasında başı çektiğini göstermektedir.

Jeofiziksel olaylar⁶ nedeniyle ise 16.000 kişinin yer değiştirmek zorunda kaldığı görülmektedir. Bunun kendi içinde olaylara göre dağılımı şu şekildedir:

⁶ Depremler ve volkanik patlamalar tsunamileri de içerebilir.



Depremler, jeofiziksel olaylar arasında en yaygın ve büyük etkiye sahip olan olaylardır. Volkanik patlamalar ve heyelanlar jeofiziksel olaylar arasında daha az yaygın olmasına rağmen, bazen büyük göçlere yol açabilmektedirler.

Afet kaynaklı zorunlu yer değiştirme durumuna ülkeler temelinde bakıldığında 2022 yılı verilerine göre en yüksek rakamları bildiren beş ülkenin sırasıyla; Pakistan (8.168.000), Filipinler (5.445.000), Çin (3.632.000), Hindistan (2.507.000) ve Nijerya (2.437.000) olduğu görülmektedir (IDMC, 2023, s. 10). Yani Asya hem doğal afetler hem de iklim değişikliğine bağlı uzun vadeli çevresel değişiklikler bakımından en kırılgan bölgelerden biri olarak öne çıkmaktadır.

Afrika Asya'dan sonra diğer en kırılgan bölge olarak dikkat çekmektedir. Kuzey Afrika'da su mevcudiyetindeki değişiklikler, iç iklim göçünün başlıca itici gücü haline gelmeye adaydır. Bu değişiklikler, özellikle su kıtlığının arttığı kıyı ve iç bölgelerde yaşayan insanları zorunlu göç etmeye itecektir. Bölgedeki su stresinin yoğun olduğu yerlerde, su kaynaklarının azalması, tarım arazilerinin verimsizleşmesi ve içme suyu kaynaklarının tükenmesi, göç hareketlerini tetikleyecek önemli faktörler arasında yer alacaktır. Özellikle Tunus'un kuzeydoğu kıyısı, Cezayir'in kuzeybatı kıyısı, batı ve güney Fas gibi bölgeler, su kaynaklarının hızla tükenmesiyle en fazla etkilenecek alanlar arasında yer almaktadır. Bu yerler, zaten su stresi altında olan ve iklim değişikliği nedeniyle su kaynakları giderek azalan bölgeler olup, kıyı bölgelerinde yaşayan nüfusun göç etme ihtimali artacaktır. Ayrıca, merkezi Atlas eteklerindeki bölgeler de su sıkıntısı çeken ve daha az suya sahip olan yerleşim alanları olarak öne çıkmaktadır (World Bank Group, 2021). Bu durum, bölgedeki göç dinamiklerini önemli ölçüde etkileyecek ve nüfus artışını yavaşlatacaktır. Su kaynaklarının azalması, bu bölgelerdeki tarımsal üretimi ve yaşam koşullarını zorlaştırarak, insanlar için başka bölgelere göç etme ihtiyacı doğuracaktır. Bu bağlamda, su kıtlığının arttığı bölgelerde iklim göçü, Kuzey Afrika'da önemli bir sosyal ve ekonomik sorun haline gelecektir. Daha önce de değinildiği gibi Mısır'da, İskenderiye de dahil olmak üzere Nil Deltası'nın doğu ve batı kısımları hem su

mevcudiyetinin azalması hem de deniz seviyesinin yükselmesi nedeniyle göçün sıcak noktaları haline gelebilir.

Güney Afrika'da ise Mart 2019'da gerçekleşen İdai Siklonu, Mozambik, Zimbabve ve Malavi'yi etkilemiş ve bu tropikal fırtına çok sayıda insanın hayatını kaybetmesine neden olmuştur. Kasırga sonrası meydana gelen seller, toprak kaymaları ve şiddetli fırtınalar nedeniyle, yüzbinlerce kişinin yerlerinden olduğu, Güney Afrika'da yaklaşık 1.7 milyon kişinin zorlayıcı koşullardan etkilendiği belirtilmiştir (BBC, 2019). İdai Siklonu, tropikal fırtınaların iklim değişikliği bağlamında daha sık ve şiddetli hale gelmesinin bir örneğidir ve bu tür büyük çaplı afetler, iklimsel değişimle birlikte daha fazla yerinden edilme ve göç yaşanabileceğini göstermiştir.

Myers ve Kent (1995) tarafından üretilen ve Myers (2002, s. 611) tarafından güncellenen 'çevresel göç' ün en yaygın olarak alıntılanan tahmini, bu yöntemi kullanarak 2050 yılına kadar Bangladeş'te deniz seviyesinin yükselmesi riski altında olan toplam insan sayısının 26 milyon, Mısır'da 12 milyon, Çin'de 73 milyon, Hindistan'da 20 milyon ve küçük ada devletleri de dahil olmak üzere diğer yerlerde 31 milyon olabileceğini ve toplamda 162 milyona ulaşabileceğini ileri sürmektedir. Aynı zamanda 50 milyon insanın da artan kuraklıklar ve diğer iklim bozulmaları nedeniyle ciddi risk altında olacağını ileri sürmektedir. Yani iklimsel olaylara bağlı yer değiştirmelerin oranı oldukça yüksektir.

Dünya Bankası'nın 2021 yılında güncellenmiş Groundswell raporu (Clement vd., 2021, s. XXII), göçün giderek daha güçlü bir itici gücü olan iklim değişikliğinin, 2050 yılına kadar dünyanın altı bölgesinde 216 milyon insanı kendi ülkeleri içinde hareket etmeye zorlayabileceğini ortaya koymaktadır. Rapora göre 2050 yılına gelindiğinde Sahraaltı Afrika'da 85.7 milyon, Doğu Asya ve Pasifik'te 48.4 milyon, Güney Asya'da 40.5 milyon, Kuzey Afrika'da 19.3 milyon, Latin Amerika'da 17.1 milyon, Doğu Avrupa ve Orta Asya'da 5.1 milyon kadar iç iklim göçmeni görülebilir. Bu süreç 2050 yılı itibarıyla dünyadaki her 45 kişiden birinin yerinden edilmesiyle sonuçlanabilir.

İklimsel olaylara bağlı yer değiştirme sürecine yönelik bu verilere ve tahminlere rağmen iklim değişikliği kaynaklı yerinden edilme hareketliliğinin tam olarak tespit edilmesi ve sayılarının doğru bir şekilde kaydedilmesi karmaşık ve çok boyutlu bir sorun olmaya devam etmektedir. Gönüllü ve zorunlu göçler arasındaki belirsizlik, kısa ve uzun vadeli yerinden edilme süreçlerinin karışıklığı ve hukuki boşluklar gibi etkenler, doğru veriler toplamak için önemli engeller oluşturmaktadır.

Nitekim iklim değişikliği nedeniyle gerçekleşen göç hareketlerine yönelik politikalar ve çevresel faktörlerle bağlantılı olarak hareket eden kişilere nasıl davranılması gerektiği ile ilgili konular hem ulusal hem uluslararası düzeyde

değerlendirilmelidir. Bu durum, iklim değişikliğinin etkilerine karşı savunmasız durumda olanlara sağlanması gereken olası koruma, güçlendirme ve baş etme mekanizmalarının sorumluluğunun hükümetler ve uluslararası toplum düzeyinde nasıl paylaştırılacağı sorununu da beraberinde getirmektedir. Ayrıca uluslararası hukukun bu yeni gerçekliğe ayak uydurması gerektiğini de ortaya koymaktadır.

4.2. İklim Mültecileri ve Göçe Yönelik Uluslararası Hukuk: Mevcut Düzenlemeler ve Yeni Yaklaşımlar

Göç ve mültecilerle ilgili uluslararası hukuk ve yönetim çerçevesi, tarihsel olarak insani krizlere ve savaşlara verilen yanıtlarla gelişmiş bir alandır. Bu çerçeve, devletlerin egemenlik hakları, insan hakları ve insani yardım gibi temel ilkeler arasında denge kurmayı amaçlamaktadır. Uluslararası göç ve mültecilerle ilgili hukukun ilk temelleri, BM bünyesinde yapılan 1951 tarihli *BM Mülteci Sözleşmesi* ve 1967 tarihli *Protokol* ile atılmıştır.

BM, özellikle mülteciler ve göçmenlerle ilgili en önemli uluslararası kurumlardan biridir. UNHCR ise BM'nin mültecilere yönelik özel ajansıdır ve mültecilerin korunmasını ve ihtiyaçlarının karşılanmasını sağlar. UNHCR tarafından paylaşılan mülteci istatistiklerine göre küresel mülteci nüfusu, 2023 sonuna göre %1 artışla 2024 ortasına kadar 43,7 milyona ulaşmıştır. Bu, 2023 sonuna kıyasla %5 veya 5,3 milyonluk bir artışı temsil etmektedir.

İklim değişikliğinin göçle ilişkisi, BM gibi uluslararası organizasyonlar tarafından 1990'lardan sonra tartışılmaya başlanmıştır. Özellikle 1990'larda yapılan BM Çevre ve Kalkınma Konferansı (Rio Konferansı) ve İklim Değişikliği Çerçeve Sözleşmesi gibi anlaşmalar, çevresel değişimlerin insanların hareketliliği üzerindeki etkilerini araştırma ihtiyacını ortaya koymuştur.

İklim değişikliğine bağlı göç ve yerinden edilme konusu, uluslararası iklim politikası çerçevesinde ilk kez ciddi bir şekilde 2010 yılında Meksika'nın Cancun kentinde yapılan COP16 İklim Konferansı'nda ele alınmıştır. Cancun'da kabul edilen Cancun Uyum Çerçevesi (Cancun Adaptation Framework), ülkeler ve toplumların iklim değişikliğinin mevcut ve gelecekteki etkilerine yanıt vermek için uyum çözümleri geliştirmeleri ve eylemler uygulamalarına yönelik bir dizi politika önerisi içermektedir (UNFCCC, 2011).

Çerçevenin 14(f) maddesi özellikle göçü ve yerinden edilme gibi insani sorunları iklim değişikliği ile ilişkilendiren bir düzenleme getirmiştir. Madde 14(f), iklim değişikliğinin üç ana insan hareketliliği biçimine yol açabileceğini belirtmiştir: İlki *yerinden edilme (displacement)* olarak ifade edilen ve zorunlu göçe vurgu yapan, ikincisi *göç (migration)* olarak ifade edilen ve insanların gönüllü olarak gerçekleştirdiği harekete vurgu yapan ve üçüncüsü ise *planlı yer değiştirme (planned relocation)* olarak ifade edilen ve kamu müdahalesi ile

gerçekleşen hareketlere vurgu yapan yer değiştirme süreçleridir (IOM, 2011, s. 2). Bu düzenleme, iklim değişikliğinin etkilerini göz önünde bulundurarak, farklı göç biçimlerinin anlaşılmasını ve bunlara yönelik daha kapsamlı ve etkili politikaların geliştirilmesini teşvik etmektedir. Ayrıca, her bir insan hareketliliği biçiminin ulusal ve uluslararası hukuki düzeyde nasıl ele alınması gerektiği konusunda bir çerçeve sunmaktadır.

Cancun Uyum Sözleşmesi'nin çizdiği çerçeve doğrultusunda 2012 yılında iklim politikası ve göç ile bağlantılı önemli bir gelişme olan Nansen İnisiyatifi başlatılmıştır. Nansen İnisiyatifi'nin genel hedefi, iklim değişikliğiyle bağlantılı olanlar da dahil olmak üzere doğal afetler nedeniyle meydana gelen afetler bağlamında sınırlar boyunca yerinden edilmiş kişileri korumak için devletler arasında temel ilkeler ve unsurlar konusunda fikir birliği oluşturmaktır (IOM, 2012).

Afet Yerinden Edilme Platformu (The Platform on Disaster Displacement - PDD) ise Nansen İnisiyatifi tarafından 2012 yılında başlatılan çalışmaları takip etmeyi ve sürdürmeyi amaçlayan onun devamı niteliğinde bir girişimdir. Yerinden edilmeyi daha iyi önlemek ve buna hazırlanmak ve insanların kendi ülkelerinde veya sınır ötesinde sığınma bulmaya zorlandığı durumlara yanıt verme süreçlerine odaklanmıştır (PDD, 2015). PDD, politika yapıcılar, uygulayıcılar ve araştırmacılar arasında ortaklıklar kuran, diyalog, bilgi paylaşımı ve politika geliştirme için çok paydaşlı bir forum oluşturmıştır.

İklim değişikliğinin etkileri dünya genelinde daha belirgin hale gelirken, özellikle gelişmekte olan ülkelerdeki kayıp ve zararın tazmini, bu ülkelerin sürdürülebilir kalkınma hedeflerini etkileyen bir konu olarak gündeme gelmiştir. Bunun üzerine, COP19'da Varşova Uluslararası İklim Değişikliği Etkileriyle İlgili Kayıp ve Zarar Mekanizması (*Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts*) kurulmuştur.

Bu mekanizma kapsamında (UNFCCC, 2013); iklim değişikliğinin olumsuz etkilerine karşı, özellikle zarar görme riski yüksek olan gelişmekte olan ülkelerde ortaya çıkan kayıpları telafi etmek amaçlanmıştır. Mekanizmanın fonksiyonları arasında özellikle göç hareketleri ve iklim değişikliğinin insan hareketliliği üzerindeki etkileri de bir başlık olarak ele alınmaktadır. İklim değişikliğinin yarattığı ani ya da yavaş gelişen etkiler, göçün nedenleri arasında yer alırken, bu hareketliliklerin telafisi de Kayıp ve Zarar Mekanizması'nın temel amaçları arasında sayılmaktadır. Göç, yerinden edilme ve planlı yer değiştirme gibi durumlar, gelişmekte olan ülkelerdeki iklim değişikliği etkilerine maruz kalan nüfus için önemli bir sorun olmaktadır.

2015 yılında Paris'te gerçekleştirilen COP21'in en önemli sonucu olan Paris İklim Anlaşması'nda, devletler iklim değişikliğinin etkilerini hafifletmeye

yönelik ulusal taahhütlerde bulunmuşken, aynı zamanda iklim değişikliğine bağlı yerinden edilme (Wilkinson, Kirbyshire, Mayhew, Batra, & Milan, 2016, s. 7) konusunda çeşitli stratejiler geliştirmeye yönelik çağrılarda bulunulmuştur. Bu dönemde, iklim göçmenleri ile ilgili ilk somut öneriler ve çözüm yolları ortaya konmaya başlanmıştır.

İklim değişikliğinden kaynaklanan yerinden edilme sorununu daha derinlemesine ele almak için atılmış bir diğer önemli adım 2016 yılında gerçekleştirilen COP22’de ‘Yerinden Edilme Çalışma Grubu’nun (*Task Force on Displacement*) oluşturulmasıdır. İklim değişikliğinden kaynaklanan yerinden edilme ve göç sorunlarını araştırmayı hedefleyen grubun çözüm önerileri 2018 yılında düzenlenen COP24 Konferansı’nda, ‘İklim Kaynaklı Yerinden Edilmeler Hakkında Tavsiyeler’ olarak kabul edilmiştir (UNFCCC, 2018). Tavsiyeler hem göçmenlerin korunmasını hem de iklim değişikliğinin etkileri nedeniyle yerinden edilme riskini azaltmayı hedefleyen bir dizi strateji içermektedir.

Diğer uluslararası politika çerçevesini Sürdürülebilir Kalkınma Hedefleri (Sustainable Development Goals - SDGs) oluşturmaktadır. Küresel Hedefler olarak da bilinen Sürdürülebilir Kalkınma Hedefleri (SKH’ler), Birleşmiş Milletler tarafından 2015 yılında yoksulluğu sona erdirmek, gezegeni korumak ve 2030 yılına kadar tüm insanların barış ve refah içinde yaşamasını sağlamak için evrensel bir eylem çağrısı olarak kabul edilmiştir (UN, 2015). SKH’lerin odağında 2030 Sürdürülebilir Kalkınma Gündemi çerçevesinde küresel düzeyde ekonomik, sosyal ve çevresel eşitsizliklerin giderilmesi amacıyla oluşturulmuş 17 ana hedef yer almaktadır. İklim değişikliği ve göç, bu hedeflerin birkaçında doğrudan ve dolaylı bir şekilde yer almakta ve birbirleriyle güçlü bir ilişki içindedir.

İklim değişikliği, göç ve Sürdürülebilir Kalkınma Hedefleri arasındaki ilişki açısından bakıldığında ‘Yoksulluğun Sona Erdirilmesi’ (*No Poverty*) başlıklı SKH 1 (UNDP, 2015a) ile en kırılgan durumda olanları hedef almayı, göçmenlerin yeni yerleşim yerlerinde sosyal hizmetlere erişimi, temel kaynakları ve hizmetleri artırmayı ve çatışma ve iklimle ilgili afetlerden etkilenen toplulukları desteklemeyi içermektedir. ‘Sıfır Açlık’ (*Zero Hunger*) başlıklı SKH 2 (UNDP, 2015b) ile her türlü açlık ve yetersiz beslenmenin sona erdirilmesi ve sürdürülebilir tarımın teşvik edilmesi ile sürdürülebilir gıda sistemlerinin kurulması hedeflenmektedir. Böylece hem iklim değişikliğini hem de göçü dengeleyebilecek bir sistem oluşturulmuş olacaktır.

İklim değişikliğinin göç üzerindeki etkileri doğrudan ‘İklim Eylemi’ (*Climate Action*) başlıklı SKH 13 (UNDP, 2015c) ile bağlantılıdır. Bu hedef, en az gelişmiş ülkelerde ve gelişmekte olan küçük ada devletlerinde, kadınlara, gençlere ve yerel ve marjinal topluluklara odaklanmak da dahil olmak üzere,

iklim değişikliğiyle ilgili etkili planlama ve yönetim için kapasite artırma mekanizmalarını teşvik etmeyi amaçlamaktadır. İklim eylemi, ayrıca göçün nedenlerini önlemeyi ve mevcut göçmen nüfusları için sürdürülebilir çözümler sunmayı kapsamaktadır.

‘Eşitsizliklerin Azaltılması’ (*Reduced Inequalities*) başlıklı SKH 10 (UNDP, 2015d) ise göçle doğrudan ilgili temel amaçtır. İklim değişikliği, genellikle en az gelişmiş ülkelerde yaşayan insanları daha fazla etkiler. İklim mültecileri, ekonomik ve sosyal eşitsizlikleri derinleştirir, çünkü bu gruplar sıklıkla düşük gelirli ve altyapısı zayıf bölgelerde yaşar. Bu bağlamda, göçmenlerin sosyal haklara erişimini ve eşitsizliklerin azaltılmasını hedefleyen politikalar geliştirilmesi tavsiye edilerek 10.7 numaralı hedef ile planlı ve iyi yönetilen göç politikalarının uygulanması da dahil olmak üzere, insanların güvenli, düzenli ve sorumlu bir şekilde göç etmesini ve hareketliliğini kolaylaştırma önerilmektedir.

Sürdürülebilir Kalkınma Hedefleri, iklim değişikliği ve göç arasında güçlü bir ilişki kurarak, daha adil, eşitlikçi ve dayanıklı bir küresel toplum inşa edilmesini amaçlar. Söz konusu hedeflere ulaşmak, sadece çevresel krizleri çözmekle değil, aynı zamanda iklim değişikliğinden etkilenen göçmenlerin haklarını korumakla da mümkündür. 2018 yılında imzalanan Güvenli, Düzenli ve Kurallı Göç için Küresel Mutabakat (*Global Compact for Safe, Orderly, and Regular Migration-GCM*) ise bu hedeflerin önemli bir sonucu olarak karşımıza çıkmaktadır.

Birleşmiş Milletler himayesinde müzakere edilen Küresel Mutabakat, uluslararası göçün tüm boyutlarını kapsayan ilk hükümetler arası anlaşmadır. GCM, göç yönetimini güçlendirmek, günümüz dünyasında göçle ilişkili zorlukları ele almak ve göçün sürdürülebilir kalkınmaya katkısını kullanmak için benzeri görülmemiş bir fırsat sunmaktadır (IOM, 2018). Ayrıca Mutabakat, devletlerin egemenliklerini ve uluslararası hukuk kapsamındaki yükümlülüklerini destekleyen, hukuksal bağlayıcılığı olmayan ve iş birliğine dayalı bir çerçevedir.

Küresel Mutabakat (UN, 2018a, s. 5-6) kapsamında göçle ilişkili zorlukları ele almak için 23 adet hedef ortaya konulmuştur. Bu hedefleri gerçekleştirmek için yararlanılacak eylemler “insanları menşe ülkelerini terk etmeye zorlayan olumsuz etkenleri ve yapısal faktörleri en aza indirmeyi (Hedef 2), düzenli göç için yolların kullanılabilirliğini ve esnekliğini artırmayı (Hedef 5), göçteki güvenlik açıklarını belirlemeyi ve azaltmayı (Hedef 7), göçmenler için temel hizmetlere erişim sağlamayı (Hedef 15), göçmenleri ve toplumları tam katılım ve sosyal uyumu gerçekleştirmeleri için güçlendirmeyi (Hedef 16), güvenli, düzenli ve düzenli göç için uluslararası işbirliğini ve küresel ortaklıkları

güçlendirmeyi (Hedef 23)’’ öngörmektedir. Kısaca GCM, dünya genelinde göç yönetimi konusunda önemli bir adım olarak kabul edilmektedir. Göçün daha insancıl, düzenli ve güvenli bir şekilde gerçekleşmesi için küresel bir iş birliği zemini sunan bu mutabakat, aynı zamanda göçmenlerin haklarının korunmasını da hedeflemektedir.

Bir diğer önemli belge ise BM’nin 1951 tarihli *Mülteci Sözleşmesi* ve protokollerinin üzerine inşa edilen Mültecilere İlişkin Küresel Mutabakat (*The Global Compact for Refugees-GCR*)’tır. GCR uluslararası iş birliği olmadan mülteci durumlarına sürdürülebilir bir çözümün elde edilemeyeceğini kabul etmektedir (UNHCR, 2018). Ayrıca GCR, GCM ile aynı doğrultuda mülteci hareketliliğini, ülkeler arası dayanışmayı ve mültecilerin haklarını korumayı hedeflemektedir.

Ev sahibi ülkeler üzerindeki baskıların hafifletilmesi, mültecilerin kendi kendilerine yeterliliklerinin artırılması, üçüncü ülke çözümlerine erişimin genişletilmesi ve güvenli ve onurlu bir şekilde geri dönüş için menşe ülkelerdeki koşulların desteklenmesi GCR’nin dört temel hedefini yansıtmaktadır (UN, 2018b, s. III). Bu hedeflerden de anlaşıldığı üzere GCR, doğrudan ‘iklim mültecileri’ ifadesini kullanmamaktadır; ancak iklim değişikliğinin neden olduğu yerinden edilme ve çevresel faktörler ile mülteciliği tartışan önemli bir gelişme olarak karşımıza çıkmaktadır.

GCR dünya genelinde göç yönetimini düzenlerken bu bağlamdaki önemli bir bölgesel gelişme olan Kampala Sözleşmesi’ne (African Union Convention for The Protection and Assistance of Internally Displaced Persons in Africa - Kampala Convention) de değinmek gerekmektedir. Afrika Birliği, hükümetlerin çatışma, şiddet, felaketler ve insan hakları ihlallerinden kaçan göçmenleri korumasını zorunlu kılan dünyanın ilk yasal olarak bağlayıcı kıtasal düzenlemesi olarak Kampala Sözleşmesini kabul etmiştir (Roderick, Garg, Morel, Brick, & Powers, 2021, s. 42). Sözleşmede iklim göçünün, zulüm ve benzeri diğer insani nedenlere bağlı göç ile aynı önemde ele alınması oldukça önemlidir (Balaban vd., 2021, s. 164). Bu bölgesel hukuk, iklim göçü ile ilgili olarak henüz uluslararası ölçekte bir çözüm bulunmamakla birlikte, Afrika kıtasında yaşanan iklim krizinin etkilerini hafifletmeye ve mağdurları hukuki güvence altına almaya yönelik önemli bir adım oluşturmaktadır.

Küresel Mutabakat ise hem mültecilere hem de onlara ev sahipliği yapan toplumlara fayda sağlayarak, dünyanın mülteci durumlarına müdahale şeklini dönüştürmek için eşsiz bir fırsat teşkil etmektedir. Mutabakat, iklim değişikliğinin yarattığı yerinden edilme sorunlarını doğrudan ele almasa da iklim mültecilerinin korunması ve bu kişilere yönelik uluslararası dayanışmanın güçlendirilmesi gerektiğini dolaylı olarak vurgulamaktadır. Bu, iklim

değişikliğine dayalı göçün küresel bir sorun olarak kabul edilmesi gerektiği anlamına gelmektedir. Mutabakatın sunduğu çerçeve, iklim değişikliğinin neden olduğu yerinden edilme konusunun, gelecekteki mülteci politikalarına entegre edilmesi için önemli bir fırsat sunmaktadır. Ancak, bu konuda daha fazla hukuki düzenleme ve uluslararası iş birliği gerekmektedir.

5. SONUÇ

İklim değişikliği, göç hareketlerinin şekil ve yönlerini yeniden tanımlamaktadır. Özellikle gelişmekte olan ülkelerde, su kaynaklarının tükenmesi, gıda güvensizliği ve doğal afetlerin sıklıklaşması, insanların daha güvenli bölgelere göç etmelerini zorunlu kılmaktadır. Bu durum, küresel göç dinamiklerinde önemli bir değişim yaratmaktadır.

Bugün iklim mültecileri, çoğu zaman ‘mülteci’ statüsü kazanamamaktadır çünkü mülteci statüsü genellikle savaş, etnik temizlik veya politik baskılar gibi nedenlere dayalıdır. Bu durum, yeni bir uluslararası yasal çerçevenin gerekliliğini ortaya koymaktadır. Ayrıca hükümetlerin ve uluslararası organizasyonların iklim değişikliği ile mücadele ederken, göç ve mülteci kabulü gibi politikalarını yeniden şekillendirmeleri gerekmektedir. Çözüm, iklim değişikliğini durdurmaya yönelik küresel eylem kadar, iklim mültecilerinin korunması ve yerinden edilmiş topluluklar için politikalar geliştirilmesi ile sağlanabilir.

Küresel iş birliği ve etkili mülteci politikaları oluşturulmadan, iklim mültecilerinin haklarının ve yaşam koşullarının iyileştirilmesi söz konusu değildir. İklim değişikliğinin etkileri, sadece çevresel bir sorun olmanın ötesine geçerek, insan hakları, ekonomik eşitsizlikler ve sosyal adalet gibi daha geniş sorunları da gündeme getirmektedir. Bu nedenle iklim değişikliğinin artan etkileri karşısında, küresel iş birliği ve mutabakat önem kazanmaktadır. Birçok ülke, Birleşmiş Milletler çerçevesinde, iklim mültecilerinin hakları ve korunmasına dair ortak bir yaklaşım geliştirmek için çeşitli toplantılar ve konferanslar düzenlemiş ve 2018’de Güvenli, Düzenli ve Kurallı Göç için Küresel Mutabakat adıyla bir anlaşma kabul etmiştir. Bu mutabakat, göçmenlerin haklarının korunması, göç yönetimi ve göçün düzenlenmesi üzerine bir dizi ilke belirlemiş, ancak doğrudan iklim mültecilerinin korunmasına yönelik hukuki bir bağlayıcılık sağlamamıştır. Yine de bu metin, iklim değişikliği nedeniyle zorunlu göçün giderek daha fazla görünür hale geldiği gerçeğini kabul etmiş ve ülkelerin bu tür göçmenlere yönelik daha proaktif politikalar geliştirmeleri gerektiğini belirtmiştir.

Küresel Göç Mutabakatı, Nansen İnisiyatifi ve Kampala Sözleşmesi gibi önemli belgeler, iklim mültecilerinin korunmasına yönelik yeterli bir çerçeve

sağlamamaktadır. Küresel ölçekte iklim değişikliğinin etkileri arttıkça, yerinden edilmiş kişilerin korunmasına yönelik hukuki ve politik mekanizmaların daha fazla güçlendirilmesi gerekmektedir. İklim mülteciliği, geleneksel mülteci sorunlarından farklı bir dinamik geliştirdiği için, uluslararası toplumun yeni bir İklim Mülteciliği Sözleşmesi üzerinde mutabakata varması önemlidir. Nitekim iklim mültecilerinin uluslararası düzeyde tanınması ve korunması için daha güçlü bir hukuki çerçeve geliştirilmesi, yalnızca iklim değişikliğiyle mücadele çabalarını değil, aynı zamanda insan hakları ve küresel adalet anlayışını da güçlendirecektir.

6. ÇIKAR ÇATIŞMASI BEYANI

Yazarlar arasında çıkar çatışması bulunmamaktadır.

7. MADDİ DESTEK

Bu çalışmada herhangi bir fon veya destekten yararlanılmamıştır.

8. YAZAR KATKILARI

GG: Fikir;

GG: Tasarım;

GG: Denetleme;

GG: Kaynakların toplanması ve/veya işleme;

GG: Analiz ve/veya yorum;

GG: Literatür taraması;

GG: Yazıyı yazan;

GG: Eleştirel inceleme

9. ETİK KURUL BEYANI VE FİKRİ MÜLKİYET TELİF HAKLARI

Çalışma etik kurul izni gerektirmemektedir.

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A SPATIAL ANALYSIS OF TÜRKİYE'S CROSS-BORDER COUNTERTERRORISM OPERATIONS ON IRAQ'S STABILITY: 2004-2023¹



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ABSTRACT

The main purpose of this study is to examine the spatial impact of Türkiye's cross-border operations on Iraq, particularly focusing on their potential to destabilize the northern region using Geographical Information Systems (GIS). Türkiye's operations are often criticized in both political discourse and academic literature, with the argument that they disrupt the stability of Iraq's northern provinces, which are considered to be among the most stable parts of the country. To investigate this claim, this study employs Global Moran's I* and Getis-Ord General G analyses to assess the spatial distribution of attack intensity across Iraqi provinces. The time period considered is the post-occupation era. To further delve into the dynamics of violence, the analysis will be divided into three sub-periods based on significant changes in attack patterns in general: 2004-2012, 2013-2017, and 2018-2023. Additionally, to ensure the reliability of the results, the analyses will be conducted both with and without data on Türkiye's involvement. To enhance the robustness of the findings, comparative analyses will be conducted both with and without incorporating data on Türkiye's military interventions. The results of this study will provide valuable insights into the complex relationship between cross-border operations and regional stability in the Middle East. The study concluded that Türkiye's operations did not statistically affect the spatial distribution of violence in North of Iraq.

Keywords: Spatial analysis, operations of Türkiye, Geographical Information Systems

JEL Codes: C21, D74

Scope: International relations

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¹ The study has been officially stated to follow the ethical standards required for its specific field of research.

TÜRKİYE’NİN SINIRÖTESİ TERÖR KARŞITI OPERASYONLARININ IRAK’IN İSTİKRARINA ETKİSİNİN MEKANSAL ANALİZİ: 2004-2023



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ÖZ

Bu çalışmanın temel amacı, Türkiye'nin Irak'a yönelik sınır ötesi operasyonlarının, özellikle kuzey bölgesini istikrarsızlaştırma potansiyeli üzerindeki mekansal etkisini Coğrafi Bilgi Sistemleri (CBS) kullanarak incelemektir. Türkiye'nin operasyonları, hem siyasi söylemde hem de akademik literatürde sıklıkla eleştirilmekte ve Irak'ın en istikrarlı bölgeleri olarak kabul edilen kuzey illerinin istikrarını bozduğu iddia edilmektedir. Bu iddiayı araştırmak için, çalışma, Irak illerindeki saldırı yoğunluğunun mekânsal dağılımını değerlendirmek için Global Moran's I* ve Getis-Ord Genel G analizlerini kullanmaktadır. İncelenen dönem, işgal sonrası dönemdir. Şiddet dinamiklerini daha derinlemesine incelemek için, analizler genel olarak saldırı modellerindeki önemli değişikliklere dayanarak üç alt döneme ayrılacaktır: 2004-2012, 2013-2017 ve 2018-2023. Ayrıca, sonuçların güvenilirliğini sağlamak için analizler, Türkiye'nin müdahil olduğu verilerle ve olmadan gerçekleştirilecektir. Bulguların sağlamlığını artırmak için, karşılaştırmalı analizler, Türkiye'nin askeri müdahaleleri hakkındaki veriler dâhil edilerek ve edilmeden gerçekleştirilecektir. Bu çalışmanın sonuçları, Ortadoğu'da sınır ötesi operasyonlar ile bölgesel istikrar arasındaki karmaşık ilişki hakkında değerli bilgiler sağlayacaktır. Araştırmada Türkiye'nin operasyonlarının Kuzey Irak'taki şiddetin mekansal dağılımını istatistiksel olarak etkilemediği sonucu ortaya çıkmıştır.

Anahtar Kelimeler: Mekânsal analiz, Türkiye'nin operasyonları, Coğrafi Bilgi Sistemleri

JEL Kodları: C21, D74

Alan: Uluslararası ilişkiler

Türü: Araştırma

1. INTRODUCTION

Since the 2003 U.S. invasion of Iraq, the country has experienced both domestic and international conflicts. While Saddam Hussein's Ba'ath regime maintained relative domestic stability through the use of force, the U.S. invasion exposed Iraq's underlying fragility, rooted in its diverse and cosmopolitan structure. The country is composed of three major groups: Shia, Sunni Arabs, and Kurds, along with other minorities such as Turkmens and Assyrians. Despite the Ba'ath regime's authoritarian rule, which suppressed ethnic conflicts for four decades, the U.S. invasion's liberal interventionist motives failed to restore liberal institutions and instead created a power vacuum that fueled long-lasting conflicts. Following the U.S. invasion, conflicts spread throughout Iraq, exacerbated by the Syrian Civil War and the aggression of DAESH. Ultimately, Iraq suffered from state failure.

The state failure in Iraq either empowered or gave rise to several non-state actors. Hafez (2006) categorizes the suicide attackers based on their objectives (system reintegration or system collapse) and ideologies (Islamists or Nationalists), identifying seven major active groups targeting the post-invasion political structure. Since Hafez's work focuses on suicide bombings, Sunni Arab groups naturally became the primary subject of study. However, considering other groups or terrorist organizations, such as the PKK in the north of Iraq, the number of actors involved in the region's conflicts increases. Therefore, following the U.S. invasion and subsequent state failure, conflicts in Iraq surged dramatically after 2003. For instance, while there were only 6 violent events in Iraq in 2002, the number skyrocketed to 106 in 2003 and 344 in 2004 (Davies et al., 2024).

The magnitude and scope of violent attacks in Iraq elevated the country to a critical research area for conflict studies. Indeed, Iraq has become an important case study within the field of conflict studies. Since the invasion, conflict and post-conflict issues have been prominent in Iraq. These include the failed American invasion (Godfroy & Collins, 2019), which created a security vacuum and necessitated the establishment of new security forces for the post-invasion regime (Wilcke, 2006). Related to this, both political integration (Ucko, 2008) and descriptions of insurgencies (Hughes, 2010), and counterinsurgency (Hoffman, 2006) have been extensively examined in the literature. Regarding quantitative analyses, significant contributions have been made to the literature examining different times and spaces. While in the early years of the Iraq War, attention had been on the US's strategic decision such as Mead's (2005) game theoretical approach to the war, it has shifted to terrorist and suicide attacks after the invasion. The quantitative analyses of Ayers (2008) and Seifert & McCauley

(2014) are the outstanding studies on suicide bombings in Iraq. Additionally, several studies have tested the power law distribution of violent attacks in both the whole of Iraq (Amara & McNab, 2010) and specifically in Diyala Province (Cioffi-Revilla & Romero, 2009). In this regard, the existing literature on quantitative analyses primarily focuses on attacks by non-state actors. The effects of state involvement (i.e., U.S. involvement) or counter-terrorism operations (i.e., Türkiye's operations) are not sufficiently explored quantitatively. Finally, the prolonged and pervasive terrorist attacks provide valuable data for scholars studying spatial analysis (Medina et al., 2011; Siebeneck et al., 2009). Both Medina et al.'s and Siebeneck et al.'s studies conclude that terrorist attacks are correlated with population density and special days. Furthermore, Baghdad, East of Iraq, and North of Iraq are identified as the regions with the highest intensity of attacks. These valuable studies contribute to our understanding of the spatial dependence of violent events throughout Iraq. Due to their focus on general tendencies, however, the marginal contribution of individual actors cannot be discerned.

Türkiye has also been involved in the northern part of the country due to the increased attacks by the terrorist Kurdistan Workers' Party (PKK). Although the number of attacks against Türkiye dramatically decreased after 1994 and reached near-cease levels in 2002, they revived after the US invasion and escalated again after 2010 (START, 2022). Despite shared counter-terrorism interests, a significant gap existed between the U.S. and Türkiye regarding north of Iraq (Müftüler-Bac, 2006, p. 63). While the US rhetorically supported Türkiye's counter-terrorism operations, it hesitated to provide active aid to its NATO ally in the region. This reluctance stemmed, in part, from the close relationship between the U.S. and Iraqi Kurds, who were valued partners in the war against Saddam Hussein (Altunışık, 2006, p. 190; Kardaş, 2021, p. 137; Gunter, 2015, p. 108). Ironically, north of Iraq is often cited as the most stable region within the country (Aspell, 2005; Glavin, 2015; Hitchens, 2007). Despite this, Türkiye has undertaken several military interventions in Iraq, particularly since 2008, in response to escalating border tensions and attacks on border outposts. However, these interventions have drawn criticism from academic, public, and political circles, who perceive them as destabilizing factors (Larrabee, 2010, pp. 16–17; Mohammed, 2007). As a result, only Türkiye's anti-Daesh operations have been supported by both the US and Iraqi governments.

In contrast to criticisms, Turkish academia asserts that Türkiye's cross-border operations to Iraq are based on international law under Positive Obligations (Akutay & Ateş, 2013). Additionally, they contribute to regional security due to their counter terrorism nature (Şahin, 2023). Unlike the US

claimant that the region is the most stable part of Iraq, from Türkiye's perspective the northern region of Iraq became a safe haven for the PKK following the US invasion, making the area far from an island of stability. Therefore, Türkiye's operations, which are conceptualized as Rapid Decisive Operations (Yeşiltaş, 2020) do not harm the non-existent stability. According to Sadri Alibabalu, (2022, p. 156) the so-called stability in the north of Iraq was not due to the state capacity but rather to regional government's reluctance to initiate action against the PKK and affiliated groups.

As the preceding discussion illustrates, scholarly discourse regarding Türkiye's cross-border operations into Iraq is characterized by two divergent viewpoints. On the one hand, Türkiye's interventions are qualitatively posited as destabilizing forces in north of Iraq. Conversely, it is argued that the region is far from an 'island of stability,' thereby rationalizing the operations as integral to the war on terror. However, both assertions lack robust empirical support within the existing literature. Therefore, this article endeavors to examine Türkiye's military operations within Iraq through the application of spatial analytical techniques, specifically to assess whether north of Iraq constitutes the most stable region of the country and whether Türkiye's engagement has influenced this condition. Thus, the main research question of the article is: How do Türkiye's military operations affect the stability of north of Iraq. The research question will be inquired by the hypotheses that are H_0 : *There is no clustering in violent attacks in Iraq* in each time periods. The analysis is limited by the test of spatial autocorrelation instead of spatial dependence, because the main aim is to understand only Türkiye's marginal effect on stability. In this regard, having put the data and method in the second section, the third section of the paper will provide a descriptive overview of Türkiye's military operations in Iraq and outline the primary objectives of these operations. This will be followed by the spatiotemporal analysis of organized violence in Iraq after the US invasion.

2. THEORETICAL FRAMEWORK

Cross-border military operations frequently expose the tension inherent in international relations. Although state sovereignty is widely recognized as a core principle, its infringement occurs regularly. While aggression has been codified as an international crime for close to a century, the parameters of 'just war' continue to be a subject of debate. Contemporary literature identifies three primary justifications for cross-border military operations: liberal interventionism, the Responsibility to Protect (R2P), and counter-terrorism efforts against non-state actors.

Liberal interventionism was used as a democracy promotion tool especially after 9/11. The doctrine basically argues that collective military intervention is justified in cases of severe human rights violations by a state or within an internal conflict (Lipsey, 2016, p. 416). Tony Blair prominently used this rationale in the period preceding the Iraq War. The period following the Cold War was characterized by a perception of the triumph of liberal values, with an expectation of the expansion of the liberal international order. Consequently, resistance to this perceived order was often framed as necessitating transformation, potentially through intervention. This contributed to a heightened prevalence of interventionist rhetoric and action following 9/11. However, liberal interventionism faces significant criticism, including accusations of bias and of serving to reinforce a US-favorable liberal international system. Critiques also point to the frequent disparity between stated goals of democracy promotion and the actual outcomes of interventions (Baciu et al., 2024).

The second justification for cross-border operations is the emerging Responsibility to Protect (R2P) doctrine. The doctrine was adopted by the United Nations in 2005. Accordingly, when a state fails to protect its population from genocide, war crimes, ethnic cleansing, and crimes against humanity, the international community, through the Security Council, has a responsibility to take collective action. This may include the use of diplomatic, humanitarian, and other peaceful means, and, as a last resort, the use of force under Chapter VII of the UN Charter. However, scholarly inquiry and a vast body of literature on the Responsibility to Protect often center on its implementation failures (Gözen Ercan, 2022, p. 291). Consequently, R2P's practical application in justifying cross-border operations and political violence is limited. It primarily functions as a normative principle rather than a consistent explanatory factor.

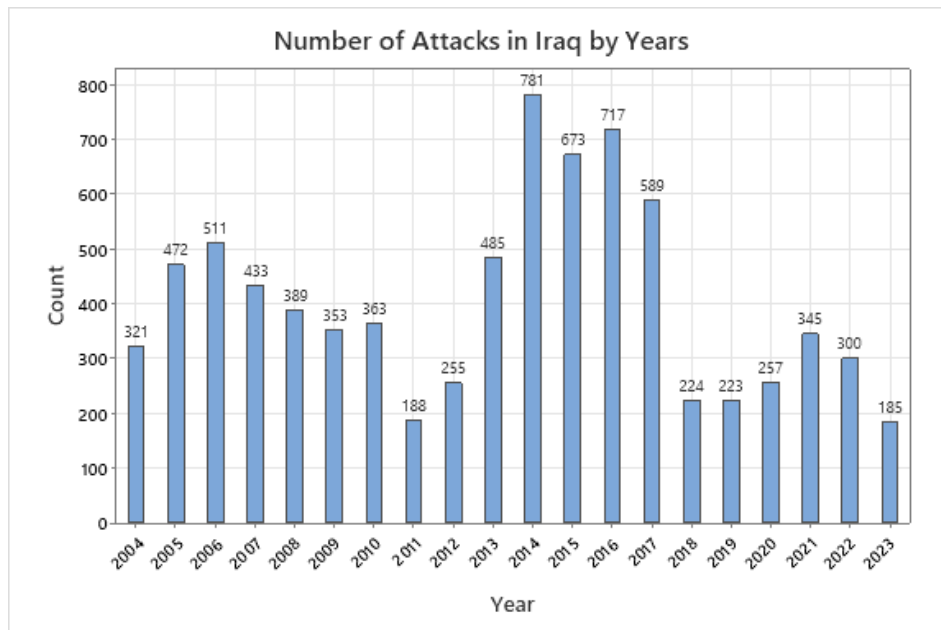
Finally, counter-terrorism efforts against non-state actors represent not only the most frequent form of cross-border operation but also a significant explanatory factor for instances of political violence. While the perceived decline of the UN's influence is often cited as a contributing factor to the rise in cross-border operations (Nyadera & Kisaka, 2020), state fragility or failure can be argued as an equally, if not more, compelling explanation. In many cases, it is the inability or unwillingness of states to control their territories that creates the vacuum in which non-state terrorist groups thrive, necessitating cross-border intervention. This explanation holds particular relevance for the case of Turkish cross-border operations. In this regard, this article posits that state failure is a primary driver of violence in Iraq, and further argues that Türkiye's cross-border operations do not significantly destabilize Iraq.

3. DATA AND METHOD

The conflict data was sourced from the Uppsala Conflict Data Program (UCDP). The primary reason for selecting this database is its inclusion of both spatial details, such as coordinates, and demographic information, including dyad names and administrative divisions. Thus, interpolation and spatial analysis could be examined along with. This enables the examination of both spatial distribution and autocorrelation of conflicts. Moreover, UCDP encompasses all conflict data, including attacks by non-state actors as well as interstate wars.

To conduct a spatial analysis of post-war Iraq, the data used in this study covers the period from 2004 onwards. To ensure validity and reliability, the post-2004 period is divided into three sub-periods. The temporal division of the study is based on fluctuations in the number of attacks in Iraq after the US invasion. Graph 1 helps visualize these changing fluctuations in event numbers and their groupings. The first period, from 2004 to 2012, witnessed a surge in attacks primarily perpetrated by insurgent groups. Although the number of events declined somewhat in 2011 and 2012, the emergence of DAESH led to a resurgence, surpassing the levels of the previous period. Consequently, the period between 2013 and 2017, marked by the highest number of attacks, constitutes the second period of this analysis. Following the suppression of DAESH, the number of attacks decreased after 2018. Therefore, the period from 2018 to 2023 represents the final period of this analysis. Graph 1 presents the total number of attacks in Iraq by year.

A total of 8444 events were identified in Iraq between 2004 and 2023. However, only 8064 of these events were included in the analysis due to the unclear locations of 380 events. The UCDP assigned more general locations to these events, such as Eastern Iraq or Iraq, and assigned coordinates randomly. Consequently, this article will focus on the conflicts with identifiable locations. Additionally, 22 different dyad names were recorded by the UCDP in the whole of Iraq. This data was collected to test if there is a relationship between the number of dyads and attack intensity.

Figure Graph 1: Total Number of Attacks in Iraq by Years

Source: Prepared by the authors based on ((Davies et al., 2024))

Two methods can be employed to examine spatial autocorrelation and draw conclusions: interpolation and attribution. Interpolation involves generating a map of conflict points and testing the dependency of the interpolation. Attribution involves assigning a number to each administrative division and then testing the spatial dependency of these divisions. While both methods have their advantages and disadvantages, this paper will focus on the attribution method for two main reasons. First, interpolation carries the risk of data loss, particularly when transforming raster data into polygons. This can compromise the validity and reliability of the analysis. Second, while spatial autocorrelation requires spatial continuity for reliability, interpolation may create gaps, leading to misleading results. Therefore, the hypothesis will be tested by attributing relevant rates to administrative divisions.

To assess regional stability more accurately, attack intensity ratings, rather than the total number of events, were assigned to administrative divisions. This approach, similar to the GIS analyses of Medina et al. (2011) and Siebeneck et al. (2009), addresses potential inconsistencies between the number of events and causalities, which can lead to misleading conclusions about stability. In both

studies, attack intensity ratings were calculated by dividing the sum of total fatalities, injuries, and hostages in a specific time period by the total number of incidents over the same period (Medina et al., 2011, p. 866) (Siebeneck et al., 2009, p. 597). While both studies primarily focused on terrorist activities, data on total casualties, including fatalities, injuries, and hostages, were available from various sources. However, the UCDP database, which includes all political violence events, records only fatalities for each event, not the total number of casualties. For state-to-state and state-to-non-state conflicts, data on total casualties were not recorded. Consequently, the analysis in this study will consider only fatalities when calculating attack intensity ratings. The attack intensity is therefore defined as $A = F/T$, where F represents the number of fatalities in a specific time and space, and T is the total number of events in the relevant period and location. The UCDP database offers low, high, and best estimates for the number of fatalities, with varying levels of data reliability. For the purposes of this analysis, the "best" estimate, which represents the most likely scenario, is used for all calculations.

Apart from dividing the time period into three stages, spatial analyses will be conducted both including and excluding Türkiye's operations in Iraq. This will help us to identify if there is a marginal contribution of Türkiye's involvement. In this regard, the spatiotemporal analysis will be supported by testing the correlation between dyad numbers and attack intensity. The spatial analyses will be conducted by GIS program. Maps will also be produced by using GIS.

4. SUMMARY OF TÜRKİYE'S CROSS-BORDER OPERATIONS AFTER 2004

Türkiye conducted three major and several minor cross-border operations into Iraq in the post-invasion era. Major operations involved more than 5,000 troops, while minor operations were either aerial strikes or ground operations with fewer than 5,000 troops.

Türkiye's first major cross-border operation occurred in 2007, following the Dağlica Attack by the PKK in Hakkari province. This attack, which resulted in the deaths of 12 Turkish soldiers, significantly impacted Turkish public opinion and led to an intensification of cross-border operations. Turkish parliament almost unanimously (central-right Justice and Development Party, central-left Republican People's Party and right-wing Nationalist Movement Party voted in favor) issued a memorandum that allows Turkish Armed Forces to commit cross-border operations to Iraq. In response, the Turkish Air Force

launched comprehensive air strikes against PKK targets in Iraq, including strategic locations like Kandil, Zap, and Hakurk.

The operations were not limited to air strikes after the Dağlica Attack; rather, the first major land operation was launched in February 2008, which was an unusual season for a massive operation, named “Operation Sun”. It was also the first land operation to Iraq after the US invasion. An estimated 8,000 troops were involved in operation according to military sources of Türkiye (Bendern, 2008). Despite the huge amount of military mobility, the operation took eight days eventually Türkiye’s withdrawn as the operation succeeded neutralizing more than two hundred terrorists.

After the operation, however, Turkey's domestic policy shifted towards the Solution Process, a peace initiative aimed at resolving the conflict with the PKK through dialogue and negotiation between 2009 and 2015. Additionally, the rise of DAESH in Syria became a primary security concern for Turkey. The PKK also redirected its focus to the Syrian Civil War. As a result, Turkey's cross-border operations into Iraq were significantly reduced during this period.

After suppressing the threat of ISIS, Türkiye launched a new ground operation against the PKK in Iraq in 2018, codenamed "Operation Tigris Shield." This operation, which extended 15 kilometers into Iraqi territory, aimed to eradicate PKK groups at their source. Unlike previous operations, Türkiye established permanent bases at strategic points in Iraq, enabling sustained and focused cross-border operations. As a result, Türkiye's military presence in Iraq has significantly increased since 2018.

Türkiye's second major cross-border operation into Iraq, codenamed "Operation Claw," commenced in 2019. This operation marked the beginning of a series of significant military campaigns aimed at eradicating terrorist threats targeted Metina, Gara, Avasin, Basyan, and Zap. Invoking Article 51 of the UN Charter, Türkiye sought to establish a 30-kilometer security zone within Iraqi territory. The most recent major operation in this series, "Operation Claw-Locked," was conducted in 2022.

Overall, Türkiye's cross-border operations into Iraq have been driven by security concerns, aiming to establish a secure border, limit the PKK's freedom of movement, and contribute to regional stability. However, these operations have also drawn criticism from some regional countries, who argue that they have destabilized the region (Geldi, 2020).

To test these contrasting perspectives, this article employs spatial autocorrelation analysis to examine the impact of Turkish cross-border operations on attack intensity and the spatial patterns of attacks in Iraq, both before and after Turkish intervention. The following section presents the results of the regression

analysis of attack intensity and dyad number, as well as the spatiotemporal analysis of attacks in Iraq.

5. RESULTS

5.1. Summary of Violent Events

Table 1 demonstrates the total events, death numbers, attack intensity, and dyad number in accordance with provinces. Accordingly, although Al Muthanna has the lowest number of events and deaths, its attack intensity is close to the mean. This means the magnitude of attacks has more destructive effects in that province. Ninawa, on the other hand, has the greatest number of events and deaths, and its attack intensity rate is significant.

Table 1: Events, Deaths, Attack Intensity and Dyad Number in Iraq between 2004-2023

Provinces	Events	Deaths	Attack Intensity (Death/Events)	Dyad Number
Al Anbār	1220	16729	13,71229508	7
Al Baṣrah	85	597	7,023529412	7
Al Muthanná	5	45	9	2
Al Qādisīyah	16	98	6,125	5
An Najaf	50	825	16,5	5
Arbīl	335	2197	6,558208955	7
As Sulaymānīyah	54	137	2,576923077	6
Bābil	105	1943	18,5047619	6
Baghdād	1421	13583	9,558761436	15
Dahūk	417	1325	3,177458034	2
Dhī Qār	20	266	13,3	4
Diyālá	692	5190	7,5	12
Karbalá'	54	641	11,87037037	6
Kirkūk	469	4975	10,60767591	9
Maysān	16	103	6,4375	5
Nīnawá	2305	25201	10,93318872	10
Ṣalāḥ ad Dīn	759	9036	11,90513834	9
Wāsiṭ	41	449	10,95121951	5

Source: Prepared by the authors based on ((Davies et al., 2024))

To begin the statistical analysis of the number of actors in the conflict area, Table 1 prompted us to investigate the correlation between the number of actors involved in violent events (dyad number) and their potential impact on attack intensity. This led us to set the following hypothesis as: H_0 : *There is no relationship between the dyad number and attack intensity in Iraq.*

Table 2: Regression Analysis for Attack Intensity and Dyad Number

p value	R-square	r
0,774	0,53	0,07

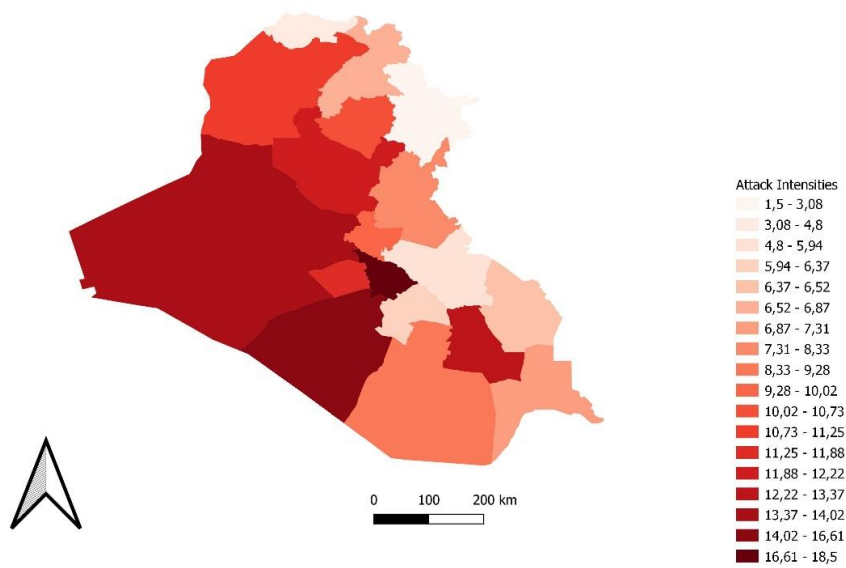
Table 2 demonstrates the results of regression analysis examining the relationship between attack intensity and the dyad numbers. With a p-value greater than 0,05, the null hypothesis is not rejected. This means that, contrary to some expectations, the effect of the number of dyads on attack intensity is not statistically significant in the events of Iraq at the 0,05 significance level. A very low r value, which is 0,07, supports this result. It indicates a very weak linear relationship between the dyad number and attack intensity. The 0,53 R-squared value suggests that 53% of the variance in attack intensity is explained by the dyad number. This suggests that the number of dyads, as measured in this analysis, does not demonstrate a statistically significant linear effect on attack intensity in Iraq at the 0.05 significance level. Therefore, based on this analysis, we cannot conclude that an increase in the number of involved actors directly correlates with increased attack intensity. This finding suggests that an increase in the number of actors, including Türkiye, does not translate to a statistically significant linear increase in attack intensity. In other words, any actor's involvement, including Türkiye's, does not have a marginal effect on instability in Iraq. Having demonstrated the general relationship between attack intensity and the number of dyads, we will now turn to the main purpose of the article, which is the spatial analysis of violent events in Iraq.

5.2. Spatial Analysis Results in General

To understand the spatial patterns of violent events in Iraq, two tests, namely Global Moran's I^* and Getis-Ord General G, will be conducted. Global Moran's I^* will demonstrate the spatial autocorrelation. That is to say, it will test if the attacks in each administrative level could be explained by geographical location. Global Moran's I^* can take a value between +1 and -1, where in the former situation, spatial dependence is high, indicating clustering of attacks, and the latter indicates dispersed attack locations. In this case, attacks occur in different places. If the result is close to zero, it means that the attacks are

randomly distributed. Getis-Ord General G, on the other hand, will show the hot spots and cold spots of attack intensities. That is to say, it will test if the intensity rates in some administrations are significantly different from other locations. Similarly, Getis-Ord General G can take a value between +1 and -1, where +1 means a hot spot and -1 means a cold spot and zero indicating no clustering.

Figure Map 1: Attack Intensity Intervals between 2004 – 2023



To start with the general results, Map 1 demonstrates the attack intensity intervals based on the data in Table 1. While Babil and Najaf have the highest attack intensity rates in general, Suleymaniyah and Dahuk have the lowest rates, despite Dahuk having a relatively high number of events and death numbers. Having presented the general situation and extreme cases, let us now set the hypothesis for our spatial analysis. In this regard, the main hypothesis of the article is H_0 : *There is no clustering in violent attacks in Iraq*. To test the hypothesis, Global Moran's I^* and Getis-Ord General G were conducted. The results are as follows: Table 3: Global Moran's I^* and Getis-Ord General G analyses for Iraq in 2004-2023

		Observed Index	z-score	p-value
Global Moran's I*		-0,016179	0,346509	0,728960
Getis-Ord General G		0,000002	0,635708	0,524966

The conclusion that there is no indication of clustering (either overall or localized) in violent incidents in Iraq is strengthened by the findings of Moran's I and Getis-Ord General G, which both show no significant spatial autocorrelation. This suggests that spatial characteristics like proximity or geographic features have little bearing on the distribution of violent attacks, which are essentially random.

However, since violent events have fluctuated throughout the 20 years, we will test the same hypothesis for the aforementioned time periods to reach reliable and valid results. Additionally, attack intensity rates with and without Türkiye's involvement will be tested separately.

5.3. Spatial Analysis between 2004-2012

The years between 2004 and 2012 were characterized mostly by suicide attacks in Iraq. The events were mostly concentrated in Ninawa, Baghdad, and Al Anbar, while Dahuk, Najaf, and Karbala were calculated as the most intensively attacked administrations. It is worth noting that this time span is the only period in which all provinces in Iraq were victimized by violent events. Table 4 demonstrates the numbers. This time span coincides with Türkiye's first cross-border military operation to Iraq after the US invasion, which is named 'Operation Sun' in 2008. However, it was not the only military campaign Türkiye conducted. In the end, 25 events in this period were conducted with Türkiye's involvement out of 3341 total events, which constitutes 0.7% of all events in the respective period. Türkiye's involvement was observed in three provinces, namely Arbil, Sulaymaniyah, and Dahuk. It should be highlighted that the attack intensity of Arbil is greater without Türkiye's operations. In this regard, Maps 2 and 3 demonstrate attack intensity rates in Iraq with and without Türkiye's operations, respectively. While the highest rate of attack intensity is in Dahuk in general, without Türkiye's operations, it is in Arbil and Najaf. This leads us to test both situations in the spatial analysis.

Table 4: Events, Deaths, and Attack Intensity in Iraq between 2004-2012 with and without Türkiye's Involvement

Provinces	Events	Death	Attack Intensity	Events w/o Türkiye	Death w/o Türkiye	Attack Intensity w/o Türkiye
Al Anbār	458	4633	10,11572	458	4633	10,11572
Al Başrah	69	495	7,173913	69	495	7,173913
Al Muthanná	2	8	4	2	8	4
Al Qādisīyah	15	98	6,533333	15	98	6,533333
An Najaf	43	779	18,11628	43	779	18,11628
Arbīl	26	386	14,84615	17	288	16,94117
As Sulaymānīyah	14	57	4,071429	11	33	3
Bābil	62	824	13,29032	62	824	13,29032
Baghdād	764	6509	8,519634	764	6509	8,519633
Dahūk	7	153	21,85714	0	0	0
Dhī Qār	11	128	11,63636	11	128	11,63636
Diyālā	290	2313	7,975862	290	2313	7,975862
Karbalā'	34	515	15,14706	34	515	15,14706
Kirkūk	94	364	3,87234	94	264	2,808510
Maysān	10	96	9,6	10	96	9,6
Nīnawá	1151	4464	3,878367	1151	4464	3,878367
Şalāḥ ad Dīn	212	1562	7,367925	212	1562	7,367925
Wāsiṭ	23	263	11,43478	23	263	11,43478

Source: Prepared by the authors based on ((Davies et al., 2024))

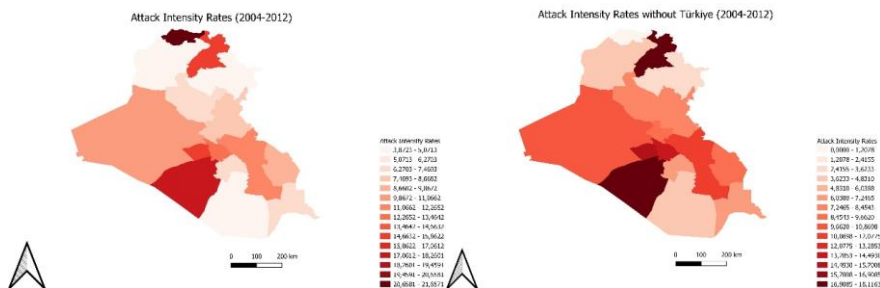
Figure Map 2 and 3: Attack Intensity Rates between 2004 – 2012 with and without Türkiye

Table 5 demonstrates the results. Global Moran's I^* reflects a random distribution in the general analysis. A very close result to 0 with a z-score of 0.34 indicates a random spatial pattern in the events in Iraq between 2004 and 2012. The Getis-Ord General G result supports the random distribution. A very close result to 0 shows the lack of hot spots and cold spots. When focusing on the results without Türkiye, Global Moran's I^* is observed to be 0.032212, again indicating a random distribution. Although the increase may suggest a potential trend towards a more clustered pattern, the change is still not statistically significant due to the relatively high p-value. Therefore, the results are still interpreted as a spatially random distribution.

Table 5: Global Moran's I^* and Getis-Ord General G analyses for Iraq in 2004-2012 with and without Türkiye

		Observed Index	z-score	p-value
General	Global Moran's I^*	-0,017426	0,339105	0,734531
	Getis-Ord General G	0,000002	0,065715	0,947605
Without Türkiye	Global Moran's I^*	0,032212	0,734054	0,462916
	Getis-Ord General G	0,000002	1,181978	0,237214

This leads us to conclude that although Türkiye's operation had a tendency to shift the clustered pattern, in the end, their marginal contribution was still limited. With the exception of Dahuk, Türkiye's involvement did not have

significant effect on attack intensity or a game-changing effect on the spatial pattern.

5.4. Spatial Analysis between 2013-2017

2013 was a milestone for Iraq due to the triggered attacks of DAESH. Owing to the DAESH offensive, the time period between 2013 and 2017 witnessed the highest average attack intensity rate as it is seen in Table 6. The years from 2014 to 2017 also hold the record number of total events in Iraqi history. Throughout this period, violent attacks were intensified in Ninawa and Al Anbar in terms of events and total deaths. More than 20,000 people were killed in Ninawa in 4 years, and more than 11,000 in Al Anbar. Yet, attack intensity rates were highest in Babil and Kirkuk, which are 28.73684211 and 20.31914884, respectively. Map 4 and 5 reflect the attack intensity maps between 2013 and 2017 with and without Türkiye.

The rates remain the same when excluding Turkey's operations. Despite Turkey shifting its attention to the YPG and DAESH in Syria, 37 events conducted by Turkey were recorded, which constitutes 1,1% of all events in Iraq. While Dahuk and Suleymaniya's attack intensity rates were increased by Turkey's operations, the rate of Arbil increased when Turkey's operations were excluded.

Table 6: Events, Deaths, and Attack Intensity in Iraq between 2013-2017 with and without Türkiye's Involvement

Provinces	Events	Death	Attack Intensity	Events w/o Türkiye	Death w/o Türkiye	Attack Intensity w/o Türkiye
Al Anbār	671	11731	17,4828614	671	11731	17,4828614
Al Başrah	9	90	10	9	90	10
Al Muthanná	3	37	12,33333333	3	37	12,33333333
An Najaf	4	22	5,5	4	22	5,5
Arbil	61	932	15,27868852	43	770	17,90697674
As Sulaymānīyah	1	6	6	0	0	0
Bābil	38	1092	28,73684211	38	1092	28,73684211
Baghdād	577	6608	11,45233969	577	6608	11,45233969
Dahūk	18	202	11,22222222	1	0	0
Dhī Qār	6	102	17	6	102	17
Diyālā	195	2295	11,76923077	195	2295	11,76923077
Karbalā'	13	91	7	13	91	7
Kirkūk	188	3820	20,31914894	188	3820	20,31914894

Maysān	2	4	2	2	4	2
Ninawá	1035	20215	19,53140097	1034	20210	19,54545455
Şalāḥ ad Dīn	406	6852	16,87684729	406	6852	16,87684729
Wāsiṭ	18	186	10,33333333	18	186	10,33333333
Al Qādisīyah	0	0	0	0	0	0

Figure Map 4 and 5: Attack Intensity Rates between 2013 – 2017 with and without Türkiye

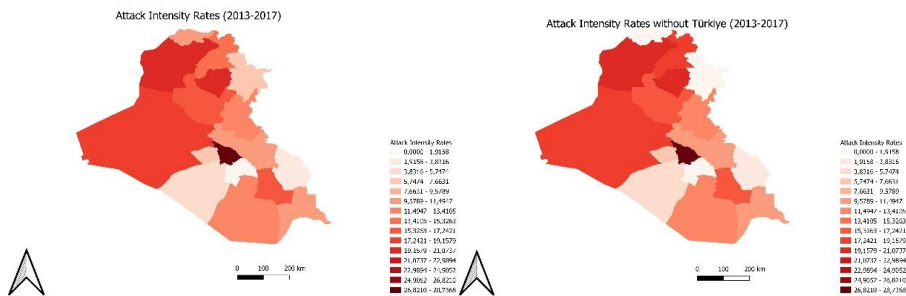


Table 7 reflects the spatial results. Accordingly, Global Moran's I^* indicates a random spatial distribution between 2013 and 2017. The observed index of -0.166366 with a z-score of -0.887352 means that the pattern does not appear to be significantly different from random. The Getis-Ord General G results support the results of Global Moran's I^* . Excluding Türkiye's involvement has a tendency to slightly shift towards clustering but not at a significant level. Therefore, with and without Türkiye, the spatial pattern is random.

Table 7: Global Moran's I^* and Getis-Ord General G analyses for Iraq in 2013-2017 with and without Türkiye

		Observed Index	z-score	p-value
General	Global Moran's I^*	-0,166366	-0,887352	0,374889
	Getis-Ord General G	0,000002	0,090439	0,927938
Without Türkiye	Global Moran's I^*	-0,225636	-1,349456	0,177191
	Getis-Ord General G	0,000002	0,189617	0,849609

5.5. Spatial Analysis between 2018-2023

Iraq has become relatively calm since 2018, despite ongoing conflict with DAESH. Still, owing to the Iraqi government's offensives in Mosul and Al Anbar, the terrorist group was significantly suppressed. Table 8 reflects the relatively low numbers of events, deaths, and attack intensity rates. As shown in the table, this period is not only characterized by a relatively low amount of attacks but also the lowest average attack intensity rate. Dahuk, Arbil, and Diyala recorded the most events, while Dahuk, Arbil, and Kirkuk recorded the most deaths. In contrast, no attacks were recorded in two provinces, namely Muthanna and Wasit, and only one event without any casualties was observed in Qadisiyah. As a result, the attack intensity rates of three provinces became 0. Except for Dhi Qar and Najaf provinces, attack intensity rates are less than 5,4.

Türkiye's relative intervention is more visible in this period compared to previous years. It launched two operations in 2019 and 2022, which resulted in 658 total events out of 1534. Dahuk and Arbil are the provinces that received the most frequent attacks. However, the attack intensity rate in Arbil is greater without Türkiye's operations. Therefore, the province is already a conflict zone in Iraq. In contrast, all events in Dahuk were caused by Türkiye's operations. Map 6 and 7 shows the differences with and without Türkiye.

Table 8: Events, Deaths, and Attack Intensity in Iraq between 2018-2023 with and without Türkiye's Involvement

Provinces	Events	Death	Attack Intensity	Events w/o Türkiye	Death w/o Türkiye	Attack Intensity w/o Türkiye
Al Anbār	91	359	3,945054945	91	359	3,945054945
Al Başrah	7	12	1,714285714	7	12	1,714285714
Al Muthanná	0	0	0	0	0	0
Al Qādisīyah	1	0	0	1	0	0
An Najaf	3	24	8	3	24	8
Arbīl	248	879	3,544354839	52	292	5,615384615
As Sulaymānīyah	39	77	1,974358974	10	13	1,3
Bābil	5	27	5,4	5	27	5,4
Baghdād	80	384	4,8	80	384	4,8
Dahūk	392	970	2,474489796	0	0	0
Dhī Qār	3	36	12	3	36	12
Diyālā	207	524	2,531400966	207	524	2,531400966
Karbalā'	7	35	5	7	35	5

Kirkūk	187	782	4,181818182	180	592	3,288888889
Maysān	4	3	0,75	4	3	0,75
Ninawá	119	429	3,605042017	86	436	5,069767442
Şalāḥ ad Dīn	141	599	4,24822695	141	599	4,24822695
Wāsiṭ	0	0	0	0	0	0

Source: Prepared by the authors based on ((Davies et al., 2024))

Figure Map 6 and 7: Attack Intensity Rates between 2018 – 2023 with and without Türkiye

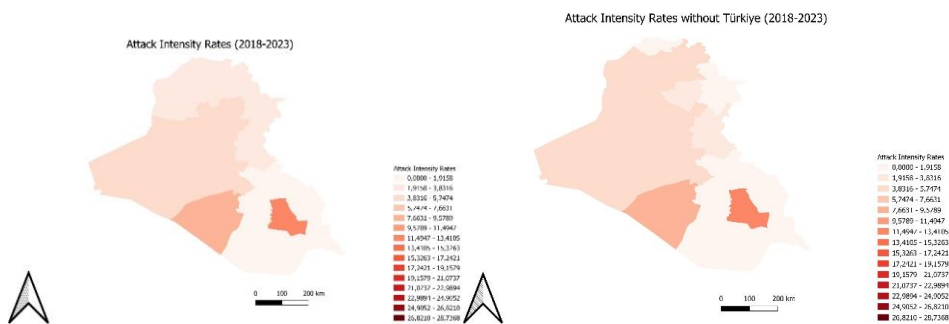


Table 9 reflects the spatial results. Accordingly, due to the decreasing rates of attack intensity in several provinces, Global Moran's I^* of -0.281694 with a z-score of -1.94287 indicates a dispersed pattern in the conflict in Iraq after 2018. However, the Getis-Ord General G score concludes that there are neither hot nor cold spots in the conflict areas. Focusing on Turkey's effects, as has already been demonstrated, Turkey's operations are intensified in Dahuk and Arbil. Yet, the spatial analysis indicates that Turkey's involvement does not marginally affect the cluster. A Global Moran's I^* of -0.276132 with a z-score of -1.8389 is very close to the general results that show a dispersed pattern. Turkey's operations do not change the main results.

Table 9: Global Moran's I* and Getis-Ord General G analyses for Iraq in 2018-2023 with and without Türkiye

		Observed Index	z-score	p-value
General	Global Moran's I*	-0,281694	-1,94287	0,052033
	Getis-Ord General G	0,000002	-0,487985	0,625561
Without Türkiye	Global Moran's I*	-0,276132	-1,8389	0,0693
	Getis-Ord General G	0,000002	-0,445183	0,656187

6. DISCUSSION AND CONCLUSION

The main purpose of this article is to test whether Türkiye's cross-border operations to Iraq cause destabilization of the northern region, as claimed in political discussions and literature, or if they have no marginal effect. Throughout this period, Türkiye committed four cross-border operations to Iraq and conducted several small-scaled conflicts in the region. These operations are perceived as a destabilizing factors, so the spatial analysis sought to test this claim. Before starting the spatial analysis, the correlation between the additional actors and attack intensity was tested in general by a regression analysis for violence in Iraq. The model indicates that the number of dyads has no statistically significant effect on attack intensity. Therefore, Türkiye's involvement doesn't change the situation of violent events in Iraq.

Spatial analyses in general and each time period support the regression analysis. The overall results and two sub-periods, namely between 2004 and 2012 and between 2013 and 2017, show that violent events in Iraq cannot be explained by space, because the attack intensity is randomly distributed in the respective periods as well as in the overall period. When Türkiye's operations are omitted from the dataset, despite a slight shift towards clustering, the general result does not change. Therefore, Türkiye's operations do not alter the stability in the northern region.

Thanks to the victory against DAESH, both the number of events and attack intensity significantly decreased after 2018. As a result, the spatial analysis found a dispersed pattern in the relevant period. The results are similar and very close when Türkiye's operations are omitted, despite its significant contribution in Dahuk. One might expect a clustering when omitting data of Türkiye. This would mean that Turkey was a destabilizer in Iraq and in the north of the country. However, the marginal change caused by Türkiye's involvement is very limited, so it does not have a destabilizing effect on the violence in Iraq between 2018 and 2023.

Overall, according to the spatial analysis results, Türkiye's involvement in Iraq has no effect on the general stability pattern of the country or the northern region. The destabilization of Iraq after 2004 is the general situation regardless of the number of actors involved, and no region is different from one another. Therefore, the destabilization in the north of Iraq could be explained by alternative reasons rather than Türkiye's involvement. While this study provides valuable insights, it is crucial to recognize that a more thorough explanation of violent events in Iraq necessitates further research. Specifically, future investigations should expand the variable set and employ spatial dependence analysis, as this method allows for a more detailed examination than spatial autocorrelation.

7. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

8. FINANCIAL SUPPORT

No funding or support was used in this study.

9. AUTHOR CONTRIBUTIONS

The authors' contributions to the study are equal.

10. ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS

The study does not require clearance from an ethics commission.

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ANALYZING THE AGEING POPULATION AND HEALTHCARE EXPENDITURES FROM AN ENVIRONMENTAL SUSTAINABILITY PERSPECTIVE FOR THE EU COUNTRIES: A SPATIAL APPROACH¹



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ABSTRACT¹

The aim of this study is to analyze the impact of population aging (AG), healthcare expenditures (HE), per capita GDP, and renewable energy budgets (REB) on environmental quality (EQ). To achieve this, data from 22 European Union (EU) countries covering the period from 2005 to 2020 were examined using spatial panel data analysis. The findings indicate the presence of spatial interactions among EU countries. Model specification tests supported the spatial panel lag model with fixed effects. The spatial effect coefficient was found to be 0.53 and statistically significant. While AG and REB positively influenced EQ, HE and per capita GDP exhibited negative effects. The results highlight the complex interactions among economic, social, and environmental factors. The study concludes with policy recommendations aimed at supporting EU countries in achieving their climate goals.

Keywords: Health expenditures, ageing population, environmental sustainability, spatial panel

JEL Codes: H51, I15, Q16

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¹ Compliance with the ethical rules of the relevant study has been declared.

YAŞLANAN NÜFUS VE SAĞLIK HARCAMALARININ ÇEVRESEL SÜRDÜRÜLEBİLİRLİK PERSPEKTİFİNDEN ANALİZİ: MEKÂNSAL BİR YAKLAŞIM



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ÖZ | Bu çalışmanın amacı, nüfus yaşlanması (AG), sağlık harcamaları (HE), kişi başına düşen GSYİH ve yenilenebilir enerji bütçelerinin (REB) çevre kalitesi (EQ) üzerindeki etkisini incelemektir. Bu amaç doğrultusunda, 22 Avrupa Birliği (AB) ülkesinde 2005-2020 yılları arasındaki veriler mekânsal panel veri analizi ile incelenmiştir. Bulgular, AB ülkeleri arasında mekânsal etkileşimler olduğunu göstermiştir. Model belirleme testleri, sabit etkiler içeren panel mekânsal gecikme modelini desteklemiştir. Mekânsal etki katsayısı 0.53 olup, istatistiksel olarak anlamlıdır. AG ve REB, EQ üzerinde olumlu bir etkiye sahipken, HE ve kişi başına düşen GSYİH negatif etkiler göstermiştir. Sonuçlar, ekonomik, sosyal ve çevresel faktörler arasındaki karmaşık etkileşimleri ortaya koymuştur. Çalışma, AB ülkelerinin iklim hedeflerine ulaşmalarını desteklemek için politika önerileriyle sona ermektedir.

Anahtar Kelimeler: Sağlık harcamaları, Yaşlanan nüfus, çevresel sürdürülebilirlik, mekânsal panel

JEL Kodları: H51, I15, Q16

Alan: İktisat
Türü: Araştırma

1. INTRODUCTION

Many human activities pose threats to ecosystems, impacting essential elements for life such as air, clean water, food, and other vital resources. The rate of natural resource consumption has exceeded the Earth's biological capacity, requiring 1.6 times the Earth's renewal capacity to sustain ecological services (Nathaniel, 2021). Basic human needs, including water, infrastructure, housing, energy, and food, place a significant burden on the ecosystem, leading to consequences such as resource depletion, increased emissions, and the disruption of ecological balance. These environmental pollutants make the Earth uninhabitable for living beings and serve as a major trigger for global climate change (Ahmed & Wang, 2019; Lin et al., 2018; Nathaniel, 2021). One of the most significant contributors to changing climate is carbon dioxide (CO₂) emissions, which account for approximately 70% of greenhouse gas emissions (Yang et al., 2022; Polat et al., 2024). Consequently, environmental degradation in the literature is often assessed through CO₂ levels, as CO₂ is a primary cause of air pollution and declining air quality (Aydın et al., 2024). The effects of CO₂ deeply impact various aspects of life, including public health, income levels, and Overall well-being (Kumar & Radulescu, 2024). The World Health Organization (WHO) reports that the energy and housing sectors account for 18% of global CO₂ emissions, creating significant risks for both environmental sustainability (ENS) and human health. The report suggests adopting renewable energy (RE) production and clean energy sources as a means to mitigate this threat. Between 2010 and 2020, the adoption of renewable energy sources is estimated to have reduced CO₂ emissions by 0.4 to 0.9 billion tons (WHO, 2015; Karaaslan & Çamkaya, 2022).

Many developed and developing countries jeopardize air quality and a healthy environment subsequently rapid economic growth (EG). At the root of this issue lies the assumption of infinite growth embedded in current economic systems, which is simply unattainable on a finite planet (Wang & Azam, 2024). Particularly in recent years, numerous scholars have focused on ENS. In this context, extensive scientific research has been conducted on topics such as the causes of environmental pollution, environmental quality (EQ), climate change, and global warming (Bilgili et al., 2016). In fact, institutional interest in environmental issues dates back to the early 1970s. For instance, the report *The Limits to Growth* published by the Club of Rome highlighted a potential relationship between EQ and EG. According to this report, EG is not sustainable in terms of natural resources and the environment (Meadows et al., 1972).

The foundations of sustainable development have been severely undermined by current environmental issues. To tackle this global challenge, the

United Nations (UN) established the Sustainable Development Goals (SDGs), which comprise 17 objectives that countries are expected to achieve by 2030. The SDGs aim to reshape existing EG models to restore global balance. Among these goals, SDG 13 holds critical importance due to its direct relevance to climate action (UN, 2024). With population growth and the acceleration of industrialization, the demand for commercial energy has increased significantly. Since fossil fuels remain the most common source of commercial energy, this growing demand exacerbates the adverse effects on environmental air pollution, health, and climate change, directly linking it to SDG 3 (health and well-being) (Yang et al., 2022; Sabău-Popa et al., 2024). Thus fulfilling the requirements of SDG 13 also necessitates implementing SDG 7, which targets clean, renewable, and accessible energy solutions, as well as SDG 3. Therefore, addressing current climate challenges requires the development and deployment of clean energy technologies (Xue et al., 2022).

Health is one of the fundamental elements of economic development, as a healthy society leads to higher productivity and increased per capita income. Health expenditures (HE) are considered an investment in human capital, enhancing labor force efficiency, raising income levels, and contributing to overall societal well-being (Yadav et al., 2023). According to the UN, leading a healthy life is a fundamental human right. Moreover, health is one of the most significant indicators of sustainable development. Of the 17 SDGs set by the UN in 2015, SDG 3, "Good Health and Well-being," is particularly crucial in this context (UN, 2024). In this context, while reducing CO₂ emissions may not have an immediate impact on HE, it creates a favorable foundation for the long-term prevention of diseases caused by environmental pollution and extreme weather conditions (Yang et al., 2022). For instance, CO₂ emissions penetrate the lungs and bloodstream, leading to cardiovascular, cerebrovascular, and respiratory diseases. Moreover, it has been proven that these pollutants harm other organs and contribute to various diseases (Aydin & Bozatlı, 2023). Environmental pollution caused by anthropogenic emissions, such as CO₂, and the resulting diseases are significant factors that drive up healthcare costs (Ahmad et al., 2021). The accurate assessment of the health impacts of environmental degradation and the associated costs has become increasingly important. While improvements in public health enhance life expectancy and well-being, addressing both health and environmental issues with limited resources remains a significant challenge (Apergis et al., 2020). Industrial transformations aimed at reducing emissions can promote not only environmental justice but also improvements in public health, reductions in health inequities, and increased resilience for individuals, communities, and society at large (Muntean et al.,

2018; Yang et al., 2022; Çobanoğulları, 2024). Rising HE reflect the growing public awareness of health and the impacts of industrial environmental pollution (Watts et al., 2015).

In addition, the acceleration of global aging and the growth of the elderly population will lead to significant changes in the scale and structure of societal consumption. Literature reviews address the impact of aging populations (AG) on HE and the determinants of these expenditures. While Feldstein (1988) and Hitiris and Posnett (1992) examined the accounting of national income and HE, Zweifel et al. (1999) demonstrated a positive relationship between age and HE. In aging societies, the participation of fewer individuals in the labor market, coupled with the rapid increase in welfare expenditures, slows global productivity growth (Li et al., 2024). It has been demonstrated by researchers such as Meng et al. (2018) and Zheng et al. (2022) that shifts in production and consumption processes have long-term implications for CO₂ emissions. Consequently, assessing the influence of aging on CO₂ emissions requires an examination of the indirect effects embedded within both production and consumption processes (Li et al., 2024). The increased demand for healthcare services driven by an AG might give rise to higher HE, which, subsequently, could contribute to a rise in CO₂ emissions (Çobanoğulları, 2024). For instance, as elderly individuals spend more time at home, household energy consumption tends to increase (Shi et al., 2023). Furthermore, higher hospitalization rates among the elderly result in increased CO₂ emissions in the healthcare sector (Yang et al., 2022). These factors highlight a strong link between aging and CO₂ emissions. The impact of aging on CO₂ emissions has become a significant focus of academic research (Yu et al., 2022; Li et al., 2024). Recent literature offers varying Perspectives on the environmental implications of AG. York (2007) and Liddle (2011) identified a relationship between the age structure of the population and CO₂ emissions. Some studies suggest that the energy usage habits of elderly societies contribute to increased CO₂ emissions (Menz & Welsch, 2012; Yang et al., 2015; Zhang & Tan, 2016; Aslam & Ahmad, 2018; Yu et al., 2018; Wu, 2019; Pan et al., 2021; Yang et al., 2022; Jiang et al., 2023). However, other research argues that aging may promote industrial transformation, thereby reducing CO₂ emissions (Yang & Wang, 2020; Yang et al., 2021; Zheng et al., 2022; Wang et al., 2023; Chu, 2024). In this context, the relationship between aging and CO₂ emissions appears to be highly complex, with findings varying depending on the period and region analyzed. Consequently, analyzing the interconnections among environmental issues, EG, and HE has become increasingly crucial.

In light of the aforementioned information, this study focuses on European Union (EU) countries due to the increasing prominence of environmental and economic concerns in recent years.

Developing countries within the EU face interconnected challenges such as air pollution, rising HE, AG, and rapid EG. AG in the EU also emerge as a significant issue. Low fertility rates and increasing life expectancy in the EU countries have led to population aging. The transition to a low fertility regime worldwide after 1993 has accelerated the aging process (Ertürk & Koç, 2023). Declining fertility rates and increasing life expectancy have led to a rapid rise in the proportion of people aged 65 and older in the EU countries. While this proportion was around 16% in 2010, it is projected to reach 30% by 2050 (EU, 2023). However, the pace of aging varies across the EU countries. In Northern European countries, the process is progressing more slowly, whereas in Southern European countries, it is occurring at a faster rate. AG not only places considerable pressure on healthcare systems but also alters consumption behaviors and production structures, leading to a demand model associated with higher emissions. In the EU countries, the AG has increased the demand for healthcare services, causing the share of HE in GDP to rise rapidly. In some countries, this share exceeds 10%, while in others, it remains below 5% (MS, 2023). At the same time, increased investments in RE sources have emerged as a critical tool for reducing CO₂ emissions in line with ENS goals. Finally, collaborative efforts to implement interrelated SDGs, could strengthen policy coordination within the EU. This study aims to examine the interactions among these factors in the EU context, assessing the effect of air pollution on HE and GDP growth.

In light of this information, this study contributes to the literature on EU countries in the following ways: First, it uses spatial econometric data analysis to examine 22 EU member states experiencing AG during the period 2005-2020 using variables such as EQ, AG, HE, GDP per capita and renewable energy budgets (REB).

EU countries were selected for the analysis due to their shared environmental, economic, social, and health policies, as well as their strong spatial interdependence. The period 2005–2020 was chosen primarily to ensure data continuity within this country group and to provide a detailed assessment of the environmental policy changes initiated by the Kyoto Protocol. Additionally, during this period, the impact of population aging and health expenditures on the environment became more evident, the share of renewable energy investments in R&D expenditures increased significantly, and sustainability policies gained priority. Furthermore, to maintain the consistency of the results, the study was

limited to pre-pandemic data, as 2020 marked a year in which the COVID-19 pandemic led to a significant reallocation of national budgets toward health expenditures. Considering these factors, this period and country group were deemed appropriate for the study.

This study employs the spatial panel data analysis model for several reasons. Factors such as health expenditures, an aging population, and environmental sustainability extend beyond national borders and directly influence neighboring countries. Traditional panel data methods fail to account for these spatial dependencies, whereas spatial econometric techniques enable a more precise analysis of interactions between countries. Neglecting spatial dependencies could result in an incomplete evaluation of how health expenditures impact carbon emissions or how an aging population affects environmental sustainability. In this regard, analyzing the spatial interactions among the EU countries constitutes a key contribution of this study.

A review of the literature reveals an absence of spatial econometric studies that encompass almost the entirety of the EU and focus specifically on the topic under investigation. In this regard, the study is expected to fill a significant knowledge gap in the literature.

Secondly, the analysis of REB instead of RE consumption is based on the premise that R&D budgets underpin the use of renewable energy. Higher allocations for REB increase a country's potential to develop its RE market. In this context, public funding plays a vital role in the expansion of RE sources. Thirdly, the study focuses on EU countries, which share common challenges such as AG and high HE. Among developed economies, EU countries stand out for their efforts to develop sustainable energy and healthcare policies. Lastly, by examining the relationship between HE and REB, this study extends beyond the existing debates in the EU context to offer policy recommendations for the more efficient use of financial resources in EU countries. These approaches will contribute to the EU's ability to more effectively align its energy and healthcare policies with its sustainable development goals.

The rest of this study is structured as follows: (1) the "Literature Review" section covers the most relevant and useful studies on the topic, (2) the "Methodology" section provides a detailed explanation of the dataset and methods used in the study, (3) the "Empirical Findings" section presents the estimation results of the research, and (4) the "Discussion and Conclusion" section offers interpretations and evaluations of the findings.

2. LITERATURE REVIEW

The demographic structure of a population is an vital factor that can influence a country's economic structure and energy consumption. According to Germany's climate law, which came into effect in 2019, the country plans to reach zero greenhouse gas emissions by 2050. Italy and France show strong political performance in RE based on the size of their supply share in this sector (CT, 2022).

This paper aims to contribute to the literature examining the relationships among GDP, CO₂, REB, AG and HE. Accordingly, the literature has a number of noteworthy research examining the impacts of diverse factors on EQ in different countries and regions.

Jerrett et al. (2003) conducted the first study to explore the relationship between environmental factors and HE. Using cross-sectional data from 49 districts in Ontario, Canada, during 1991–1992, the study examined the association between air pollution and HE through a two-stage regression approach. The results showed that although districts that made greater investments in enhancing EQ allocated fewer resources to health services, districts with high pollution levels allocated more money to HE. Using a panel data set from eight OECD nations between 1980 and 1999, Narayan and Narayan (2008) investigated how health expenditure was impacted by income per capita, carbon monoxide, sulfur dioxide, and nitrogen dioxide emissions. According to their findings, health expenditure was positively impacted by carbon monoxide, sulfur dioxide emissions, and income per capita in a statistically significant way. The aging of the population has a suppressive influence on the increase of HE, as Zweifel et al. (1999) highlighted. Using a conceptual model, Pammolli et al. (2012) assessed how aging indirectly affects HE by taking into account sociocultural variables including medical technology. De Meijer et al. (2013) looked at how aging affected health spending in light of how different variables interacted.

Energy consumption, share, and technology have been the main areas of attention when it comes to RE (Qi et al., 2014; Uz Zaman et al., 2021; Chen et al., 2022; Charfeddine & Kahia, 2021; Altıntaş & Kassouri, 2020). There haven't been many research on REB, though. Important contributions include Yang et al. (2022), which investigated the relationship between AG, HE, and CO₂ emissions in G7 countries; Ahmad et al. (2022), which investigated the relationship between financial risk, REB, and ecological footprint; and Ahmed et al. (2021), which investigated the effects of economic uncertainty and REB on ENS. In terms of environmental concerns, the research also highlights how crucial the relationship between economic development and emissions is. Upon reviewing the current

literature, it can be observed that two primary approaches panel data analysis and time series analysis dominate the research. A review of the panel data-based literature is outlined below:

Table 1: Literature Review (studies based on panel data)

Author(s)	Region/ Period	Methods	Results
Narayan & Narayan (2008)	8 OECD country groups	Panel co-integration	Rising EG harms environmental quality.
Qureshi (2015)	5 Asian country groups 2000-2013	FMOLS-DOLS and CCR	As EG increases, HE increase.
Siti Khalijah (2015)	Malaysia 1970-2013	Panel co-integration	The deterioration of EQ increases HE.
Yahaya et al. (2016)	125 Developing country group 1995-2012	Panel co-integration	EQ negatively affects HE.
Chaabouni et al. (2016)	51 country groups 1995-2013	Panel dynamic synchronous equations	The increase in EG reduces the EQ.
Cetin (2018)	BRICS-T country group 2000-2015	Panel ARDL	EG and EQ have a positive impact on HE.
Zaidi & Saidi (2018)	Sub-Saharan Africa country group 1990-2015	Panel ARDL	EG positively affects HE, whereas EQ negatively influences HE.
Apergis et al. (2020)	178 country groups 1995-2017	Panel GMM	EG positively influences HE. Likewise, the deterioration of EQ leads to an increase in HE.
Yang & Wang (2020)	China 10 provinces 2000-2016	Panel threshold	As the aging level of the population increases, EQ improves.
Nawab et al. (2021)	6 ASEAN country groups 2000-2018	GMM and Granger causality	Health sector investments and RE use contribute to reducing environmental degradation.

Table 1: Literature Review (studies based on panel data, continued)

Author(s)	Region/ Period	Methods	Results
Bilgili et al. (2021)	36 Asian country groups 1991-2017	GMM, FMOLS and quantile regression	HE increase the EQ.
Ahmad et al. (2022)	OECD country groups 1984-2018	Panel data analysis	RE technology contributes to the ENS of budgets.
Yang et al. (2022)	G7 group of countries 1985-2019	Panel causality and CS-ARDL	HE and EG adversely affect EQ.
Li et al. (2022)	BRICS countries 2000-2019	Fourier ARDL	EG in Brazil and India is reducing EQ. In South Africa, HE increase as growth increases.
Karimi et al. (2023)	G-7 countries 2000-2019	MMQR, FMOLS, DOLS	The decrease in EQ negatively affects life expectancy.
Al (2023)	OPEC countries 2000-2020	Multiple regression analysis	The deterioration of EQ increases HE.
Dorbonova & Sugozi (2024)	Asian countries 2000-2020	Dumitrescu-Hurlin panel causality	Higher HE results in increased consumption of renewable energy.
Chu (2024)	30 OECD country groups 1995-2015	Quantil panel analysis	AG's effect on the ecological footprint is non-linear, following an inverted U-shape.
Kumar & Radulescu (2024)	45 Sub-Saharan African country groups 1991-2020	Dumitrescu–Hurlin panel causality analysis and Fisher Johnson cointegration test	EQ has a strong positive relationship with EG and life expectancy.
Li et al. (2024)	China (30 provinces) 2000-2020	Dynamic panel threshold	The increase in aging on both the producer and the consumer side deteriorates the EQ.
Sui et al. (2024)	212 country group 2000-2021	Panel GMM	RE development is significantly and positively influenced by AG.

Table 2: Literature Review (studies based on time series)

Author(s)	Region/ Period	Methods	Results
Apergis et al. (2018)	ABD 1996-2009	Quantity regression	EQ has a positive effect on HE.
Metu et al. (2018)	Nigeria 1990-2015	ARDL	There is a negative relationship between EQ and HE.
Gunduz (2020)	ABD 1970-2016	Granger and Yoon secret co-integration	The deterioration of EQ increases HE.
Ullah et al. (2020)	Pakistan 1998-2017	2SLS, 3SLS, and Granger causality	The use of RE improves EQ, which in turn reduces HE.
Karaaslan & Çamkaya (2022)	Türkiye 1980-2016	ARDL and Toda-Yamamoto causality	EQ increases as HE and RE consumption rise.
Aydin & Bozatlı (2023)	Türkiye 1979-2019	Fourier based co-integration	The relationship between EQ and HE is negative.
Triki et al. (2023)	Saudi Arabia 1980-2020	ARDL and NARDL	It increases the EQ of HE and renewable energy.
Çobanogulları (2024)	Türkiye 1975-2020	ARDL	The increase in EG reduces the quality of the environment.

The literature review has identified areas requiring further research within the context of EU countries. Firstly, studies examining the impact of population aging (AG) on environmental quality (EQ) are limited, and existing findings exhibit inconsistencies. Additionally, the interaction between AG, healthcare expenditures (HE), renewable energy budgets (REB), and CO₂ emissions has not been sufficiently explored. In particular, there is a notable lack of studies investigating the effects of HE on REB and EQ.

Secondly, most existing research focuses on the relationship between EQ and HE. However, comprehensive analyses that directly assess the impact of HE on EQ remain insufficient. Spatial dependence makes it impossible to address environmental issues in isolation. Given the environmental policy interactions among EU countries, the use of spatial econometric modeling is essential.

Ignoring spatial relationships may lead to inaccurate estimations of environmental impacts. Previous studies have generally examined the relationships between environmental sustainability, healthcare expenditures, and an aging population. However, the majority of these studies have relied on panel data analysis or time series methods without considering spatial dependence or analyzing cross-country interactions. By incorporating spatial interactions among EU countries, this study fills a critical gap in the literature.

Thirdly, prior research has predominantly focused on OECD countries or specific regional groups, often overlooking EU countries. Considering the economic disparities among EU nations, treating them as a homogeneous group may compromise the accuracy of the findings. Moreover, studies focusing on a single country may limit the generalizability of policy recommendations.

Therefore, this study aims to analyze EU countries with similar economic and social indicators, providing more comprehensive and applicable insights into ENS and policy recommendations.

3. EMPIRICAL ANALYSIS

This section of the study will look at the regional implications on the EU member states as well as the relationship between AG, HE, REB, and EQ. Prior to discussing the application findings, the data and model will be presented, followed by an explanation of the research methods of the relevant subject.

3.1. Methodology

According to the statement at Tobler's First Geography Lesson "Everything is related to everything else, but near things are more related than distant things" (Tobler, 1970), all of the ascribed values of indicators in a given geographic region are interested in one another, but closer indicators have a stronger relationship than more distant ones. indicates that they are related in some way. One surface is not separated from another, in accordance with this principle. Ignoring geographical correlations in an economic study might provide biased conclusions when variables are spatially connected (Anselin, 1988).

There are three main methods of spatial panel data analysis. These methods are used as Spatial Lag Model (SLM), Spatial Error Model (SEM) and Spatial Durbin Model (SDM) which includes both SLM and SEM. The SLM model makes the assumption that a spatially weighted average of nearby dependent variables contributes to the value of the dependent variable seen at a particular location (Elhorst, 2012).

$$y_{it} = \sum_{j=1}^N w_{ij} y_{jt} + x_{it} + \alpha_i + \varepsilon_{it} \quad (1)$$

From the subscripts in the above equation; i countries ($i = 1, \dots, N$), t is time ($t = 1, \dots, T$) represents. $\sum_{j=1}^N w_{ij} y_{jt}$ the dependent variable y_{it} 's represent endogenous interaction effects. y_{jt} is the weighted average of dependent variables in neighboring countries. parameters The spatial autoregressive coefficient measures the strength of the simultaneous spatial correlation between a region and its geographically neighboring regions. x_{it} refers to the matrix of explanatory variables. 's are vectors of parameters to be estimated. ε_{it} represents the error term. The error term is independent and identical, has zero mean and variance σ^2 it is suggesting that w_{ij} represents the spatial weight matrix.

Interaction effects between error components are included in the SEM model. When missing factors have an impact on both local and nearby regions, resulting in regional interaction effects, this model is employed. The following is the panel SEM model (Elhorst, 2012):

$$y_{it} = x_{it} + \alpha_i + \varepsilon_{it} \quad (2)$$

$$y_{it} = \sum_{j=1}^N w_{ij} y_{jt} + \alpha_i + \lambda_t + \sum_{j=1}^N w_{ij} x_{jt} + \varepsilon_{it} \quad (3)$$

signifies the spatial autocorrelation coefficient of the error term, measuring the influence of residuals from neighboring regions on the residuals of the local region. The primary difference between the coefficients α_i and λ_t lies in how spatial dependence is incorporated into the regression equation. Other parameters remain as previously specified.

A more comprehensive model is created by integrating SLM and SEM into SDM. Panel SDM is obtained with this method proposed by LeSage and Pace (2008). Panel SDM is as follows:

$$y_{it} = \sum_{j=1}^N w_{ij} y_{jt} + x_{it} + \alpha_i + \lambda_t + \sum_{j=1}^N w_{ij} x_{jt} + \varepsilon_{it} \quad (4)$$

α_i is a vector of the explanatory factors' spatial autocorrelation coefficients. The other parameters are identical to those previously given. We apply Elhorst's (2012) specification tests to identify the model that best fits the data. To examine fixed effects (FE), we begin by estimating conventional panel data models and conducting the likelihood ratio (LR) test. Subsequently, we use Lagrange Multiplier (LM) tests— LM_{LAG} and LM_{ERR} —along with their robust versions, Robust- LM_{LAG} and Robust- LM_{ERR} , to assess whether the SLM or the SEM better represents the data compared to a model excluding spatial interaction effects. If the LM tests indicate that the spatial panel model is preferred over the non-spatial

panel model, we then apply Wald and LR tests to confirm whether the spatial panel model provides a superior fit.

We first estimate the SDM model and then $H_0: \gamma = 0$ and $H_0: \gamma + \rho\beta = 0$ the hypotheses are tested with Wald and LR test. The first hypothesis says that the SDM model is valid and the second hypothesis says that the SEM model is valid. (Burridge, 1981). If both hypotheses are rejected, the SDM model best explains the data. For this reason, SDM is a more generalized form compared to the SLM and SEM model. However, a relevant statistical test needs to be performed to decide whether SDM can be applied to a particular regression analysis. CO₂ exhibit spatial spillover effects (Shahnazi & Shabani, 2021). The SDM specification of the model established in this study is presented as follows:

$$\ln prCO2_{it} = \alpha + \rho \sum_{j=1}^n W_{ij} \ln prCO2_{jt} + \beta_1 \ln prAG_{it} + \beta_2 \ln HE_{it} + \beta_3 \ln prGDP_{it} + \beta_4 \ln REB_{it} + \rho_1 \sum_{j=1}^n W_{ij} \ln prAG_{jt} + \rho_2 \sum_{j=1}^n W_{ij} \ln HE_{jt} + \rho_3 \sum_{j=1}^n W_{ij} \ln prGDP_{jt} + \rho_4 \sum_{j=1}^n W_{ij} \ln REB_{jt} + \mu_i + \lambda_t + \epsilon_{it} \quad (5)$$

In the above equation, the subscripts (*i*) and (*t*) represent the cross-sectional units (22) and time periods (16), respectively. While μ_i denotes the individual FE, λ_t represents the time FE, and ϵ_{it} denotes the random error term. (*W*) is defined as the spatial weight matrix. $W_{ij} \ln prCO2_{jt}$ represents the spatially lagged value of the model's dependent variable. $W_{ij} \ln prAG_{jt}$, $W_{ij} \ln HE_{jt}$, $W_{ij} \ln prGDP_{jt}$ and $W_{ij} \ln REB_{jt}$ represent the spatially lagged terms of the independent variables. A spatial weight matrix that considers geographical distance is used to define spatial effects between units. The formulation of this matrix is as follows:

$$W = (1/d_{ij}^2) \quad (6)$$

Here, d_{ij}^2 represents the distance between country (*i*) and another country (*j*). The queen contiguity method is adopted by considering only neighboring countries for each country. In this constructed matrix, countries that share a border are assigned a value of 1, while other countries (non-bordering ones) are assigned a value of 0. The values on the main diagonal of the matrix are zero. This is because a country is not considered a neighbor to itself. In this study, the spatial weight matrix employed in the spatial panel data analysis was constructed based on border adjacency. This method, widely used for modeling spatial dependence, captures spatial relationships by considering the interaction of a unit

solely with the geographically adjacent units (Anselin, 2013). In the literature, weight matrices based on border adjacency are recognized as an effective approach for identifying spatial dependence (LeSage & Pace, 2009). Following this perspective, a binary spatial weight matrix was developed and utilized in the analysis, ensuring that each unit is connected only to its directly adjacent counterparts. This approach effectively represents spatial interactions at the regional level and enables a precise assessment of spatial autocorrelation.

In the SLM, including the spatially lagged dependent variable as an independent variable introduces feedback effects, which create an endogeneity problem. Consequently, estimating model parameters using the ordinary least squares (OLS) method leads to inconsistent results. However, in this context, maximum likelihood estimation (MLE) can be employed to sustain consistent parameter estimates. It is necessary to maximize the log-likelihood (LR) function, which is:

$$\ln L = \left(-\frac{NT}{2} \right) \ln(2\pi\sigma^2) + T \ln |I_N - \rho W| - \frac{1}{2\sigma^2} \sum_{i=1}^N \sum_{t=1}^T (y_{it} - \rho \sum_{j=1}^N w_{ij} y_{jt} - x_{it} \beta - \alpha_i)^2 \quad (7)$$

3.2. Model and Dataset

To measure the impact of population aging (AG), healthcare expenditures (HE), per capita GDP, and renewable energy budgets (REB) on environmental quality (EQ), data from 22 EU countries were used for the period between 2005 and 2020. The variables include per capita CO2 emissions (million tons), total population ages (> 65), current healthcare expenditures (% of GDP), per capita GDP (=2015 USD), and the renewable energy budget (million USD). Data on per capita CO2 emissions, the AG, HE, and per capita GDP were derived from the World Development Indicators (WDI), while REB were sourced from the OECD. All variables were used in their natural logarithmic forms. This log-log model allows for the interpretation of all variables in terms of elasticity, ensuring they are analyzed in the same unit. The EU countries included in the study are listed in the table below:

Table 3: EU Member State Group

Austria	Estonia	Greece	Latvia	Poland	Spain
Belgium	France	Hungary	Lithuania	Portugal	Sweden
Czech Rep.	Finland	Ireland	Luxembourg	Slovakia	
Denmark	Germany	Italy	Netherlands	Slovenia	
Note: Bulgaria, Croatia, Cyprus, Malta and Romania could not be included in the group of					

countries considered. Cyprus does not have borders with EU countries that could create spatial effects due to its geographical location. Data from the other 5 countries could not be accessed in certain years. Since a balanced panel structure was preferred in the study, missing observations were removed.

Within the EU, EQ and an AG are two intrinsically linked variables. Maintaining a healthy environment is vital, particularly for older citizens, since access to clean water, unpolluted air, and green spaces is essential for both quality of life and public health. Meanwhile, the demographic shift toward an older population is reshaping economic and social structures by increasing the demand for healthcare services, social security, and infrastructure (Yang et al., 2022). As a result, sustainable environmental policies must not only preserve natural balance but also support the development of healthier and more active lifestyles among the elderly (Van de Kaa, 1999; Pascual-Saez et al., 2020). Spatial econometric models play a critical role in uncovering how economic outcomes in EU countries are affected by factors such as geographic location, regional interactions, and spatial dependencies. In these nations, the impact of economic, social, and environmental policies extends beyond national borders. Consequently, these models are seen as indispensable tools for both economic analysis and policy-making within the European Union (Vangerven & Crombez, 2012).

This study explores the effect of AG, HE, GDP per capita, and REB on EQ by selecting 22 EU member countries. Due to the absence of data for certain variables, Bulgaria, Croatia, Cyprus, Malta, and Romania were omitted from the analysis. Since this study aims to maintain a balanced panel structure, these countries were not included. Additionally, Cyprus was excluded because it is not a geographical neighbor, which is a relevant factor given the study's focus on spatial effects. A comprehensive table displaying the variables is provided below.

Table 4: Table Containing Detailed Information of Variables

Variables	Indicator	Measurement	Expectation	Source	References
lnprCO2	Environmental Quality (EQ)	Million tonnes of carbon dioxide per person	.	WDI	.
lnprAG	Population aging (AG)	Total population aged > 65	Negative	WDI	Chu, 2024; Sui et al., 2024; Yang & Wang, 2020
lnHE	Health Expenditures (HE)	Current health expenditures (GDP%)	Positive	WDI	Karaaslan & Çamkaya, 2022; Apergis et al., 2018
lnprGDP	GDP per capita (Economic growth, EG)	US dollars (= 2015)	Positive	WDI	Çobanogulları 2024; Narayan & Narayan, 2008; Qureshi, 2015
lnREB	Renewable	Million US	Negative	OECD	Ahmad et al.

	energy budget (REB)	Dollars (=2015 and PPP)			2022; Yang et al., 2022

The variables in the table represent EQ and the socio-economic and energy-based factors influencing it. The expected effect of each variable is assessed based on previous studies in the literature. Below is an interpretation of the expected impact of each variable on EQ. AG is expected to enhance EQ by reducing CO₂ emissions, as older populations tend to consume less energy and adopt more environmentally conscious lifestyles. This positive relationship has been confirmed in studies by Chu (2024), Sui et al. (2024), and Yang & Wang (2020), supporting the notion that AG positively contributes to ENS. The impact of HE on EQ is complex. Besides, the energy consumption and medical waste produced by the healthcare sector can cause to environmental degradation. On the other hand, eco-friendly healthcare infrastructure and energy-efficient practices can improve EQ. The expected positive effect of this variable can be explained by the idea that a healthier population is more likely to support ENS initiatives. Similar results have been reported by Apergis et al. (2018) and Karaaslan & Çamkaya (2022). EG typically leads to environmental degradation due to higher energy consumption and industrial activities. Studies by Çobanoğulları (2024), Narayan and Narayan (2008), and Qureshi (2015) indicate that a rise in GDP per capita leads to higher CO₂ emissions, thereby reducing EQ. Therefore, EG is expected to have a negative impact on EQ. Investments in RE contribute to improving EQ by reducing fossil fuel consumption and CO₂ emissions. Studies by Ahmad et al. (2022) and Yang et al. (2022) confirm the positive effect of REB on EQ. Consequently, this variable is expected to have a favorable impact AG on ENS.

Overall, these variables exert different effects on EQ. While AG and REB positively influence EQ, HE and GDP per capita negatively affect EQ. These findings highlight the need to carefully balance energy consumption, population dynamics, and EG to achieve sustainable development goals. Increasing investments in RE and promoting eco-friendly healthcare infrastructure play a vital role in enhancing EQ in the long term.

One effective way to gain prior insight into variables is through correlation analysis (Tosunoğlu, 2024). This statistical method examines the degree and direction of the relationship between variables, allowing researchers to identify patterns and associations. By measuring how one variable changes in response to another, correlation analysis provides valuable preliminary information about potential interactions. This understanding can help guide further analysis, refine hypotheses, and improve the accuracy of predictive

models in various fields of research. The table below displays descriptive statistics and the correlation relationships among the variables.

Table 5: Descriptive statistics and correlation matrix of the variables (N=352)

	lnprCO2	lnprAG	lnHE	lnprGDP	lnREB
lnprCO2	1				
lnprAG	0.18*** (0.0009)	1			
lnHE	0.53*** (0.0000)	0.34*** (0.0000)	1		
lnprGDP	0.11*** (0.0430)	-0.08 (0.1339)	0.44*** (0.0000)	1	
lnREB	0.93*** (0.0000)	0.28*** (0.0000)	0.71*** (0.0000)	0.34*** (0.0000)	1
Mean	4.21	-1.75	2.11	10.24	7.50
Std. deviation	1.24	0.16	0.22	0.60	1.50
Minimum	1.96	-2.24	1.56	9.05	4.16
Maximum	6.74	-1.45	2.55	11.63	10.9
Notes: Asterisks indicate significance: ***, **, and * denote 1%, 5%, and 10% levels, respectively. Parentheses show p-values.					

The study's variables' descriptive statistics were examined to provide preliminary information, revealing that the variables did not contain any outliers.

An analysis of the correlation matrix indicated that the correlations between $\ln\text{prCO}_2$ and $\ln\text{prAG}$, $\ln\text{HE}$, $\ln\text{prGDP}$, and $\ln\text{REB}$ were statistically significant at the 0.05 significance level, with all relationships being positive. The correlation coefficients between $\ln\text{REB}$ and $\ln\text{HE}$, as well as between $\ln\text{REB}$ and $\ln\text{prCO}_2$, were 0.93 and 0.53, respectively, indicating a strong correlation. Additionally, the correlations between $\ln\text{prAG}$ and $\ln\text{prGDP}$, as well as between $\ln\text{prAG}$ and $\ln\text{prCO}_2$, were 0.18 and 0.11, respectively. Moreover, the correlation between $\ln\text{HE}$ and $\ln\text{REB}$ was found to be statistically significant, with a high and positive coefficient of 0.71.

The model employed in this study is grounded in the existing literature. In addition to being developed from prior research, it was further refined by Yang et al. (2022), who used this model to analyze panel effects in G7 countries. However, this study extends the analysis by considering not only panel effects but also spatial effects within EU countries. The functional form of the model subject to this study is given in the following equation.

$$\ln\text{prCO}_2 = f(\ln\text{prAG}, \ln\text{HE}, \ln\text{prGDP}, \ln\text{REB}) \quad (8)$$

Included in the model $\ln\text{prCO}_2$ is the dependent variable and represents CO₂ per capita (EQ). Included in the model $\ln\text{prAG}$ population aging, $\ln\text{HE}$ healthcare expenses, $\ln\text{prGDP}$ GDP per capita and $\ln\text{REB}$ renewable energy budget constitutes the independent variables of the model. The variables were converted into their natural logarithmic forms, transforming the analysis into a log-log model. This transformation linearizes the estimator equations, making the analysis more straightforward (Tosunoğlu, 2025). Additionally, it enables a clearer interpretation of the results in terms of elasticity, providing valuable insights into the relationships between variables.

3.3. Results and Discussion

Spatial panel analyses were handled using the available data in this section of the study. So as to identify the appropriate econometric model, the presence of spatial effects was first examined using LM tests. Next, pooled OLS, FE, and random effects models were compared using LR and Hausman tests. The queen border method was utilized to determine the relationship between EU member states based on the model employed in the investigation. Elhorst's codes and MATLAB were utilized for the analyses. Before presenting the findings of the spatial panel data analysis, specific specification tests outlined in Elhorst's (2012) methodology are conducted to determine the appropriate model. The specification tests used for model selection are as follows:

Table 6: Test Result of Model Selection Spesification Tests

Tests	Hypotesis	Statistics
LM _{LAG}	H ₀ : There is no spatially lagged dependent variable.	Pooled OLS: 19.9*** Spatial panel fixed effect: 71.4*** Spatial-time-period panel fixed effects: 25.2***
LM _{ERR}	H ₀ : The error term exhibits no spatial autocorrelation.	Pooled OLS: 1.77 Spatial panel fixed effect: 29.1*** Spatial-time-period panel fixed effects: 22.4***
LM _{LAG} (Robust)	H ₀ : There is no spatially lagged dependent variable.	Pooled OLS: 22.3*** Spatial panel fixed effect: 49.28*** Spatial-time-period panel fixed effects: 2.83*
LM _{ERR} (Robust)	H ₀ : The error term exhibits no spatial autocorrelation.	Pooled OLS: 4.05*** Spatial panel fixed effect: 6.97*** Spatial-time-period panel fixed effects: 0.04

Table 6: Test Result of Model Selection Spesification Tests (Continued)

Tests	Hypotesis	Statistics
Hausman	H ₀ : The difference in coefficients is not systematic.	SLM: -77.8*** SEM: 216.1***
LR _{LAG}	H ₀ : The SDM can be simplified into the SLM.	Spatial panel fixed effect: 1635.7*** Spatial panel random effect: 1424.9***
LR _{ERR}	H ₀ : The SDM can be simplified into the SEM.	Spatial panel fixed effect: 1598.3***

		Spatial panel random effect: 1444.9***
Wald lag (W_{LAG})	H_0 : The SDM can be simplified into the SLM.	Spatial panel fixed effect: 0.53*** Spatial panel random effect: 0.38***
Wald error (W_{ERR})	H_0 : The SDM can be simplified into the SEM.	Spatial panel fixed effect: 0.55*** Spatial panel random effect: 0.57***
Note: Asterisks indicate significance: ***, **, and * denote 1%, 5%, and 10% levels, respectively.		

The table above displays the results of specification tests used to determine the appropriate model, following the approach outlined by Elhorst (2012). Initially, traditional panel data models (Pooled OLS, FE, and spatial-time-period FE) are estimated using the LR method. In the SLM, feedback effects arise because of the inclusion of the spatially lagged dependent variable as an independent variable, leading to an endogeneity problem. Consequently, estimating model parameters using the ordinary OLS method results in inconsistent estimates. To address this issue and obtain consistent estimates, the maximum likelihood estimator is applied. Additionally, after performing LM tests, the LR test is used to compare the models.

Next, LM tests are handled to assess the presence of spatial effects (Elhorst, 2012). The calculated LM statistic is evaluated using the chi-square (χ^2) distribution. The results of the LM spatial lag test indicate that the null hypothesis (H_0)—stating that there is no spatially lagged dependent variable—is rejected at the 1% significance level in the pooled OLS, spatial FE, and spatial-time-period FE models. This suggests that the spatially lagged value of the dependent variable should be included in the model, confirming the presence of spatial effects.

Regarding the LM spatial error test, the H_0 —asserting that there is no spatial autocorrelation in the error term—cannot be rejected in the pooled OLS model. However, it is rejected at the 1% significance level in both the spatial FE and spatial-time-period FE models, indicating spatial dependence in the error terms of these models. Since both the LM_{LAG} and LM_{ERR} tests are significant, robust tests are performed for further validation. The results reveal that the H_0 is

rejected at the 1% significance level in both the LM_{LAG} and LM_{ERR} tests. However, in the spatial-time-period FE model, the LM_{LAG} test rejects the H_0 at the 10% significance level, while the LM_{ERR} test does not reject it. Overall, the LM tests confirm the presence of spatial effects, but they do not provide conclusive evidence regarding whether the SLM or SEM should be preferred. Given that both models are significant, the results point to the SDM.

The SDM is a spatial panel econometric model that includes the spatial lag of the dependent variable as well as the spatial lags of the independent variables. This model offers greater flexibility by accounting for the effects of independent variables in neighboring regions. However, additional tests are required to assess the validity of the SDM compared to alternative models.

In both the LR and Wald tests, the null hypotheses propose that the SDM can be simplified to either the SEM or the SLM. The test results reject the H_0 in all cases, displaying that the SDM is preferable to both the SEM and SLM.

Another crucial specification test is the Hausman test, which compares FE and random effects models to identify the appropriate model. The H_0 , which states that there is no systematic difference between the coefficients, is rejected in this analysis, confirming that the FE model is more suitable. Therefore, FE models are particularly appropriate for cross-sections involving social and economic cooperation, such as EU countries, further supporting the preference for this model. The subsequent section presents traditional panel data analyses conducted without spatial data analysis.

Table 7: Prediction Results Without Spatial Interaction

The dependent variable: $\ln prCO_2$	Pooled OLS	Panel Fixed Effects	
	Base	Spatial	Spatial and Time- Period
Constant	-15.8*** (t-stat: -41.3)	.	.
$\ln prAG$	-0.64*** (t-stat: -4.98)	-1.56*** (t-stat: -22.6)	-0.49*** (t-stat: -4.23)
$\ln HE$	-0.79*** (t-stat: -6.19)	0.04 (t-stat: 0.77)	0.20*** (t-stat: 3.93)
$\ln prGDP$	0.41*** (t-stat: 11.7)	0.75*** (t-stat: 12.6)	0.68*** (t-stat: 13.3)
$\ln REB$	0.04** (t-stat: 2.52)	-0.13*** (t-stat: -5.21)	-0.04* (t-stat: -1.91)
σ^2	0.12	0.0061	0.0040

R²	0.40	0.65	0.35
logL	-117.9	400.9	.
Note: Asterisks indicate significance: ***, **, and * denote 1%, 5%, and 10% levels, respectively.			

The above table (7) displays the estimation findings of the econometric model established without spatial interaction, obtained using traditional panel data analysis methods through the LR method. Using these outputs, LM tests from the specification tests presented in Table 6 were obtained. According to the specification tests, spatial effects were detected in the established model. As indicated by the LM_{LAG} and LM_{ERR} statistics, SDM is estimated in a comparative manner with other models. The SDM findings, which include the comparative results of the models, are as follows:

Table 8: Spatial Interactive Prediction Results With Comparisons

The dependent variable: lnprCO2	Spatial Panel Fixed Effects		Spatial Panel Random Effects	
	SLM	SEM	SLM	SEM
Determinants				
Constant	.	.	-14.85***	-18.15***
lnprAG	-0.98***	-1.18***	-1.13***	-1.15***
lnHE	0.13***	0.11**	0.10**	0.10*
lnprGDP	0.50***	0.48***	0.56***	0.45***
lnREB	-0.06***	-0.07***	-0.08***	-0.06***
W*lnprCO2 (W_{LAG})	0.53***	.	0.38***	.
θ (W_{ERR})	.	.	0.01***	26.02***
ϕ	.	0.55***	.	0.57***
σ^2	0.004	0.005	0.005	0.005
R²	0.98	0.96	0.97	0.97
logL	445.4	426.7	339.9	350.1
Note: Asterisks indicate significance: ***, **, and * denote 1%, 5%, and 10% levels, respectively.				

The table above displays the results of comparative estimation considering spatial effects. Based on these results, the LR, Wald, and Hausman tests in Table 6 were conducted to determine the appropriate model specification.

The LR and Wald tests suggest that the SDM model is the most suitable. Meanwhile, the Hausman test displays a preference for the FE model. Consequently, the choice must be made between the SLM and the SEM within the fixed effects framework.

To identify the more appropriate model, the log-likelihood (logL) statistic is also considered. A higher logL value indicates a model's superior performance in explaining the observed data. When comparing the SLM and SEM, the FE spatial lag model is preferred since its logL value (445.4) is higher than that of SEM (426.7). Based on these model specification tests, the coefficients are interpreted using the fixed effects SLM.

The findings show that the coefficients are statistically significant at the 1% significance level. Given that a log-log model is employed, the coefficients represent elasticities. Specifically, a 1% increase in $\ln prAG$ leads to a 0.98% decrease in $\ln prCO_2$, suggesting that population aging enhances environmental quality. This outcome may be attributed to lower energy consumption and more environmentally conscious behaviors among older individuals. Conversely, a 1% increase in $\ln HE$ results in a 0.13% increase in $\ln prCO_2$, implying that higher health expenditures negatively impact environmental quality. This relationship could stem from energy consumption in healthcare facilities, the operation of medical devices, and waste management processes. Additionally, a 1% increase in $\ln prGDP$ leads to a 0.50% rise in $\ln prCO_2$, indicating that GDP per capita diminishes environmental quality. In contrast, a 1% increase in $\ln REB$ reduces $\ln prCO_2$ by 0.06%, suggesting that expanding the renewable energy budget improves environmental quality by decreasing fossil fuel consumption. Finally, the spatial effect across EU countries is found to be statistically significant, with a spatial effect coefficient of 0.53.

4. CONCLUSION AND POLICY RECOMMENDATIONS

This paper researches the effects of AG, HE, GDP per capita, and REB on EQ across 22 EU member countries from 2005 to 2020, using the spatial panel econometric data analysis method. The diagnostic tests conducted for model specification display that the fixed effect-SLM the most appropriate. The constructed model reveals the existence of spatial interactions among EU countries. The existence of spatial effects underscores the significance of regional disparities and interactions between countries. The findings indicate that while AG and REB enhance EQ, healthcare expenditures and GDP per capita negatively affect EQ.

Compared to prior literature, the results of this study align with previous findings that an aging population improves EQ (Chu, 2024; Sui et al., 2024; Yang

& Wang, 2020). Furthermore, the negative impact of per capita GDP on EQ observed in this study is consistent with previous research (Çobanogulları, 2024; Narayan & Narayan, 2008; Qureshi, 2015). Additionally, studies by Ahmad et al. (2022) and Yang et al. (2022) support this study's findings that REB positively impact EQ. However, since the presence of spatial effects has not been explored in the existing literature, it is not possible to draw a comparison in this regard. In this study, the spatial data analysis method was employed based on the assumption that factors such as health expenditures, an aging population, and environmental sustainability are not confined within the boundaries of individual countries, but rather exhibit significant spillover effects on neighboring countries. While conventional panel data methods typically neglect these spatial interdependencies, spatial econometric models provide a more holistic and nuanced analysis of these cross-country interactions. Ignoring spatial dependence could result in incomplete or biased assessments regarding the impact of healthcare expenditures on carbon emissions or the role of an aging population in environmental sustainability. Therefore, examining spatial interactions among European Union countries constitutes one of the distinctive contributions of this research to the existing literature.

This study has certain limitations. Firstly, the analysis covers only the period from 2005 to 2020. This temporal limitation primarily stems from constraints in data availability and the necessity of maintaining a balanced panel structure. Additionally, since the year 2020 marked a critical turning point due to the significant impact of the COVID-19 pandemic on global health expenditures, the analysis was intentionally restricted to pre-pandemic data to ensure the integrity and consistency of the results. Another limitation relates to the cross-sectional scope of the study. Croatia, Cyprus, Bulgaria, Malta, and Romania were excluded from the analysis to better capture spatial effects and maintain a balanced panel structure. Cyprus was excluded specifically due to its geographical isolation from other European Union countries, thus preventing any potential spatial interactions. For the remaining four countries, certain data points were unavailable for specific years. To preserve the balanced panel structure, these missing observations were appropriately addressed.

The finding that AG enhances EQ suggests the need to promote sustainable lifestyles among the elderly population. Moreover, policies aimed at improving access to eco-friendly transportation and energy use for older individuals could be implemented. Given that REB positively impact EQ, both governments and the private sector should promote RE production, expand infrastructure investments, and support research and development in this field. To reduce the environmental impact of the healthcare sector, sustainable practices

such as energy efficiency and waste management should be adopted. Additionally, green hospital initiatives should be encouraged. Considering that per capita GDP growth negatively affects EQ, it is essential to maintain EG while ensuring ENS. This can be achieved by promoting green technologies, supporting a circular economy, and adopting low-carbon production processes.

It is well known that aging populations are more vulnerable to environmental impacts. Therefore, prioritizing environmental protection and developing policies that promote ENS in aging societies is essential. Sustainable transportation alternatives are particularly crucial for older populations, as they often rely on transportation to access healthcare services. One of the largest indirect costs in healthcare economics is related to transportation, which typically increases fossil fuel consumption and CO₂ emissions, posing a significant challenge to ENS. Investing in electric vehicles, public transportation, and age-friendly transportation options can help establish environmentally friendly transportation systems. This, in turn, can facilitate the transition to RE and support ENS. Moreover, the positive impact of REB on EQ, as identified in this study, highlights the necessity of increasing investments in RE and expanding eco-friendly energy systems. In this context, governments should provide incentives for RE and offer financial support for technologies that reduce CO₂ emissions.

Given the spatial interactions among EU countries, this study emphasizes the need to strengthen cross-border cooperation in environmental protection and energy policies. Aligning joint climate goals and carbon neutrality strategies in a coordinated manner is crucial for achieving sustainable environmental outcomes across the EU. Future research could extend the analysis by incorporating additional data sources for Bulgaria, Croatia, Cyprus, Malta, and Romania, which were excluded due to data limitations. Including these Eastern European countries would provide a more comprehensive understanding of spatial spillover effects, improving the generalizability of the findings. Expanding datasets to cover these missing countries could enhance the depth and inclusivity of future studies.

5. CONFLICT OF INTEREST STATEMENT

Authors don't have any competing interests.

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7. AUTHOR CONTRIBUTIONS

IHP, MT, TA: Idea;

MT, İHP: Design;
İHP, MT: Supervision;
MT: Collection and/or processing of resources;
MT: Analysis and/or interpretation;
İHP: Literature review;
İHP, MT: Author of the article;
İHP, MT: Critical review

8. ETHICS COMMITTEE STATEMENT

The study adhered to the ethics committee's principles, and necessary permissions were obtained in accordance with intellectual property and copyright regulations.

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THE POWER OF CORPORATE GOVERNANCE IN CALL CENTER: THE ROLE OF WORKPLACE HAPPINESS AND EMPLOYEE VOICE IN THRIVING AT WORK¹



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ABSTRACT The purpose of this study is to examine the mediating role of workplace happiness and the moderating role of employee voice in the effect of employees' perceptions of corporate governance working as customer communication consultants on thriving at work. For this purpose, corporate governance, thriving at work, workplace happiness, and employee voice scales were used in the study. The population of the study consists of 874 employees working in two different institutions operating as call centers in Türkiye. The data of the study was obtained from 449 employees (205 male, 244 female) who participated in the survey. AMOS 24 application was used to verify the factors of the scales in the study. SPSS 27 was used in the analysis of the variables and the mediation and moderation role of the research was evaluated with SPSS PROCESS MACRO model 14. According to the results of the research, it was determined that workplace happiness had a mediating role in the effect of corporate governance perception on thriving at work, and employee voice had a moderating role in the indirect effect of corporate governance (through workplace happiness) thriving at work. Therefore, increasing corporate governance and supporting employee happiness can create an environment where employees can thrive at work, and employee voice plays an important role in this process.

Keywords: Corporate governance, thriving at work, workplace happiness, employee voice, call center employee.

JEL Codes: G34, I31, L2

Scope: Business Administration

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ÇAĞRI MERKEZİNDE KURUMSAL YÖNETİŞİMİN GÜCÜ: İŞTE KENDİNİ YETİŞTİRMEDE İŞYERİ MUTLULUĞU VE ÇALIŞAN SESLİLİĞİNİN ROLÜ



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ÖZ

Bu çalışmanın amacı, müşteri iletişim danışmanı olarak görev yapan çalışanların kurumsal yönetim konusundaki algılarının işte kendini yetiştirme davranışı üzerindeki etkisinde işyeri mutluluğunun aracı, çalışan sesliliğinin düzenleyici rolünü incelemektedir. Bu amaçla çalışmada kurumsal yönetim, işte kendini yetiştirme, işyeri mutluluğu ve çalışan sesliliği ölçekleri kullanılmıştır. Araştırmanın evreni, Türkiye’de çağrı merkezi olarak faaliyetlerini sürdüren iki farklı kurumda görev yapan 874 çalışandan oluşmaktadır. Araştırmanın verileri ankete katılan 449 çalışandan (205’i erkek, 244’ü kadın) elde edilmiştir. Araştırmada ölçeklerin faktörlerinin doğrulanabilmesi için AMOS 24 uygulaması kullanılmıştır. Değişkenlerin analizinde ise SPSS 27 kullanılmıştır ve SPSS PROCESS MACRO model 14 ile araştırmanın aracılık ve düzenleyicilik rolü değerlendirilmiştir. Araştırma sonuçlarına göre kurumsal yönetim algısının işte kendini yetiştirme üzerindeki etkisinde işyeri mutluluğunun aracılık rolüne sahip olduğu ve kurumsal yönetimin (işyeri mutluluğu yoluyla) işte kendini yetiştirme üzerindeki dolaylı etkisinde çalışan sesliliğinin düzenleyici rolünün bulunduğu tespit edilmiştir. Dolayısıyla kurumsal yönetimin artırılması ve çalışan mutluluğunun desteklenmesi ile çalışanların işte kendini yetiştirebilecekleri ortam sağlanabilir ve çalışan sesliliğinin de bu süreçte önemli bir rol oynadığı söylenebilir.

Anahtar Kelimeler: Kurumsal yönetim, işte kendini yetiştirme, işyeri mutluluğu, çalışan sesliliği

JEL Kodları: G34, I31, L2

Alan: İşletme

Türü: Araştırma

1. INTRODUCTION

Corporate governance, which has become increasingly important in today's business world and has emerged especially in developed countries and has become popular all over the world, is regarded as a new management model by managers (Gurbanlı & Bal, 2023). Businesses adopt corporate governance approach to sustain their existence in the long term, to gain competitive advantage, to protect the rights of all stakeholders and to produce high added value outputs (Koçel, 2003). In addition, it is important for organizations to adopt a corporate governance approach to fulfil their duties such as transparency, accountability, fairness, and responsibility, which are the basic principles of corporate governance, in terms of relations with stakeholders (Teixeira & Carvalho, 2024). Because in organizations where the understanding of corporate governance is widespread, employees will be happier and will want to improve themselves and be more successful in the work they do (Erer, 2021). This study examined the mediating role of workplace happiness and the moderating role of employee voice in the effect of corporate governance on thriving at work.

The dependent variable of the research, thriving at work refers to the positive situations of the employee related to work, such as improving employees' skills, acquiring new knowledge and skills, advancing their careers, and ensuring their individual and professional development (Sheng & Zhou, 2021). Since corporate governance is a managerial tool that regulates the management processes and decision-making mechanisms of an organization or enterprise, it also supports the personal and professional development of employees (Solomon, 2020). In this respect, self-improvement opportunities of employees are directly related to the organizations' corporate governance approach and practices. In particular, training and improvement opportunities, performance evaluations, job rotations, employee innovation and collaborations can be carried out in a more professional manner through corporate governance (Han et al., 2024; Needles et al., 2012). Therefore, in an organization where the understanding of corporate governance is dominant, employees will have the opportunity to develop and improve themselves. As the understanding of corporate governance increases within an organization, employees will be happy and their desire to thrive at work will also increase.

The mediator variable of the research, workplace happiness is the state of employees being pleased with their work environment, feeling happy, and being satisfied with the results of their work (Basinska & Rozkwitalska, 2022). Employees who are happy in their workplaces can have higher motivation and work performance with corporate governance (Kılınç & Akdemir, 2019). On the other hand, in organizations where the understanding of corporate governance is

widespread, employees will feel happier. The widespread understanding of corporate governance such as transparency, accountability, equality, and fairness within the organization will increase employee happiness. Employees who are happy at work will want to develop and improve themselves at work (Erer 2021). In order for workplace happiness to emerge, factors such as good management and leadership, employee participation and employee voice, job satisfaction and career opportunities, recognition and rewards will also be effective in addition to corporate governance (Foncubierto-Rodríguez, 2021). In this research, it is expected that employee voice will have a moderating effect among these factors. The moderator variable of the study, employee voice is the free expression of individuals' thoughts, suggestions and concerns about their workplaces and core areas of activity to achieve organizational goals and improve organizational performance (Morrison, 2011). Employee voice enables individuals to express their opinions, realistic expectations, and thoughts about the main fields of activity of the organization, which is in line with the principle of transparency and accountability of corporate governance. There is also a similar relationship with the employee participation principle of corporate governance. While corporate governance encourages employees to participate in the decision-making processes of the organization through employee participation, it also enables them to have more positive work experiences.

As a result, when the literature was examined, no study was found showing that workplace happiness has a mediating effect and employee voice has a moderating effect on the effect of corporate governance on thriving at work. Therefore, this study was designed to determine the relationship between the management of an organization in accordance with corporate governance principles and employees' thriving at work behaviours and the mediating role of workplace happiness and the moderating role of employee voice in this relationship. This comprehensive study covering call center employees has highlighted the critical role of corporate governance in individual development and happiness in the modern business world and has made various contributions to the literature. Corporate governance principles such as transparency, accountability, fairness and responsibility not only make employees happy but also have a positive impact on their professional development. Drawing on established theoretical perspectives and earlier empirical studies, it is evident that robust corporate governance has a direct influence on individual development.

2. CONCEPTUAL FRAMEWORK

2.1. Relations between Corporate Governance and Thriving at Work

The concept of corporate governance was studied in the USA before the 1990s, then it was taken up in England, especially in the field of management, and in the 1990s it was also discussed in Europe and Asia, and eventually became known all over the world. Its importance increased especially with the impact of the financial crisis centered in Asia in 1997 (Abdioğlu, 2007). In the 2000s, the concept of corporate governance began to appear widely in the literature and became an understanding whose importance in the field of management increases day by day (Doğan, 2018). According to Rhodes (1996), corporate governance has emerged as an approach that emphasises that management should be based on mutual interaction and transparent principles. Corporate governance is a management philosophy designed to ensure that the management processes of an enterprise are accountable, transparent, sustainable, consistent, and based on ethical principles (Mohamad, 2004). In this respect, corporate governance in its broadest sense means how an organization is managed.

Thriving at work can be defined as the employee's ability to develop his/her personal knowledge, experience, skills, and attitudes at work and thus become successful at work (Koçak, 2016; Spreitzer et al., 2005). The concept of thriving at work is generally an employee behaviour related to the philosophy of lifelong learning. In order to adapt to today's business world, employees need to constantly renew and improve themselves (Koçak, 2020). Within the scope of the research, it is expected that employees working in organizations where corporate governance is dominant will achieve success more easily. In other words, it is anticipated that corporate governance will increase thriving at work.

Corporate governance refers to the transparent, accountable, and effective execution of management activities within the organization (Teixeira & Carvalho, 2024). Thriving at work means that the employee provides more benefits to the organization by devoting himself/herself to the job (Koçak, 2020). The theory of reciprocity is based on the principle that members will respond in kind to the benefits and positive behaviors offered to them. In other words, according to this theory, positive situations within the organization will cause employees to react positively (Sürücü, 2021). From this perspective, the corporate governance environment can provide employees with the opportunity to thriving at work. The literature has shown that effective corporate governance will positively affect the performance of individuals and the organization (Needles et al., 2012). Karamustafa et al., (2009) pointed out in their study that corporate governance is important for the sustainability of organizational performance. Han et al. (2024) showed that corporate social responsibility positively affects thriving

at work. Based on these studies and the reciprocity theory, corporate governance is expected to positively and positively affect thriving at work. In addition, through corporate governance, the management of the organization can increase the opportunities for thriving at work by setting effective goals for the development, training, and learning opportunities of its employees. Employees can manage their careers more effectively by developing new experiences and skills through new goals and objectives set by corporate governance. In this respect, the first hypothesis, which is based on the information in the literature, is as follows.

Hypothesis 1. Corporate governance has a significant and positive effect on thriving at work behaviour.

2.2. Mediating Role of Workplace Happiness on the Relationship between Corporate Governance and Thriving at Work

Happiness is an individual's satisfaction with life and the state of feeling or experiencing positive emotions more than negative emotions and situations (Khan, 2009). Workplace happiness can also be expressed as the employee enjoying his/her job, being proud of his/her job, doing his/her job with the understanding of continuous learning and development, taking responsibility in his/her job, and performing the work in a more dynamic, fun and motivated way (Kjerulf, 2014). Employees who used to say "I will work in any job as long as it pays a good salary" today prioritise happiness in the workplace before money, i.e., workplace happiness. Employees who are happy at work can be more productive, creative, and successful, and can also provide high performance and quality service (Çetin & Polat, 2021). Akduman & Duran (2017) listed the factors that affect employees' workplace happiness as follows: coworkers being sympathetic and supportive, managers treating employees well, employees believing that their work is important, employees being appreciated, wages and salaries being motivating, etc. In addition, In addition, employees can be happier in organizations where corporate governance is effective. Employees with high workplace happiness enable the organization to emerge from the competitive environment more successfully and achieve business goals more effectively (Karayaman, 2021). Finally, employees' happiness at work will affect their job performance, productivity, retention, and self-development at work (Güner & Bozkurt, 2017).

Corporate governance is the managerial techniques that enable the control of processes such as effective principles, vision, purpose, and business performance that every business wants to achieve in general. These techniques include various principles that must be followed within a system (Karamustafa et

al., 2009). In the context of corporate governance, these techniques require businesses to adopt transparent, communicative, fair, and honest management principles (Teixeira & Carvalho, 2024). Thanks to these obligations, enterprises that try to establish a good governance infrastructure endeavour to provide a fairer working environment for their employees and to distribute justice resources equally (Firidin & Uzun, 2018). In addition, the fair evaluation of employee performance and the participation of employees in decision-making processes help to increase the motivation of employees and support workplace happiness within the organization (Çetin & Polat, 2021).

The factors that affect employees' happiness at work have been studied by many researchers. For example, Foncubierta-Rodríguez (2021) stated that the management style within the company will have an impact on employee happiness as a result of his research. Erer (2021) stated in his study that employees will be happy at work when managers have positive characteristics such as fair, honest, transparent, helpful, equitable, innovative, and talented. In this respect, the second hypothesis, which is based on the information in the literature, is as follows.

Hypothesis 2. Corporate governance has a significant and positive effect on workplace happiness.

Workplace happiness is defined as the positive attitudes, judgements, and experiences of the employee regarding the work environment. In addition, workplace happiness is the reflection of employees' good moods and positive feelings towards their workplaces (Abraham, 2015). On the other hand, thriving at work means that the employee uses the work processes that he/she has learnt or experienced at work as a means of thriving with a lively and energetic mood simultaneously in his/her work life (Spreitzer et al., 2005). According to the theory of reciprocity, employees who feel emotionally good at work will try to be useful to the organization (Sürücü, 2021). Therefore, employees who are happy at work will want to improve themselves at work and be useful to the organization. In addition, the concepts of workplace happiness and thriving at work are variables that mutually affect each other. As a result of his research, Erhan (2021) showed that thriving at work can be a precursor to happiness at work. Kaiser et al., (2020) found that there is a positive relationship between workplace happiness and thriving at work. Based on these studies, it can be said that employees having the opportunity to develop themselves within the organization will increase their job satisfaction and therefore their happiness. On the other hand, employees who love their workplace and are happy at work will be motivated and want to develop themselves. Because happy employees are

motivated to work, develop creative and innovative ideas and want to develop themselves at work. In this respect, the third hypothesis, which is based on the information in the literature, is as follows;

Hypothesis 3. Workplace happiness has a significant and positive effect on thriving at work behaviour.

When corporate governance and workplace happiness are analysed, a study conducted by Kjerulf (2014) stands out. Several studies on the prioritisation and happiness of employees in Rosenbluth International, a corporate travel agency with approximately 6000 employees, have once again revealed the importance of happiness in corporate enterprises. Unlike other businesses, prioritising employees instead of customers and caring about their happiness makes employees happier, increases employee performance and productivity and increases business profitability. Because according to the theory of reciprocity that forms the basis of this article, if an individual encounters a positive behavior, they will react positively (Sürücü, 2021). Therefore, in institutions where there is corporate governance, that is, transparency, open communication and fair evaluation of performance, it is expected that employees will be happy and as a result, they will want to thrive at work.

In this study, it is assumed that corporate governance will have an impact on employees' thriving at work and workplace happiness will play a mediating role in this relationship. When considered from this perspective, workplace happiness will have an impact on employees' motivation, performance, productivity and thriving at work. In particular, a good corporate governance process will positively affect employees' thriving at work. In addition, corporate governance can create an environment that increases employees' workplace happiness and can produce certain results on the overall efficiency and performance of the business. Therefore, corporate governance increases employees' happiness and employees who are happy at work strive to develop and improve themselves in their jobs. From this perspective, it is predicted that employees' happiness at work will mediate the relationship between corporate governance and thriving at work. Based on the above information, the fourth hypothesis was developed.

Hypothesis 4. Workplace happiness has a mediating role between corporate governance and thriving at work behaviour.

2.3. Moderating Role of Employee Voice

Employee voice is the voluntary sharing of suggestions for improvement, ideas, information, and thoughts for the benefit of the organization (Van Dyne et

al., 2003). Employee voice is the voluntary sharing and expression of constructive ideas for the improvement of business and management functions and thoughts and suggestions that improve the organization (Morrison, 2011). Employee voice is based on open communication, the issues shared with the organization should be of interest to the organization, the opinions, and suggestions to be shared should include actions to influence the working environment, and finally, the opinions to be conveyed should have an addressee in the organization (Maynes & Podsakoff, 2014). As a result, it is important for employee voice to find a place in organizations, for a culture of voice to be seen as a necessity in organizations, and for managers to encourage their employees to display voice behavior (Özbolat & Şehitoğlu, 2018). Because in organizations where employee voice is present, employees are expected to be happy and exhibit behaviors aimed at improving themselves at work.

Corporate governance is a management style that aims to manage businesses effectively, to create transparent management structures and to protect the interests of all stakeholder groups (Mohamad, 2004). Thriving at work, on the other hand, focuses on the improvement of employees both individually and professionally, and encourages them to increase their skills and contribute to them (Carmeli & Spreitzer, 2009). Although these two variables are in a complementary relationship, employee voice can assume a moderating role. Employee voice is when employees freely and voluntarily present their views and opinions on any subject, or their suggestions and recommendations for improvement, to the organization or share them with the management, for the benefit of the organization or the unit in which they work (Van Dyne & LePine, 1998). In this respect, employee voice helps to create effective communication and a democratic working environment within the organization. Employees' free expression of their thoughts or suggestions for improvement of the organization and their participation in decision-making processes contribute to corporate governance and thriving of the individual. In addition, corporate governance practices can increase their effectiveness within the organization through employee voice. This situation may also create an environment for a better governance and a stronger business structure of the organization. In this respect, the fifth hypothesis, which is based on the information in the literature, is as follows;

Hypothesis 5a. Employee voice has a moderating role between workplace happiness and thriving at work behaviour.

Hypothesis 5b. Employee voice has a conditional mediating role between corporate governance and thriving at work behaviour (through workplace happiness).

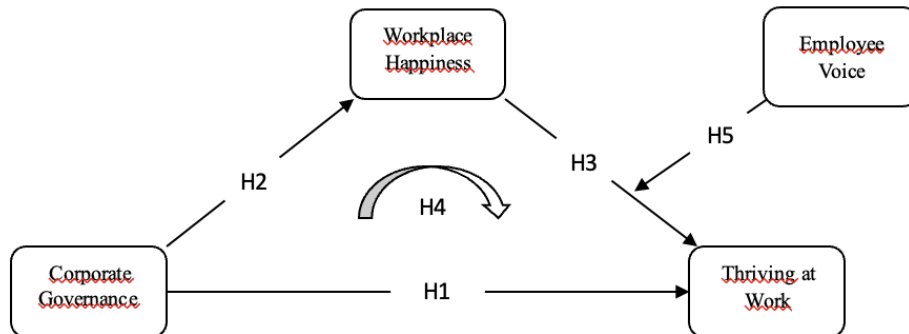


Figure 1: Research model

3. METHODOLOGY

This study was designed to determine the mediating role of workplace happiness and the moderating role of employee voice in the effect of corporate governance perception on thriving at work behaviour of private sector employees working as customer communication consultants.

3.1. Sample and Procedure

The population of the study consists of employees working in two different institutions operating as call centres in Türkiye. The reason why the research was applied to call center employees is Call centers are work environments characterized by dynamic work environments, high customer interaction, and strict performance management processes (Holman, 2005). This sector provides a critical context for emphasizing the importance of corporate governance practices that directly affect employees' participation in organizational processes, career development, and happiness levels at work (Babin & Boles, 1996). As a result, call center employees constitute a suitable sample to examine the impact of corporate governance on thriving at work. Due to the nature of their work environment, the mediating role of workplace happiness in this process and the moderating effect of employee voice becomes more apparent. Therefore, the selection of call centers as a sample is not only a preference arising from sectoral dynamics but also provides a theoretical framework that can fill the gap in the literature. According to information obtained from managers working in the Human Resources Management

department of Assist Information Technologies, it was determined that approximately 874 employees work in organizations that provide customer communication consultancy services. This figure may vary due to the turnover rate of employees who leave the organization and start new jobs. A survey was conducted with all employees who agreed to participate in the survey using the simple random sampling method. The sample of the study consisted of 449 employees who filled out the distributed survey forms completely and accurately. Among the call center employees who participated in the survey, 45.7% were male, while 54.3% were female. Regarding marital status, 46.3% of the respondents were married, whereas 53.7% were single. In terms of age distribution, 45.2% of the participants were between 18 and 28 years old, 46.3% were in the 29–39 age group, 6.5% were between 40 and 50 years old, and 2% were aged 51 and above. Concerning educational background, 5.3% were high school graduates, 29.2% held an associate degree, 59.5% possessed a bachelor's degree, and 6% had completed postgraduate education. Regarding work experience, 54.6% of the participants had 1–5 years of experience, 25.8% had 6–10 years, 16.7% had 11–15 years, and 2.9% had 16 or more years of experience. In addition, to determine the ethical appropriateness of the study, the opinion of Erzincan Binali Yıldırım University Human Research Ethics Committee (document protocol no: 07/08) was obtained at the meeting dated 25/07/2022 that the study was ethically appropriate.

3.2. Data Collection Tools

All the scales used for data collection in this study are established scales from the existing literature, and no scale development process was conducted within the scope of the research. The survey form employed in the study consists of five sections. The first section includes five questions aimed at identifying participants' demographic characteristics, such as gender, marital status, age, educational background, and work experience. In the second section, the Corporate Governance Scale developed by Dinç & Abdioğlu (2009) was utilized to measure the perception of corporate governance. This scale comprises 15 items and four dimensions. Sample statements from the scale include: "My organization places importance on audit activities" and "My organization has corporate policies concerning its employees." The third section incorporates the Thriving at Work Scale, originally developed by Porath et al. (2012) and adapted into Turkish by Koçak (2020). This scale consists of eight items grouped into two dimensions, each containing four items. Examples of statements in the scale include: "At work, I often find myself learning something new" and "At work, I acquire new knowledge that benefits me." The fourth section includes the Happiness Scale,

developed by Salas-Vallina and Alegre Vidal (2018), which was adapted into Turkish and validated by Bilginoğlu & Yozgat (2020). This scale consists of nine items and three dimensions. Sample items from the scale include: "I feel strong and energetic in my job" and "I have a strong sense of belonging to my organization." Finally, the fifth section of the survey employs the Employee Voice Scale, developed by Van Dyne & LePine (1998) and adapted into Turkish by Çetin & Çakmakçı (2012). This unidimensional scale consists of six items. Examples of statements include: "I make suggestions regarding issues that concern my organization" and "I openly express my thoughts about new projects and changes."

3.3. Data Analysis

The research data were evaluated through SPSS 27, AMOS 24, and the SPSS PROCESS MACRO analysis programs. Initially, frequency analyses were conducted to examine the demographic details of the employees who participated voluntarily in the study. Subsequently, the reliability of each scale was evaluated through the Cronbach Alpha coefficient. Confirmatory factor analysis (CFA) was applied to determine the validity of the model created with the scales in the study.

4. FINDINGS

4.1. Relationship among Variables

Table 1 presents the correlations between variables, along with the reliability, mean and standard deviation values of the scales. In Table 1, when Cronbach alpha values are examined, it is seen that the scales are reliable: corporate governance (0.96), workplace happiness (0.95), employee voice (0.94) and self-cultivation at work (0.97). The reliability results obtained revealed that the scales had a high degree of reliability (Karagöz, 2019).

Table 1: Cronbach Alpha Values, Means, Standard Deviations and Correlation Coefficients

Variables	α	M	SD	1	2	3
Corporate Governance	0.96	3.73	0.91	-		
Workplace Happiness	0.95	3.53	1.08	0.75**	-	
Employee Voice	0.94	3.78	0.97	0.67**	0.60**	-
Thriving at Work	0.97	3.58	1.09	0.71**	0.80**	0.72**

N=449; ***p* < 0.01

When the relationships of the variables are analyzed in Table 1, various relationships are observed. Firstly, a positive and significant correlation was observed between corporate governance and thriving at work ($r = 0.71$; $p < 0.01$). Similarly, another correlation result is that there is a positive relationship between corporate governance and workplace happiness ($r = 0.75$; $p < 0.01$). Thirdly, Table 1 illustrates a significant positive correlation between corporate governance and employee voice ($r = 0.67$; $p < 0.01$). Additionally, a significant positive relationship was found between workplace happiness and employee voice ($r = 0.60$; $p < 0.01$). Findings show that there is a positive correlation between workplace happiness and thriving at work ($r = 0.80$; $p < 0.01$). Finally, it is seen that there is a positive relationship between employee voice and thriving at work ($r = 0.72$; $p < 0.01$).

4.2. Validation Models

Before testing the models, a confirmatory factor analysis was conducted to assess the structural validity of the scales. In this framework, the existence of common method variance was also tested (Lindell & Whitney, 2001; Podsakoff et al., 2003). Common method variance refers to the systematic error variance resulting from the evaluation of more than one scale by the same individual in the same questionnaire in the same time period (Özyılmaz & Eser, 2013). In the study, there is a possibility of common method variance since the variables of corporate governance, workplace happiness, employee voice and success at work were assessed by the same participants in the same time period. A method frequently used by researchers to determine the existence of this tendency is Harman's single factor test (Bolat et al., 2018). In Harman's single factor test, all variables in the study are subjected to explanatory factor analysis at the same time (Malhotra et al., 2006; Podsakoff et al., 2003). Within this framework, confirmatory factor analysis (CFA) was conducted to evaluate the construct validity of the variables included in the study. In Table 2, goodness of fit values for the four-factor measurement model including all variables in the study and other alternative model are presented.

Table 2: Analysis of Assessment Models

Models	X ² / df	RMSEA	CFI	TLI	SRMR
Measurement model	3.28	0.06	0.96	0.97	0.07
Model 1, three-factor model	6.77	0.11	0.84	0.80	0.13
Model 2, three-factor model	7.67	0.12	0.81	0.77	0.14
Model 3, two-factor model	8.57	0.13	0.79	0.73	0.20

Model 4, one-factor model	9.22	0.14	0.72	0.77	0.28

N=449

Model 1= Corporate Governance and Workplace Happiness combined into a single factor

Model 2= Corporate Governance and Employee Voice combined into a single factor

Model 3 = Corporate Governance, Workplace Happiness and Employee Voice combined into a single factor

Model 4 = All variables combined into a single factor

Upon reviewing Table 2, it is evident that the goodness of fit values for the measurement model developed for the scales used in the study are as follows: ($\chi^2/df = 3.28$, RMSEA = 0.06, CFI = 0.96, TLI = 0.97, SRMR = 0.07). These findings suggest that the fit of the study outperforms that of the other alternative models (Hu & Bentler, 1999; Mishra & Datta, 2011). According to this result, the scales used in the study support the measurement model. Therefore, in this context, it can be expressed that the 4-factor measurement model of the study best explains the structural relationship between the scales.

4.3. Testing Hypotheses

In this study, four different stages of hypotheses were identified and tested. In the first stage, the first three hypotheses (Hypotheses 1-3) were examined to analyse the interaction between the variables of the study. During the second stage, the role of workplace happiness as a mediator in the link between corporate governance and thriving at work was analysed (Hypothesis 4). In the third stage, it was tested whether employee voice has a moderating role in the effect of workplace happiness and thriving at work behaviour (Hypothesis 5a). In the last stage of the study, it was tested whether employee voice plays a conditional mediating role between corporate governance and thriving at work (through workplace happiness) (Hypothesis 5b).

4.4. Mediation Analysis

In the first stage, the effect of corporate governance on thriving at work (Hypothesis 1), the effect of corporate governance on workplace happiness (Hypothesis 2) and the effect of workplace happiness on thriving at work (Hypothesis 3) were evaluated. The study also investigated the mediating role of workplace happiness in the relationship between corporate governance and thriving at work to determine the mediating effect. To evaluate the hypotheses, Model 4 from the Process Macro in the SPSS software was selected, and analyses

were conducted using 5000 bootstrap samples. The findings are displayed in Table 3.

Table 3. Statistical Results for the Mediation Analysis

Workplace Happiness						
	β	SE	t	p	LLCI	ULCI
Corporate Governance	0.87	0.04	22.82	0.00	0.80	0.95
Thriving at Work						
	β	SE	t	p	LLCI	ULCI
Workplace Happiness	0.63	0.04	15.31	0.00	0.55	0.71
Direct effect of Corporate Governance	0.31	0.05	6.44	0.00	0.22	0.41
Total effect of Corporate Governance	0.86	0.04	21.13	0.00	0.78	0.94
Indirect effect of Workplace Happiness on Corporate Governance via Thriving at Work			Effect	SE	LLCI	ULCI
			0.55	0.08	0.39	0.71
Sobel Test	z	p	Model Summary		R²	F
	12.80	0.00			0.67	454.11
						p
						0.00

Note. N=449; SD = Standard deviation; SE = Standard Error; Bootstrap Sample size = 5,000. LL = lower limit; CI = confidence interval; UL = upper limit

The analysis of the data in Table 3 shows that corporate governance has a positive and significant effect on thriving at work ($\beta = 0.31$, $t = 6.44$, $p < 0.01$). H_1 hypothesis was accepted. The second result in Table 3 shows that corporate governance has a significant and positive effect on workplace happiness ($\beta = 0.87$, $t = 22.82$, $p < 0.01$). H_2 hypothesis was accepted. The third result in Table 3 shows that workplace happiness has a significant and positive effect on thriving at work ($\beta = 0.63$, $t = 15.31$, $p < 0.01$). H_3 hypothesis was accepted. Table 3 shows that workplace happiness plays a mediating role between corporate governance and thriving at work ($\beta = 0.55$). In order to say that the H_4 hypothesis of the study is fully supported, it is necessary to test whether the mediation effect is significant (MacKinnon et al., 2002; Sobel, 1982). To evaluate the significance of the mediating effect, the Sobel test, a widely utilised method in mediation analysis, was employed (Sobel, 1982). The results of the Sobel test, displayed in Table 3, indicate that the indirect effect is statistically significant (Sobel $z = 12.80$, $p < 0.01$). Additionally, the Bootstrap confidence interval values (CI [0.39, 0.71]) provided in Table 3 further support the significance of the indirect effect. Based on these findings, Hypothesis H_4 is confirmed.

4.5. Analysis of Moderated Mediation Effects

The focus of the study is to test existence of the moderating role of employee voice (Hypothesis 5a) between workplace happiness and thriving at work. Furthermore, the possibility that employee voice assumes the conditional mediating role (through workplace happiness) of corporate governance on thriving at work (Hypothesis 5b) is analyzed and shown in Table 4. Within this framework, Model 14 from the Process Macro in SPSS was utilised to perform the analyses.

Table 4. Regression Results for Moderator Effect

Thriving At Work						
	β	SE	t	p	LLCI	ULCI
Corporate Governance	0.12	0.05	2.59	0.00	0.03	0.22
Workplace Happiness	0.54	0.04	14.28	0.00	0.46	0.61
Employee Voice	0.42	0.04	10.72	0.00	0.34	0.50
Thriving At Work x Employee Voice	0.05	0.02	2.48	0.00	0.01	0.09
Conditional Effect of Workplace Happiness on Thriving at Work						
Employee Voice	β	SE	t	p	LLCI	ULCI
-1 SD (-0.92)	0.48	0.04	11.07	0.00	0.40	0.57
M (.00)	0.53	0.04	14.28	0.00	0.46	0.61
+1 SD (0.92)	0.58	0.04	14.13	0.00	0.50	0.67

Note: $N=449$

A moderating factor is a variable that affects how the relationship between the independent and dependent variables is expressed. The effect of the moderating variable indicates how this variable influences the severity of the relationship as its severity increases or decreases (Gürbüz, 2019). In this context, the interaction between workplace happiness and employee voice should be considered to determine the presence of moderator effect. Table 4 shows that the interaction between workplace happiness and employee voice is significant ($\beta = 0.05$, $p < .01$).

As shown in Table 4, the slope analysis results demonstrate the impact of

workplace happiness on thriving at work under varying conditions of employee voice, considered at low, moderate, and high levels (Aiken & West, 1991). The significance of workplace happiness on thriving at work, depending on low, medium, and high levels of employee voice, can be determined by examining the bootstrap-derived confidence intervals. The absence of zero within these intervals indicates statistical significance (Hayes, 2018; Gürbüz, 2019). The regression analysis results in Table 4 demonstrate that workplace happiness has a significant positive impact on thriving at work across varying levels of employee voice: low ($\beta = 0.48$, 95% CI [0.40, 0.57]), medium ($\beta = 0.53$, 95% CI [0.46, 0.61]), and high ($\beta = 0.58$, 95% CI [0.50, 0.67]). This evidence confirms the moderating effect of employee voice, validating Hypothesis 5a.

The graph in Figure 2 displays how the indirect influence of corporate governance on thriving at work via workplace happiness changes across different levels of employee voice. Since employee voice is centralised, low values represent one standard deviation below the mean, high values reflect one standard deviation above the mean, and medium values are close to zero (Aiken & West, 1991; Gürbüz, 2019). The figure reveals that the indirect effect is weakest at low levels of employee voice, becomes more pronounced at medium levels, and is strongest at high levels.

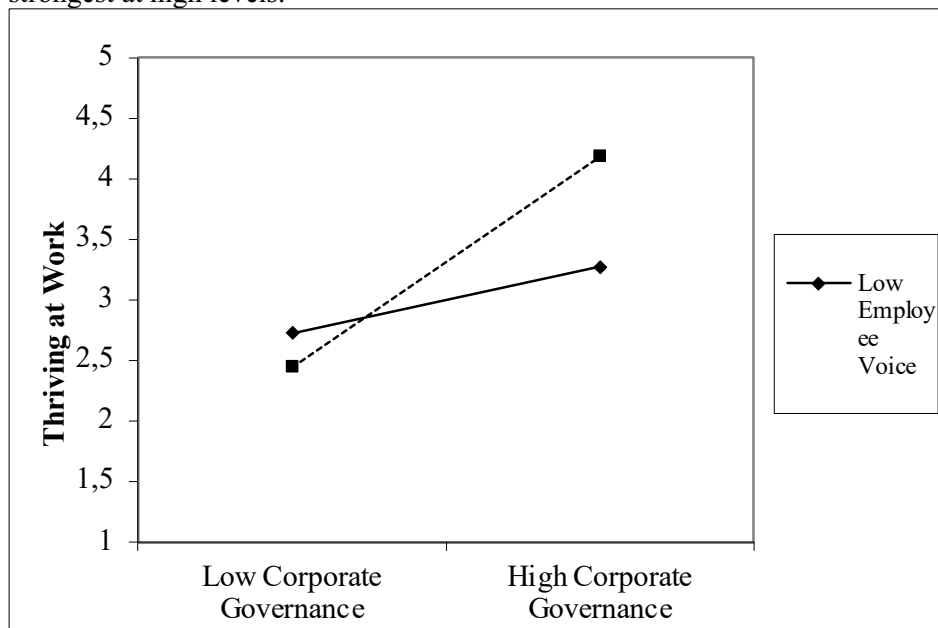


Figure2:

In the last hypothesis of the study, it was questioned whether the indirect

effect of corporate governance on thriving at work is realised through workplace happiness and the role of employee voice as a moderating factor in this process. The Bootstrap approach was utilised to determine whether a conditional mediation effect exists, with an analysis of the corresponding confidence interval values. According to the results, it was determined that the effects of workplace happiness on thriving at work were significant at low ($\beta = 0.42$), medium ($\beta = 0.47$) and high ($\beta = 0.51$) levels of employee voice. As shown in Table 5, the conditional mediation index value ($\beta = 0.05$) confirms the significance of this mediation effect. These results imply that employee voice moderates the indirect impact of corporate governance on thriving at work through workplace happiness, thereby supporting Hypothesis 5b.

Table 5: Analysis Results for Conditional Mediation Effect

Workplace Happiness	Boot indirect	BootSE	BootLLCI	BootULCI
-1 <i>SD</i> (-0.92)	0.42	0.07	0.30	0.57
<i>M</i> (.00)	0.47	0.08	0.33	0.63
+1 <i>SD</i> (0.92)	0.51	0.09	0.36	0.69
Index of Moderated Mediation	0.05	0.02	0.01	0.10

Note: $N=449$

5. RESULT AND SUGGESTIONS

The aim of this study was to examine how workplace happiness mediates and employee voice moderates the relationship between corporate governance perceptions of customer communication consultants in the private sector and their thriving at work behaviours. Additionally, the study assessed the direction and strength of the relationships among corporate governance, workplace happiness, and thriving at work. Data collection was conducted through questionnaires completed by 449 employees from two call centre organisations in Türkiye. The results derived from the analyses are summarised below, along with corresponding suggestions.

When the first hypothesis “Corporate governance has a significant and positive effect on thriving at work behaviour” was tested, it was found that there was a significant and positive relationship between employees’ perceptions of corporate governance and their thriving at work behaviour. Corporate governance perceptions of employees working as customer relationship consultants affect their thriving at work behaviour. Accordingly, as the employees’ perception of

corporate governance increases, their tendency to thriving at work increases at the same rate. There are studies in the relevant literature that directly or indirectly show that there is a positive relationship between corporate governance and thriving at work (Han et al., 2024; Karamustafa et al., 2009; Needles et al., 2012). Corporate governance includes the development of employees, the enhancement of their skills and abilities, the facilitation of business processes, and the development of employee productivity and performance. Therefore, good corporate governance practices implemented in organizations contribute to the enhancement of employees' abilities and their professional development. The training and development needs of employees who strive for thriving can be identified through corporate governance, and an organizational environment in which employees can thrive themselves can be prepared by conducting studies in this direction.

When the second hypothesis "Corporate governance has a significant and positive effect on workplace happiness" was tested, a significant and positive relationship was found between corporate governance and workplace happiness. According to the second result, a significant relationship was found between employees' perceptions of corporate governance and their workplace happiness, and it was determined that as employees' perceptions of corporate governance increase, their workplace happiness increases. In the related literature, significant relationships were found between different dimensions of corporate governance and employee happiness or workplace happiness. For example, according to a study conducted by Nazlı (2015) on service sector employees, a statistically significant relationship was found between the fairness/equality, responsibility and transparency dimensions of corporate governance and workplace happiness. It has been observed that there are many studies supporting these results in the related literature (Amin & Akbar, 2013; Kruger, 2014). Based on this result and the studies in the literature, it can be stated that managers should attach importance to corporate governance practices, and that employees' workplace happiness can be increased through corporate governance practices such as fairness, transparency, equality, and responsibility in organizations. Determining wages in a fair and transparent manner and equal distribution of professional work can also enable the development and strengthening of workplace happiness.

When the third hypothesis "Workplace happiness has a significant and positive effect on thriving at work behaviour" was tested, a significant and positive relationship was found between employees' workplace happiness and their thriving at work behaviour. According to the third result obtained, it can be stated that as the workplace happiness of the employees increases, their thriving at work behaviour will also increase. In the relevant literature, it has been

observed that there is a positive relationship between workplace happiness and thriving at work (Qaiser et al., 2020). This situation encourages employees' thriving at work behaviour because happy employees invest more in their work and are willing to learn and develop more. Workplace happiness increases employees' commitment to their jobs and enables them to develop themselves more selflessly and consistently.

When the fourth hypothesis developed within the scope of the study "Workplace happiness has a mediating role between corporate governance and thriving at work behaviour" was tested, it was determined that workplace happiness has a mediating role in the significant relationship between corporate governance and thriving at work behaviour. According to the results of the study, it can be stated that workplace happiness has a mediating effect on the relationship between employees' perceptions of corporate governance and thriving at work behaviour. Workplace happiness mediates the relationship between corporate governance and thriving at work behaviour because applying principles such as transparency, fairness and responsibility encourages employees to trust their work. At the same time, corporate governance facilitates the effective participation of the employees, enables them to exhibit thriving behaviours by valuing their opinions, and facilitates the improvement of the working environment, quality of life, and job satisfaction.

When the fifth hypothesis "Employee voice is a moderator between workplace happiness and thriving at work behaviour" was tested, it was found that employee voice has a moderating role in the positive relationship between workplace happiness and thriving at work behaviour. According to this result, employee voice has a regulatory role in the relationship between workplace happiness and thriving at work behaviour. The direction and strength of this relationship is affected by the change in the level of employee voice. Employee voice contributes to an individual's level of satisfaction at work, job satisfaction, and positive or negative emotional state. When an employee feels happy and satisfied at work, it can trigger thriving at work behaviour. An employee who is happy at work can increase their commitment to their job, be more open to development and learning, and continuously improve themselves. On the other hand, a negative employee voice situation may lead to unhappiness and dissatisfaction at work. In this case, thriving at work behaviour may decrease or may not develop at all. A negative employee voice can hinder the development of the employee and cause a decrease in motivation at the workplace.

When the sixth hypothesis designed within the scope of the study, "Employee voice has a situational mediating role between corporate governance and thriving at work behaviour (through workplace happiness)" was tested,

employee voice was found to be a moderating variable in the indirect effect of corporate governance on thriving at work through workplace happiness. According to this result, it can be stated that employee voice through workplace happiness has a moderating role in the relationship between employees' perceptions of corporate governance and thriving at work behaviours. The moderating role of employee voice enables employees to express their voice within the company, share their ideas, and participate in management processes. This role encourages the company to operate in a democratic environment and supports the active participation of employees in decision-making processes. With corporate governance, organizations regulate power and authority and ensure accountability. Good corporate governance aims to ensure that decision-making processes are fair and transparent, stakeholders' rights are protected, and the company is sustainable. Corporate governance encourages employee participation and at the same time facilitates employee thriving through the organizing role of employee voice.

Based on the results of this research, we recommend managers to spread the concept of corporate governance in businesses. Because the results of this research have shown us that employees are happier and want to improve themselves at work in a place where the perception of corporate governance increases. Another important issue is that managers give employees the freedom to express themselves. The results of the research have shown us that employee voice within the organization can also have positive effects. Therefore, we recommend that managers develop strategies to increase employee happiness by implementing governance principles such as transparency, justice and accountability, and create an environment where employees can express themselves freely. In this context, it is necessary for organizations to adopt practices that strengthen the understanding of corporate governance and develop policies that support employee happiness and voice for sustainable success. This research has certain limitations. Primarily, it was carried out with participants from two organisations based in Türkiye, which restricts the generalisability of the findings. To enhance the applicability of the results, future studies could involve employees from diverse sectors across different regions.

6. CONFLICT OF INTEREST STATEMENT

Authors don't have any competing interests.

7. FUNDING ACKNOWLEDGEMENTS

No specific grant is provided to this research by any institution.

8. AUTHOR CONTRIBUTIONS

This study has two authors. All stages of the study were equally designed and prepared by the authors.

9. ETHICS COMMITTEE STATEMENT

This study has been prepared in accordance with the rules of scientific research and publication ethics. The research was approved by the Ethics Committee of Erzincan Binali Yildirim University Rectorate Social and Human Sciences Ethics Committee with the decision numbered 07/08 dated 25.07.2022.

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THE IMPACT OF SCHOOL CHOICE ON EMPLOYMENT IN OECD COUNTRIES¹



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ABSTRACT | Education is crucial in preparing individuals with the skills needed for the labor market. Understanding how different types of institutions contribute to employment is vital for policymakers. This paper examines the relationship between student enrollment in different types of institutions and employment in OECD countries from 1998 to 2017. It focuses on tertiary, post-secondary, and upper secondary levels, in public and private institutions. Using the two-step System GMM, the study finds that enrollment in both private and public schools positively affects employment at all education levels, with public schools making the most significant contribution. This paper fills an empirical gap by analyzing the relationship between employment and school choice rather than relying on standardized test scores. Unlike most studies, it covers multiple education levels and compares results across countries, providing a broader and more comprehensive perspective.

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JEL Codes: I25, I21, O1

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ÖZ

Eğitim, bireyleri iş gücü piyasasında ihtiyaç duyulan becerilerle donatmada hayati bir rol oynar. Farklı türdeki kurumların istihdama nasıl katkıda bulunduğunu anlamak, politika yapıcılar için büyük önem taşır. Bu çalışma, 1998-2017 yılları arasında OECD ülkelerinde farklı eğitim kurumlarına kayıtlı öğrenci sayısı ile istihdam arasındaki ilişkiyi incelemektedir. Çalışma, kamu ve özel kurumlarda yükseköğretim, ortaöğretim sonrası ve üst ortaöğretim seviyelerine odaklanmaktadır. İki aşamalı sistem GMM yöntemini kullanan çalışma hem özel hem de kamu okullarına kayıtların tüm eğitim seviyelerinde istihdamı olumlu etkilediğini ve kamu okullarının en büyük katkısı sağladığını ortaya koymaktadır. Bu çalışma, standart test sonuçlarına dayanmaktan ziyade, istihdam ile okul tercihlerinin ilişkisini analiz ederek ampirik bir boşluğu doldurmaktadır. Çoğu çalışmadan farklı olarak, birden fazla eğitim seviyesini kapsamakta ve ülkeler arasında sonuçları karşılaştırarak daha geniş ve özgün bir perspektif sunmaktadır.

Anahtar Kelimeler: Kurumlar, istihdam, eğitim

JEL Kodları: I25, I21, O1

Alan: İktisat

Türü: Araştırma

1. INTRODUCTION

The determinants of economic growth have been extensively debated by economists. As a result, numerous in-depth analyses have been conducted to explain the differences in growth across countries over the past three decades. These analyses suggest that long-term economic growth is largely dependent on the skills of the population in each country (Hanushek & Woessmann, 2010). Likewise, it fosters technological innovation, which is widely recognized as a key driver of sustained long-term growth, along with other advantages (Solow, 1994). Therefore, education is the primary mechanism for developing human capital, and it is important to explore how education contributes to economic prosperity.

In addition to economic growth, employment is also a key indicator for the well-being of society. A more educated population encourages innovative ideas, leading to increasingly more and more favorable labor market outcomes for individuals (OECD, 2024). Traditionally, governments have been the primary providers of education in many countries, given its nature as a public good. However, this landscape is gradually changing, with increasing participation from private sector providers. Accordingly, the key decision for parents is whether their child will engage in an educational institution (Bizenjo, 2020). The quality and accessibility of education play a crucial role in shaping this outcome. Different educational systems, such as private and public schools, may have varying impacts on the skills and opportunities available to individuals. Private schooling, in its many forms, plays a significant role in education systems worldwide. It offers parents the opportunity to choose alternatives to state-provided schooling for their children (Green, Machin, Murphy, & Zhu, 2010). As a key component of an education system, it is essential to compare the educational performance of private schools with that of public schools. Therefore, understanding the impact of public and private schools is crucial, particularly in relation to their influence on employment prospects and economic development.

OECD countries, with their similar socio-economic contexts and educational systems, provide comprehensive datasets on education, employment, and economic indicators. Such a classification allows for a more comprehensive analysis of the impact of school choice and its outcomes, highlighting how different types of institutions affect employment rates and overall economic activities. Educational institutions in these countries can generally be classified as follows: public schools, which are managed by a public education authority and private schools, which are managed directly or indirectly by a non-governmental organization. Private schools can be further divided into government-dependent and independent private schools, depending on the degree of their reliance on government funding (OECD, 2024). Despite the clear

classification of educational institutions across OECD countries, research on their comparative effectiveness remains limited.

This study addresses this gap by conducting a robust empirical analysis using data from OECD countries. Existing literature primarily relies on secondary education and standardized test scores such as PISA (Cox & Jimenez, 1988; Bedi & Garg, 2000; Donkers & Robert, 2003; Pfefferman & Landsman, 2011; Maulin, 2022). Considering studies on this topic for OECD countries, Donkers and Robert (2003), for instance, focus on PISA scores and 15-year-old students, similar to other studies in literature. The paper expands its scope to include post-secondary and tertiary education, in addition to upper secondary education. Additionally, while many studies focus on a single country, this paper employs its analysis across OECD countries, providing a broader perspective on educational outcomes.

In this context, the paper aims to investigate the relationship between students enrolled in different types of schools and employment across 23 OECD member countries from 1998 to 2017, with the time period selected based on data availability. The objective is to understand how different educational systems, particularly public and private institutions, contribute to labor market outcomes. Using the two-step system GMM method, I include students enrolled in public and private institutions, covering upper secondary, postsecondary and tertiary level education. I find a strong correlation between students in public schools and employment across all education levels. I also report that private schools contribute positively to employment, following public institutions.

Therefore, the findings of this study are intended to provide valuable insights for policy makers to strengthen both public and private education, ultimately fostering better employment opportunities. The paper contributes to the literature by comparing education systems in OECD countries, using advanced econometric methods to explore new areas of study.

The rest of the paper is organized as follows: Section 2 summarizes the literature. Section 3 describes model, methodology and data. Section 4 discusses the estimation results. Section 5 concludes the paper.

2. LITERATURE

The impact of education on economic variables has been extensively discussed in literature. Various indicators have been used to demonstrate the contribution of education to economic outcomes. For instance, Marquez-Ramos and Mourelle (2019) employed secondary and tertiary enrollment rates as measures of education and found a nonlinear relationship between education and economic growth in Spain. Su and Nguyen (2020) indicated that human capital

accumulation, based on years of schooling and returns to education, enhances the capacity of FDI inflows to foster economic growth in African countries. Habibi and Zabardast (2020) highlighted a positive correlation between primary gross enrollment, as a proxy for the education variable, and economic growth for 10 Middle Eastern and 24 OECD countries. Agasisti and Bertoletti (2020) argued that regional economic growth in Europe is positively influenced by the number of universities, with research quality and Science, Technology, Engineering and Mathematics (STEM) specialization as key drivers. Suwandaru, Alghamdi and Nurwanto (2021) found that public expenditure in the education sector positively affects economic growth in Indonesia. Similarly, Ziberi, Rexha, Ibraimi and Avdiaj (2022) used public expenditure on education as an education indicator, showing a positive correlation between economic growth and public expenditure on education in North Macedonia. Apostu, Mukli, Panait, Gigaru and Hysa (2022) also pointed to a positive correlation between economic growth and tertiary educational attainment across 30 European countries.

In addition to these studies focusing on the direct effects of education, factors influencing labor market outcomes are also crucial for understanding the broader effects of education. Lachenmaier and Rottmann (2015) estimated the positive effect of innovation on employment in German manufacturing firms, emphasizing the importance of skilled labor in fostering innovation. Similarly, Bouzid (2016) identified a positive correlation between the unemployment rate for people with secondary education as dependent variable and corruption across 92 countries, including developed and developing nations. Accordingly, it is essential to consider not only the direct effects of education but also the factors that influence labor market outcomes and shape economic dynamics.

Building on this, the relationship between school choice and economic dynamics-such as the type of institution-plays a critical role in shaping parents' decisions regarding school choice (OECD, 2024). Accordingly, numerous studies have been conducted to explore the connection between school types and economic outcomes, with most research indicating that private schools outperform public schools. For instance, Cox and Jimenez (1988) used student performance on standardized achievement test to compare the effectiveness of private and public secondary schools for Tanzania and Colombia. They found students in private schools to be more successful than those in public schools in the two countries. Lockheed and Jimenez (1994) compared the efficiency of public and private secondary schools based on math, English and verbal test scores across five developing countries, including Colombia, the Dominican Republic, Philippines, Tanzania and Thailand, concluding that private secondary schools had a superior effect compared to public schools. Bedi and Garg (2000)

found strong evidence that graduates of private secondary schools are superior to those of public schools in Indonesia. Donkers and Robert (2003) also reported that private schools are more efficient than public schools in 19 OECD countries, based on PISA scores for 15-year-old students in reading and mathematics. Similarly, Pfefferman and Landsman (2011) demonstrated that PISA test scores of pupils in private schools are higher than pupils in public schools. Chudgar and Quin (2012) conducted a regression analysis in rural and urban India to assess the efficiency of public and private schools at primary education level. Their findings indicate that students in private schools outperform their peers in public schools for both rural and urban areas. Bizenjo (2020) analyzed the effect of low-cost private schools (LCPSs) compared to public schools in Pakistan, highlighting that LCPSs outperform public schools. Furthermore, Kumar and Choudhury (2020) pointed out that families in India prefer private schools over public schools. Maulin (2022) showed that private lower secondary schools have a large and significant effect on educational success in France. Likewise, Shakeel and Dills (2024), using test scores at secondary education level across 120 countries, showed that private institutions have a slightly higher positive effect on student performance compared to public institutions.

Conversely, some studies have shown that public schools better perform than private ones. Lassibille and Tan (2001) documented, using longitudinal data based on survey of students in some 150 schools, that students enrolled in private secondary schools in Tanzania are less efficient than those in public schools. Jin and Rubin (2009) showed, using longitudinal data from New York City School Choice, that public schools have an advantage over private schools. These findings highlight that the effectiveness of educational institutions may be dependent on various factors, including local context, resource availability and policy frameworks.

Overall, the existing literature provides limited insight into the impact of students enrolled in public and private schools on employment. Therefore, the findings of this paper will help bridge this critical knowledge gap.

3. MODEL, METHODOLOGY AND DATA

3.1. Model and Methodology

The baseline model is based on the empirical studies of Lachenmaier and Rottman (2015) and Bouzid (2016). Accordingly, the baseline model is as follows:

$$\begin{aligned} \log emp_{i,t} = & \beta_0 + \beta_1 \log emp_{i,t-1} + \beta_2 \log X_{i,t-3} + \beta_3 \log Y_{i,t} \\ & + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where $\log emp_{i,t}$ is the logarithm of employment for country i , $L.\log emp_{i,t}$ is the initial log of employment, $\log X_{i,t-j}$ refers each institution variable by education level in the model which lagged 3 period, including students enrolled in tertiary, post-secondary and upper secondary at public and private institutions, for each level of institutions, respectively, $\log Y_{i,t}$ represents control variables: trade, inflation, tax, population and foreign direct investment (FDI). The empirical results generally yield better predictions when different combinations of explanatory variables are used. Furthermore, combining estimations enhances predictive accuracy compared to using individual ones (Wu&Blake,2023). Based on this, I construct different combinations of control variables, including trade, population, tax, inflation and FDI, to check the validity of the results. These combinations are based on both theoretical and empirical considerations in literature. For instance, Stepanok (2022) discusses the trade and population combination in relation to employment, while Nguyen, Le, Le, & Duong (2024) focus on FDI and inflation combinations and their impact on employment. On the other hand, OECD (2011) suggests that tax rates influence the investment decisions of multinational corporations, thereby affecting FDI flows and employment levels. Based on this, I use the combination of FDI and tax. Similarly, the World Bank (2020) reports that labour market outcomes are affected by international trade, with tax serving as an important indicator of trade. Accordingly, the model with trade and tax is also estimated in this paper.

Additionally, students may take time to enter the labor market due to economic conditions, industry demand, and skill mismatches, which can delay the full return of their education. The optimal lag length, though unknown, may exceed one year (Tsai, Hung, & Harriott, 2010; Serifoglu & Guney, 2022). Accordingly, I include a 3- year lag of student enrollment variables in the model, taking into account the data span. Based on Equation (1), I specify the main form for each equation used in Tables 4, 5, 6 and 7. Accordingly, Equations above explicitly present the models including different combinations of the control variables. In each equation, as in Equation (1), $\log public_{i,t-3}$ and $\log private_{i,t-3}$ indicate the number of students enrolled in tertiary, post-secondary and upper secondary education in public and private schools, respectively,

$$\begin{aligned} \log emp_{i,t} = & \gamma_0 + \gamma_1 \log emp_{i,t-1} + \gamma_2 \log public_{i,t-3} \\ & + \gamma_3 \log trade_{i,t} + \gamma_4 \log pop_{i,t} + \theta_{i,t} \end{aligned} \quad (2)$$

$$\log emp_{i,t} = \gamma_0 + \gamma_1 \log emp_{i,t-1} + \gamma_2 \log private_{i,t-3} \quad (2.1)$$

$$+ \gamma_3 \logtrade_{i,t} + \gamma_4 \logpop_{i,t} + \theta_{i,t}$$

$$\begin{aligned} \logemp_{i,t} = & \alpha_0 + \alpha_1 \logemp_{i,t-1} + \alpha_2 \logpublic_{i,t-3} \\ & + \alpha_3 \logFDI_{i,t} + \alpha_4 \loginf_{i,t} + \omega_{i,t} \end{aligned} \quad (3)$$

$$\begin{aligned} \logemp_{i,t} = & \alpha_0 + \alpha_1 \logemp_{i,t-1} + \alpha_2 \logprivate_{i,t-3} \\ & + \alpha_3 \logFDI_{i,t} + \alpha_4 \loginf_{i,t} + \omega_{i,t} \end{aligned} \quad (3.1)$$

$$\begin{aligned} \logemp_{i,t} = & \rho_0 + \rho_1 \logemp_{i,t-1} + \rho_2 \logpublic_{i,t-3} \\ & + \rho_3 \logtrade_{i,t} + \rho_4 \logtax_{i,t} + \epsilon_{i,t} \end{aligned} \quad (4)$$

$$\begin{aligned} \logemp_{i,t} = & \rho_0 + \rho_1 \logemp_{i,t-1} + \rho_2 \logprivate_{i,t-3} \\ & + \rho_3 \logtrade_{i,t} + \rho_4 \logtax_{i,t} + \epsilon_{i,t} \end{aligned} \quad (4.1)$$

$$\begin{aligned} \logemp_{i,t} = & \mu_0 + \mu_1 \logemp_{i,t-1} + \mu_2 \logpublic_{i,t-3} \\ & + \mu_3 \logFDI_{i,t} + \mu_4 \logtax_{i,t} + \epsilon_{i,t} \end{aligned} \quad (5)$$

$$\begin{aligned} \logemp_{i,t} = & \mu_0 + \mu_1 \logemp_{i,t-1} + \mu_2 \logprivate_{i,t-3} \\ & + \mu_3 \logFDI_{i,t} + \mu_4 \logtax_{i,t} + \epsilon_{i,t} \end{aligned} \quad (5.1)$$

Considering equations above, our models consist of the lagged level of dependent variable, which introduces potential autocorrelation in the residuals. Additionally, considering the dynamic structure of the models, as employment may be persistent, with previous levels potentially impacting current employment. There may be a bi-directional relationship between employment and some independent variables, leading to endogeneity bias. As a result, using OLS estimates or other panel data estimators such as fixed effect, random effect could produce biased and inconsistent estimates (Roodman, 2009). To address these issues, appropriate estimation techniques such as Generalized Methods of Moments (GMM) are often employed. GMM estimation techniques have become very popular methods for estimating panel data, especially in empirical growth literature. Additionally, these estimators have been widely adopted in labour and industrial studies (Soto, 2009; Kripfganz & Schwarz, 2015). There are two forms of GMM estimation: Difference GMM estimator introduced by Arellano and Bond (1991) and System GMM developed by Arellano and Bover (1995) and Blundell and Bond (1998). According to Roodman (2009), the System GMM estimator produces more efficient results than the Difference GMM Method.

Firstly, System GMM method allows us to use more instruments, thereby improving the effectiveness of results (Piper, 2014). Secondly, Difference GMM estimator increases the gaps in unbalanced panels, so that if some values of the dependent variable are missing, both the change in dependent variable and the change in its previous value will also be missing in the transformed data (Baum, 2013), which contribute to the development of the System GMM. To deal with weakness of Arellano and Bond estimator, Blundell and Bond (1998) develop a System GMM method, suggesting an additional set of extra moment conditions (Roodman, 2009). System GMM method is applied in both one-step and two-step GMM, with the two-step GMM method often considered superior due to its ability to provide more efficient estimates. Accordingly, the two-step System GMM method developed by Arellano and Bover (1995) and Blundell and Bond (1998) have been adopted to estimate the models in the paper. To ensure the validity of the results, the AR test is implemented to check for serial correlation, and Hansen test is applied to assess the validity of the instruments.

3.2. Data

The dataset consists of 23 OECD countries presented in Table 1 over the period from 1998 to 2017, depending on data availability. The dependent variable in the models is total annual employment, sourced from OECD database. Education variables by institution type, cover students enrolled in tertiary education, post-secondary education and upper secondary education at private and public institutions, are also taken from OECD database. Control variables in the models, including trade, inflation, tax, population and FDI, are obtained from the World Bank (WB) database.

Table 1: Country List

Australia	Ireland	Slovenia
Austria	Italy	Spain
Belgium	Japan	Sweden
Czechia	Netherland	Switzerland
Estonia	New Zealand	United States
Finland	Norway	
France	Poland	
Hungary	Portugal	
Iceland	Slovak Republic	

Source: OECD

Table 2 provides detailed information about the data and sources used in

the models. I use a logarithmic transformation of all variables in the models to stabilize the variance and reduce skewness, allowing for a more accurate interpretation of the relationships between the variables.

Table 2: Data and Source

Variable	Description	Source
logemp	annual employment by economic activity, domestic concept, total (all activities)	OECD
logtrade	the sum of exports and imports of goods and services (% of GDP)	WB
logFDI	net inflows (BoP, current US \$)	WB
logpop	total population between the ages 15 to 64 as a percentage of the total population	WB
loginf	consumer prices (annual %)	WB
logtax	tax revenue (% of GDP)	WB
logpublicter	tertiary education enrolled in public institutions	OECD
logprivater	tertiary education enrolled in private institutions	OECD
logpublicpost	post-secondary education in public institutions	OECD
logprivatepost	post-secondary education in private institutions	OECD
logpublicupper	upper secondary education in public institutions	OECD
logprivateupper	upper secondary education in private institutions	OECD

Table 3 shows the descriptive statistics for variables in the models. Considering all the variables in models, FDI has the highest average value at 9.284, followed by employment at 5.165, while inflation has the lowest average value at 0.250. The average values for tax and population are 1.233 and 1.825, respectively. Regarding the education variables, the average values for students enrolled in post-secondary education are higher than those at other education levels. The values are as follows: private institutions at 1.694 and public institutions at 1.617. The lowest values belong to upper secondary education, ranging from 1.404 to 1.450. In terms of tertiary education, values fall between 1.447 and 1.469.

Table 3: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Logemp	460	5.165	1.107	2.170	6.993
Logtrade	460	1.909	0.232	1.258	2.358
logFDI	460	9.284	2.734	0.000	11.866
Logpop	460	1.825	0.013	1.772	1.858
Loginf	460	0.250	0.406	-1.746	1.151

Logtax	459	1.233	0.265	0.000	1.575
logpublicter	460	5.448	1.447	0.000	1.000
logprivater	457	4.810	1.469	0.000	9.602
logpublicpost	447	3.912	1.617	0.000	6.944
logprivatepost	449	3.573	1.694	0.000	6.987
logpublicupper	460	5.537	1.404	0.000	9.041
logprivateupper	460	4.731	1.450	0.000	6.998

Source: Author's calculations.

4. ESTIMATION RESULTS AND DISCUSSION

The paper begins the analysis by estimating the model using trade and population variables, as shown in Table 4. All models in Table 4 report that the lagged level of employment exhibits a positive effect on employment, as expected. The estimated coefficient for the lagged level of employment ranges from 0.463 to 0.509. Considering the effect of population, as a reflection of the working-age population, across all models in Table 4, the estimated population coefficient, varying between 3.605 and 8.581, demonstrates a robust positive influence on employment. This suggests that as the working-age population increases, the employment level rises significantly, supporting the notion that a growing working-age population contributes positively to employment growth, as reported by Georgieva (2024). Looking at the effect of trade on employment, the results show no correlation between trade and employment in Models 1, 2 and 6. Furthermore, trade negatively affects employment in Model 3, with a coefficient -0.707, and in Model 4, with a coefficient of -0.621, while a positive effect is observed only in Model 5, with a coefficient of 0.245. Based on these results, it is difficult to draw a definitive conclusion about the effect of trade on employment, as the relationship varies across different models- some showing no effect, some showing negative effects, and only one showing a positive effect.

Table 4: Test Results with Trade and Population

Variables	1 Model 1	2 Model 2	3 Model 3	4 Model 4	5 Model 5	6 Model 6
L.logemp	0.463*** (0.030)	0.509*** (0.035)	0.464*** (0.024)	0.472*** (0.015)	0.492*** (0.010)	0.491*** (0.012)
Logtrade	-0.159 (0.152)	-0.214 (0.242)	-0.707*** (0.149)	-0.621*** (0.073)	0.245** (0.107)	0.089 (0.077)
Logpop	8.581*** (1.344)	5.547*** (1.523)	5.078*** (0.764)	3.605*** (0.671)	7.814*** (0.383)	4.613*** (1.076)
L3.logpublicter	0.168***					

L3.logprivater	(0.027)	0.059**				
		(0.027)				
L3.logpublicpost			0.137***			
			(0.031)			
L3.logprivatepost				0.118***		
				(0.027)		
L3.logpublicupper					0.342***	
					(0.047)	
L3.logprivateupper						0.265***
						(0.049)
Constant	-13.48***	-7.461**	-5.671***	-3.064**	-13.99***	-7.132***
	(2.395)	(2.768)	(1.659)	(1.378)	(0.913)	(2.018)
Observations	391	388	387	387	391	391
Number of countries	23	23	23	23	23	23
Number of instruments	22	22	22	22	22	22
AR (1)	0.002	0.003	0.002	0.003	0.002	0.003
AR (2)	0.147	0.116	0.111	0.107	0.353	0.196
Hansen	0.313	0.367	0.474	0.462	0.447	0.489

Standard errors in parentheses *** p<0.01, **p<0.05, * p<0.1

Taking into account students enrolled in tertiary education, it is evident that the impact of students from public institutions on employment is greater than those from private institutions. The coefficient for students enrolled in public institutions is 0.168, followed by 0.059 for private institutions. This is consistent with OECD (2024) data, which indicates that the share of tertiary graduates from public schools surpasses that of private schools, reaching 63% at bachelor's level, 65% at the master's level, and 76% at the doctoral level or equivalent across OECD countries. According to OECD (2024), various factors influence the choice of institutions, including whether they are private or public institutions: tuition fees, living costs, availability of scholarships and expectations after graduation. Given these factors and our findings, public institutions seem to attract more students than private institutions in tertiary education. Similarly, at the post-secondary and upper secondary levels, the test results indicate that students tend to prefer public institutions over private institutions. The coefficient for students enrolled in public institutions is 0.137 at post-secondary level and 0.342 at upper secondary level, whereas the coefficient is 0.118 at post-secondary level and 0.265 at upper secondary level.

Overall, based on test results, students enrolled in upper secondary level at public institutions contribute more to employment compared to those from tertiary and post-secondary levels. In OECD countries, upper secondary education provides students with crucial skills and vocational training that meet labor market demands, making them more employable and contributing significantly to economic development (OECD,2024). Therefore, the results suggest that upper secondary education could lead to a boost in employment. On

the other hand, at the tertiary and post- secondary levels, students enrolled in private institutions make the most significant contribution to employment, followed by those in public institutions.

To determine the reliability of the models, the paper employs the AR test for serial correlation and the Hansen test to assess the validity of the instruments. Based on the models presented in Table 4, all models fit correctly within the specified parameters.

I present different results based on a combination of various variables to demonstrate confidence in the findings shown in Table 4. Accordingly, Tables 5, 6 and 7 provide test results, covering different cases. For the models with FDI and inflation, as noted in Table 5, students enrolled in public institutions at the tertiary level, with a coefficient of 0.218, are positively correlated with employment, followed by those in private institutions, with a coefficient of 0.065. Up until now, the test results in Table 5 align with the findings in Table 4. In terms of post-secondary and upper secondary levels, as reported in Table 4, public institutions exhibit a positive correlation with a coefficient of 0.165 at the post-secondary and 0.411 at the upper secondary. In addition to the findings for upper secondary education, private institutions, after public institutions, have a statistically significant effect on employment, with a coefficient of 0.386. When it comes to post-secondary education, students enrolled in private institutions also have a positive effect on employment, with a coefficient of 0.106. Regarding control variables for models in Table 5, it is observed that FDI has no effect on employment in most models; however, it exhibits a negative effect on Model 2, with a coefficient of -0.003, and in Model 6, with a coefficient of -0.004. Inflation is also insignificant in Models 1, 3, and 5, while it has a positive effect with a coefficient of 0.010 in Model 2, 0.010 in Model 4, and 0.077 in Model 6. Based on these results, it appears difficult to explain the overall effect of inflation and FDI on employment. On the other hand, as indicated in Table 4, all models in Table 5 confirm the validity of these results regarding education levels.

Table 5: Test Results with FDI and Inflation

	1	2	3	4	5	6
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
L.logemp	0.481*** (0.010)	0.503*** (0.008)	0.489*** (0.020)	0.506*** (0.016)	0.499*** (0.012)	0.525*** (0.012)
logFDI	-0.002 (0.001)	- 0.003*** (0.001)	0.002 (0.003)	0.002 (0.002)	-0.002 (0.005)	-0.004** (0.002)
Loginf	0.010 (0.014)	0.010* (0.005)	0.008 (0.005)	0.010** (0.004)	0.004 (0.012)	0.077*** (0.010)

L3.logpublicter	0.218*** (0.031)					
L3.logprivater		0.065*** (0.008)				
L3.logpublicpost			0.165*** (0.029)			
L3.logprivatepost				0.106*** (0.028)		
L3.logpublicupper					0.411*** (0.048)	
L3.logprivateupper						0.386*** (0.071)
Constant	1.516*** (0.139)	2.285*** (0.024)	1.982*** (0.061)	2.164*** (0.043)	0.350* (0.203)	0.661* (0.373)
Observations	391	388	387	387	391	391
Number of countries	23	23	23	23	23	23
Number of instruments	22	22	22	22	22	22
AR (1)	0.003	0.003	0.003	0.003	0.002	0.003
AR (2)	0.168	0.156	0.116	0.107	0.452	0.43
Hansen	0.476	0.51	0.483	0.468	0.394	0.342

Standard errors in parentheses ** p<0.01, * p<0.05, * p< 0.1

Table 6 summarizes the test results including trade and tax. As reported in Table 4 and 5, the lagged level of employment consistently demonstrates a positive impact on employment across all models, with the coefficient ranging from 0.459 to 0.491. In terms of control variables, in some models, trade is found to have a negative effect, while in others, it appears to have no effect. As previously discussed in Table 4, the influence of trade on employment remains inconclusive. Conversely, tax has a positive contribution to employment in most models, with the coefficient of tax ranging from 0.100 to 0.200. When comparing students from public and private schools, Table 6 indicates that public schools have a greater impact across all education levels. The coefficient for students from public schools is 0.131 at the tertiary level, 0.158 at the post-secondary level, and 0.357 at the upper secondary level, while students from private school have coefficients of 0.027 at the tertiary level, 0.131 at the postsecondary level, and 0.342 at the upper secondary level. Furthermore, as shown in Tables 4 and 5, students from upper secondary schools make the highest contribution to employment across OECD countries. The education findings in Table 6 align

with the results reported in Tables 4 and 5. All models in Tables 6 have successfully passed the post-estimation tests including AR and Hansen tests, confirming their accuracy and validity.

Table 7 presents the test results in the models with FDI and tax. As illustrated in Tables 4,5 and 6, the lagged level of employment positively affects employment, with effects ranging from 0.471 to 0.510. Regarding control variables for Table 7, tax has a positive impact on employment in most models across both tables, similar to Table 6. The coefficient of tax ranges from 0.112 to 0.223. In contrast, FDI shows an insignificant effect on employment in most models. However, it demonstrates a negative coefficient in Model 2 with a value of -0.003, and in Model 6, with a value of -0.005. In terms of tertiary education, the coefficient for public schools is 0.235. Similar to the findings in Tables 4, 5 and 6, private institutions, with a coefficient of 0.046 in Table 7, make the second largest contribution to employment. Considering upper secondary and post-secondary levels, students enrolled in upper secondary at public institutions have the greatest effect on employment, with a coefficient of 0.456 in Table 7, compared to other education levels as noted in Tables 4,5 and 6. Additionally, for upper secondary education, the second highest contribution comes from private institutions, the coefficient of 0.346 in Table 7. When looking at the post-secondary education, as shown in Tables 4,5 and 6, the effect of public institutions on employment is 0.176 in Table 7. Following public institutions, like other education levels, private institutions have the second highest effect on employment, with coefficient of 0.110. As reported in Tables 4,5 and 6, all models in Table 7 provide robust estimates, confirmed by AR and Hansen tests.

Overall, the findings of this study align with the broader literature on education and economic indicators. The results confirm that education positively influences economic activities, consistent with the findings of Marquez-Ramos and Mourelle (2019), Agasisti and Bertoletti (2020), Suwandaru, Alghamdi and Nurwanto (2021), and Apostu, Mukli, Panait, Gigaru and Hysa (2022). The findings also correspond with studies examining the direct effects of education, such as those conducted by Lachenmaier and Rottmann (2015) Bouzid (2016). Furthermore, the analysis of public and private schooling, irrespective of education level, aligns with the studies of Lassibille and Tan (2001) and Jin and Rubin (2009), with public schools showing a stronger impact on employment outcomes. However, these findings differ from many previous studies, such as those by Bedi and Garg (2000), Donkers and Robert (2003), Chudgar and Quin (2012), and Maulin (2022). The literature on employment and school type generally indicates that private schools outperform public schools. The findings in this paper, which focus on different education levels, may differ from the

majority of studies due to variations in methodological approaches, sample characteristics, or institutional factors across countries. For instance, Cox and Jimenez (1988), Bedi and Gang (2000), Chudgar and Quin (2012), Bizenjo (2020), Donkers and Robert (2003), Choudhury (2020) and Shakeel and Dills (2024) conducted studies focusing on secondary education and relied on PISA test scores. However, according to International Standard Classification of Education (ISCED) 2011, secondary education consists of lower secondary, upper secondary and post-secondary non-tertiary education, yet these studies do not differentiate between these sublevels. In contrast, this paper specifically distinguishes between upper secondary and post-secondary education. Furthermore, unlike previous studies, the paper extends the analysis to include tertiary level. Beyond these factors, sample characteristics can also contribute to the contrasting results. For example, most studies are based on country-specific analyses, except for Shakeel and Dills (2024) and Donkers and Robert (2003), which examine multiple countries. In conclusion, estimation results in this paper highlight the importance of educational institutions in shaping employment and suggest that, based on the literature, the impact of schooling on employment may be influenced by broader structural factors.

Table 6: Test Results with Trade and Tax

Variables	1 Model 1	2 Model 2	3 Model 3	4 Model 4	5 Model 5	6 Model 6
L.logemp	0.459*** (0.007)	0.491*** (0.008)	0.464*** (0.028)	0.470*** (0.021)	0.486*** (0.012)	0.480*** (0.014)
logtrade	-0.437** (0.167)	-0.0345 (0.189)	1.026*** (0.103)	0.753*** (0.145)	-0.0543 (0.065)	-0.00789 (0.260)
logtax	0.007 (0.009)	0.137*** (0.009)	0.188*** (0.028)	0.200*** (0.038)	0.137*** (0.024)	0.100*** (0.022)
L3.logpublicter	0.131*** (0.016)					
L3.logprivater		0.027** (0.013)				
L3.logpublicpost			0.158*** (0.042)			
L3.logprivatepost				0.131*** (0.027)		
L3.logpublicupper					0.357*** (0.040)	
L3.logprivateupper						0.342***

						(0.073)
Constant	2.931*** (0.403)	2.712*** (0.312)	3.892*** (0.208)	3.469*** (0.245)	0.617** (0.241)	0.973 (0.803)
Observations	391	388	387	387	391	391
Number of countries	23	23	23	23	23	23
Number of instruments	22	22	22	22	22	22
AR (1)	0.003	0.003	0.002	0.02	0.002	0.004
AR (2)	0.145	0.14	0.09	0.088	0.355	0.359
Hansen	0.43	0.35	0.365	0.504	0.468	0.398

Standard errors in parentheses *** p<0.01i ** p<0.05, * p<0.1

Table 7: Test Results with FDI and Tax

Variables	1 Model 1	2 Model 2	3 Model 3	4 Model 4	5 Model 5	6 Model 6
L.logemp	0.471*** (0.007)	0.506*** (0.007)	0.486*** (0.027)	0.504*** (0.016)	0.486*** (0.016)	0.510*** (0.015)
logFDI	-0.002 (0.001)	- 0.003*** (0.001)	0.002 (0.003)	0.002 (0.002)	-0.001 (0.005)	-0.005** (0.002)
logtax	0.189*** (0.030)	- 0.135*** (0.009)	0.116*** (0.030)	0.087*** (0.019)	0.223*** (0.042)	0.112*** (0.020)
L3.logpublicter	0.235*** (0.027)					
L3.logprivater		0.046*** (0.006)				
L3.logpublicpost			0.176*** (0.040)			
L3.logprivatepost				0.110*** (0.029)		
L3.logpublicupper					0.456*** (0.053)	
L3.logprivateupper						0.346*** (0.066)
Constant	1.230*** (0.109)	2.526*** (0.031)	1.810*** (0.078)	2.053*** (0.063)	-0.132 (0.276)	0.842** (0.362)

Observations	391	388	387	387	391	391
Number of countries	23	23	23	23	23	23
Number of instruments	22	22	22	22	22	22
AR (1)	0.003	0.003	0.003	0.003	0.003	0.003
AR (2)	0.167	0.154	0.112	0.101	0.484	0.327
Hansen	0.458	0.518	0.456	0.463	0.477	0.325

Standard errors in parentheses *** p<0.01i ** p<0.05, * p<0.1

5. CONCLUSION

Understanding the effect of school choice is crucial for developing educational policies that promote employment outcomes for students. In this paper, I analyze the impact of students attending different types of educational institutions at various education levels on employment outcomes across 23 OECD countries from 1998 to 2017. Through the two-step System GMM estimation method, I found a strong relationship between students enrolled in public institutions and employment for all education levels. Additionally, the results show that public institutions provide the greatest contribution at the upper secondary level, while private schools have a positive, though secondary, effect on employment outcomes.

Given these findings, public schools play a crucial role in influencing labor market outcomes. Policymakers should prioritize the enhancement by improving access to public education, affordability, and alignment with labor market needs. Supporting public institutions with additional funding and improving teaching quality could further boost the employability of graduates. On the other hand, the test results indicate that private institutions have a relatively significant impact on employment. Based on this, private institutions could also be encouraged to better align with labor market conditions to increase their contribution to employment outcomes. Another point is highlighted by the findings, for both public and private schools, the contribution of upper secondary education is higher than that of other education levels in OECD countries. At this stage, encouraging students to pursue higher education, perhaps by increasing employment opportunities, could enhance their interest in higher education and contribute to better labor market outcomes.

Limitations of this study include exclusion of other potential factors, such as gender-specific variables, which may also play a significant role in shaping employment outcomes. Further research could explore the gender-specific effects of educational institutions on employment outcomes, as well as how different

education levels—such as bachelor’s, master’s, and doctoral degrees—impact labor market participation and outcomes. This paper also focuses on total employment, so extending the research to examine sector-specific employment distributions could offer a more comprehensive understanding of the effect of schools on employment within various sectors. Additionally, expanding the analysis to include non-OECD countries could provide a broader perspective on how schools impact employment outcomes across different economic contexts.

6. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

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8. AUTHOR CONTRIBUTIONS

The author developed research design, conducted data analysis, and reviewed the final manuscript.

9. ETHICS COMMITTEE STATEMENT

The study does not require approval from an ethics committee.

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COMPASSION FATIGUE AMONG SOCIAL WORKERS: A RESEARCH ON THE KAHRAMANMARAŞ EARTHQUAKE¹



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ABSTRACT

Compassion fatigue is a cumulative reaction in workers exposed to others' traumatic stories, impacting them emotionally, physically, and socially. This paper aims to explore two primary research questions: the experiences of compassion fatigue among social workers who worked in the field during the February 6 Kahramanmaraş earthquake and the strategies they employed to cope with this condition. Within the scope of a phenomenological study, in-depth interviews were conducted with 11 social workers who served during the earthquake. The data obtained were analyzed using thematic analysis with the assistance of the MAXQDA software. Social workers working with earthquake survivors face various professional challenges such as high workload and responsibilities as well as risk factors such as feeling of loneliness, lack of support, limited autonomy, pressure to stay strong, time constraints, decreased sense of belonging. These stressors can lead to emotional, physical and social symptoms. To cope, social workers resort to strategies such as spirituality, physical exercise, seeking professional support, maintaining a professional attitude, finding fulfillment in their work and building solidarity with colleagues.

Keywords: *Compassion fatigue, Kahramanmaraş earthquake, social work, coping strategies*

JEL Codes: *I10, I14, I19*

Scope: *Social work*

Type: *Research*

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¹ Compliance with the ethical rules of the relevant study has been declared.

SOSYAL ÇALIŞMACILARIN MERHAMET YORGUNLUĞU: KAHRAMANMARAŞ DEPREMİ ÜZERİNDEN BİR ARAŞTIRMA



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ÖZ

Merhamet yorgunluğu, başkalarının travmatik anlatılarına maruz kalan çalışanlarda görülen ve bireyi duygusal, fiziksel, sosyal olarak etkileyen kümülatif bir tepkidir. Bu çalışma, 6 Şubat Kahramanmaraş depreminde sahada çalışan sosyal çalışmacıların merhamet yorgunluğu deneyimlerini ve bu durumla nasıl başa çıktıkları olmak üzere iki temel araştırma sorusunu anlamayı amaçlamaktadır. Fenomenolojik bir araştırma kapsamında, depremde görev yapan 11 sosyal çalışmacının deneyimine yönelik derinlemesine görüşmeler yapılmış ve elde edilen veriler MAXQDA programı kullanılarak tematik analizle incelenmiştir. Depremzedelerle çalışan sosyal çalışmacıların, iş yükünün fazla olması ve sorumluluklar gibi mesleki zorlukların yanı sıra yalnızlık hissi, destek eksikliği, yapabileceklerinin sınırlı olması, güçlü kalma baskısı, zaman kısıtlamaları, aidiyet duygusunun azalması gibi risk faktörleriyle de karşı karşıya oldukları görülmüştür. Bu stres faktörleri duygusal, fiziksel ve sosyal semptomlara yol açmaktadır. Sosyal çalışmacıların başa çıkmak için maneviyat, fiziksel egzersiz, profesyonel destek arama, profesyonel bir tutum sürdürme, işlerinde tatmin olma ve meslektaşlarıyla dayanışma gibi stratejilere başvurduğu görülmüştür.

Anahtar Kelimeler: Merhamet yorgunluğu, Kahramanmaraş depremi, sosyal hizmet, baş etme stratejileri

JEL Kodları: I10, I14, I19

Alan: Sosyal hizmet

Türü: Araştırma

1. INTRODUCTION

According to the Disaster and Emergency Management Presidency (AFAD), two major earthquakes with magnitudes of 7.7 and 7.6, centered in the Pazarcık and Elbistan districts of Kahramanmaraş on February 6, 2023, caused significant loss of life and property across multiple provinces. The earthquake, which affected such a large area, resulted in widespread social trauma (Yelboğa, 2023). Traumatic events are not limited to those caused by humans; natural disasters such as floods, earthquakes, and hurricanes can also induce trauma (Gautschi et al., 2008; Kılınç, Yıldız, & Harmancı, 2017). Located in an earthquake-prone zone, Turkey continuously faces the threat of earthquakes. However, the inadequacy of protective and preventive measures (Tuncay, 2004) leads to both loss of life and property, as well as social, psychological, and economic impacts (Soydan & Alparslan, 2014). The inadequacy of protective and preventive measures has exacerbated the consequences of the disaster. According to an official statement from the Ministry of Internal Affairs of the Republic of Turkey, the death toll from the Kahramanmaraş-centered earthquakes stands at 53,537 (Ministry of Internal Affairs of the Republic of Turkey, 2024).

Beyond physical destruction and economic losses, disasters of this magnitude have profound social and psychological consequences. Individuals who experience such traumatic events often suffer from anxiety, depression and post-traumatic stress disorder (PTSD), while societies face long-term disruption to their social structures (Norris et al., 2002). In this context, social workers play a crucial role in helping affected individuals. However, constant exposure to trauma narratives and the huge emotional burden of disaster response can negatively affect these professionals, leading to compassion fatigue.

Compassion is a critical emotional response that allows individuals to empathize with others' suffering and take action to alleviate it. However, sustained exposure to such emotional engagement can have a cumulative emotional impact. In this context, compassion fatigue is recognized as an emotional and time-developing reaction of professionals, including social workers, to the traumatic narratives of clients. This phenomenon is a critical concern for healthcare and mental health professionals, as it can lead to emotional exhaustion and decreased professional efficacy. Various strategies have been identified to mitigate or prevent compassion fatigue, including maintaining clear professional boundaries, fostering a strong supervisory relationship, seeking professional support when needed, engaging in hobbies, and participating in physical and social activities (Figley, 1995; Killian, 2008; Knight, 2013; Ray et al., 2013). These protective factors contribute to the well-being and resilience of professionals working in emotionally demanding environments.

A review of the international literature reveals a growing body of research on social work and compassion fatigue. These studies primarily aim to explore the lived experiences of social workers in their interactions with challenging client populations and to identify protective factors against compassion fatigue (Kapoulitsas & Corcoran, 2014). For instance, Adams, Boscarino, and Figley (2006) investigated the presence of compassion fatigue among social workers and its implications for the profession. Similarly, Bride (2007) examined the extent to which social workers are exposed to secondary traumatic stress and its association with compassion fatigue. Craig and Sprang (2009) focused on compassion fatigue and burnout among trauma professionals, including social workers. Lloyd, King and Chenoweth (2002) compared burnout and stress factors in social workers with those in other health professionals, highlighting their connection to compassion fatigue. Additionally, Harr and Moore (2011) explored the psychological impact of compassion fatigue on social work students during their field placements.

When examining the studies conducted in Turkey, it becomes evident that compassion fatigue predominantly affects healthcare professionals, particularly nurses (Gök, 2015; Dikmen & Aydın, 2016; Polat & Erdem, 2017; Yılmaz & Üstün, 2018; Pehlivan & Güler, 2018). In the literature, compassion fatigue is primarily associated with the burnout experienced by doctors and nurses (McHolm, 2006; Polat & Erdem, 2017). However, there is a significant gap in the national literature regarding compassion fatigue among social workers. Apart from Başer and Mavili's (2017) "Social Work and Compassion: A Qualitative Research", Türk and Kaya's (2023) "The Effect of Compassion Fatigue on Psychological Resilience in Post-Earthquake Psychosocial Support Practices: A Research on Social Workers," and Sena's (2023) "Investigation of Factors Affecting Compassion Fatigue in Medical Social Workers" research on this subject is scarce. While previous studies have focused on the role of compassion in social work and the relationship between compassion fatigue and psychological resilience, this research is significant for directly addressing the experiences of compassion fatigue among social workers in earthquake areas within the national literature. It aims to explore coping strategies and protective measures against compassion fatigue.

In this study, the primary objective was to gain insight into the compassion fatigue experienced by social workers who assist individuals affected by traumatic events resulting from earthquakes. The study sought to understand the behaviors, emotions, and challenges encountered by social workers engaging with individuals impacted by earthquake trauma. This research addresses the following questions: How do social workers working in the earthquake zone

experience compassion fatigue with earthquake survivors? What are their coping strategies with compassion fatigue?

This research seeks to explore the compassion fatigue experienced by social workers in the earthquake zone, with a particular focus on its causes, symptoms, and coping strategies. The study addresses the following key questions:

What are the underlying causes of compassion fatigue among social workers in earthquake-affected areas?

What symptoms do social workers experience as a result of compassion fatigue?

What coping strategies can be employed to mitigate or prevent compassion fatigue?

2. CONCEPTUAL FRAMEWORK

The definition of compassion is widely established in the literature as the capacity to empathize with others' suffering and take action to alleviate their distress (Lazarus, 1991; Goetz et al., 2010). This concept, which is not easy to define, can often be confused with concepts such as empathy and sympathy. However, Ledoux (2015) proposes that compassion stands apart from these concepts by mobilizing individuals into action. McHolm (2006) describes compassion as a profound emotion that allows one to enter the world of the client (or patient), recognize their pain, and act to alleviate that pain. However, prolonged exposure to such sensitivity and compassion can exact an emotional toll on the individual. It is recognized that care recipients can inflict emotional trauma on caregivers, directly impacting their work performance (Deville, Wright, & Varker, 2009).

Compassion fatigue is a response that occurs cumulatively (Killian, 2008) as a result of exposure to others' traumatic narratives (Kapoulitsas & Corcoran, 2014), affecting the individual emotionally (Portnoy, 2011). Figley and Figley (2009) suggest that continuously listening to the stories of individuals who have experienced significant losses, such as the loss of a limb or a loved one, war veterans, or victims of child sexual abuse, can induce acute stress. Repeated and frequent contact with trauma-exposed individuals leads to secondary traumatization (Killian, 2008). Compassion fatigue, defined as secondary traumatization, is a condition faced by social workers who work directly with clients with traumatic life experiences such as individuals with AIDS, oncology patients, the elderly, child welfare cases, individuals with a history of suicide attempts, victims of abuse, children who have experienced sexual abuse, and women subjected to violence (Bride, 2007). Because most of the areas where

social workers work are directly related to traumatized individuals (Adams et al., 2006), they may experience secondary traumatization (Gil & Weinberg, 2015). This phenomenon can disrupt helping professionals' perception of safety and their beliefs about the world and interpersonal relationships (Schauben & Frazier, 1995).

There are several risk factors associated with compassion fatigue, as well as various symptoms indicating its presence. The literature primarily indicates that individuals with compassion fatigue often feel lonely and unsupported (Malone, 2022). Additionally, symptoms such as feelings of inadequacy (Adams et al., 2006), helplessness (Kanter, 2007), regret, guilt (Kim et al., 2021), lack of organizational belonging, lack of coordination (Simon et al., 2005; Yi et al., 2016), and depersonalization (Wagaman et al., 2015; Denne, Stevenson, & Petty, 2019) are commonly observed in these individuals. Emotional symptoms of compassion fatigue include anxiety, sadness, helplessness, anger, guilt, and fear (Harr et al., 2014; Dikmen & Aydın, 2016). Furthermore, physical symptoms such as fatigue, sleep disturbances, eating disorders, weight loss, and loss of appetite are also indicative of compassion fatigue (Aycock & Deborah, 2009; Sorenson et al., 2017; Peters, 2018). To avoid or mitigate the symptoms of compassion fatigue, various coping strategies can be employed. One of the most significant strategies is maintaining a professional attitude among social workers. A professional attitude not only protects social workers from compassion fatigue but also enables them to work longer and more effectively (Yi et al., 2018). Other coping strategies include physical exercises, spirituality, professional support, social support, and professional solidarity (Bride & Figley, 2007; Yoder, 2010; Whitebird et al., 2013; Yi et al., 2016; Yi et al., 2018; Türk & Kaya, 2023).

3. METHODOLOGY

In this study, phenomenological design was selected from qualitative research methods in order to reveal the experiences of social workers with compassion fatigue in depth. Data collection in this study was conducted using the in-depth interview technique. The interviews were carried out using a semi-structured interview form prepared by the researcher. In this context, the information of the interviewed participants was kept confidential, and codes were assigned to them for identification purposes in the study.

Interview Questions

Could you describe your professional experiences in working with clients?

What emotional responses do you experience when working with clients who have been traumatized by the earthquake? In what ways do their traumatic

experiences impact you personally and professionally? How do you manage these effects?

In what ways do the experiences shared by clients influence your daily life? What strategies do you employ to manage these effects?

How does working with clients who have experienced trauma affect your social life? What strategies do you employ to cope with these effects?

What are your reactions when you feel that neither your support nor the support provided by your organization is sufficient to meet clients' needs? How do you manage these experiences?

Do you think you have experienced compassion fatigue in your professional role? If so, how has it manifested and what strategies have you found effective in dealing with it?

3.1. Research Process and Participant Profile

After preparing the semi-structured interview form, the researcher contacted social workers operating in the earthquake zone through social media to inform them about the study. Following preliminary interviews with two social workers (pilot study), the interview form was finalized. Social workers who agreed to participate were asked to confirm their involvement by signing a consent form outlining the study's purpose and significance. Subsequently, online participation was facilitated via Zoom. Interviews were scheduled at times convenient for the social workers, spanning approximately three months from June to September. Since the researcher did not reside in the earthquake zone, all interviews were conducted via online platforms (Zoom). A total of 11 participants were interviewed, with each session lasting an average of 40 minutes.

The inclusion criteria required that participants be social workers actively working in the earthquake-affected zone. What is important here is that social workers have a practice of working with clients traumatized by the earthquake. The exclusion criteria specified that professionals from disciplines other than social work were not included in the study. Additionally, social workers operating outside the eleven provinces impacted by the earthquake were excluded.

A purposive sampling method was chosen for the selection of the study group. In this type of sampling, the sample is selected based on the judgment of an expert or according to predetermined objectives (Neuman, 2016, p. 322). In this context, criterion sampling was used. Generalizations are not appropriate in qualitative studies; instead, the goal is to understand and comprehend the phenomenon in depth. In this context, the data collection process continued until no new information emerged, a concept known as saturation (Krysik & Finn, 2015). Study included 11 social workers as participants.

Table 1: Participant Introduction Table

Participant	Age	Gender	Marital Status	Years of Work	Work Location	Institution	CF Awareness
P1	28	Female	Married	6	Hatay	Private	Unaware
P2	25	Female	Single	1.5	Kahramanmaraş	Private	Aware
P3	25	Female	Single	1	Kahramanmaraş	Public	Unaware
P4	29	Male	Single	6	Gaziantep	Private	Unaware
P5	33	Male	Married	9	Kahramanmaraş	Public	Unaware
P6	28	Male	Single	1.5	Malatya	Private	Unaware
P7	24	Female	Single	1	Malatya	Public	Unaware
P8	29	Female	Single	1	Mardin	Public	Aware
P9	29	Female	Single	1	Diyarbakır	Public	Aware
P10	28	Male	Single	5	Gaziantep	Private	Unaware
P11	30	Female	Single	6	Hatay	Public	Unaware

*CF: Compassion Fatigue

3.2. Data Analysis

Thematic analysis was used in the study (Miles et al., 2014). The researcher has an important role in data analysis in qualitative research (Braun & Clarke, 2006). In this study, the researcher used Creswell's (2017) analysis process in the analysis process by adhering to the research questions. Accordingly, the data were made ready for analysis and the first discoveries about the data were made through coding. A voice recorder was used in all interviews. The researcher made the voice recordings herself and transcribed them verbatim. In this step, the interviews were analyzed and the data were organized with the notes taken. Then the codes were combined under categories and these categories were given under different themes. These codes were created by reading the previously transcribed audio recordings multiple times and considering the literature on similar topics (Bryman, 2015). Data that could be categorized in the same category were given together. In addition, the data were analyzed with the help of MAXQDA 24 qualitative data analysis program. The findings obtained in this context are presented under four main themes: Challenging Working Conditions: "We are not Superheroes", Risk Factors: "You Have to Be Strong",

Symptoms of Compassion Fatigue: “I Feel Angry” and Strategies for Coping with Compassion Fatigue: “Being a Good Person”.

3.3. Ethical Permission for the Study

Name of the ethical review board: University Social Sciences and Humanities Scientific Research and Publication Ethics Committee

Date of ethical assessment decision: 16.06.2023

Certificate of Ethics Assessment Number: E.110040

Limitations

While this study provides valuable insights into social workers' experiences of compassion fatigue, it is important to acknowledge its limitations. Primarily, the study's scope does not allow for generalization to all social workers. Moreover, conducting online, in-depth interviews via video conferencing introduces constraints in observing non-verbal cues. The researcher's observation is limited to the screen, resulting in a different dynamic compared to face-to-face interactions during in-depth interviews (Ardahanlioğlu, 2022).

4. RESULTS

Table 2: Themes and Categories

Table 2: Themes and Categories

Challenging Working Conditions: "We Are Not Superheroes"	Risk Factors: "You Have to Be Strong"	Symptoms of Compassion Fatigue: "I Feel Angry"	Strategies for Coping with Compassion Fatigue: "Being a Good Person"
Excessive Workload	Institutional Inefficiencies Feeling Alone and Lack of	Emotional Symptoms	Job Satisfaction
Experiencing the Same Trauma Responsibility and Lack of Support	Supervisory Support Taking Initiative The Notion of Being Strong Guilt Inability to Resist Time Constraints Feeling Inadequate Lack of Belonging	Physical Symptoms Social Symptoms	Postponing Confrontation Solidarity and Cooperation Spirituality Hobbies and Physical Activities Professional Support

4.1. Challenging Working Conditions: "We Are Not Superheroes"

Under this theme, the quotations were categorized into the following subcategories: excessive workload, experiencing the same trauma, responsibility, and lack of support.

Excessive Workload

Participants stated that they worked both physically and under stressful conditions in the earthquake zone:

"I was staying at the Nursing Home at that time. We were upstairs, and our patients were downstairs. During that period, we were here 24/7. We worked extra shifts. I was the only one at that time" (P7, Female, Malatya).

"Some of our colleagues take medication not to sleep, thinking about how they can be more helpful, how they can provide service." (P2, Female, Kahramanmaraş).

Interviews revealed that managing numerous cases and the high workload exhausts social workers both physically and emotionally. Participant P4 expressed this sentiment: "*Working with many cases makes people robotic rather than human*" (P4, Male, Gaziantep).

Experiencing the Same Trauma

The experience of social workers in the earthquake zone, working with clients who have undergone traumatic experiences, combined with their own experience of the earthquake, has made this period particularly complex for them. In this regard, Participant P1 explained her experience:

"I realized that no matter how much we say we empathize with people, we can only understand them. But now, when they talk about their feelings one-on-one, their losses in the earthquake, I realized that I started to feel bad because I experienced the same thing. So, in this sense, I feel tired and exhausted" (P1, Female, Hatay).

Participant P4 noted that it may not be beneficial for clients when social workers who have also been affected by the earthquake provide services directly in the earthquake zone during the same period:

"For example, when a case comes to me, I cannot handle it well because I have already experienced this event myself. I try to recover from the shock. I try to save my relatives. I could direct them to people who did not experience the event and who could handle this job better" (P4, Male, Gaziantep).

Social workers in earthquake-affected areas are not only victims themselves but also service providers to other earthquake victims, which further exacerbates their burden. Assisting trauma survivors and those in pain can lead professional workers to experience compassion fatigue.

Responsibility and Lack of Support

The losses, mourning, financial hardships, and the large number of clients due to the earthquake have been observed as exhausting aspects of the job. Furthermore, limited resources have placed social workers in an even more challenging position:

"With the earthquake, we are dealing with many losses, mourning, and material damages. We want to help but often can't. Acting with conscience exhausts us, revealing our limits. We are not heroes and get exhausted without any environment to regain our strength. Compassion fatigue is deeply felt." (P11, Female, Hatay)

4.2. Risk Factors: "You Have to Be Strong"

The categories within this theme include individual and institutional inadequacies, feelings of isolation, lack of supervisory support, taking initiative, the perception of needing to be strong, difficulties in managing time-related pressures, a sense of not belonging, feeling unsupported, and experiencing guilt.

Institutional Inefficiencies

In this study on compassion fatigue experiences, social workers in the earthquake zone expressed dissatisfaction with institutional inadequacies, describing how these challenges drain their energy. Participant P10 highlighted how deficiencies and lack of coordination within official institutions also impact NGOs:

"Humanitarian aid had to be coordinated. The state blocked this at one point, causing a backlog. As a result, people initially received excessive support, but later on, this support diminished

and sometimes disappeared altogether. This is an issue of coordination." (P10, Male, Gaziantep)

Participant P11 described the atmosphere created by organizational deficiencies and the emotional toll it takes on them:

"People amidst this suffering are also advocating for their rights. Where should they go? Which institution should they apply to? ... Being constantly scolded and yelled at by people, we sometimes found ourselves emotionally overwhelmed." (P11, Female, Hatay)

Feeling Alone and Lack of Supervisory Support

Various factors contributing to compassion fatigue among social workers in the earthquake zone have been identified. Chief among these is the sense of being unsupported and isolated in their work. The absence of supervisory support emerges as a significant issue:

"Not receiving any support in the field. For instance, normally when you encounter a case, when you are triggered, you need to be able to give this case to someone else. Or you need to be able to get supervision." (P4, Male, Gaziantep)

Taking Initiative

Some of the social workers interviewed mentioned feeling occasionally exhausted due to taking too much initiative. Regarding this issue, P3 shared her experiences as follows:

"Women were coming and saying that they needed hygienic pads and underwear. Normally, it was against the rules for us to provide these items, but I was no longer that professional because I empathized with them a lot and ended up buying those products and giving them. It was forbidden, but I couldn't resist because I was deeply involved in those events. These are just two simple examples I can give you; there are many more like this." (P3, Female, Kahramanmaraş).

The Notion of Being Strong

Another factor contributing to burnout and, consequently, compassion fatigue among social workers in the earthquake zone is the expectation that they must

always remain strong. This mindset can gradually exhaust the social worker over time:

“For example, they thought I was very strong because I was supportive. However, there were nights when I could sit on the street and feel sorry for, I don't know, a ball that was left in a house after the earthquake, because of the memories associated with that ball... I felt the pressure to always appear strong and supportive, which slowly wore me down.” (P4, Male, Gaziantep).

Guilt

The devastation and traumatic nature of the earthquake have caused social workers in the field to question even their daily activities. Simple tasks such as eating, sleeping, and listening to music have become sources of guilt in light of the earthquake's aftermath:

“I used to love listening to music, but after the earthquake, I didn't feel like listening anymore. Music is supposed to uplift my spirits, but it felt wrong, like I should remain in that state of sadness. I mean I felt guilty, as if I should be immersed in that sorrow. Listening to music felt selfish to me.” (P8, Female, Mardin).

Inability to Resist Time Constraints

The social workers interviewed as part of the study were asked to reflect on their initial entry into the profession compared to their current experiences. Nearly all of the social workers noted that their motivation was exceptionally high when they first started. However, they mentioned that this motivation dwindled over time, and this shift was particularly pronounced after the earthquake:

"In other words, the process we are going through is not just due to the earthquake, but also due to a professional lack of compassion or what we call a decrease in compassion. This trend began before the earthquake, but it became significantly worse afterward, accelerating the compassion fatigue we mentioned." (P4, Male, Gaziantep)

Feeling Inadequate

During the earthquake crisis, social workers described feeling inadequate due to

both personal and institutional limitations:

"It was a bit more there; it was like I was not enough. You know, I felt as if no matter how many pieces I was divided into, it wasn't enough." (P9, Female, Diyarbakır)

"Yes, I remember a girl who was traumatized. She had lost her whole family. She was frozen, not crying at all. We couldn't communicate with her. What effect did that have on me? I felt a sense of inadequacy." (P8, Female, Mardin)

Lack of Belonging

Several social workers criticized the institutions they worked for, highlighting a lack of belonging:

"It, The Ministry of Family and Social Services, is not supportive towards its own staff. This not only exhausts the staff but also diminishes their sense of belonging and leads to feelings of worthlessness." (P5, Male, Kahramanmaraş)

4.3. Symptoms of Compassion Fatigue: "I Feel Angry"

The data for this theme were categorized into physical symptoms, emotional symptoms, and social symptoms.

Emotional Symptoms

Emotionally, social workers in the earthquake zone exhibited signs of compassion fatigue. P8 described her emotional symptoms as follows:

"Emotionally, I couldn't adapt to anything. I couldn't tolerate someone laughing, sharing something normal, or talking about something normal. You know, because you have to feel bad anyway in a situation like this. Even if someone was a victim of the earthquake, it affected me deeply." (P8, Female, Mardin)

Among the emotional symptoms experienced by participants were loneliness, fatigue, anger, and intolerance:

"There were frequent outbursts of anger. People just couldn't

stand each other." (P7, Female, Malatya)

"Overall, when I think about it, I feel angry. " (P10, Male, Gaziantep)

Physical Symptoms

Another significant symptom of compassion fatigue is the physical toll experienced by social workers during the earthquake. Insomnia, fatigue, weight loss, and loss of appetite were common physical symptoms:

"We were dealing with very difficult cases. I couldn't sleep for days. I mean, I lost a lot of weight during this time. I mean, loss of appetite and then insomnia followed." (P9, Female, Diyarbakır)

P3 explains how empathic interactions with earthquake victims who have undergone traumatic experiences lead to compassion fatigue for social workers:

"At the time of the earthquake, in the first cases, I was crying all the time. And in the evenings, with that emotion, sleep disturbances started to occur. I couldn't eat at work. I couldn't sleep when I thought of those traumatic things. My sleep pattern was ruined. I remember not eating for a week straight. They tell me, 'Okay, I am a victim too,' but I can't do anything. I couldn't do anything for anyone." (P3, Female, Kahramanmaraş)

Their psychosomatic experiences, manifesting as both physical and emotional symptoms from working with traumatized clients, are attributed to the challenging nature of their work and exhausting conditions:

"I didn't realize it during the day. There was a liquid flowing here (pointing to her lip). I was not aware of it. When I went home in the evening, I realized that I had a cold sore here. I didn't realize it at all. When I went home, I felt very serious pain in my shoulder and neck that wouldn't go away." (P8, Female, Mardin)

Social Symptoms

Another symptom experienced by social workers was social symptoms, including

changes in daily routines, withdrawal from social environments, neglecting family, and depersonalization. They mentioned that their daily routines were disrupted, and their social and family relationships were affected:

"My eating and drinking habits changed a lot during this process. I mean, I consume alcohol, and I started to embrace it more. My alcohol use increased. I couldn't sleep; I was sleeping late and waking up quite early. I went through such a process. If you say eating and drinking, I started to avoid cooking more. I don't order from outside either. I try to make do with small snacks. I became lazy." (P10, Male, Gaziantep)

Social workers experiencing compassion fatigue continue to think about the traumatized earthquake survivors they work with during the day, even outside of work. P3 expressed this situation as follows:

"I continue to think about the experiences of traumatic clients at home. We were only talking about work with my friends I stayed in the same tent with. 'Today, such a woman came, this one died, that one died.'" (P3, Female, Kahramanmaraş)

4.4. Strategies for Coping with Compassion Fatigue: "Being a Good Person"

The data for this theme are presented in various categories, including professional satisfaction, postponement of confrontation, solidarity and cooperation, spirituality, hobbies and physical exercises, and receiving professional support.

Job Satisfaction

According to the data gathered from the participants, a significant factor in managing compassion fatigue is deriving professional satisfaction and having a passion for the social work profession. In this context, P5 describes his experiences as follows:

"When I was on the field, my professional dedication was keeping me up. I was telling myself that you are doing your job well, you are doing it properly so that people feel strong when they are with you. This kept me going." (P5, Male, Kahramanmaraş)

Postponing Confrontation

Some participants stated that they used avoidance mechanisms, which is a negative coping method (Görgülü & Kumova, 2023), and in this sense, they postponed their emotions or did not want to confront them:

"You know, it was like this, I showed avoidance behavior. When I was idle, the scenes would come to my mind. I gave myself completely to my work to avoid these situations." (P2, Female, Kahramanmaraş)

Solidarity and Cooperation

Another coping mechanism is seen as the solidarity and cooperation among professionals working in the earthquake zone. P4 describes this collectivity in the field as follows:

"There is no access to any services, but at least there is human-supported access. I mean, there is emotional sharing, sharing any food, sharing food, sharing space here, these were very valuable things and I think this process, the healing process, I mean, we overcame this a little more with the support we gave each other in this urgent intervention process. It made things easier as coping." (P4, Male, Gaziantep)

Spirituality

Some participants pointed to spirituality as a way to protect themselves from compassion fatigue during the earthquake. P6 expressed his thoughts on this issue as follows:

"I have one goal in life: to be a good person. Being a good person is something that motivates me in a different way. It gives me strength." (P6, Male, Malatya)

Hobbies and Physical Activities

Additionally, some participants indicated that they tried to cope with this difficult process by engaging in hobbies or physical activities that they found beneficial:

"I was walking behind the container with my headphones on. It was very good for me. It motivated me for the next day." (P3,

Female, Kahramanmaraş)

Professional Support

Finally, according to the data obtained, social workers stated that they coped with the process by receiving professional psychological support:

"I get professional support now. I try to relate something that affects my social life to the earthquake and try to reveal it very well in therapy. Because really, a human is not enough. A human is not a hero in the full sense. And I would rather demand that he continues his life in a more professional process by utilizing the opportunities, if any." (P4, Male, Gaziantep)

5. DISCUSSION

By its nature, social work is an emotionally challenging profession (Collins, 2008). This is because social workers deal directly with cases and events such as a woman subjected to violence, a child subjected to abuse, an elderly person not receiving proper care, and a woman raped during war (Bride, 2007; Akbaş, 2023, p. 78). Social workers operating in earthquake zones also work directly with cases experiencing traumatic events. In this context, many individuals in Turkey experienced material and emotional losses due to the earthquake that occurred on February 6, 2023. Social work is one of the professions that first comes into contact with these individuals. This research specifically examines compassion fatigue in the context of the February 6, 2023 earthquake and provides insights into the unique challenges faced by social workers in disaster settings.

Due to the challenging working conditions during the earthquake, including a heavy workload (Yi et al., 2018) and significant responsibilities, social workers frequently face difficult cases involving trauma. These conditions often result in secondary trauma, which is commonly experienced due to the nature of their work. A study on secondary trauma experienced by social workers following the 2011 earthquake in Japan indicated that clinical social workers working with earthquake survivors were highly exposed to secondary trauma (Kanno, Kim, & Constance-Huggins, 2016). Rossi et al. (2012), in their study on burnout, compassion fatigue, and compassion satisfaction, highlighted that psychiatrists and social workers are among the professions most affected by compassion fatigue. Additionally, the fact that social workers themselves are also victims of the earthquake complicates the situation further. It has been observed

that, in addition to the high levels of responsibility (Bride, 2007), feelings of lack of support (Malone, 2022) contribute to their emotional exhaustion.

The research revealed multiple risk factors contributing to compassion fatigue among social workers. A key factor is the feeling of isolation and lack of support reported by some social workers. A study by Ottaway and Selwyn (2016) indicated that all individuals experiencing compassion fatigue felt unsupported and alone (Malone, 2022). Additionally, several participants reported experiencing emotional exhaustion due to the expectation of maintaining a strong exterior and guilty even during daily routines like eating, sleeping, and listening to music. Kim et al. (2021) reported that oncology social workers in Korea experiencing compassion fatigue felt guilt and regret. Social workers in the earthquake context noted that they were highly sensitive initially but became desensitized over time. Studies also show that secondary traumatization leads to desensitization among social workers over time (Wagaman et al., 2015; Denne, Stevenson, & Petty, 2019, Stevens & Abbadey, 2024).

Furthermore, participants identified feelings of inadequacy (Adams et al., 2006), helplessness (Kanter, 2007), and a low sense of belonging to their institution as risk factors for compassion fatigue. They also cited institutional inadequacies, organizational disarray, managerial incompetence, and lack of support as significant risk factors. These factors are associated with compassion fatigue in the literature (Simon et al., 2005; Yi et al., 2016). Consistent with the literature (Lynch & Lobo, 2012; Peters, 2018), participants in this study exhibited physical, social and emotional symptoms of compassion fatigue. Emotionally, symptoms such as emotional exhaustion, loneliness, anger, and irritability were observed. Emotional symptoms of compassion fatigue include anxiety, sadness, hopelessness, anger, guilt, and fear (Harr et al., 2014; Dikmen & Aydın, 2016). According to participants, physical symptoms included fatigue, sleep disturbances, insomnia, eating disorders, weight loss, and loss of appetite. Similar physical symptoms are recognized in the literature as indicators of compassion fatigue (Aycock & Deborah, 2009; Sorenson et al., 2017; Peters, 2018).

In addition to emotional and physical symptoms, social symptoms of compassion fatigue were also evident. These included desensitization, changes in daily routines, social withdrawal (Bush, 2009), and neglect of family. Persistently thinking about cases even outside of work and being unable to break free from this cycle were also common experiences. Similarly, in a study involving a group of oncology social workers, participants reported continuing to think about their clients even after work, especially in the early years of their careers (Yi et al., 2018). Given the significant impact of compassion fatigue on social workers' well-being, various coping strategies have been identified to manage these

challenges. Participants in this study reported employing coping mechanisms such as spirituality, physical exercise, seeking professional support, maintaining a professional approach to the profession, professional satisfaction, loving the social work profession, and professional solidarity. Adopting a professional demeanor has been shown to shield social workers from compassion fatigue and enhance their effectiveness (Yi et al., 2018). Additionally, supervision has been found effective in mitigating compassion fatigue (Kapoulitsas & Corcoran, 2014).

Similarly, factors like physical exercise, faith, seeking professional support, social support, and professional solidarity are recognized coping strategies in the literature (Bride & Figley, 2007; Yoder, 2010; Whitebird et al., 2013; Yi et al., 2016; Yi et al., 2018; Türk & Kaya, 2023). The demanding nature of social work and heavy workloads also contribute to compassion fatigue among practitioners. Kanno et al. (2012) suggested that reducing workloads and fostering professional solidarity could mitigate the risk of secondary trauma for social workers dealing with traumatized clients.

6. CONCLUSION

The study aims to understand the experiences of compassion fatigue among social workers in the earthquake-affected areas following two major earthquakes in Kahramanmaraş on February 6, 2023. It seeks to explore the behaviors, emotions, and experiences of social workers dealing with individuals who have faced traumatic and adverse events due to the earthquakes.

Observations show that social workers in earthquake zones experience secondary trauma due to challenging conditions, heavy workloads, high responsibilities, and dealing with traumatized cases. Various risk factors for compassion fatigue are evident, including loneliness, lack of support, and pressure to appear strong. Social workers initially display heightened sensitivity but gradually become desensitized over time.

Participants in this study displayed emotional, physical, and social symptoms of compassion fatigue. Emotional symptoms included fatigue, loneliness, anger, and irritability, while physical symptoms comprised fatigue, sleep disturbances, insomnia, eating disorders, weight loss, and loss of appetite. Social symptoms included desensitization, altered routines, social withdrawal, and family neglect.

Social workers employ varied coping strategies for compassion fatigue, which differ among individuals. Predominant strategies observed in this study include spirituality, physical exercise, seeking professional support, maintaining professionalism, job satisfaction, passion for social work, and professional

solidarity.

Based on the perspectives of the social workers who participated in this study, several recommendations have been proposed to prevent compassion fatigue. The first recommendation emphasizes the importance of maintaining clear professional boundaries. Social workers should remain within professional limits while engaging with clients to protect their emotional well-being. Additionally, nearly all participants highlighted the critical role of professional supervision. Supervision serves as one of the most significant protective factors against compassion fatigue, providing guidance, support, and professional reflection. Another crucial preventive measure is access to specialized services such as psychotherapy when needed, allowing social workers to process their emotional experiences effectively. Furthermore, reducing excessive workload and improving salaries were identified as structural changes that could help mitigate compassion fatigue. Professional satisfaction, driven by a strong passion for the profession, was also recognized as a protective factor. Beyond workplace measures, participants emphasized the importance of maintaining a personal space, engaging in social activities outside of work, developing hobbies, and participating in physical exercise as essential strategies for fostering resilience and preventing burnout.

7. CONFLICT OF INTEREST STATEMENT

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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9. AUTHOR CONTRIBUTIONS

The author developed the research design, conducted data analysis, and reviewed the final manuscript.

10. ETHICS COMMITTEE STATEMENT

The study complied with the principles of the ethics committee and necessary permissions were obtained in accordance with the principle of intellectual property and copyright.

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YUSUF HAS HACIP'S IDEAL MANAGEMENT MODEL: SCALE DEVELOPMENT STUDY¹



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ABSTRACT | Management is one of the most researched subjects in social sciences. Management science is increasingly gaining attention in the literature because it is a broad field where various management models are constantly investigated, and scientists try to obtain better and more effective solutions. However, the number of researchers who carry out studies to develop new management models is low. This study, which includes both qualitative and quantitative methods, is an attempt to develop a management model scale based on Yusuf Has Hacıp's work Kutadgu Bilig. Various processes were carried out during the development phase, including item generation, scale improvement, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA) and validation process. The results revealed that the Yusuf Has Hacıp (YYH) Ideal Management Model Scale has four sub-dimensions: law and justice, wisdom, destiny and satisfaction and happiness and status. The goodness-of-fit indices obtained as a result of confirmatory factor analysis can be listed as Chi-Square (CMIN)/Degrees of Freedom (FD)=1.678, Comparative Fit Index (CFI)=0.97, Root Mean Square Error of Approximation (RMSEA)=0.041, Standardized-Root Mean Square Residual (SRMR)=0.048 and Goodness of Fit Index (GFI)=0.95. These obtained values show that the semantic and structural validity of the developed scale is accepted.

Keywords: Yusuf Has Hacıp, management science, Kutadgu Bilig, scale, ideal management

JEL Codes: M12, Y10, C10

Scope: Public Administration

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YUSUF HAS HACİP İDEAL YÖNETİM MODELİ: ÖLÇEK GELİŞTİRME ÇALIŞMASI



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ÖZ | Yönetim, sosyal bilimler alanında en çok araştırılan konulardan biridir. Yönetim bilimi, çeşitli yönetim modellerinin sürekli olarak araştırıldığı ve bilim insanlarının daha iyi ve daha etkili çözümler elde etmeye çalıştığı geniş bir alan olması nedeniyle literatürde giderek daha fazla ilgi görmektedir. Ancak yeni yönetim modelleri geliştirmek için çalışma yapan araştırmacı sayısı azdır. Hem nitel hem de nicel yöntemlerin yer aldığı bu çalışma, Yusuf Has Hacıp'in Kutadgu Bilig adlı eserinden yola çıkarak bir yönetim modeli ölçeği geliştirme girişimidir. Geliştirme aşamasında madde oluşturma, ölçek iyileştirme, Açıklayıcı Faktör Analizi (AFA), Doğrulayıcı Faktör Analizi (DFA) ve doğrulama süreci olmak üzere çeşitli süreçler yürütülmüştür. Sonuçlar Yusuf Has Hacıp (YHH) İdeal Yönetim Modeli Ölçeği' nin hukuk ve adalet, bilgelik, kader ve doyum ve mutluluk ve statü olmak üzere dört alt boyuta sahip olduğunu ortaya koymuştur. DFA analizi neticesinde ortaya çıkan uyum iyiliği indeksleri ise Chi-Square (CMIN)/Serbestlik Derecesi (SD)=1.678, Comparative Fit Index (CFI)=0.97, Root Mean Square Error of Approximation (RMSEA)=0.041, Standardized-Root Mean Square Residual (SRMR)=0.048 ve Goodness of Fit Index (GFI)=0.95 şeklinde sıralanabilir. Elde edilen bu değerler geliştirilen ölçeğin anlamsal ve yapısal geçerliliğinin kabul edildiğini göstermektedir.

Anahtar Kelimeler: Yusuf Has Hacıp, yönetim bilimi, Kutadgu Bilig, ölçek, ideal yönetim

JEL Kodları: M12, Y10, C10

Alan: Kamu Yönetimi

Türü: Araştırma

1. INTRODUCTION

In the periods when the classical management approach prevailed, shortcomings of and criticisms towards this kind of management approach paved the way for the emergence of new management models (Hartley, 2006). Today, management can be described as a concept encountered in every aspect of the lives of societies, communities, and individuals (Pindur, Rogers and Suk, 1995). Both now and in the future, the presence of management will be discussed in any environment where human beings exist (Babailov and Iaroslava, 2022). Management is a pervasive human activity that emerges in diverse settings, including local, social, and political spheres, as well as within organizational structures (Kırlmaz, 2020; Zawada, 2023).

When the management models and practices of the Turkish states in the past are examined, there were scholars, scientists, and managers with high-level management capabilities who aimed to bring advanced management practices to management science (Terrill, 1965). Among others, notable figures were Bilge Kağan, Gazzali, Tonyukuk, Kanuni Sultan Süleyman, Osman Bey, Fatih Sultan Mehmet, Kültigin, Farabi, Koçi Bey, Katip Çelebi, Ibn Khaldun and Yusuf Has Hacı (Akçakaya, 2019). All these management geniuses made great contributions to management science and played a pioneering role in developing a management understanding unique to Central Asia (Harry, 2006).

Kutadgu Bilig is a fundamental work that shaped the ideal management approach of the period. In this important work, the importance of values such as justice, knowledge, reason, moderation and happiness in the triangle of the individual, society and state in administrative processes is emphasized. In this context, the work points to a deep management philosophy. The developed scale is important in terms of bringing together the teachings of Kutadgu Bilig with the systematic approach of today's management sciences. In this respect, it offers an original and local management tool that can be used both in academic studies and in practical applications. The relevant scale not only reveals the contribution of a historical text to management science, but also brings to light the contribution that Turkish-Islamic thought can provide to management practices. On the other hand, the aim of this study, which was used in the past years and described as quite successful, is to develop a scalable management model based on the influential ideas and views of Yusuf Has Hacı, a well-known scholar of Central Asia and whose works are still valid today. This study aims to develop a management model scale grounded in the influential ideas and insights of Yusuf Has Hacı, a renowned scholar from Central Asia whose work continues to be highly relevant today.

2. LITERATURE REVIEW

Bukhara, Samarkand, Fara, Balasagun, and Tashkent were the leading cultural and artistic cities of the Karakhanid State in the 11th century (Polat, 2015). The most significant figures of intellectual life were raised in these cities were Farabi, Ibn Sina, Mahmud al-Kashgari, Khwaja Ahmed Yasavi, and Ghazali, each of whom was renowned and expert in their fields, enlightened the skies of Central Asia and humanity with their thoughts (Akçakaya, 2019). Yusuf Has Hacıp was born in one of these significant cities, Balasagun in 1018 (Uçar, 2019). Balasagun was described as the capital of Central Asian Turkic khans in the 12th and 13th centuries. Yusuf Has Hacıp completed his education in areas including Arabic, Persian, Hebrew language and literature, philosophy, history, mathematics, astronomy, and medicine in this city. In addition to these, he was interested in chess, birding, hunting, archery, and chovgan, a type of polo (Çakan, 2017). Yusuf Has Hacıp was a good reader; he critically read and tried to understand the works of Aristotle, Plato, Avicenna, and Farabi. He also read the legends of Moses, Jesus, and Alexander, as well as Ferdowsi's Shahnameh, participating in various debates to understand them comprehensively (Özden and Günay, 2024).

Yusuf Has Hacıp began writing his work named Kutadgu Bilig in Balasagun. Actually, his work concretizes his thoughts on life, humanity, society, and state administration through the dialogues, debates, and correspondences of four heroes representing four principles (Can, 2023). He centered seriously on the nature and importance of the classes that form society. Yusuf Has Hacıp left Balasagun in 1068 and went to Kashgar, the center of the Eastern Karakhanid State (Akçakaya, 2019). He worked on his work for another year and a half. He completed it in 1070 and presented it to Tavgaç Buğra Khan (Kaya, 2017).

Kutadgu Bilig is composed of 73 chapters and over 6500 couplets. After writing this work in the Kashgar Turkish language, the author, known as Yusuf of Balasagun, began to be called Yusuf Has Hacıp (Hacıyeva, 2020). Yusuf Has Hacıp began writing his book in his thirties and finished it when he approached his sixty (Adıyaman, 2022). According to a rumor, Yusuf Has Hacıp prayed to God as "O God, let me live a little longer, grant me the strength and power to complete my Kutadgu Bilig" (Taşdelen, 2019).

Kutadgu Bilig was recorded as major works of for the Turks, with the Karakhanids being the first Turkish state to accept Islam (Karaman, 2020). Today, three known copies of this great work of Turkish literature exist. One of these three, written in Uyghur script and later known as the Vienna manuscript, was found and purchased by a diplomat in the 18th century at the Istanbul book market (Gürsoy and Eraslan, 2021). The second copy, written in Arabic script,

was found in 1896 and is known as the Cairo manuscript, housed in the Khedivial Library in Egypt (Kalyon and Kalyon, 2019). The third copy, the Fergana manuscript, was written in Arabic script. Kutadgu Bilig has been the subject of many studies to date (Mert, 2017). The nature of the book as well as its name have been debated. Some researchers consider Kutadgu Bilig a political treatise written according to Aristotelian philosophy, while others argue that describing the work as a political treatise undermines its human value. On the other hand, some others accept it as a moral, philosophical, didactic poem or a summary of political and legal ideas gathered in Turkish circles for centuries (Adalıoğlu, 2013).

Kutadgu Bilig is essentially based on four basic principles: justice, state, wisdom, and contentment. These four principles both conflict with and complement each other (Yazıcı, 2006). Life and the world are described as the product of these four essences coming together in harmony and creating a balance in every aspect of life (Uluçay, 1977). Likewise, what Yusuf Has Hacıp tried to achieve in Kutadgu Bilig can be interpreted as an effort to integrate with the universe and complete himself (Arat, 1993; Kafesoğlu, 1970; Ercilasun, 2002; Arsal, 2014). In his work, these four fundamental principles are explained via four characters. The plot of the work is shaped around four symbolic characters: the ruler Kün-Togdı, representing justice, the vizier Ay-Toldı representing administration/state (kut), the vizier's son Ögdülmiş, representing wisdom and knowledge, and Odgurmış, representing the dervish (Demirel, 2014; Büyükbaş and Vargün, 2016). In the Kutadgu Bilig, a work focused on the themes of knowledge and wisdom, the primary objective of governance is to achieve justice, which entails the fair and impartial application of the law rather than the benevolence of the ruler. The legal framework underpinning this system is grounded in the principles of truth, goodness, equality, and humanity (Demirel, 2014).

Considering all these aspects, it can be easily understood that Yusuf Has Hacıp was a wise man who raised in Central Asia. On the other hand, Kutadgu Bilig, the work to which he devoted almost all his life, is still the subject of many studies today (Dilaçar, 1995). Based on all these, the main purpose of this study is to develop a management model scale based on the mentioned work.

The method adopted for the development of the "YHH (Yusuf Has Hacıp) Ideal Management Model" scale and for the validation of its values is based on the scale development stages mentioned in DeVellis (2016). The steps encompass a comprehensive review of the pertinent literature, the generation of an initial item set, the solicitation of expert feedback, the implementation of a pilot study, the execution of requisite analyses, the administration of the scale to

the target population, the conduct of factor and reliability analyses, and the subsequent reporting of the findings. Initially, the construct and dimensions to be measured in the study were examined in detail through a literature review. Then, steps were taken to create the item pool.

3. METHODOLOGY

3.1. Creation of the Item Pool

As an initial step, similar studies in the literature were thoroughly reviewed to create the item pool. Next, the gathered information was listed as items in accordance with the scale to be developed. The researchers developed multiple items to capture the construct of interest as precisely as possible. After the necessary format and grammar revisions, the items were sent to experts in their final form. A total of 36 items were created for the scale. Then the item pool was formed, it was sent to a group of experts from relevant fields to receive their feedback. Based on the feedback and suggestions received, a 5-point Likert was preferred.

3.2. Ethical Permission for the Research

This research was carried out in accordance with the decision of Karabük University, Social and Human Sciences Research Ethics Committee dated 29.03.2024 and numbered 2024/04.

3.3. Conducting the Pilot Study

The survey form, revised in accordance with experts' feedback and suggestions, was administered to 50 participants for the pilot study. When the relevant literature reviewed, it is seen that the pilot study should be carried out with 30 to 50 participants (Erkuş, 2012). The results of the pilot study can be categorized into positive or negative comments as the comprehensibility of the scale, the duration of the scale, item-total analyses, and reliability coefficients.

Table 1: Frequency Analysis of Participants for the Pilot Study

	Demographic	Frequency	Percentage (%)
Gender	Male	30	60
	Female	20	40
Status	Employee	41	82
	Manager	9	18

Education Level	Primary	9	18
	Secondary	3	6
	High School	7	14
	University	14	28
	MA	14	28
	PhD	3	6
Age	24 and Below	1	2
	25-34	9	18
	35-44	24	48
	45-54	12	24
	55 and Over	4	8
Income	17.000 TL and	3	6
	17.001 TL - 30.000	18	36
	30.001 TL - 50.000	18	36
	50.000 TL and	11	22

First, four questions were asked to the participants to obtain information about the clarity, simplicity, readability and duration of the survey. The responses of the 50 participants to these four questions are presented in the table below.

Table 2: Participants' Comments in the Pilot Study

	Expression	Number of
Comprehensibility of the Items	Comprehensible	49
	Complex	1
Legibility of the Items	Legible	48
	Illegible	2
Duration of the Survey	Long	2
	Suitable	48
Comprehensibility of the Concepts in the Survey	Comprehensible	49
	Complex	1

Table 2 indicates that 49 participants found the survey and its items comprehensible, while 1 participant found the items complex. According to 48 participants the items were legible, whereas 2 participants found them illegible. 2 participants found the survey long, while 48 participants did not find it long. Finally, the concepts in the survey were comprehensible for 49 participants whereas they were complex for 1 participant. Based on the feedback, formal problems such as spelling mistakes and line spacing were revised. The absence of any other criticisms can be interpreted as the survey form not causing discomfort to the participants.

3.4. Item Analyses after the Pilot Study

The pilot study's findings prompted the execution of relevant analyses using the SPSS 26 software suite to assess the overall reliability of the scale. The item analysis stage, one of the most essential phases in scale development, should not be overlooked by researchers. After this stage of the research, it is important to express the item analysis results of the scale and the relevant Cronbach alpha value. Furthermore, it is essential to provide a rationale for the removal of items from the scale.

Table 3: Reliability Analysis of the Pilot Study

Reliability Statistics	
Cronbach's Alpha	,886
Number of Items	36

The results of Cronbach's Alpha coefficient were analysed to analyse the internal consistency of the relevant items of the scale. The acceptable lower limit for the Alpha coefficient is stated to be 0.70, but in scale development studies, this coefficient can be reduced to 0.60 (Field, 2009; Kılıç, 2016)). After the pilot study, the Cronbach Alpha coefficient was analysed as 0.886. Considering that this is a scale development study, it can be interpreted that it is reliable. After that, item-total analysis results were obtained, and the correlation coefficients of each item were examined.

Table 4: The Results of the Item-Total Analysis

	Corrected Item-Total Correlation	Cronbach's Alpha If Item Deleted
Scale item no 1	-,221	,898
Scale item no 2	,550	,881
Scale item no3	,401	,884
Scale item no 4	,494	,882
Scale item no 5	,448	,883
Scale item no 6	,482	,882
Scale item no 7	,220	,886
Scale item no 8	,521	,881
Scale item no 9	,513	,882
Scale item no 10	,626	,879
Scale item no 11	,515	,881
Scale item no 12	,588	,880
Scale item no 13	,585	,879
Scale item no 14	,595	,880
Scale item no 15	,366	,884
Scale item no 16	,587	,882
Scale item no 17	,357	,885
Scale item no 18	,401	,884
Scale item no 19	,536	,883
Scale item no 20	,323	,885
Scale item no 21	,294	,885
Scale item no 22	,390	,885

Scale item no 23	,387	,884
Scale item no 24	,358	,884
Scale item no 25	,496	,882
Scale item no 26	,442	,883
Scale item no 27	,480	,884
Scale item no 28	,213	,886
Scale item no29	,026	,889
Scale item no 30	,310	,888
Scale item no 31	,448	,883
Scale item no 32	,582	,880
Scale item no 33	,592	,881
Scale item no 34	,403	,884
Scale item no 35	,376	,884
Scale item no 36	,584	,879

As mentioned before, after the “Adjusted Item-Total Correlation” analysis, it is seen that the items with a value lower than 0.30 have low correlation (Cristobal, Flavian and Guinaliu, 2007). In that situation, removing the mentioned item from the scale is important for obtaining better results in the next phases of the study. However, it should be noted that removing all items below the specified value at once can lead to incorrect results. Since the analysis values change after each item is removed, the item removal process should be carried out one by one and in the relevant order. In this study, as a result of sequential item simplification, the values of these items have changed, and the mentioned items (items 1, 7, 21, 28, and 29) have been removed from the scale to obtain more reliable results. After the removal of the mentioned items from the scale, the Cronbach's Alpha coefficients of the remaining items and total item analysis results are presented in the following tables.

Table 5: Reliability Analysis of the Pilot Study After the Elimination of the Items

Reliability Statistics	
Cronbach's Alpha	,901
Number of Items	31

Table 6: Item-Total Analysis Data After Item Removal

Item No	Corrected Item-Total Correlation Value	Cronbach's Alpha If Item Deleted Value
Scale item no 2	,540	,897
Scale item no3	,399	,899
Scale item no 4	,489	,897
Scale item no 5	,454	,898
Scale item no 6	,478	,897
Scale item no 8	,536	,897
Scale item no 9	,509	,897
Scale item no10	,610	,895
Scale item no 11	,522	,897
Scale item no 12	,597	,895
Scale item no 13	,589	,895
Scale item no 14	,598	,896
Scale item no 15	,347	,900
Scale item no 16	,583	,897
Scale item no 17	,364	,900
Scale item no 18	,415	,900
Scale item no 19	,504	,899

Scale item no 20	,319	,901
Scale item no 22	,370	,900
Scale item no 23	,401	,899
Scale item no 24	,334	,900
Scale item no 25	,484	,898
Scale item no 26	,445	,898
Scale item no 27	,473	,899
Scale item no 30	,339	,902
Scale item no 31	,468	,898
Scale item no 32	,608	,895
Scale item no 33	,604	,897
Scale item no 34	,410	,899
Scale item no 35	,363	,899
Scale item no 36	,600	,895

After the pilot study and item removal procedures, the Cronbach Alpha value increased from 0.886 to 0.901, indicating that removing the items did not harm the scale but rather increased its reliability coefficient. Table 6 presents the items that will be administered to a larger sample group in the next stage of the study. The fact that none of the eliminated items had values below 0.30 proves that the items are compatible with the scale structure.

3.5. Explanatory Factor Analysis Data

After finalizing the items and the scale, the survey form was prepared for explanatory factor analysis. Tabachnick and Fidell (2001) state that it is sufficient to involve participants equal to five times the number of items, while Preacher and MacCallum (2002) suggest that the sample size should be at least between 100 and 250. Based on the recommended sample size in the existing literature,

the present study involved a total of 205 participants, which exceeded the requisite 155 participants (31×5). It was found that five participants' surveys were not suitable, and these were excluded from the study. Analyses were conducted with 200 surveys. After the pilot study, exploratory factor analysis was conducted to test the construct validity of the scale, which was reduced to 36 items. This analysis also aimed to collect information regarding the factor distribution, as the scale included five demographic questions. At this phase of the study, varimax rotation was preferred to extract the principal components using Kaiser's normalization criterion (Field, 2009). The initial results of the factor analysis, including the Kaiser-Meyer-Olkin (KMO) value and Bartlett's test results, are presented in the table below.

Table 7: The Initial Results of KMO and Bartlett's Test after the Exploratory Factor Analysis

KMO and Bartlett Sphericity Test	
Kaiser-Meyer-Olkin Value	,823
Bartlett Sphericity Test Chi-square Approximation Value	2089,904
Bartlett Sphericity Test df Value	465
Bartlett Sphericity Test Sig.Value	,000

In order to understand whether the data are suitable for factor analysis, KMO Bartlett Sphericity Test was performed. A KMO value below 0.60 indicates that the data are not suitable for EFA, while a value close to 1.00 indicates that the collected data are suitable for EFA. Bartlett Sphericity Test examines whether the variables are related to each other and whether these relationships are of sufficient magnitude for EFA (Büyüköztürk, 2014). As a result of the analyses, the KMO value for the "YHH Ideal Management Model" scale was found to be .823. EFA was performed in order to test the suitability of the collected data for factor analysis (Kline, 2014). This method was adopted to determine the most appropriate structure for a previously determined model (Fabrigar, Wegener, MacCallum and Strahan, 1999). Considering the suggestions presented in the study by Hair, Black, Babin and Anderson (2005), items with factor loadings below 0.5, items with cross-loadings, and items loaded on more than one factor were removed from the scale form. The factor loading values of each item were determined by rotation. As stated in the previous sections of the research, the acceptable factor loading threshold for each item is 0.5. The initial analysis revealed that the scale consisted of eight sub-factors with eigenvalues above 1.

It is crucial that the item removal process be performed sequentially and one by one, just like in the item analysis process. Removing multiple items simultaneously can cause problems in the explanatory and confirmatory factor analysis phases. In this study, 14 items (items 2, 8, 9, 11, 15, 17, 19, 23, 24, 25, 26, 33, 34, and 36) were excluded because they had loading values on multiple factors (difference less than .10), loading values above .32 for more than one factor (Costello and Osborne, 2019), and factor loading values below .50 (Büyüköztürk, 2014). After removing the items, the factor analysis was reconducted. It is generally accepted that factors with eigenvalues of 1 or higher should be included in the study. Additionally, it has been highlighted that at least 40% of the total variance should be explained (Çokluk, Şekercioğlu and Büyüköztürk, 2012). After the rotation, a four-factor structure consisting of 17 items was obtained, explaining 55.826% of the total variance. The KMO value was 0.813, and Bartlett's Test of Sphericity provided a chi-square value of approximately $\chi^2(276) = 1483.960$ ($p < 0.01$), confirming the fundamental factor structure of the scale. The final values of the KMO and Bartlett tests, the explained variance ratio, and the factor loadings of the items are presented in the tables below.

Table 8: The Results of KMO and Bartlett Sphericity Test after the Elimination of the Items

KMO and Bartlett Sphericity Test	
Kaiser-Meyer-Olkin Value	,813
Bartlett Sphericity Test Chi-square Approximation Value	1483,960
Bartlett Sphericity Test df Value	276
Bartlett Sphericity Test Sig.Value	,000

The results of the KMO and Bartlett tests improved after the item elimination process, indicating that the factor distributions became more meaningful and explanatory. The increase in the total variance explained supports this finding.

Table 9. The Result of Total Variance Explained as a Result of Exploratory Factor Analysis After the Elimination of the Items

C.	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance		Total	% of Variance		Total	% of Variance	
	Cum. %			Cum. %			Cum. %		
1	4,709	27,700	27,700	4,709	27,700	27,700	2,890	16,998	16,998
2	1,937	11,396	39,096	1,937	11,396	39,096	2,576	15,155	32,153
3	1,567	9,216	48,312	1,567	9,216	48,312	2,362	13,891	46,044
4	1,277	7,513	55,826	1,277	7,513	55,826	1,663	9,781	55,826
5	,937	5,509	61,335						
6	,869	5,113	66,448						
7	,786	4,625	71,072						
8	,746	4,386	75,458						
9	,689	4,050	79,508						
10	,593	3,488	82,996						
11	,562	3,305	86,301						
12	,546	3,212	89,513						
13	,458	2,693	92,205						
14	,421	2,475	94,680						
15	,373	2,194	96,874						
16	,276	1,623	98,497						
17	,256	1,503	100,000						
Principal Component Analysis									

After determining the number of factors, it is necessary to identify which factors are grouped under which dimensions and the factor loadings as a result of the rotation process. The distribution obtained after the rotation process is specified below.

Table 10: The Distribution of Factor Loadings after the Elimination of the Items

Item No	Factor1	Factor2	Factor3	Factor4	Cr. Alfa	CR Value	AVE Value
Scale item no 3		,732			0,77	0,77	0,57
Scale item no 4		,669					
Scale item no 5		,855					
Scale item no 6		,776					
Scale item no 10	,726				0,78	0,84	0,53
Scale item no 12	,847						
Scale item no 13	,802						
Scale item no 14	,695						
Scale item no 18	,540						
Scale item no 16			,809		0,55	0,73	0,48
Scale item no 22			,675				
Scale item no 27			,578				
Scale item no 20				,627	0,69	0,79	0,43
Scale item no 30				,753			
Scale item no 31				,722			
Scale item no 32				,598			
Scale item no 35				,592			
Principal Component Analysis.							
Varimax with Kaiser Normalization.							
5 iterations.							

Removal of overlapping items resulted in the factors having clear and distinct loadings. As seen in the table, the scale consists of 17 items under four dimensions. In his work "Kutadgu Bilig," Yusuf Has Hacıp referred to four principles: law/justice, wisdom, fate/contentment, and happiness/state. In present study, the factor analysis grouped the items into four dimensions as Factor1 (law and justice), Factor2 (wisdom), Factor3 (fate and contentment), and Factor4 (happiness and state).

At the end of all these processes, confirmatory factor analysis can be performed. When developing a scale with more than one factor, Cronbach's Alpha value must be calculated for each sub-dimension. Especially in scale development studies (Cronbach, 1951), care must be taken to ensure that Cronbach's Alpha value is greater than 0.5 for each sub-dimension. Table 10 above shows Cronbach's Alpha values for reliability and the Critical Ratio (CR) and Average Variance Extracted (AVE) values used to measure convergent validity for each sub-dimension. According to Fornell and Larcker (1981), an AVE value greater than 0.5 is important for convergent validity. However, AVE values below 0.5 are also acceptable. However, some conditions must be met for this acceptance to occur. The first of these conditions is that the CR value must be greater than 0.6. If this condition is not met, if the $CR > AVE$ condition is met, the convergent validity is provided with an AVE value less than 0.5 (Hair et al., 2005; Temel, 2022; Özdemir and Tan, 2023).

Considering all these statements and the AVE values in the study, the convergent validity of the Factor1, Factor2 and Factor3 sub-dimensions is accepted. The AVE value for the Factor4 and Factor3 sub-dimensions is low. However, since the CR is greater than 0.6, it is seen that an AVE value below 0.5 is accepted. In addition, the $CR > AVE$ condition is met for this factor (Hair et al., 2005; Temel, 2022; Özdemir and Tan, 2023). In the light of these explanations and values, it can be said that the scale and its sub-dimensions are acceptable in terms of convergent validity. Finally, it is seen that the CR values for all sub-dimensions are higher than the AVE values (Nunnally and Bernstein, 1994).

3.6. Confirmatory Factor Analysis Data

After conducting EFA, it is necessary to verify and confirm the factor structures with data from a different sample (Sümer, 2000). The study involved a confirmatory factor analysis conducted with a sample size of 396 participants. The analysis was carried out using the LISREL 8.80 software package, which was employed to verify the four-factor structure proposed in this investigation. Following the confirmatory factor analysis, the diagram presented in Figure 1 was generated using the LISREL version 8.80 program developed by Karl Jöreskog and Dag Sörbom. The analysis of the Path Diagram showed that some values were not within the desired range. After making the modifications suggested by the program, the values were observed to be within the acceptable range. The findings obtained after these modifications are presented below.

As seen in Figure 1, t-values were first examined in the confirmatory factor analysis. Examining this value initially is critical, as any statistical errors

in these values would necessitate the removal of the relevant item from the scale and the subsequent repetition of the study. It is crucial for t-values in confirmatory factor analysis to be significant. A t-value greater than the critical value of 1.96 suggests statistical significance at the conventional 0.05 significance level, while a t-value surpassing the more stringent threshold of 2.56 denotes statistical significance at the 0.01 significance level (Çapık, 2014). The findings revealed that the preliminary model is statistically significant and does not exhibit any notable errors, as evidenced by the t-values.

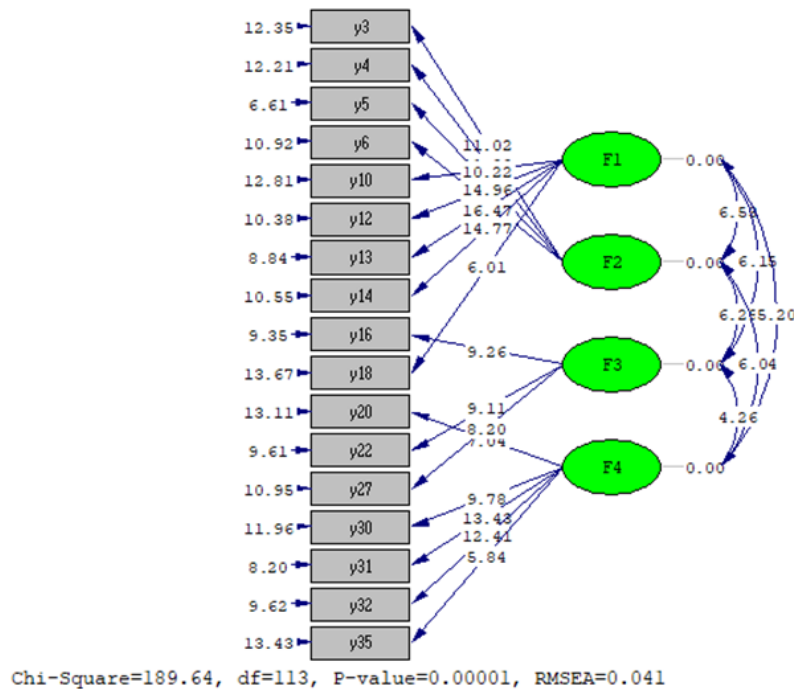


Figure 1: The T-Values for the Confirmatory Factor Analysis of the Yusuf Has Hacıp's Ideal Management Model Scale

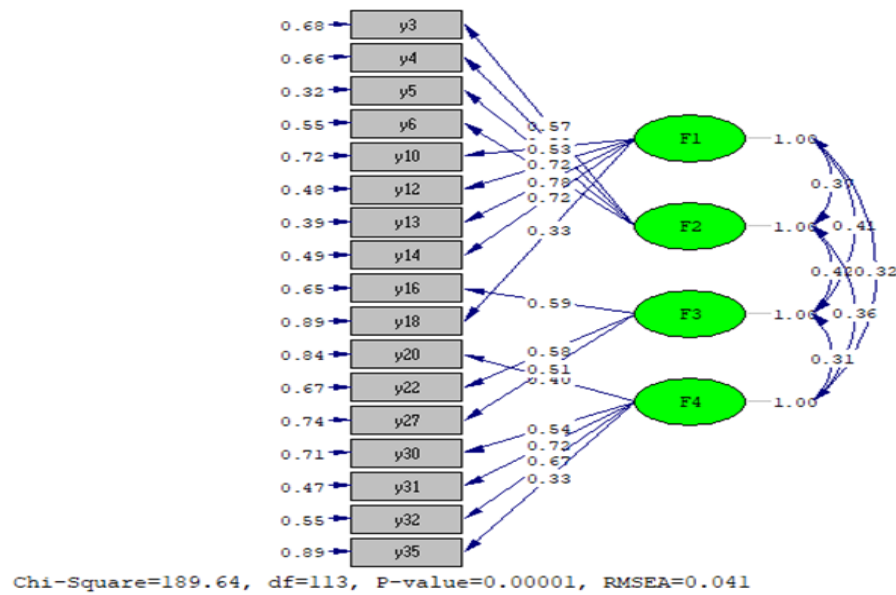


Figure 2: The Standardized Solution Values of the Yusuf Has Hacıp's Ideal Management Model Scale

After investigating the t-values, the subsequent set of values that require analysis are the standardized solution values. As depicted in Figure 2, these values typically range from 0.32 to 0.89. Following the EFA, the overall measurement integrity of the research framework should be evaluated through confirmatory factor analysis, utilizing relevant analysis programs. The results of the confirmatory factor analysis should then be thoroughly analysed (Tarcan, Varol, Kantarcı and Fırlar, 2012). The measurement model exhibited a Chi-square value of 189.64 with 113 degrees of freedom. The chi-square freedom value is 1.678. The relevant value was found to be below the accepted value of 3.0. As a result of this value, it can be interpreted that the model fit of the scale is at a good level. In addition, RMSEA was found to be 0.041 and SRMR was found to be 0.044. Both indicate a sufficient level of model fit. (Hooper, Joseph and Mullen, 2008). The measurement model demonstrated acceptable fit, as evidenced by a NFI of 0.92, and excellent fit, with a CFI of 0.97 (Hu and Bentler, 1999). The GFI also showed an excellent fit of 0.95. The confirmatory factor analysis findings affirm the robust measurement properties of the research framework. (Anderson and Gerbing, 1988; Ağbekaş and Karagöz, 2016; Thompson, 2006).

3.7. Reliability Analysis

After the completion of factor analyses, the reliability analysis of the scale needs to be re-evaluated and presented. In the study conducted, Cronbach's Alpha and Split-Half Reliability tests, which are frequently preferred in order to prove the reliability of the scale, were used (Robinson, Shaver and Wrightsman, 1991).

Table 11: The Results of Reliability Analysis - Split-Half Reliability

Reliability Statistics	
Cronbach's Alpha	,780
Split-Half Reliability	,818

Reliability analysis results were obtained for the remaining 17 items based on CFA data. Alpha value of the scale was found to be 0.78, and the Spearman-Brown split-half test result was found to be 0.818. In scale development and adaptation studies, scales with a reliability value of 0.70 and above are considered reliable (Robinson et al., 1991). When all these results are considered, it has been proven that the internal reliability of the Yusuf Has Hacıp Ideal Management Model Scale is acceptable.

4. CONCLUSION

In today's rapidly changing business environment, the traditional uniform approach to management is no longer sufficient (Büyükbacı et al., 2021). The concept of management and management behaviour can be expressed in different ways and explained with different meanings in today's societies and by researchers. In fact, the most important issue about management is that all individuals inevitably face this concept. It is accepted that knowledge in social sciences is produced by a central authority and that scientists transmit this knowledge to their own countries.

When countries that produce and use knowledge in social sciences are examined, it can be argued that research focuses more on testing the knowledge produced by developed countries rather than revealing something new. This situation leads to various results. First, countries that use or test knowledge face difficulties in producing their own knowledge. Second, analysis processes may not have been sufficiently taken into account in the studies in the literature. Finally, the scales used by countries that use previously produced knowledge may not be suitable for their own countries (Erdemir, 2018). With the acceleration of

globalization, communication, disruptive technologies and capital flows, fundamental changes have emerged in organizations and a more dynamic, competitive and unpredictable environment has been created (Camillus, 1996; Ahn et al., 2004). As a result, organizations should adopt and adapt to new management models that are more flexible, organic and innovative in their approaches to strategy and organizational structure. (Dasgupta, 2019) All these mentioned issues actually reveal the objectives of the study. The aim of the study is to develop an ideal management model scale based on the work of an important, knowledgeable and well-educated scientist in terms of Turkish management history, taking into account the issues that are suitable for Turkish culture today and have been successful in the past. For the relevant scale development study, Kutadgu Bilig, written by Yusuf Has Hacı in the 11th century and the first example of a political treatise in Turkish literature, was used.

The scale items of the study were created by examining the relevant work in detail and then arranged in the form of scale items by expert academics in the field. Then, the scale items were subjected to a pilot study. The pilot study was conducted with the participation of 50 academicians working in the field of management. After the analysis of the answers given, the scale items with an item-total correlation value below 0.30 were removed from the scale and exploratory factor analysis was performed. The exploratory factor analysis was also conducted with 205 academicians working on management, considering the need for more than 5 times the number of items. Finally, confirmatory factor analysis was conducted with 396 participants working in the field of management. The fact that the goodness of fit values had good fit values showed that the relevant scale was valid. In addition, Cronbach Alpha analysis was performed to determine the reliability of the measurement tool.

When all these aforementioned findings are taken into consideration, the Ideal Management Model scale, which is valid and reliable, suitable for the Turkish management structure and culture, and consists of successful experiences in the past, has been introduced to the literature. The scale consists of 17 items with four factors. On the other hand, it should be noted that more studies are needed to support the reliability and validity of the Ideal Management Model scale. The scale should be used in various geographical and cultural contexts to assess its applicability and validity. In this way, comparative studies can be conducted in the future.

5. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

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7. AUTHOR CONTRIBUTIONS

ATŞ: Idea;

ATŞ, AÖ: Design;

ATŞ: Supervision;

ET, FZS, DK: Collection and/or processing of resources;

ATŞ, AÖ: Analysis and/or interpretation;

ET, FZS, DK: Literature review;

ATŞ, AÖ: Author of the article;

ET, FZS, DK: Critical review

8. ETHICS COMMITTEE STATEMENT

The study adhered to the ethics committee's principles, and necessary permissions were obtained in accordance with intellectual property and copyright regulations.

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Appendix 1. Yusuf Has Hacıp's Ideal Management Model Scale

1-Kesinlikle Katılmıyorum 2- Katılmıyorum 3-Kararsızım 4- Katılıyorum 5- Kesinlikle Katılıyorum

Yönetim rasyonel (akılcı) davranışlara dayanmalıdır.	1	2	3	4	5
Yönetim faaliyetlerinde duygulara yer verilmemelidir.	1	2	3	4	5
Yönetim kadrosu içerisinde görev yapan kişiler de rasyonel (akılcı) davranan kişiler arasından seçilmelidir.	1	2	3	4	5
İdeal yönetim ancak akıl ve bilgi ile gerçekleştirilebilir.	1	2	3	4	5
Yönetim faaliyetlerinde halkın menfaatine yapılan yasal düzenlemeler toplumsal gelişmişliğin göstergesidir.	1	2	3	4	5
Yasal düzenlemeler yönetim bozulmalarının önüne geçilmesinde en önemli unsurdur.	1	2	3	4	5
Yasal düzenlemeler siyasal iktidarın kişiselleşmesini önlemektedir.	1	2	3	4	5
Yasal düzenlemeler yöneten ve yönetilen arasındaki güven düzeyinin yükselmesinde önemlidir.	1	2	3	4	5
Etkin ve verimli bir yönetim için yöneticinin olumlu karakter özellikleri önemlidir.	1	2	3	4	5
Yönetilenler kötü yönetim faaliyetlerine karşı sabır göstermemelidir.	1	2	3	4	5
Etkin ve verimli bir yönetim ancak sabır ile gerçekleştirilebilir.	1	2	3	4	5
Adil bir yönetim yöneten ve yönetilen arasındaki ilişkileri güçlendirmektedir.	1	2	3	4	5
İyi bir yönetim kadrosu tek başına karar alan değil, ortak karar alan bir yapıdan oluşmalıdır.	1	2	3	4	5
Çalışacak olan kişilerin seçimlerinde mülakat ve referans önemlidir.	1	2	3	4	5
Yükselme sürecinde yönetici çalışanların deneyim sürelerine göre karar vermelidir.	1	2	3	4	5
Yönetim faaliyetlerinde yer alan kişiler işe bağlılık düzeylerine göre seçilmelidir	1	2	3	4	5
Yönetimde devamlılığın sağlanması adına sürekli görev değişimi ve yeni kişilerin yetiştirilmesi önemlidir.	1	2	3	4	5

ADAPTING TO CONFLICT: IRAN'S PROXY WARFARE STRATEGY IN SYRIA AND YEMEN (2011–2020)¹¹



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ABSTRACT | This research investigates how Iran employs proxy warfare in Syria and Yemen. Andrew Mumford's quadrilateral framework is employed to analyze Iran's use of proxy warfare in these cases, the focusing the provision of manpower, the provision military supplies, financial assistance, and non-military assistance. The study employed a method of multiple case analysis, enabling an examination of both the situations within and between cases. The objective of employing this approach was to identify the similarities, differences and underlying causes of these cases. The selection of these two cases for analysis was based on their distinctive environmental and socio-political factors, allowing for an evaluation of Iran's proxy war strategy in the region. The time span of the study covers the decade following the beginning of the Arab Spring and ends with the assassination of Qassem Soleimani. This study demonstrates that Iran utilises a flexible proxy war strategy, modifying its approach in accordance with evolving war dynamics and conflict points.

Keywords: Proxy war, Iran's security, civil war, Syria, Yemen

JEL Codes: F50, F52, N45

Scope: Political science and international relations

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¹ Compliance with ethical principles regarding the relevant study has been declared.

ÇATIŞMAYA UYUM SAĞLAMA: İRAN'IN SURİYE VE YEMEN'DEKİ VEKALET SAVAŞI STRATEJİSİ (2011- 2020)



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ÖZ | Bu çalışma İran'ın, Suriye ve Yemen'de vekalet savaşını nasıl kullandığını incelemektedir. Çalışmada vekalet savaşı kavramsal çerçevesi kullanılmış ve sahadaki uygulaması Andrew Mumford'un ortaya koyduğu dörtlü çerçeve olan, insan gücü temini, askeri malzeme temini, finansal yardım ve askeri olmayan yardım üzerinden incelenmiştir. Çalışmada, hem vakalar içindeki hem de vakalar arasındaki durumların incelenmesine olanak tanıyan çoklu vaka analizi yöntemi kullanılmıştır. Bu yaklaşımı kullanarak vakaların benzerliklerini, farklılıklarını ve altında yatan nedenleri ortaya koymak amaçlanmıştır. Suriye ve Yemen'in vaka analizi için seçilmesi, İran'ın bölgedeki vekalet savaşı stratejisinin değerlendirilmesine olanak tanıyan farklı çevresel ve sosyo-politik faktörlere dayanmaktadır. Çalışmanın zaman aralığı Arap Baharı sürecinin başlangıcından sonraki on yılı kapsamakta ve Kasım Süleymani'nin öldürülmesi ile sona ermektedir. Bu çalışma, İran'ın, esnek bir vekalet savaşı stratejisi kullandığını, değişen savaş dinamikleri ve çatışma noktalarına göre yaklaşımını değiştirdiğini göstermektedir.

Anahtar Kelimeler: Vekalet savaşı, İran'ın güvenlik stratejisi, Suriye, Yemen

JEL Kodları: F50, F52, N45

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Türü: Araştırma

1. INTRODUCTION

The phenomenon of war has undergone a substantial transformation in the period following World War II. During this period, there has been a notable surge in the prevalence of intra-state conflicts, accompanied by a shift from wars involving all state parties to those with a greater involvement of non-state armed actors. This situation, which is also typically referred to as a civil war, can be attributed to several factors. The arming of ethnic, religious, sectarian, or political (separatist) groups or opposition within the state gives rise to a politically motivated internal armed conflict that subsequently evolves into war. In such instances, external actors, situated outside the conflicting groups, become involved in the conflict in a manner that aligns with their respective interests. Subsequent to this intervention, the extant civil wars have begun to exhibit the hallmarks of proxy wars, with the transformation of such wars into proxy wars being a common phenomenon in the Middle East.

A review of the literature reveals a substantial body of work on Iran's proxy warfare practices. Jonathan Spyer (2016) focuses on Iran's proxies in Syria, Iraq, Yemen, Lebanon and Palestine and concludes that by supporting its proxies, Iran aims to reach the Mediterranean and compensate for the legitimacy gap caused by its Shiite-Persian identity. Afshon Ostovar, (2018) who also focuses on Iran's relationship with its proxies, analysed this relationship through religion. Ostovar focuses more on Iran's engagement with non-state actors and categorises Iran's success and failure in engaging with these actors. Omer Carmi (2017) categorised pro-Iranian groups, which he called the Iran Threat Network (ITN), into five categories and focused on the development of Iran's relations with these groups. Ariane M. Tabatabai, Jeffrey Martini and Becca Wasser, (2021) who use the same concept (ITN) as Carmi, use ITN to refer to a network of non-Iranian, non-state organisations. The authors analysed Iran's level of engagement with these actors and categorised these groups into four categories: Targeters, Deterrers, Stabilisers and Influencers. The first book on Iran's proxy war strategy was written by Ofira Seliktar and Farhad Rezai (2020). The book analysed Iran's relationship with its proxies in separate chapters. The authors conclude that Iran has implemented a successful proxy war strategy and argue that only a very heavy economic cost can dissuade Iran from this policy. Mohammad Topçu (2021) explained the role of proxy war in Iran's foreign policy through the actors Hashd al-Shaabi and Houthis, employing the theoretical framework of proxy wars coined by Tyrone L. Groh. The author concludes that Iran adopted a different strategy in both cases. Finally, Ronen A. Cohen and Gadi P. Shamci (2022) also examined the proxy war strategy in Iran's foreign policy. The authors argue that Iran aims to establish a Shiite Crescent in the geography stretching from Iraq to

Lebanon. The article focuses mostly on Syria and emphasises Iran's relations with the groups there and its strategic interests. The authors demonstrate that Tehran's success has been limited and that this strategy has isolated it and, on the contrary, curbed its sphere of influence.

This study delves into Iran's evolving strategy of proxy warfare in two key conflict zones, Syria and Yemen, with a focus on the period between 2011 and 2020. The cases of Syria and Yemen were selected based on their divergent geographies and conflict dynamics within the same period. Moreover, they were chosen for their compatibility with the conceptual framework of the study and Mumford's quadrilateral framework. Iran's engagement in these conflicts has become a defining element of its broader regional influence, particularly in the aftermath of the Arab Spring. By employing Andrew Mumford's (2013a, 2013b) quadrilateral framework this research aims to offer a comprehensive analysis of Iran's proxy warfare tactics. These four dimensions provide a structured lens through which Iran's involvement in Syria and Yemen can be examined, highlighting the multifaceted nature of its support to non-state actors and its ability to influence conflicts without direct military intervention. Therefore, this study is expected to contribute to the relevant literature. The rest of the study is as follows. The first section describes the conceptual framework of proxy war. In this section, it is emphasised what is the proxy war is and how it is employed. The second section discusses why Iran embraces a proxy war strategy. The final section, Tehran's implementation of proxy war in Syria and Yemen are analysed in the context of Mumford's quadrilateral framework.

2. CONCEPTUAL FRAMEWORK: WHAT IS PROXY WARFARE AND HOW IT UTILISED?

The concept of proxy is employed in a multitude of categories within the existing literature. Accordingly, it is essential to provide a clear and precise definition of the concept. In the broadest sense, a proxy is an actor *A* acting on behalf of actor *B*. This necessitates the presence of at least two elements in all definitions of agency. The first of these is the existence of a relationship between at least two actors; the second is that the relationship is not equivalent. As a result, the nature of the relationship between two equivalent actors is typically understood through the concepts of partnership or alliance (Maurer, 2016, p. 387,399). The Proxy war is characterized by the involvement of three distinct actors. These are the *benefactor*, the *proxy* and the *target*, which is the common enemy. It can be reasonably deduced, therefore, that in each instance of a proxy war, the triadic relationship of patron-proxy-target must exist. As a matter of fact, Vladimir Rauta (2018, p. 457) posits that proxy wars are characterized by three

intertwined binary relationships: the patron-target dyad, the patron-proxy dyad, and the proxy-target dyad.

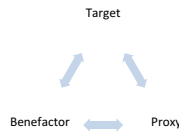


Figure 1: Actors and Relationship Diagram

Brendan Sozer (2016) defines proxy warfare as “an external actor(s) seeking to indirectly influence the outcome of a conflict in pursuit of their strategic policy objectives by providing direct and intentional assistance to an existing actor in the conflict.” In order to present a traditional understanding of proxy warfare, Sozer’s definition excludes other forms of support or intervention. Accordingly, the definition excludes the involvement of a state in a war on the side of a certain actor in a conflict from the concept of proxy war. For a proxy relationship to exist between actors, three criteria must be met. The first criterion is that the benefactor provides direct support to the proxy. Such assistance may encompass the provision of military equipment, training, logistical support and financial assistance. The second criterion is that the benefactor and the proxy must share a common objective. The third criterion is that the benefactor-proxy relationship should persist for a period.

For a proxy actor to receive external assistance, two elements must be present. These are the state or non-state armed actor willing to provide support to the proxy and the proxy willing to accept this support (Salehyan et al., 2011, p. 711). Once the relationship between these actors is established, the implementation of proxy warfare proceeds as follows: the provision of manpower, delivery of material (weapons, equipment, etc.), financial assistance, and non-military assistance (Byman et al., 2001, p. 84; Mumford, 2013b, p. 61). The provision of manpower typically originated during the Cold War era as a means of sending advisors and military training, and subsequently evolved to encompass the direct recruitment of foreign fighters. The provision of advisors offers two principal benefits. Firstly, they permit the patron to observe the behaviour of the proxy and to prevent undesirable behaviour. Secondly, advisors utilize their expertise to persuade proxies to act in a manner that aligns with the interests of their patrons, even when it may not be in the proxies’ immediate self-interest (Patten, 2013, p. 833).

The provision of military equipment, including weapons, armament, ammunition, and advanced technological devices, by the patron to the proxy

represents a fundamental element in the context of proxy warfare. Arms aid is typically furnished by states through illicit smuggling to bolster the capabilities of non-state proxies. This is due to the fact that states remain the primary actors in the production and distribution of weapons (Alaraby & Müller, 2020, p. 1). Furthermore, the provision of arms and military aid serves to enhance the fighting capacity of the proxy in the most expedient and straightforward manner. During the Cold War, this assistance manifested as arms exports from the United States and the Soviet Union to their proxies in areas of conflict. Subsequently, numerous actors, particularly middle or regional powers such as Iran and Saudi Arabia, furnished their proxies with arms in areas of conflict (Alaraby & Müller, 2020, p. 2).

If the motivations underlying financial assistance to parties in an existing conflict are based on strategic reasons related to the outcome of the war, rather than humanitarian or developmental ones, this support is regarded as a part of proxy war strategy. For example, between 1955 and 1980, the Soviet Union provided approximately \$51 billion in financial assistance to its proxies. In contrast, the United States allocated a comparatively modest sum of \$17.2 million to just six states in 1962 (Mumford, 2013b, p. 65). On the other hand non-state armed organizations utilize this support not only for military purposes but also for social activities such as housing, hospital construction and the treatment of the wounded. Such assistance serves to enhance the prestige and influence of the organization among the local population (Byman et al., 2001, p. 87; Malakoutikhah, 2020, p. 922).

Non-military assistance can be defined as comprising political, media, or propaganda support. For example, Iran has utilized media and propaganda to advance Hezbollah's anti-Israel stance, thereby enhancing the organization's popularity within Lebanon and across the broader Arab region. In this manner, Tehran deploys both its own international media outlets, such as Press TV, and endeavors to augment Hezbollah's media influence. Hezbollah has established media outlets, such as al-Manar, with the assistance of Iran. A further significant form of assistance provided by the patron to the proxy in this context is political support. For example, France, the United Kingdom, and the United States provided support to the Libyan rebels in the Libyan civil war at the United Nations and other international organizations. In another illustrative example, Iran permitted the Palestinian resistance groups Hamas and Palestinian Islamic Jihad to establish official representative offices in Tehran. Furthermore, Iran furnished Hamas with a plethora of political support, which takeover of Gaza following the 2006 elections and was subsequently subjected to sanctions by the West and Israel (Byman, 2013, p. 986).

3. WHY EMBRACES PROXY WAR STRATEGY?

In the post-revolutionary 1980s, Iran began to cultivate relations with non-state actors in the Middle East, laying the foundations for its subsequent proxy war strategy. During this period, Tehran provided support to Palestinian and Lebanese groups, marking the first successful attempt at establishing a proxy group with the formation of Hezbollah in Lebanon in 1982. The war with Iraq and the existing difference of opinion within the revolutionary cadre brought this period to an end, with gains in Lebanon. In the 1990s, the end of the Cold War and the occurrence of Gulf War had a significant impact on Tehran's foreign policy. During this period, Iran sought to meddle in regional conflicts, including the Bosnian War and the Tajik Civil War, by providing support to the warring parties. However, Iran's experience during this period was documented as a series of ad hoc, conflict zone-based initiatives rather than a unified, comprehensive military and security strategy. In the 2000s, Iran's strategy of proxy warfare underwent a significant evolution. The US invasions of Afghanistan in 2001 and Iraq in 2003 respectively prompted a shift in Tehran's threat perception. From 2003 onward, relations with non-state actors and the related proxy war strategy became a pivotal aspect of Iran's security strategy. The success of the use of proxy groups against American and coalition forces in Iraq since 2003 led Iranian decision-makers to pursue an expansion of the proxy network (Divsallar & Azizi, 2023, pp. 4–8).

The constant state of instability in the Middle East, the frequency of wars and conflicts, and the interventions of global powers, especially the United States, necessitate a country like Iran, which has both the desire to become a regional hegemon and limited capacity, to develop a strategy accordingly. In a geography where there are two states with high defence expenditures such as Saudi Arabia and the United Arab Emirates (UAE), and regional actors with strong military power such as Israel and Türkiye (NATO member), in addition to the constant interventions of the US, Iran must determine a security strategy according to the conditions it is in to protect its interests and survive. Therefore, for Iran, which is militarily weaker than its rivals and has problems finding allies in the region, engaging in conflicts through proxies rather than fighting directly is the most logical option. Moreover, for Iran, which has been subjected to economic sanctions for many years, the low-cost conflict management offered by proxy warfare is more advantageous than the costly consequences of direct war. Hence, it is not advantageous for Iran to directly start a conventional war or to be a part of it. For all these reasons, Tehran has developed relations with many different non-state armed actors throughout the Middle East, from Iraq to Yemen and used them as its proxies at conflict hotspots (Cohen & Shamci, 2022, pp. 393–964).

Since 1979, Iran has sought to enhance its strategic depth and develop asymmetric capabilities to compensate its conventional disadvantages vis-à-vis its rivals, particularly the USA, Israel, and Saudi Arabia. Following the revolution, Iran experienced a significant decline in its military capabilities. Iran significantly developed its military capacity with the assistance of Western weapons by establishing a close alliance with the United States during the pre-revolution period. The loss of a global hegemonic supporter such as the US following the revolution, coupled with the transformation of this former ally into an adversary, has had a detrimental impact on Iran's military capabilities. The army, which had previously relied on US weapons, equipment, and training, experienced difficulties in maintaining its military capabilities after the revolution. The aging inventory of military vehicles and weapons, which had been acquired with US assistance, presented a significant challenge in this regard. Moreover, there has been a significant transformation within the Iranian armed forces, with the Islamic Revolutionary Guard Corps (IRGC) undergoing a period of growth and expansion at the expense of the Artesh, has experienced a decline in strength (Tabatabai et al., 2021, pp. 4–5).

In order to achieve strategic depth in the region, Iran has constructed a network of proxies and militias within the context of its “forward defense” policy. The primary objective of Tehran is to expand its influence in the Middle East, particularly fragile and failed states such as Syria, Iraq, and Yemen. Additionally, it seeks to utilize proxies to confront its rivals. The most tangible result of this policy is the formation of the “axis of resistance” which is designed to counter the influence of the United States and its allies in the region (International Crisis Group, 2018, p. 4). This network of relations with non-state actors has constituted a critical element of Iran's security policy since the revolution and an indispensable component of its defense doctrine. Tehran deploys this network of proxies as a means of deterring its rivals, fortifying its homeland defense, augmenting its strategic depth, expanding its regional influence, and projecting its power beyond its borders. Furthermore, the use of proxies allows Tehran to overestimate its role in the region. Because, through its proxies, Tehran is able to engage in the most significant conflicts and political issues in the region, including those pertaining to Israel-Palestine, Israel-Lebanon, the US occupation of Iraq, and the war in Syria. In this context, the proxy network serves as a complementary means of achieving national security objectives, particularly in relation to Iran's asymmetric capabilities, including its ballistic missile and nuclear programs. It provides a source of power that compensates for the country's lack of conventional capabilities (Cohen & Shamci, 2022, p. 386; Ostovar, 2018, p. 96; Tabatabai et al., 2021, pp. 4–5).

4. CASE STUDY: SYRIA AND YEMEN (2011-2020)

This section examines Iran's proxy warfare practices in Syria and Yemen through the lens of Mumford's quadrilateral framework.

4.1. The Provision of Manpower

From the outset of the crisis in Syria, Iran maintained a close watch on developments in the region and promptly dispatched advisors to the area. This mission, which was spearheaded by the Quds Force under the direction of Qassem Soleimani, also involved the participation of intelligence units. The involvement of the Quds Force in Syria was first revealed with the assassination of Brigadier General Hassan Shateri in February 2013 (Fulton et al., 2013, p. 10). In addition to dispatching advisors to Syria, Iran also established militia forces within the country and deployed fighters to the region by leveraging its network of proxies in the Middle East. It is therefore estimated that approximately 7,000 members of the IRGC and the Basij militia served in Syria from the outset of the conflict until 2015 (Azizi, 2022, p. 511).

As the conflict in Syria intensified and spread across the country, the Syrian army began to demonstrate clear signs of weakness. In consequence of the Syrian army's precipitous reduction in personnel and its incompetent performance against the opposition, Qassem Soleimani initiated the formation of a paramilitary force. To this end, Soleimani recruited men from local committees and *Shabbiha*³ members to form the National Defence Forces (NDF) in 2012, with the supervision of IRGC commanders. NDF fighters, including Sunnis, Druze, and Alawites, whose primary objective was to guarding their own communities. They underwent training conducted by Hezbollah fighters and Iranian personnel (Azizi, 2022, pp. 507–508; Seliktar & Rezaei, 2020, pp. 171–172). Another militia force formed by Iran in Syria is the Local Defence Forces (LDF). This organization was established in 2012 and was responsible for coordinating local militia groups in and around Aleppo. The LDF had close ties with Hezbollah and had been officially recognized as part of the Syrian army since 2017 (Azizi, 2022, p. 508; Seliktar & Rezaei, 2020, p. 172).

In addition to establishing paramilitary forces within Syria, Iran gathered numerous Shiite militia groups from across the Middle East. One of the most

³ Shabbiha is the name given to the Alawite smuggling gangs led by the Assad's extended family, operating in coastal cities such as Latakia and Tartous. In 2011, these gang members, along with other criminals, were released from prisons and transformed into a militia with Baathist volunteers. These militias were intended to undertake the regime's "dirty work" and have been the group that has demonstrated the greatest severity and brutality in its treatment of opposition and Sunni groups (Fulton et al., 2013, p. 20).

prominent Shiite militias operated in Syria was the Iraqi Shiite militia organization Liwa Abu Fadl al-Abbas (LAFA). The Damascus-based organization, which was established in 2012 with the support of the Quds Force, was constituted with the objective of safeguarding Shiite holy sites, particularly the Sayyida Zeinab Shrine. LAFA was a multinational and multiethnic Shiite organization comprising members from Damascus, Iraq, and other countries. At its peak, the organization had 10,000 fighters (Akbar & Isakhan, 2023, p. 546; Zorri et al., 2020, p. 63). A significant number of Iraqi groups, most notably Asaib Ahl al-Haq (AAH) and Kataib Hezbollah (KH), two of Tehran's most reliable proxies in Iraq, have deployed fighters to engage in combat alongside the Assad regime in Syria since late 2011 (Leenders & Giustozzi, 2022, p. 618). The Iraqi Harakat of Hezbollah al-Nujaba was established in 2013 by fighters under the AEH and KH with the objective of providing support to the Assad regime. The group, which is among the largest Iraqi Shiite militias, is estimated to have reached 10,000 fighters at its peak (Hashem, 2015).

Hezbollah, Iran's most significant proxy in the region,⁴ is one of the most influential actors engaged in combat operations on the ground in Syria. However, the organization denied its intervention until it was acknowledged by Secretary General Hassan Nasrallah in an interview on May 25, 2013. Hezbollah has become a significant actor in the conflict, with its fighters and commanders engaged in combat, training numerous Shiite militia fighters within and beyond Syria, and defending the regime's strategic bases. The organization's experience in urban warfare and the fact that the native language of its fighters is Arabic have both enabled it to more effectively communicate with regime elements and increased cohesion among them. But, Hezbollah's involvement in the war in Syria, the largest military operation in the organization's history, has exacted a toll. Nevertheless, Nasrallah, who described Syria as the "backbone" of the axis of resistance, asserted that the loss of such an important ally would not be permitted (Al-Aloosy, 2022, pp. 133–134; Youssef, 2016, p. 30,33).

The inability of the aforementioned organizations to recruit fighters for the Syrian civil war prompted Tehran to seek fighters from other regions. Consequently, Tehran established the Fatemiyoun Brigade, comprising Afghans, and the Zaynabiyoun Brigade, comprising Pakistanis. The Fatemiyoun Brigade was established in 2013 by Ali Reza Tavassoli and initially deployed in Syria that same year to engage in combat against Daesh. The stated objective of the organization was to safeguard the Sayyida Zeinab Shrine and its environs. It was

⁴ Hezbollah embraces the doctrine of Velayet-e Faqih and recognize Ayetollah Ali Khamanei as the supreme religious authority (Ostovar, 2018, p. 1240). It is important to note that the group functions as a model for Iran's proxies throughout the Middle East and beyond.

asserted that Fatemiyoun had 14,000 combatants at the zenith of its involvement in the Syrian civil war (Jamal, 2019; Nadimi, 2016; Schwartz, 2022, pp. 96-97,98-99). In addition to Pakistani nationals residing in Iran, primarily from al-Mustafa University in Qom (Alfoneh, 2018), Shiites from various regions in Pakistan, including Parachinar, Kurram and Ketta, have traveled to Syria to engage in combat since early 2013 (Clarke & Smyth, 2017). The Zaynabiyoun Brigade is estimated to have comprised approximately 8,000–10,000 fighters at the peak of the conflict (Nadimi, 2016; Zahid, 2016).

The data obtained by Ali Alfoneh (2020) through open-source intelligence indicates that 573 Iranian, 925 Afghan, 118 Iraqi, 1,262 Lebanese, and 174 Pakistani foreign fighters have been killed in Syria since the beginning of 2012. These figures not only provide data on the network of foreign fighters utilized by Iran in Syria, but they also elucidate their role in the conflict. In this context, the considerable number of Lebanese casualties is significant in terms of illustrating the role played by Hezbollah in the conflict. It is also the case that the Fatemiyoun Brigade, which is composed of Afghans, is subject to the same analysis.

Michael Knights (2018, p. 21) has posited that Iran and Hezbollah have takeover a prominent advisory role in Yemen since 2014. The release of two Hezbollah and three IRGC suspects by the Houthis⁵, who had initially been accused of providing military training and logistical support to the Houthis (Ghobari, 2014), soon after taking the capital, both serves to reinforce Knights' claims and demonstrates the existing relationship between the two actors. Furthermore, the assertions that Iran has deployed advisors and trainers in Yemen are corroborated by the statements of officials. In May 2015, Ismael Kaani, then Deputy Commander of the Quds Force, stated that "the Islamic Republic was responsible for training Yemen's guards" (Kendall, 2017, p. 10). In November 2017, Ali Jafari, a former Revolutionary Guards Commander, acknowledged the deployment of Iranian advisers in Yemen at the request of Yemen's legitimate government and stated that Iran would make every effort to assist the Yemeni people (Sinkaya, 2022, p. 88).

Hezbollah plays a significant role in Iran's involvement in the Yemeni

⁵ The Houthis, unlike Iran and Hezbollah, do not embrace to Khomeini's concept of *velayat-e faqih* (Salmoni et al., 2010, pp. 67, 121). Nevertheless, the two events transformed the Houthis's relations with Iran and Hezbollah. The first was the post-2001 US invasion of Afghanistan and Iraq under the "war on terror" doctrine. The second was the Saudi-led coalition targeting the Houthis since 2015 (Juneau, 2021, p. 1). Furthermore, the fact that no other actors except Iran and Hezbollah, provided assistance to the Houthis in the Yemeni civil war, served to deepen the Houthis' relationship with them over time.

conflict. Tehran's advisory and training activities in Yemen are primarily conducted through Hezbollah. The group has deployed senior commanders to Yemen, including Abu Ali Tabatabai and Khalil Harb, a trusted advisor to Nasrallah. Similarly, to the situation in Syria, Hezbollah personnel has been engaged in training and advisory activities on the ground, thereby facilitating Iran's objective of increasing the Houthis' capabilities. In the initial stages of the intervention, Hezbollah and IRGC fighters conducted training and advisory activities, but did not engage in direct combat operations or strategic planning, in contrast to their involvement in Syria. However, this situation underwent a transformation with the advent of the Saudi-led coalition in 2015, resulting in a notable escalation in the number of casualties and captures of Iranian and Hezbollah advisors. The organisation's activities in Yemen became evident in 2019 when Nasrallah stated, "We are not ashamed that we have martyrs from Hezbollah in Yemen" (Juneau, 2021, p. 9; Levitt, 2021, pp. 12-13,14).

In both cases, Iran utilised the provision of manpower to boost its proxies' fighting power. Iran's initial deployment of manpower in Syria entailed the dispatch of military advisors. Subsequently, the Assad regime's significant decline in military personnel resulted in the Quds Force's establishment of militia forces within Syria. The inadequacy of these militia forces necessitated the recruitment of additional fighters from external countries. The Tehran administration, which declared a Shiite jihad by invoking the sanctity of holy shrines, notably Sayyida Zeinab Shrine in Syria, provided fighters to the Syrian conflict from Iraq, Afghanistan, Lebanon, and Pakistan. Consequently, the case of Syria featured in the provision of manpower. A distinct scenario has unfolded in Yemen. The Houthis, who had been engaged in conflict with government forces for an extended period, took control in 2014. The advisors dispatched to the Houthis, who had already demonstrated competency in military operations, concentrated on addressing their shortcomings. Furthermore, it is notable that Iran has typically conducted these advisory and military training operations through Hezbollah. This situation also demonstrates that Iran engages in some activities through its proxies as part of a strategy of proxy warfare.

4.2. The Delivery of Material

Iran has provided a substantial array of weaponry and equipment to Syria, encompassing a diverse range of items, including communications equipment and sophisticated technological weapons. These include rifles, machine guns, sniper rifles, explosives, mortars, surface-to-surface ballistic missiles and unmanned aerial vehicles (UAVs). Furthermore, Iranian tanks, multiple rocket launchers, ballistic missiles and military vehicles have been deployed in combat by the

Syrian army and Iranian proxy groups. In addition to supplying the Assad regime with weapons and missiles, Tehran has also provided technical expertise. In February 2015, Brigadier General Amir Ali Hajizadeh, commander of the IRGC Aerospace Force, confirmed that Iran exported technology to Syria to enable it to produce its own missiles and other equipment (Qaidaari, 2016; Youssef, 2016, pp. 92-93,95).

The first evidence of Iranian arms support to the Houthis emerged in June 2013, when the *USS Farragut* warship intercepted a ship, the *Jahan 1*, off the coast of Yemen. It was believed that the ship was carrying arms to the Houthis. A search of the ship revealed the presence of approximately 40 tons of weaponry, including Katyusha rockets, heat-seeking surface-to-air missiles, RPGs, Iranian-manufactured Misagh-2 man-portable air defense (MANPAD) ammunition and batteries, night vision goggles, and artillery systems. The Yemeni government asserted that these weapons were transferred to the Houthis, whereas Tehran refuted any involvement in the weapons discovered on the vessel (Bayoumy & Ghobari, 2014; Knights, 2018, pp. 17–18). However, the independent arms research organisation Conflict Armament Research (CAR), which subsequently examined the weapons seized from the Houthis both on the ship and in combat, found significant similarities between them (Conflict Armament Research, 2018).

Since the onset of hostilities in Yemen, Ansarullah forces have progressively employed sophisticated technological weaponry against their adversaries. Among these, unmanned aerial vehicles (UAVs) are particularly noteworthy. With the assistance of Iran, the Houthis have made considerable advances in their drone capabilities since 2015. The Houthis' most frequently deployed attack drones are the *Kasef-1* and *Kasef-2*, which are replications of Iran's *Ebabil-T* drone. Indeed, an analysis of the available evidence suggests that these drones are not locally produced, but rather manufactured in Iran and supplied to the Houthis. Furthermore, the vertical gyroscope, among other components, is indicative of an Iranian origin, as it is not commonly found in other UAVs (Conflict Armament Research, 2020). In January 2019, General Saleh Tammah, the Chief of Intelligence of the Hadi Government, was killed by *Kasef-2* drone strike during a military parade at al-Anad military base. In August of the same year, Brigadier General Mohammad Ahmad al-Mashali, Commander of the UAE-backed Security Belt Forces, was killed after a drone and missile attack on a military ceremony in Aden. In the summer of 2018, the Houthis executed a successful *Samed-3* drone strike on Abu Dhabi airport, followed by drone strike on Saudi Aramco oil and gas facilities in the same month and on the Saudi east-west oil pipeline in May 2019 (Muhsin, 2019; Mutschler & Bales, 2023, pp. 14–16; Williams & Shaikh, 2020, pp. 7–8, 25).

In mid-2016, Houthi forces began utilising missiles that were not previously in the Yemeni army's arsenal. The Houthis initially deployed the *Borkan-1* in September 2016 and the *Borkan-2H* in 2017. In September 2016, the *Borkan-1* was first launched for the first time striking the Saudi air base in Taif. In January 2017, 80 coalition soldiers were killed by the same missiles in an attack on a Saudi-UAE military base on Zukar Island in the Red Sea. The examination of the remnants of these novel missiles has reinforced the hypothesis that Iran has provided ballistic missiles that were not previously present in the Houthi arsenal. In light of the aforementioned evidence, United Nations (UN) experts have reached the conclusion that the *Borkan-2H* missiles, which bear resemblance to the Iranian-made Qiam-1 missile, were manufactured in Iran, smuggled into Yemen in parts and subsequently assembled. The missile was first utilized in the attack on the Saudi Aramco facility in Yanbu in July 2017. Furthermore, the remnants of the *Borkan-2H* missiles display the insignia of the Shahid Bagheri Industrial Company, the producer of the Qiam missiles. Furthermore, in addition to the *Borkan* missile series, Iranian design and production fingerprints have been identified on numerous missiles utilised by Houthi forces, including the *Quds-1*, *al-Mandeb-1* and *Sayyid-2C* (United Nations, 2018, pp. 28–29; Williams & Shaikh, 2020, pp. 4-5,43-45).

There is a marked difference between the two cases in the provision of arms, equipment and military support. Although Iran provided significant amount of arms in both cases, Yemen stands out in this regard. In Yemen, which is resource-poor and experiencing a civil war, even the smallest external arms support has been of great importance. Indeed, for the Houthis, who are fighting against both direct and indirect military intervention by countries such as Saudi Arabia and the UAE, weapons provided by Iran, especially drones and ballistic missiles, are of great importance. The Houthi forces, using the advanced technological weapons they obtained from Iran, have both made serious gains in the field and have the capacity to strike Saudi Arabia and the UAE on their own territory. In Syria, Iran's supply of weapons and military equipment has been overshadowed by the supply of manpower. The main reason for this is that the Syrian regime has its own arsenal of weapons and is rather shortage of manpower.

4.3. The Provision of Financial Support

To maintain the Assad regime's ability to withstand the civil war, Iran has implemented a series of financial support programmes, including tariff reductions and direct crude oil supplies. Indeed, in June 2015, Steffan de Mistura, who was UN Special Envoy for Syria, asserted that Iran spends approximately \$6 billion annually to sustain the Assad regime. Steven Heydemann, a prominent

scholar on the Syrian conflict, asserts that the aggregate cost of Iran's oil transfers, financial loans, military personnel expenses, and arms procurement for the Syrian regime is between \$3.5 and \$4 billion annually. When the financial support provided to Hezbollah and other Shiite militias in Syria is included in this figure, it can be estimated that Iran's financial support to the Assad regime reaches approximately \$20 billion annually (Al-Khalidi, 2013; Shaam, 2015). Conversely, Tehran was responsible for the payment of most fighters in proxy and other militia groups in Syria. To illustrate, members of the Fatemiyoun Brigade received a monthly salary of between \$450 and \$700, while other militias received between \$200 and \$300. Local militias such as the Nubl and Zahra Brigades received a salary of approximately \$100 (Nadimi, 2016).

In a recent statement, Hashmatullah Falahat Pisheh, the former head of the National Security Committee of the Iranian Parliament, revealed that his country had spent a considerable sum of money, estimated to be between \$20 and \$30 billion, in Syria between the years 2011 and 2019 (Radio Farda, 2020). This figure provides an explanation as to why Tehran has adopted a strategy of proxy warfare. It can be reasonably deduced that had Iran engaged in direct military action in Syria, the economic cost of the war would have been significantly higher. To understand the distinction between these two forms of intervention, a comparison between Iran's expenditure in Syria and Saudi Arabia's expenditure in Yemen is illustrative. In the first three-year period of its military intervention in Yemen, Riyadh spent approximately \$100 billion (Azizi & Vazirian, 2023, p. 13).

In comparison to the level of financial assistance provided to Syria, Iran has offered less support to the Houthis. As reported by Naame Shaam, (2015, p. 13) Houthi leaders have acknowledged receiving financial assistance from Iran as early as 2012, although the precise extent of this assistance has not been specified. In 2014, following the capture of the capital city of Sana'a by the Houthis, the organisation received financial and military support from Iran. In 2015, the Houthis admitted to receiving logistical and intelligence support as well as financial assistance from Iran. The financial support provided by Iran to Ansarullah is estimated to be between \$10-\$20 million annually, according to experts (Counterextremism, n.d.).

The financial support provided by the patron to the proxy is typically conducted through unofficial channels, as it is relatively easy to trace internationally and there is a high probability of it being blocked. Indeed, some Iranian economic organisations and businessmen have been subjected to sanctions as a result of such surveillance. Consequently, Iran's financial assistance in such instances has been constrained. Nevertheless, the majority of

Tehran's financial support has been concentrated in Syria. The primary rationale for this is that this particular conflict is more closely aligned with Tehran's strategic interests. Indeed, in contrast to the considerable financial outlay of billions of dollars by Iran in support of the Assad regime, the direct financial backing provided by Tehran to the Houthis has been comparatively limited and modest.

4.4. The Provision of Non-Military Support

The non-military dimension of Iran's proxy war in Syria is characterized by the utilization of soft power elements, encompassing social and educational services, reconstruction and economic projects. Iran has established educational institutions and expanded its cultural activities in strategic areas across Syria, particularly in the eastern regions and Damascus. Moreover, state backed Iranian cultural and political institutions⁶ have helped the organization of events in Syria to promote the image of the Iran, including the celebration of the anniversary of the Islamic Revolution (The International Institute for Strategic Studies, 2020, p. 98). Indeed, these parastatal organization, prominently Islamic Culture and Relations Organization, have played a pivotal role in the facilitation of Shia jihad in Syria by mobilizing Shia foreign fighters (Wastnidge, 2020, p. 5).

Iran has sought to utilise its propaganda apparatus in a strategic manner in the context of the Syrian civil war. During the most intense phase of the Syrian civil war in 2015 and 2016, Iran engaged in a significant expansion of its recruitment of Afghan fighters and domestic propaganda operations. The fallen Fatemiyoun soldiers were laid to rest in sacred cemeteries across Iran as heroes. Senior clerics and high-ranking military officers paid visits to the fighters and their families, and these visits were recorded and published to the media for propaganda purposes. Additionally, programmes, documentaries and interviews with fighters have been extensively covered in the Iranian media, particularly on state television, with the objective of encouraging new recruits (Jamal, 2019, pp. 7–8).

Another instrument employed by Iran in its propaganda operations in Syria is the *maddahs*. Maddahs, who exert influence through the recital of poems, have been instrumental in motivating numerous Iranian combatants to engage in combat. In Syria, maddahs recited poems with the objective of boosting the morale of soldiers stationed at the frontlines. The maddahs, who perceive the

⁶ The most influential of these entities are: Islamic Culture and Relations Organization, The Imam Khomeini Relief Foundation, Al-Mustafa International University, Islamic Azad University, Astan Quds Razavi Foundation, Ahlul Bayt World Assembly and Al-Thaqin Charity Center (The International Institute for Strategic Studies, 2020, p. 99).

conflict in Syria as a religious and national one in dedication to Sayyida Zeinab Shrine, address this situation in their poems alongside the Karbala incident, referring to the fighters as “the guardians of the shrine.” Maddahs, who are renowned throughout the country and closely aligned with Khamenei, have frequently travelled to Syria to recite poems with the objective of boosting the morale of the combatants on the front line. Some of them were even actively engaged in the combat operations (Yılmaz, 2023, p. 115,155,162,167).

Furthermore, prominent Iranian decision-makers have voiced their support for the Assad regime in both statements and interviews. The Supreme Leader Ayatollah Khamenei, has stated that Syria constitutes the “golden ring” of the axis of resistance (Seliktar & Rezaei, 2020, p. 170). In another statement in 2017 regarding Iran’s involvement in the Syrian war, he said if Iran does not fight takfirism in Syri, it will have to do so on its own soil (Mansharof, 2013). Mehdi Taeb, an influential figure close to Khamenei, has stated that Syri is even more important than Khuzestan: “If we protect Syria, we can regain Khuzestan, but if we lose Syria, we cannot defend Tehran” (Mansharof, 2013).

Iran’s non-military support for Ansarullah can be divided into two distinct categories: political and media (propaganda) support. Tehran offers political support to the Houthis, and there is no other country in the international community that has recognised the Houthi regime, with the exception of Iran and (pre-revolutionary) Syria (Sinkaya, 2022, p. 85). While Iranian high-ranking officials have expressed support for the Houthis in statements, the parties have also met each other occasionally. For instance, in February 2018, Iranian Foreign Minister Javad Zarif held a meeting with Houthi spokesman Mohammad Abdulsalam in Tehran (Reuters, 2019). Subsequent to these bilateral meetings, Ibrahim Mohammed al-Daylemi, who had been serving in Iran as Abdelmalik al-Houthi’s special envoy since 2015, was appointed as the new ambassador of Yemen in the same year. One year after al-Daylemi’s appointment, Iran designated Hasan Irlo as its ambassador to Sana’a (Sinkaya, 2022, pp. 87–88). This action on the part of Tehran is of considerable symbolic importance for the Houthi regime, which is perceived as lacking legitimacy on the international stage.

For non-state actors engaged in conflict with more powerful adversaries, visibility in the media and propaganda activities is of paramount importance. It is therefore evident that the Houthis endeavour to utilise the media as effectively as possible. The Houthi media platform commenced its activities in 2007 and, with the assistance of Hezbollah, established a Beirut-based television channel, al-Masirah, in 2012. The channel is headquartered in southern Beirut, where Hezbollah maintains a strong presence, and receives logistical support from al-

Menar, one of the organisation's leading media outlets. Indeed, both media organisations utilise the same premises and produce broadcasts of an identical standard and design (Orkaby, 2021, p. 170).

Senior Iranian officials have expressed their support for the Houthi movement in various statements. For instance, in February 2015, Ali Shirazi, the Supreme Leader's representative to the Quds Force, stated that the Houthis, in conjunction with Hezbollah in Lebanon and proxy groups in Iraq and Syria, constitute the pro-Iranian popular army in the region. Other prominent figure Ali Akbar Velayati, Khamenei's advisor, underlined the importance of Yemen and stated that "the freedom of Palesitne passes through Yemen (Mansharof & Kharrazi, 2015).

Iran's provision of non-military assistance to its proxies in Syria and Yemen has manifested itself in three principal ways: through political support, propaganda and media support. In particular, propaganda activities have been particularly prominent in Syria. Iran's protracted and costly involvement in the Syrian civil war, which resulted in significant military losses, underscored the necessity for Iran to leverage propaganda effectively to persuade both its domestic audience and Shiite communities in the region. Indeed, Supreme Leader Ali Khamenei and senior Iranian officials have lauded the fighters in Syria as the guardians of the shrine, and even Iranian intermediaries have been deployed for this purpose. Furthermore, Tehran has consistently provided political support for the Assad regime since the outset of the conflict. In Yemen, Iran has provided assistance to the Houthis in the realms of propaganda and media, as well as offering them political support. Iranian recognition of the Houthi-led Yemeni regime was accompanied by the appointment of an ambassador to reinforce this position. Furthermore, Iran has provided support to the Houthis' media activities, both through Hezbollah's media organisations and its own media outlets. Consequently, there is no significant difference between the two cases in terms of the non-military assistance provided by Iran.

5. CONCLUSION

The present study examines Iran's proxy war strategy in Syria and Yemen between 2011 and 2020 through the lens of Andrew Mumford's quadrilateral framework, which encompasses the provision of manpower, military and financial assistance and the non-military support. Through a comparative analysis of these two cases, the study has underscored the parallels and distinctions in Iran's approach to proxy warfare across diverse geopolitical and socio-political contexts.

The analysis demonstrates that, whilst Iran's overarching objective in

both Syria and Yemen is to expand its regional influence and counter its adversaries, particularly the US, Israel and Saudi Arabia, the operationalization of its proxy warfare strategy varies significantly. In Syria, Iran's primary goal was to ensure the survival of the Assad regime, a pivotal ally that provides Tehran with strategic depth and a conduit for its influence across the Levant. In pursuit of this objective, Iran has amassed a substantial deployment of personnel, comprising IRGC-Quds Force operatives, Hezbollah combatants and additional Shia militias. Additionally, considerable military and financial resources have been allocated to pro-Assad forces, further demonstrating Iran's commitment to maintaining its presence in Syria.

In contrast, Iran's involvement in Yemen has been more indirect but no less strategic. Instead of deploying personnel on the ground at the same scale in Syria, Iran has focused on providing the Houthis with advanced weaponry, particularly ballistic missiles and drones alongside financial and logistical support. This assistance has enabled the Houthis to sustain their resistance against the Saudi-led coalition, draining Saudi resources and increasing Iran's strategic influence in the Arabian Peninsula. Moreover, Iran's provision of non-material support, encompassing ideological and media support, has been instrumental in shaping the Houthis' political narrative and legitimizing their resistance against external intervention.

Notwithstanding the aforementioned differences, both cases demonstrate Iran's capacity to adopt its proxy warfare strategy to varying environments whilst sustaining its overarching strategic objectives. The employment of proxies enables Tehran to exercise influence without the necessity for direct military confrontation, thereby mitigating the risks of escalation while maintaining plausible deniability. The study also underscores the pivotal role of Qasem Soleimani, who was critical in shaping the effectiveness of Iran's regional interventions through his leadership in orchestrating the country's proxy network.

Ultimately, the Iranian regimes's involvement in Syria and Yemen demonstrates the broader implications of proxy warfare in contemporary conflicts. As the dynamics of regional and global power continue to evolve, it is highly likely that Iran will continue to rely on non-states actors as a fundamental element of its security and foreign policy strategy. Future research could further explore the long-term sustainability of Iran's proxy networks and the potential counterstrategies that regional and international actors may employ in response.

6. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

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The methods and data used in the study do not require ethics committee approval.

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HİZMETKÂR LİDERLİK ALGISININ ÇALIŞAN SESLİLİĞİ ÜZERİNDEKİ ETKİSİNDE PSİKOLOJİK SÖZLEŞMENİN ARACI ROLÜ¹



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ÖZ | Bu çalışma, hizmetkâr liderlik algısının çalışan sesliliğine etkisinde psikolojik sözleşmenin aracılık rolünü incelemektedir. Marmara Bölgesi'nde mal ve hizmet üreten işletmelerin çalışanları araştırmanın evrenini oluştururken, zaman, erişim ve kaynak kısıtları nedeniyle kolayda örneklem yöntemiyle 419 gönüllü çalışan seçilmiştir. Nicel yöntemle yürütülen araştırmada, istatistiksel analizler IBM AMOS 24.0 yazılımı ile gerçekleştirilmiştir. Literatür ışığında geliştirilen hipotezler test edilmiş ve hem teorik hem de uygulamaya yönelik katkılar sunulmuştur. Sonuçlar, hizmetkâr liderlik algısının ve psikolojik sözleşmenin çalışan sesliliği üzerinde anlamlı bir etkisi olduğunu göstermektedir. Hizmetkâr liderlik algısının işlemsel kontrat ile anlamlı bir ilişkisi bulunmazken, ilişkisel kontrat ile pozitif ve anlamlı bir etkisi tespit edilmiştir. Ayrıca, ilişkisel kontratın hizmetkâr liderlik ile çalışan sesliliği arasındaki ilişkide kısmi aracılık rolü üstlendiği, ancak işlemsel kontratın aracılık etkisinin olmadığı belirlenmiştir. Bulgular doğrultusunda öneriler sunulmuştur.

Anahtar Kelimeler: Hizmetkâr liderlik, psikolojik sözleşme, çalışan sesliliği, işlemsel kontrat, ilişkisel kontrat

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¹ İlgili çalışmanın etik kurallara uygunluğu beyan edilmiştir.

THE MEDIATING ROLE OF PSYCHOLOGICAL CONTRACT IN THE EFFECT OF SERVANT LEADERSHIP PERCEPTION ON EMPLOYEE VOICE



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ABSTRACT

This study examines the mediating role of the psychological contract in the relationship between servant leadership perception and employee voice. The research focuses on employees in the Marmara Region, with 419 volunteers selected through convenience sampling due to time and resource constraints. A quantitative approach was used, and statistical analyses were conducted with IBM AMOS 24.0. Hypotheses developed from the literature were tested, contributing to theory and practice. Findings show that servant leadership perception and the psychological contract significantly impact employee voice. No significant relationship was found between servant leadership and the transactional contract, while a positive relationship was observed with the relational contract. Additionally, the relational contract partially mediates the relationship between servant leadership and employee voice, whereas the transactional contract has no significant mediating effect. The results were interpreted within the literature framework, and recommendations were provided.

Keywords: *Servant leadership, psychological contract, employee voice, transactional contract, relational contract*

JEL Codes: *M10, M12, D23*

Scope: *Business administration*

Type: *Research*

1. GİRİŞ

İşletmelerin rekabet stratejilerinin en önemli unsurlarının başında liderlik edebilme kabiliyetleri gelmektedir. Etkili liderden beklenen özellikler; gelecek vizyonuna sahip, takipçilerine yönelik karşılıklı saygı ve değerlere odaklı, iş ahlakı ve kişisel dürüstlüğü önemseyen (Cohen, 2010, s.16), yüksek duygusal zekâyâ sahip (Spellman, 2011, s.53), takipçilerine ilham veren (Sharma, 2013, s.28) bir anlayış ortaya koymasıdır. Yönetim literatüründe ileri sürülen çeşitli liderlik tipleri ve tarzları içerisinde liderliğin duygusal, ilişkisel ve ahlaki boyutlarını kullanışlı bir biçimde açıklayan liderlik modellerinin başında hizmetkâr liderlik gelmektedir (Zehir, Akyüz, Eren & Turhan, 2013, s.2). Hizmetkâr liderlik ile liderlik algısı hizmet talep eden ve/veya alan lider anlayışından hizmet sunan /veren lider misyonu ile karakterize olarak farklı bir boyut kazanmaktadır. Greenleaf (1970)' in ileri sürdüğü hizmetkâr liderlik yaklaşımı, bir yönetim modeli olmaktan ziyade hizmet etmeye duyulan içgüdüsel bir yaşam şekli olarak ifade edilmektedir. Aşkın bir düşünce yapısına karşılık gelmesi ve kadim bir felsefeyi barındırması sebebiyle hizmetkâr liderlik tarzı özgün bir yönetim modelini savunmaktadır. İçeriğinde lider kişinin, çalışanları önceliklendirmesi, önemsemesi ve çalışanların beklentilerine değer vermesi, çalışanların mutluluğu ve memnuniyeti yer almaktadır (Blanchard, Blanchard & Zigarmi, 2007, s.294).

İşletmeler, organizasyon içerisindeki süreçleri iyileştirmek, geliştirmek (Morrison, 2011, s.374) ve çalışanları karar alma süreçlerine dâhil ederek çalışanların işletmeye katkı sunma potansiyeli olan farklı fikir ve görüşlere ihtiyaç duymaktadır (Arslan & Yener, 2016, s.174). Bu duruma olanak tanıyan işletmelerin pozitif ve yapıcı kazanımları olduğu literatür tarafından desteklenmektedir (Dyne & LePine, 1998; Walumbwa & Schaubroeck, 2009, s.1275). Çalışmalar sürdürülebilir işletme refahı ve örgütsel gelişim için iş gören sesliliğinin önemli bir parametre olduğu yönünde bir eğilim ileri sürmektedir (Andiyasari, Matindas & Riantoputra, 2017, s. 2). Daha çok çalışan sesine kulak veren işletmelerde, işletmeye katkı sunmaya motive olan çalışan olduğu ve katılımcı çalışan tavrının ortaya konulduğu gözlemlenmektedir (Chou & Barron, 2016, s.1723). Bu noktada yapılan çalışmalarda iş gören sesliliğinin örgütü iyileştirici, geliştirici, yapıcı davranışlar olduğu tespit edilmiş, hatta çalışan sesliliğinin ekstra rol davranışının bir bileşeni olduğu da ileri sürülmüştür (Walumbwa & Schaubroeck, 2009, s.1275).

Psikolojik sözleşme, iki veya daha fazla taraf arasındaki var olan sorumluluklara yönelik inanç (Rousseau, 1995, s.6) ve var olan ilişkiye dair şahsi algıları (Nikolaou, Tomprou & Vakola, 2007, s.649) içermektedir. Psikolojik sözleşmeler işletme içerisindeki güçlü duyguları, algıları yorumlamayı

kapsayarak (Rousseau & Parks, 1993, s. 18), taraflar arasındaki beklenti ve yükümlülükleri içeren ayrıntılı bir çizelge olarak ifade edilmektedir. Bu sürecin anlaşılması ve etkili yönetilmesi işletme başarısına yardımcı olan bir faktördür (Wangithi & Muceke, 2012, s.121). Psikolojik sözleşme temelde ilişkisel kontrat ve işlemsel kontrat olmak üzere iki ana alt boyuttan oluşmaktadır (Rousseau, 2004, s.122; Hess & Jepsen, 2009, s.263). İşlemsel sözleşmeler, esnek olmayan (Grimmer & Oddy, 2007, s.155), taraflar arasındaki ekonomik ilişkileri açıklayan (Haq, Jam, Azeem, Al, & Fatima, 2011, s.7972), kısa vadeli, resmi bir anlaşmaya dayanan (Conway & Briner, 2005, s.44) ve çalışan katkısının sınırlı olduğu sözleşme türüdür (Roussenu, 2004). İlişkisel sözleşmeler ise karşılıklı güven ve sadakat sunan (Rousseau, 2004, s. 122), uzun vadeli olarak işletmeye ve çalışana önemli kazançlar sunan bir psikolojik sözleşme türüdür (Millward & Hopkins, 1998, s.1532).

Liderlik literatüründe hizmetkâr liderliğin çalışanların motivasyonu, örgütsel bağlılığı ve iş tatmini üzerindeki etkilerine odaklanan birçok çalışma bulunmaktadır (Yan & Xiao, 2016; Akgemci, Kalfaoğlu & Erkunt, 2019). Liderlik tarzlarının çalışanın sesliliği davranışı üzerindeki doğrudan etkili olduğu ileri süren çalışmaların (Morrison, 2014; Bulut & Meydan: 2018; Chen, Wang & Lee, 2018) mevcut olduğu gözlenmektedir. Bunun yanı sıra özellikle hizmetkâr liderliğin çalışan sesliliğini sağlayan bir unsur olduğunu ileri süren çalışmalarda bulunmaktadır (Yan & Xiao, 2016; Akgemci, Kalfaoğlu & Erkunt, 2019). Bu duruma ek olarak çeşitli çalışmalarda hizmetkâr liderlik ile çalışan sesliliği davranışı arasındaki ilişkide çeşitli değişkenlerin aracılık ettiğini ileri sürülmektedir (Erkutlu & Chafra, 2015; Yan & Xiao, 2016; Arain, Hameed & Crawshaw, 2019; Song, Tian & Kwan, 2020; Liao, Liden, Liu & Wu, 2021; Chen, Wang & Li, 2022; Khan, Mubarik, Ahmed, Ali & Siraj, 2023a; Khan, Mubarik, Ahmed & Islam, 2023b). Yapılan çalışmalar doğrultusunda liderlik anlayışı çalışan sesliliğini yönetme konusunda yöneticilere bir alan açtığı açıkça görülmektedir (Mowbray, Wilkison & Tse, 2015, s.393). Hizmetkâr liderlik ise çalışana hizmet bilincinden hareket ettiğinden çalışanlarda ses verme davranışını teşvik ederek işletme amaçlarını destekleyen katılımı sağlamaktadır (Erkutlu & Chafra, 2015; Yan & Xiao, 2016; Akgemci vd., 2019; Arain vd., 2019; Liao vd., 2021; Chen vd., 2022; Song vd., 2022; Khan vd., 2023a; Khan vd., 2023b). Benzer şekilde psikolojik sözleşme ve alt boyutları ve çalışan sesliliğini analiz eden ve psikolojik sözleşme ve çalışan sesliliği arasında ilişki tespit eden çalışmalar mevcut olduğu görülmektedir (Arain, Bukhari, Hameed, Lacaze & Bukhari, 2018; Tokmak, 2019; Memon & Ghani, 2020; Botha & Steyn, 2023). Çalışan sesliliği literatürü, çalışanların örgütsel süreçlere aktif katılımının inovasyon ve işletme performansı açısından kritik olduğunu ortaya koymaktadır

(Morrison, 2011; Dyne & LePine, 1998). Ancak, hizmetkâr liderliğin çalışanların ses verme davranışı üzerindeki etkisinin hangi psikolojik mekanizmalar üzerinden şekillendiği yeterince incelenmemiş ve bu doğrultuda bir yönetim modeli henüz geliştirilmemiştir. Ancak, psikolojik sözleşme teorisi (Rousseau, 1995), çalışanların işverenleriyle olan ilişkilerini, örgütsel bağlılıklarını ve beklentilerini anlamlandırmalarını sağlayan temel bir çerçeve sunmaktadır. Mevcut çalışmalar psikolojik sözleşmenin çalışanların tutum ve davranışlarını yönlendirdiğini ortaya koysa da (Wangithi & Muceke, 2012), hizmetkâr liderliğin bu sözleşme türlerini nasıl şekillendirdiği ve bunun çalışan sesliliği üzerindeki etkisi literatürde açık bir şekilde ele alınmamıştır.

Bu çalışma, hizmetkâr liderlik ile çalışan sesliliği arasındaki ilişkiyi psikolojik sözleşme aracılığıyla ele alarak, hizmetkâr liderlik teorisi, psikolojik sözleşme teorisi ve çalışan sesliliği literatürünü bütünleştiren disiplinler arası bir çerçeve sunmaktadır. Bu bağlamda, çalışmanın özgünlüğü, hizmetkâr liderlik ile çalışan sesliliği arasındaki ilişkiyi psikolojik sözleşme dinamikleri üzerinden ele alarak, liderlik ve örgütsel davranış literatüründeki önemli bir boşluğu doldurmasından kaynaklanmaktadır. Psikolojik sözleşmenin iki temel boyutu olan ilişkisel ve işlemsel sözleşmelerin çalışanların liderleriyle kurdukları ilişkiyi nasıl anlamlandırdığı, bu sürecin çalışanların ses verme davranışlarını nasıl etkilediği araştırmanın temel odak noktalarından birini oluşturmaktadır. Bu bağlamda çalışmanın literatüre yapacağına inanılan katkılar üç temel noktada özetlenebilir: İlk olarak, liderlik ve çalışan sesliliği arasındaki ilişkiyi psikolojik sözleşme perspektifinden ele alarak, örgütsel davranış ve liderlik literatürünü bütünleştiren uzun vadeli ve güven temelli teorik bir model sunmaktadır. İkinci olarak, psikolojik sözleşmenin alt boyutlarının hizmetkâr liderlik ve çalışan sesliliği arasındaki ilişkide nasıl bir rol oynadığını analiz ederek, bu ilişkinin arka planındaki psikolojik mekanizmaları açıklığa kavuşturur. Üçüncü olarak, çalışma işletmeler tarafından adapte olunabilir, eylemsel bir planın zeminini oluşturmaktadır. İşletmelerin çalışan bağlılığını ve motivasyonunu artırma stratejilerinde hizmetkâr liderlik uygulamalarının nasıl daha etkin kullanılabileceğine dair somut öneriler geliştirerek, yöneticilere çalışan sesliliğini teşvik eden bir iş ortamı oluşturma konusunda rehberlik eden bir kaynak sağlamaktadır. Özellikle liderlerin çalışanlarıyla kurduğu psikolojik sözleşme türlerinin, çalışanların örgütsel katılım düzeyleri üzerindeki etkisini anlamak, insan kaynakları yönetimi ve liderlik geliştirme programları açısından önemli içgörüler sunmaktadır. Bu bağlamda, hizmetkâr liderlik doğrultusunda çalışan beklentilerinin dikkate alındığı bir yönetim anlayışı, işletmelerin inovasyon süreçlerini destekleyerek rekabet avantajı elde etmelerine ve sürdürülebilir büyümeyi sağlamalarına katkı sağlayacaktır.

2. TEORİK ARKA PLAN

2.1. Hizmetkâr Liderlik Kavramı

Liderlik kavramı, sadece yönetsel bir yetkinlik değil, aynı zamanda geleceğe dair bir vizyon oluşturarak, çalışanların bu vizyonu anlamasını ve benimsemesini sağlayan kritik bir yönetim mekanizmasıdır. Etkili bir lider, çalışanlarının örgütsel hedefler doğrultusunda uyumlu bir şekilde hareket etmelerini sağlarken, aynı zamanda karşılaşılan zorlukları aşmalarında da yol gösterici bir rol üstlenir. Bu bağlamda, hizmetkâr liderlik, geleneksel liderlik anlayışından ayrılarak, liderin öncelikli amacının otorite kullanmak değil, ekibine hizmet etmek olduğu bir yönetim tarzı olarak öne çıkmaktadır. Hizmetkâr lider, hizmet etmeyi doğal bir davranış biçimi olarak benimseyen ve bu yaklaşımı bilinçli bir liderlik tercihiyle birleştiren kişidir (Yukl, 2006, s.420). Buna göre, hizmet etmeyi önceleyen liderler, bireysel çıkarları geri planda tutarak, çalışanlarının gelişimi ve refahına odaklanmaktadır. Geleneksel liderlik anlayışları genellikle liderin otoritesini ve yetkisini kullanarak organizasyonu yönlendirmesi üzerine kuruluyken, hizmetkâr liderlik bu anlayışa ters bir mantıkla yaklaşarak liderin ekibine hizmet etmesini esas alan özgün bir liderlik modelidir.

Greenleaf (1970)' in ileri sürdüğü hizmetkâr liderlik teorisinde, liderin yalnızca yönetim işlevini yerine getiren bir figür olmasının ötesinde, çalışanlarının bireysel ve profesyonel gelişimine katkı sağlayan bir rehber olması ve bu minvalde çalışana hizmet sunması söz konusudur. Bu liderlik yaklaşımı, çalışanlara güven aşılayarak onların içsel motivasyonlarını artırmayı, böylece işletmeye karşı daha yüksek bir bağlılık ve sorumluluk geliştirmelerini hedefler. Spears (2010), hizmetkâr liderlik anlayışının on temel özelliğini belirlemiştir. Bunlar; dinleme, insanların gelişimine katkıda bulunma, farkındalık yaratma, empati kurma, ikna etme, sağduyu, kavramsallaştırma, topluluk oluşturma ve hizmet etmektir (Spears, 2010). Bu özellikleri itibarıyla çalışanı ile yakın ilişki kuran lider, çalışanların kendi potansiyellerini bulmalarına yardımcı olur, onlara güvenir ve kendilerine güven duymalarını sağlar (Liden, Wayne, Zhao & Henderson, 2008, s.162). Çalışanlarına değer veren ve onların gelişimini destekleyen bir lider, karşılığında onların işletmeye duyduğu bağlılığı artırarak, daha yüksek düzeyde performans sergilemelerini sağlar.

Hizmetkâr liderlik, liderin takipçiye veya çalışana hizmet etmesine karşılık, takipçinin veya çalışanın da bu anlayışa bir geri bildirim olarak işletme yararına pozitif katkıda bulunması ile sonuçlanma eğilimindedir (Zehir vd., 2013, s.10). Trompenaars ve Verman (2009, s.5) hizmetkâr liderliğin bu etkisinin, işletme performansını doğal bir çıktı olarak artırdığını vurgulamaktadır. Hizmetkâr liderlik, sadece bireysel performans gelişimini değil, aynı zamanda

örgütsel büyümeyi ve sürdürülebilirliği destekleyen bir yönetim anlayışıdır. Bu sebeple, hizmetkâr liderlik yaklaşımı hem toplumsal dinamikleri beslemesi hem de işletme başarısını desteklemesi açısından kritik bir noktada yer almaktadır. Toplumsal açıdan bakıldığında, hizmetkâr liderlerin oluşturduğu çalışma kültürü, daha adil, şeffaf ve destekleyici bir iş ortamına katkı sağlar. İşletmeler açısından ise, hizmetkâr liderlerin çalışanlarını motive ederek, onların işletmeye duyduğu bağlılığı artırmaları sayesinde, uzun vadede sürdürülebilir bir rekabet avantajı elde edilmesine yardımcı olmaktadır. Çalışanlarının seslerini duyan ve onlara değer veren liderler, sadece kısa vadeli başarılar elde etmekle kalmaz, aynı zamanda işletmenin inovasyon kapasitesini artırarak, uzun vadede kurumsal dayanıklılığı güçlendiren bir yapı oluşturur. Bu nedenle, hizmetkâr liderlik hem çalışan refahını artıran bir yönetim yaklaşımı hem de işletme başarısını sürdürülebilir kılan bir liderlik modelidir.

2.2. Psikolojik Sözleşme Kavramı

Sözleşme/kontrat kavramı en genel ifade ile taraflar arasındaki taahhütleri içeren alışveriş anlaşması olarak tanımlanabilir (Rousseau, 1995, s.6). Psikolojik sözleşme ise çalışanın, işletme içerisinde açık veya örtük vaatleri ne şekilde yorumladığının bir karşılığıdır. Argyris (1960) tarafından ilk defa kullanılan kavram (Anderson & Schalk, 1998, s.638), Rousseau (1995) tarafından psikolojik sözleşme teorisine dayandırılmaktadır. Bu yaklaşım, çalışanın işletmeye ne sunacağı ve işletmeden ne elde edeceğine dair beklentilerin bir çerçevesinin oluşturulduğu, yazılı olan ve olmayan dinamiklere yönelik çalışanın öznel inançlarını kapsayan bir ilişki biçimi olarak değerlendirilebilir (Hess & Jepsen, 2009, s.261). Bu durum ise kurum içerisinde aynı veya benzer görev ve sorumlulukları olan çalışanların farklı geri bildirimde bulunmaları sonucunu doğurmaktadır (Aggarwal & Bhargaya, 2009, s.5). İşletmelerde psikolojik sözleşmenin şekillenmesinde, işveren/yönetici ile çalışan arasındaki ilişkileri düzenleyen ilk yıl psikolojik sözleşme açısından kritik bir yıl olarak ifade edilmektedir (Lee, Liu, Rousseau, Hui & Chen, 2011, s.221). İşletmelerdeki insan kaynakları birimi uygulamaları aracılığıyla kurumun beklentileri ile ilgili çalışanlardan nasıl bir geri bildirim yapmalarına gerektiğine yönelik güçlü bir mesaj gönderebilir. Hem çalışan hem de işveren/yönetici kanadında bu beklentilerin eşleşmesi, iş doyumu, bağlılık ve performans gibi sonuçların pozitif yönlü olmasına katkı sunmaktadır (Coyle-Shapiro & Parzefall, 2008, s.18).

Literatürde psikolojik sözleşmelerin birden çok formu bulunsa da (Persson & Wasieleski, 2015, s.369) temelde ilişkisel ve işlemsel sözleşmeler olarak iki tip üzerine yoğunlaşmaktadır (Rousseau, 2004, s.122). İlişkisel sözleşme/kontrat, uzun vadeli hedeflere odaklanan, çalışanların kendilerini ifade

edebilecekleri bir ortam sunarak gelişimlerini sağlayan (Conway & Briner, 2005, s.44), şeklen bir çerçeve çizilmeyen (Rousseau & Parks, 1993, s.12), karşılıklı sadakat ve güven ilişkisine dayanan (Braekkan, 2012, s.281) bir psikolojik sözleşme türüdür. Bu sözleşme tipi çalışanın örgüt ile özdeşleşme seviyesini artırmaktadır (Millward & Hopkins, 1998, s.1532). Örgütsel özdeşleşmesi yüksek çalışanlar, örgütün kurallarını benimseyerek yükümlülüklerini eksiksiz yerine getirmeyi tercih ederler (Baykal, Zehir & Köle, 2018, s.117). Buna bağlı olarak ilişkisel sözleşme, çalışanın işletmeyi içselleştirmesini ve yaratıcılıklarını işletme yararına kullanmaya istekli olmasını sağlamaktadır. İşlemsel sözleşmeler ise belirlenmiş performans kriterleri ile sınırlı, işletme ve çalışanlar açısından karşılıklı ekonomik ilişkileri açıklayan (Haq vd., 2012, s.7972), esnek olmayan kısa vadeli amaçlar etrafında şekillenmektedir (Grimmer & Oddy, 2007, s.155). Buradaki kritik eşik psikolojik sözleşmelerin örgüt kültürü, sektör özelliklerine göre şekillenen (Conway & Briner, 2005, s. 11), çevresel ve bireysel farklılıklara uyum sağlayacak akıcılıkta olması ve içeriğinin güncellenebilir nitelikte olmasıdır (Wangithi & Muceke, 2012, s.121; Persson & Wasieleski, 2015, s.369).

2.3. Çalışan Sessliliği Kavramı

Çalışanlar, işletme faaliyetlerine birinci dereceden muhatap olan, süreç içerisinde yapıcı katkı sunma potansiyeline sahip işletme paydaşlarıdır. Çalışanların zihinlerinde oluşan işletmeye dair fikirlerin paylaşımına olanak tanımak işletme adına büyük değer taşımaktadır (Carnevale, Huang, Crede, Harms & Uhl-Bien, 2017, s.518). Bu sebeple çalışanların ses verme davranışına motiv edilmeleri örgüte ait olma ve örgüte bağlılık duygularını kuvvetlendirmektedir (Aygün & Özen, 2019, s.3). Bir davranışın çalışan sessliliği kapsamında değerlendirilebilmesi için çalışanların iş ile ilgili duygu, düşünce, görüş ve bilgi içermesi gerekmektedir (Çetin & Çakmakçı, 2012, s.4).

Çalışan sessliliği, Hirschman (1970) tarafından ‘ses verme’ olarak ifade edilerek literatürde yer almıştır. Çalışanın gerekli gördüğü ve öneri sunmak istediği iş ile ilgili konularda dâhil olmak üzere sorunlarını ve alternatif çözüm yollarını açıkça ifade etmesi çalışan sessliliği olarak tanımlanmaktadır (Premeaux & Bedian, 2003, s.1538). Çalışan sessliliği açık iletişim biçiminin uygulamaya dönük bir pratiğini içermektedir (Maynes & Podsakoff, 2014, s.91). Van Dyne ve arkadaşları (2003) çalışan sessliliğini; kabullenici sesslilik, savunmacı sesslilik, örgüt yararına sesslilik olmak üzere üç kategoride ele almıştır. Söz konusu sesslilik biçimleri farklı motivasyon unsurlarından etkilenmektedir. Kabul edilmiş sesslilikte, çalışanlar işletmede çoğunluk ile aynı duygu ve düşüncüyü paylaşırlar. Burada çalışanlar, konuşmalarının anlamlı olmayacağına yönelik hâkim bir düşünceye sahip olarak ve muhtemel bir değişime öncülük edemeyeceklerine

yönelik bir algıdan beslenirler (Van Dyne, Ang & Botero, 2003; Yetim & Erigüç, 2018). Savunma amaçlı seslilikte, çalışan yalnızca kendisini ilgilendiren ve kendisini savunmak amacıyla görüş, bilgi ve önerilerde bulunma eğilimindedir (Van Dyne vd., 2003). Bu seslilik türü çalışmada korku temeline dayanır ve iç güdüsel olarak savunma mekanizmasının aktif olmasıyla son bulur. Örgüt yararına seslilik ise bireyin iş ile ilgili bilgi, fikir ve düşüncelerini örgüt içerisinde iş birliği çerçevesinde paylaşması olarak tanımlanmakta (Van Dyne vd., 2003, s.1371) ve bunun sonucunda bir ilerleme ve gelişme katkı sunması beklenmektedir (Morrison, 2011, s.375).

Çalışanın, işletmede var olan bir durumu karşı söz konusu seslilik türlerinden hangisini tercih edeceğinde, çalışanın işletme ile arasındaki bağlılık belirleyici rol oynamaktadır. Literatürde örgütsel başarının, çalışanın deneyimlerini, endişelerini, dilek ve isteklerini dile getirdiği ses verme davranışı ile doğru orantılı olduğunu savunan çalışmalar bulunmaktadır (Borman & Motowidlo, 1997; Liang, Farh & Farh, 2012; Cheng, Chang, Kuo & Lu, 2014; Carnevale vd., 2017; Bulut & Meydan, 2018).

2.4. Değişkenler Arası İlişkiler ve Hipotez Geliştirme

Hizmetkâr liderlik, liderin çalışanlarına hizmet etmeyi temel alan bir yönetim anlayışı benimsemesi ve onların gelişimini destekleyerek örgütsel süreçlere katılımlarını teşvik etmesi üzerine şekillenen bir liderlik modelidir (Greenleaf, 1970). Bu liderlik yaklaşımı, çalışanların güvenini kazanarak örgütsel bağlılığı artırırken, çalışanların görüş ve düşüncelerini ifade etme eğilimlerini de güçlendirmektedir. Çalışan sesliliği, bireylerin örgütsel gelişime katkıda bulunma ve iyileştirme amacıyla düşüncelerini açıkça dile getirmeleri olarak tanımlanır (Morrison, 2011). Bu kavram, çalışanların örgüt içindeki olumsuzlukları gidermek, yenilikçi fikirler sunmak ve yönetime geri bildirim sağlamak amacıyla örgütsel süreçlere aktif katılım göstermelerini ifade eder. Liderlik tarzlarının çalışan sesliliği üzerindeki etkisine dair yapılan çalışmalar, liderlerin çalışanlarının seslerini ne derece dikkate aldığının ve onların fikirlerini nasıl yönlendirdiğinin, örgütsel yenilikçilik ve sürdürülebilir başarı açısından kritik bir faktör olduğunu ortaya koymaktadır (Detert & Burris, 2007).

Hizmetkâr liderliğin çalışan sesliliği üzerindeki etkisini inceleyen ampirik araştırmalar, bu liderlik tarzının çalışanların güvenli bir ortamda kendilerini ifade etmelerine imkân sağladığını ve onların görüşlerini örgütsel süreçlere dâhil etme motivasyonlarını artırdığını göstermektedir (Liden vd., 2008; Henderson, 2013; Erkötlü & Chafra, 2015; Yan & Xiao, 2016; Arain vd., 2019; Akgemci vd., 2019; Eva, Robin, van Dierendock & Liden, 2019; Liao vd., 2021; Chen vd., 2022; Song vd., 2022; Khan vd., 2023a; Khan vd., 2023b).

Henderson 2013 yılında yaptığı çalışmada, hizmetkâr liderlik ve dönüşümcü liderlik tarzlarına odaklanmış ve çalışan sesliliği üzerindeki etkilerini olduğuna yönelik bulgularını raporlamıştır. Yan ve Xiao (2016), 430 memur ve onların birinci derece amirlerinden toplanan veriler doğrultusunda hizmetkâr liderliğin çalışan sesliliğini artırdığını ve bu etkiye psikolojik güvenlik değişkeninin aracılık ettiğini ortaya koymuştur. Benzer şekilde, Arain vd. (2019) tarafından farklı sektörlerde çalışan 231 ast ve üstten toplanan verilerin analizinde, yine hizmetkâr liderliğin çalışan sesliliğini doğrudan teşvik ettiği bulunmuştur. Liao vd. (2021) tarafından Çin’de 308 mimar ve yöneticilerinden elde edilen veriler doğrultusunda hizmetkâr liderliğin teşvik edici ve yasaklayıcı seslilik ile pozitif bir ilişkiye sahip olduğu ve bu ilişkinin farklı aracı değişkenler tarafından yönlendirildiği belirlenmiştir. Song vd. (2022) bankacılık sektöründe 23 süpervizör ve 216 çalışan ile yürütülen araştırmasında, hizmetkâr liderliğin çalışanların işe bağlılığını artırarak, teşvik edici ve yasaklayıcı seslilik davranışlarını kolaylaştırdığını göstermiştir. Chen vd. (2022) ise 424 çalışan ve yöneticileri ile gerçekleştirdiği çalışmada, hizmetkâr liderliğin çalışan sesliliği üzerinde doğrudan anlamlı ve pozitif bir etkisi olduğunu ampirik olarak kanıtlamıştır. Khan vd. (2023a), 286 hizmet sektörü çalışanı ile gerçekleştirdiği çalışmada, hizmetkâr liderlik ile çalışan yasaklayıcı ve teşvik edici ses davranışı arasında anlamlı bir ilişki olduğunu ve anlam değişkeninin bu süreçte aracılık rolü üstlendiğini belirlemiştir. Yine Khan vd. (2023b) tarafından 71 işletmeden 312 çalışan ile yürütülen bir başka çalışmada, hizmetkâr liderlik ile yenilikçi iş davranışı arasındaki etkiye ses davranışının aracılık ettiğini ispat etmiştir. Ulusal yazında ise Erkutlu ve Chafra (2015), 10 devlet üniversitesinden 793 öğretim üyesinden veri toplamış, hizmetkâr liderlik ile dile getirme davranışı üzerinde etkisini saptamıştır. Bu etkide psikolojik güvenlik ve psikolojik güçlendirme unsurlarının tam aracı rolü ispatlanmaktadır. Akgemci ve arkadaşları (2019) ise 132 araştırma görevlisinden veri toplanmış ve hizmetkâr liderliğin çalışan sesliliği üzerindeki etkisi ispatlanmıştır. Bu araştırmalar, hizmetkâr liderliğin çalışan sesliliğini teşvik ettiğine dair güçlü ampirik kanıtlar sunmaktadır. Bu bağlamda, yapılan bu çalışmada hizmetkâr liderliğin çalışan sesliliğini artırdığı yönünde güçlü teorik ve ampirik temellere dayanan bir ilişki olduğu öne sürülerek aşağıdaki hipotez geliştirilmiştir:

H1: *Hizmetkâr liderlik algısının çalışan sesliliği üzerinde anlamlı ve pozitif etkisi vardır.*

Psikolojik sözleşme teorisi, çalışanların işverenleriyle aralarındaki karşılıklı beklenti ve yükümlülükleri nasıl algıladıklarını ifade eden, yazılı olmayan bir anlaşma olarak tanımlanmakta ve buna dair önemli bir çerçeve

sunmaktadır (Rousseau, 1995). Bu teoriye göre, çalışanların iş yerinde kendilerini ne derece güvende hissettikleri, örgütle kurdukları bağın niteliği ve işverenin sunduğu olanakların algılanan adaleti, çalışanların örgütsel süreçlere katılım düzeylerini belirlemektedir (Rousseau & Parks, 1993). Ampirik çalışmalar, psikolojik sözleşmenin çalışan sesliliği üzerindeki etkisini destekleyen önemli bulgular sunmaktadır (Arain vd., 2018; Tokmak, 2019; Memon & Ghani, 2020; Botha & Steyn, 2023). Arain vd. (2018), kâr amacı gütmeyen işletmelerde 234 çalışan ve yöneticileri ile gerçekleştirdiği çalışmada, psikolojik sözleşmenin çalışan sesliliği üzerinde anlamlı ve pozitif bir etkisi olduğunu göstermiştir. Benzer şekilde, Tokmak (2019) tarafından kamu sektöründeki güvenlik hizmetlerinde 170 çalışan ile yapılan araştırmada, psikolojik sözleşmenin çalışan sesliliği üzerindeki etkisi analiz edilmiş ve özellikle ilişkisel psikolojik sözleşmenin çalışanların destekleyici ve yapıcı ses davranışlarını artırdığı, işlemsel sözleşmenin yapıcı ve destekleyici çalışan sesliliğini azalttığı belirlenmiştir. Memon ve Ghani (2020) ise psikolojik sözleşme ile yapıcı seslilik arasında güçlü bir pozitif ilişki saptanmıştır. Botha & Steyn (2023) tarafından 11 farklı kuruluştan 620 çalışanın katılımıyla yürütülen çalışmada ise ilişkisel psikolojik sözleşmenin çalışan sesliliğini teşvik edici, işlemsel psikolojik sözleşmenin ise çalışan sesliliğini engelleyici bir faktör olduğu belirlenmiştir. Bu bulgular, çalışanların örgütsel süreçlere katılım eğilimlerinin, işverenleriyle kurdukları psikolojik sözleşme türüne bağlı olarak şekillendiğini göstermektedir. Bu teorik çerçeve ve ampirik bulgular doğrultusunda, psikolojik sözleşmenin çalışan sesliliği üzerindeki etkisinin anlamlı olduğu ve bu etkinin psikolojik sözleşmenin türüne göre farklılık göstereceği varsayılmıştır. Bu kapsamda, aşağıdaki hipotezler geliştirilmiştir:

H2: Psikolojik sözleşmenin çalışan sesliliği üzerinde anlamlı bir etkisi vardır.

H2a: İşlemsel kontratın çalışan sesliliği üzerinde anlamlı ve negatif etkisi vardır.

H2b: İlişkisel kontratın çalışan sesliliği üzerinde anlamlı ve pozitif etkisi vardır.

Hizmetkâr liderlik yaklaşımında, hizmetkâr liderlerin çalışanlarını destekleyici, onların gelişimini teşvik edici ve uzun vadeli bir bağlılık oluşturan bir yönetim anlayışı benimsediği göz önünde bulundurulduğunda (Eva vd., 2019), hizmetkâr liderlik algısının ilişkisel psikolojik sözleşme ile pozitif yönde, işlemsel psikolojik sözleşme ile ise negatif yönde bir ilişki içinde olması beklenmektedir. İlişkisel sözleşmelerin güvene dayalı bir iş ortamını desteklediği, çalışanların liderleriyle kurdukları yakın bağları güçlendirdiği ve örgütsel bağlılıklarını artırdığı bilinmektedir (Botha & Steyn, 2023). Öte yandan, işlemsel sözleşmelerin lider-çalışan ilişkisini sadece kısa vadeli ekonomik beklentiler

üzerinden tanımlaması, hizmetkâr liderliğin çalışanlara sunduğu güven ve bağlılık ilkeleriyle örtüşmemektedir. Bu alandaki bulgular incelendiğinde, hizmetkâr liderliğin çalışanların psikolojik sahiplenme, kişi-kurum uyumu, duygusal bağlılık (Dahleez, Aboramadan & Bansal, 2021), örgütsel vatandaşlık, adalet algısı, çalışan katılımı ve örgütsel performans üzerindeki etkisini ele alan birçok araştırma bulunmaktadır (Carter & Baghurst, 2014; Eva vd., 2019; Faraz, Xiong, Mehmood, Ahmed & Pervaiz, 2023). Ancak, bu çalışmaların büyük bir kısmı psikolojik sözleşmeyi dolaylı bir unsur olarak ele almaktadır. Panaccio vd. (2015) tarafından yapılan araştırma, liderlik ve psikolojik sözleşme arasındaki bağlantıyı dolaylı olarak ele almış ancak hizmetkâr liderlik bağlamında kapsamlı bir inceleme sunmamıştır. Bu çalışmada, hizmetkâr liderlik algısının psikolojik sözleşmenin türleri üzerindeki etkisini doğrudan ele alarak literatürdeki bu boşluk doldurulmaya çalışılmaktadır. Bu nedenle, hizmetkâr liderlik algısının işlemsel sözleşmelerle olumsuz bir ilişki içinde olması beklenmektedir. Bu teorik ve ampirik temeller doğrultusunda aşağıdaki hipotezler geliştirilmiştir:

H3: *Hizmetkâr liderlik algısının psikolojik sözleşme üzerinde anlamlı bir etkisi vardır.*

H3a: *Hizmetkâr liderlik algısının işlemsel kontrat üzerinde anlamlı ve negatif etkisi vardır.*

H3b: *Hizmetkâr liderlik algısının ilişkisel kontrat üzerinde anlamlı ve pozitif etkisi vardır.*

Hizmetkâr liderler, çalışanlarına uzun vadeli bağlılık, destek ve güven ortamı sunarak, çalışanların ilişkisel psikolojik sözleşmeleri benimsemelerini teşvik edebilir. Öte yandan, işlemsel sözleşmelerin baskın olduğu bir çalışma ortamında, lider-çalışan ilişkisi daha yüzeysel ve maddi temelli olabilir, bu da çalışanların örgütsel süreçlere olan bağlılığını ve ses verme davranışlarını sınırlandırabilir (Panaccio vd., 2015). Dahleez vd. (2021) tarafından yapılan çalışmada, hizmetkâr liderliğin çalışanların örgütsel kimlikleri üzerindeki etkisini artırdığı ve psikolojik sahiplenme, kişi-kurum uyumu ve duygusal bağlılık gibi faktörleri güçlendirdiği belirlenmiştir. Benzer şekilde, Carter & Baghurst (2014) ve Eva vd. (2019) tarafından yürütülen çalışmada, hizmetkâr liderliğin örgütsel adalet algısını, çalışan katılımını ve örgütsel performansı artırdığı gösterilmiştir. Erkutlu ve Chafra (2015) Türkiye’de gerçekleştirdikleri kapsamlı çalışmada hizmetkâr liderliğin, çalışan sesliliğine etkisinde psikolojik mekanizmaların (psikolojik güvenlik-psikolojik güçlendirme) tam aracı etkisini olduğu bulgusuna ulaşmışlardır. Yapılan literatür taramasında (Liden vd., 2008; Carter & Baghurst, 2014; Erkutlu & Chafra, 2015; Panaccio vd., 2015; Yan & Xiao 2016; Arain vd.,

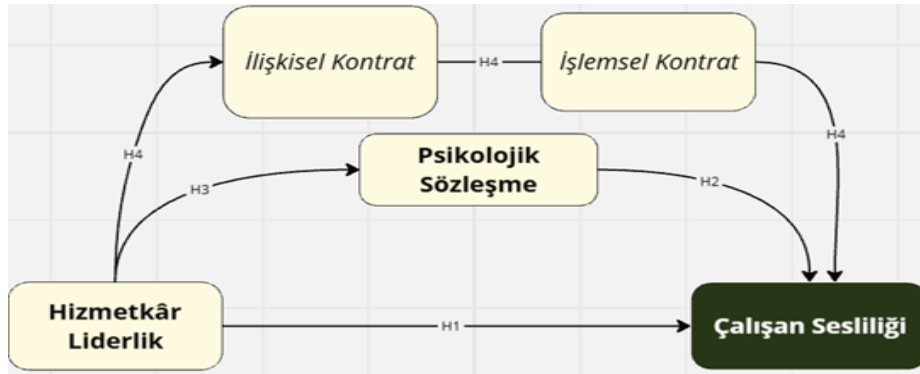
2018; Arain vd., 2019; Akgemci vd., 2019; Eva vd., 2019; Tokmak, 2019; Song vd., 2020; Memon & Ghani, 2020; Dahleez vd., 2021; Liao vd., 2021; Chen vd., 2022; Botha & Steyn, 2023; Faraz vd., 2023; Khan vd., 2023a; Khan vd., 2023b) örgüt içinde çalışanların liderleri ile kurdukları psikolojik sözleşmelerin bu süreçte çalışanın ses verme davranışı üzerinde kritik bir rol oynayabileceği düşünülmüştür. Bu bağlamda, hizmetkâr liderlik algısı ile çalışan sesliliği arasındaki ilişkide psikolojik sözleşmenin aracılık rolü olabileceği öne sürülmektedir. Hizmetkâr liderlerin çalışanlarıyla kurduğu güvene dayalı ve destekleyici ilişkiler, ilişkiel sözleşmeler aracılığıyla çalışan sesliliğini teşvik ederken, işlemsel sözleşmeler aracılığıyla çalışan sesliliğini azaltabilir. Literatürdeki bu boşluğu doldurmak ve hizmetkâr liderliğin çalışan sesliliği üzerindeki etkisini daha kapsamlı bir şekilde açıklayabilmek amacıyla aşağıdaki hipotezler geliştirilmiştir:

H4: Hizmetkâr liderlik algısı ile çalışan sesliliği arasındaki ilişkide psikolojik sözleşmenin aracılık (mediation) etkisi vardır.

H4a: Hizmetkâr liderlik algısı ile çalışan sesliliği arasındaki ilişkide işlemsel kontratın aracılık (mediation) etkisi vardır.

H4b: Hizmetkâr liderlik algısı ile çalışan sesliliği arasındaki ilişkide ilişkiel kontratın aracılık (mediation) etkisi vardır.

Geliştirilen hipotezlere ait araştırma modeli Şekil 1’ de sunulmaktadır;



Şekil 1: Araştırmanın Modeli

3. YÖNTEM

Bu çalışmanın amacı, hizmetkâr liderlik algısının, çalışan sesliliğine etkisinde psikolojik sözleşmenin aracılık etkisinin olup olmadığını tespit etmektir. Çalışma, verilerin anket yöntemi ile toplanacağı nicel bir araştırmadır. Anket formu, “Demografik Bilgiler”, “Hizmetkâr Liderlik Ölçeği”, “Psikolojik Sözleşme (İşlemsel Kontrat ve İlişkisel Kontrat) Ölçeği” ve “Çalışan Sesliliği Ölçeği” olmak üzere dört bölümden oluşmaktadır. Tanımlayıcı bilgi formunda, formu dolduran kişiler hakkında cinsiyet, yaş, medeni durum, eğitim durumu, mevcut işyerinde çalışma süresi, işletmedeki pozisyonu olmak üzere toplam 6 soru bulunmaktadır. Hizmetkâr liderlik ölçeği, Liden ve arkadaşları (2015) tarafından geliştirilen ve Kılıç ve Aydın (2016) tarafından yapılan çalışmada Türkçe’ye uyarlanan 7 maddelik kısa form olan ve tek boyuttan oluşan ölçek, 5’li Likert ölçeği şeklinde kullanılmıştır. Psikolojik sözleşme algılarını ölçmek için Millward ve Hopkins (1998) tarafından geliştirilen Psikolojik Sözleşme Ölçeğinin Türkçe uyarlaması kullanılmıştır. Ölçeğin Türkçe uyarlaması Mimaroglu (2008)’nin doktora tezinden alınmıştır. Ölçeğin ‘işlemsel kontrat (8 madde)’ ve ‘ilişkisel kontrat (6 madde)’ olmak üzere iki alt boyutu vardır. Ölçek, çalışmada 5’li Likert tipi ölçek olarak kullanılmıştır. Araştırmada çalışan sesliliğine yönelik kullanılan ölçek olarak, van Dyne ve Le Pine (1998) tarafından geliştirilen ve Çetin ve Çakmakçı (2012) tarafından Türkçe’ye uyarlanan 6 maddelik kısa formu 5’li likert tipi ölçek olarak kullanılmıştır. Böylelikle çalışmada gönüllü katılımcılara toplamda 33 ifadeden oluşan bir anket formu sunulmuştur. Araştırmanın evrenini, Marmara Bölgesi’nde faaliyet gösteren mal ve hizmet üreten işletmelerde çalışan personel oluşturmaktadır. Türkiye işgücü istatistikleri (2022) verilerine göre Marmara Bölgesi, Türkiye’nin en yüksek işgücüne sahip bölgesi olup sanayi ve hizmet sektörlerinde faaliyet gösteren girişimlerin yaklaşık %54,1’i bu bölgede bulunduğu rapor edilmiştir (TİSK, 2022). Türkiye İş Kurumu 2022 yılı İşgücü Piyasası Araştırması kapsamında 29.771 işletmeden derlenen veri ile yalnızca İstanbul ilinde 20+ istihdamlı işletmeler için toplam çalışan sayısı 3.057.458 olarak rapor edilmiştir (Türkiye İş Kurumu, 2022). Bu kapsamda Marmara Bölgesi’ndeki çalışan sayısının yaklaşık 7 milyon olduğu tahmin edilmektedir (TÜİK, 2022). Bu geniş evrene ulaşmak pratik olarak mümkün olmadığından, araştırmada kolayda örnekleme yöntemi kullanılmış ve ulaşılabilen işletme çalışanları örnekleme dâhil edilmiştir. Bu çerçevede anket formu; yüz yüze/elden teslim, e-posta ve çevrim içi anket bağlantıları yoluyla ulaştırılmıştır. Toplamda 419 gönüllü katılımcıdan tam ve eksiksiz geri bildirim alınmıştır. %95 güven düzeyi ve %5 örnekleme hatası kabul edilerek yapılan örneklem büyüklüğü hesaplamalarına göre, evrenin 100.000 ve üzerinde olması durumunda minimum örneklem büyüklüğü 384 kişi olarak

önerilmektedir (Gürbüz & Şahin, 2014, s.271). Bu doğrultuda, araştırmada elde edilen 419 kişilik örneklem sayısının, evreni temsil etme açısından yeterli olduğu değerlendirilmektedir. Anket verileri IBM AMOS 24.0 yazılımı kullanılarak analiz edilmiştir.

3.1. Araştırmanın Etik İzinleri

Yapılan bu çalışmada ‘Yükseköğretim Kurumları Bilimsel Araştırma ve Yayın Etiği Yönergesi’ kapsamında uyulması gereken tüm kurallara uyulmuştur. Yönergenin ikinci bölümü olan ‘Bilimsel Araştırma ve Yayın Etiğine Aykırı Eylemler’ başlığı altında belirtilen eylemlerden hiçbiri gerçekleştirilmemiştir.

Etik değerlendirmeyi yapan kurul adı: Yıldız Teknik Üniversitesi Sosyal ve Beşerî Bilimler Araştırmaları Etik Kurulu

Etik değerlendirme kararının tarihi: 20.11.2023

Etik değerlendirme belgesi sayı numarası. 2023/11

3.2. Verilerin Analizi

Bu araştırmada, veri analizi için Anderson ve Gerbing'in (1988) önerdiği iki aşamalı yaklaşım benimsenmiştir. Bu yöntem, yapısal eşitlik modellemesi çerçevesinde ölçüm ve yapısal modellerin birleşik değerlendirmesini içerir. Söz konusu yaklaşıma göre, araştırmacılar yapısal model testinden önce sağlam bir ölçüm modeli oluşturmalıdır. Bu modelin uygunluğu, faktör analizi gibi tekniklerle değerlendirilir. Yapısal model ise hipotezleri sınavarak bağımsız değişkenlerin bağımlı değişkenler üzerindeki etkilerini ortaya çıkarır. Ölçüm modelinin temel alındığı yapısal model, değişkenler arasındaki karmaşık ilişkileri test etme imkânı sunar.

Veri analizine geçmeden önce, olası aykırı değerleri tespit etmek amacıyla Cook uzaklık değerleri hesaplanmıştır. Elde edilen sonuçlar, veri setinde aykırı değer bulunmadığını göstermiştir (En yüksek Cook uzaklık değeri = 0,08 < 1). Hesaplanan katsayılar, verilerin normallik varsayımını karşıladığını ortaya koymuştur (çarpıklık: -0.92 ile -0.19 arasında; basıklık: -0.53 ile 0.97 arasında). Çarpıklık ve basıklık katsayılarının ± 2 aralığında yer alması, verilerin normal dağılıma yakın olduğuna işaret etmektedir (George & Mallery, 2010). Hizmetkâr liderlik için VIF değeri 1,60, ilişkisel kontrat için 1,02 ve işlemsel kontrat için 1,59 olarak hesaplanmıştır. Varyans Şişirme Faktörü (VIF) değerlerinin 3'ün altında olması, değişkenler arasında çoklu doğrusal bağlantı sorunu olmadığını göstermektedir (Yurt, 2023). Bu bulgular, değişkenler arasında çoklu bağlantı problemi olmadığını doğrulamıştır. Tüm istatistiksel analizler, IBM AMOS 24.0 yazılımı kullanılarak gerçekleştirilmiştir.

4. BULGULAR

4.1.Örnekleme Ait Demografik Veriler

Demografik verilere ait tanımlayıcı istatistikler Tablo 1’ de sunulmaktadır;

Tablo 1: Katılımcıların Tanımlayıcı Özelliklere Göre Dağılımı

		f	%
Cinsiyet	Kadın	152	36,3
	Erkek	267	63,7
Yaş	18-25 yaş arası	67	16,0
	26-32 yaş arası	144	34,4
	33-42 yaş arası	142	33,9
	43-50 yaş arası	56	13,4
	51 ve üzeri yaş	10	2,4
Medeni durum	Evli	213	50,1
	Bekâr	205	49,9
Eğitim durumu	İlkokul	13	3,1
	Ortaokul	22	5,3
	Lise	67	16,0
	Ön lisans	65	15,5
	Lisans	169	40,3
	Lisansüstü	83	19,8
Mevcut iş yerinde çalışma süresi	1 yıldan az	76	18,1
	1-3 yıl arası	122	29,1
	4-6 yıl arası	78	18,6
	7-9 yıl arası	61	14,6
	10 yıl ve üzeri	82	19,6
Pozisyon	Üst Düzey Yönetici	26	6,2
	Orta Düzey Yönetici	94	22,4
	Alt Düzey Yönetici	70	16,7
	Çalışan	229	54,7

Tablo 1 incelendiğinde, katılımcıların %36,3’ü kadın, %63,7’si erkektir.

Yaş dağılımına bakıldığında, katılımcıların büyük bir kısmı 26-32 (%34,4) ve 33-42 (%33,9) yaş gruplarında bulunmaktadır. Evli katılımcıların oranı %50,1'dir. Lisans (%40,3) ve lisansüstü (%19,8) mezunları en yüksek oranlara sahiptir. Katılımcıların büyük bir kısmı mevcut iş yerinde 1-3 yıl (%29,1) ve 10 yıl ve üzeri (%19,6) süreyle çalışmaktadır. Üst düzey yönetici (%6,2), orta düzey yönetici (%22,4), alt düzey yönetici (%16,7) ve çalışan (%54,7) pozisyonlarında görev yapan katılımcıların oranları incelendiğinde, çalışanların en yüksek orana sahip olduğu anlaşılmaktadır.

4.2. Ölçüm Modeli

Araştırmanın ölçüm modelinde dört ana değişken ele alınmıştır: hizmetkâr liderlik, psikolojik sözleşme (işlemsel ve ilişkisel boyutları) ve çalışan sesliliği. Bu modelin yapı geçerliğini değerlendirmek için doğrulayıcı faktör analizi (DFA) uygulanmıştır. Ayrıca, modelin birleşme ve ayrışma geçerliği de ayrıntılı olarak incelenmiştir. Model testi için maksimum olabilirlik yöntemi kullanılmıştır. Faktör yüklerinin değerlendirilmesinde, literatürde yaygın olarak kabul gören 0,32 eşik değeri temel alınmıştır (Yurt, 2023). Yapılan analizler sonucunda, bu eşik değerin altında kalan herhangi bir faktör yükü gözlemlenmemiştir. Yapılan analizler sonucunda, bu eşik değerin altında kalan herhangi bir faktör yükü tespit edilmemiştir. Hesaplanan uyum iyiliği değerleri ($\chi^2= 777,79$; Sd= 310; $\chi^2/sd=2,51$; $p<0,001$; RMSEA=0,06; SRMR= 0,06; CFI=0,93; TLI= 0,92; IFI= 0,93) modelin veriler ile kabul edilebilir düzeyde uyum gösterdiğini işaret etmiştir (Bollen, 1989; Browne & Cudeck, 1993; Hu & Bentler, 1999; Tanaka & Huba, 1985). Faktör yükleri, AVE, CR, MSV, MaxR(H) ve Alfa katsayıları Tablo 2'de gösterilmiştir.

Tablo 2: Ölçüm Modelinin Test Edilmesi ile Elde Edilen Değerler

Ölçek	Madde no	Faktör yükü	AVE	CR	MSV	MaxR(H)	Alfa
Hizmetkâr liderlik	HI1	0,70	0,595	0,913	0,473	0,926	0,910
	HI2	0,88					
	HI3	0,80					
	HI4	0,84					
	HI5	0,81					
	HI6	0,52					
	HI7	0,78					
İşlemsel kontrat	Psi1	0,66	0,363	0,820	0,030	0,842	0,818
	Psi2	0,58					
	Psi3	0,78					
	Psi4	0,66					
	Psi5	0,44					
	Psi6	0,37					
	Psi7	0,70					
İlişkisel kontrat	Psi8	0,52	0,504	0,866	0,473	0,868	0,865
	Psi11	0,60					

	Psil2	0,78					
	Psil3	0,73					
	Psil4	0,77					
	Psil5	0,71					
	Psil6	0,66					
	Çs1	0,77					
	Çs2	0,82					
Çalışan sesliliği	Çs3	0,84	0,617	0,908	0,219	0,924	0,905
	Çs4	0,49					
	Çs5	0,88					
	Çs6	0,65					

HL= Hizmetkâr liderlik, Psi= İşlemsel kontrat, Psil= İlişkisel kontrat, Çs= Çalışan sesliliği
 AVE= Average Variance Extracted, CR=Composite Reliability, MSV= Maximum shared variance, MaxR(H)= Maximal Reliability

Tablo 2'deki veriler incelendiğinde, hesaplanan Cronbach alfa katsayılarının tümünün 0,70 eşiğinin üzerinde olduğu görülmektedir. Bu bulgu, ölçek faktörlerinin iç tutarlılık açısından güvenilir olduğunu göstermektedir (Cortina, 1993). Birleşme geçerliği açısından, Ortalama Açıklanan Varyans (AVE) değerinin 0,50'nin ve Birleşik Güvenilirlik (CR) değerinin 0,70'in üzerinde olması beklenmektedir (Fornell & Larcker, 1981). Analiz sonuçlarına göre, CR > 0,70 kriteri tüm faktörler için sağlanırken, AVE > 0,50 kriteri bazı faktörler için karşılanamamıştır. Bununla birlikte, Hair ve arkadaşları (2010) AVE > 0,50 kriterinin esnek bir kural olduğunu ve birleşme geçerliği için CR > 0,70 koşulunun yeterli olabileceğini belirtmiştir. Ayrıca, CR > AVE koşulunun sağlanması da birleşme geçerliğinin bir göstergesi olarak kabul edilmektedir (Yurt, 2023). Bu bulgular ışığında, faktörler için birleşme geçerliğinin genel olarak sağlandığı söylenebilir. Ayrışma geçerliği açısından, Maksimum Paylaşılan Varyans (MSV) değerlerinin AVE değerlerinden küçük olması (MSV < AVE) beklenmektedir. Analiz sonuçları bu koşulun karşılandığını göstermiştir. Ek olarak, Maksimum Güvenilirlik [MaxR(H)] değerlerinin CR değerlerinden yüksek olduğu gözlemlenmiştir. Bu sonuçlar, ölçeğin ayrışma geçerliğinin de sağlandığına işaret etmektedir (Hu & Bentler, 1999). Dolayısıyla, elde edilen bulgular ölçüm modelinin geçerlik ve güvenilirlik açısından kabul edilebilir düzeyde olduğunu desteklemektedir.

4.3. Korelasyon Analizi Sonuçları

Pearson korelasyon katsayıları hesaplanarak hizmetkâr liderlik, işlemsel kontrat, ilişkisel kontrat ve çalışan sesliliği arasındaki ikili ilişkiler incelenmiştir. Ayrıca, hizmetkâr liderlik, işlemsel kontrat, ilişkisel kontrat ve çalışan sesliliği puanlarına ait betimsel değerler hesaplanmıştır. Elde edilen sonuçlar Tablo 3'te yer almaktadır.

Tablo 3: Pearson Korelasyon Katsayıları

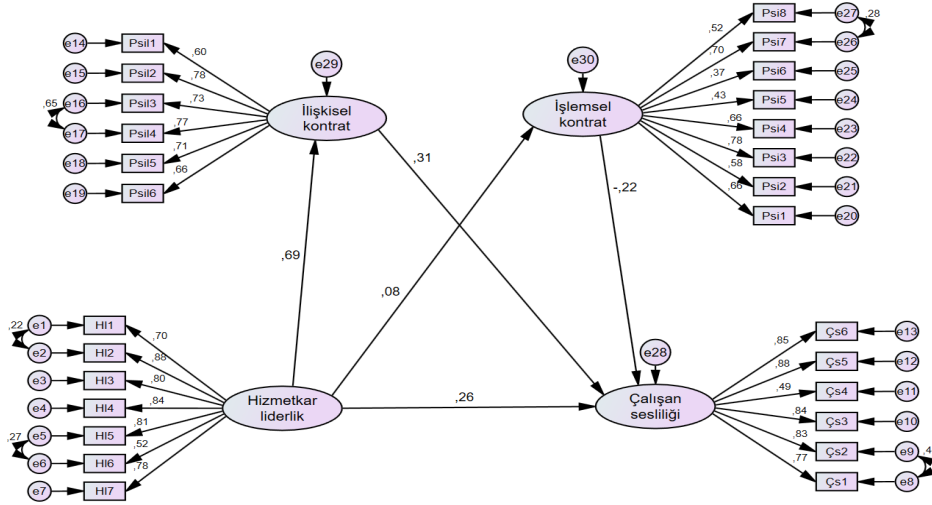
Değişkenler	Ort	Ss	1.	2.	3.	4.
1. Hizmetkâr liderlik	26,11	6,23	1			
2. İşlemsel kontrat	22,18	5,94	,128**	1		
3. İlişkisel kontrat	20,95	5,42	,610**	,116*	1	
4. Çalışan sesliliği	22,36	5,65	,394**	-,126**	,397**	1

**p<0,01; *p<0,05; N=419

Tablo 3, hizmetkâr liderlik, işlemsel kontrat, ilişkisel kontrat ve çalışan sesliliği puanları arasındaki Pearson korelasyon katsayılarını göstermektedir. Hizmetkâr liderlik puanları ile işlemsel kontrat ($r=,128$; $p<0,01$), ilişkisel kontrat ($r=,610$; $p<0,01$) ve çalışan sesliliği ($r=,394$; $p<0,01$) puanları arasında pozitif ve anlamlı ilişkiler bulunmuştur. İşlemsel kontrat puanları ile çalışan sesliliği puanları arasında negatif ve anlamlı bir ilişki vardır ($r=-,126$; $p<0,01$). İlişkisel kontrat puanları ile çalışan sesliliği puanları arasında pozitif ve anlamlı bir ilişki bulunmuştur ($r=,397$; $p<0,01$).

4.4. Yapısal Model

Araştırmanın hipotezlerini test etmek için Şekil 2’de gösterilen yapısal model geliştirilmiş ve test edilmiştir. Algılanan hizmetkâr liderlik bağımsız değişken, işlemsel ve ilişkisel kontrat aracı değişken ve çalışan sesliliği ise bağımlı değişken olarak yapısal modelde yer almıştır. Maksimum olabilirlik yöntemi kullanılarak model test edilmiştir. Hesaplanan uyum iyiliği değerleri ($\chi^2= 778,86$; $Sd= 311$; $\chi^2/sd=2,50$; $p<0,001$; $RMSEA=0,07$; $SRMR= 0,06$; $CFI=0,93$; $TLI= 0,92$; $IFI= 0,93$) modelin veriler ile kabul edilebilir düzeyde uyum gösterdiğini işaret etmiştir (Bollen, 1989; Browne & Cudeck, 1993; Hu & Bentler, 1999; Tanaka & Huba, 1985). Yol katsayısı, standart hata değeri, anlamlılık düzeyi ve güven aralıkları Tablo 3’te gösterilmiştir.



Şekil 2: Yapısal Model

Tablo 4'te gösterilen doğrudan etkiler incelendiğinde, hizmetkâr liderliğin çalışan sesliliğini yordama gücü 0,26'dır (95% GA [0,06; 0,44], $p<0,01$). Hizmetkâr liderlik algısı arttıkça çalışan sesliliği de artış göstermektedir. Bu sonuca göre, H1 hipotezi kabul edilmiştir. İşlemsel kontratın çalışan sesliliğini yordama gücü -0,22'dir (95% GA [-0,34; -0,14], $p<0,01$). İşlemsel kontrat arttıkça çalışan sesliliği azalmaktadır, bu sonuca göre H2a hipotezi kabul edilmiştir. İlişkisel kontratın çalışan sesliliğini yordama gücü 0,31'dir (95% GA [0,15; 0,48], $p<0,01$). İlişkisel kontrat arttıkça çalışan sesliliği de artmaktadır, bu sonuca göre H2b hipotezi kabul edilmiştir. Son olarak, hizmetkâr liderliğin işlemsel kontratı yordama gücü 0,08 (95% GA [-0,07; 0,02], $p>0,05$), ilişkisel kontratı yordama gücü 0,69'dur (95% GA [0,60; 0,78], $p<0,01$). Bu sonuca H3a hipotezi reddedilmiş H3b hipotezi ise kabul edilmiştir. Hizmetkâr liderlik arttıkça ilişkisel kontrat da artmaktadır. Modelde ilişkisel kontratın %47'si işlemsel kontratın %1'i ve çalışan sesliliğin ise %31'i açıklanmıştır.

Tablo 4: Standardize Yol Katsayıları ve Anlamlılık Düzeyleri

Paths			β	B	Sh	p	%95 GA		Sonuç	
							Alt	Üst		
Doğrudan etki										
H1.	H1	--->	Çs	0,26	0,28	0,08	<0,001	0,06	0,44	Kabul
H2a.	İşKo	--->	Çs	-0,22	-0,25	0,06	<0,001	-0,34	-0,14	Kabul
H2b.	İlKo	--->	Çs	0,31	0,35	0,09	<0,001	0,15	0,48	Kabul
H3a.	H1	--->	İşKo	0,08	0,08	0,06	0,130	-0,07	0,20	Red
H3b.	H1	--->	İlKo	0,69	0,66	0,07	<0,001	0,60	0,78	Kabul
Dolaylı etki										
H4a.	H1--->	İşKo o	--->Çs	-0,03	-0,05	0,02	0,386	-0,06	0,02	Red
H4b.	H1--->	İlKo	--->Çs	0,23	0,25	0,07	<0,01	0,11	0,41	Kabul
Toplam etki										
	H1	--->	Çs	0,46	0,49	0,05	<0,001	0,35	0,55	

H1= Hizmetkâr liderlik, İşKo= İşlemsel kontrat, İlKo = İlişkisel kontrat, Çs= Çalışan sesliliği, GA= Güven aralığı

Dolaylı etki incelendiğinde, hizmetkâr liderliğin işlemsel kontrat üzerinden çalışan sesliliğini etkileme gücünün -0,03 95% GA [-0,06; 0,02], $p<0,01$) olduğu ve bu etkinin istatistiksel olarak anlamlı olmadığı gözlenmiştir. Diğer yandan hizmetkâr liderliğin ilişkisel kontrat üzerinden çalışan sesliliğini etkileme gücünün 0,23 (95% GA [-0,06; 0,02], $p<0,01$) olduğu ve bu etkinin istatistiksel olarak anlamlı olduğu belirlenmiştir. Bu sonuca H4a hipotezi reddedilmiş H4b hipotezi ise kabul edilmiştir. İşlemsel kontrat aracı role sahip değildir. Bununla birlikte ilişkisel kontrat hizmetkâr liderlik ile çalışan sesliliği arasındaki ilişkide kısmi aracılık rolüne sahiptir.

5. SONUÇ

Bu çalışma, hizmetkâr liderlik ile çalışan sesliliği arasındaki ilişkiyi incelemiş ve bu süreçte psikolojik sözleşmenin aracılık rolünü değerlendirmiştir. Yapılan analizler, hizmetkâr liderliğin çalışan sesliliği üzerinde anlamlı ve pozitif bir etkisi olduğunu ortaya koymuştur (H1). Bu bulgu, literatürde daha önce yapılan çalışmalarla paralellik göstermektedir (Erkutlu & Chafra, 2005; Liden vd., 2008; Yan & Xiao 2016; Arain vd., 2019; Akgemci vd., 2019; Eva vd., 2019; Song vd., 2020; Liao vd., 2021; Chen vd., 2022; Khan vd., 2023a; Khan vd., 2023b). Elde edilen bu sonuç hizmetkâr liderlik yaklaşımının (Greenleaf, 1970),

temel felsefesi oldukça uyumlu olduğu ifade edilebilir. Ayrıca söz konusu etkinin dayandığı diğer yaklaşımlar ‘Sosyal Değişim Teorisi’ ve ‘Lider-Üye Etkileşim Teorisi’ dir. Sosyal Değişim Teorisi (Blau, 1964), liderlerin çalışanlarına destekleyici ve adil bir yaklaşım sergilediğinde çalışanların örgüte katkı sağlama isteğinin arttığını vurgulamaktadır. Benzer şekilde, Lider-Üye Etkileşim Teorisi (Graen & Uhl-Bien, 1995), yüksek kaliteli lider-çalışan ilişkilerinin çalışan sesliliğini teşvik ettiğini savunmaktadır. Bu sonuçlar, Detert ve Burris (2007) ile Walumbwa ve Schaubroeck (2009) tarafından yapılan çalışmalarda da desteklenmiştir.

Çalışmada test edilen ikinci hipotez (H2), psikolojik sözleşme ile çalışan sesliliği arasındaki ilişkiyi ele almıştır. Sonuçlar psikolojik sözleşme teorisi ile açıklanmaktadır. İşlemsel kontratın çalışan sesliliği üzerinde negatif bir etkiye sahip olduğunu, ilişkisel kontratın ise çalışan sesliliğini desteklediğini göstermiştir. Benzer sonuçlar, Arain vd. (2018), Tokmak (2019), Memon & Ghani (2020) ve Botha & Steyn (2023) tarafından da ortaya konulmuştur. Rousseau (1995)’ e göre işlemsel kontratlar, çalışanların işverenle olan ilişkilerini yüzeysel ve kısa vadeli tuttuğu için, bu durum çalışanların örgüte duygusal bir yatırım yapmasını engellemektedir. Bu düşünce Morrison ve Milliken (2000) tarafından güven ekseninde yorumlanmaktadır. Yani Morrison ve Milliken (2000)’ e göre işlemsel kontratlar, yalnızca görev ve ödül odaklı olduğundan çalışanlar örgüt içerisinde güven geliştiremezler ve geri bildirim vermekten kaçınırlar. İlişkisel ve güven temelli bir iş ortamı çalışan sesliliğini beslemektedir (Detert & Burris, 2007). Çalışanlar üzerinden uzun vadeli bağlılık ve güven gibi unsurlar sesliliği davranışını açığa çıkarmaktadır (Van Dyne & LePine, 1998). Bu durum sosyal değişim teorisi temelinde de açıklanmaktadır. Teoriye göre, çalışanlar örgütle ilişkilerini güven ve uzun vadeli beklentiler üzerine kurduğunda, örgüte duygusal olarak daha bağlı hale gelmektedirler.

Çalışmada test edilen üçüncü hipotez kapsamında, hizmetkâr liderlik ile işlemsel kontrat arasında anlamlı bir ilişki bulunmazken (H3a reddedilmiştir), hizmetkâr liderlik ile ilişkisel kontrat arasında pozitif ve anlamlı bir ilişki olduğu belirlenmiştir (H3b kabul edilmiştir). Hizmetkâr liderlik teorisi, çalışanların somut ve kısa vadeli beklentilerinden ziyade uzun vadeli bağlılık ve güvene dayalı ilişkiler kurmalarına odaklandığı için işlemsel kontratlar üzerinde doğrudan bir etkisi bulunmamaktadır (Rousseau, 1995; Eva vd., 2019). Benzer bulgular, Carter & Baghurst (2014), Panaccio vd. (2015), Dahleez vd. (2021) ve Faraz vd. (2023) tarafından da desteklenmiştir. Bu doğrultuda, hizmetkâr liderliğin çalışanların örgüte olan güvenini artırarak uzun vadeli ilişkisel bağları güçlendirdiği ve bu yolla çalışan sesliliğini teşvik ettiği söylenebilir.

Son olarak, çalışmanın dördüncü hipotezi (H4) kapsamında yapılan

analizlerde, hizmetkâr liderlik ile çalışan sesliliği arasındaki ilişkide işlemsel kontratın aracılık etkisi bulunmamış (H4a reddedilmiştir), ancak ilişkisel kontratın aracılık etkisi anlamlı çıkmıştır (H4b kabul edilmiştir). İşlemsel kontrat, kısa vadeli maddi beklentilere dayandığından, liderlik tarzı ne olursa olsun çalışanlarla uzun vadeli güven ilişkisi kurmada yetersiz kalmaktadır. Buna karşılık, ilişkisel kontratlar uzun vadeli güvene ve bağlılığa dayalı bir iş ortamı sunduğundan, çalışanların sesliliğini teşvik etmektedir. Bu bulgular, Rousseau (2004), Detert & Burris (2007) ve Botha & Steyn (2023) tarafından yapılan çalışmalarda elde edilen sonuçlarla uyumludur.

Teorik açıdan, çalışma, hizmetkâr liderliğin çalışan sesliliği üzerindeki etkisini açıklamak için Hizmetkâr Liderlik Teorisi, Sosyal Değişim Teorisi, Lider-Üye Etkileşim Teorisi ve Psikolojik Sözleşme Teorisi gibi kuramsal çerçevelerden yararlanmıştır. Sosyal Değişim Teorisi'ne göre, liderlerin çalışanlara yönelik destekleyici ve adil tutumları, çalışanların örgüte olan bağlılığını artırmaktadır (Blau, 1964). Lider-Üye Etkileşim Teorisi ise, lider-çalışan ilişkilerinin kalitesinin çalışanların sesliliğini nasıl teşvik ettiğini açıklamaktadır (Graen & Uhl-Bien, 1995). Ayrıca, Psikolojik Sözleşme Teorisi (Rousseau, 1995), çalışanların örgütle kurdukları ilişkilerin niteliğinin örgütsel süreçlere katılım düzeylerini etkilediğini ortaya koymaktadır. Bu çalışma, hizmetkâr liderliğin işlemsel kontratlarla anlamlı bir ilişkisi bulunmadığını, ancak ilişkisel kontratları güçlendirdiğini ve bu yolla çalışan sesliliğini artırdığını ortaya koymuştur.

Araştırma sonuçları, örgütlerde liderlik uygulamaları ve insan kaynakları politikalarının gözden geçirilmesi gerektiğini ortaya koymaktadır. Öncelikle, hizmetkâr liderlik anlayışının benimsenmesi önemlidir. Liderlerin çalışan gelişimine odaklanmaları, onların fikirlerini dinlemeleri ve güven ortamı oluşturmaları, çalışan sesliliğini desteklemektedir. Ayrıca, örgütlerin psikolojik sözleşmeleri bilinçli biçimde yönetmeleri gerekmektedir. Çalışma, ilişkisel sözleşmelerin örgüte bağlılık ve seslilik davranışını teşvik ettiğini göstermektedir. Bunun yanında, örgüt içi iletişim şeffaf ve katılımcı bir yapıya kavuşturulmalı; çalışanların görüşlerini ifade edebilecekleri etkili geri bildirim mekanizmaları oluşturulmalıdır. Dijital araçlardan faydalanarak, çalışanların görüşlerini iletebileceği çevrimiçi platformlar geliştirilebilir. Son olarak, örgüt kültürü, çalışanların fikirlerini özgürce paylaşabilecekleri güvenli bir yapıya dönüştürülmeli ve bu süreç liderlik tarafından desteklenmelidir.

Sonuç olarak, hizmetkâr liderlik, çalışan sesliliğini teşvik eden etkili bir liderlik modeli olup, bu süreçte ilişkisel psikolojik sözleşmeler belirleyici bir rol oynamaktadır. Örgütlerin, hizmetkâr liderlik anlayışını benimseyerek çalışanlarla güven temelli ilişkiler kurmaları, çalışan sesliliğini artırmada stratejik bir

yaklaşım sunmaktadır. Bununla birlikte, araştırmanın bazı sınırlılıkları bulunmaktadır. Çalışma yalnızca Marmara Bölgesi'ndeki işletmelerde uygulanmış ve kesitsel bir tasarımla gerçekleştirilmiştir. Bu durum, bulguların genellenebilirliğini ve nedensellik ilişkilerinin değerlendirilmesini sınırlamaktadır. Ayrıca, veriler katılımcıların öznel beyanlarına dayandığı için yanıltıcı yanlılığını ve zaman kısıtı gibi etkenlerle yüzeysel cevaplar verilmiş olma ihtimalini barındırmaktadır. Bu riski azaltmak amacıyla kısa ve sade ölçeklerden oluşan soru formları tercih edilmiştir. Ancak bu durum, ana değişkenlerin tüm alt boyutlarını içeren daha kapsamlı formların dışlanmasına ve kapsam sınırlılığına yol açmıştır. Gelecek araştırmalarda farklı sektör ve bölgelerden örneklerle benzer analizlerin gerçekleştirilmesi, bulguların genellenebilirliğini güçlendirecektir. Ayrıca, boylamsal ve nitel araştırma yöntemlerinin kullanımı, liderlik ve psikolojik sözleşme dinamiklerinin zaman içindeki değişimini daha sağlıklı biçimde ortaya koyabilir. Alternatif liderlik yaklaşımlarının psikolojik sözleşme türleri ve çalışan sesliliği üzerindeki etkileri de karşılaştırmalı biçimde ele alınabilir. Bu doğrultuda, örgütlerin çalışan katılımını destekleyen liderlik biçimlerini benimsemeleri ve güven temelli ilişkileri güçlendirmeleri, çalışan sesliliğini artırmada etkili olacaktır.

6. ÇIKAR ÇATIŞMASI BEYANI

Yazarlar arasında çıkar çatışması bulunmamaktadır.

7. MADDİ DESTEK

Bu çalışmada herhangi bir fon veya destekten yararlanılmamıştır.

8. YAZAR KATKILARI

CZ, EB: Fikir;

CZ, EB: Tasarım;

CZ, EB: Denetleme;

CZ, EB: Kaynakların toplanması ve/veya işlemesi;

CZ, EB: Analiz ve/veya yorum;

CZ, EB: Literatür taraması;

CZ, EB: Yazıyı yazan;

CZ, EB: Eleştirel inceleme;

9. ETİK KURUL BEYANI VE FİKRİ MÜLKİYET TELİF HAKLARI

Çalışmada etik kurul ilkelerine uyulmuştur ve fikri mülkiyet ve telif hakları ilkesine uygun olarak gerekli izinler alınmıştır.

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Z KUŞAĞI TÜKETİCİLERİN MINİMALİZM YÖNELİMLERİNİN YAŞAM TATMİNİ ÜZERİNDEKİ ETKİSİ: KENDİNİ GERÇEKLEŞTİRMENİN ARACILIK ROLÜ¹



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ÖZ | Kaynakların hızla tüketildiği günümüzde geleceği şekillendirme potansiyeline sahip olan Z kuşağının minimalizm yönelimlerinin araştırılması, sürdürülebilir uygulamaları teşvik edecek pazarlama stratejilerinin benimsenmesi açısından önemlidir. Bu araştırmanın amacı Z kuşağı tüketicilerin minimalizm yönelimlerinin yaşam tatmini üzerindeki etkisini tüketici davranışları kapsamında araştırmaktır. Araştırmada nicel yöntemler kullanılmıştır. Çalışmanın örneklemini Z kuşağı olarak sınıflandırılan 18-26 aralığındaki tüketiciler oluşturmaktadır. Kolayda örnekleme ile çevrimiçi anket yöntemi kullanılarak 228 katılımcıdan veri toplanmıştır. Araştırmanın analizleri En Küçük Kareler Yöntemi Yapısal Eşitlik Modellemesi (EKKY-YEM) ile gerçekleştirilmiş; tanımlayıcı istatistikler için SPSS yazılımı kullanılmıştır. Çalışma sonuçlarına göre minimalizmin Z kuşağı tüketicilerinin yaşam tatmini üzerinde doğrudan bir etkisi bulunmamaktadır. Bununla birlikte, minimalizmin kendini gerçekleştirme üzerinde olumlu bir etkisi olduğu; kendini gerçekleştirmenin ise yaşam tatmini üzerinde pozitif bir etkisinin bulunduğu sonucuna ulaşılmıştır. Ayrıca, kendini gerçekleştirmenin, minimalizmin yaşam tatmini üzerindeki etkisinde tam aracı rol oynadığı belirlenmiştir. Bu doğrultuda, minimalizmin yaşam tatminini artırabilmesi, Z kuşağının psikolojik gereksinimlerinden biri olan kendini gerçekleştirme ihtiyacını karşılaması durumunda mümkün olmaktadır.

Anahtar Kelimeler: Tüketici minimalizmi, yaşam tatmini, Z kuşağı, kendini gerçekleştirme, sürdürülebilir tüketim

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THE EFFECT OF MINIMALISM ON LIFE SATISFACTION OF GENERATION Z: THE FULL MEDIATION ROLE OF SELF- FULFILLMENT



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ABSTRACT

Investigating

Generation Z's minimalism orientation is critical for adopting strategies that promote sustainable practices, given that the rapid depletion of resources. The study aims to explore the impact of Generation Z consumers' minimalism orientation on their life satisfaction in the scope of consumer behaviour. This study aims to examine the impact of Generation Z consumers' minimalism orientation on their life satisfaction within the scope of consumer behavior. A quantitative research method was employed, and the sample consisted of 228 participants aged between 18 and 26, classified as members of Generation Z. Data were collected using an online survey through convenience sampling. Partial Least Squares Structural Equation Modeling (PLS-SEM) was used for the analysis via SmartPLS software, and descriptive statistics were obtained through SPSS. The findings revealed that minimalism does not have a direct effect on life satisfaction among Generation Z consumers. However, minimalism positively influences self-fulfillment, and self-fulfillment, in turn, has a significant positive impact on life satisfaction. Furthermore, self-fulfillment was found to have a full mediating role in the relationship between minimalism and life satisfaction. Accordingly, minimalism enhances life satisfaction only when it meets psychological needs such as self-fulfillment among Generation Z consumers.

Keywords: Consumer minimalism, life satisfaction, generation Z, self fulfillment, sustainable consumption

JEL Codes: M30, M31, M39

Scope: Business administration

Type: Research

1. GİRİŞ

Günümüzde tüketici davranışları, çevresel sorunların önemli nedenlerinden biri olarak dikkat çekmektedir. Hızlı tüketim kültürü ve plansız tüketim alışkanlıkları, doğal kaynakların tükenmesine, atıkların artmasına ve ekosistemlerin zarar görmesine yol açmaktadır. Özellikle, gereksiz tüketim ve kısa ömürlü ürünlere olan talep, karbon ayak izinin büyümesine ve çevresel sürdürülebilirlik hedeflerinin tehdit altına girmesine neden olmaktadır. Bu bağlamda, tüketici davranışlarında sürdürülebilirlik hem bireysel hem de toplumsal düzeyde çevreye olan olumsuz etkilerin azaltılması için kritik bir öneme sahiptir (Jianping vd., 2014).

Aşırı tüketimin çevreye verdiği zararların farkında olan tüketiciler, doğa ile olan ilişkilerini yeniden kurmak için çeşitli alternatif çözümler aramaktadır. Bu arayışlar, tüketim karşıtı yaşam biçimlerinin ve sosyal hareketlerin gelişmesine olanak tanımaktadır. Materyalist değerlerin neden olduğu tatminsizlik ve aşırı tüketimin çevresel sonuçları, bu yaşam tarzlarının temelini teşkil etmektedir. Tüketim karşıtı düşünce biçimi hayatı daha anlamlı kılmak ve daha bilinçli bir şekilde sürdürmenin yollarını keşfederek alternatif yaşam biçimleri geliştirmeye yönelmektedir (Taş, 2020, s.39). Sürdürülebilir tüketim alışkanlıklarını teşvik eden yaklaşımlar, yalnızca çevresel zararı en aza indirmekle kalmayıp, aynı zamanda bireylerin daha bilinçli ve tatmin edici bir yaşam tarzı benimsemelerine de katkı sağlamaktadır (Wilson & Bellezza, 2022, ss. 796-797). Minimalizm, bu noktada, sürdürülebilir tüketim için güçlü bir araç olarak öne çıkan ve bireyleri daha az tüketerek daha çok değer yaratmaya yönlendiren bir yaklaşım olarak değerlendirilebilir. Minimalizm, maddi sahiplikleri azaltmayı ve maddi eşyalar yerine deneyimlere odaklanmayı öncelik haline getiren bir yaşam tarzı tercihidir. Maddi sahiplikleri azaltmaya yönelik bu odaklanma, tüketimi ve atıkları azaltmayı teşvik ettiği için sürdürülebilir tüketimle uyumludur. Minimalizm tüketici davranışlarında kasıtlı bir paradigma değişimi olarak sürdürülebilir tüketim araştırmalarında benimsenebilecek bir yaklaşım olarak karşımıza çıkmaktadır (Kang, Martinez, & Johnson, 2021, s. 802).

Minimalizm, geçmişte estetik, iç mimari tasarım alanında ele alınan bir kavram olup sürdürülebilir tüketim alanında henüz netleşmiş bir tanımı bulunmamaktadır. Tüketici davranışlarında yeni bir olgu olup kuramsallaştırılmasına yönelik çalışmalar (Kang vd., 2021; Wilson & Bellezza, 2022) hız kazanmış durumdadır. Kang ve diğerleri (2021), minimalizmi sürdürülebilir tüketimin bir ögesi, sürekli bir yaşam tarzı olarak tanımlamaktadır. Tüketimin azaltılması, dağınıklığın ortadan kaldırılması gibi tüketim uygulamalarını kapsayan minimalizmin, tüketicilerin yaşam kalitesini artırdığını

gösteren çalışma sayısı giderek artmaktadır (Jain, Gupta, & Verma, 2024; Malik & Ishaq, 2023). Ancak, söz konusu çalışmaların çoğunlukla gelişmiş ülkelerde yapıldığı, gelişmekte olan ülkelerde konunun ihmal edildiği görülmektedir. Nejad, Skeiseid ve Våland (2024), gelişmekte olan ülkelerde minimalizm gibi tüketimi azaltma çabalarına yönelik araştırmaların az olmasının büyük bir boşluk oluşturduğunu ifade etmektedir. Bu boşluğu doldurmak için araştırmada minimalizm gelişmekte olan bir ülke olarak Türkiye’de ele almaktadır. Bununla birlikte, Fu, Zhang ve Nagai (2024), minimalizmin yaşam tatmini üzerindeki etkilerini Asya kültürü bağlamında ele almış olup farklı kültürlerde konunun ele alınmasını önermektedir. Bu öneri doğrultusunda bu çalışmada minimalizmin yaşam tatmini üzerindeki etkileri Asya, Avrupa ve Ortadoğu coğrafyasında köprü durumunda olup farklı bir geçiş kültürüne sahip Türkiye’de ele alınmaktadır. Jain ve diğerleri (2024), Y kuşağı üzerinde yaptıkları çalışmada minimalizmin yaşam tatmini üzerindeki etkilerini ele almakta ve çalışmanın farklı jenerasyonlarda ele alınmasını önermektedir. Bu çalışmada minimalizmin yaşam tatmini üzerindeki etkileri Z kuşağı özelinde araştırılmaktadır. Z Kuşağı, dijitalleşme ve bilgiye hızlı erişim gibi faktörlerle şekillenen bir nesil olarak, daha bilinçli ve sürdürülebilir tüketim tercihlerine eğilim göstermektedir (Statista, 2024). Bu kuşağın tüketici davranışları üzerinde minimalizmin etkisini incelemenin, yalnızca özne iyi oluş düzeyindeki değişiklikleri anlamak için değil, aynı zamanda çevresel ve toplumsal sürdürülebilirlik hedeflerine ulaşmak için de kritik öneme sahip olduğu düşünülmektedir.

Bu çalışmanın amacı minimalizmin Z kuşağı tüketicilerinin yaşam tatmini üzerindeki etkisi ile kendini gerçekleştirmenin bu etkideki aracılık rolünü araştırmaktır. Söz konusu ilişkiler Öz Belirleme Teorisi (SDT) (Ryan & Deci, 2000) temelinde değerlendirilmiştir. SDT’ye göre bireyin temel psikolojik gereksinimlerinin tatmini, içsel motivasyon düzeyini arttırarak karar alma süreçleri ve davranış eğilimleri üzerinde belirleyici bir rol oynamaktadır. Kendini gerçekleştirme gibi psikolojik gereksinimler içsel motivasyon unsuru olup söz konusu gereksinimlerin giderilmesi bireyin motivasyonunu arttırmaktadır (Ryan & Deci, 2000, s.71). Tüketici davranışlarında yaşam tatmini çalışmaları, tüketim yönelimlerinin tüketicilerin bir sorununu çözerek yaşam tatmini sağladığı varsayımına dayanmaktadır (Grzeskowiak & Sirgy, 2015). Bu bağlamda bu çalışmada; “Minimalist tüketim Z kuşağı tüketicilerin yaşam tatminini arttırıyor mu? Minimalist tüketim Z kuşağı tüketicilerinin kendini gerçekleştirme gereksinimini karşılıyor mu? Tüketicilerin minimalist tüketim faaliyetlerinin kendini gerçekleştirme gereksinimini karşılayarak (sorunu çözerek) yaşam tatminini arttırıyor mu? sorularına cevap aranmaktadır.

Bu çalışma alan yazına şu katkıları sağlamaktadır. Bu çalışmada

minimalizmin yaşam tatmini üzerindeki etkisi Z kuşağı özelinde araştırılmıştır. Bu bağlamda, yapılan incelemede tüketici davranışları alan yazınında Z kuşağı üzerinde yapılmış çalışmaya rastlanmamıştır. Bu durum çalışmanın özgün değerini arttırmakla birlikte Z kuşağının minimalizm yönelimlerinin ele alınması gerek ulusal gerekse uluslararası Z kuşağı tüketim alan yazınına katkı sağlamaktadır. Minimalizm tüketici davranışlarında bir paradigma değişimi olarak tanımlanan çok yeni bir kavramdır (Wilson & Bellezza, 2022). Bu nedenle kendini gerçekleştirmenin minimalizm ile öznel iyi oluş ilişkisindeki tam aracılık etkisi minimalizmin teorik olarak geliştirilmesine ve ilgili yazının zenginleşmesine katkı sağlamaktadır.

Nejad ve diğerleri (2024), gelişmekte olan toplumların bireysel düzeyde tüketim alışkanlıklarının düşürülmesine yönelik araştırmaların eksikliğine ve önemine dikkat çekmektedir. Buna göre bu çalışma gelişmekte olan ülke kategorisindeki Türkiye örneğinde bireysel düzeyde anti tüketim alışkanlıklarına yönelik sonuçlar sunması açısından ulusal ve uluslararası sürdürülebilir tüketim alan yazınına katkı sağlamaktadır. İşletmeler açısından bakıldığında günümüzde sürdürülebilirliğe karşı farkındalığın giderek artması minimalizm tüketim şeklini benimseyecek bir tüketici kitlesinin ortaya çıkarabilir. Bu kitlenin özelliklerinin anlaşılması söz konusu tüketicilere yönelik pazar bölümlendirme stratejilerinin geliştirilmesine yardımcı olabilir. Bu bağlamda bu çalışma ile uygulayıcılara öneriler sunulmaktadır.

2. TEORİK ARKA PLAN

2.1. Öz Belirleme Teorisi ve Minimalizm

Ryan ve Deci (2000), tarafından geliştirilen SDT, bireylerin davranışlarını yönlendiren motivasyon kaynaklarını açıklamak amacıyla geliştirilmiş bir motivasyon kuramıdır. Teori, bireylerin üç temel psikolojik gereksinime sahip olduğunu varsaymaktadır: özerklik, yetkinlik ve ilişkilenme. Bu gereksinimlerin karşılanması, bireyin içsel motivasyonunu güçlendirmekte ve daha sağlıklı, tatmin edici bir yaşam sürmesine katkıda bulunmaktadır. Özerklik, bireylerin kendi davranışlarını ve kararlarını kontrol etme, seçimlerini özgürce yapma ve yaşamlarını bağımsız bir şekilde yönlendirme yetisini ifade etmektedir. Bireyler, eylemlerinin kontrolünü ellerinde bulundurduklarında, daha güçlü bir içsel motivasyon geliştirme eğiliminde olmaktadır (Andersen, Chen & Carter, 2000; Ryan & Deci, 2000). Yetkinlik, bireylerin sahip oldukları beceri ve yetenekleri geliştirmelerine ve bu yetileri etkili biçimde kullanabilmelerine atıfta bulunmaktadır. Bu gereksinim, bireylerin kendilerini başarılı ve etkili hissetmelerine katkı sağlamaktadır (Kowal & Fortier, 1999). İlişkililik ise bireylerin diğer insanlarla anlamlı sosyal bağlar kurma ve bu bağlar aracılığıyla

kabul görme ve aidiyet hissetme gereksinimlerini kapsamaktadır (Ryan & Deci, 2000).

Minimalist tüketim, bireyin daha az maddi tüketime yönelerek yaşamında daha fazla anlam ve tatmin aramasını teşvik eden bir yaşam biçimidir (Wilson & Bellezza, 2022). Bu yaklaşım, bireylerin tüketim kararlarında daha bilinçli ve kasıtlı tercihler yapmalarına olanak sağlamaktadır. Söz konusu tercihler, bireyin kendi değerlerine ve yaşam amacına uygun seçimler yapması anlamına geldiğinden, bireyin özerklik ihtiyacını destekleyeceği söylenebilir. Ayrıca, minimalistlerin kaynaklarını daha etkili yönetmesi ve yaşamındaki karmaşayı azaltması, yetkinlik hissini güçlendirirken; materyal odaklılıktan uzaklaşıp deneyim ve ilişkilerle daha derin bağlar kurması, ilişkililik ihtiyacını karşılayabilir (Kang, Martinez, & Johnson, 2021).

SDT çerçevesinde, bireylerin psikolojik ihtiyaçlarının tatmini, içsel motivasyonun artmasına ve buna bağlı olarak davranışsal ve duygusal sonuçların daha olumlu olmasına neden olmaktadır (Ryan & Deci, 2000). Bu bağlamda, minimalist tüketim biçimi, bireylerin yalnızca çevresel fayda sağlama çabası değil, aynı zamanda kendi içsel gelişimlerine ve kendini gerçekleştirme süreçlerine katkıda bulunma arzusuyla da ilişkilidir. Kendini gerçekleştirme, bireyin potansiyelini tam anlamıyla ortaya koyma ve yaşamını anlamlı bir şekilde sürdürme çabasıdır (Grzeskowiak & Sirgy, 2015). SDT'ye göre bu tür psikolojik ihtiyaçların karşılanması, bireyin içsel motivasyonunu artırmakta ve yaşam tatmini üzerinde pozitif etkiler oluşturmaktadır (Ryan & Deci, 2000, s. 71).

Bu çerçevede, çalışmada ele alınan modelde minimalist tüketimin Z kuşağı tüketicilerinin yaşam tatmini üzerindeki etkisinin, kendini gerçekleştirme ihtiyacının karşılanması yoluyla dolaylı bir şekilde gerçekleştiği varsayılmaktadır. SDT'nin, minimalist tüketim ile yaşam tatmini arasındaki ilişkinin kuramsal temellendirilmesi açısından güçlü bir açıklayıcı çerçeve sunduğu düşünülmektedir.

2.2. Minimalizm ve Yaşam Tatmini

Tüketici minimalizmi, az sayıda mal ve mülkiyete sahip olmayı temel alan bilinçli bir tüketim yaklaşımıdır. Minimalist tüketiciler, kasıtlı olarak daha az eşya ile yaşamayı tercih etmekte, genellikle küçük evde yaşama, sıfır atık hareketi ve çeşitli kiralama hizmetleri gibi tüketim uygulamalarını benimsemektedir (Wilson & Bellezza, 2022, s. 797). Pangarkar, Shukla ve Charles (2021), minimalist tüketim uygulamalarını gönüllü sadelik, azaltılmış tüketim, anti-tüketim ve gösterişsiz minimalizm olmak üzere dört boyutta ele almaktadır. *Gönüllü sadelik*, tüketicilerin daha az eşya ile yaşamayı tercih ederek, daha sade ve anlamlı bir yaşam sürme yönelimini ifade etmektedir (Hook, Hodge,

Zhang, Van Tongeren, & Davis, 2023, s.131). *Azaltılmış tüketim boyutu* tüketicilerin edinimlerini miktar olarak sınırlandırmalarını ifade etmektedir. Bu yönelimdeki tüketiciler satın alacakları ürünleri kalitesine, fonksiyonelliğine ve kendi yaşam tarzına uygunluğuna göre özenli bir şekilde seçerek anlamlı bir bütün oluşturmaktadır. Bu yaklaşım, tüketim alışkanlıklarını gözden geçirme ve daha az ama daha değerli olan şeylere odaklanma isteği ile ilişkilidir. Gösterişsiz minimalizm bireylerin sosyal çevrelerinden etkilenecek daha sade ve işlevsel ürünlere yönelmelerini vurgulamaktadır (Meissner, 2019, s. 187). *Anti-tüketim*, bireylerin belirli ürün ve hizmetlerin tüketim uygulamalarına karşı duyduğu güçlü bir nefret ve tiksinti duygusuna atıfta bulunmaktadır. Anti-tüketim, bireylerin belirli tüketim biçimlerine karşı duruş sergileyerek, bu ürünleri kullanmaktan kaçınmalarını içerir. Bu yaklaşım, daha sürdürülebilir ve anlamlı bir yaşam sürme arzusunu desteklerken, aynı zamanda tüketim kültürünün eleştirilmesine de olanak tanımaktadır. Zalewska ve Cobel-Tokarska (2016), minimalizmin tüketimi karşıt bir şekilde ele almadığını veya sona erdirmediğini savunmaktadır. Ancak, bireysel ahlaki tüketim kararlarının merkezine koyarak etik tüketim davranışlarını vurgulamaktadır ve bu perspektiften tüketim toplumuna karşı bir duruş sergilemektedir. Bu yaklaşımı benimseyen bireyler, maddi tüketimi sınırlarken, tüketim değerinden ödün vermezler. Bu bireyler, işlevselliği prestij, sembolizm ve marka değerine tercih ederek satın alma yaparlar. Uzun ömür ve dayanıklılık gibi özelliklere odaklanarak, ihtiyaç duyduklarında ürünlere bakım yapar veya onarımlarını gerçekleştirirler ve gereksiz atıkları azaltarak gerekli eşyalarını korurlar. Sonuç olarak, minimalist yaşam tarzı maddi tüketimi tamamen terk etmez, aksine bilinçli tüketimi vurgular (Kang vd., 2021; Shafqat, Ishaq, & Ahmed, 2023, s. 8).

Minimalizm, bir yaşam tarzı olarak, pek çok kişi tarafından maddi kısıtlamalar nedeniyle değil, yaşam doyumu, mutluluk ve dolu bir hayat elde etmek için benimsenen yeni ortaya çıkan bir düşüncedir. Tüketim süreçlerinin başlangıcından (satın alma kararları) sonuna (atım davranışı) kadar geniş bir yelpazeyi kapsayan bütünsel bir yaşam tarzı sunmaktadır. Bu bağlamda minimalizm, sürdürülebilir tüketim için yeni bir paradigma sunmaktadır. Bireyler, minimalizmi benimseyerek dağınıklığı giderebilir, yeni alımlarda dikkatli olabilir, ürünlerin dayanıklılığına önem verebilir ve öz yeterlilik değerini benimseyebilirler. Bu uygulamalar, daha bilinçli ve sürdürülebilir bir yaşam tarzı geliştirmeye yardımcı olmaktadır (Shafqat vd., 2023, s. 9). Geçmiş çalışmalarda gönüllü sadelik ile birbiri yerine kullanılan kavramlar olsa da minimalizm, yalnızca tüketim azaltmayı değil aynı zamanda bu süreçlerin anlaşılmasını da teşvik eden tüketicilerin satın alma kararlarını daha dikkatli ve düşünceli bir şekilde vermelerini ifade eden yaklaşımıyla gönüllü sadeliğin önüne geçmektedir

(Matte vd., 2021).

Günümüzde bir tüketim biçimi olarak minimalizm çalışmaları henüz başlangıç aşamasında olup çalışmalar minimalizmin kavramsallaştırmasını (Wilson & Belezza, 2022; Kang vd., 2001), minimalist tüketim patriklerine etki eden faktörleri (Gong Zhang, & Wang, 2023), minimalizmin tüketici iyi oluş haline etkileri (Jain vd., 2024; Malik & Ishaq, 2023) ile minimalizmin sürdürülebilir tüketim üzerindeki etkilerine (Shukla, Mishra, Chatterjee, & Arora, 2023; Mishra, Moharana, Sharma, & Kautish, 2024) odaklanmaktadır. Martin Woodhead (2022), minimalist tüketicilerin çevresel kaygılar, etik kaygılar ve iyi oluş motivasyonu ile minimalizm uygulamalarını gerçekleştirdiklerini ifade etmektedir. Jain ve diğerleri (2024), çevresel farkındalık, modern estetik, gönüllü sadelik, kaynak paylaşımı, normatif etkinin minimalizm üzerinde olumlu etkileri olduğunu bulmuştur. Minimalizm çalışmaları henüz başlangıç aşamasında olsa da en yaygın sonuçlarından biri tüketicilerin iyi oluş hallerini arttırdığıdır (Kang vd., 2021). Bu çalışmada minimalizmin yaşam tatmini üzerindeki etkisi ele alınmaktadır. Alan yazında çalışmalar yaşam memnuniyetini yaşam heyecanı, duygusal iyi oluş, depresyon gibi ölçekler ile ölçmektedir. Bu çalışmada tüketicilerin iyi oluş halleri Diener' in (1985) yaşam tatmini ölçeği ile ölçülmüştür.

Öznel iyi oluş, bireylerin yaşamlarından duydukları memnuniyete ilişkin bilişsel ve duygusal değerlendirmelerini kapsar. İnsanlar, istedikleri hedefe ulaşarak veya ihtiyaçlarını karşılayarak iyi oluş haline ulaşabilirler. Öznel iyi oluş, mutluluk, yaşam tatmini, moral ve olumlu etki gibi çeşitli kavramlar altında yapılan çalışmaları kapsamaktadır (Diener, 1984, s. 584). İyi oluşun bilişsel bileşeni olan yaşam tatmini, bireylerin yaşamlarını kendi belirledikleri ölçütlere dayanarak değerlendirdikleri, öznel bir karar verme sürecidir (Shin & Johnson, 1978, s. 478). Bu değerlendirme sürecinde, bireyler mevcut yaşam koşullarını belirledikleri standartlarla kıyaslamaktadır. Yaşam koşulları ile standartlar arasındaki uyum ne kadar yüksekse, bireyin yaşam doyumu da o ölçüde artış göstermektedir (Pavot & Diener, 1993, s. 164). Tüketici araştırmalarında yaşam tatmini tüketicilerin pazarlama faaliyetlerinin mutluluk düzeyine nasıl etki ettiğini ele almaktadır. Tüketim ürünleri ile yaşam tatmini arasındaki ilişkiyi açıklayan bir grup araştırma, tüketicilerin kimlikleri (benlikleri) ile tüketim davranışlarının uyumlu olmasının mutluluk düzeylerini arttırdığını göstermektedir (Diener, Suh, Lucas, & Smith, 1999). Bununla birlikte, materyalist eğilimleri yüksek olan tüketicilerin mutsuzluk, depresyon ve düşük yaşam tatmini deneyimledikleri alan yazındaki en güçlü bulgulardan biridir (Kasser, 2002, s. 22; Richins & Dawson, 1992, s. 123).

Buna göre, materyalist eğilimler, bireylerin içsel değerleri ve kişisel

ilişkileri yerine maddi kazanımlara odaklanmalarına neden olmaktadır. Maddi kazanımlar kısa süreli memnuniyet yaratsa da uzun vade de yaşam tatminin düşmesine neden olmaktadır (Richins & Dawson, 1992). Bu bağlamda, materyalist değerlerin, bireylerin yaşamlarını daha yüzeysel bir şekilde değerlendirmelerine ve derin anlam arayışından uzaklaşmalarına yol açtığı söylenebilir. Bu durum minimalizm gibi tüketim karşıtı yönelimlerin çıkış noktasını oluşturmaktadır. Tüketim karşıtı yaşam tarzlarının temelinde içsel, manevi zenginleşme fikri yaygın olarak kabul görse de yeni bir materyalizm karşıtı yönelim olarak minimalizmin yaşam tatmini üzerindeki etkilerini ele alan çalışmalar henüz başlangıç aşamasındadır. Bu bağlamda, bu çalışmada minimalizmin yaşam tatmini üzerindeki etkisi Z kuşağı bağlamında araştırılmaktadır.

Yapılan araştırmalar (Kang vd., 2021; Shafqat vd., 2023) minimalizmin tüketicilerin iyi oluş hallerini olumlu etkilediğini göstermektedir. Lloyd ve Pennington (2020), minimalizmin bireylere özerklik (bağımsızlık), yetkinlik, daha fazla zihinsel alan ve artan pozitif duygular sağlayarak eudaimonik (anlam ve amaç odaklı) iyi oluşu artırdığını göstermektedir. Jain ve diğerleri (2024), çalışmalarında minimalizmin tüketici öznel iyi oluş üzerinde olumlu etkisi olduğunu ortaya koymuştur. Shafqat ve diğerleri (2023), pandemi sürecinde minimalizmin tüketicilerin duygusal iyi oluş halleri üzerindeki etkisini araştırmışlardır. Çalışma sonuçları minimalizmin iyi olma haliyle anlamlı ve olumlu bir ilişkiye sahip olduğunu ve depresyonla negatif bir ilişkiye sahip olduğunu ortaya koymuştur. Malik ve Ishaq (2023), minimalizmin finansal refah ve mutluluk üzerinde doğrudan bir etkiye sahip olduğunu ortaya koymuştur. Kang ve diğerleri (2021), yaptıkları çalışmada minimalizmin duygusal iyi oluş ve depresyon üzerindeki etkilerini ele almıştır. Çalışma sonucunda minimalizmin duygusal iyi olma üzerinde olumlu, depresyon üzerinde olumsuz etkisinin olduğu ortaya çıkmıştır. Fu ve diğerleri (2024), Çin’de yaptıkları çalışmada minimalizm ile genel kişisel iyi oluş arasındaki ilişkiyi incelemiştir. Minimalizmin, özellikle gereksiz eşyalardan arınma yoluyla, bireysel öznel iyi oluş üzerinde anlamlı bir olumlu etki yarattığını ortaya koymuştur.

Bu bağlamda bu çalışmada SDT’nin varsayımları ile uyumlu olarak, minimalist yaşam tarzı uygulamalarının tüketicilerin özerklik, yetkinlik ve ilişkililik gereksinimlerini karşılayacağını ve bunun sonucunda tatminlerinin artacağı ileri sürülmektedir. Çalışmanın hipotezi aşağıdaki gibidir.

H1.Minimalizmin yaşam tatmini üzerinde anlamlı ve olumlu etkisi vardır.

2.3. Minimalizm ve Kendini Gerçekleştirme

Kendini gerçekleştirme, bireyin potansiyelini en üst düzeye çıkarma ve kişisel hedeflerine ulaşma sürecini ifade etmektedir. Bu kavram, Maslow'un ihtiyaçlar hiyerarşisinde en üst düzeyde yer almakta ve bireyin kendini ifade etmesi, yaratıcılığı, içsel tatmini ve başkalarına yardım etme gibi unsurları içermektedir (Maslow, 1954, ss. 327-328; McLeod, 2007). Maslow'un ihtiyaçlar hiyerarşisi, bireylerin motivasyonlarını ve ihtiyaçlarını belirli bir sıraya göre düzenleyen bir teoridir. Bu hiyerarşi, beş temel ihtiyaç seviyesinden oluşur ve her bir seviye, bir önceki seviyenin tatmin edilmesine bağlıdır. Maslow (1954), hiyerarşinin en alt seviyesinde fizyolojik gereksinimlerin olduğunu ikinci seviyede ait olma duygusu ve saygı gibi sosyal ve duygusal gereksinimlerinin olduğunu, hiyerarşinin en üst seviyesinin ise kendini gerçekleştirme gereksiniminin olduğunu ifade etmektedir. Kendini gerçekleştirme, bireyin içsel tatminini sağlarken, aynı zamanda çevresine ve güzel nesnelere karşı bir ilgi ve alturizm (başkalarını düşünme) geliştirmesini de ifade eder. Bu aşamada birey, sadece kendi ihtiyaçlarını değil, aynı zamanda başkalarının ihtiyaçlarını da gözetir. Kendini gerçekleştirme, bireyin psikolojik ve duygusal ihtiyaçlarının tatmin edilmesiyle doğrudan ilişkilidir. Bu süreç, bireyin kendine güvenini artırır, özsaygısını güçlendirir ve genel yaşam memnuniyetini yükseltir (Taormina & Gao, 2013). Kang ve diğerleri (2021), minimalizmin tüketime karşı bir duruş olduğunu ifade etmektedir. Minimalizm gibi anti-materyalist yönelimlerin çıkış noktasının gelecek nesiller için kaynakların sürdürülebilirliğinin sağlanması olduğu düşünüldüğünde minimalist tüketicilerin alturistik özellikler gösterdiği söylenebilir. Alturistik desenler kendini gerçekleştirme sürecinin bir unsuru olup minimalizmin tüketicilerin kendini gerçekleştirme gibi gereksinimlerine katkıda bulunacağı söylenebilir. Rich Hanna, Wright ve Bennett (2017), gönüllü sadelik, psikolojik ihtiyaç tatmini ve yaşam memnuniyeti arasındaki ilişkiyi ele almıştır. Sonuçlar sade yaşam biçiminin yaşam memnuniyeti üzerindeki olumlu etkisi olduğunu ortaya koymuştur. Özerklik, yetkinlik ve ilişki kurma ihtiyaçları psikolojik ihtiyaçlar olarak gönüllü sadelik ve yaşam tatmini ilişkisine aracılık ettiği bulunmuştur. Jain ve diğerleri (2024), Y kuşağı üzerinde yaptığı çalışmada minimalizm yaşam tarzının tüketicilerin kendini gerçekleştirme ihtiyaçları üzerinde olumlu etkisi olduğunu ortaya koymuştur. Minimalist bir yaşam tarzı benimseyen bireyler, maddi nesnelerden ziyade, kişisel gelişimlerine, ilişkilerine ve yaratıcı faaliyetlerine odaklanma fırsatı bulacaklardır. Böylece bireyler içsel hedeflerine ulaşmak için daha fazla zaman ve enerjiye sahip olacaklardır. Bu bağlamda çalışmada minimalizmin kendini gerçekleştirme sürecine katkıda bulunacağı beklenmektedir. Çalışmanın hipotezi aşağıdaki gibidir:

H2. Minimalizmin kendini gerçekleştirme üzerinde anlamlı ve olumlu bir

etkisi vardır.

Öz Belirleme Teorisi (SDT) (Deci & Ryan, 2012) insan motivasyonunun özerklik, yetkinlik ve ilişkililik olmak üzere üç temel psikolojik gereksinimin karşılanmasıyla yönlendirildiğini öne sürmektedir. Buna göre bu ihtiyaçlar karşılandığında bireylerin içsel motivasyon deneyimleme olasılığının artmakta, daha fazla katılım, azim ve memnuniyet ile sonuçlanmaktadır. Aksine, bu ihtiyaçlar engellendiğinde, motivasyonun azalması ve olumsuz psikolojik sonuçlar ortaya çıkabilmektedir (Deci & Ryan 2008). Rich ve diğerleri (2017), yaptıkları çalışmada sade yaşam biçimine yönelik aktivitelerin bireylerin psikolojik ihtiyaçlarını tatmin ederek yaşam memnuniyetini arttırdığı ortaya konmaktadır. Kendini gerçekleştirme bireyin psikolojik olarak en iyi halini ifade eden bir ihtiyaç olarak değerlendirilebilir. Birey kendini gerçekleştirme ile içsel motivasyon elde ederek tatmin olmuş hissedecek ve böylece yaşam tatmini artacaktır. Bu bağlamda çalışmanın hipotezi aşağıdaki gibidir.

H3. Kendini gerçekleştirmenin yaşam tatmini üzerinde anlamlı ve olumlu bir etkisi vardır.

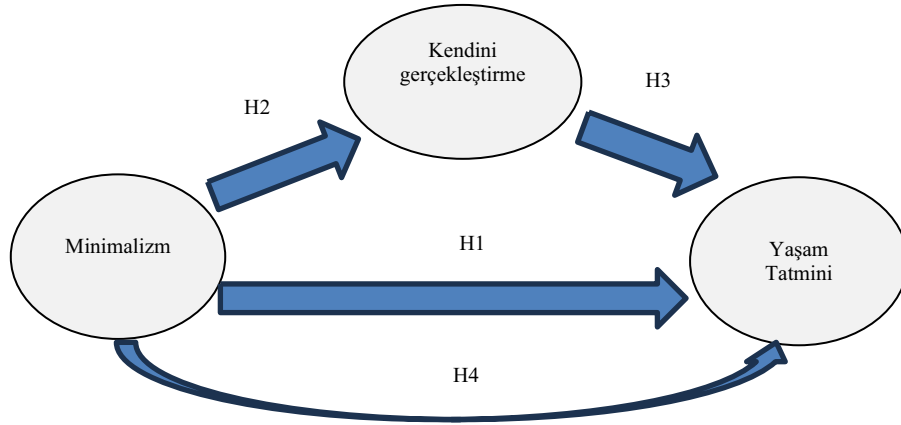
2.4. Minimalizm, Kendini Gerçekleştirme ve Yaşam Tatmini

Minimalizm, bireylerin gereksiz eşyaları ve tüketim alışkanlıklarını azaltarak daha anlamlı bir yaşam sürmelerini sağlayan sürdürülebilir bir yönelimdir. Araştırmalar, anti materyalist yönelimlerin bireylerin psikolojik ihtiyaçlarını (güvenlik, özerklik, yetkinlik ve ilişkiler) karşılama konusunda olumlu etkiler yarattığını göstermektedir (Kasser, 2009; Kang vd., 2021). Ayrıca, minimalizm uygulamaları, bireylerin stres ve kaygı seviyelerini azaltarak genel yaşam memnuniyetini artırır (Dopiera, 2017; Lloyd & Pennington, 2020). Bu bağlamda, minimalizm, bireylerin refahını ve kendini gerçekleştirme süreçlerini destekleyen önemli bir yaşam tarzı olarak öne çıkacağı söylenebilir. Jain ve diğerleri (2024), Y kuşağı üzerinde yaptıkları araştırmada kendini gerçekleştirmenin minimalizm ve tüketici iyi oluş arasındaki ilişkiye aracılık ettiğini ortaya koymaktadır. Rich ve diğerleri (2017), yaptıkları çalışmada sade yaşam biçimine yönelik uygulamaların bireylerin psikolojik ihtiyaçlarını tamamlayarak iyi oluş hallerini olumlu etkilediğini ortaya koymuştur. SDT bağlamında ele alındığında bireylerin özerklik, yetkinlik ve ilişkililik gibi temel psikolojik gereksiniminin karşılanması, içsel motivasyonu artırmakta ve öznel iyi oluşu desteklemektedir (Ryan & Deci, 2000). Minimalist yaşam tarzı, bireyin kendi değerlerine uygun kararlar almasına, yaşamını sadeleştirerek kontrol etmesine ve anlamlı ilişkiler kurmasına imkân tanıyarak bu gereksinimini karşılayacaktır. Bu ihtiyaçların tatmini, bireyin kendini gerçekleştirmesini kolaylaştıracak, kendini gerçekleştirme ise öznel iyi oluş üzerinde doğrudan etkili

olacaktır. Bu nedenle, minimalizmin öznel iyi oluş üzerindeki etkisinde kendini gerçekleştirmenin aracı bir rol oynadığı düşünülmektedir. Bu bağlamda çalışmanın hipotezi aşağıdaki gibidir:

H4.Minimalizmin öznel iyi oluş üzerindeki etkisinde kendini gerçekleştirmenin aracı rolü bulunmaktadır.

Çalışmanın hipotezlerini içeren araştırma modeli Şekil 1’de sunulmaktadır.



Şekil 1: Araştırma Modeli
Kaynak: Yazar

3. ARAŞTIRMA YÖNTEMİ

3.1. Araştırmanın Örneklemi

Bu araştırmada örneklem Türkiye’de yaşayan Z kuşağı olarak sınıflandırılan 1996-2012 yıllarında doğmuş tüketicilerden oluşmaktadır. Z kuşağı, millennial kuşağından (1981-1996 yılları arasında doğanlar) sonra ve Alpha kuşağından (2010 ve sonrasında doğanlar) önce gelen bir nesildir. Z kuşağının en yaşlı bireyleri, şu anda yirmili yaşlarının sonlarına gelmiş durumdadır. TÜİK (2023), verilerine göre Türkiye’de yasal evlilik yaşı 18 olup ortalama evlilik yaşı erkeklerde 28, kadınlarda 25 olduğundan bu kuşağın üyelerinin okul bitirmiş, iş sahibi, evlenmiş ve çocuk yapmış olduğu varsayılabilir. Bu bağlamda, Z kuşağının yaşam döngüsünün belirli aşamalarını

tamamladığı söylenebilir. Z kuşağı, dijital çağın içinde doğmuş ve tüketim alışkanlıkları geleneksel yaklaşımlardan farklılaşmış bir nesildir. Bununla birlikte, 2026 yılı itibarıyla Z kuşağının dünya üzerindeki en büyük nüfus grubu olacağını tahmin etmektedir. Gelecekte tüketim potansiyeli en yüksek tüketiciler olacağı ifade edilmektedir. Minimalizm gibi tüketim ve yaşam tarzlarına dair kavramlar, bu neslin değerleri, çevresel farkındalık düzeyi ve deneyim odaklı eğilimleriyle yakından ilişkilidir (Dombrosky, Templeton, Fong, & Director, 2018, s. 8). Z kuşağının örneklem olarak seçilmesi, minimalizmin yeni nesil tüketiciler arasında nasıl algılandığını ve deneyimlendiğini anlamak için kritik bir öneme sahiptir. Tüketim potansiyeli yüksek olan ve genç bir nesli temsil ettiğinden minimalizmin gelecekteki toplumsal ve ekonomik etkilerini öngörmek açısından değerli veriler sunabilir. Sonuç olarak Z kuşağının minimalizm yöneliminin anlaşılması daha sürdürülebilir bir gelecek için tüketim tercihlerinin yönlendirilmesi ve onların beklentilerine uygun stratejiler geliştirilmesi açısından önemli olduğu düşünülmektedir. Bu nedenle çalışmanın örneklemini Z kuşağı olarak belirlenmiştir. Kolayda örnekleme yöntemi kullanılarak anakütleyi temsil edecek 228 örnek birimlere ulaşılmıştır. Zaman kısıtına karşı avantaj sağlaması açısından etkin bir yöntem olduğu ifade edilen çevrimiçi anket tekniği uygulanmıştır (Lefever, Dal, & Matthíasdóttir 2007, s. 575). Google Forms uygulaması kullanılarak anket formu oluşturulmuş ve WhatsApp ve e-posta gibi çevrimiçi kanallar vasıtası ile veriler toplanmıştır.

3.2. Araştırmanın Ölçekleri

Araştırmanın gerçekleştirilmesine ilişkin etik kurul raporu 07.11.2024 tarihinde HMKU Araştırma ve Yayın Etiği Kurulu tarafından onaylanmıştır. Araştırmanın verileri 12.11.2024-28.11.2024 tarihleri arasında gönüllülük esasına dayanarak online anket yöntemi kullanılarak toplanmıştır. Anket formu, katılımcılara araştırmaya yönelik bilgi metni ile 2 kısım şeklinde yapılandırılmıştır. Anketin ilk kısmı katılımcıların tanımlayıcı özelliklerini içeren sorulardan oluşmaktadır. İkinci kısım, katılımcıların minimalizm, Kendini gerçekleştirme ve öznel iyi oluşlarını ölçmeye yönelik ölçekler kullanılmıştır. Çalışmada kullanılan ölçekler alan yazında geçerlilik ve güvenilirlikleri test edilmiş ölçeklerdir. Bu bağlamda, minimalizmin ölçümünde tüketici minimalizmi ölçeği (Wilson & Bellezza, 2021), yaşam tatmini değişkeninin ölçümünde Diener'in (1985) yaşam tatmini ölçeği kullanılmıştır. Kendini gerçekleştirme değişkeninin ölçümünde Jain ve diğerleri'nin (2024) çalışmasında kullanılan 3 madde çalışmanın bağlamına uyarlanmıştır. Toplam 14 madde çalışma bağlamına göre uyarlanmıştır. Tüketicilerin ölçeklerde yer alan ifadelere katılma düzeyleri Likert yöntemi ölçülmüştür. Anket soruları İngilizce' den

Türkçe 'ye çevrilmiştir. Çeviriden kaynaklanan anlam hatalarını gidermek için anketler öncelikle 40 kişiye uygulanmıştır. Katılımcıların önerilerine göre anlam kargaşası yaratan maddeler düzeltilmiş ve anketin son şekli verilmiştir. 237 veri toplanmış ve 9 veri yanlış doldurmadan dolayı analize dahil edilmemiştir. Sonuç olarak 228 katılımcı verisi analiz edilmiştir.

3.3. Verilerin Analizi

Çalışmanın ölçüm modelinin analizinde en küçük kareler yapısal eşitlik modellemesi ile Smart PLS 4.0 kullanılmıştır. Demografik özelliklerin ölçümünde SPSS paket programı kullanılmıştır. Bu bağlamda modelin geçerlilik ve güvenilirlik testleri yapıldıktan sonra hipotezler testleri gerçekleştirilmiştir.

3.4. Araştırmanın Etik İzinleri

Yapılan bu çalışmada “Yükseköğretim Kurumları Bilimsel Araştırma ve Yayın Etiği Yönergesi” kapsamında uyulması belirtilen tüm kurallara uyulmuştur. Yönergenin ikinci bölümü olan “Bilimsel Araştırma ve Yayın Etiğine Aykırı Eylemler” başlığı altında belirtilen eylemlerden hiçbiri gerçekleştirilmemiştir.

Etik kurul izin bilgileri

Etik değerlendirmeyi yapan kurul adı = ... Üniversitesi Sosyal ve Beşerî Bilimler Bilimsel Araştırma ve Yayın Etiği Kurulu

Etik değerlendirme kararının tarihi= 07.11.2024

Etik değerlendirme belgesi sayı numarası= E-21817443-050.99-441254

4. BULGULAR

4.1. Katılımcıların Demografik Özellikleri

Katılımcılara yönelik demografik özellikler Tablo 1’de sunulmaktadır. Buna göre katılımcıların%54’ü kadın, %46’ı erkek tüketicilerden oluşmaktadır. Katılımcıların büyük çoğunluğu 18-26 (%97,4) yaş aralığındadır. Katılımcıların %82’ si ön lisans, %18 i lisans mezunudur. Gelir düzeylerine göre katılımcıların %71’i 17bin ve altı, %22,8’i 17 bin-30 bin, %6’sı 30 bin ve üstü gelir düzeyine sahiptir.

Tablo 1: Katılımcıların Demografik Özellikleri

Değişkenler		N	%
Cinsiyet	Kadın	123	53,9
	Erkek	105	46,1
	Toplam	228	100
Eğitim Düzeyi	Lise ve öncesi	8	3,50
	Ön-lisans	120	52.60

	Lisans	100	43,90
	Toplam	228	100
Gelir Düzeyi	17 bin ve altı	162	71,2
	17bin- 30 bin	52	22,8
	30 bin ve üstü	14	6
	Toplam	228	100

4.2. Ortak Yöntem Sapması

Anket yöntemi yapılan çalışmalarda ortak yöntem yanlılığı önemli bir sorun teşkil edebilir. Bu tür yanlılıkların önüne geçmek ve belirsizliği en aza indirmek amacıyla, araştırmanın başlangıcında katılımcılara çalışmanın amacı ve kapsamına ilişkin detaylı bilgiler sunulmuştur. Ayrıca, soru formunda, verilen cevapların katılımcıların algılarına dayalı olması gerektiği ve doğru ya da yanlış bir cevabın bulunmadığı belirtilmiştir. Bununla birlikte Smart PLS algoritmasının kullanıldığı çalışmalarda ortak yöntem yanlılığı olasılığı, Varyans Artış Faktörü (VIF) test yöntemiyle test edilebilir. Değişkenlerin içsel VIF değerlerinin altında olması, verilerin güvenilir olduğunu ve ortak yöntem yanlılığı nedeniyle modelin tahminlerinin çarpıtılmadığını göstermektedir (Kock, 2015, s. 8). Değişkenlerin içsel VIF değerleri Tablo 5' te sunulmaktadır. Buna göre, ölçüm modeline ilişkin değişkenlerin VIF değerleri 3.3' ün altında olup, verilerin ortak yöntem yanlılığı hatalarından etkilenmediğini doğrulamaktadır (Kock & Lynn, 2012).

4.3. Faktör Analizi

4.3.1. Yakınsaklık Geçerliliği

Tablo 2' de, ölçüm modelinin değişkenlerinin faktör yükleri ile geçerlilik ve güvenilirlik göstergeleri olarak Crobach's Alfa, AVE ve CR değerleri sunulmaktadır.

Fornell ve Larcker (1981), modelin yakınsak olarak geçerli olması için faktör yükleri 0,50 değerini aşması gerektiğini önermektedir. Bunun yanı sıra, faktör yüklerinin 0,40 ile 0,70 arasında olduğu durumlarda, eğer ilgili AVE veya CR değerleri sınır değerlerin altındaysa, bu ifadelerin modelden çıkarılması önerilmektedir. Yakınsaklık geçerliliğinin sağlanması için yapıların Cronbach Alfa ve (CR) değerlerinin 0,70'in üzerinde olması beklenmektedir (Fornell & Larcker, 1981). Ayrıca, AVE değerlerinin 0,50'yi aşması durumunda yakınsaklık geçerliliğinin sağlandığı kabul edilmektedir.

Modelin gözlemlenen değişkenlerine ait faktör yüklerinin en düşük 0,697 olduğu görülmektedir (Tablo 2). Bunun yanı sıra, Cronbach Alfa ve CR değerlerinin 0,70'in üstünde olduğu, AVE değerlerinin ise 0,50'yi aştığı tespit edilmiştir. Bu sonuçlar, ölçüm modelinin yakınsaklık geçerliliği kriterlerini karşıladığını göstermektedir.

Tablo 2: Ölçüm Modelinin Sonuçları

Boyutlar	Ölçeklerin maddeleri	Faktör Yükleri	Cronbach Alfa	CR	AVE
Kendini Gerçekleştirme	KG1.(Çevreye karşı) Sorumlu davrandığımda bir tatmin duygusu hissediyorum.	0,906			
	KG2.Anlamalı ve üretken bir şey yaptığımda daha mutlu ve tatmin olmuş hissediyorum.	0,946	0,891	0,932	0,821
	KG3.Tatmin duygusu hissetmek, bende olumlu duygular ve düşünceler yaratıyor.	0,863			
Yaşam Tatmini	YT1.Pek çok açıdan ideallerime yakın bir yaşamım var.	0,835			
	YT2.Yaşam koşullarım mükemmeldir.	0,829	0,893	0,892	0,581
	YT3.Yaşamım beni tatmin ediyor.	0,874			
	YT4.Şimdiye kadar, yaşamda istediğim önemli şeyleri elde ettim.	0,847			
	YT5.Hayatımı bir daha yaşama şansım olsaydı, hemen hemen hiçbir şeyi değiştirmedim	0,776			
Tüketici Minimalizmi	TM1.İhtiyacımdan fazla eşya almaktan özellikle kaçınıyorum.	0,697			
	TM2.Çok param olsa bile alacağım şeyi dikkatlice düşünerek alırım.	0,851			
	TM3.Eşyalarımı alırken düşünerek, özenle seçerim.	0,735	0,857	0,919	0,694
	TM4.Eşya sahipliği söz konusu olduğunda, "ne kadar az o kadar iyi (less is more)" anlayışını benimserim.	0,756			
	TM5.Sahip olduğum eşyaların/şeylerin sayısını sınırlandırırım.	0,773			
	TM6.Çok fazla eşya biriktirmekten kaçınıyorum.	0,754			

4.3.2. Ayırışım Geçerliliği

Ölçüm modelinin ayırışım geçerlilik ölçütlerini sağlayıp sağlamadığı, Fornell ve Larcker kriteri ve HTMT oranı kullanılarak değerlendirilmiştir. Fornell ve Larcker kriteri, “modeldeki her yapının AVE büyüklüğünün

karekökünün, arta kalan yapılarla arasındaki ilişki katsayılarından daha yüksek olmasını önermektedir (Hair, Sarstedt, Ringle, & Gudergan, 2018, s. 9). Tablo 3 incelendiğinde, değişkenler arasındaki korelasyon katsayılarının ilgili AVE değerlerinin kareköklerinden düşük olduğu ve Fornell-Larcker kriterinin sağlandığı görülmektedir.

Tablo 3: Ölçüm Modeline İlişkin HTMT Oranları ile Fornell Larcker Değerleri

	Faktörler	1	2	3
HTMT Oranları	1.Kendini Gerçekleştirme			
	2.Minimalizm	0,531		
	3.Yaşam Tatmini	0,285	0,226	
	Faktörler	1	2	3
Fornell ve Larcker Değerleri	1.Kendini Gerçekleştirme	0,906		
	2.Minimalizm	0,493	0,762	
	3.Yaşam Tatmini	0,276	0,204	0,833

HTMT katsayıları, modelde bulunan değişkenlerin bütün korelasyonlarının ortalamasının aynı değişkene ait ifadelerin korelasyonlarını geometrik ortalamalara oranlarını göstermektedir. Ölçmeye çalışılan yapıların teorik olarak birbirlerine yakın olmaları durumunda HTMT oranlarının 0,90'ın altında olması önerilmektedir (Henseller, Ringle, & Sarstedt, 2015). Tablo 3'te de görüldüğü üzere HTMT oranları 0,540'ın altındadır.

Son aşamada, ölçüm modelinin uyum indisleri test edilmiştir. Ölçüm modelinin iyi uyum göstergeleri sergilediği (SRMR<0,10 ve NFI≥0,80) Tablo 4'te görülmektedir. Bu sonuçlarla birlikte, ölçüm modelinin geçerliliği ve güvenilirliğinin testi sonuçlandırılmıştır. Yapılan analizlerin sonuçlarına göre, ölçüm modeli yapısal olarak geçerlidir.

Tablo 4: Model Uyum Göstergeleri

	Doymuş Model	Tahmin Edilmiş Model
SRMR	0,077	0,077
d- ULS	0,622	0,622
d- G	0,219	0,219
Ki Kare	310,556	310,556
NFI	0,833	0,833

4.3.3. Araştırmanın Modelinin Uyumu

VIF, R^2 , f^2 ve Q^2 parametreleri KEKK-YEM 'de ölçüm modelinin test edilmesinde kullanılmaktadır. Çalışmanın ölçüm modeline yönelik etki katsayıları Tablo 5'te gösterilmektedir.

Tablo 5: Ölçüm Modeli Etki Katsayıları

Değişkenler	VIF	f ²	R ²	Q ²
Kendini Gerçekleştirme-> Yaşam Tatmini	1,347	0,045	0,082	0,242
Minimalizm-> Yaşam Tatmini	1,347	0,007		
Minimalizm-> Kendini Gerçekleştirme	1,000	0,320	0,243	0,023

VIF değerleri, değişkenler arasındaki çoklu doğrusallığı değerlendirmek için kullanılan bir göstergedir. Bu değerlerin 5'in altında olması, değişkenler arasında çoklu doğrusallık sorununun bulunmadığını ifade eder (Hair vd., 2018, s. 194). Tablo 5 incelendiğinde, VIF değerlerinin tamamının 5'in altında olduğu ve bu nedenle modelde çoklu doğrusallığın olmadığı sonucuna ulaşılmıştır.

Modele ilişkin R² katsayıları değerlendirildiğinde yaşam tatmini %8, kendini gerçekleştirme %24 oranında açıklanmaktadır. f² etki büyüklük değeridir. Cohen (1992), söz konusu değer 0,02 ile üstü olduğunda az düzeyde etkili, 0,15 ile üstü olduğunda orta düzeyli etkili, 0,35 ile üstü olduğunda ise yüksek düzeyde etkili olarak değerlendirildiğini ifade etmektedir. Çalışmada yer alan değişkenlerin f² katsayılarına bakıldığında kendini gerçekleştirmenin yaşam tatmini üzerinde etkisinin zayıf (f²=0,45, R²=0,082), minimalizmin yaşam tatmini üzerindeki etkisinin zayıf (f²=0,003, R²=0,082) ve minimalizmin kendini gerçekleştirme üzerindeki etkisinin orta düzeyde (f²=0,32, R²=0,243) olduğu söylenebilir.

Q² değeri, ölçüm modelinin tahmin gücünü belirten bir katsayıdır ve bağımlı değişkenler için hesaplanarak modelin öngörü kapasitesini değerlendirmeye olanak tanır. Q²'nin 0'dan büyük olması araştırma modeli değişkenlerinin tahmin gücünün olduğunun göstergesidir (Hair vd., 2017). Modele ilişkin Q² değerleri yaşam tatmini için 0,242 ve kendini gerçekleştirme için 0,023'tür. Bu değerlere göre araştırmanın modelinde tahmin geçerliliği sağlanmaktadır. Diğer bir ifade ile, araştırmanın yapısal modeli, modelin bağımlı değişkenlerini iyi bir şekilde tahminlemektedir.

4.4. Hipotezlerin Test Edilmesi

Çalışmanın hipotezleri PLS-SEM yöntemi kullanılarak test edilmiştir. Modelin değişkenleri arasındaki ilişkiler, t ve p istatistik değerleri ile yol katsayıları üzerinden değerlendirilmiştir. Analizler, yeniden örnekleme yöntemiyle 5000 örneklem kullanılarak gerçekleştirilmiştir. Analiz sonuçlarına göre minimalizmin kendini gerçekleştirme üzerindeki anlamlı ve olumlu bir etkisi vardır ($\beta=0,493$, $p=0,000$). H1 desteklenmektedir. Kendini gerçekleştirmenin yaşam tatmini üzerinde olumlu ve anlamlı bir etkisi vardır ($\beta=0,233$, $p=0,000$). H2 desteklenmektedir. Minimalizmin yaşam tatmini üzerindeki etkisi istatistiksel

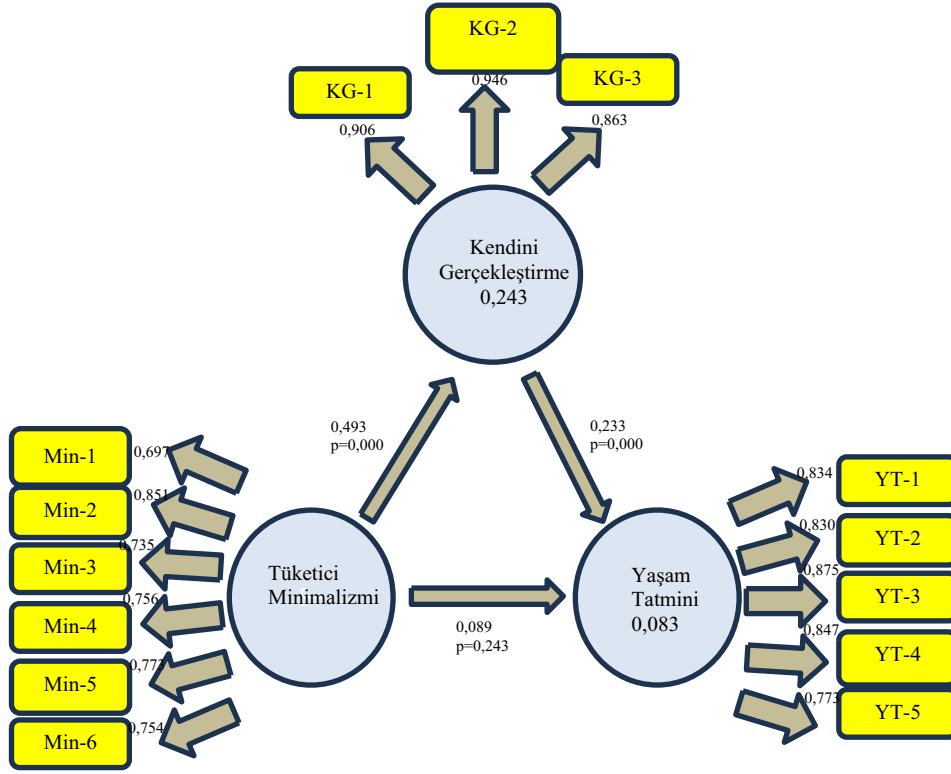
olarak anlamsız olup ($\beta=0,089$, $p=0,243$). H3 hipotezi reddedilmiştir. Tablo 6 araştırmanın hipotezlerine yönelik etki katsayılarını ve hipotezlerin kabul veya ret durumlarını göstermektedir.

Aracılık analizleri

Kendini gerçekleştirmenin, minimalizmin yaşam tatmini üzerindeki etkisindeki aracılık etkisi güven aralığı ile test edilmiştir. Değerler istenilen aralıkta olup sıfırdan farklıdır. Bu bağlamda Kendini gerçekleştirme minimalizmin yaşam tatmini üzerindeki etkisinde aracılık rolü oynamaktadır ($\beta=0,115$, $p=0,000$). H4 hipotezi desteklenmektedir. Araştırmanın yapısal modelinin yol katsayıları, anlamlılık değerleri, açıklama oranları Şekil 2’de sunulmaktadır.

Tablo 6: Araştırma Modelinin Etki Katsayıları

Hipotezler	Beta	B	Standart Sapma	T Değeri	P Değeri	Kabu l/ Ret
H1.Minimalizm-> Kendini Gerçekleştirme	0,233	0,236	0,066	3,522	0,000	Kabul
H2.Kendini Gerçekleştirme-> Yaşam Tatmini	0,493	0,499	0,068	7,219	0,000	Kabul
H3.Minimalizm-> Yaşam Tatmini	0,089	0,092	0,076	1,168	0,243	Ret
Spesifik Dolaylı Etkiler						
Hipotezler	Beta	BBCI [%2,5, %97,5]	Standart Sapma	T Değeri	P Değeri	Kabu l/ Ret
H4. Minimalizm-> Kendini Gerçekleştirme-> Yaşam Tatmini	0,115	[0,050; 0,178]	0,032	3,572	0,000	Kabul



Şekil 2: Yapısal Model Analiz Sonuçları
Kaynak: Yazar

5. SONUÇ VE TARTIŞMA

Bu çalışmada Z kuşağı tüketicilerde minimalist yaşam tarzının tüketici öznel iyi oluşuna ne derece etki ettiği ve bu etkide kendini gerçekleştirmenin aracılık rolü SDT bağlamında araştırılmıştır. Yapılan analizler sonucunda minimalizmin tüketicilerin yaşam tatminini arttırmak için tek başına yeterli olmadığı sonucuna ulaşılmıştır. Minimalizmin tüketicilerde psikolojik olarak bir tatmin duygusu yarattığında içsel bir motivasyon sağladığı bunun sonucunda öznel iyi oluş düzeyini arttırdığı sonucuna ulaşılmıştır.

Çalışmanın ilk bulgusu minimalizmin kendini gerçekleştirme üzerinde olumlu etkisi olduğudur. Bu bulgu (Jain vd., 2024) ile ve SDT (Ryan & Deci, 2000) varsayımları uyumludur. Rich ve diğerleri (2017), sade yaşam biçimi pratiklerinin bireylerin psikolojik gelişimlerine katkıda bulunduğunu ifade

etmektedir. Çalışmanın bulgusu benzer şekilde minimalizmin Z kuşağı tüketicilerin kendini gerçekleştirme süreçlerine katkıda bulunduğunu göstermektedir. Minimalizm, Z kuşağı tüketicilerinin yaratıcı faaliyetlere ve kişisel gelişimlerine daha fazla zaman ayırmalarına olanak tanır. Bununla birlikte minimalizm pratikleri bireylerin kaynakları daha dikkatli kullanması ve çevreye karşı sorumlu davranmasını beraberinde getirmektedir. Örneğin; minimalizm pratiği olarak az eşya kullanmak daha az temizlik yaparak, daha az deterjan ve su kullanılarak hem çevreyi kimyasal atıklardan korumak hem de daha az su kullanarak kaynakları tüketmemek anlamına gelmektedir. Bu gibi sorumluluk bilinci ile hareket eden bireylerin içsel tatmin duygusunu deneyimleyerek kendini gerçekleştirme süreçlerine katkıda bulundukları söylenebilir.

Çalışmanın bir diğer bulgusu kendini gerçekleştirmenin yaşam tatmini üzerinde olumlu etkisi olduğudur. Bu bulgu SDT varsayımı ile uyumludur. Yapılan araştırmalar tüketicilerin kendilerini etkili ve yeterli hissettikleri, bir topluluğa ait hissettikleri, kendi yaşamlarında kontrolü olduklarını hissettikleri aktiviteleri gerçekleştirdiklerinde motive olduklarını ve yaşam tatmininin arttığını göstermektedir (Deci & Ryan, 2008). Bir diğer ifade ile bireyler bir takım psikolojik ihtiyaçlarını tatmin ettiklerinde doyum ve tatmin deneyimlemektedir. Kendini gerçekleştirmenin de bir psikolojik gereksinimlerin en üst basamağı olduğu düşünüldüğünde Z kuşağı tüketicilerinin de kendini gerçekleştirme süreci sonucunda yaşam tatmini arttırdığı söylenebilir. Çalışmanın bulgusu alan yazınla uyumludur (Rich vd., 2017, Deci & Ryan, 2008).

Çalışmanın bir diğer bulgusu minimalizmin yaşam tatmini üzerindeki etkisinin anlamsız olduğudur. Minimalizmin çıktılara ilişkin çalışmalar, minimalizmin yaşam enerjisini arttırdığı ve depresyonu azalttığı (Kang vd., 2021) ve mental refah (Lloyd & Pennington, 2020), duygusal iyi oluş hali (Shafqat vd., 2023), finansal iyi oluş ve mutluluk düzeyi (Malik & Ishaq, 2023), kişisel iyi oluşu (Fu vd., 2023) arttırdığını ortaya koymaktadır. Çalışmanın bulgusu alan yazın ile çelişmektedir. Bunun nedeni çalışmanın Z kuşağı üzerinde yapılmış olması olabilir. Z kuşağı tüketicileri 12-26 yaş aralığında olan Türkiye de yaşayan tüketicilerden oluşmaktadır. Bu yaş aralığındaki tüketicilerin oldukça genç olup mental olarak belirli bir olgunluğa erişmemiş bireyler olabileceği söylenebilir. Minimalizm gibi bilinçli tüketim pratiklerinin en önemli göstergelerinden biri olan çevresel kaygılar ve farkındalık (Jain vd., 2024) kendi hayatlarını kurabilme kaygısında olmaları olabilir. Bu durumu Maslow'un ihtiyaçlar hiyerarşisi ile açıklamak gerekirse minimalizm pratikleri daha çok psikolojik tatmin sonucunda iyi oluş halini arttırmaktadır. Bu bağlamda Z kuşağı tüketicileri henüz piramidin fizyolojik ihtiyaçlar basamağında oldukları için minimalizm yaşam tatminini doğrudan arttırmayabilir.

Çalışmanın bir diğer bulgusu kendini gerçekleştirmenin minimalizmin yaşam tatmini üzerindeki etkisinde aracılık rolü olduğudur. Bu bulgu çalışmanın en çarpıcı bulgusudur. Buna göre minimalizm Z kuşağı tüketicilerin yaşam tatminini arttırmak için tek başına yeterli bir faktör değildir. Minimalizm bireyin kendini gerçekleştirmesi yoluyla tüketicilerde yaşam tatminini arttırmaktadır. Buna göre Z kuşağı tüketicilerin minimalist tüketim pratikleri sadece psikolojik gelişimlerine hizmet ettiğinde tatmin sağlamaktadır. Bu bulgu çalışmanın en ilginç bulgularından biridir. Jain ve diğerleri (2024), X kuşağı üzerinde yaptıkları çalışmada kendini gerçekleştirmenin kısmi aracılık ettiğini ortaya koysa da bu çalışma Z kuşağı için durumun farklı olduğunu kendini gerçekleştirmenin tam aracı etkisi olduğunu ortaya koymaktadır. Bu bulgu SDT (Ryan & Deci, 2000) varsayımlarını desteklemektedir.

Bu çalışma alan yazına şu katkıları sağlamaktadır. Bu çalışmada minimalizmin yaşam tatmini üzerindeki etkisi Z kuşağı özelinde araştırılmıştır. Gerek ulusal gerek uluslararası alan yazında Z kuşağı üzerinde yapılmış çalışmaya rastlanmamıştır. Kendini gerçekleştirmenin tam aracılık etkisi minimalizmin teorik olarak geliştirilmesine ve zenginleşmesine katkı sağlamaktadır. Bununla birlikte, Nejad ve diğerleri (2024), gelişmekte olan toplumların bireysel düzeyde tüketim alışkanlıklarının düşürülmesine yönelik araştırmaların eksikliğine ve önemine dikkat çekmektedir. Buna göre Türkiye örneğinde bireysel düzeyde anti tüketim alışkanlıklarına yönelik sonuçlar sunması açısından ulusal ve uluslararası sürdürülebilir tüketim alan yazına katkı sağlamaktadır.

Bu çalışmanın bazı kısıtlılıkları bulunmaktadır. Kolayda örnekleme tesadüfi olmayan bir örnekleme yöntemidir. Çalışmada kolayda örnekleme yönteminin benimsenmesi çalışmanın ana kütleye genellenebilirliğini kısıtlamaktadır. Gelecekteki çalışmalarda, araştırma modeli, tesadüf örnekleme yöntemlerinden faydalanılarak test edilebilir. Çalışma nicel analiz yöntemi ile yapılmıştır. Minimalizmin bir yaşam biçimi olduğu düşünüldüğünde çalışmanın boylamsal bir tasarımla nitel olarak tekrar edilmesi önerilebilir. Bu çalışma gelişmekte olan ülke kategorisinde bulunan Türkiye kapsamında gerçekleştirilmiştir. Çalışma sonuçlarının gelişmiş ülkelerdeki Z kuşağı tüketicileri ile aynı sonucu verip vermeyeceği test edilebilir. Fu ve diğerleri (2024), minimalizm pratiklerinin yorumlanmasında kültürün önemine vurgu yapmaktadır. Bu çalışma Türkiye’de gerçekleştirilmiş olup Türkiye Asya Avrupa ve Ortadoğu arasında bir geçiş coğrafyasında bulunmaktadır. Çalışmanın sonuçları farklı kültürlerde farklı sonuçlar verebilir. Bu bağlamda, çalışma modelinin farklı kültürlerde test edilmesi önerilebilir. Çalışma sonuçları minimalizmin Z kuşağı tüketicilerinin yaşam tatminini doğrudan etkilemediğini

göstermektedir. Gelecek çalışmalarda bunun nedenleri araştırılabilir. Minimalizm henüz çok yeni bir kavram olup ulusal alan yazında pek çalışmaya rastlanmamıştır. Çalışmanın Türkiye’de farklı bölgelerde tekrarlanarak sonuçların benzer ya da farklılığın karşılaştırılması minimalizmin teorik olarak anlaşılmasına katkı sağlayabilir. Örneğin aynı modelde mindfulness, bilişsel farkındalık gibi değişkenlerin moderatör etkisi test edilmesi minimalizmin sonuçları hakkında daha derin bir anlayış sunabilir. Bu çalışma Z kuşağını öznel iyi oluş düzeyini ölçmektedir. Gelecek çalışmalarda Minimalizmin duygusal iyi oluş, finansal iyi oluş halleri ölçülebilir. Çalışma modelinin farklı jenerasyonlarda tekrar test edilmesi ve karşılaştırılması konuya ilişkin daha detaylı bilgi ve anlayış sunacaktır.

Çalışmanın bulgularının pazarlama uygulayıcılarına bazı öneriler sunabilir. Pazarlama uygulayıcıları minimalist tüketicileri hedefleyen işletmeler ve markalar bu tüketici grubunun kendini gerçekleştirme gibi psikolojik ihtiyaçlarını ön plana çıkaran stratejiler benimseyerek müşteri memnuniyeti sağlayabilirler. Örneğin, markalarının sürdürülebilir yaşam biçimini desteklediklerine yönelik reklamlar ve logolar kullanabilir, reklam metinlerinde içsel motivasyonlarını harekete geçirecek sloganlar kullanabilirler. Böylece işletmeler hedef tüketici kitlesinin daha sürdürülebilir bir tüketim anlayışını benimsemelerini sağlayabilirler.

6. ÇIKAR ÇATIŞMASI BEYANI

Yazarlar arasında çıkar çatışması bulunmamaktadır.

7. MADDİ DESTEK

Bu çalışmada herhangi bir fon veya destekten yararlanılmamıştır.

8. YAZAR KATKILARI

MG: Fikir;

MG: Tasarım;

MG: Denetleme;

MG: Kaynakların toplanması ve/veya işlemesi;

MG: Analiz ve/veya yorum;

MG: Literatür taraması;

MG: Yazıyı yazan;

MG: Eleştirel inceleme

9. ETİK KURUL BEYANI VE FİKRİ MÜLKİYET TELİF HAKLARI

Çalışmada etik kurul ilkelerine uyulmuştur ve fikri mülkiyet ve telif hakları ilkesine uygun olarak gerekli izinler alınmıştır.

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CULTURAL DIMENSIONS SHAPING ISA ADOPTION SPEED IN EMERGING COUNTRIES¹



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ABSTRACT

This study investigates the cultural, economic, and political determinants of the speed of International Standards on Auditing (ISA) adoption in emerging economies. Utilizing Hofstede's cultural dimensions, the research explores the influence of factors such as uncertainty avoidance, individualism, long-term orientation, and motivation toward achievement on ISA adoption. Data from 22 emerging economies spanning 2010–2022 are analyzed using OLS and mixed-effects regression models. The findings reveal that cultural dimensions like uncertainty avoidance and indulgence positively influence ISA adoption speed, while power distance and motivation toward achievement hinder the process. Among economic and political variables, GDP positively impacts adoption speed, whereas countries with advanced financial markets show resistance to adopting ISA. The study emphasizes the need for culturally and economically sensitive approaches to facilitate the harmonization of auditing standards across diverse contexts.

Keywords: *International standards on auditing (ISA), cultural dimensions, emerging economies.*

JEL Codes: *M42, Z10, P52*

Scope: *Business Administration*

Type: *Research*

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GELİŞMEKTE OLAN ÜLKELERDE UDS BENİMSEME HIZINI ŞEKİLLENDİREN KÜLTÜREL BOYUTLAR



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ÖZ | Bu çalışma, Uluslararası Denetim Standartlarının (UDS) gelişmekte olan ülkelere benimsenme hızını şekillendiren kültürel, ekonomik ve politik faktörleri incelemektedir. Özellikle, Hofstede'nin kültürel boyutları çerçevesinde belirsizlikten kaçınma, bireycilik, uzun vadeli yönelim ve başarıya yönelik motivasyon gibi unsurların, UDS'nin benimsenmesine olan etkileri değerlendirilmektedir. Araştırmada, 22 gelişmekte olan ekonomiden 2010-2022 dönemine ait veriler kullanılmış ve OLS regresyon ile karma etkili regresyon modelleri uygulanmıştır. Bulgular, belirsizlikten kaçınma ve hoşgörü gibi kültürel boyutların UDS benimsenme hızını pozitif etkilediğini, güç mesafesi ve başarıya yönelik motivasyonun ise bu süreci yavaşlattığını ortaya koymaktadır. Ekonomik ve politik kontrol değişkenleri arasında, ekonomik büyüklüğün UDS benimsenmesini teşvik ettiği, ancak gelişmiş finansal piyasalara sahip ülkelerin bu standartlara direndiği gözlemlenmiştir. Çalışma, küresel standartlaştırma çabalarını destekleyen kültürel ve ekonomik açıdan hassas yaklaşımlar geliştirilmesi gerektiğini vurgulamaktadır.

Anahtar Kelimeler: Uluslararası denetim standartları (UDS), kültürel boyutlar, gelişmekte olan ekonomiler

JEL Kodları: M42, Z10, P52

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1. INTRODUCTION

The growing need for universally understood financial information has become increasingly critical as globalization progresses (Fraser, 2010). Disclosure regulations and reporting standards are unlikely to achieve their intended effectiveness without the support of reliable auditing (Leuz & Wysocki, 2016), making International Standards on Auditing (ISA) an essential component in today's interconnected world. High-quality audits not only enhance the credibility of financial statements but also reduce agency costs and the cost of capital (Vanstraelen & Schelleman, 2017).

The heightened focus on ISA has often been linked to concerns over financial statement quality following the Asian economic crisis in the late 1990s and the global financial crisis, reflecting their critical role in building an efficient global economy (Boolaky & Soobaroyen, 2017). The establishment and implementation of suitable, high-quality standards is recognized as the foundational and critical step toward achieving quality audits (Burns & Fogarty, 2010).

Despite significant global convergence in implementing ISA (Boolaky & Soobaroyen, 2017; Elmghaamez & Elmagrhi, 2022) research on their adoption and commitment levels remains limited (Boolaky & Soobaroyen, 2017; Elmghaamez et al., 2020, 2024; Elmghaamez & Elmagrhi, 2022; Eltweri et al., 2022). A growing body of literature has increasingly acknowledged the importance of methodologically rigorous approaches to capture the complexities of ISA adoption. Studies have predominantly relied on regression models, particularly Ordinary Least Squares (OLS), but recent research has employed more sophisticated techniques, such as mixed-effects regression models and the Diffusion of Innovation (DOI) Theory, to better account for the multi-level and dynamic processes driving adoption (Elmghaamez et al., 2020; Elmghaamez & Elmagrhi, 2022).

ISA aim to formalize various elements of the audit process, including planning, engagement procedures, gathering and analyzing evidence, evaluating internal control systems, and defining the structure and content of audit reports (Mennicken, 2008). While prior studies have largely focused on technical elements of ISA adoption, such as procedural standardization, there is increasing recognition that these standards also carry cultural significance. The adoption of ISA represents a cornerstone in global efforts to enhance the quality and consistency of auditing practices. While considerable research has examined the adoption of International Financial Reporting Standards (IFRS), studies on the adoption of ISA remain relatively sparse, particularly regarding the role of cultural factors. As prior research demonstrates, cultural dimensions shape not

only organizational practices but also the speed and manner in which countries align with global standards (Hofstede, 2011; Zeghal & Lahmar, 2018).

This study explores these dynamics in the context of ISA adoption. By extending prior research, this study incorporates lesser-studied cultural dimensions, such as indulgence and motivation toward achievement, thereby offering a novel and more comprehensive perspective on ISA adoption dynamics in emerging economies. This gap is significant, as ISA are not merely technical tools but also cultural artifacts, shaped by and shaping the environments in which they are implemented. As emphasized by El-Helaly et al. (2020) cultural factors significantly influence how countries respond to the introduction of international standards. For instance, countries with high uncertainty avoidance often adopt standards more rapidly to mitigate future uncertainties. This underscores the need to explore the cultural dimensions that shape the adoption process of ISA.

While ISAs aim for global consistency (IAASB, 2024), their implementation remains deeply intertwined with national cultures, which shape local interpretations and practices (Mennicken, 2008). This cultural lens is particularly crucial in emerging economies, where rapid economic transitions create environments that either facilitate or hinder the alignment with international standards. Building on Gray's (1988) cultural accounting theory and Hofstede's (1980, 2011) cultural dimensions, this study explores how various cultural traits interact with economic and political factors to influence the speed of ISA adoption. While previous research has focused on dimensions such as power distance, uncertainty avoidance, and individualism, this study broadens the scope by incorporating newer dimensions like indulgence and motivation toward achievement and success. These newer dimensions provide valuable insights into the adoption dynamics in emerging economies, where cultural diversity and evolving economic landscapes present unique challenges and opportunities for standardization.

Methodologically, this study integrates a combination of cultural, economic, and political factors, while offering a more nuanced understanding of how these dimensions collectively shape ISA adoption. The adoption process in these contexts is not only a technical transition but also a cultural negotiation that influences the success or failure of international standards. By extending the literature with these insights, this study bridges the gap between theory and practice, offering a culturally nuanced understanding of ISA adoption and paving the way for more inclusive global standardization efforts.

2. CULTURAL INFLUENCE ON ISA ADOPTION AND HYPOTHESES DEVELOPMENT

While there is an extensive body of literature on the adoption of IFRS (De George et al., 2016), the adoption of ISA has been relatively less explored in academic research. Research on the adoption of ISA primarily examines the determinants (Boolaky & Omoteso, 2016; Elmghaamez & Elmagrhi, 2022; Eltweri et al., 2022), regional variations (Boolaky, 2012; Boolaky & Cooper, 2015), and impacts of ISA adoption (Elmghaamez et al., 2020, 2024; Zhou, 2007), as well as the challenges associated with its implementation (Lin & Chan, 2000; Samaha & Hegazy, 2010).

The adoption of ISA is influenced by a variety of factors, including institutional, political, economic, cultural, regional, and regulatory elements, which collectively reflect the complexity of this process (Boolaky & Omoteso, 2016; Elmghaamez & Elmagrhi, 2022; Mennicken, 2008). These dimensions highlight the complexity and interplay of global and local contexts in shaping ISA adoption practices.

Among these, national culture plays a pivotal role in shaping how countries respond to global standardization initiatives. Gray's (1988) cultural accounting theory highlights cultural diversity as a key determinant of accounting and auditing practices worldwide. Similarly, Hofstede's (1980, 2011) cultural dimensions provide a valuable framework for understanding these variations, influencing attitudes toward compliance, openness to external norms, and the balance between global and local practices. Supporting this perspective, Nobes (1998) argued that national culture is one of the internal local factors that could affect differences in national financial reporting, further emphasizing the critical role of cultural context in shaping accounting systems.

Recent research also highlights the role of culture in the adoption of international standards. El-Helaly et al. (2020) demonstrate that cultural dimensions such as uncertainty avoidance and power distance influence the adoption of IFRS, suggesting that cultural factors may also play a critical role in ISA adoption. For instance, countries with high levels of uncertainty avoidance are more inclined to adopt standards quickly to reduce ambiguity in financial reporting. In their study, El-Helaly et al. (2020) employ OLS and binary logistic regression analyses using a sample of 76 non-EU countries between 2003 and 2014. They examine the association between IFRS adoption and five cultural dimensions—uncertainty avoidance, masculinity, individualism, power distance, and long-term orientation—while controlling for economic, institutional, and regional factors. Building on this perspective, the present study expands the focus to ISA adoption, investigating how cultural dimensions interact with economic and political factors to shape adoption behaviors in emerging economies.

These cultural dimensions not only influence financial reporting but also play a critical role in shaping the adoption dynamics of auditing standards, as this study aims to explore in the context of emerging economies.

To the best of our knowledge, the relationship between ISA adoption and culture has been explored in a limited number of studies (Boolaky & Soobaroyen, 2017; Cowperthwaite, 2010; Elmghaamez & Elmagrhi, 2022; Eltweri et al., 2020).

Cowperthwaite (2010) highlights that ISAs are based on cultural assumptions that may not always align with local contexts. Using Hofstede's dimensions—power distance, uncertainty avoidance, and individualism vs. collectivism—the study analyzes how these mismatches can affect adoption. It finds that high power distance and uncertainty avoidance hinder open communication, and the adaptation required for ISA's principles-based framework, while individualistic societies are more aligned with the independence and professional judgment essential for effective ISA implementation. To explore these issues, Cowperthwaite (2010) conducts a conceptual and literature-based analysis, drawing on findings from other professions such as medicine, peacekeeping, aviation, and environmentalism, to predict cultural impacts on the global adoption and consistent implementation of ISAs.

Examining 89 countries, Boolaky & Soobaroyen (2017) demonstrate that lower power distance and lower uncertainty avoidance facilitate ISA adoption by fostering adaptability and openness to global norms. The study also underscores the interplay between cultural values and institutional factors, concluding that addressing cultural barriers is crucial for achieving global harmonization of auditing standards. Employing a neo-institutional theoretical framework, the authors conduct an empirical analysis using an ordinal logistic regression approach on archival data from 89 countries between 2009 and 2012. They integrate cultural, social, political, and economic variables to explain cross-national differences in ISA adoption levels.

Eltweri et al. (2020) examined how Libya's collectivist culture, marked by tribalism and nepotism, hinders the adoption of ISA by limiting individual initiatives. Despite these challenges, the study highlights those Islamic principles, which promote high ethical standards, align with ISA values, offering insights into the cultural factors shaping ISA adoption in North Africa. The research employed a mixed-method approach, consisting of expert interviews and archival analysis, which enabled the researchers to capture comprehensive insights from Libyan stakeholders in the auditing environment.

Focusing on Hofstede's dimensions, Elmghaamez & Elmagrhi, (2022) reveal that countries with high individualism, low power distance, and low

uncertainty avoidance are more likely to adopt ISAs proactively. The study also identifies regional variations, noting that Anglo-Saxon countries tend to adopt ISAs faster than more conservative continental European nations due to greater cultural alignment with ISA principles. The study used a large dataset of 162 countries spanning from 1995 to 2014, employing a combination of cultural, legal, and political factors as independent variables, alongside a logit model to assess the probability of ISAs adoption.

Although power distance and uncertainty avoidance have been extensively studied, newer dimensions like long-term orientation, indulgence and motivation toward achievement provide fresh insights into ISA adoption. By incorporating these newer dimensions, the literature provides a more nuanced understanding of how cultural traits influence the adoption and implementation of ISAs. This evolving approach enriches the global standardization discourse and highlights the importance of accounting for cultural diversity in implementing ISAs effectively.

According to Hofstede (2011) countries with a higher long-term orientation (LTO) adapt more easily to changing circumstances due to their focus on future benefits and pragmatic approaches. In the context of ISA adoption, this cultural trait facilitates quicker implementation, as high-LTO countries are more inclined to embrace change and effectively overcome barriers. This underscores how future-oriented cultural traits drive the adoption of global standards by aligning national practices with international norms.

In particular, the emphasis on pragmatism and long-term stability enables high-LTO countries to adapt more readily to the changes required for ISA implementation. In contrast, short-term-oriented societies, which prioritize stability and traditional methods (Hofstede, 2011), are more likely to resist adopting new international standards. These contrasting tendencies highlight the crucial role of cultural orientation in shaping adoption behaviors.

Indulgent societies, valuing freedom and openness, are more receptive to adopting international standards like ISA, leveraging benefits such as improved information quality and reduced equity costs (Hofstede, 2011). In contrast, restrained societies prioritize control and traditional practices, which may slow adoption despite mandatory compliance. Such openness and alignment with global principles suggest that indulgent societies are better positioned to implement ISAs effectively.

Hofstede's cultural dimensions further suggest that societies emphasizing achievement and success view ISA adoption as an opportunity to enhance global competitiveness and professional standards, accelerating their integration into international markets (Hofstede, 2011)

Based on the literature, the following hypotheses are formulated to explore the relationship between cultural dimensions and the ISA Adoption in emerging countries. These hypotheses capture both established and exploratory perspectives. While H1, H2, and H3 are rooted in well-established findings from previous studies, H4, H5, and H6 focus on lesser-studied cultural dimensions, providing a broader framework for understanding the complex interplay between traditional cultural attributes and emerging dimensions in shaping ISA adoption behaviors:

H1: Countries with lower power distances tend to adopt ISAs more proactively.

H2: Countries with higher levels of individualism tend to adopt ISAs less proactively.

H3: Countries with higher levels of uncertainty avoidance tend to adopt ISAs more proactively.

H4: Countries with a high level of long-term orientation tend to adopt International Standards on Auditing (ISA) more proactively.

H5: Countries with higher levels of indulgence tend to adopt International Standards on Auditing (ISA) more proactively.

H6: Countries with higher levels of motivation toward achievement and success tend to adopt International Standards on Auditing (ISA) more proactively.

This framework integrates well-established and emerging cultural dimensions, providing a comprehensive perspective on how culture shapes ISA adoption behaviors in diverse national contexts.

3. RESEARCH METHODOLOGY

This study uses Ordinary Least Squares (OLS) regression to analyze the relationship between cultural dimensions and ISA Adoption in emerging countries. The analysis focuses on identifying how cultural factors influence the likelihood of proactive ISA adoption, while economic and political variables are included as controls to account for broader contextual influences.

The sample comprises data from 22 emerging economies in the broader European region, covering the period from 2010 to 2022. Multicollinearity diagnostics, using tolerance and Variance Inflation Factor (VIF) values, confirm the suitability of the variables for regression analysis. This methodological framework provides a comprehensive basis for evaluating the impact of cultural dimensions on ISA adoption behaviors.

To ensure the robustness of the findings, mixed-effects ML regression was applied. This method is widely recognized for its ability to address dynamic relationships and control for biases in multilevel data.

Its effectiveness has been demonstrated in studies such as (Tariq et al., 2024) and (Cui et al., 2024), where it was used to validate findings in contexts involving complex interdependencies. Accordingly, its use here strengthens the reliability and generalizability of the results.

3.1. Definition of Variables

Table 1 summarizes the study's variables, including their definitions and sources. The dependent variable in this study is the speed at which countries adopt ISA, denoted as *ISAADOPS*. This categorization adopts the Diffusion Theory framework as utilized by (Elmghaamez et al., 2020, 2024) and (Elmghaamez & Elmagrhi, 2022). Using this approach, countries are coded on a scale from 1 to 5 based on their ISA adoption years, where 5 represents the earliest adopters and 1 represents the latest adopters or non-adopters. The classification relies on data from the IFAC (International Federation of Accountants) Action Plan Template and the World Bank's 'Reports on the Observance of Standards and Codes (ROSC),' applying (Rogers et al., 2014) Diffusion of Innovation Theory to categorize adoption stages.

Cultural variables, based on Hofstede's framework, include Power Distance (PoD), Individualism (Indv), Motivation toward Achievement and Success (MtAS), Uncertainty Avoidance (UncA), Long-Term Orientation (LTO), and Indulgence (Indg). These variables with the others will be referred to by their abbreviations from this point onward until the discussion and conclusion sections, where their full names will be used again for clarity.

Economic and political control variables include GDP (logarithm of gross domestic product), the Democracy Index (DemX), and the Financial Markets Depth Index (FDMI). The inclusion of *DemX* as a control variable is justified by its potential to capture the broader political and institutional environment that influences ISA adoption. Democratic governance fosters transparency, accountability, and institutional quality, which are critical factors in promoting the adoption of international standards. As noted by (Boolaky & Omoteso, 2016) countries with higher levels of democracy tend to adopt auditing and accounting standards more effectively due to their emphasis on openness and regulatory compliance. Including *DemX* allows for a nuanced analysis of how political systems shape the *ISAADOPS*. GDP is included as a measure of economic size, reflecting its potential role in facilitating ISA adoption. Prior studies (e.g., (Mueller et al., 1994; Zeghal & Mhedhbi, 2006) suggest that economic growth supports the efficient allocation of resources and strengthens investor confidence,

which could encourage earlier ISA adoption. Additionally, robust accounting and financial systems in wealthier economies, as highlighted by (Pirveli & Zimmermann, 2019), may provide the infrastructure necessary for implementing ISA more efficiently.

Similarly, *FDMI* reflects the size and liquidity of financial markets, which can indirectly support conditions favorable to ISA adoption. By fostering investor confidence and enhancing financial infrastructure, capital markets create an environment conducive to earlier adoption. Studies (e.g., Humphrey et al., 2009; Judge et al., 2010) emphasize the role of capital markets in promoting harmonization of standards to improve economic efficiency. Additionally, (Needles et al., 2002) highlight the importance of high-quality accounting information in sustaining financial system confidence, particularly in the wake of past market crises.

Table 1: Definitions of Variables

Analysis Code	Description	Source
ISAADOP S	The speed of ISA adoption, coded from 1 (latest/non-adopters) to 5 (earliest adopters).	(Elmghaamez et al., 2020, 2024; Elmghaamez & Elmagrhi, 2022)
PoD	Reflects hierarchical structures in society.	Hofstede's Framework
Indv	Captures the degree of individual vs. collective orientation.	Hofstede's Framework
MtAS	Motivation towards Achievement and Success; reflects societal focus on achievement.	Hofstede's Framework
UncA	Measures societal tendency to avoid ambiguity.	Hofstede's Framework
LTO	Indicates future-oriented cultural values.	Hofstede's Framework
Indg	Reflects societal focus on enjoyment and life satisfaction.	Hofstede's Framework
GDP	Logarithm of GDP; represents the economic size of a country.	World Bank's World Development Indicators
DemX	Democracy Index; captures the level of democratic governance.	World Bank 's Prosperity Data 360 Platform
FDMI	The Financial Markets Depth Index reflects the size and liquidity of financial markets.	IMF's Financial Development Index Database

3.2. Research Model

The study investigates the influence of cultural, economic, and political factors on *ISAADOPS* using Ordinary Least Squares (OLS) regression and incorporates mixed-effects regression to enhance robustness. The research model is represented as:

$$\text{ISAADOPS}_i = \beta_0 + \beta_1 \text{PoD}_i + \beta_2 \text{Indv}_i + \beta_3 \text{MtAS}_i + \beta_4 \text{UncA}_i + \beta_5 \text{LTO}_i + \beta_6 \text{Indg}_i + \beta_7 \text{GDP}_i + \beta_8 \text{DemX}_i + \beta_9 \text{FDMI}_i + \epsilon_i$$

This approach provides a comprehensive analysis of the determinants shaping ISA adoption, highlighting the interplay of cultural, economic, and political dimensions.

3.3. Sample Selection

The sample comprises emerging economies in the broader European region, focusing on the period from 2010 to 2022 and including a total of 286 observations. Initially, data was collected for 26 countries; however, due to data unavailability, 4 countries were excluded from the analysis. As a result, the study includes 22 countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czechia, Estonia, Hungary, Kosovo, Latvia, Lithuania, Moldova, Montenegro, North Macedonia, Poland, Romania, Serbia, Slovakia, Slovenia, Turkey, Ukraine, Georgia, and Armenia.

These countries were selected for their dynamic economic transitions, cultural diversity, and active engagement in global standardization efforts. By targeting this specific region and time frame, the study captures the complex interactions between cultural, economic, and political factors in shaping *ISAADOPS*. This sample provides a rich dataset for investigating how these factors influence the global alignment of auditing standards.

3.4. Descriptive Statistics

Table 2 provides descriptive statistics for the study's variables, highlighting key cultural, economic, and political factors influencing *ISAADOPS*. The *ISAADOPS* variable has a mean of 3.36, indicating moderate-to-early adoption among emerging economies. Cultural variables show significant variation: *PoD* is high (mean: 72), suggesting hierarchical societies, while *Indv* and *MtAS* have moderate averages of 46.23 and 44.77, respectively. *UncA* is notably high (mean: 83.55), reflecting strong preferences for structured

environments, whereas *Indg* is low (mean: 28.18), indicating a more restrained cultural approach.

Economic and political variables also vary considerably. *GDP* (mean: 24.55) reflects differences in economic size, while the *DemX* (mean: 6.31) indicates moderate levels of democratic governance. *FMDI* shows significant diversity (mean: 9.49), suggesting varying levels of financial market development. These findings underline the importance of cultural factors such as *UncA* and Indulgence, alongside economic and political contexts, in shaping ISA adoption behaviors.

Table 2: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
<i>ISAADOPS</i>	286	2	5	3.360	0.480
<i>PoD</i>	286	40	92	72.000	17.590
<i>Indv</i>	286	15	81	46.230	17.760
<i>MtAS</i>	286	9	88	44.770	17.930
<i>UncA</i>	286	60	96	83.550	10.380
<i>LTO</i>	286	24	71	47.090	12.400
<i>Indg</i>	286	13	66	28.180	13.370
<i>GDP</i>	286	22.12	27.59	24.550	1.340
<i>DemX</i>	286	2,65	8,39	6.310	1.260
<i>FMDI</i>	286	0	0,45	9.490	8.800
Valid N (listwise)	286				

4. EMPIRICAL RESULTS

The analysis of Tables 3 and 4 provides valuable insights into the relationships between cultural dimensions and the *ISAADOPS*. Table 3, the correlation matrix, reveals significant relationships between several variables. *UncA* has the strongest positive correlation with *ISAADOPS* (0.480, $p < 0.01$), indicating that societies with a low tolerance for ambiguity are more likely to adopt ISA standards proactively. Similarly, *Indg* is positively correlated with *ISAADOPS* (0.459, $p < 0.01$), suggesting that cultures emphasizing openness and life satisfaction tend to embrace ISA adoption more quickly. On the other hand, *MtAS* exhibits a negative correlation with *ISAADOPS* (-0.221, $p < 0.01$), implying

that achievement-oriented societies may prioritize domestic concerns over aligning with international standards. *PoD*, however, shows no significant correlation with *ISAADOPS* ($p > 0.05$), indicating that hierarchical structures may have a limited direct impact on the speed of adoption.

Table 3: Correlation Matrix

	<i>ISAADOPS</i>	<i>PoD</i>	<i>Indv</i>	<i>MtAS</i>	<i>UncA</i>	<i>LTO</i>	<i>Indg</i>	<i>GDP</i>	<i>DemX</i>	<i>FDMI</i>
<i>ISAADOPS</i>	1.000 (1.000)									
<i>PoD</i>	0.022 (0.002)	1.000 (1.000)								
<i>Indv</i>	0.127* (0.049)	-0.613** (-0.562**)	1.000 (1.000)							
<i>MtAS</i>	-0.221** (-0.095)	0.164** (0.062)	-0.310** (-0.355**)	1.000 (1.000)						
<i>UncA</i>	0.480** (0.514**)	0.642** (0.538**)	-0.313** (-0.239**)	0.195** (0.058)	1.000 (1.000)					
<i>LTO</i>	-0.141* (-0.209**)	-0.307** (-0.193**)	0.332** (0.339**)	-0.281** (-0.275**)	-0.415** (-0.188**)	1.000 (1.000)				
<i>Indg</i>	0.459** (0.317**)	-0.065 (-0.076)	0.181** (0.012)	0.129* (0.315**)	0.401** (0.225**)	-0.420** (-0.596**)	1.000 (1.000)			
<i>GDP</i>	-0.105 (-0.178**)	-0.230** (-0.215**)	0.431** (0.517**)	0.085 (0.001)	0.021 (-0.094)	-0.094 (-0.036)	0.064 (0.068)	1.000 (1.000)		
<i>DemX</i>	0.149* (0.113)	-0.579** (-0.608**)	0.692** (0.768**)	-0.224** (-0.314**)	-0.318** (-0.232**)	0.248** (0.345**)	0.098 (-0.023)	0.091 (0.186**)	1.000 (1.000)	
<i>FDMI</i>	-0.048 (-0.053)	-0.356** (-0.497**)	0.346** (0.523**)	0.152* (0.079)	0.082 (-0.036)	-0.096 (0.022)	0.477** (0.367**)	0.668** (0.678**)	0.113 (0.369**)	1.000 (1.000)

Pearson coefficients (linear relationships) are shown outside parentheses; Spearman coefficients (monotonic relationships) are inside. Significance levels are indicated as follows: ** $p < 0.01$ (denoted by **) and $p < 0.05$ (denoted by *).

The correlation matrix also highlights notable relationships among the cultural variables themselves. For instance, *Indg* and *UncA* are positively correlated (0.401, $p < 0.01$), suggesting that indulgent societies may also value structured environments. Additionally, the strong negative correlation between *Indv* and *PoD* (-0.613, $p < 0.01$) reflects the tendency of hierarchical societies to oppose individualistic values.

Table 4, which presents collinearity statistics, assesses the multicollinearity among variables to ensure the robustness of regression analysis. *Indv* has the highest VIF value (4.272), but it remains well within acceptable limits (below 10), indicating no severe multicollinearity issues. All tolerance values exceed 0.1, further confirming that multicollinearity is not a concern.

In summary, the correlation analysis underscores the importance of *UncA* and Indulgence as key cultural dimensions influencing ISA adoption. At the same time, collinearity diagnostics validate the suitability of the variables for regression analysis, ensuring reliable results. These findings provide a robust foundation for the subsequent regression analysis, which will further explore the relationships and causal dynamics between cultural factors and *ISAADOPS*.

Table 4: Collinearity Statistics

Variables	Tolerance	VIF
PoD	0.284	3.526
Indv	0.234	4.272
MtAS	0.797	1.254
UncA	0.358	2.794
LTO	0.503	1.989
Indg	0.313	3.194
GDP	0.279	3.587
DemX	0.415	2.412
FDMI	0.277	3.610

Model 1 evaluates the impact of cultural dimensions on *ISAADOPS*. The results reveal that *PoD* has a significant negative effect on *ISAADOPS* ($\beta = -0.017$, $p < 0.01$), indicating that societies with strong hierarchical structures are less likely to adopt ISAs quickly. This may be due to centralized decision-making and resistance to change, which are characteristics of high-*PoD* cultures. *MtAS* also shows a significant negative relationship with *ISAADOPS* ($\beta = -0.015$, $p < 0.01$). This suggests that achievement-oriented cultures might prioritize domestic agendas or exhibit skepticism toward externally imposed standards.

Conversely, *UncA* demonstrates a significant positive effect ($\beta = 0.056$, $p < 0.01$), indicating that societies with high levels of *UncA* adopt ISAs more proactively. This aligns with the idea that ISAs, by providing structured guidance, reduce ambiguity and align well with cultures favoring predictability. Similarly, *Indg* has a positive and significant effect on ISA adoption ($\beta = 0.014$, $p < 0.01$), implying that cultures valuing openness and life satisfaction are more receptive to adopting international standards. However, *Indv* and *LTO* do not show significant effects, suggesting that these dimensions may play a less direct role in shaping ISA adoption behaviors.

The adjusted R^2 value of 0.479 indicates that the cultural dimensions included in Model 1 explain approximately 47.9% of the variation in *ISAADOPS*.

Table 5: Regression Results

Variable	Model 1				Model 2			
	β	Std. Error	t-value	p-value	β	Std. Error	t-value	p-value
Constant	0.128	0.446	0.29	0.774	-2.332	1.1224	-2.08	0.039
PoD	-0.017**	0.003	-5.03	0.000	-0.027**	0.003	-8.12	0.000
Indv	-0.002	0.003	-0.59	0.558	-0.003	0.004	-0.76	0.450
MtAS	-0.015**	0.002	-6.97	0.000	-0.012**	0.002	-6.00	0.000
UncA	0.056**	0.005	10.14	0.000	0.063**	0.005	12.83	0.000
LTO	0.004	0.004	0.97	0.331	0.007	0.003	1.90	0.058
Indg	0.014**	0.004	3.84	0.000	0.027**	0.004	6.66	0.000
GDP					0.089*	0.043	2.06	0.040
DemX					0.028	0.038	0.73	0.465
FDMI					-0.053**	0.007	-7.93	0.000
N		286				286		
Adj R-Square		0.479				0.610		
F (sig.)		44.64 (0.000)				50.51 (0.000)		

Significance levels are indicated as follows: ** $p < 0.01$ (denoted by **) and $p < 0.05$ (denoted by *).

Model 2 incorporates economic and political control variables, providing a more comprehensive framework for understanding *ISAADOPS*. The negative effect of *PoD* becomes more pronounced ($\beta = -0.027$, $p < 0.01$), suggesting that hierarchical structures significantly hinder ISA adoption when accounting for economic and political factors. Similarly, the negative influence of *MtAS* persists but slightly decreases in magnitude ($\beta = -0.012$, $p < 0.01$), which might indicate that economic and political variables partially mediate the relationship between achievement orientation and ISA adoption.

The positive effects of *UncA* ($\beta = 0.063$, $p < 0.01$) and *Indg* ($\beta = 0.027$, $p < 0.01$) become stronger in Model 2. These findings reinforce the notion that cultures emphasizing structured environments and openness are more aligned with the principles underlying ISAs.

Among the control variables, *GDP* has a positive and significant effect on *ISAADOPS* ($\beta = 0.089$, $p < 0.05$), indicating that economically larger countries are more likely to adopt ISAs quickly. This may reflect the presence of more

robust financial infrastructures and greater resources to support the implementation of international standards. However, *DemX* does not exhibit a significant impact ($\beta = 0.028$, $p > 0.05$), suggesting that democratic governance alone does not directly influence ISA adoption. Interestingly, the *FDMI* has a significant negative effect ($\beta = -0.053$, $p < 0.01$). This finding could be attributed to mature financial markets being more resistant to external changes or favoring established local practices over international standards.

The adjusted R^2 for Model 2 increases to 0.610, indicating that the inclusion of economic and political control variables improves the model's explanatory power, accounting for 61.0% of the variation in *ISAADOPS*. These statistical findings are further supported by the overall model significance levels.

The F-statistics presented in Table 5 confirm that both models are statistically significant. Model 1, which includes only *PoD*, *Indv*, *MtAS*, *UncA*, *LTO*, and *Indg*, reports an F-statistic of 44.64 ($p < 0.001$), indicating a strong relationship between these cultural variables and *ISAADOPS*. The adjusted R^2 value of 0.479 shows that the model explains approximately 47.9% of the variation in *ISAADOPS*. When economic and political control variables—*GDP*, *DemX*, and *FDMI*—are added in Model 2, the F-statistic increases to 50.51 ($p < 0.001$), and the adjusted R^2 rises to 0.610. This suggests that the extended model offers a more comprehensive explanation of *ISAADOPS* by incorporating additional contextual influences. Overall, the results demonstrate the joint importance of cultural and structural factors in shaping ISA adoption patterns across countries.

The results from both models highlight the critical role of cultural dimensions in shaping ISA adoption behaviors. Societies with lower *PoD* and higher *UncA* and indulgence are more likely to adopt ISAs proactively, while those emphasizing achievement and success tend to delay adoption. Additionally, the inclusion of economic and political control variables demonstrates the importance of *GDP* and financial market structures in influencing adoption speed. These findings underscore the need for culturally sensitive approaches and targeted capacity-building efforts to facilitate the adoption of global auditing standards in diverse national contexts.

5. ROBUSTNESS CHECK

Table 6 presents the results of the mixed-effects maximum likelihood (ML) regression analysis, which was methodologically chosen as a robustness check for the Ordinary Least Squares (OLS) results presented in Table 5. By incorporating mixed-effects, this analysis accounts for potential variations across countries and evaluates whether the relationships identified in the OLS model hold under different methodological assumptions. The findings demonstrate a

high degree of consistency between the two models, underscoring the reliability of the OLS results.

The results in Table 6 reaffirm the main findings from the OLS model in Table 5. For instance, *PoD* continues to exhibit a significant negative effect on *ISAADOPS* (Mixed-Effects: $\beta = -0.027$, $p < 0.01$; OLS: $\beta = -0.027$, $p < 0.01$), suggesting that hierarchical cultures are less likely to adopt ISAs proactively. Similarly, *MtAS* also retains its negative and significant relationship (Mixed-Effects: $\beta = -0.012$, $p < 0.01$; OLS: $\beta = -0.012$, $p < 0.01$), indicating that achievement-oriented societies may prioritize domestic goals over international alignment. On the positive side, *UncA* (Mixed-Effects: $\beta = 0.063$, $p < 0.01$; OLS: $\beta = 0.063$, $p < 0.01$) and *Indg* (Mixed-Effects: $\beta = 0.027$, $p < 0.01$; OLS: $\beta = 0.027$, $p < 0.01$) remain strongly associated with faster ISA adoption. These consistent findings indicate that the core relationships identified in the OLS analysis are robust to alternative modeling approaches.

One of the main advantages of the mixed-effects ML regression is its ability to incorporate random effects, capturing country-specific unobserved heterogeneity. This approach allows the model to account for the influence of country-level characteristics that vary across but remain constant within countries. For instance, cultural and institutional factors unique to each country, which might not be explicitly included in the model, are indirectly accounted for through the random-effects structure. The results show that these random effects do not significantly alter the relationships between the independent variables and *ISAADOPS*, further supporting the robustness of the OLS findings.

The mixed-effects ML regression model demonstrates improved fit compared to the OLS model, as evidenced by the lower AIC (447.42) and BIC (487.63) values for Model 2. Additionally, the likelihood ratio test confirms the significance of the random-effects parameters, highlighting the importance of accounting for group-level dependencies in cross-country analyses. These metrics validate the use of mixed-effects regression to address potential biases in the OLS results, ensuring that the findings are both statistically reliable and generalizable.

The consistent results across the OLS and mixed-effects ML regression models underscore the robustness of the identified relationships. The negative effects of *PoD* and *MtAS*, along with the positive effects of *UncA* and *Indg*, are reliable and not sensitive to methodological variations. Furthermore, the inclusion of random effects demonstrates that these relationships hold even when accounting for unobserved country-level characteristics, strengthening the validity of the study's conclusions.

Table 6: Mixed-effects ML regression Results

Variable	Model 1				Model 2			
	β	Std. Error	z-value	p-value	β	Std. Error	z-value	p-value
Constant	0.128	0.440	0.29	0.771	-2.332*	1.103	-2.11	0.034
PoD	-0.017**	0.003	-5.1	0.000	-0.027**	0.003	-8.26	0.000
Indv	-0.002	0.003	-0.59	0.552	-0.003	0.004	-0.77	0.442
MtAS	-0.015**	0.002	-7.06	0.000	-0.012**	0.002	-6.11	0.000
UncA	0.056**	0.005	10.27	0.000	0.063**	0.005	13.06	0.000
LTO	0.004	0.004	0.99	0.324	0.007	0.003	1.94	0.053
Indg	0.014**	0.004	3.89	0.000	0.027**	0.004	6.78	0.000
GDP					0.089*	0.043	2.1	0.036
DemX					0.028	0.037	0.74	0.456
FDMI					-0.053**	0.007	-8.08	0.000
Log likelihood		-255.68496				-212.70945		
N		286				286		
Wald chi2 (9)		274.550				471.060		
Prob > Chi2		0.000				0.000		
AIC		527.370				447.419		
BIC		556.618				487.635		
<i>Random-effects Parameters</i>								
Estimate (S.E.)		0.5916 (0.025)				0.5090 (0.0213)		

Significance levels are indicated as follows: **p < 0.01 (denoted by **) and p < 0.05 (denoted by *).

In conclusion, this study methodologically chose robustness analysis to ensure the validity of the OLS results. The mixed-effects ML regression results not only confirm the robustness of the OLS findings but also provide additional insights into the role of country-level heterogeneity in shaping *ISAADOPS*. This robustness check enhances the credibility of the study, emphasizing the critical interplay of cultural, economic, and institutional factors in global standardization efforts.

6. DISCUSSION AND CONCLUSION

This study investigates the cultural, economic, and political determinants of ISA Adoption Speed in emerging economies, providing valuable insights into the global standardization process. The findings highlight the critical role of cultural dimensions while also emphasizing the influence of economic and political contexts. Importantly, some variables do not show significant relationships with ISA adoption, shedding light on the nuanced interplay of factors.

The results reveal a significant negative relationship between Power of Distance and ISA Adoption Speed, suggesting that hierarchical societies face challenges in aligning with international standards due to centralized decision-making and resistance to change. This finding is consistent with Boolaky & Soobaroyen (2017), who emphasized that lower Power of Distance facilitates adaptability to global norms, and Cowperthwaite (2010), who highlighted the difficulties hierarchical cultures face in adopting principles-based frameworks like ISA.

Conversely, Uncertainty Avoidance positively influences ISA Adoption Speed. Societies with high levels of Uncertainty Avoidance are more proactive in adopting ISAs, likely because the structured guidance provided by these standards reduces ambiguity. This finding aligns with El-Helaly et al. (2020) which demonstrated that high Uncertainty Avoidance cultures favor international standards that enhance predictability and control.

Indulgence also demonstrates a significant positive effect on ISA Adoption Speed. Cultures emphasizing openness, life satisfaction, and flexibility are better positioned to embrace global standards. This extends Hofstede's (2011) framework by illustrating how indulgent societies prioritize the long-term benefits of adopting international standards, such as improved transparency and reduced financial uncertainty.

Interestingly, Motivation toward Achievement and Success exhibits a negative relationship with ISA Adoption Speed. This suggests that achievement-oriented societies may focus on domestic objectives or prefer frameworks that align more closely with their specific priorities. This finding highlights the complex interplay between cultural traits and institutional contexts, indicating that the drive for achievement may not always align with externally imposed standards like ISA.

Among the economic variables, Financial Market Depth Index shows a significant negative effect on ISA Adoption Speed. This suggests that countries with more developed financial markets may resist adopting ISA due to the entrenchment of local practices or the self-sufficiency of existing frameworks. This finding aligns with studies such as (Humphrey et al., 2009) which highlight

how advanced financial markets can create inertia against the adoption of new international standards.

In contrast, Indv and LTO do not show significant relationships with ISA Adoption Speed in this study. While prior research, such as Elmghaamez & Elmagrhi (2022), has linked these dimensions to global standardization, their lack of significance here suggests that their influence may be context-specific. For instance, Indv might play a stronger role in regions with less collectivist cultural traits, while Long-Term Orientation could require additional factors, such as economic stability, to fully manifest its impact.

Among the control variables, GDP positively influences ISA Adoption Speed, consistent with (Zeghal & Mhedhbi, 2006) findings, which emphasize the role of economic size and capacity in enabling quicker adoption of international standards. However, the Democracy Index does not exhibit a significant relationship with ISA adoption. This suggests that democratic governance alone may not directly drive standardization efforts, a conclusion supported by Boolaky & Omoteso (2016), who highlighted the importance of institutional capacity and resources alongside transparency and accountability.

The findings validate Gray's (1988) cultural accounting theory, which posits that cultural diversity significantly shapes global standardization processes, and support Hofstede's (1980, 2011) dimensions in explaining variations in ISA adoption behaviors. The inclusion of newer dimensions like Indulgence and Motivation toward Achievement in this study adds depth to the discourse, offering a more comprehensive understanding of how cultural factors influence ISA adoption in emerging economies.

Practically, the results emphasize the importance of culturally and economically informed approaches to promoting ISA adoption. Policymakers and international organizations should design capacity-building programs tailored to address specific cultural barriers, such as resistance to change in hierarchical societies or the domestic focus of achievement-oriented cultures. Additionally, strategies should consider the potential resistance from countries with advanced financial markets, focusing on aligning ISA with existing frameworks to reduce implementation friction.

While this study provides valuable contributions, its focus on 22 emerging economies in the European region may limit the generalizability of its findings. Differences in ISA adoption patterns across regions, as noted by Boolaky & Cooper (2015), highlight the need for broader studies that include a wider range of countries and explore additional cultural, economic, and institutional variables. Future research could also integrate alternative cultural frameworks, such as Schwartz's value theory or the GLOBE study, to provide a

more nuanced perspective on how cultural traits influence global standardization efforts.

In conclusion, this study highlights the critical role of cultural, economic, and political factors in shaping ISA Adoption Speed. By bridging theoretical insights with empirical evidence, it advances the understanding of global standardization efforts and underscores the need for culturally and economically sensitive approaches to enhance the harmonization of auditing practices worldwide.

7. CONFLICT OF INTEREST STATEMENT

Authors don't have any competing interests.

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9. AUTHOR CONTRIBUTIONS

This study was prepared by one author.

10. ETHICS COMMITTEE STATEMENT

The study does not require clearance from an ethics commission.

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ENERJİ ÇEŞİTLİLİĞİ VE İSTİHDAM: BRIC-T ÜLKELERİ ÖRNEĞİ¹



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ÖZ

Yenilenebilir enerji, özellikle

çevresel bozulmaları azaltması ve enerji arz güvenliğini sağlaması nedeniyle önem taşımaktadır. Bu çalışmada, yenilenebilir enerjinin tek bir yenilenebilir enerji kaynağından mı yoksa birden fazla yenilenebilir enerji kaynağından mı elde edilmesinin ekonomi açısından önemi incelenmiştir. Bu kapsamda, yenilenebilir enerji çeşitliliğinin istihdam üzerindeki etkisi BRIC-T ülkeleri için araştırılmıştır. Yenilenebilir enerji çeşitliliğini temsil etmek üzere Gozgor ve Paramati'nin (2022) yöntemi kullanılarak yeni bir endeks hesaplanmıştır. Çalışmada, 2000-2021 dönemi AMG (Genişletilmiş Ortalama Grup) yöntemi ile analiz edilmiş ve yenilenebilir enerji çeşitliliğinin istihdamı pozitif etkilediği tespit edilmiştir. Bu sonuç, yenilenebilir enerji çeşitliliğinin istihdamı artırdığını ifade etmektedir. Bu durumda, BRIC-T ülkelerinde otoritelerin tek bir yenilenebilir enerji kaynağına bağlı kalmayıp farklı yenilenebilir enerji kaynaklarını teşvik etmesi istihdamı artırıcı etki gösterebilir. Çalışmada fosil enerji çeşitliliğinin istihdam üzerindeki etkisi de benzer şekilde sorgulanmış ve pozitif etki tespit edilmiştir. Özetle, otoriteler sadece petrole bağımlı olmak yerine yenilenebilir ve yenilenemeyen enerji kaynaklarının çeşitlenmesini teşvik eden politikalar uyguladığında istihdamda da artış gözlenebilir.

Anahtar Kelimeler: Enerji çeşitliliği, yenilenebilir enerji çeşitliliği, fosil enerji çeşitliliği, istihdam

JEL Kodları: Q20, Q30, J20, E24

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¹ İlgili çalışmanın etik kurallara uygunluğu beyan edilmiştir.

ENERGY DIVERSITY AND EMPLOYMENT: THE CASE OF BRIC- T COUNTRIES



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ABSTRACT

Renewable

energy is especially crucial as it reduces environmental degradation and ensures security of energy supply. In this study, the importance of whether renewable energy is obtained from a single renewable energy source or from multiple renewable energy sources in terms of economy is analysed. In this context, the impact of renewable energy diversity on employment is investigated for BRIC-T countries. A new index is computed using the method of Gozgor and Paramati (2022) to represent renewable energy diversity. In the study, the 2000-2021 period was analysed using the AMG (Augmented Mean Group) method and it was found that renewable energy diversity has a positive impact on employment. This result implies that renewable energy diversity boosts employment. In this case, in BRIC-T countries, the authorities' encouragement of different renewable energy sources rather than depending on a single renewable energy source may have an employment-enhancing effect. In the study, the effect of fossil energy diversity on employment was similarly investigated and a positive impact was detected. In sum, an increase in employment can be observed when the authorities implement policies that encourage the diversification of renewable and non-renewable energy sources instead of being only dependent on oil.

Keywords: Energy diversity, renewable energy diversity, fossil energy diversity, employment

JEL Codes: Q20, Q30, J20, E24

Scope: Economy

Type: Research

1. GİRİŞ

Ekonomik kalkınma ile sanayi, tarım ve ulaşım gibi sektörlerin sürdürülebilirliği, güvenilir ve sürdürülebilir enerji kaynaklarının kullanılmasına bağlıdır. Enerji arz güvenliğinin sağlanması, ekonomik büyümenin desteklenmesi ve işsizliğin azaltılması açısından kritik bir rol üstlenmektedir. Fakat fosil yakıt ithalatına olan bağımlılık, enerji arz güvenliğini tehdit etmekte ve ülkeleri enerji çeşitliliğine yöneltmektedir. Enerji çeşitliliği, farklı enerji kaynaklarının dengeli bir şekilde kullanılmasını ifade etmektedir. Enerji çeşitliliğinin sağlanması enerji arz güvenliğinin yanı sıra çevre kalitesini artırmak ve ekonomik istikrarı desteklemek açısından da önemli bir strateji olarak kabul edilmektedir. Bu kapsamda, fosil yakıtı alternatif olarak yenilenebilir enerji kaynakları ön plana çıkmaktadır (Solarin, Bello & Hammoudeh, 2024; Skea, 2010; Shahbaz, Topcu, Sarıgül & Vo, 2021; Irfan, 2021; Genc & Kosempel, 2023; Daştan, 2024a). Enerji üretiminde yaşanan teknolojik ilerlemeler, 1990'lı yıllardan itibaren pek çok ülkede fosil yakıtlardan yenilenebilir enerji kaynaklarına geçişi hızlandırmıştır (Shahbaz, Gozgor & Hammoudeh, 2019; Paramati, Shahzad & Dogan, 2022).

Yenilenebilir enerji, doğada sürekli olarak yenilenen ve tükenme riski bulunmayan enerji kaynaklarından elde edilmektedir. Geleneksel fosil yakıtlara bağımlılığı azaltmak ve karbon emisyonlarını düşürmek amacıyla yenilenebilir enerjiye yönelik büyük yatırımların yapılması istihdam piyasasında da yapısal değişikliklere neden olmakta ve yeni iş fırsatları yaratmaktadır (IRENA & ILO, 2024). Yenilenebilir enerjiye yapılan yatırımlar ülkelerin enerji politikaları ve sektörel dinamiklerine göre değişiklik göstermekle beraber doğrudan ve dolaylı istihdam yaratma potansiyeli açısından büyük fırsatlar sunmaktadır (Mu, Cai, Evans, Wang & Roland-Holst, 2018). Kısacası, yenilenebilir enerji yatırımları sadece enerji sektöründe değil, aynı zamanda sanayi, hizmet ve araştırma ve geliştirme (Ar-Ge) alanlarında da istihdam imkânı sağlamaktadır.

Küresel ölçekte yapılan incelemelere göre, yenilenebilir enerji sektöründeki istihdam son yıllarda artış eğilimi göstermektedir. IRENA ve ILO'nun raporuna göre, 2022 yılında yenilenebilir enerji alanındaki küresel istihdam, 2021 yılına göre 1 milyon artarak 13,7 milyona ulaşmıştır. 2023 yılında ise bu rakam 16,2 milyona yükselmiştir (IRENA & ILO, 2023). Birleşmiş Milletler İklim Değişikliği Konferansı (COP28) kapsamında kabul edilen karar doğrultusunda, küresel yenilenebilir enerji kapasitesinin 2030 yılına kadar yaklaşık üç katına çıkarılması hedeflenmektedir. Bu hedefin gerçekleşmesi durumunda, önümüzdeki yıllarda enerji sektöründe önemli ölçüde istihdam artışı sağlanması beklenmektedir (IEA, 2024). Küresel bağlamda yenilenebilir enerji

istihdamı belirli ülkelerde ve özellikle küresel toplamın % 46'sına sahip olan Çin'de yoğunlaşmaktadır. 2023 yılı için 7,4 milyon istihdam sağlayan Çin'i, Avrupa Birliği (AB) ülkeleri, Brezilya, ABD ve Hindistan takip etmektedir. Dünyadaki yenilenebilir enerji yatırımlarının büyük bir kısmının bulunduğu bu ülkelerde en fazla istihdam güneş enerjisi sektöründe bulunmaktadır. Küresel yenilenebilir enerji istihdamının % 44'ünü oluşturan güneş enerjisi sektörünü, sırasıyla biyoenerji, hidroelektrik, rüzgâr enerjisi ve diğer sektörler takip etmektedir (IRENA & ILO, 2024). Bu bağlamda, enerji çeşitliliğinin başarılı olması ve yenilenebilir enerjiye yönelik teşviklerin sağlanması istihdamı olumlu yönde etkileme potansiyeli taşımaktadır. Enerji çeşitliliği ve yenilenebilir enerjiye geçiş, istihdam yaratma potansiyeli açısından önemli fırsatlar sunmaktadır. Bu nedenle literatürde yenilenebilir enerjinin istihdam üzerindeki etkisini araştıran çeşitli çalışmalar (Örneğin, Apergis & Salim (2015), Naqvi vd. (2022) Daştan (2024b), Nasirov, Girard, Pena, Salazar & Simon (2021)) yer almaktadır.

Bu çalışma, enerji çeşitliliğinin istihdam üzerindeki etkisini BRIC-T (Brezilya, Rusya, Hindistan, Çin ve Türkiye) örneği üzerinden analiz etmeyi amaçlamaktadır. Bu amaçla çalışmada, AMG tahmin yöntemi kullanılarak 2000-2021 dönemi için yenilenebilir enerji çeşitliliğinin istihdamı artırma potansiyeli incelenmektedir. Çalışmada, Gozgor ve Paramati (2022) tarafından hesaplanan enerji çeşitliliği endeksinden hareketle yenilenebilir enerji çeşitliliğini gösteren yeni bir endeks oluşturulmuştur. Bu endeks ile istihdam arasındaki ilişkiyi inceleyen başka bir çalışmanın bulunmaması nedeniyle çalışmanın literatüre katkı sağlaması beklenmektedir. Ayrıca bu çalışma, söz konusu endeks ile istihdam arasındaki ilişkiyi yenilenebilir enerjiye önemli yatırımlar yapan BRIC-T ülkeleri özelinde ele alan ilk çalışma olma niteliğindedir. İlaveten karşılaştırma yapabilmek amacıyla fosil enerji çeşitliliğinin istihdam üzerindeki etkisi de incelenmiştir. Fosil enerji çeşitliliği için benzer şekilde Gozgor ve Paramati (2022)'nin başvurduğu teknik tercih edilmiştir.

Çalışmadan elde edilen bulgular, BRIC-T ülkelerinde yenilenebilir ve yenilenemez enerji kaynaklarının çeşitliliğinin artırılmasının önemli bir makroekonomik sorun olan işsizliği azaltmaya katkılarına dair bilgi sunabilmektedir. Bu ülkelerde sürdürülebilir istihdam artışının sağlanabilmesi, iş gücüne yönelik eğitim ve mesleki gelişim programlarının genişletilmesi ile kamu-özel sektör iş birliklerinin teşvik edilmesine bağlıdır. Ancak, bu çalışmadan elde edilen bulgular özellikle küresel ısınma ve enerji arz güvenliği açısından teşvik edilen yenilenebilir enerjinin farklı kaynaklardan elde edilmesi durumunda istihdamı artırmaya katkısının olup olmadığını ortaya koymaktadır. Bir başka deyişle yenilenebilir enerjinin tek bir kaynaktan elde edilmeyip farklı

yenilenebilir enerji kaynaklarından elde edilmesinin istihdam üzerindeki olası rolü belirlenmektedir. Benzer şekilde fosil enerji çeşitliliğinin istihdam üzerindeki etkisi de tespit edilmektedir. Kısaca sadece petrole bağımlı olmayıp yenilenebilir ve yenilenemeyen enerji kaynaklarının çeşitliliğinin artırılmasının istihdam açısından önemi ortaya konularak istihdam politikalarının geliştirilmesi sürecinde politika yapıcılara yol göstermesi beklenmektedir.

BRIC-T ülkeleri, hızla büyüyen ekonomileri ve artan enerji ihtiyaçları nedeniyle hem büyük enerji tüketicisi hem de üreticileri olarak yenilenebilir enerji sektöründe kayda değer büyüme potansiyeline sahiptirler. Enerjisinin büyük bir kısmını hidroelektrik santrallerden karşılayan Brezilya, son yıllarda biyoenerji, güneş ve rüzgâr enerjisine önemli yatırımlar yapmıştır. Rusya, fosil yakıtlara bağımlı olmasına rağmen son yıllarda yenilenebilir enerjiye yönelmeye başlamıştır. Özellikle rüzgâr ve hidroelektrik alanlarında projeler geliştirmektedir. Hindistan, yenilenebilir enerji sektöründe en hızlı büyüyen ülkelerden biridir. 2050 yılına kadar elektrik üretiminin % 50'sini yenilenebilir enerji kaynaklarından sağlamayı amaçlamayan ülke, artan güneş ve rüzgâr enerjisi projeleri ile özellikle kırsal bölgelerde yeni istihdam fırsatları yaratmaktadır. Çin, dünyanın en büyük yenilenebilir enerji üreticisi konumundadır. Özellikle güneş ve rüzgâr enerjisinde büyük yatırımlar yaparak lider konumunda olan Çin, 2060 yılına kadar karbon emisyonunu sıfırlamayı hedeflemektedir. Devlet destekli projeler sayesinde enerji sektördeki istihdam sürekli artmaktadır (IRENA & ILO, 2024). Türkiye ise yenilenebilir enerji kapasitesini hızla artıran ülkelerden biridir. Örneğin, Türkiye'de biokütle enerji üretimi 1980'li yılların başında 0.1 TWh iken, 2015'te 4.7 ve 2021'de 17.3 TWh'ye çıkmıştır. Rüzgâr enerjisi tüketiminin ise 2000'li yılların başında 0.1 EJ olduğu ve bu oranın 2015'te 0.11 ve 2021'de 0.30' çıktığı görülmektedir. Benzer şekilde Güneş enerjisi tüketimi de özellikle 2000'li yıllarda gelişme kaydetmiş ve 2016'da 0.01 EJ olan tüketim miktarı artarak 2021'de 0.13 olmuştur. Hidrojen enerji tüketimi ise 1988'de 0.31, 2014'te 0.40 ve 2021'de 0.52 EJ olarak gerçekleşmiştir (BP, 2024).

Çalışma altı bölümden oluşmaktadır. Giriş bölümünün ardından, ikinci bölümünde araştırmanın teorik çerçevesi oluşturulmakta, üçüncü bölümde ampirik literatür incelenmektedir. Dördüncü bölümde veri seti ve model tanıtılmakta, beşinci bölümde ise ampirik bulgular tartışılmaktadır. Son olarak, altıncı bölümde elde edilen bulgular özetlenmekte ve önerilerde bulunmaktadır.

2. TEORİK ARKA PLAN

Enerji çeşitliliği, fosil yakıtlar (kömür, doğal gaz, petrol), nükleer enerji ve yenilenebilir enerji kaynaklarını (güneş, rüzgar, hidroelektrik, jeotermal,

biyokütle) içermekte ve bir ülkede bu kaynakların enerji tüketimindeki payının artırılmasını ifade etmektedir (Gozgor & Paramati, 2022; Chen vd., 2024). Ancak enerji çeşitliliği, ülkelerin enerji kaynaklarına erişim durumu, teknolojik yetenekleri ve çevresel hedefleri gibi faktörlere bağlı olarak farklılık göstermektedir. Dünya genelinde enerji kaynaklarının dağılımında önemli farklılıklar bulunmaktadır. Bazı ülkeler petrol ve doğal gaz gibi fosil enerji kaynaklarına sahipken, bu kaynaklara sahip olmayan gelişmiş ve gelişmekte olan ülkeler enerji ihtiyaçlarını ithalat yoluyla karşılamak zorunda kalmaktadır (Muller & Yan, 2018; Solarin vd., 2024).

Fosil yakıtlar küresel enerji üretiminde en büyük paya sahip enerji çeşididir. Bu durumun temel nedenleri arasında fosil yakıtlar için gerekli altyapı ve teknolojinin uzun yıllardır kullanılması, bu alandaki bilgi birikimi ve deneyimin yüksek olması, ayrıca vasıflı işgücüne duyulan ihtiyacın düşük olması yer almaktadır (Shahbaz, Topcu, Sarıgül & Vo, 2021). Buna rağmen, fosil yakıtların küresel ısınma ve iklim değişikliğine yol açması önemli bir dezavantaj oluşturmaktadır. Ayrıca fosil yakıtlarda ithalata bağımlı olunması enerji fiyatlarındaki dalgalanmalar ve jeopolitik belirsizlikler karşısında enerji ithalatçısı ülkeler kırılgan hale gelmektedir (Gozgor & Paramati, 2022). Fosil yakıtta dışa bağımlı olunması enerji arz güvenliği açısından da sorun teşkil etmektedir. Bu bağlamda, enerji çeşitliliği, ülkelerin enerji kaynaklarını çeşitlendirerek petrol başta olmak üzere fosil enerji kaynaklarına olan bağımlılıkları azaltabilir (Solarin vd., 2024). Enerji çeşitliliği sürdürülebilir kalkınma ve iklim değişikliğinin olumsuz etkilerinin azaltılması açısından da kritik öneme sahiptir. Küresel olarak, 2050 yılında net sıfır karbon emisyonu hedefine ulaşabilmek için daha temiz ve verimli enerji kaynaklarına geçişin yaygınlaşması gerekmektedir (Solarin vd., 2024; Zahra & Fatima, 2024).

Enerji çeşitliliğinin artırılması kapsamında yenilenebilir enerji kaynakları önem arz etmektedir (Ahmed vd., 2022; Zafar vd., 2022; Chen vd., 2024). Ancak, yenilenebilir enerjinin enerji arz güvenliği ve çevresel avantajlarına ilaveten istihdam üzerinde de olumlu etkilerinin gözlenmesi beklenmektedir. Özellikle kırsal ve az gelişmiş bölgelerde uygulanan yenilenebilir enerji projeleri, bu bölgelerde yaratılan yeni istihdam sayesinde işsizliğin azalmasına katkı sağlamaktadır (Mollik, Roy, Hossain & Siddiqua, 2016).

Yenilenebilir enerji kaynakları, işgücü piyasalarını doğrudan, dolaylı ve uyarılmış istihdam yollarıyla etkilemektedir (Barros vd., 2017). Enerji üretimi, dağıtımı, enerji tesislerinin inşası ve işletilmesi sürecindeki istihdam doğrudan istihdamı oluşturmaktadır (Ferroukfi vd., 2013). Bu bağlamda araştırma-geliştirme faaliyetleri, santral kurulumu, üretim, bakım ve onarım gibi faaliyetlerde mühendis, teknisyen ve işçilerin istihdamı doğrudan istihdam

kapsamında değerlendirilmektedir (IRENA, 2022). Dolaylı istihdam, enerji sektörüne bağlı tedarik zincirinde, yan sanayi ve hizmet sektörlerinde oluşan yeni iş imkânlarını ifade etmektedir. Uyarılmış istihdam ise enerji sektöründe çalışan kişilerin elde ettikleri gelirleri harcamaları sonucunda perakende, ulaşım ve hizmet gibi farklı sektörlerde yaratılan istihdamı ifade etmektedir (Mu vd., 2018; Fragkos & Paroussos, 2018; Ferroukhi vd., 2013). Sonuç olarak, yenilenebilir enerji yatırımlarındaki artışın istihdam üzerindeki yarattığı bu üç etki, ülkelerin ekonomik büyümesinde, işgücü piyasasında istihdamın artmasında ve işsizliğin azalmasında kritik öneme sahiptir.

Yenilenebilir enerjiye geçişin istihdam üzerindeki etkileri konusunda farklı görüşler de bulunmaktadır. Yenilenebilir enerji kaynaklarının maliyetinin yüksek olması ve işgücü piyasasında yapısal dönüşümün yeni beceriler gerektirmesi gibi sorunlar yenilenebilir enerji ile istihdam ilişkisinin belirsizleşmesine neden olabilmektedir (Meyer & Sommer, 2014; Daştan, 2024b). Öte yandan, genişleyen yenilenebilir enerji sektörü dolayısıyla fosil yakıt sektöründe işten çıkarmalara yol açabilmektedir (ILO, 2012; Mu vd., 2018; Ram vd., 2020). Örneğin, Mu vd. (2018) yenilenebilir enerji üretiminin kömür sektöründe 1 TWh genişleme başına 210-320 iş kaybına neden olduğunu belirtmiştir. Bununla beraber, yenilenebilir enerji sektörünün uzun dönemde fosil yakıt sektöründeki daralmadan kaynaklı işten çıkarmaları telafi edebileceği ve istihdamı artırabileceği de öngörülmektedir (Markaki, Belegri-Roboli, Michaelides, Mirasgedis & Lalas, 2013; Mu vd., 2018; Ram, Aghehosseini & Breyer, 2020; Ahmed vd., 2022; Genc & Kosempel, 2023).

Nükleer enerji de düşük karbon emisyonu, sürekli ve güvenilir enerji arzı gibi avantajlarıyla önemli bir seçenek olarak kabul edilmektedir (T.C. Enerji ve Tabii Kaynaklar Bakanlığı, 2023). Ancak, nükleer santrallerin yüksek başlangıç maliyetleri, radyoaktif atıkların güvenli olarak depolanması ve yönetim zorlukları ile nükleer kazaların yaratabileceği çevresel ve sağlık riskleri, bu enerji türünün olumsuz yönlerini oluşturmaktadır. Bu nedenlerle, enerji kaynakları arasında yenilenebilir enerjiye yönelik yatırımlar daha hızlı gelişim göstermektedir (Shahbaz, Gozgor & Hammoudeh, 2019; Paramati, Shahzad & Dogan, 2022). Nükleer enerjinin istihdama etkisi incelendiğinde ise inşaat, işletme ve bakım aşamalarında istihdam yaratma fırsatı sunduğu söylenebilir. Bununla beraber, nükleer enerji sektörü yüksek nitelikli işgücü talep etmektedir. Ancak yenilenebilir enerji sektörüne kıyasla istihdam sağlama imkânı daha sınırlı kalmaktadır. Dolayısıyla, yenilenebilir enerji alanına yapılan yatırımların uzun vadede daha fazla istihdam yaratma potansiyeline sahip olduğu kabul edilmektedir (Garrett-Peltier, 2017; Söderholm, 2019; Ibrahiem & Sameh, 2020; Yılcı, İslamoğlu, Yıldırım alp & Candan, 2020; Destek vd., 2020; Ozsoy &

Ozpolat, 2020; Liu, Ge & He, 2023).

3. AMPİRİK LİTERATÜR

Yenilenebilir enerji tüketimi ve istihdam arasındaki ilişkiyi ele alan çeşitli çalışmalar, ülkeler bazında farklı sonuçlara ulaşmıştır. Yenilenebilir enerji sektörü ile istihdam arasında pozitif bir ilişki olduğunu belirten çalışmalar genellikle yenilenebilir enerji teknolojilerinin fosil yakıt sektörlerine kıyasla daha fazla iş gücü gerektirdiğini ve dolayısıyla net istihdam artışına katkı sağladığını ortaya koymaktadır. Bu çalışmalardan Güllü ve Kartal (2021), Türkiye’de yenilenebilir enerji alt sektörlerinin istihdam üzerine etkisini incelemiştir. Çalışmada, hidroelektrik, rüzgâr ve güneş enerjisinin en fazla istihdam yaratan sektörler olduğu belirlenmiştir. ABD’yi inceleyen Garrett-Peltier (2017), enerji verimliliği ve yenilenebilir enerji yatırımlarının istihdam üzerine etkileri girdi-çıkı modelleriyle incelemiş ve fosil yakıt sektöründen yeşil enerjiye yönlendirilen her bir milyon dolarlık yatırımın beş kişilik yeni istihdam yarattığını tespit etmiştir. Nasirov, Girard, Pena, Salazar ve Simon (2021), Şili’de yenilenebilir enerji teknolojilerinin kömür ve doğal gaz sektörüne kıyasla daha fazla istihdam oluşturma potansiyeline sahip olduğunu ortaya koymuşlardır. Araştırmaya göre, 2026 yılına kadar enerji sektöründe 20.958 yeni iş fırsatı yaratılabileceği öngörülmektedir. Azretbergenova, Syzdykov, Niyazov, Gulzhan ve Yskak (2021)’nin, 2006-2019 dönemi için yaptıkları çalışmaya göre, 27 AB ülkesinde yenilenebilir enerji üretimindeki %1’lik artış, uzun dönemde istihdamı yaklaşık %0,08 oranında arttırmaktadır. Benzer şekilde, Arvanitopoulos ve Agnolucci (2020) 1990-2016 dönemi için İngiltere’de yenilenebilir enerji teknolojilerinin uzun vadeli istihdam etkisinin, nükleer veya doğal gazdan daha fazla olduğunu ve yıllık 1 GWh elektrik üretiminin 3,5 kişilik istihdam yarattığını tespit etmişlerdir. Benzer şekilde, Fragkos ve Parousos (2018) AB’de yenilenebilir enerji teknolojilerinin fosil yakıt sektörüne kıyasla daha fazla işgücü gerektirdiğini ve bu durumun net istihdam artışına katkı sağladığını ortaya koymuşlardır. Uçan ve Koçak (2021) 1991-2015 yılları arasında Çin, ABD, Hindistan, Rusya ve Japonya’yı kapsayan bir araştırma yaparak panel eşbütünleşme ve Granger nedensellik testlerini kullanmışlardır. Bulgular, büyük ekonomilerde (Örneğin, Çin ve ABD) yenilenebilir enerji tüketiminin istidamı olumlu yönde etkilediğini, ancak diğer ülkelerde bu etkinin daha sınırlı kaldığını göstermektedir. Yenilenebilir enerji ile işsizliği konu alan çalışmalardan Rahman vd. (2023) Bangladeş, Hindistan, Pakistan ve Sri Lanka için 1990-2019 dönemine yönelik yaptıkları çalışmada, yenilenebilir enerji kullanımının işsizliği azaltmada önemli bir rol oynadığını ortaya koymuşlardır. Benzer şekilde, Naqvi vd. (2022) Avrupa ülkeleri için yenilenebilir enerji üretiminin uzun vadede

işsizliği azalttığını belirlemişlerdir.

Bazı çalışmalar ise yenilenebilir enerji yatırımlarının istihdam üzerinde olumsuz etkileri olduğu sonucuna ulaşmıştır. Bu çalışmalardan Ağpak ve Özçiçek (2018), 1992-2014 yıllarını kapsayan ve 59 ülkeyi içeren çalışmalarında, yenilenebilir enerji kullanımının istihdam üzerinde olumsuz bir etkisi olduğunu saptamışlardır. Ayrıca, bu etkinin genç istihdam üzerinde genel istihdama kıyasla daha belirgin bir azalmaya yol açtığını ortaya koymuşlardır. Bu negatif ilişkinin, yenilenebilir enerji kaynaklarının görece yüksek maliyetlerinin diğer sektörler üzerindeki dışlayıcı etkisinden kaynaklanabileceğini öne sürmüşlerdir. Rafiq vd. (2018), 1980-2014 dönemini kapsayan ve 41 ülkeyi içeren çalışmada, yenilenebilir enerji tüketiminin işsizliği artırdığı sonucuna ulaşmıştır. Bu durum, teknolojik gelişmeler ve sermaye yoğun yatırımlardaki artışla açıklanmıştır. Çoban (2022) ASEAN-5 ülkeleri için 1981-2018 dönemi verilerini kullanarak gerçekleştirdiği çalışmada, yenilenebilir enerji tüketiminin uzun dönemde işsizliği artırdığı sonucuna ulaşmıştır.

Yenilenebilir enerjinin istihdam üzerindeki etkisinin belirsiz ya da hiç olmadığını tespit eden çalışmalar da mevcuttur. Örneğin, Çelik (2021) ABD için 1973-2019 dönemine ait verileri spektral Granger nedensellik analiziyle inceleyerek, yenilenebilir enerji üretimi ile istihdam arasında herhangi bir nedensellik bağı bulunmadığını belirtmiştir. Mu vd., (2018) Çin'deki yenilenebilir enerji politikalarının istihdam üzerindeki etkilerini hesaplanabilir genel denge (CGE) modelini kullanarak analiz etmişlerdir. Çalışmadan elde edilen sonuçlara göre, her 1 TWh güneş enerjisi üretimi Çin'de 45.100 yeni doğrudan ve dolaylı istihdam yaratırken, rüzgâr enerjisi için bu sayı 15.800 olarak hesaplanmıştır. Ancak, uyarılmış istihdamın kayıpları nedeniyle toplam istihdam etkisinin bazı durumlarda negatif olabileceğini belirtmişlerdir. Bu nedenle, yenilenebilir enerji politikalarının istihdam etkileri yenilenebilir enerji türüne ve finansman mekanizmasına bağlı olarak değişmektedir. Yılancı vd. (2020), seçili OECD ülkeleri üzerine yaptıkları çalışmada, yenilenebilir tüketiminin bazı ülkelerde işsizliği artırırken, bazı ülkelerde azalttığını tespit etmiştir. Özmen vd. (2022) yenilenebilir enerji üretiminin sadece Danimarka'da işsizliği azalttığını, Almanya, İspanya, Birleşik Krallık ve Fransa'da işsizliği artırdığını belirtmektedirler. Daştan (2024b), 1991-2021 dönemi için yenilenebilir enerji tüketiminin işsizlik üzerindeki etkilerini yatay kesit bağımlılığını dikkate alan ARDL (CS-ARDL) modeli kullanarak BRICS-T ülkeleri (Brezilya, Rusya, Hindistan, Çin Güney Afrika ve Türkiye) bağlamında incelemiştir. Çalışmanın bulguları, yenilenebilir enerji tüketimi ile işsizlik arasında negatif yönlü ancak istatistiksel olarak anlamlı olmayan bir ilişki olduğunu ortaya koymaktadır. Buna karşılık, fosil yakıt tüketiminin işsizliği hem kısa hem de uzun dönemde anlamlı

bir şekilde azalttığı belirlenmiştir. Bu sonuçlar, BRICS-T ülkelerinde yenilenebilir enerji tüketiminin işsizliği azaltma potansiyelinin henüz yeterli düzeye ulaşmadığını veya bu ekonomilerin geleneksel enerji kaynaklarına bağımlılığının devam ettiğini düşündürmektedir.

Bu çalışmalardan elde edilen bulgular, yenilenebilir enerji sektörünün istihdam üzerine etkilerinin ülkelere, uygulanan politikalara ve ekonomik koşullara ve kullanılan yöntemle ilgili olarak değiştiğini göstermektedir.

4. VERİ ve MODEL

Bu çalışmada, yenilenebilir enerji çeşitliliğinin istihdam üzerindeki etkisi araştırılmıştır. Çalışmada yenilenebilir enerji çeşitliliğini temsil etmek üzere bir endeks (END1) kullanılmıştır. Bu endeks, yazarlar tarafından Gozgor ve Paramati (2022)'nin yöntemi benimsenerek sadece yenilenebilir enerji çeşitliliğini yansıtacak şekilde hesaplanmıştır. Gozgor ve Paramati (2022) tarafından toplam enerji çeşitliliğini yansıtmak üzere bir endeks oluşturulmuştur. Bu endeks petrol, doğalgaz, kömür, nükleer, hidroelektrik ve yenilenebilir kaynaklar (güneş, rüzgâr, biyokütle ve diğer) dikkate alınarak hesaplanmıştır.

Gozgor ve Paramati (2022), Herfindahl–Hirschman ihracat çeşitliliği endeksine benzer şekilde enerji çeşitliliğini Eşitlik 1'deki formülü kullanarak hesaplamıştır. Burada n_i , enerji kaynakları sayısını, X_{it} toplam enerji tüketimini x_{it} farklı enerji kaynaklarından elde edilen enerji tüketimini ifade etmektedir. Burada ülkenin enerji ihtiyacını tek bir enerji kaynağından elde etmesi söz konusu ise, çeşitlenmenin olmadığı anlaşılmaktadır. Böyle bir durumda endeks hesaplanamamaktadır. Gozgor ve Paramati (2022)'nin belirttiği gibi, enerji çeşitliliği endeksinin bazı avantajları vardır. Bunlar, a) farklı ülkelerin enerji çeşitlendirme seviyelerinin karşılaştırılmasına yardımcı olabilir, b) enerji yakınsamasının olup olmadığını bilmemize olanak sağlayabilir ve c) enerji çeşitliliğinin zaman içerisindeki değişimini ortaya koyabilir.

$$\frac{\sum_{j=1}^{n_i} (\frac{x_{it}}{X_{it}})^2 - \frac{1}{n_i}}{1 - \frac{1}{n_i}}$$

(1)

Bu çalışmada, hesaplanan yenilenebilir enerji çeşitliliği endeksinde ise Gozgor ve Paramati (2022)'nin Eşitlik 1'deki yaklaşımı benimsenmiştir. Ancak burada sadece yenilenebilir enerji kaynaklarını kapsayan bir enerji çeşitliliği endeksi hesaplanmıştır. Bu endekslerin hesaplanmasında kullanılan veriler BP(2024)'den temin edilmiştir.

Yenilenebilir enerji çeşitliliğinin istihdam üzerindeki etkisini sorgularken, istihdamı (EMP) etkilemesi olası makroekonomik değişkenlerden enflasyon (INF), ekonomik büyüme (GDP) ve küreselleşme (KOF) kontrol değişkenleri olarak modele ilave edilmiştir. Yenilebilir enerji çeşitliliğinin istihdam üzerindeki etkisini sınanan Model 1 Eşitlik 2'deki gibi oluşturulmuştur.

$$\text{Model (2)} \quad 1 \quad EMP = f(END1, GDP, KOF, INF)$$

Burada, ekonomik büyümeyi temsil etmek üzere ekonomik büyüme oranı kullanılırken enflasyonu temsil etmek üzere tüketici fiyatlarıyla hesaplanan enflasyon oranı kullanılmıştır. Küreselleşmeyi yansıtmak üzere KOF küreselleşme endeksi tercih edilmiştir. Bu endeks literatürde yaygın olarak başvurulan bir endekstir. KOF endeksi, ekonomik, sosyal ve politik olarak bir ülkenin küreselleşme düzeyini ortaya koymaktadır. Bu süreçte, hem gerçekleşen nicel aktiviteler dikkate alınmakta hem de bu aktiviteleri destekleyen politikalar ve uygulamalar dikkate alınmaktadır (Amoa-Gyarteng & Dhliwayo, 2024).

Çalışmada, yenilenebilir enerji çeşitliliğinin istihdam üzerindeki etkisinin sağlamlığını sınamak için ilave kontrol değişkenler eklenerek Model 2 oluşturulmuştur.

$$\text{Model (3)} \quad 2 \quad EMP = f(END1, GDP, KOF, URB, GOV)$$

Burada, kamu harcaması (GOV) ve şehirleşme (URB) değişkenleri modele açıklayıcı değişken olarak ilave edilmiştir. Model 1 ve Model 2'deki kontrol değişkenleri literatürdeki çalışmalar (Amoa-Gyarteng & Dhliwayo, 2024; Pham, 2024; Onifade, Ay, Asongu & Bekun, 2020; Yongjin, 2011; Hjazeen, Khushik, Gilal & Yongliang, 2021) örnek alınarak belirlenmiştir.

Yenilenebilir enerji çeşitliliğine ilaveten karşılaştırma yapabilmek amacıyla fosil enerji çeşitliliğinin istihdam üzerindeki etkisi de araştırılmıştır. Fosil enerji çeşitliliğini temsil etmek üzere benzer şekilde Gozgor ve Paramati (2022)'nin formülünden yararlanılmış ve sadece fosil yakıtları dikkate alan bir endeks (END2) hesaplanmıştır. Fosil enerji çeşitliliğinin istihdam üzerindeki etkisini sınamak için Model 1 ve Model 2, END endeksi yerine END2 endeksini kapsayacak şekilde düzenlenmiş ve Model 3 ile Model 4 oluşturulmuştur;

$$\text{Model (4)} \quad 3 \quad EMP = f(END2, GDP, KOF, INF)$$

Model
(5)

$$4 \quad EMP = f(END2, GDP, KOF, URB, GOV)$$

Çalışmada, BRIC-T ülkelerine odaklanılmıştır. Söz konusu ülkeler, yenilenebilir enerjiye önemli yatırımlar yapan ve enerji çeşitliliğinde büyük aşamalar kaydetmiş ülkelerdir (Chen vd., 2024). Çalışmada verilerin mevcudiyeti dikkate alınarak 2000-2021 zaman aralığı analiz edilmiştir. Ekonomik büyüme ve şehirleşme oranı hariç diğer değişkenlere ait verilerin logaritmik versiyonlarına analizlerde yer verilmiştir. Logaritmik dönüşüm, farklı birimlerle ölçülen değişkenlere ait verileri normalize etmek ve sapmaları azaltmak amacıyla tercih edilmiştir (Neagu vd., 2023; Abbas vd., 2024; Dagar vd., 2024; Gozgor ve Paramati, 2022). Enflasyon, ekonomik büyüme, şehirleşme ve kamu harcamasına ait veriler Dünya Bankası veri tabanından (World Bank, 2024) elde edilmiştir. Küreselleşme endeksi KOF Swiss Economic Institute'den (KOF Swiss Economic Institute, 2024) alınmıştır. Değişkenlere ilişkin bilgiler Tablo 1'de özetlenmiştir.

Tablo 1: Değişkenlerin Kapsamı ve Kaynakları

Değişkenler	Kapsamı	Kaynak
EMP	İstihdam oranı	World Bank (2024)
END1	Yenilenebilir enerji çeşitliliği	Gozgor ve Paramati (2022)'nin yaklaşımına bağlı olarak yazarlar tarafından hesaplanmıştır
END2	Fosil enerji çeşitliliği	Gozgor ve Paramati (2022)'nin yaklaşımına bağlı olarak yazarlar tarafından hesaplanmıştır
GDP	Ekonomik büyüme oranı	World Bank (2024)
KOF	KOF küreselleşme endeksi	KOF Swiss Economic Institute (2024)
INF	TÜFE bazlı enflasyon oranı	World Bank (2024)
GOV	Kamu harcamasının GSYİH içindeki oranı	World Bank (2024)
URB	Şehirleşme oranı	World Bank (2024)

Kontrol değişkenlerinden kamu harcamasının çoğunlukla istihdamı artırması beklenmekle birlikte kesin bir şey söylenememektedir. Keynesyen yaklaşıma göre toplam talebin yetersiz olması işsizliğin artmasına yol

açabilmektedir. Bu sebeple, Keynesyen yaklaşım toplam talebin yetersiz olduğu durumda devletin para ve maliye politikası ile piyasaya müdahale etmesi gerektiğini savunmuştur. Kamu harcaması yatırımlar ve cari harcamalar olarak kullanıldığında istihdamı artırabilir. Kamu harcamalarının havalimanı, yol ve hastane gibi yatırım alanlarına aktarılması doğrudan yeni iş imkânları yaratabilmektedir. Kamunun maaşlar gibi cari harcamaları artırması da toplam talebi tetikleyerek ekonomik büyüme ve böylece istihdamı artırabilir (Azolibe, Dimnwobi & Uzochukwu-Obi, 2022; Pham, 2024). Buna karşın Paracı ve Yeni Klasik yaklaşımlar talep yönlü politikaların istihdam üzerindeki etkisinin etkin olmadığını savunmuştur (Gomez & Irewole, 2024). Kamu harcamasındaki artışın denk bütçe hedefinin gerçekleştirilmesi açısından daha yüksek vergilere işaret etmesi, bireylerin çalışma isteğini azaltarak istihdam oranlarını düşürebilir. Gelirin yeniden dağıtımı kapsamında kamu harcamalarının işsizlere yönelik sosyal harcamalar şeklinde dağıtılması da istihdamı azaltan bir gerekçe olabilmektedir. Kamu harcamasının ekonomik büyümeyi artırıcı değil azaltıcı etki yaratması da kamu harcamasının istihdamla negatif ilişkili olmasına yol açabilir (Yongjin, 2011; Pham, 2024).

Küreselleşme ülke ekonomilerini farklı şekillerde etkilemektedir. Bununla beraber küreselleşmenin avantajlarından yüksek gelirli ülkelerin daha çok faydalandığına inanılmaktadır (Bhat & Beg, 2023). Küreselleşmenin istihdam üzerindeki etkisi ise net değildir. David Ricardo'nun karşılaştırmalı üstünlük yaklaşımı dikkate alındığında tüm ülkelerde küreselleşme emeğin marjinal verimliliğini artırarak istihdamın artmasını sağlayabilir. Heckscher-Ohlin'in yaklaşımında, küreselleşme sonucunda sermaye yoğun bir ülkede sermaye talebi artarken, emek talebinin azalacağına işaret edilmektedir. Bu durumda, ticari dışa açıklık istihdamın azalmasına yol açmaktadır. Bunun aksine, emek yoğun ülkelerde emek talebi ve dolayısıyla istihdam artabilir. Küreselleşme ekonomik büyüme kanalıyla da istihdamı artırabilir. İhracata dayalı büyüme bu kapsamda değerlendirilmektedir. Buna karşın dışa açtık işsizliği daha da derinleştirebilir. Uluslararası firmalarla rekabet edemeyen firmalar küçülmeye gidebilir ya da piyasadan çıkabilir. Bu nedenle işten çıkarmalar gerçekleşebilir (Pal & Villanthenkodath, 2024; Ali, Yusop, Kalappan, Chin & Meo, 2022; Gonese, Sibanda & Ngonisa, 2023).

Ekonomik büyüme- istihdam konusu ise Okun Kanunu (Okun, 1962) çerçevesinde değerlendirildiğinde pozitif bir ilişki beklenebilir (Mkombe vd., 2021). Enflasyon ise, ekonomik faaliyetleri tetikleyerek yeni istihdam alanlarının açılmasını sağlayabilir. Buna karşın, enflasyonun maliyetleri ve belirsizliği artırması firmaların karlılığını ve yatırım kararlarını olumsuz etkileyerek istihdamın azalmasına yol açabilir. Enflasyon-işsizlik konusunda literatürde söz

konusu değişkenler arasında negatif bir ilişkinin olduğunu öne süren Phillips Eğrisi (Philips, 1958)'nden söz edilmektedir. Fakat birçok ülkede enflasyon ve işsizliğin aynı anda yükselmesi Phillips eğrisine olan ilgiyi azaltmıştır. Bu dönemde doğal işsizlik oranı yaklaşımı ön plana çıkmıştır. Burada işsizliğin doğal oran düzeyinde dengeye geleceği ve işsizliğin doğal işsizlik oranının üstüne çıkması durumunda enflasyonda artışın yaşanabileceğinden bahsedilmektedir (Angelov, 2023).

Gelişmekte olan ya da az gelişmiş ülkelerde tarım sektöründe çalışanların gelir düzeyleri genellikle düşüktür. Bu nedenle şehre göç etmektedirler. Fakat bireylerin şehirlere göç etmesi buradaki sanayi sektörünün ihtiyaç duyduğu emekten daha fazla bir emek arzı oluşmasına yo açar. Bir başka deyişle, kırsal kesimdeki gizli işsizler şehirlere göç ederek açık işsizler durumuna dönüşmekte ve böylece işsizliği artırabilmektedir (Şahin, 1987; Almulhim & Cobbinah, 2023). Şehirlerde sanayi ve hizmet sektöründe çalışabilmek için gerekli bilgi, beceri ve yetenekler açısından dezavantajlı olan bu kişiler kendi işini kurabilmekte ya da kayıt dışı çalışmak zorunda kalabilmektedir (Chen, Huang, Cheng, Tang & Huang, 2023). Diğer taraftan şehirleşme bireylerin daha fazla insanla etkileşime girmesini sağlayabilir. Böylece şehirlerde güçlü ya da zayıf bağlar kurulması bireylerin daha kolay iş bulmalarını sağlayabilir (Sato & Zenou, 2015).

5. BULGULAR

Çalışmada ilk olarak değişkenlerin yatay kesit bağımlılığı sorununa ilişkin testler gerçekleştirilmiştir. Bunun için, LM1 (Breusch ve Pagan, 1980), LM2 (Pesaran, 2004) ve LMadj (Pesaran, Ullah ve Yamagata, 2008) testlerinden yararlanılmıştır. Tablo 2’de özetlenen bulgulara göre, EMP, END1, END2, INF, KOF, GDP, GOV ve URB değişkenlerine ilişkin test istatistiklerinin olasılık değerleri 0.05’ten küçüktür. Bu durumda yatay kesit bağımlılığının olmadığı yönündeki temel hipotez reddedilmekte ve serilerin yatay kesit bağımlılığının olduğu sonucuna varılmaktadır.

Tablo 2. Yatay Kesit Bağımlılığı Sonuçları

Değişkenler	Sabit			Sabit+Trend		
	LM1	LM2	LMadj	LM1	LM2	LMadj
EMP	26.018 (0.004)	3.582 (0.000)	27.054 (0.000)	23.716 (0.008)	3.067 (0.001)	24.564 (0.000)

END1	33.067 (0.000)	5.158 (0.000)	4.585 (0.000)	28.946 (0.001)	4.236 (0.000)	4.183 (0.000)
END2	25.078 (0.005)	3.372 (0.000)	27.095 (0.000)	30.224 (0.001)	4.522 (0.000)	25.255 (0.000)
KOF	15.060 (0.130)	1.131 (0.129)	29.614 (0.000)	15.330 (0.120)	1.192 (0.117)	27.946 (0.000)
INF	22.087 (0.015)	2.703 (0.003)	6.901 (0.000)	26.734 (0.003)	3.742 (0.000)	7.566 (0.000)
GDP	30.358 (0.001)	4.552 (0.000)	5.554 (0.000)	29.698 (0.001)	4.405 (0.000)	6.011 (0.000)
GOV	18.124 (0.053)	1.817 (0.035)	28.675 (0.000)	18.749 (0.044)	1.956 (0.025)	28.675 (0.000)
URB	33.257 (0.000)	5.200 (0.000)	27.960 (0.000)	30.122 (0.001)	4.499 (0.000)	27.960 (0.000)

İkinci aşamada, yatay kesit bağımlılığının bulunması nedeniyle değişkenlerin birimkök özellikleri ikinci nesil birimkök testleri ile araştırılmıştır. Bu amaçla, Fisher ADF ve Fisher Philips ve Perron (PP, Choi, 2001) ve IPS (Im vd., 2003) testlerinin yatay kesit bağımlılığını dikkate alan versiyonları kullanılmıştır. ADF, PP ve IPS test sonuçları Tablo 3’de raporlanmıştır. Buradaki bulgulara göre EMP, END1 ve END2 değişkenleri birinci farkında durağandır. Diğer değişkenler ise düzeyde durağandır.

Tablo 3. Birimkök Testi Sonuçları

	Fisher PP				Fisher ADF				IPS			
	Sabit		Trend		Sabit		Trend		Sabit		Trend	
	Düze	Fark	Düze	Fark	Düze	Fark	Düze	Fark	Düze	Fark	Düze	Fark
	y		y		y		y		y		y	

EMP	- 1.046 (0.85 2)	15.17 5 (0.00 0)	- 0.819 (0.79 3)	15.35 0 (0.00 0)	- 0.881 (0.81 1)	3.497 (0.00 0)	- 1.376 (0.91 5)	4.837 (0.00 0)	0.178 4 (0.57 0)	- 5.537 (0.00 0)	0.032 (0.51 2)	- 5.296 (0.00 0)
END 1	0.001 (0.49 9)	13.75 9 (0.00 0)	- 0.652 (0.74 3)	9.224 (0.00 0)	- 0.070 (0.52 8)	8.618 (0.00 0)	- 0.433 (0.66 7)	5.198 (0.00 0)	- 0.281 (0.38 9)	- 6.310 (0.00 0)	0.175 (0.56 9)	- 4.686 (0.00 0)
END 2	0.027 (0.48 9)	35.46 3 (0.00 0)	- 1.758 (0.96 0)	34.51 7 (0.00 0)	- 0.185 4 (0.57 3)	3.007 (0.00 1)	- 2.003 (0.97 7)	2.120 (0.01 7)	- 0.801 (0.21 1)	- 7.987 (0.00 0)	2.123 (0.98 3)	- 9.742 (0.00 0)
KOF	8.012 9 (0.00 0)	18.66 4 (0.00 0)	2.778 (0.00 2)	14.27 6 (0.00 0)	12.47 0 (0.00 0)	12.07 6 (0.00 0)	7.450 (0.00 0)	7.525 (0.00 0)	- 5.814 (0.00 0)	- 6.525 (0.00 0)	-3.87 (0.00 0)	- 5.613 (0.00 0)
INF	3.963 (0.00 0)	12.83 0 (0.00 0)	0.267 (0.39 4)	12.47 5 (0.00 0)	10.43 6 (0.00 0)	6.680 (0.00 0)	4.179 (0.00 0)	8.775 (0.00 0)	- 3.674 (0.00 0)	- 5.792 (0.00 0)	- 2.050 (0.02 0)	- 5.987 (0.00 0)
GOV	5.633 (0.00 0)	12.36 6 (0.00 0)	1.292 (0.09 8)	10.30 3 (0.00 0)	4.643 (0.00 0)	11.44 5 (0.00 0)	1.737 (0.04 1)	10.28 5 (0.00 0)	- 3.444 (0.00 0)	- 6.304 (0.00 0)	1.093 7 (0.13 7)	- 5.024 (0.00 0)
GDP	8.654 (0.00 0)	41.18 9 (0.00 0)	6.868 (0.00 0)	33.06 5 (0.00 0)	3.195 (0.00 0)	11.19 9 (0.00 0)	0.856 (0.19 6)	6.723 (0.00 0)	- 4.712 (0.00 0)	- 12.50 (0.00 0)	- 3.953 (0.00 0)	- 9.918 (0.00 0)
URB	6.433 (0.00 0)	32.39 6 (0.00 0)	10.93 6 (0.00 0)	23.95 5 (0.00 0)	- 0.398 (0.65 4)	13.42 9 (0.00 0)	0.066 (0.47 3)	9.594 (0.00 0)	- 2.071 (0.01 9)	- 9.813 (0.00 0)	- 4.106 (0.00 0)	- 8.306 (0.00 0)

Üçüncü aşamada, çalışmadaki modellerin eğim parametresinin heterojenliği hakkında bilgi sahibi olmak amacıyla Pesaran ve Yamagata (2008)'nın delta ve delta_{adj} testleri kullanılmıştır. Delta testlerine ait bulguların özetlendiği Tablo 4'e göre, Model 1, Model 2, Model 3 ve Model 4'ün heterojen bir yapıya sahip olduğu gözlenmektedir. Bu bulgular, heterojenliği dikkate alan eşbütünleşme testleri ve uzun dönem katsayı tahmin yöntemlerinin kullanılmasının uygun olduğuna işaret etmektedir.

Tablo 4. Heterojenlik Testi Sonuçları

	Model 1		Model 2		Model 3		Model 4	
	test ist.	olasılık	test ist.	olasılık	test ist.	olasılık	test ist.	olasılık
Delta	8.398	0.000	6.429	0.000	8.351	0.000	6.196	0.000
Delta _{adj}	9.847	0.000	7.786	0.000	9.792	0.000	7.504	0.000

Dördüncü aşamada, uzun dönem eşbütünleşme ilişkisinin varlığına dair kanıtlar aranmıştır. Değişkenlerin I(1) ve I(0) gibi farklı derecelerden durağan

olması sebebiyle Westerlund (2008)'un Durbin-Hausman testi tercih edilmiştir. Bu test, hem heterojen (dh_g) hem de homojen (dh_p) paneller için sonuçlar üretebilmektedir. Westerlund (2008) testinin bulguları Tablo 5'te yer almaktadır. Buradaki sonuçlara göre, değişkenler arasında eşbütünleşme ilişkisinin olmadığını gösteren temel hipotez Model 1, Model 2, Model 3 ve Model 4 için reddedilmektedir. Bu sebeple, Model 1'de yenilenebilir enerji çeşitliliği, ekonomik büyüme, enflasyon ve küreselleşme istihdam ile uzun dönemde ilişkilidir. Benzer şekilde, Model 2'ye ait bulgular kamu harcaması ve şehirleşmenin dikkate alındığı durumlarda da açıklayıcı değişkenler ile bağımlı değişken arasında eşbütünleşme ilişkisinin var olduğunu göstermektedir. Fosil enerji çeşitliliğinin istihdam üzerindeki etkisini sınavan Model 3 ve Model 4'e ilişkin eşbütünleşme sonuçları da uzun dönemde eşbütünleşme ilişkisinin varlığına dar bilgi sunmaktadır.

Tablo 5. Eşbütünleşme Testi Sonuçları

	Model 1		Model 2		Model 3		Model 4	
	test ist.	olasılık	test ist.	olasılık	test ist.	olasılık	test ist.	olasılık
dh g	-1.669	0.048	-1.857	0.032	-1.883	0.030	-1.526	0.063
dh p	1.588	0.056	-1.588	0.056	-1.700	0.045	-1.342	0.090

Beşinci aşamada, açıklayıcı değişkenlerin uzun dönem katsayı tahminleri gerçekleştirilmiştir. Bu amaçla Bond ve Eberhardt (2009) ile Eberhardt ve Teal (2010) tarafından geliştirilen AMG tahmincisine başvurulmuştur. Yatay kesit bağımlılığını ve heterojenliği dikkate alan AMG tahmincisiinden elde edilen bulgular Tablo 6'da raporlanmıştır.

Model 1'in sonuçları incelendiğinde, END1 değişkeninin istihdam üzerindeki etkisinin pozitif olduğu görülmektedir. Bu sonuç, yenilenebilir enerji kaynaklarının çeşitliliği arttıkça istihdamın arttığını ifade etmektedir. Bu sonuçlar Chen (2018)'nin Çin, Simas ve Pacca (2014)'nin Brezilya ve Özenç ve Nas Özen (2020) ile Güllü ve Kartal (2021)'nin Türkiye için ulaştığı bulguları desteklemektedir. Ekonomik büyümenin istihdam üzerinde pozitif ve anlamlı bir etkisi söz konusudur. Enflasyon ve küreselleşmenin istihdam üzerindeki etkisi ise istatistiksel olarak anlamsızdır. Model 2'nin sonuçları Model 1'in sonuçlarıyla örtüşmektedir. Yenilenebilir enerji çeşitliliği ve ekonomik büyüme istihdam üzerinde pozitif etkiye sahip iken kamu harcaması negatif etkiye sahiptir. Küreselleşme, enflasyon ve şehirleşmenin istihdam üzerindeki etkisi anlamsızdır.

Model 3'ten elde edilen kanıtlar fosil enerji çeşitliliğinin istihdam üzerinde pozitif etkisi olduğuna işaret etmektedir. Ekonomik büyümenin istihdam üzerindeki etkisi pozitif iken enflasyon ve küreselleşmenin istatistiksel olarak

anamlı bir etkisi bulunmamaktadır. Model 4'e dair bulgular, fosil enerji çeşitliliğinin ve ekonomik büyümenin istihdam üzerindeki pozitif etkisini teyit etmektedir. Küreselleşme, enflasyon ve kamu harcamasının istihdam üzerinde bir etkisi yoktur. Kısaca, modellere ilişkin tahmin sonuçlarının büyük ölçüde uyumlu olduğu görülmektedir.

Sonuç olarak, hem yenilenebilir enerji çeşitliliği hem de fosil enerji çeşitliliği arttıkça BRIC-T ülkelerinde istihdam artmaktadır. Ancak fosil enerji çeşitliliğinin istihdamı artırıcı etkisi, yenilenebilir enerji çeşitliliğinin istihdamı artırıcı etkisinden daha büyüktür. Bu sonucun Daştan (2024b)'nin BRICS-T ülkeleri için elde ettiği sonucu desteklediği söylenebilir. Daştan (2024b)'nin de ifade ettiği gibi bu durum yenilenebilir enerji sektörünün söz konusu ülkelerde yeni gelişen bir sektör olmasından kaynaklanabilir. Çünkü yenilenebilir enerji sektörünün uzun vadede istihdam artışı sağlaması beklenmektedir (Markaki, vd.,2013; Ahmed vd., 2022). Diğer taraftan fosil enerji sektörüne ait altyapıların yaygın olması ve enerji ihtiyacının büyük ölçüde fosil yakıttan sağlanması, bu sonucu açıklayabilir.

Tablo 6. AMG Tahmin Sonuçları

	Model 1		Model 2		Model 3		Model 4	
	Katsayı	Olasılık	Katsayı	Olasılık	Katsayı	Olasılık	Katsayı	Olasılık
END1	.01989	0.045	.00937	0.001				
KOF	.26076	0.396	.13818	0.574	.35001	0.336	.26277	0.402
INF	.00022	0.640			.00036	0.133		
GDP	.00077	0.000	.00047	0.011	.00128	0.000	.00060	0.017
URB			.00150	0.921			.00812	0.170
GOV			-.12154	0.000			-	0.454
							.06765	
END2					.05559	0.011	.06196	0.007
c	1.2630	0.029	1.5595	0.000	1.1064	0.101	1.3871	0.030

Ekonomik büyüme ve istihdam arasında pozitif bir ilişkinin olduğuna dair bulgular Hashmi, Khushik, Gilal ve Yonliang (2021)'nin BRICS ülkeleri, Mohamed ve Abdi (2024)'nin Somali, Ugurlu (2024) ile Ekiz ve Özel (2020)'nin Türkiye ekonomisi için elde ettiği bulgularla aynı yöndedir. Ekonomik büyümenin istihdamı artırıcı etki göstermesi Okun Kanunu'nun geçerliliğine işaret emektedir. Okun kanununa göre, işsizlik ve ekonomik büyüme arasında karşılıklı bir ilişki bulunmaktadır. Ekonomik büyüme arttıkça işsizlik azalmaktadır. Bu durum ekonomik büyüme ile birlikte yeni iş alanlarının açılması ve verimlilik artışı vasıtasıyla istihdamın artmasından kaynaklanmaktadır.

İşsizlikten ekonomik büyümeye doğru bir etki de söz konusudur. İşsizlik, ülkedeki işgücünün tam olarak istihdam edilmediği ve üretim açığının yaşandığını ifade etmektedir (Hjazeen vd., 2021). Öte yandan teoride istihdam yaratmayan büyümeden de söz edilmektedir. Örneğin Türkiye ekonomisini ele alan çalışmalardan Durmuş ve Akbulut (2017) ile Arı (2016), ekonomik büyümenin istihdam üzerinde bir etkisinin olmadığını tespit etmiştir. Yazarlar bu durumu, ülkede uygulanan düşük kur politikasının ara mal ve yatırım mallarını daha ucuz hale getirmesiyle açıklamıştır. İlaveten büyüme yaşanan imalat sektörünün sermaye yoğun sektörler olmamasına vurgu yapılmıştır. Bu çalışmadan elde edilen bulgular, istihdam yaratmayan büyümenin BRIC-T ekonomisi için geçerli olmadığı yönündedir.

Enflasyon-istihdam konusunda bir ilişkinin olmaması, BRIC-T ülkelerinde istihdamın enflasyondan bağımsız olduğunu ifade etmektedir. Bu durumda Phillips eğrisi geçerli değildir. Benzer şekilde, enflasyonun belirsizlik ve ekonomik aktiviteler kanalıyla istihdamı artırması ya da azaltması da beklenmemektedir. Literatürde enflasyon-işsizlik konusunda farklı bulgularla karşılaşmaktadır. Örneğin, Gomez ve Irewole (2024) 29 Afrika ülkesinde, Uğurlu (2024) ile Ekiz ve Özel (2020) Türkiye’de enflasyonun işsizliği negatif etkilediği yönünde bulgulara ulaşmıştır. Somoye (2024) ise Nijerya’da enflasyonun işsizliği kısa dönemde etkilemezken uzun dönemde pozitif etkilediğini tespit etmiştir.

Küreselleşme-istihdam arasındaki anlamsız etkiye dair kanıtlar neticesinde David Ricardo ile Heckscher–Ohlin’in yaklaşımına bağlı olarak küreselleşmenin istihdamı artırmasından bahsedilemez. Küreselleşmenin ulusal firmaların rekabet edebilirliğini olumsuz etkileyerek istihdamı daraltıcı etki göstermesi de BRIC-T ekonomileri için geçerli değildir. Amin vd. (2023), Uğurlu (2024) ile Ali vd. (2022) küreselleşmenin işsizliği azalttığı yönünde bulgulara ulaşmıştır. Şehirleşmenin de istihdam üzerinde bir etkisinin tespit edilmemesi, hızla artan şehirleşmelerin istihdam artırıcı ya da azaltıcı bir etkisinin bulunmadığını ifade etmektedir. Bu durumda Sato ve Zenou (2015)’nin belirttiği gibi şehirlerde endüstri ve hizmet sektörünün gelişmesine ilaveten bireylerin daha fazla insanla etkileşim sağlamasının bireylerin iş bulabilmelerini kolaylaştıracağı görüşü geçerli değildir.

Bu çalışmada, kamu harcamasının istihdam üzerindeki etkisi konusunda net bir sonuca varılamamıştır. Bununla beraber kamu harcamasının istihdamı azalttığına dair bulgulara ulaşılması nedeniyle BRIC-T ülkelerinde kamu harcamalarının yeni iş alanları yaratabileceğine dair görüşler desteklenmemektedir. Buna karşın işsizlere yönelik sosyal harcamaların bireylerin çalışma/boş zaman tercihini çalışma isteğinin azalması yönünde

değiştirmesi söz konusu olabilir. İlâveten bu sonuç kamu harcamasının vergi artışına yol açmasıyla da ilişkilendirilebilir. Yapılan çalışmalarda kamu harcamasının işsizlik üzerindeki etkisi konusunda farklı bulguların olduğu görülmektedir. Örneğin, Yongjin (2011) gelişmiş ve gelişmekte olan ülkelerde 1996-2006 döneminde kamu harcamasının işsizliği artırdığını tespit etmiştir. Abrams (1999) da OECD ve gelişmiş ülkeleri incelediği çalışmasında, Yongjin (2011)'nin bulguları ile benzer yönde kanıtlar elde etmiştir. Buna karşın Pham (2024), Asya ekonomilerinde kamu harcamalarının işsizliği azalttığını belirlemiştir.

6. SONUÇ

İşsizlik ülkeler için önemli sosyoekonomik sorunlar yarattığından sürdürülebilir bir ekonomik büyüme için istihdamın artırılması önemlidir. Bu çalışmada, yenilenebilir enerji sektörüne önemli yatırımlar yapılan BRIC-T ülkelerinde istihdam üzerinde yenilenebilir enerji çeşitliliğinin etkisi sorgulanmıştır. 2000-2021 zaman aralığı AMG tahmin yöntemiyle analiz edilmiştir.

Yenilenebilir enerji çeşitliliğini ölçek amacıyla, Gozgor ve Paramati (2022) tarafından önerilen yöntemle bir endeks hesaplanmıştır. AMG tahmini sonucunda yenilenebilir enerji çeşitliliğinin istihdam üzerindeki etkisinin pozitif olduğu belirlenmiştir. Yenilenebilir enerji çeşitliliğinin istihdamı artırması, BRIC-T ülkelerinde tek bir yenilenebilir enerji kaynağına bağımlı olunmayıp yenilenebilir enerji kaynakları çeşitlendirildiğinde istihdamın arttığına işaret etmektedir.

BRIC-T ekonomilerinde, yenilenebilir enerji sektörünün gelişimiyle birlikte istihdamda yaşanan artışların önemli seviyede olduğu bilinmektedir. Örneğin, 2012 yılında yenilenebilir enerji sektörünün sağladığı istihdam dünyada 7.3 milyon iken 2022 yılında bu oran 13.7 milyona yükselmiştir. Sadece 2022-2023 döneminde yenilenebilir enerji sektöründeki büyümeden kaynaklı istihdam artışı % 18 olup bunun üçte ikisi Çin'de gerçekleşmiştir. 2023 yılında yenilenebilir enerji alanındaki küresel istihdam artışı 16.2 milyon olup bunun 7.4 milyonu (%46) Çin'dedir. Çin'i 1.8 milyonla AB ülkeleri, 1.56 milyonla Brezilya ve 1'er milyonla ABD ile Hindistan takip etmiştir. Güneş enerjisi sektörü dünya genelinde 7,2 milyon istihdam yaratmış olup bunun 4.6 milyonu Çin'dedir. Brezilya sıvı biyoenerjide dünyadaki 2,8 milyon işin üçte birine sahip olduğundan lider konumdaki bir ülkedir. Rüzgâr enerjisi sektöründe Çin türbin üretimi ve kurulumunda 1,5 milyon istihdama ulaşan küresel büyüklüğün %52'sine sahiptir (IRENA& ILO, 2024). Türkiye de özellikle 2000'li yıllarla birlikte yenilenebilir enerji sektörlerinde önemli gelişme kaydetmiştir. Örneğin, 2015-2021 yılları

arasında biyoenerji üretimi yaklaşık % 268 artarken, bu oran rüzgâr ve güneş enerjisi için sırasıyla % 172 ve % 1200 olarak gerçekleşmiştir (BP, 2024). Böylece, güneş enerjisinde dünyanın ilk 20 ülkesi arasında yer alan Türkiye'nin 2021-2022 döneminde güneş ve rüzgâr enerjisi sektöründe sırasıyla 41.000 ve 5.100 istihdam yaratması beklenmiştir (IRENA& ILO, 2024).

Sonuç olarak, BRIC-T ülkelerinde sadece güneş ya da sadece rüzgâr ya da sadece biokütle enerjisinin gelişimine odaklanmamak gerekmektedir. Bunun aksine, ülkede güneş enerjisi, rüzgâr enerjisi ve biyoenerji gibi yenilenebilir enerji kaynaklarının hepsinin gelişimi teşvik edilmelidir. Kısacası, sadece petrole bağımlı olmayıp yenilenebilir enerji kaynaklarına geçilmesi enerji güvenliği ve çevre kalitesi avantajlarına ilaveten istihdamı artırarak işsizliğin azalmasını sağlayabilir. Yenilenebilir enerji kaynaklarına geçişin istihdam yaratma potansiyeli olsa da bu geçişin başarılı olması için eğitim, beceri geliştirme ve uygun politika önlemleri alınması gerekmektedir. Bu nedenle, enerji politikaları oluşturulurken yalnızca ekonomik ve çevresel faktörler değil, istihdam üzerine etkileri de dikkate alınmalıdır.

Çalışmada, fosil enerji çeşitliliğinin istihdam üzerindeki etkisi de sınanmıştır. Fosil enerji çeşitliliği için de yenilenebilir enerji çeşitliliğine benzer şekilde bir endeks hesaplanmıştır. Analizden elde edilen bulgulara göre, fosil enerji çeşitliliği arttıkça istihdam da artmaktadır. Bu durumda otoritelerin petrol gibi tek bir fosil enerji kaynağı yerine, kömür ve doğalgaz gibi diğer fosil enerji kaynaklarını teşvik etmesi yeni iş alanları yaratacaktır. Özetle, hem fosil hem de yenilenebilir enerji kaynaklarının çeşitlenmesini teşvik edecek politikalar, petrole dışa bağımlılığı azaltarak enerji arz güvenliğini sağlarken işsizliğin azalmasına da katkı sunabilir. Öte yandan, fosil enerji çeşitliliğinin yenilenebilir enerji çeşitliliğine kıyasla istihdam üzerinde daha büyük bir etkiye sahip olduğu gözlenmiştir. Bu durum, BRIC-T ülkelerinde yenilenebilir enerji sektörünün yeterince gelişmemiş olması ve fosil yakıtın hâkim enerji kaynağı olmasıyla açıklanabilir.

İstihdamı artıran bir başka faktör olarak ekonomik büyüme belirlenmiştir. Enflasyon, şehirleşme ve küreselleşmenin istihdam üzerinde anlamlı bir etkisi bulunmamaktadır. Bu durumda, yöneticiler yenilenebilir enerji çeşitliliğiyle beraber ekonomik büyümeyi hızlandıracak makroekonomik politikalara öncelik vererek istihdamın artmasını sağlayabilir.

Yenilenebilir enerji sektörünün gelişiminin BRIC-T ülkelerinde son yıllarda gerçekleşmesi, daha uzun bir zaman aralığını kapsayan analizlerin yapılmasına imkân vermemektedir. İlerleyen yıllarda bu sorun ortadan kalkacağından yapılacak analizlerden daha güvenilir sonuçlar elde edilebilir. Bundan sonraki çalışmalarda, yenilenebilir enerji sektörünün gelişiminin daha

eski yıllara dayandığı gelişmiş ülkeler için analizler yapılabilir.

7. ÇIKAR ÇATIŞMASI BEYANI

Yazarlar arasında çıkar çatışması bulunmamaktadır.

8. MADDİ DESTEK

Bu çalışmada herhangi bir fon veya destekten yararlanılmamıştır.

9. YAZAR KATKILARI

AY: Fikir;

CA, AY: Tasarım;

CA, AY: Denetleme;

AY, JOR: Kaynakların toplanması ve/veya işlemesi;

AY: Analiz ve/veya yorum;

CA: Literatür taraması

CA, AY: Yazıyı yazan;

CA, AY: Eleştirel inceleme

10. ETİK KURUL BEYANI VE FİKRİ MÜLKİYET TELİF HAKLARI

Yapılan bu çalışmada, “Yükseköğretim Kurumları Bilimsel Araştırma ve Yayın Etiği Yönergesi” kapsamında uyulması belirtilen tüm kurallara uyulmuştur. Yönergenin ikinci bölümü olan “Bilimsel Araştırma ve Yayın Etiğine Aykırı Eylemler” başlığı altında belirtilen eylemlerden hiçbiri gerçekleştirilmemiştir. Çalışma etik kurul izin zorunluluğunu gerektirmemektedir.

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ASYMMETRICAL IMPACTS OF GLOBAL DRIVERS ON INFLATION: EVIDENCE FROM NEW-KEYNESIAN PHILLIPS CURVE¹



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ABSTRACT

This study examines inflation dynamics by introducing global factors to the New Keynesian Phillips Curve (NKPC) under various inflation conditions for developed countries from January 1998 to December 2022. The Threshold VAR (TVAR) model is employed to identify potential nonlinearity arising from asymmetric responses to shocks and regime switching. The results indicate a negative relationship between the inflation and unemployment, with the exception of Germany and Japan in high inflation conditions. Expected inflation has an important impact on inflation. Moreover, the variance between the 10-year government bond rate and the 3-month interbank rate leads to an increase in inflation during high inflation regimes. As for global factors, global supply chain pressure has a more pronounced impact on inflation during low inflation conditions, whereas changes in oil and commodity prices have a greater effect on inflation during high inflation conditions. The findings show that central banks have become more effective at stabilizing economies against domestic shocks, but challenges remain with external shocks.

Keywords: Inflation, new keynesian phillips curve, threshold VAR

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¹ Compliance with the ethical rules of the relevant study has been declared.

KÜRESEL BELİRLEYİCİLERİN ENFLASYON ÜZERİNDEKİ ASİMETRİK ETKİSİ: YENİ KEYNESYEN PHILIPS EĞRİSİNDEN KANIT



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ÖZ Bu çalışma, farklı enflasyon koşulları altında Yeni Keynesyen Philips Eğrisi'ne (NKPE) küresel faktörleri dahil ederek gelişmiş ülkeler için Ocak 1998 – Aralık 2022 dönem aralığında enflasyon dinamiklerini incelemektedir. Rejim değişiminden kaynaklanan olası doğrusal olmamayı ve şoklara asimetrik tepkileri tanımlamak amacıyla Eşik Değişkenli VAR (TVAR) yöntemi kullanılmıştır. Çalışmadan elde edilen sonuçlar, yüksek enflasyon koşullarında, Almanya ve Japonya haricindeki ülkelerde, işsizlik ve enflasyon arasında negatif bir ilişkiyi göstermektedir. Beklenen enflasyon, enflasyonun belirlenmesinde önemli bir rol oynamaktadır. Ayrıca, yüksek enflasyon rejiminde 10 yıllık devlet tahvili ve 3 aylık bankalar arası faiz oranı arasındaki fark enflasyonda artışa neden olmaktadır. Küresel faktörler açısından, küresel arz zincir baskısı düşük enflasyon koşullarındaki etkisi daha belirginken, petrol ve emtia fiyatlarındaki değişimler yüksek enflasyon koşullarında enflasyon üzerinde daha büyük bir etkiye sahiptir. Çalışmadan elde edilen bulgular, merkez bankalarının yurtiçi şoklara karşı ekonomilerde istikrarı sağlamada daha etkili hale geldiğini, dış şoklarla ilgili zorlukların devam ettiğini göstermektedir.

Anahtar Kelimeler: Enflasyon, yeni keynesyen philips eğrisi, eşik değişkenli VAR

JEL Kodları: E31, E52, C32

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Türü: Araştırma

1. INTRODUCTION

As the global economy began to recover from the COVID-19 pandemic, supply chain disruptions became more pronounced, putting upward pressure on prices. Many companies found it challenging to meet the rising consumer demand due to widespread shortages of supplies and delays in delivery. The supply-demand imbalances caused by the pandemic resulted in a significant shortage of raw materials and container transportation, leading to price increases for these items. These challenges, along with their impact on inflation, were worsened by labor shortages, low inventory levels, and production delays due to COVID-19 containment measures and increases in commodity prices induced by the Russia-Ukraine war. While such disruptions were relatively rare before the pandemic, they have increasingly become a common occurrence in many countries (Binici, Centorrino, Cevik, & Gwon, 2022; Ascari, Bonam, & Smadu, 2024). Global inflation, which had been relatively stagnant for a decade, has significantly fluctuated over the past four years. It sharply declined during the pandemic due to reduced demand and oil prices but began to rise again by mid-2020 as demand recovered and supply chain disruptions worsened. By 2022, inflation reached its highest level since the mid-1990s (Ha vd. 2024). The COVID-19 pandemic have profoundly impacted the global economy and inflation, disrupting supply chains and leading to significant inflationary pressures and increased price stickiness (Usman & Gil-Alana, 2024). Global inflation has reached 7.5% as of August 2022. This ratio is 2.1% between 2010-2010 and 3.4% in 2020 (Binici et al., 2022). Inflation rate in the Euro Area reached the highest level in history with 8.4% in 2022. Similarly, inflation rate peaked at 9.5% in the UK, 8.7% in Germany, 5.9% in France, 8.7% in Italy and 6.8% in Canada in this period. Therefore, global factors such as oil prices and supply chain pressures have increasingly become significant drivers of inflation. This problem is not only recurred in developing countries, but it has also become an important phenomenon in developed countries with low and stable inflation for long years.

The Covid-19 pandemic has led to a re-evaluation of the inflation-unemployment relationship. While unemployment fell sharply, inflation surged, contradicting traditional views. The Phillips curve, introduced by A.W. Phillips in 1958, appears outdated as inflation rose despite high unemployment early in the pandemic and continued to increase during recovery. This issue isn't unique to Covid-19, as past research has shown similar discrepancies. Additionally, the recession from the war in Ukraine raises questions about whether these crises indicate further failures of the Phillips curve and if different recessions require unique theoretical frameworks (Haschka, 2024).

The Phillips curve emerged as a relationship between wage inflation and unemployment in the U.K., with Phillips (1958) providing a theoretical basis that favored the “demand pull” explanation of inflation. Traditional Phillips curve analysis links inflation to cyclical indicators and lagged inflation, portraying it as a backward-looking phenomenon shaped by adaptive expectations or price-setting behaviors. In contrast, the new-Keynesian Phillips curve connects inflation to the output gap and includes a “cost push” effect influenced by expected inflation, indicating a forward-looking dynamic. This forward-looking nature stems from staggered nominal price setting, as articulated by Taylor (1980) and Calvo (1983), or through quadratic price adjustment costs (Rotemberg, 1982), making it essential in monetary policy analysis (Herz and Röger, 2024).

Due to its significance in policy-making, there is a substantial body of literature focused on inflation dynamics and the challenges of forecasting inflation (Stock & Watson, 2009; Edge & Gürkaynak, 2010; Ball & Mazumder, 2011; Dotsey, Fujita, & Stark, 2018). One approach in this literature remains largely neutral regarding the macroeconomic models that influence inflation trends, while another approach adopts a structural framework that establishes explicit connections to macroeconomic models grounded in microeconomic theories. A crucial aspect of the microfounded approach to understanding inflation dynamics is the estimation of the New Keynesian Phillips Curve (NKPC).

The theoretical microeconomic foundations that underpin nominal price rigidities serve to establish the NKPC as a pivotal instrument for central banks in the implementation of effective monetary policy. The NKPC articulates a nuanced relationship between inflation rates, the expectations of future inflation, and real economic activity, particularly in the context of cyclical fluctuations in the economy known as business cycles. By capturing how these factors interact over time, the NKPC offers comprehensive insights into the dynamics of inflation, making it an invaluable tool for policymakers. Consequently, it has achieved widespread acceptance in both practical applications and scholarly research, where it is frequently employed to model and predict inflationary trends (Mavroeidis, Plagborg-Møller, & Stock, 2014; Abbas, Bhattacharya, & Sgro, 2016; Abbas, 2023).

In this study, we aim to analyze the determinants of inflation based on the NKPC framework in Italy, Germany, France, Canada, Japan, and the United Kingdom under different inflation regimes. Inflation co-movement is one of the important research questions arising from heightened globalization of goods and financial markets. Studies show that this co-movement more pronounced inflation co-movement in advanced countries than in developing countries. This

study covers Canada, Japan, Germany, Italy, France and the UK (G7 countries), as these developed countries exhibit higher co-movement and more homogenous macroeconomic structure. Ergemen (2022) shows that inflation has a global component, mainly driven by G7 countries, which explains, on average, 77% of the variation in 22 high-income OECD countries (Nazlioglu, Akin, Gurel, & Gunes, 2025).

We use the nonlinear Threshold VAR (TVAR) model to research whether the response of inflation to its determinants in the NKPC framework changes significantly across different inflation conditions. This model offers a flexible tool to capture potential nonlinearities arising from regime switching and asymmetric responses to shocks (Atanasova, 2003; Ferraresi, Roventini, & Fagiolo, 2015).

To this end, the following issues will be focused in this research:

- What have been the global factors contributing to inflation across different inflation regimes?
- How have the roles of global supply chain pressures and other global shocks evolved across different inflation regimes?
- Which factors have a greater impact on inflation in a high inflation environment?

This study is expected to make a significant contribution to the existing literature in several ways. Firstly, earlier studies have examined the roles of domestic and global shocks affecting inflation fluctuations. For example, Charnavoki & Dolado (2014) use a FAVAR model to analyze how global supply, demand, and commodity prices affect inflation in Canada, finding that both commodity price and global demand shocks have a significant impact. Similarly, Finck & Tillmann (2022) use SVAR models to investigate these shocks' influence on inflation in emerging Asian economies, reporting they account for a substantial portion of inflation. Ha, Kose, Ohnsorge, & Yilmazkuday, (2023) analyze how global supply chain pressures and various shocks, such as oil price fluctuations, have impacted inflation across 55 countries from 1970 to 2022. They show that global shocks have increasingly become significant factors in driving variations in inflation over time. However, these studies ignore the effects of different economic conditions. This study evaluates the significance of both domestic and global factors in driving inflation, particularly under different inflationary conditions. In other words, the study aims to estimate the inflation dynamics in the NKPC framework under different inflation conditions, specifically low and high inflation regimes, using the TVAR model. This model allows us to capture asymmetric responses to shocks and nonlinearities arising from regime switching (Atanasova, 2003; Jiang, Wang, Ma, & Yang, 2021).

Secondly, we include global factors to NKPC model. Global factors such as the global commodity prices and disruption in the supply chain are important reasons for rising inflation during the Covid-19 period. Thus, the model includes the variables of crude oil price, the Bloomberg Commodity Index, global supply chain pressure index, and global economic policy uncertainty index.

The following sections are proposed for inclusion in the report: ‘Literature Review’ section will provide a comprehensive overview of the existing literature regarding market efficiency. ‘Data’ will explain the data that has been utilized for the analysis. ‘Methodology’ will outline the methodology implemented, along with the relevant context. ‘Empirical Findings’ will present the empirical findings obtained from the research. ‘Conclusion’ will summarize the results and offer corresponding recommendations based on the findings.

2. LITERATURE REVIEW

There are many studies related to explaining inflation dynamics in the literature. Some of these studies extensively investigate macroeconomic model generating the inflation path, while the another studies has taken a structural approach, connecting to macroeconomic models with microeconomic foundations. An important aspect of the microfounded approach to inflation dynamics involves estimating the NKPC. Several important concepts emerged in the late 1970s and 1980s, such as asymmetric information, efficiency wage hypothesis, staggered contracts, and the NKPC. The NKPC, among these contributions, provides the microeconomic basis for Keynesian macroeconomics (Abbas et.al., 2016). It operates on the assumption that inflation expectations are rational and that prices are inflexible, with future price expectations playing a crucial role in price setting (Haschka, 2024). This is based on the theoretical work of Taylor (1980), Rotemberg (1982), and Calvo (1983), which maintain the assumptions of nominal rigidities to explain inflation. These theoretical models, as highlighted by Roberts (1995), establish a common relationship known as the NKPC, which connects the inflation to a measure of real economic activity and expected inflation.

The NKPC has attracted the attention of many researchers, particularly following the estimation of the inflation structural model by Gali & Gertler (1999) and Sbordone (2002). Gali & Gertler (1999) aimed to create an empirical relationship between short-term inflation dynamics and real economic activity. Utilizing nominal labor compensation and labor productivity to estimate marginal costs, Sbordone (2002) calculates the anticipated price path based on the optimal pricing solution for firms. His findings reveal compelling evidence of substantial price rigidity and robust endorsement for the forward-looking pricing model.

However, Mazumder (2010) criticized the use of the labor share of income due to its countercyclical behavior.

There is currently a focus on studying inflation dynamics in the NKPC framework for both emerging and developed countries. This is typically done using linear econometric methods such as GMM (Abbas et.al., 2016; Hyder & Hall, 2020; Wardhono, Nasir, Qori'ah, & Indrawati, 2021; Ayisi & Mensah, 2023), panel (Byrne, Kontonikas, & Montagnoli, 2013), and DSGE (McKnight, Mihailov, & Rumler, 2020). However, there are only a limited number of studies that use nonlinear econometric models to investigate whether NKPC is supported (Chin, 2019; Kocoglu, 2023; Abbas, 2023; Loria & Tirado; 2023). Abbas et al. (2016) estimated the New Keynesian Phillips Curve (NKPC) for Canada, Australia, the UK, and New Zealand, including imported goods and the real exchange rate. Hyder and Hall (2020) examined the NKPC's validity in Pakistan's services, manufacturing, and agriculture sectors, finding that manufacturing is the most forward-looking. Wardhono et al. (2021) investigated inflation determinants in ASEAN countries using a Generalized Method of Moments (GMM) model, concluding that inflation is influenced by expectations, money supply, output gap, and exchange rate. Ayisi and Mensah (2023) analyzed drivers of food, non-food, core, and headline inflation in Ghana within the NKPC framework and found the model suitable for understanding inflation dynamics. Byrne et.al. (2013) analyze the characteristics of NKPC at sectoral and aggregate levels for 14 European countries for the period of 1971-2006. From the their findings, they concluded that sectoral heterogeneity is an important factor for aggregate inflation. They stated that heterogeneity reveals under-estimation of the effect of marginal costs in the NKPC model. McKnight et.al. (2020) developed a forecasting method based on the New Keynesian Phillips Curve that incorporates time-varying trend inflation to capture shifts in central bank preferences and monetary policy fort he Euro Area and the US. They found that the findings are robust across structural breaks, geographic regions, and different econometric specifications. Chin (2019) estimated the New Keynesian Phillips Curve (NKPC) using a time-varying parameter model for the United States from 1960 to 2017. He revealed that the relationship between inflation and output changes over time and is more pronounced during periods of high inflation, which is related to the degree of price rigidity. Kocoglu (2023) examined the factors driving inflation within the framework of the NKPC for Turkey from 2000 to 2021 bu using QARDL. His research revealed that the output gap has a negative effect on inflation, while aggregate expenditures contribute to an increase in inflation. Additionally, he found that both oil prices and the exchange rate have positive impacts on inflation. Abbas (2023) analyzed the NKPC for Canada, Australia, New Zealand, the UK,

and the US using an Instrumental Variable Threshold Model. He demonstrated that the response of inflation to various driving forces is asymmetric under different economic and inflationary conditions. Loria and Tirado (2023) examined the factors influencing inflation in Mexico using the NKPC framework for the period from 2005 to 2022. They discovered that the unemployment gap has a stronger disinflationary effect than critical labor conditions. Additionally, improvements in the labor market can result in inflation if critical labor conditions are reduced.

Some studies have explored how domestic and global shocks influence fluctuations in inflation. For instance, Charnavoki & Dolado (2014) utilized a FAVAR model to assess the impact of global supply, demand, and commodity prices on inflation in Canada. Similarly, Finck & Tillmann (2022) employed SVAR models to analyze the influence of these shocks on inflation in emerging Asian economies. Additionally, Ha et al. (2023) examined the effects of global supply chain pressures and various shocks. However, this study highlights the importance of both domestic and global factors in driving inflation, particularly under varying inflationary conditions in framework of NKPC. We aim to estimate the inflation dynamics in the NKPC framework under different inflation conditions, specifically low and high inflation regimes, using the TVAR model. This model allows us to capture asymmetric responses to shocks and nonlinearities arising from regime switching.

Table 1 provides a summary of the latest empirical studies investigating inflation dynamics within the NKPC framework.

Table 1: Literature Review

Author(s)	Period	Country	Method	Findings
Byrne et.al. (2013)	1971-2006	Austria, Italy, Denmark, Belgium, France, Greece, Germany, Ireland, Portugal, Spain, The Netherlands, UK, Sweden, and US	Weighted Mean Group estimator	The coefficient of lagged inflation is statistically significant in most countries and sectors. The model performs well in explaining inflation in the U.S., UK, and France, despite being less supportive for some smaller countries in their dataset.
Abbas et.al. (2016)	1959Q1-2011Q1	Canada, Australia, the United Kingdom and New Zealand	GMM	The open economy version of the NKPC is increasingly relevant in a globalized world where monetary policy decisions are often coordinated among countries. It's important for understanding inflation dynamics across developed

				countries.
Chin (2019)	1960Q1-2017Q4	US	GMM and Time Varying Parameter (TVP) model	The estimated output-inflation trade-off parameter varies over time and is higher during periods of high inflation. This time-varying trade-off is linked to price rigidity, which is inversely related to inflation. Forward-looking price-setting behavior predominantly explains inflation dynamics for most of the sample period.
Saygılı (2020)	1990-2016	OECD countries	Prais-Winsten regression heteroskedastic panels corrected standard errors (PCSE)	The dynamics of inflation are influenced by both country-specific and global factors, each playing a significant role. The impacts of these factors vary among sectors based on the level of integration into global value chains and the nature of trade. Understanding these dynamics is crucial in identifying the trade effects on inflation.
Hyder and Hall (2020)	1973-2013	Pakistan	GMM	The real marginal cost is a more accurate indicator of inflation compared to competing measures such as the labor share of income or output gap.
McKnight et.al. (2020)	1970Q1-2015Q4	Euro Area and United States	DSGE	The TVT-NKPC forecasts were consistently 10–20 percentage points more accurate than the AO benchmark, particularly at 8 and 12 quarters ahead in the US data.
Wardhono et.al. (2021)	2005Q1-2018Q4	ASEAN countries	GMM	The estimated NKPC models suggest that backward-looking behavior has a greater influence on inflation than forward-looking behavior. Inflation changes are influenced by factors such as inflation expectations, the output gap, money supply variations, and exchange rate fluctuations, indicating the relevance of NKPC models in

				explaining inflation dynamics in the ASEAN region.
Ayisi and Mensah (2023)	1970-2021	Ghana	GMM	The traditional NKPC model aligns with both deflator-based and CPI-based headline inflation. The study suggests that the NKPC model is suitable for examining inflation dynamics in Ghana.
Kocoglu (2023)	2000M1-2021M10	Turkey	Quantil ARDL (QARDL)	The production gap negatively affects inflation, but aggregate expenditures increase. Price asymmetries in crude oil have a positive impact on inflation. The relationship between international oil prices, output gaps, and CPI inflation is nonlinear in the context of the NKPC.
Abbas (2023)		New Zealand, the UK, Australia, Canada, and the US	Instrumental Variable Threshold Model	The response of inflation to the driving force is asymmetric in different economic and inflationary conditions. Price stickiness varies across different economic conditions, impacting the relationship between the output gap and inflation.
Loria and Tirado (2023)	2005Q1-2022Q4	Mexico	Nonlinear ARDL (NARDL)	The unemployment gap has a higher disinflationary effect than critical labor conditions. Improvements in the labor market can lead to inflation when critical labor conditions are reduced. These asymmetries can result in a low unemployment trap with high and growing precariousness.
Martins and Verona (2024)	1978Q1-2021Q4	US	Maximal Overlap DiscreteWavelet Transform	Unemployment and inflation expectations are the main predictors.
Haschka (2024)	1980-2022	US	Literature research	The correlation between inflation and unemployment has experienced a decline since the 1980s, particularly during the Covid-19 pandemic, attributable to the impacts of globalization and the enhanced stability of inflation expectations, resulting from the implementation of more

				credible monetary policies.

3. METHODOLOGY

The nonlinear Threshold VAR (TVAR) model researches whether the response of inflation to their determinants in framework NKPC changes considerably across different inflation conditions. This model provides a flexible instrument to obtain possible nonlinearities resulting from regime switching, and asymmetric response to shocks (Atanasova, 2003). The threshold variable is endogenous in TVAR model. Therefore, the parameters can be change in each regime. The state dependent dynamics of TVAR enables asymmetric and nonlinear impulse-response functions (Jiang et al., 2021).

The linear VAR model used in the study as follows:

$$Y_t = \sum_{i=1}^p A_i Y_{t-i} + \sum_{i=1}^q B_i X_{t-i} + \varepsilon_t$$

where Y_t and X_t are vectors of endogenous and, xogenous variables, respectively. A_i and B_i are matrices of coefficient. ε_t is the error vector, which has normal distrubition with mean zero and variance-covariance matrix $\sum E\varepsilon_t\varepsilon_t'$

$$Y_t = (\text{inf}_t, \text{expinf}_t, \text{unemp}_t, \text{intspread}_t)'$$

$$X_t = (\text{oil}_t, \text{commodity}_t, \text{gscpi}_t, \text{gepu}_t)'$$

TVAR model (Balke, 2000; Atanasova, 2003) assumes the economy with two regime, and the regime switches depending on the value of threshold variable, and is the extended version of VAR model. TVAR model with two regimes can be written as follows:

$$Y_t = I[c_{t-d} \geq \gamma] \left(\sum_{i=1}^p A_i^1 Y_{t-i} + \sum_{i=1}^q B_i^1 X_{t-i} \right) + I[c_{t-d} < \gamma] \left(\sum_{i=1}^p A_i^2 Y_{t-i} + \sum_{i=1}^q B_i^2 X_{t-i} \right) + \varepsilon_t$$

where c_{t-d} is threshold variable determining what regime the economic system is. $I[c_{t-d} \geq \gamma]$ takes the value of one if $c_{t-d} \geq \gamma$, zero otherwise. A_i^1 , A_i^2 , B_i^1 , and B_i^2 are regime parameters. In this study, inflation rate is used as a threshold variable. Therefore, $I[\text{inf}_{t-d} \geq \gamma]$ is an dummy indicator function with $I[\text{inf}_{t-d} \geq \gamma] = 1$ and 0 otherwise. Here the economic system is split into two regimes characterized by different phases of inflation rate, i.e., the low and high inflation regime. The high inflation regime indicates high degree of inflation rate where $I[\text{inf}_{t-d} \geq \gamma] = 1$, while the low inflation regime refers to low degree of

inflation rate with $I[\inf_{t-d} < \gamma] = 0$. d states the lag parameters of threshold variable.

The threshold nonlinearity of the model is tested by the $C(d)$ test developed by Tsay (1998). This test researches the null hypothesis of linear model against the alternative hypothesis of nonlinear TVAR model. $C(d)$ test have a chi-squared distribution with $k(pk+1)$ degrees of freedom, where p is lag order and k is the number of endogenous variables. Then, the interval involving the potential breakpoint of the threshold variable is divided by certain grids, and the model is estimated for each grid to determine the optimal value of threshold variable (γ). The optimal threshold value is obtained based on the minimum selection criteria. The impulse-response functions (IRFs) are nonlinear because of changing between regimes. IRFs obtained from TVAR model are calculated as follows:

$$IRF_j(k, \varepsilon_t | \Omega_{t-1}) = E(Y_{t+k} | \Omega_{t-1}, \varepsilon_t) - E(Y_{t+k} | \Omega_{t-1})$$

where Ω_{t-1} is past information set at time $t-1$, k is a pre-specified forecast horizon. Firstly, ε_{t+j} $j=1, \dots, k$, randomly draws vectors of residuals of TVAR model. The series of shocks is obtained to generate forecasts based on initial conditions for each initial value. Secondly, one standard deviation shock (+1/-1) to the variable is included at time t to each shock series. Following Balke (2000), the ε_{t+j} simulates to remove any asymmetry stemming from sampling variation in the draws of ε_{t+j} (Jiang et al., 2021).

4. DATA

We aim to analyze the determinants of inflation based on the NKPC framework in Canada, Japan, Germany, France, Italy, and the UK. According to the NKPC, the inflation rate is a function of real marginal cost of production and a forward-looking component (Gali & Gertler, 1999; Guay, Luger, & Zhu, 2003; Hornstein, 2008; Szabq & Jancovic, 2022). By following with the study of Gali & Gertler (1999), we utilize monthly data including the unemployment rate, long-short interest rate spread, and inflation expectation from January 1998 to December 2022. Inflation is measured by the percent change from a year ago in the consumer price index. Interest rate spread is measured 10-year Government Bond Rate minus 3 month interbank rates.

The different measures are used as a proxy for marginal cost in the literature. One of these measures is real unit labor costs. Gali & Gertler (1999) measure the marginal cost as a labor income share. Gali et al. (2001) include real unit labor in the NKPC model. They find that this model is appropriate to estimate European inflation. Leith & Malley (2005) state that the NKPC model is more appropriate for the Euro Area than the United States when labor income share is

used as a proxy for real marginal cost. Similarly, Jondeau and Bihan (2005) and Rumler (2007) discuss that the labor income share may estimate the inflation dynamics in the Euro Area. The unemployment rate reflects real unit labor costs. Pehnelt (2007) use unemployment rate as a proxy for the real economic activity to estimate inflation dynamics in OECD countries. Therefore, we use unemployment rate as a proxy for marginal cost in the NKPC model.

The NKPC also involves the external factors affecting marginal cost (Gali & Monecalli, 2005; Blinder & Rudd, 2008; Gordon, 2011). Mihailov, Rumler, & Scharler, (2011) and Szafronek (2017) show that external factors such as global commodity price index and oil price are important factors of increases in inflation. The COVID-19 pandemic has created inflation uncertainty around the world. Global factors such as the global commodity prices and disruption in the supply chain are important reasons for rising inflation during the Covid-19 period. Thus, the model includes the variables of crude oil price, the Bloomberg Commodity Index, global supply chain pressure index, and global economic policy uncertainty index. The Bloomberg Commodity Index serves as a reliable indicator of commodity futures price movements. This index undergoes annual rebalancing, with a weight of 2/3 assigned according to trading volume and 1/3 based on world production. Additionally, weight-caps are strategically applied at the level of commodity, sector, and group to ensure adequate diversification. The index's methodology offers a comprehensive approach to tracking commodities and provides valuable insights to businesses and academic institutions. The Global Supply Chain Preparedness Index (GSCPI) is designed to provide a comprehensive summary of potential supply chain disruptions by incorporating several commonly used metrics. This index aims to integrate various factors that may impact the supply chain, offering a holistic view of the overall preparedness of businesses to deal with potential disruptions. The GSCPI is a valuable tool that allows businesses to assess their supply chain risks and take proactive measures to mitigate potential threats. The Global Economic Policy Uncertainty (GEPU) Index is a GDP-weighted average of national EPU indices for 21 countries. The GEPU Index is derived from individual national EPU indices that reflect the relative frequency of newspaper articles in each country that contain a specific combination of terms related to economy (E), policy (P) and uncertainty (U). By aggregating these national indices, GEPU offers a comprehensive overview of the global economic policy uncertainty that can be useful for businesses, policymakers, and researchers. Table 2 shows the variables used in the study.

Table 2 Description of the Variables

Variables	Explanations	Data Source
inf	Inflation rate (the percent change from a year ago in the consumer price index)	https://fred.stlouisfed.org/
expinf	The expected inflation	https://fred.stlouisfed.org/
unemp	Unemployment rate	https://fred.stlouisfed.org/
intspread	10-year Government Bond Rate minus 3 month interbank rates	https://fred.stlouisfed.org/
oil	Crude oil price	https://fred.stlouisfed.org/
commodity	Bloomberg Commodity Index	www.investing.com
gscpi	Global Supply Chain Pressure Index	www.investing.com
gepu	Global Economic Policy Uncertainty Index	www.policyuncertainty.com

Sources: <https://fred.stlouisfed.org/> , www.policyuncertainty.com , www.investing.com

Table 3 indicates the descriptive statistics for the variables. According to Table 2, Japan appears to have the lowest inflation rate (0.18%) and unemployment rate (3.96%) among the countries listed. Following Japan, France and Germany have relatively lower inflation rates than the other countries. On the other hand, Canada, Italy, and the UK seem to have an average inflation rate of around 2%. It seems that France and Italy have the highest unemployment rates, with 9.16% and 9.5% respectively. When standard deviation values are examined, it appears that GSCPI is the variable with the highest risk among the external factors affecting inflation. Additionally, OIL has a negative skewness value, whereas COMMODITY, GEPU, and GSCPI have positive skewness values, indicating that extreme events occurred for oil prices. Furthermore, it seems that the null hypothesis assuming that the returns distribute normally for the Jarque–Bera test is rejected at level 5% for all variables.

5. EMPIRICAL RESULTS

It is important to consider structural change in analyzing macroeconomic variables. There can be various reasons behind structural change, such as economic crisis, policy changes, and regime shifts. Ignoring structural changes in time series leads to biased outcomes in an econometric model, which causes the wrong non-rejection of the null hypothesis of non-stationarity against alternative of structural breaks (Perron, 1989; 1997; Leybourne and Newbold, 2003). Thus, it's crucial to consider the presence of a structural break in the data when conducting the test of non-stationarity. Otherwise, there's a risk of incorrectly concluding that the series has a stochastic trend, which means that any shock -

demand, supply, or policy-induced - will have long-term effects on the variable. This understanding of the economic content of the result is essential for accurate analysis. Therefore, we use Lee-Stratizich (2003) and Lumsdaine Papell (1997) with two structural breaks to research stationarity of the variables. The results are given in Table 4.

	County-Specific Factors									Global Factors			
	Canada			France			Germany						
	INF	UNEMP	INTSPREAD	INF	UNEMP	INTSPREAD	INF	UNEMP	INTSPREAD	LCOMM ODITY	LGE PU	LOIL	GSCP I
Mean	2.089	7.131	0.9409	1.48	9.169	1.1955	1.631	6.471	0.8736	2.0569	2.088	1.711	0.008
Median	1.985	7.1	0.7833	1.41	9	1.156	1.434	6.45	0.7853	2.0498	2.064	1.757	-0.259
Maximum	8.133	14.1	3.4265	6.20	12.1	2.839	8.820	11.2	2.5778	2.3674	2.640	2.126	4.316
Minimum	-0.949	4.9	-1.6115	-0.7253	7	-0.9295	-1.040	2.9	-1.2296	1.7846	1.714	1.054	-1.652
Std. Dev.	1.357	1.111	0.9761	1.13	1.140	0.7857	1.393	2.578	0.7653	0.1228	0.217	0.240	1.006
Skewness	1.705	1.883	0.5038	1.52	0.559	-0.076	2.568	0.161	0.0972	0.1436	0.371	-0.64	2
Kurtosis	7.712	12.46	2.8411	7.35	3.298	2.5035	12.48	1.628	2.5424	2.1029	2.275	2.701	7.329
Jarque-Bera	423.08***	1297.83***	13.0068***	353.43***	16.7538***	3.3703	1453.50***	24.8134***	3.0898	11.0914**	13.4561***	21.7348***	434.2804***
	Italy			Japan			UK						
	INF	UNEMP	INTSPREAD	INF	UNEMP	INTSPREAD	INF	UNEMP	INTSPREAD				
Mean	1.918	9.507	2.0446	0.18	3.965	0.7019	2.201	5.588	0.9668				
Median	1.878	9.4	1.8862	0	4.1	0.6483	1.9	5.2	0.9576				
Maximum	11.83	13.2	5.5724	3.99	5.5	2.017	9.6	8.5	3.9834				
Minimum	-0.583	5.9	-0.7551	-2.5151	2.2	-0.289	0.2	3.5	-1.6037				
Std. Dev.	1.720	1.841	1.2943	1.09	0.946	0.5912	1.479	1.314	1.1975				
Skewness	2.575	0.063	0.3575	1.11	-0.243	0.2255	2.693	0.675	0.3039				
Kurtosis	14.29	1.976	2.9289	4.89	1.837	1.8606	12.43	2.425	2.5495				
Jarque-Bera	1926.73***	13.2957***	6.4548*	107.27***	19.8716***	18.7715***	1476.59***	26.9667***	7.1557*				

Note: *, **, and *** indicates significance at %10, %5, and %1, respectively

Based on the results presented in Table 4, it can be observed that the null hypothesis of non-stationarity cannot be rejected for INF, indicating that INF has a unit root at level for all countries. Similarly, the variable UNEMP is not stationary at level value for all countries except Canada. Furthermore, INTSPREAD has a unit root at level value except for France and Japan. In terms of global factors, the analysis reveals that COMMODITY, OIL, and GEPU are trend stationary at first difference, while GSCPI is trend stationary at level. These findings provide important insights into the stationarity of the variables and can inform further analysis and modeling efforts.

Macroeconomic series can display nonlinear patterns (Enders, 2010). If the series or the relationship between these series has nonlinear behaviors, the results based on linear analysis are biased. Thus, we apply Tsay, White, Keenan, Teraesvirta and LR tests to determine whether the variables exhibit nonlinear structures. According to the results in Table 5, all variables show nonlinear behaviors because the null hypothesis of linear structure is rejected for each of them. For this reason, we use KSS (Kapetanios, Shin, & Snell, 2003) nonlinear unit root test to research stationarity of variables. This test is based on ESTAR (Exponential Smooth Transition Autoregressive) process. It tests the null hypothesis of a unit root against the alternative hypothesis of global stationarity ESTAR process (Gürış vd., 2020). When examined Table 5, it is seen that INF exhibits global stationarity ESTAR process at first difference for all countries. LIP is stationarity at 5% significance level for all countries except Canada. UNEMP has a unit root at level except Canada. However, INTSPREAD is global stationarity at level except Canada and the United Kingdom. In terms of global factors, LCOMMODITY, LGEP, LOIL and GSCPI become global stationary at first difference.

Firstly, we apply the C(d) test recommended by Tsay (1998) to test the existence of multiple regimes in the TVAR model. It tests the null hypothesis of a linear VAR model against a TVAR model. The inflation rate is determined as threshold variable. According to Akaike information criteria, the optimal lag length is 1. The suitability of the TVAR model was assessed through the application of the C(d) test statistics. The results of this nonlinearity test, generated via iterative regression estimation utilizing lag parameters d and alternative starting points $m_0=50$ and $m_0=100$, are presented in Table 6. The choice of delay parameter d is based on the maximum value of Chi-Square test statistic. The test results show that the null hypothesis that linear model is valid is

rejected for all delays at the 5% significance level. This result provides strong evidence in favor of TVAR model against the linear VAR model, and supports the existence of two regimes given by changes in inflation. Threshold values based on grid search that maximizes the determinant of the variance-covariance matrix for Canada, Germany, France, Japan, Italy, and the UK are 2.04, 2.26, 2.01, 1.90, 2.20, and 2.30, respectively. Thus, low inflation regime occurs when inflation rate is less than threshold value; otherwise the economy are in high inflation regime

Table 4: The Results for Lee-Strazicich and Lumsdaine Papell Tests

	Lee-Strazicich Test							Lumsdaine Papell Test					
	Model A (Crash Model)				Model C (Trend Shift Model)			Breaks in Intercept			Breaks in Intercept and Trend		
	LM-stat	Breaking Points D1t	D2t	LM-stat	Breaking Points DT1t	DT2t		t-stats	Breaking Point D1t	D2t	t-stats	Breaking Points DT1t	DT2t
Canada													
INF	-2.89	2006:8	2020:5	-	2003:9	2020:6		-3.86	2003:3	2008:9	-5.47	2003:3	2019:4
ΔINF	-12.3***	2001:2	2005:8	5.59**	2009:5	2020:7		-	2003:2	2011:5	-	2009:9	2013:5
UNEMP	-4.82***	2009:1	2020:6	13.5***	2009:1	2020:1		-	2008:10	2019:4	-6.9136	2008:10	2019:4
INTSPREAD	-2.9150	2001:4	2008:10	7.02**	2002:2	2008:9		6.522**					
ΔINTSPREAD	-9.98***	2007:8	2010:1	4.0012	2002:1	2020:2		-3.330	2005:1	2008:9	-4.4901	2002:9	2008:9
				10.7***				-	2002:3	2007:9	-	2002:3	2009:7
								10.02**			10.58***		
France													
INF	-3.461*	2001:12	2009:8	3.9136	2003:2	2017:9		-	2008:7	2012:10	-5.3225	2008:10	2012:8
ΔINF	-9.80***	2009:5	2015:4	11.0**	2007:3	2009:6		4.5022					
UNEMP	-1.4459	2013:8	2017:1	3.6405	2000:7	2012:12		-	2009:7	2015:1	-	2008:7	2011:11
ΔUNEMP	-10.7***	2002:5	2008:2	11.3**	2005:7	2008:1		10.90**			11.23***		
INTSPREAD	-3.468*	2001:11	2008:12	4.743*	2006:4	2009:3		-	2008:10	2012:3	-4.1214	2001:8	2012:8
								4.2725					
								-	2001:8	2008:2	-	2003:8	2008:2
								11.28**			11.49***		
								-	2001:8	2008:10	-8.3557	2003:5	2008:10
								7.070**					
Germany													
INF	-3.3040	2004:3	2010:12	4.3715	2008:9	2018:5		-	2008:8	2013:7	-4.5839	2008:9	2012:12
ΔINF	-9.66***	2003:12	2009:9	11.5**	2008:7	2010:11		4.0294					
UNEMP	-1.0476	2002:8	2010:5	1.3582	2002:7	2007:1		-	2003:5	2009:7	-	2009:7	2015:1
ΔUNEMP	-7.06***	2001:6	2005:2	8.30**	2001:5	2005:8		11.23**			11.52***		
INTSPREAD	-	2001:8	2008:12	4.5512	2004:6	2009:3		-	2002:3	2009:4	-4.2720	2002:3	2010:10
ΔINTSPREAD	3.7597*							4.2720					
	-9.21***	2004:4	2009:11	9.73**	2008:10	2011:11		-	2001:8	2005:4	-8.6761	2001:8	2005:4
								8.586**					
								-	2007:5	2010:10	-	2003:5	2008:10
								3.8123			7.601***		
								-	2001:8	2008:10	-	2008:10	2012:2
								9.438**			10.25***		
Italy													
INF	-2.7540	2012:9	2014:12	3.3064	2012:12	2017:3		-	2008:10	2012:9	-5.6038	2008:10	2012:9
ΔINF	-7.85***	2001:1	2017:1	11.0**	2009:9	2020:6		3.9087					
								-	2002:11	2008:7	-	2012:9	2018:11
								9.825**			12.01***		

UNEMP	-1.0873	2011:10	2014:6	-	2007:5	2014:10	-	2008:3	2011:8	-5.6040	2006:5	2011:10
AUNEMP	-12.9***	2011:2	2014:2	4.3086	2011:7	2014:4	5.2809	2007:4	2014:11	-	2011:7	2015:9
INTSPREAD	-2.7325	2008:10	2012:2	13.1**	2007:1	2011:7	13.16**	2008:10	2013:9	-5.8181	2003:5	2008:10
ΔINTSPREAD	-10.7***	2008:3	2016:7	3.5955	2008:8	2012:12	5.7633	2008:3	2011:11	-	2008:10	2015:3
				11.0**			10.80**			11.36***		
Japan												
INF	-3.74**	2009:4	2014:10	-	2013:11	2020:7	-	2008:10	2015:3	-5.2398	2008:10	2015:3
ΔINF	-11.2***	2004:10	2014:9	4.3728	2008:3	2014:6	4.2906	2008:7	2014:6	-	2008:7	2014:5
UNEMP	-1.4208	2001:8	2013:8	11.8**	2003:8	2009:3	11.90**	2008:10	2013:2	-5.9312	2008:10	2017:5
ΔUNEMP	-14.6***	2001:11	2010:10	2.7277	2006:11	2009:7	5.3728	2007:7	2018:5	-	2005:11	2009:7
INTSPREAD	-5.28***	2007:7	2020:2	16.0**	2004:2	2015:11	15.44**	2003:6	2019:3	-	2003:6	2015:12
				6.74**			6.182**			7.411***		
Lee-Strazicich Test Model A (Crash Model) Model C (Trend Shift Model) LM-stat Breaking Points DT1t DT2t												
Lumsdaine Papell Test Breaks in Intercept Breaks in Intercept and Trend t-stats Breaking Point DT1t DT2t												
United Kingdom												
INF	-1.4364	2010:1	2020:6	-	2006:7	2020:7	-	2002:1	2011:9	-3.7088	2013:9	2019:4
ΔINF	-9.35***	2015:4	2020:6	3.4197	2008:8	2020:7	1.5021	2005:9	2011:9	-11.0***	2011:9	2017:11
UNEMP	-1.1009	2009:8	2013:2	11.1**	2008:9	2014:8	10.3***	2008:4	2013:12	-5.6617	2008:4	2019:4
ΔUNEMP	-8.82***	2011:12	2020:7	2.5055	2008:3	2014:1	5.6170	2009:5	2013:1	-9.66***	2008:4	2014:6
INTSPREAD	-2.0818	2009:3	2014:12	-9.45	2008:10	2020:5	9.00***	2008:8	2013:12	-5.4864	2008:8	2019:4
ΔINTSPREAD	-10.5***	2009:7	2020:7	-3.31	2004:11	2009:7	4.1552	2002:4	2010:4	-12.4***	2008:8	2012:6
				12.0**			11.8***					
Global Factors												
LCOMMODITY	-1.8750	2011:8	2015:6	-3.40	2005:9	2020:5	-	2008:6	2014:6	5.2626	2008:6	2014:8
ALCOMMODITY	-11.1***	2001:9	2020:6	4.8207	2004:8	2020:5	4.8207	2008:6	2014:4	-11.6***	2008:6	2012:2
LGEPY	-5.42***	2007:12	2016:5	11.3***	2007:10	2014:1	11.3***	2003:4	2013:1	-6.7348	2003:4	2013:1
LOIL	-3.0277	2004:9	2014:11	-6.77**	2004:12	2014:1	-	2003:9	2014:9	-6.2386	2008:9	2014:9
ΔLOIL	-12.7***	2008:10	2020:3	5.7617	2000:11	2008:8	5.7617	2009:2	2016:2	-	2009:2	2016:2
GSCPI	-5.46***	2016:5	2020:2	11.87**	2012:4	2019:12	11.87**	2011:4	2019:4	-6.911**	2009:12	2014:2
				6.6***			-6.24**					

Note: ***, **, and * indicate a statistical significance of 1%, 5%, and 10% levels, respectively.

Table 5:Nonlinearity Tests and Nonlinear KSS Unit Root Test

	Teraesvirta	White	Keenan	Tsay	LR	KSS Unit root	
						Intercept	Intercept and Trend
Canada							
INF	5.4095* (0.066)	6.0272** (0.0491)	7.6560*** (0.006)	1.3844** (0.033)	31.3106* (0.0636)	-0.5610	-0.8799
ΔINF						-7.6920***	-7.6896***
LIP	0.4369 (0.8037)	0.9430 (0.6240)	0.0902 (0.7641)	10.2969*** (0.0000)	52.37*** (0.0000)	-1.7326	-3.0062**
ΔLIP						-10.639***	-10.6490***
UNEMP	5.9916** (0.0499)	10.6424*** (0.0048)	14.0228*** (0.0002)	25.4717*** (0.0000)	34.0601*** (0.0000)	-6.18***	-6.0368***
INTSPREAD	0.1832 (0.9124)	0.2816 (0.8686)	0.0718 (0.7888)	25.1929*** (0.0000)	29.4744*** (0.0000)	-2.7153*	-3.1664**
ΔINTSPREAD						-3.9213***	-4.1219***
France							
INF	4.7648* (0.092)	3.3612 (0.1862)	2.5316 (0.1126)	1.1723 (0.2929)	35.8607*** (0.0597)	-0.0809	-0.2119
ΔINF						-6.7296***	-6.6802***
LIP	43.4455*** (0.0000)	28.4007*** (0.0000)	13.7220*** (0.0000)	46.8935*** (0.0000)	69.9224*** (0.0000)	-9.2495***	-9.6102***
UNEMP	4.9056* (0.091)	4.8291* (0.0906)	2.4951 (0.1152)	1.4848 (0.2187)	36.685*** (0.0000)	-1.9630	-2.0516
ΔUNEMP						-7.3481***	-7.7783***
INTSPREAD	6.3231** (0.0416)	1.0491 (0.5918)	0.0018 (0.9659)	1.5854 (0.1103)	39.0144*** (0.0000)	-3.6131***	-3.5802***
Germany							
INF	17.0882*** (0.0001)	11.9128*** (0.0025)	3.1190* (0.0784)	3.9217*** (0.0008)	16.8768** (0.0301)	0.5385	0.0988
ΔINF						-3.9598***	-4.1437***
LIP	5.7538* (0.0563)	4.097 (0.1289)	0.1107 (0.7403)	8.7195*** (0.0000)	45.7515*** (0.0000)	-3.2864***	-7.5965***
UNEMP	6.4751** (0.0392)	6.5270** (0.0382)	4.8107** (0.0290)	5.3561** (0.0213)	11.6067** (0.0429)	-0.7883	-1.0481
ΔUNEMP						-3.3431***	-3.3590***
INTSPREAD	1.7501 (0.4168)	1.1099 (0.5740)	0.3571 (0.5504)	0.8585 (0.6115)	15.8297** (0.0367)	-3.8502***	-3.7703***
Italy							
INF	39.4369*** (0.0000)	20.2324*** (0.0000)	0.7245 (0.3953)	8.5609*** (0.0000)	42.6330*** (0.0000)	1.0164	1.1353
ΔINF						-6.6042***	-6.6356***
LIP	89.5416*** (0.0000)	41.3704*** (0.0000)	34.4965*** (0.0000)	23.4039*** (0.0000)	54.0195*** (0.0000)	-12.3114***	-13.5075***
UNEMP	1.2298 (0.5406)	1.0674 (0.5864)	0.3130 (0.5762)	0.3138 (0.5757)	3.5811 (0.3292)	-1.4921	-1.6955
ΔUNEMP						-3.1061**	-3.1058**
INTSPREAD	2.2865 (0.3187)	0.7461 (0.6886)	0.1505 (0.6983)	1.8967 (0.1302)	12.7813* (0.0622)	-3.4918***	-3.2348**
Japan							
INF	1.1707 (0.5569)	0.9606 (0.6185)	3.0361* (0.0825)	1.3431 (0.0478)	24.3943 (0.2446)	-1.4291	-2.8498*
ΔINF						-5.0808***	-5.1264***
LIP	6.4050** (0.0406)	5.9551* (0.0509)	8.1241*** (0.0046)	5.1780*** (0.0016)	22.9082*** (0.0011)	-3.9901	-3.5993
UNEMP	3.6563 (0.1607)	2.5015 (0.2862)	0.1487 (0.7004)	0.1494 (0.6993)	5.0371 (0.3095)	-0.9221	-3.4302***
ΔUNEMP						-8.6003***	-8.6419***
INTSPREAD	5.3761* (0.0681)	4.0398 (0.1326)	0.4248 (0.5150)	1.7960** (0.0349)	10.6346 (0.3301)	-3.7305***	-5.1992***
United Kingdom							
INF	15.7884*** (0.0000)	7.8930** (0.0193)	1.0278 (0.3114)	1.1096 (0.3566)	12.1306 (0.1385)	0.9573	0.5720
ΔINF						-5.2213***	-5.3932***
LIP	3.4708 (0.1763)	0.9426 (0.6241)	0.6994 (0.4036)	6.0354*** (0.0000)	52.3201*** (0.0000)	-2.7491	-4.5026***

UNEMP	0.6933 (0.7070)	0.5168 (0.7722)	0.1515 (0.6973)	1.7612** (0.0227)	19.8595* (0.0691)	-0.9511	-0.9906
ΔUNEMP						-3.0419**	-3.0062**
INTSPREAD	1.6701 (0.4338)	0.6834 (0.7105)	0.4387 (0.5082)	6.7189*** (0.0000)	9.3883 (0.2602)	-2.3930*	-1.9594
ΔINTSPREAD						-6.5260***	-6.5242***
Global Factors							
LCOMMODITY	3.2263 (0.1992)	2.5527 (0.2790)	0.4141 (0.5203)	1.7293* (0.0739)	37.1483*** (0.0000)	-2.4374*	-2.7317*
ALCOMMODITY						-4.3355***	-4.3381***
LGPEU	1.5518 (0.4602)	0.9293 (0.6283)	0.0095 (0.9222)	6.5030*** (0.0000)	36.0933*** (0.0000)	-2.3946*	-3.8800***
ALGPEU						-5.8352***	-5.8343***
LOIL	0.2932 (0.8636)	0.3145 (0.8544)	0.1845 (0.6677)	5.3959*** (0.0012)	11.7035* (0.0895)	-2.5868*	-6.3275***
ALOIL						-6.4961***	-6.4318***
GSCPI	8.1820** (0.0167)	7.6553** (0.0217)	4.0750** (0.0444)	1.9204 (0.1263)	12.4437* (0.0699)	-1.9052	-2.5517*
ΔGSCPI						-4.7508***	-4.7444***

Note: The values in the parenthesis indicate the probabilities. The critical values are -2.22, -2.93 and -3.40 at 10%, 5% and 1% significance levels, respectively. ***, **, and * indicate a statistical significance of 1%, 5%, and 10% levels, respectively.

Table 6: The Results of C(d) Nonlinearity Test

	d	m0	Canada	France	Germany	Italy	Japan	United Kindom
C(d) statistics	1	50	57.13***	265.48***	242.67***	196.24***	159.61***	175.97***
	1	100	54.97***	181.98***	190.23***	183.04***	143.89***	145.99***
	2	50	47.47***	255.98***	213.10***	196.42***	144.30***	154.70***
	2	100	40.45***	223.73***	163.19***	187.57***	136.40***	154.42***
	3	50	28.58***	202.95***	193.40***	198.07***	124.71***	130.16***
	3	100	28.18***	168.72***	151.72***	206.33***	123.09***	123.94***
	4	50	20.88***	158.01***	165.18***	190.21***	88.64***	116.49***
	4	100	57.57***	135.47***	148.72***	189.32***	98.71***	149.71***
	5	50	20.38***	143.67***	135.73***	233.68***	79.93***	125.53***
	5	100	20.97***	140.42***	140.52***	202.30***	80.89***	135.23***
	6	50	19.5**	139.93***	133.23***	175.98***	77.32***	121.69***
	6	100	18.14**	158.25***	122.81***	187.88***	82.90***	109.07***
	7	50	20.64***	116.03***	126.34***	170.56***	77.21***	147.71***
	7	100	18.86**	132.84***	134.10***	169.62***	72.59***	132.69***
γ			2.04	2.26	2.01	1.90	2.20	2.30
AIC			-2106.06	-3684.23	-3662.71	-2956.46	-3616.42	-3743.01

Note: ***, **, and * indicate a statistical significance of 1%, 5%, and 10% levels, respectively.

Figure 1 depicts the graphs related to regime classification based on the threshold variable (inflation rate) for Canada, France, Germany, Italy, Japan, and the United Kingdom. The dark areas represent a high inflation regime, while the light areas indicate a low inflation regime. As shown in Figure 1, the inflation rates in all countries sharply increase after 2022. The substantial increase in inflation can be attributed to several factors, including implemented expansionary fiscal policies during the COVID-19 pandemic, deterioration in global supply chains, increases in demand, and rises in commodity prices.

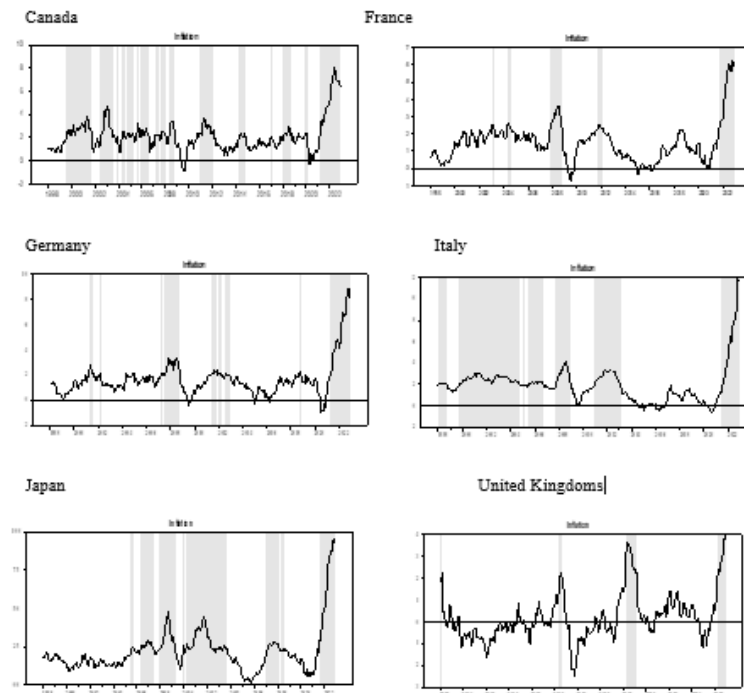


Figure 1: Regime Classification

In Figure 2, the impulse-response graphs in both high and low inflation regimes for Canada are represented. According to the graph in Figure 2, during the low inflation regime, the inflation tends to decrease over three months in response to a one standard deviation shock in unemployment. On the other hand, expected inflation has a positive effect on the inflation rate, which persists for up to twelve months. Interestingly, the interest spread doesn't seem to have a significant impact on the inflation rate. When it comes to global factors, GSCPI leads to a decline in inflation in the first month. While commodity prices enhances inflation over two months, GEPU reduces it. It's also worth noting that the response of inflation to oil prices isn't statistically significant. During the high inflation regime, unemployment can lead to a decrease in the inflation rate over a period of two months. However, expected inflation and the interest spread can increase the inflation rate over approximately three months. When taking global factors into consideration, it can be observed that the inflation rate responds positively to commodity and oil prices for a period of three months. GEPU and GSCPI can also increase the inflation rate, but the effect of GSCPI takes longer

to materialize than the effect of GEPU.

Figure 3 illustrates the impulse-response graphs for high and low inflation regimes for France. During the low inflation regime, a one standard deviation shock in the unemployment rate has a negative effect on the inflation rate. Furthermore, expected inflation causes the inflation rate to increase over a period of 12 months. However, the interest spread does not seem to have a significant impact on the inflation rate. Commodity and oil prices can cause a decline in the inflation rate over a period of 3 months. On the other hand, the inflation rate positively responds to GSCPI, and this effect continues for over 12 months. Interestingly, it appears that the inflation rate increases simultaneously with GEPU. During the high inflation regime, the inflation rate positively responds to unemployment rate, expected inflation, and interest spread, but the impact of the interest spread takes longer. In terms of global factors, commodity and oil prices enhance the inflation rate over a period of 3 months. The inflation rate simultaneously decreases in response to changes in GEPU. However, GSCPI does not have a significant impact on inflation.

Figure 4 presents the impulse-response graphs for Germany, highlighting some interesting trends. During a low inflation regime, the unemployment rate leads to a decrease in the inflation rate over a one-month period. Additionally, the inflation rate positively responds to the expected inflation over 12 months, although the interest spread does not have a significant effect on the inflation rate. It is observed that commodity and oil prices as well as GSCPI positively affect the inflation rate, but the effect of GSCPI takes longer. On the other hand, GEPU does not have a significant impact on the inflation rate. During a high inflation regime, the response of the inflation rate to the unemployment rate is statistically significant only for the first month. One standard deviation shocks in the expected inflation and interest spread also enhance the inflation rate during this regime. Furthermore, it is seen that the inflation rate positively responds to commodity and oil prices and GSCPI, and this effect lasts long in terms of global factors.

Figure 5 depicts the impulse-response function for Italy. In a low inflation regime, the unemployment rate has a significant effect on the inflation rate only during the first month. Conversely, expected inflation tends to increase the inflation rate over a period of 12 months, with no significant effect observed for the interest spread. When considering global factors, it seems that commodity and oil prices can have a positive impact on the inflation rate over a two-month period, while the GSCPI can lead to an increase in the inflation rate over a 12-month period. However, in a high inflation regime, the effects are observed over a longer period of 12 months, with the unemployment rate leading to a decrease in the inflation rate, while expected inflation and the interest spread tend to increase it.

In terms of global factors, changes in GSCPI, commodity, and oil prices can have an even more significant impact on the inflation rate, with the effect of oil prices being observed over a shorter period of two months. Lastly, it is worth noting that GEPU has a negative impact on the inflation rate over a period of three months. Figure 6 shows the impulse-response graphs for Japan. The inflation rate significantly and negatively responds to a one standard deviation shock in the unemployment rate in the first month. Conversely, the expected inflation enhances the inflation rate throughout 12 months. Commodity and oil prices have an increasing effect on inflation for 3 months. GSCPI leads to a rise in the inflation rate over 12 months. However, the inflation rate negatively responds to changes in GEPU throughout 3 months. During the high inflation regime, the unemployment rate, the expected inflation, and the interest spread positively affect the inflation rate; however, the effect of the expected rate takes longer than the others. The response of the inflation rate to GSCPI, commodity, and oil prices is positive and significant over 12 months. However, GEPU does not have a significant impact on the inflation rate.

In Table 7, there are insights into the inflation rates of the United Kingdom. During low inflation periods, a rise in unemployment can cause inflation to increase simultaneously. Additionally, expected inflation over 12 months can have a positive impact on inflation rates. Interest spread can also affect inflation rates, causing them to rise over a period of 3 months. When examining global factors, commodity and oil prices can lead to an increase in inflation rates over a period of 3 months, while GSCPI has a positive impact on inflation rates for 1 month, but GEPU has a negative impact on inflation rates over 1 month. During high inflation periods, the impact of unemployment on inflation rates is not significant. Instead, expected inflation can cause inflation rates to increase for a period of 4 months. Changes in interest spread can also cause inflation rates to rise. Interestingly, global factors like commodity and oil prices can have a longer-term impact on inflation rates, leading to an increase over time. Similarly, GSCPI can enhance inflation rates for a period of 12 months. However, inflation rates respond negatively to changes in GEPU for only the first month.

6. CONCLUSION

The NKPC explains the dynamics of inflation within macroeconomic models underpinned by microeconomic principles and rational expectations. The NKPC considers factors such as price expectations and expected real marginal cost in determining prices, making it important for monetary policy decisions. In simple terms, it suggests that inflation depends on how people expect prices to

change in the future and the real cost of production. However, it's important to note that the way inflation behaves can be different in times of low and high inflation. As a result, a simple linear NKPC model may not capture these differences in inflation and business cycles.

Recent developments on a global scale, such as the COVID-19 pandemic and the Russia-Ukraine conflict, have led to increased interest in the role of global factors in the rapid rise in inflation. In this study, we research the global and domestic factors explaining inflation in NKPC framework for G7 countries in low and high inflation regimes. We use the Threshold VAR (TVAR) model to obtain the response of inflation to its determinants under different inflation regimes. We have observed a negative correlation between inflation and the unemployment rate across all countries in both low and high inflation regimes, except for Germany and Japan. These two countries have notably high unemployment rates in high inflation scenarios, indicative of the stagflation phenomenon. For instance, Germany encountered a similar economic downturn towards the end of 2022. The inflation and unemployment rates for Germany in 2022 stood at 7.9% and 5.3% respectively. Furthermore, our analysis demonstrates that changes in expected inflation and commodity prices exert a more pronounced influence on inflation during low inflation periods. Conversely, during high inflation periods in G7 countries, expected inflation, the variance between the 10-year Government Bond rate and the 3-month interbank rate, commodity prices, and global supply chain pressures play a significantly more pivotal role in driving inflation.

The findings show inflation rates in all countries have sharply increased after 2022 due to expansionary fiscal policies during the COVID-19 pandemic, global supply chain disruptions, increased demand, and higher commodity prices. Our empirical results support the view that global factors, such as global supply chain pressure, and commodity and crude oil prices, play an important role in the increase in inflation. These factors contribute significantly and positively to G7 inflation, especially during the high inflation regime. Inflation responds asymmetrically to driving factors in different inflationary conditions. Crude oil and commodity price asymmetries have a positive effect on inflation. The unemployment rate and expected inflation are key factors in determining inflation in the context of the NKPC. The relationship between GSCPI, GEPU, and inflation is nonlinear. The findings from the study align with the conclusions drawn by Abbas (2023) and Loria & Tirado (2023).

The findings suggest that global supply chain constraints and fluctuations in commodity and oil prices during periods of heightened inflation influence the recent escalation of inflation in G7 nations. Furthermore, the study indicates that the enduring impact of global supply chain pressures on inflation, as well as the

substantial influence of changes in oil and commodity prices, particularly affect inflation in countries that are net importers of energy and commodities and possess extensive global trade and financial interconnections.

The evolving impact of domestic and global shocks indicates significant changes in monetary policy over time. Our findings suggest that central banks have become more effective at stabilizing their economies in response to domestic shocks, but they still face challenges when dealing with external shocks. Strains in global supply chains have significantly contributed to inflation trends in many advanced economies since late 2020. While these supply chain issues have been gradually easing, it is likely that supply bottlenecks will continue to exert inflationary pressures for some time. However, a persistent challenge remains in stabilizing the effects of global shocks. This emphasizes the importance of firmly anchoring inflation expectations and may necessitate stronger policy actions to prevent second-round effects from external shocks, such as fluctuations in oil prices and disruptions in global supply chains.

7. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

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9. AUTHOR CONTRIBUTIONS

D.E.: Idea

D.E.: Conception

D.E.: Supervision

D.E.: Collection and/or processing of resources

D.E.: Analysis and comment;

D.E.: Literature Review;

D.E.: Write the article;

D.E.: Critical Review

10. ETHICS COMMITTEE STATEMENT

Ethics committee principles were complied with in the study and necessary permissions were obtained in accordance with the principles of intellectual property and copyrights.

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APPENDIX

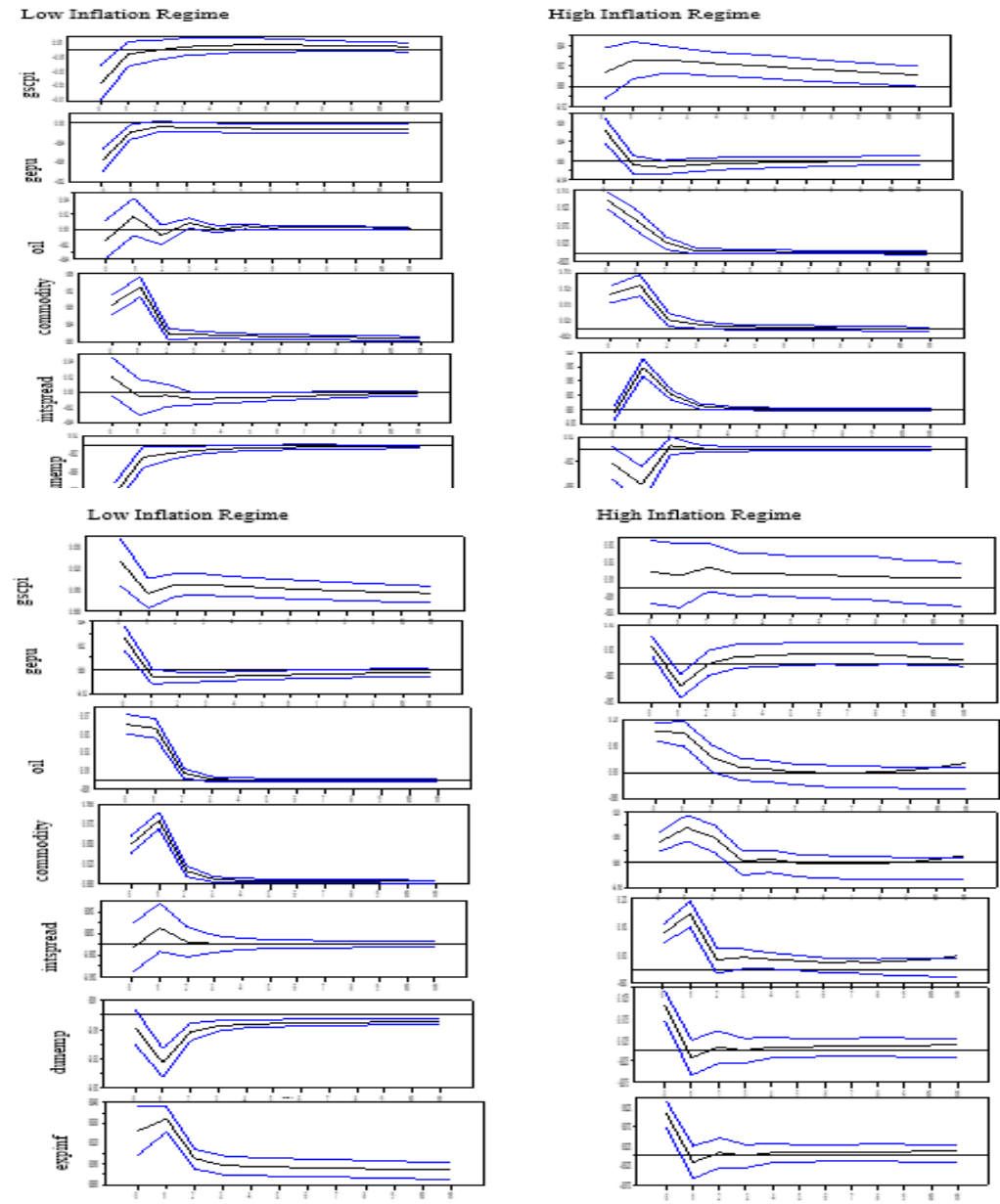


Figure 3 Impulse-Response Functions For France

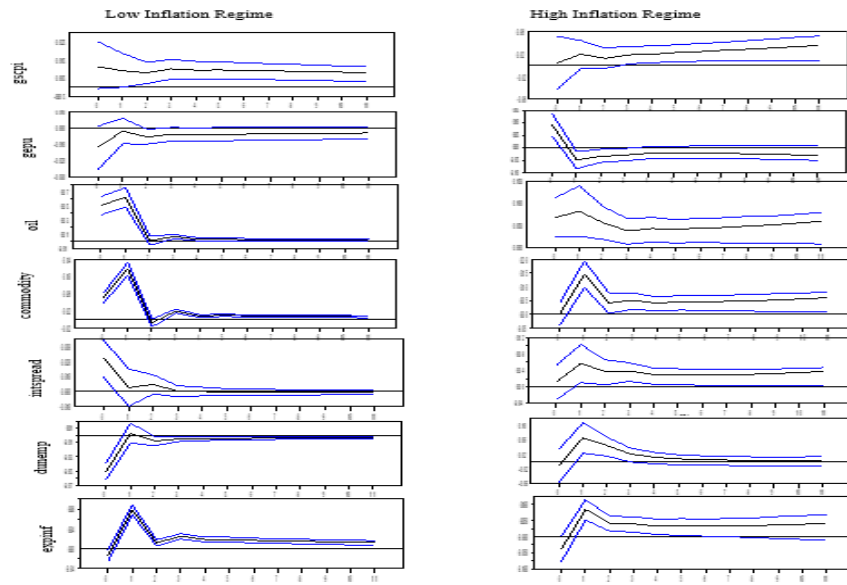


Figure 4 Impulse-Response Functions For Germany

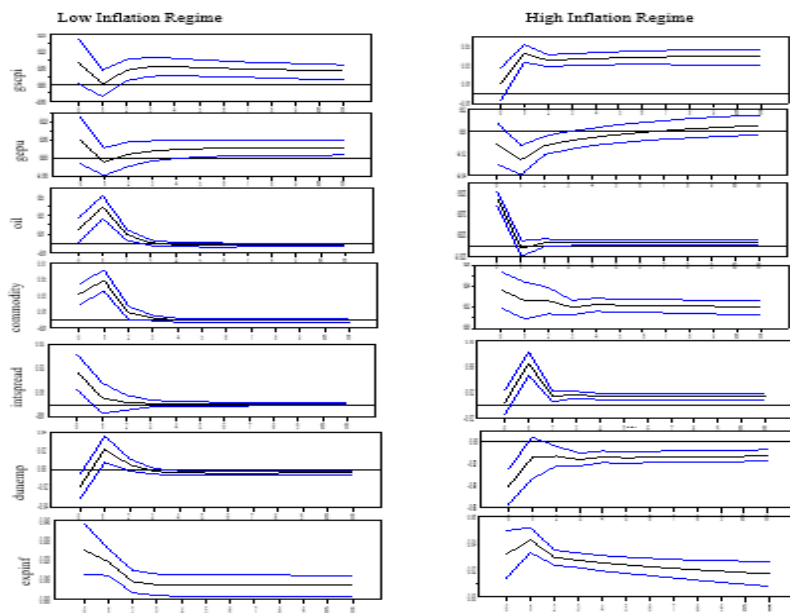


Figure 5 Impulse-Response Functions For Italy

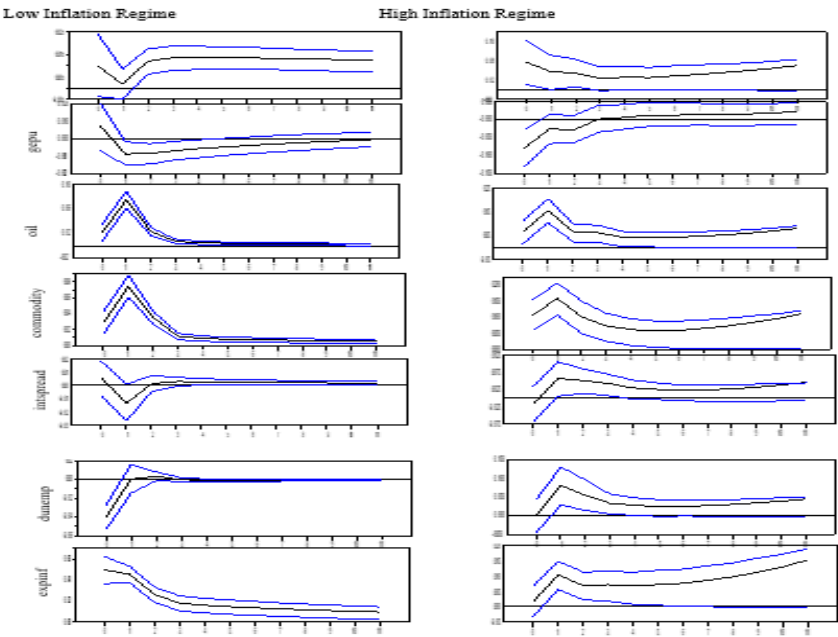


Figure 6 Impulse-Response Functions For Japan

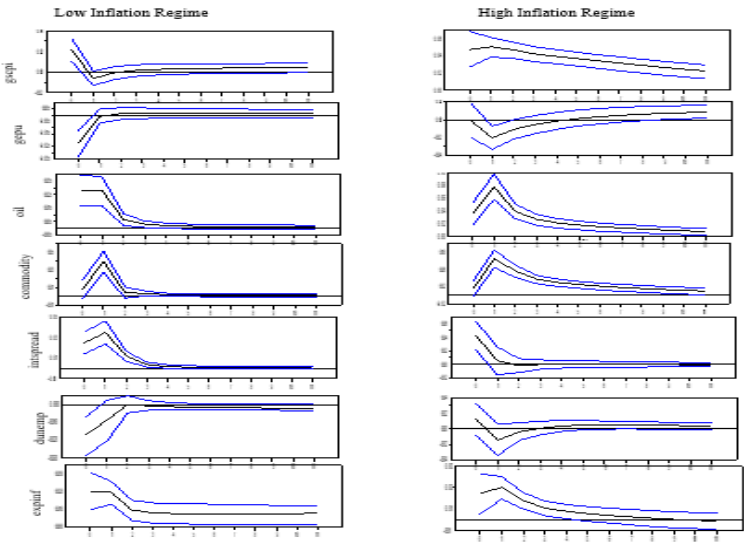


Figure 7 Impulse-Response Functions For The United Kingdom

MACROECONOMIC INDICATORS AND LIQUIDITY: LONG AND SHORT RUN DYNAMIC EFFECTS ON THE TÜRKİYE STOCK EXCHANGE WITH THE ARDL APPROACH¹



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ABSTRACT

Stock market liquidity is a key indicator of market functionality, stability and investor sentiment. Furthermore, stock market liquidity serves as a crucial indicator for gauging the depth of liquidity and market dynamics in money and capital markets. In light of the pivotal role of stock market liquidity, this article seeks to examine the dynamic influence of select macroeconomic indicators pertaining to monetary, fiscal, and general economic outlook on stock market liquidity in both the long and short run. To this end, the symmetric ARDL method is employed. The ARDL findings indicate that interest rate, exchange rate, central government expenditures, oil, industrial production index, and consumer price index exert a discernible impact on stock market liquidity.

Keywords: Macroeconomic indicators, trading volume, Amihud illiquidity

JEL Codes: C58, G10, G11

Scope: Economics

Type: Research

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¹ It has been declared that the relevant study complies with ethical rules.

MAKROEKONOMİK GÖSTERGELER VE LİKİDİTE: TÜRKİYE BORSASINDA ARDL YAKLAŞIMI İLE UZUN VE KISA DÖNEMLİ DİNAMİK ETKİLER



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ÖZ

Borsa likiditesi, hisse senedi piyasasının iyi işlediğini, piyasada istikrarın olduğunu ve yatırımcıların hisse senetlerine olan duyarlılığını gösteren en önemli göstergelerden biridir. Borsa likiditesi aynı zamanda para ve sermaye piyasasındaki likiditenin ve piyasa dinamiklerinin derinliğini görmek açısından da önemli bir belirleyici olarak öne çıkmaktadır. Borsa likiditesinin öneminden yola çıkarak bu makalede, para, maliye ve genel ekonomik görünüme ait bazı makroekonomik göstergelerin uzun ve kısa dönemde borsa likiditesi üzerindeki dinamik etkisi simetrik ARDL yöntemi ile incelemek amaçlanmıştır. ARDL bulgularında faiz, döviz kuru, merkezi yönetim harcamaları, petrol, sanayi üretim endeksi ve tüketici fiyat endeksinin borsa likiditesi üzerindeki etkisinin varlığını göstermektedir.

Anahtar Kelimeler: Makroekonomik göstergeler, işlem hacmi, Amihud likidite azlığı

JEL Kodları: C58, G10, G11

Alan: İktisat

Türü: Araştırma

1. INTRODUCTION

Exchange liquidity is the ability of investors to buy and sell significant amounts of securities quickly, at lower transaction costs and without major price concessions (Brennan, Chordia, Subrahmanyam, & Tong, 2001, p. 523). Market liquidity is a key characteristic of the stock exchange, referring to the ease with which assets can be bought and sold by participants who are willing to trade at an agreed price within a short timeframe (Amihud, Mendelson, & Pedersen, 2006, p. 235). Given the significant role of stock liquidity, both governmental bodies and regulatory authorities continuously work to ensure an optimal level of liquidity. One of the primary strategies to enhance market liquidity involves macroeconomic policies, encompassing both monetary and fiscal measures (Chowdhury, Uddin, & Anderson, 2018, p. 2).

Liquidity, or the ease with which an asset can be bought and sold in a timely manner at low cost, plays an important role in money and capital markets (Ahmed, Hudson, & Gregoriou, 2023). A high level of stock liquidity leads to an increase in both the creation of information and the trading of informed decisions (Chang, Chen, & Zolotoy, 2017, p. 1607). This results in the provision of essential information for trading opportunities, an additional incentive for shareholders, and enhancement of market trust. With this in mind, market liquidity is taken into consideration as an indicator of the overall success of the economy in the majority of developed economies. Mainly due to the fact that a growth in stock value has an effect on the entire economic activity through the confidence channel (Ehrmann, Fratzscher, & Rigobon, 2016). In addition, since it determines the magnitude of possible returns for an investor, it is also important in developing more profitable investment strategies. In this respect, stock market liquidity is one of the most important leading indicators both for the development of general economic activity and for determining the size of returns for investors and developing appropriate investment strategies (Naik & Reddy, 2021, p. 1). Similarly, stock markets contribute positively to economic growth as they make an important contribution to the development of industry and trade (Ho & Odhiambo, 2016, p. 136). Due to their liquidity, stock exchanges also play an important role in quickly obtaining the funds that firms need for investment and growth (Camba & Camba, 2020, p. 37). Increased liquidity may adversely affect trading, potentially elevating the company's default risk and resulting in mispricing and heightened volatility (Brogaard, Li, & Xia, 2017, p. 487).

Enhancements in stock market liquidity play a crucial role in bolstering investor confidence by ensuring the efficient dissemination of trading-related information. Moreover, stock markets fulfill essential functions, such as offering an exit strategy for venture capitalists and facilitating liquidity, which promotes

international diversification and the movement of investment portfolios. This, in turn, allows firms to enhance their financial performance by securing necessary capital (Rousseau & Wachtel, 2000, p. 1955). The availability of stock market liquidity is fundamental to a country's financial stability and economic expansion, particularly in times of economic uncertainty. Butler, Grullon, and Weston (2005) suggest that a high level of liquidity contributes to a decline in equity capital costs. This dynamic not only alleviates financial constraints faced by businesses but also strengthens their ability to withstand economic crises. Additionally, liquidity enables the swift realization of financial gains or losses (Zaremba, Aharon, Demir, Kizys, & Zawadka, 2021, p. 2).

High levels of illiquidity not only provide higher gains for investors than liquid markets due to price volatility, but also entail a higher risk of loss. Due to the possibility that illiquid markets may cause significant price changes and thus higher losses, investors are hesitant to make a large securities transaction. Therefore, increasing illiquidity has a negative impact on market development as it reduces capital inflows (Kumar & Misra, 2015). Low liquidity in stock markets is often associated with misallocation of capital and mispricing of assets, leading to fragility in the financial system. Moreover, illiquidity makes IPOs unattractive if it exceeds the cost of equity capital. This can discourage innovation and growth, especially for young start-ups as they tend to rely on financing sources such as IPOs (Brandao-Marques, 2016). One of the leading economic indicators that responds to different macro factors like interest rates and money supply is stock market liquidity, which represents investors' expectations about the return, earnings, and cash flow of firms (Khan, Hussain, & Tajummul, 2022, p. 55).

Stock market indicators are a vital indicator for the welfare of the economy due to their pricing properties that enable policymakers and investors to make decisions. They also allow for a sound view of the future state of the economy. Stock market liquidity plays an important role here, as it allows different stakeholders to securely hold and trade exchange instruments (Alaoui Mdaghri, Raghibi, Thanh, & Oubdi, 2021). Indeed, the liquidity indicator is one of the stabilization measures used by the institutions responsible for the functioning of the financial system to make an objective and comprehensive assessment. Market liquidity is one of the important stability indicators used to evaluate the dynamics in financial markets as a whole. In liquid markets, high bid-ask spreads indicate market depth. Market liquidity has emerged as a critical indicator for investors to comprehensively assess financial stability, especially in recent years (Santoso, Harun, Hidayat, & Wonida, 2010). Since the unpredictability of market liquidity is a significant source of risk for investors,

knowing the macroeconomic determinants of its liquidity will be helpful to investors (Choi & Cook, 2006).

The primary aim of this study is to examine how Türkiye-specific macroeconomic factors influence liquidity fluctuations in the Borsa İstanbul (BIST 100) index. Independent variables considered in the analysis include industrial production, inflation, interest rates, government expenditures, energy prices, exchange rates, and gold prices. The introductory section outlines the theoretical background and significance of stock market liquidity. The second section provides a review of empirical studies where stock liquidity is analyzed as a dependent variable. Following this, the third section elaborates on the data set and the econometric techniques employed. Lastly, the findings are presented and interpreted, leading to a discussion that offers policy recommendations in light of the study's conclusions.

2. LITERATURE REVIEW: STOCK MARKET LIQUIDITY AND MACROECONOMICS INDICATORS

Since it is one of the primary areas of finance, liquidity studies have garnered a lot of interest in the literature. Liquidity has been the subject of a great deal of research, both theoretical and empirical. Since liquidity encompasses aspects like trade volume, trading duration, and price impact, there is no universally applicable metric or definition for all markets. A stock's liquidity, on the other hand, indicates its cheap cost, low price effect, and high trading volume, all of which allow for rapid trading. Quantity, velocity, cost, and impact on price are the four aspects of stock liquidity that pertain to this. It is necessary to examine the liquidity literature because liquidity is so important to academics and economists (Le & Gregoriou, 2020). This section provides a concise overview of empirical research on macroeconomic determinants and their influence on stock market liquidity across various global markets.

Ülengin and Yobaş (1997) highlight that macroeconomic variables, including money supply, inflation, output, and interest rates, influence stock market trading volumes in both developed and developing economies, with the extent of this impact differing based on the stock exchange. Karamustafa and Karakaya (2004) establish that inflation, measured via the Consumer Price Index (CPI), has a substantial impact on ISE 100 trading volume. Özgümüş, Korkmaz, and Çevik (2013) find that money supply positively influences transaction volumes in the ISE 100, while inflation exerts a significant negative effect. Liu (2015), analyzing data from the NYSE and AMEX, suggests that investor sentiment enhances both stock market liquidity and trading activity. Additionally, Arjoon, Bougheas, and Milner (2016) demonstrate that institutional ownership

levels significantly affect liquidity and returns, with stocks held predominantly by institutional investors exhibiting strong predictive power.

Ali, Liu and Su (2017) assert that corporate governance improvements contribute positively to liquidity within the Australian stock market. They suggest that enhanced governance mechanisms help lower trading costs and influence price dynamics, leading to increased trading frequency. Similarly, Siikanen, Kannianen, and Valli (2017) reveal that planned and unexpected announcements of NASDAQ-listed firms significantly impact stock market liquidity, particularly due to information leaks occurring before official announcements. Reddy, Wacá and Goyal (2017) highlight that stock market liquidity in India is notably shaped by policy decisions from governmental and financial institutions. Chowdhury et al. (2018) examine the role of macroeconomic factors such as money supply, government expenditures, private sector borrowing, and bank interest rates in determining stock market liquidity across eight emerging economies. Their findings indicate that these factors exert varying effects across different industries. Furthermore, they emphasize that illiquidity is strongly influenced by interest rate fluctuations, short-term borrowing, and government lending practices. Debata, Dash, and Mahakud (2018) explore the impact of investor sentiment on liquidity within 12 emerging markets, concluding that while domestic investor sentiment influences liquidity, foreign investor sentiment plays an even more significant role in shaping stock market liquidity trends. Canbaz (2019) finds no direct causal link between GDP, total loan volume, and deposit volume in explaining stock market trading activity in Türkiye. Through variance decomposition, their study identifies deposits as the primary driver of trading volume fluctuations, followed by GDP and loan volume, with trading volume reacting initially to increases in these variables but declining in response to loan shocks. Lastly, Öztürk, Çetanak and Haykır (2019) establish that no causal relationship exists between economic growth and stock market liquidity in Türkiye.

Ekinci, Akyildirim and Corbet (2019) highlight that announcements related to monetary policy, interest rates, and GDP in the U.S. economy significantly influence liquidity in Borsa İstanbul. Abudy (2020) identifies a strong and positive correlation between retail sales and stock market liquidity, suggesting that retail investors are more inclined to engage in trading when liquidity is high. Conversely, retail investors acting as sellers often execute trades at lower liquidity levels compared to buyers. Çiftçi and Reis (2020) conducted an analysis on the causality link between the BIST Amihud illiquidity measure and Türkiye's risk appetite. Their findings indicate a unidirectional causality, where liquidity influences risk appetite rather than the reverse. Mishra, Parikh, and Spa

(2020) examine the impact of unconventional monetary policies introduced by the Federal Reserve during the 2007–2009 financial crisis, revealing that these policies significantly shaped stock market liquidity, with variations observed across different phases of quantitative easing. Furthermore, the study finds that stock market liquidity experiences growth when Federal Reserve stimulus measures coincide with an increase in bank lending.

Onyele, Ikwuagwu, and Onyekachi-Ony (2020) observe that public spending did not impact stock market liquidity in Nigeria over the long term; however, in the short term, a negative effect was noted. Similarly, Ye, Zhou and Zhang (2020) report that stock market liquidity in China improved following the relaxation of leveraged trading restrictions, whereas credit trading had a positive effect under normal market conditions. In contrast, short-term selling transactions exerted a negative influence. Wan (2020) highlights that short selling and margin buying negatively affect liquidity in the Chinese stock market, with information asymmetry exacerbating liquidity deterioration. Dash, Maitra, Debata, and Mahakud (2021) determine the presence of a bidirectional relationship between economic policy uncertainty and stock market liquidity in G7 countries, underlining the complex interplay between macroeconomic policies and liquidity trends. Güzel and Şekeroğlu (2021) found a causality from CDS premiums to BIST 100 trading volume in Türkiye. According to Altunöz (2021), money supply, credit default swap, inflation rate and interest rate appear to have a significant effect on the transaction volume of the BIST 30 futures contract. In the studies of Elçiçek and Kayalıdere (2021), it was determined that the effect of the ratio of budget deficit to GDP on VIOP 30 futures contracts was positive and significant. Wu and Qin (2021) found a positive relationship between market efficiency and market liquidity in the Chinese market.

Pan (2023) suggests that information diffusion related to macroeconomic variables in China has an asymmetric influence on market volatility, subsequently impacting liquidity. Specifically, investor hedging strategies during financial crises have been found to alter short-term liquidity conditions. Das and Yaghubi (2023) investigate the role of political risk in stock market liquidity within the U.S., concluding that heightened political uncertainty leads to liquidity reductions. Moreover, their findings indicate that the impact of political risk on liquidity varies depending on firms' political affiliations. Yılmaz (2023) explores the cointegrated and asymmetric link between BIST 100 liquidity and capital flows influenced by monetary factors. Lyu and Hu (2024) argue that money supply exerts a dynamic influence on stock market liquidity in China, with liquidity fluctuations differing across various time periods and markets. They also highlight that expansionary monetary policies can contribute to liquidity

recovery, provided they establish stable expectations regarding liquidity conditions. Naik and Reddy (2024) determine that while foreign investment inflows and gold prices adversely affect stock market liquidity in India, money supply has a contrasting positive influence. Other macroeconomic variables incorporated into their model further illustrate the intricate relationships governing liquidity dynamics. Other macroeconomic indicators used in the model (including foreign exchange reserves, inflation, interest rates, oil prices, exchange rate, GDP, imports, exports, government final consumption expenditures, current account balance) were not significant.

Macroeconomic variables are important in terms of measuring the overall performance of the economy and learning the economic climate. Investigating the relationship between stock market indicators, which represent real market dynamics, and macroeconomic variables remains an interesting topic. Stock price and trading volume stand out as two important indicators in the stock market. The values of these two indicators are determined by the same market participants. However, in the literature review, the majority of researchers have focused on stock price or return rather than trading volume. In this respect, it has been observed that the number of studies focusing on trading volume as a focal point is low, and in the existing studies, it is generally taken as an explanatory variable. Liquidity and depth in the stock market are measured by trading volume. This situation shows the importance of trading volume in the stock market. The most important focal point that distinguishes this study, in which we examine the effect of macroeconomic variables on stock market trading volume, from other studies is that the BIST 100 trading volume, which is the main indicator of the Turkish stock market, is taken rather than a certain group of stocks. Secondly, we use two different proxy variables for the stock market, namely total trading volume and illiquidity. Thirdly, macroeconomic indicators representing monetary, fiscal and other areas of the economy are used as explanatory variables to test both long and short-term dynamic effects. We believe that this distinguishes our study from other studies conducted in Türkiye and will contribute to the literature by expanding the literature.

3. DATASET, METHOD AND FINDINGS

3.1. Dataset

This paper aims to empirically analyze the dynamic impact of macroeconomic indicators on BIST liquidity with two different models using time series data specific to the Turkish market. In other words, we seek an answer to the question of whether macroeconomic indicators play an important role on the liquidity of the stock market, which represents the real markets in Türkiye.

Today, stock market indicators represent the real markets in the economic system and are seen as a barometer for the general course of the economy in terms of production, investment, demand and savings.

This study utilizes quarterly time series data covering the period from 2006:Q2 to 2023:Q2. Data on central government expenditures are sourced from the consolidated financial statements available on the official website of the Republic of Türkiye's Ministry of Treasury and Finance and are expressed as a ratio to Gross Domestic Product (GDP). BIST 100 trading volume and closing price data, which are necessary for illiquidity calculations, are retrieved from the Finnet analysis expert platform, offering insights into publicly listed companies. Additionally, time series data on key macroeconomic indicators-including gold prices (per ounce), exchange rates, deposit interest rates, Brent oil prices, the industrial production index, and the consumer price index-are collected from the corporate website of the Central Bank of the Republic of Türkiye (CBRT). Further details on the variables and data sources used in this study are provided in Table 1.

Table 1: Variables

Symbol	Variables	Source
VOL	BIST 100 Trade Volume	Finnet Analysis Expert
ILQ	BIST 100 Illiquidity Measure	
CGE	Central Government Expenditures	Ministry of Treasury and Finance
DIR	Deposit Interest Rate	Central Bank of The Republic of Türkiye
GP	Gold Prices	
DER	US Dollar Exchange Rate	
BOP	Brent Oil Price	
IPI	Industrial Production Index	
CPI	Consumer Price Index	

As seen in Table 1, VOL and ILQ are taken as dependent variables in the regression models of our study. Volume in the table is the quarterly trading volume data of the BIST 100, while ILQ is the illiquidity measure of the BIST 100 index calculated by us as calculated by Amihud (2002). Amihud's illiquidity measure (ILQ) is calculated using the following mathematical method.

$$(ILQ_t = 1/D_t \times \sum_{d=1}^{D_t} |Return_{t,d}| / (Trading Volume_{t,d})) \quad (1)$$

In formula 1, t is the quarter period, d is the trading day, D is the total number of trading days in the quarter period, and $||$ is the absolute value. The return value is calculated with the formula $(\text{return}_t = (\text{closing price}_t / \text{closing price}_{t-1}) - 1)$. The research model developed by Ülengin and Yobaş (1997), Yobaş (2014), Choi and Cook (2006), Fernández-Amador et al. (2011), Florackis, Giorgioni, Kostakis, and Milas (2014), Chowdhury et al. (2018), Onyele et al. (2020), Mannoun and Sjöblom (2021), Debata, Dash, and Mahakud (2021), Siddiqi et al. (2021), Chiad and Hadj Sahraoui (2022), and Lyu and Hu (2024) is grounded in an empirical approach.

Our independent variables, which we focus on in this study, are accepted as determinant macroeconomic indicators in the change in stock market performance in the liquidity literature. In this respect, we believe that this study, which aims to analyze the long and short-run dynamic relationship between stock market liquidity and macroeconomic indicators, will provide important evidence on the reflections of monetary and fiscal policy decisions on the stock liquidity of the real sector in Türkiye. The methodology followed in the econometric analysis process for the validity and reliability of the regressions of the models established in the study is as shown in Figure 1.

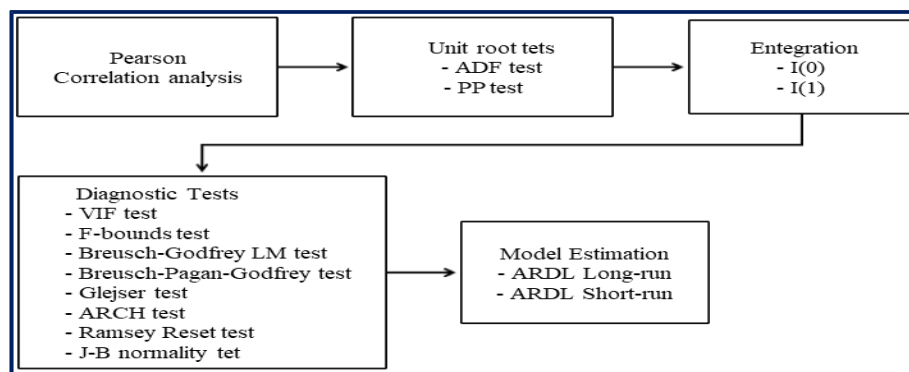


Figure 1: Methodology Flow Diagram

As illustrated in Figure 1, before assessing the long- and short-term impacts of macroeconomic factors on stock market liquidity, it is essential to prevent spurious regression results through appropriate statistical analyses. Accordingly, preliminary tests are conducted in this study to identify the most suitable econometric estimator for regression analysis. Initially, Pearson correlation analysis is applied to determine the correlation coefficients among independent variables. Additionally, stationarity tests, including the Augmented

Dickey-Fuller (Dickey & Fuller, 1981) and Phillips-Perron (Phillips & Perron, 1988) tests, are employed to evaluate the time series properties. Finally, the ARDL model is used to obtain both long-run and short-run estimates following diagnostic tests to ensure model validity.

3.2. Descriptive Statistics

Table 2 presents a summary of the descriptive statistical analysis for the variables included in the study.

Table 2: Descriptive Statistics

	VOL	ILQ	GP	DER	CGE	DIR	BOP	IPI	CPI
Mean	0.067	-0.018	0.021	0.044	0.007	0.017	0.042	0.013	0.031
Maximum	0.532	0.910	0.165	0.297	0.258	0.525	1.663	0.157	0.116
Minimum	-0.278	-0.979	-0.128	-0.087	-0.172	-0.343	-0.793	-0.178	0.004
Std. Dev.	0.203	0.341	0.063	0.081	0.088	0.146	0.291	0.051	0.022
Skewness	0.255	0.452	0.364	1.239	0.320	0.764	2.030	-1.064	1.682
Kurtosis	2.142	3.629	2.927	4.630	2.745	4.788	15.945	6.764	5.835
J-B	2.861	3.485	1.538	25.308	1.365	15.902	52.916	53.777	55.651
P-value	0.239	0.175	0.464	0.000	0.506	0.000	0.000	0.000	0.000
N	69	69	69	69	69	69	69	69	69

When the findings of the descriptive statistics reported in Table 2 are analyzed, it is seen that each variable was analyzed with a total of 69 observations from the second quarter of 2006 to the second quarter of 2023. In the data set, the percentage change of the time series of all variables compared to the previous period was first calculated and then seasonally adjusted with the "Moving Average Methods" method and used in regression analyses.

According to Table 2, which reports the descriptive results of the data, the average of the volume variable is the highest, followed by DER, BOP, CPI, GP, IPI, CGE, ILQ, respectively. The highest change compared to the previous period is BOP, ILQ, DIR, VOL, DER, CGE, GP, CPI, IPI, and the smallest change is CPI, DER, IPI, GP, VOL, DIR, BOP, ILQ. As for the standard deviation, which represents volatility, the highest is BOP, followed by VOL, ILQ, DIR, CGE, IPI, DER, GP, CPI. One of the important statistics in the table is that according to the skewness and kurtosis values indicating the normal distribution of the data set, it is seen that there is no skewness and kurtosis at a level that would disrupt normality in the data set.

3.3. Correlation

The Pearson correlation coefficients, which indicate the degree of association among the study variables, are displayed in Table 3.

Table 3: Correlation Findings

Variables	VOL	ILQ	GP	DER	CGE	DIR	BOP	IPI	CPI
VOL	1								
ILQ	-0.373***	1							
GP	-0.080	0.047	1						
DER	0.025	0.093	-0.249**	1					
CGE	-0.072	0.179	0.076	-0.071	1				
DIR	-0.208*	0.071	-0.287**	0.203*	-0.024	1			
BOP	0.124	-0.377***	0.214*	0.008	-0.082	-0.149	1		
IPI	0.313***	-0.051	0.113	-0.199	-0.250**	-0.080	-0.136	1	
CPI	0.022	0.077	-0.086	0.445**	0.032	0.330**	-0.052	-0.117	1

*** <0.01, ** <0.05, * <0.1.

Before implementing dynamic regression models, it is crucial to examine the relationships among independent variables and construct a correlation matrix to detect potential multicollinearity issues. The findings of the Pearson correlation analysis applied to the time series data, as presented in Table 3, indicate that volume exhibits the highest correlation with IPI at 31.3%, while illiquidity shows the strongest correlation with BOP at 3.7%. Further analysis of correlation values among independent variables reveals that CPI and DIR share the highest correlation at 33%, followed by BOP and DER with 0.8%. Based on these results, the correlation analysis assesses whether multicollinearity is present among the explanatory variables in the regression models. Kennedy (2003) states that when correlation coefficients remain significantly below the 80% – 90% threshold, multicollinearity is unlikely to pose a problem in model estimation. In econometric analyses involving time series data, conducting a test for linearity is essential. Additionally, stationarity and stability should be taken into consideration to ensure the robustness of the model.

3.4. Unit Root Analysis

In the context of unit root analysis, the null hypothesis assumes the presence of a unit root, whereas the alternative hypothesis suggests its absence, depending on the chosen test specification. Accordingly, before selecting the

appropriate econometric approach for this study, unit root tests were conducted using the Augmented Dickey-Fuller and Phillips-Perron methods to examine the stationarity properties of the time series. In unit root tests, the Schwarz Information Criterion (Schwarz, 1978) in ADF and Bartlett Kernel in PP are tested with Newey and West (1994) method.

Table 4: Findings of Unit Root Test

	Augmented Dickey Fuller (ADF)			Phillips-Perron (PP)			Integration
	Intercept	Trend and Intercept	None	Intercept	Trend and Intercept	None	
VOL	-7.64***	-7.78***	-7.01***	-7.85***	-9.29***	-7.02***	I(0)
ILQ	-9.27***	-9.21***	-9.29***	-9.82***	-10.01***	-9.75***	I(0)
GP	-6.78***	-6.76***	-6.39***	-6.79***	-6.78***	-6.41***	I(0)
DER	-6.36***	-7.34***	-5.31***	-6.38***	-7.31***	-5.46***	I(0)
CGE	-12.40***	-12.31***	-12.39***	-20.87***	-20.92***	-16.68***	I(0)
DIR	-4.45***	-6.16***	-4.42***	-4.58***	-4.64***	-4.55***	I(0)
BOP	-10.52***	-10.48***	-10.29***	-10.53***	-10.49***	-10.25***	I(0)
IPI	-8.86***	-8.81***	-8.40***	-9.57***	-9.51***	-8.41***	I(0)
CPI	-12.49***	-12.52***	-12.54***	-16.94***	-44.75***	-15.32***	I(1)

As presented in Table 4, the results of the unit root tests indicate that VOL, ILQ, GP, DER, CGE, DIR, BOP, and IPI are stationary at the 1% significance level according to the ADF and PP tests, regardless of trend and constant specifications. Additionally, CPI is found to be stationary at the first difference at the I(1) level with a 1% significance threshold. The stationarity properties of the time series at both I(0) and I(1) levels suggest that the ARDL (Autoregressive Distributed Lag) Bound Test method is appropriate for multiple regression analysis. This selection is based on the consideration of I(0) and I(1) critical values, as outlined in the F-bounds test proposed by Pesaran, Shin, and Smith (2001) for ARDL long-run and short-run estimations.

3.5. Econometric Model

To examine the presence of cointegration between stock market liquidity and macroeconomic variables in Türkiye, this study employs the linear ARDL method introduced by Pesaran et al. (2001). This approach is widely utilized in econometric research due to its flexibility in handling variables with different

stationarity properties. The ARDL methodology enables researchers to estimate both short-run and long-run equilibrium relationships while incorporating the lagged Error Correction Mechanism (ECM) to capture adjustment dynamics.

In the linear ARDL framework, the unit root test is applied to assess the stationarity characteristics of the time series at levels $I(0)$, first differences $I(1)$, or a combination of both, as noted by Bekhet and Matar (2013). The mathematical equations of the ARDL methodology (Equation 2, 3, 4, and 5), which are theoretically appropriate for the econometric analysis of the models established after the unit root analysis results, are formulated below. The mathematical equations used in the ARDL econometric method are as in equations 2 and 3.

Model I: ARDL Equation:

$$\begin{aligned} \Delta VOL_t = & \gamma_0 + \psi_1 VOL_{t-1} + \psi_2 GP_{t-1} + \psi_3 DER_{t-1} + \psi_4 CGE_{t-1} + \\ & \psi_5 DIR_{t-1} + \psi_6 BOP_{t-1} + \psi_7 IPI_{t-1} + \psi_8 CPI_{t-1} + \sum_{i=1}^p \phi_{1i} \Delta VOL_{t-i} + \\ & \sum_{i=0}^q \phi_{2i} \Delta GP_{t-i} + \sum_{i=0}^r \phi_{3i} \Delta DER_{t-i} + \sum_{i=0}^s \phi_{4i} \Delta CGE_{t-i} + \\ & \sum_{i=0}^k \phi_{5i} \Delta DIR_{t-i} + \sum_{i=0}^l \phi_{6i} \Delta BOP_{t-i} + \sum_{i=0}^l \phi_{7i} \Delta IPI_{t-i} + \\ & \sum_{i=0}^l \phi_{8i} \Delta CPI_{t-i} + \omega_9 ECM_{t-1} + \varepsilon_t \end{aligned} \quad (2)$$

Model II: ARDL Equation:

$$\begin{aligned} \Delta ILQ_t = & \gamma_0 + \psi_1 ILQ_{t-1} + \psi_2 GP_{t-1} + \psi_3 DER_{t-1} + \psi_4 CGE_{t-1} + \\ & \psi_5 DIR_{t-1} + \psi_6 BOP_{t-1} + \psi_7 IPI_{t-1} + \psi_8 CPI_{t-1} + \sum_{i=1}^p \phi_{1i} \Delta ILQ_{t-i} + \\ & \sum_{i=0}^q \phi_{2i} \Delta GP_{t-i} + \sum_{i=0}^r \phi_{3i} \Delta DER_{t-i} + \sum_{i=0}^s \phi_{4i} \Delta CGE_{t-i} + \\ & \sum_{i=0}^k \phi_{5i} \Delta DIR_{t-i} + \sum_{i=0}^l \phi_{6i} \Delta BOP_{t-i} + \sum_{i=0}^l \phi_{7i} \Delta IPI_{t-i} + \\ & \sum_{i=0}^l \phi_{8i} \Delta CPI_{t-i} + \omega_9 ECM_{t-1} + \varepsilon_t \end{aligned} \quad (3)$$

In Equations 2 and 3, Δ is the first difference operator, γ is the constant coefficient, ψ is the long-run coefficients, ϕ is the short-run coefficients, ω is the ECM coefficient and ε is the error term. The ECM coefficient in the models is calculated by mathematical equations 4 and 5. For ARDL, the null hypothesis (H_0 : $\psi_1 = \psi_2 = \psi_3 = \psi_4 = \psi_5 = \psi_6 = \psi_7 = \psi_8 = 0$) is the absence of cointegration, while the alternative hypothesis (H_1 : $\psi_1 \neq \psi_2 \neq \psi_3 \neq \psi_4 \neq \psi_5 \neq \psi_6 \neq \psi_7 \neq \psi_8 \neq 0$) is the presence of cointegration.

Model I: ECM Equation:

$$\begin{aligned}\Delta VOL_t = & \gamma_0 + \sum_{i=1}^p \phi_{1i} \Delta VOL_{t-i} + \sum_{i=0}^q \phi_{2i} \Delta GP_{t-i} + \sum_{i=0}^r \phi_{3i} \Delta DER_{t-i} + \\ & \sum_{i=0}^s \phi_{4i} \Delta CGE_{t-i} + \sum_{i=0}^k \phi_{5i} \Delta DIR_{t-i} + \sum_{i=0}^l \phi_{6i} \Delta BOP_{t-i} + \\ & \sum_{i=0}^l \phi_{7i} \Delta IPI_{t-i} + \sum_{i=0}^l \phi_{8i} \Delta CPI_{t-i} + \omega_{9i} ECM_{t-1} + \varepsilon_t\end{aligned}\quad (4)$$

Model II: ECM Equation:

$$\begin{aligned}\Delta ILQ_t = & \gamma_0 + \sum_{i=1}^p \phi_{1i} \Delta ILQ_{t-i} + \sum_{i=0}^q \phi_{2i} \Delta GP_{t-i} + \sum_{i=0}^r \phi_{3i} \Delta DER_{t-i} + \\ & \sum_{i=0}^s \phi_{4i} \Delta CGE_{t-i} + \sum_{i=0}^k \phi_{5i} \Delta DIR_{t-i} + \sum_{i=0}^l \phi_{6i} \Delta BOP_{t-i} + \\ & \sum_{i=0}^l \phi_{7i} \Delta IPI_{t-i} + \sum_{i=0}^l \phi_{8i} \Delta CPI_{t-i} + \omega_{9i} ECM_{t-1} + \varepsilon_t\end{aligned}\quad (5)$$

In order for the ARDL model to be stable, short-run adjustments with the ECM using equations 4 and 5, the coefficient should be negative and this coefficient should be statistically significant. The ECM works as a mechanism to adjust the speed at which shocks to independent variables in the short run lead to equilibrium in the long run.

3.6. Co-integration Analysis

3.6.1. Diagnostic Tests

Before presenting the coefficients of the ARDL analysis, diagnostic tests should be performed to ensure that the regression is not misleading. The hypotheses for the model estimation of the research are as follows:

H_0 = There is no cointegration between macroeconomic variables and stock market liquidity.

H_1 = There is cointegration between macroeconomic variables and stock market liquidity.

The coefficients of the diagnostic tests calculated to verify the existence of cointegration between the dependent and independent variables in the long run in the ARDL analysis are reported in Table 5.

Table 5: ARDL Diagnostic Test

Test	Model I ARDL (4, 4, 4, 5, 5, 5, 0, 3, 3)		Model II ARDL (1, 0, 2, 0, 0, 0, 0, 2)	
	Value	k	Value	k
F-Bounds Test	8.43	7	15.98	7
F-statistic	8.43	7	15.98	7
Critical border values				
Significance level (%)	I(0)	I(1)	I(0)	I(1)
%10	2.38	3.45	2.38	3.45
%5	2.69	3.83	2.69	3.83
%2,5	2.98	4.16	2.98	4.16
%1	3.31	4.63	3.31	4.63
R ²	0.915		0.738	
Adjusted R ²	0.838		0.711	
Breusch-Godfrey LM	0.311 F(5.21) [0.598]		1.081 F(5.48) [0.383]	
Breusch-Pagan-Godfrey	0.467 F(37.26)[0.121]		0.615 F(13.53)[0.831]	
Glejser	0.591 F(37.26)[0.930]		0.901 F(13.53)[0.557]	
ARCH	0.935 F(5.53) [0.466]		0.448 F(5.56) [0.813]	
Ramsey Reset	0.637 df(1.25) [0.432]		0.846 df(1.52) [0.362]	
J-B	1.836 [0.399]		3.763 [0.152]	
VIF	<5.5		<8.3	

Note: The numbers in parentheses [] are probability (p) values.

According to Table 5, which presents the diagnostic test results for assessing the reliability of the analysis, the critical values of the F-statistic for both models exceed those associated with I(0) and I(1) significance thresholds. Since the F-statistic value, as indicated by Pesaran et al. (2001), surpasses the critical values at all significance levels, the null hypothesis is rejected, and the alternative hypothesis (H_1) is accepted. This confirms the presence of a cointegration relationship among the variables in the long run.

The selected macroeconomic indicators account for 91.5% (R^2) and 73.8% (R^2) of the variation in stock market liquidity, respectively. Potential correlation issues within the models were evaluated using the Breusch-Godfrey LM test, variance homogeneity through the Breusch-Pagan-Godfrey test, and additional assessments such as Glejser's test, ARCH, Ramsey Reset for functional form, and Jarque-Bera (J-B) for normality distribution. The

insignificance of obtained coefficients suggests no structural issues within the models. Additionally, the Variance Inflation Factor (VIF) values remaining below 10 indicate that multicollinearity among explanatory variables is not a concern. Furthermore, based on the Akaike Information Criterion (Akaike, 1974), the optimal maximum lag length for both models was determined to be 5.

3.6.2. Long and Short Run Estimation

Following the identification of a cointegration relationship between liquidity and macroeconomic variables, the ARDL methodology was applied to examine both the long-run and short-run impacts of macroeconomic factors on stock market liquidity. The results detailing the effect coefficients for the volume model are presented in Table 6, while Table 7 provides the corresponding findings for the illiquidity model.

Table 6: ARDL Model I (4, 4, 4, 5, 5, 5, 5, 0, 3, 3) Findings

Dependent variable = ΔVOL_t				
Independent variables	Coefficient	Std. Error	t-Statistic	p-value
Long-run coefficients				
GP	-0.3708	0.3318	-1.1176	0.2740
DER	-1.7004	0.7260	-2.3421	0.0271**
CGE	4.2976	1.6897	2.5434	0.0173**
DIR	-0.2226	0.2181	-1.0205	0.3169
BOP	0.0127	0.0479	0.2659	0.7924
IPI	3.8427	1.5520	2.4760	0.0201**
CPI	4.1730	1.3886	3.0051	0.0058***
Short-run coefficients				
$\Delta(VOL(-1))$	0.9696	0.1999	4.8493	0.0001***
$\Delta(VOL(-2))$	1.0601	0.1791	5.9197	0.0000***
$\Delta(VOL(-3))$	0.9187	0.1350	6.8076	0.0000***
$\Delta(GP)$	-1.3796	0.2797	-4.9324	0.0000***
$\Delta(GP(-1))$	-0.8062	0.3369	-2.3930	0.0242**
$\Delta(GP(-2))$	0.5395	0.3415	1.5800	0.1262
$\Delta(GP(-3))$	0.8977	0.2937	3.0566	0.0051***
$\Delta(DER)$	-1.1765	0.2954	-3.9827	0.0005***
$\Delta(DER(-1))$	1.9472	0.3712	5.2465	0.0000***
$\Delta(DER(-2))$	2.7440	0.3077	8.9184	0.0000***
$\Delta(DER(-3))$	1.5939	0.2848	5.5975	0.0000***
$\Delta(DER(-4))$	0.4844	0.2396	2.0218	0.0536*
$\Delta(CGE)$	1.5075	0.2775	5.4319	0.0000***
$\Delta(CGE(-1))$	-4.2388	0.6864	-6.1752	0.0000***
$\Delta(CGE(-2))$	-2.7364	0.5722	-4.7823	0.0001***

$\Delta(\text{CGE}(-3))$	-1.4526	0.4124	-3.5228	0.0016***
$\Delta(\text{CGE}(-4))$	-0.3809	0.2347	-1.6233	0.1166
$\Delta(\text{DIR})$	0.1011	0.1506	0.6709	0.5082
$\Delta(\text{DIR}(-1))$	0.5244	0.1728	3.0349	0.0054***
$\Delta(\text{DIR}(-2))$	0.0607	0.1575	0.3856	0.7029
$\Delta(\text{DIR}(-3))$	0.4871	0.1819	2.6773	0.0127**
$\Delta(\text{DIR}(-4))$	0.5469	0.1681	3.2537	0.0032***
$\Delta(\text{IPI})$	3.8888	0.4609	8.4383	0.0000***
$\Delta(\text{IPI}(-1))$	-3.0828	0.5620	-5.4855	0.0000***
$\Delta(\text{IPI}(-2))$	-2.3701	0.4757	-4.9824	0.0000***
$\Delta(\text{CPI})$	4.4682	1.4402	3.1025	0.0046***
$\Delta(\text{CPI}(-1))$	-2.1459	1.6258	-1.3199	0.1984
$\Delta(\text{CPI}(-2))$	-8.3527	1.5317	-5.4534	0.0000***
$\text{CointEq}(-1)^*$	-1.8803	0.2032	-9.2531	0.0000***
C	-0.2332	0.0412	-5.6633	0.0000***
@trend	0.0043	0.0096	4.5684	0.0001***

*** <0.01, ** <0.05, * <0.1.

The long-run symmetric ARDL estimation results for Model I, as presented in Table 6, indicate that stock market trading volume is significantly influenced by several macroeconomic factors. Specifically, the DER exhibits a significant negative effect, while CGE, the IPI, and the CPI have a significant positive impact. Furthermore, the coefficients for the DER, CGE, and the IPI are statistically significant at the 5% level, whereas the CPI coefficient is significant at the 1% level. According to Table 6, a 1% increase in DER decreases the trading volume by 1.7004%, while a 1% increase in CGE, IPI and CPI increases the trading volume by 4.2976%, 3.8427% and 4.1730%, respectively. The long-run effects of gold, DIR and oil prices on trading volume are not significant.

The short-run coefficient estimates for Model I suggest that the deposit interest rate, one of the macroeconomic variables considered in this study, has a positive influence on transaction volume in the short term. Meanwhile, the short-run impacts of other macroeconomic variables on transaction volume fluctuate between positive and negative values. The estimated coefficient for the error correction mechanism ($\text{CointEq}(-1)^*$) in Model I is -1.8803 and is statistically significant at the 1% level. The significance and negative sign of the ECM coefficient indicate the presence of both short-term dynamic adjustments and long-term effects. Additionally, the macroeconomic variables incorporated in the model stabilize at a rate of 188.03% following any external shock in the long run.

Table 7: ARDL Model II (1, 0, 2, 0, 0, 0, 0, 0, 2) Findings

Dependent variable = ΔILQ_t				
Independent variables	Coefficient	Std. Error	t-Statistic	p-value
Long-run coefficients				
GP	0.4507	0.5317	0.8476	0.4005
DER	-1.2785	0.7405	-1.7266	0.0901*
CGE	0.5200	0.3443	1.5105	0.1369
DIR	0.2092	0.2213	0.9452	0.3488
BOP	-0.2894	0.1205	-2.4017	0.0199**
IPI	-0.2590	0.6561	-0.3948	0.6946
CPI	4.2048	2.4285	1.7314	0.0892*
Short-run coefficients				
$\Delta(DER)$	0.9280	0.3988	2.3272	0.0238**
$\Delta(DER(-1))$	1.5393	0.4704	3.2723	0.0019***
$\Delta(CPI)$	0.2051	2.4636	0.0833	0.9340
$\Delta(CPI(-1))$	-6.5880	2.6067	-2.5273	0.0145**
CointEq(-1)*	-1.2392	0.1031	-12.0253	0.0000***
C	-0.0480	0.0696	-0.6892	0.4937
@trend	-0.0017	0.0018	-0.9605	0.3411

*** <0.01, ** <0.05, * <0.1.

In Model II, the stock market trading volume, calculated using the Amihud illiquidity method, serves as the dependent variable. Within this framework, negative coefficients on illiquidity indicate increased liquidity, whereas positive coefficients suggest reduced liquidity. According to Table 2, which outlines the results of Model II, an increase in exchange rates and Brent oil prices exerts a negative impact on stock market illiquidity, whereas the consumer price index has a positive effect on liquidity. While the influence of Brent oil is statistically significant at the 5% level, both the exchange rate and consumer price index effects are significant at the 1% level.

In terms of short-run dynamics, the exchange rate effect is observed to be negative, whereas the consumer price index effect is positive. The estimated ECM coefficient for the model is -1.2392, which is both negative and statistically significant at the 1% level. This outcome suggests the presence of long-term stability and cointegration between macroeconomic factors and stock market trading volume. Furthermore, the negative and significant ECM coefficient implies that short-term effects are influential, and in the long run, macroeconomic variables stabilize 123.92% of the time when exposed to external shocks. To

further validate the stability and reliability of Model I and Model II, CUSUM and CUSUMQ tests were conducted, with their graphical representations provided in Figure 2.

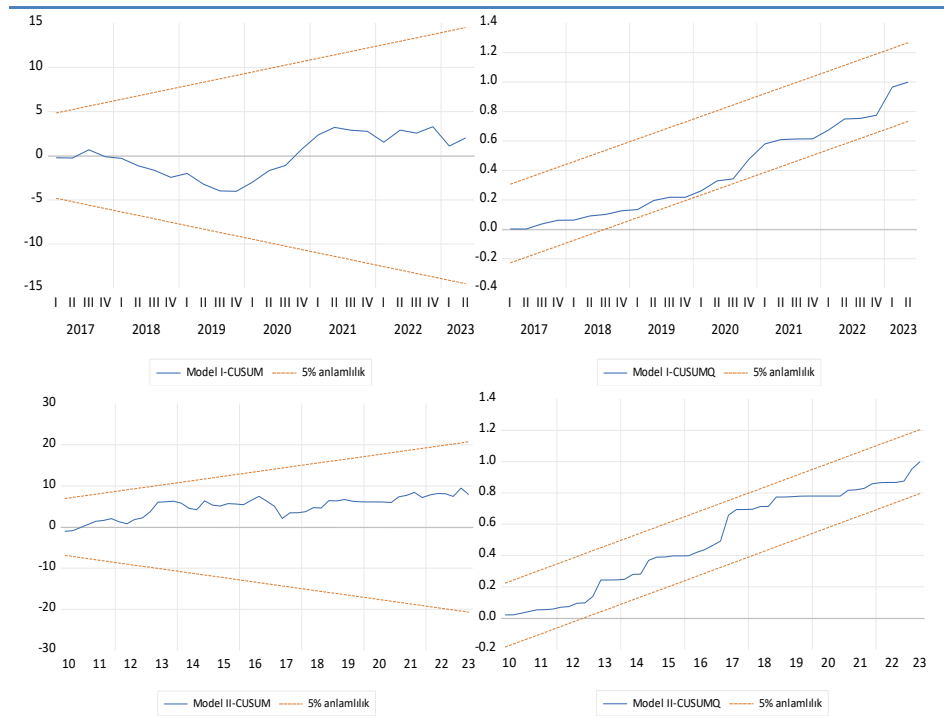


Figure 2: CUSUM and CUSUMQ Graphs

The CUSUM and CUSUMQ graphs in Figure 2 indicate that the models remain within the red lines. This suggests that all regression coefficients fall within the critical limits at the 5% significance level, confirming the stability of the models (Brown, Durbin, & Evans, 1975). Results obtained using two different liquidity measures in an emerging market context suggest that monetary and fiscal policy tools exert significant influence on stock liquidity fluctuations in both the long and short run. In our empirical analysis, exchange rates and inflation exhibit notable long- and short-run effects across both liquidity models. However, a comparison between the results in Tables 6 and 7 suggests that the relationship between macroeconomic indicators and BIST 100 liquidity, as measured by two different approaches, lacks full consistency.

Our empirical results show that the macroeconomic consequences of monetary and fiscal policy actions taken by governments in Türkiye are important

for the efficiency and stability of the stock market. Therefore, when the economic authorities want to intervene in the market by regulating the amount of liquidity through expansionary and contractionary monetary and fiscal policy, they should pay special attention to strengthen the liquidity expectation management of investors in the stock market so that stock market liquidity is not adversely affected. In this respect, institutional policies and strategies for the stock market should be compatible with liquidity dynamics in order to make investors' perceptions more attractive, increase market depth, provide confidence and increase stock market performance by ensuring stability. This is because economic policies that are prepared in a way to take into account the financial dynamics of the market are thought to increase the liquidity provision activities in stock markets, the liquidity of capital market instruments, and thus the ability of these instruments to be traded, making them more durable. Therefore, considering the importance of market liquidity for the general economy, since all companies operate within the macroeconomic cycle, the relationship between macroeconomic dynamics and stock market liquidity should not be ignored in terms of investment decisions, investment performance and economic policies.

The findings between both liquidity measures and some macroeconomic indicators used in the study support the evidence of macroeconomic indicators used by Ülengin and Yobaş (1997), Chordia et al. (2001), Karamustafa and Karakaya (2004), Mousa (2016), Chowdhury et al. (2018), Ekinçi et al. (2019), Siddiqi et al. (2021), Naik and Reddy (2024).

4. CONCLUSION AND RECOMMENDATIONS

Today, the stock market has become an important institution that attracts considerable attention from investors, stakeholders and governments. Liquidity, which is an important function of this market, is a product of modern finance and is a monetary amount generated as a result of buying and selling activities in the stock market. Stock liquidity is recognized as an important indicator for the development and efficiency of stock markets, which have a dynamic structure. Moreover, since stock markets represent the real markets in the economic system and are seen as a barometer for the general course of the economy, it is important to analyze the dynamics of these markets. In this respect, how stock liquidity is affected by external macroeconomic dynamics has attracted a great deal of attention in institutional and modern macro finance research in recent years.

Based on the importance of stock market liquidity in terms of investment and economic policies, it is investigated whether the liquidity movements of the BIST 100, which includes the 100 companies with the highest trading volume and market capitalization in Türkiye and is considered as the main indicator of

the stock market, are affected by macroeconomic indicators, and if so, in which direction. Two different measures of stock liquidity are analyzed in the study. The data set of the study consists of 69 quarterly linear data corresponding to the variables from March 2006 to June 2023. According to our long-run analysis results, higher central government expenditures, industrial production index and consumer price index imply higher trading volume in Türkiye, while exchange rate implies lower trading volume. In the case of illiquidity, higher exchange rate and oil prices correspond to higher liquidity and lower liquidity in the consumer price index. The short-run effects are either positive or negative. Overall, we believe that our findings will be useful in providing economic information to market conditions and hence investor expectations. The literature review reveals that many studies have been conducted on the relationship between macroeconomic indicators and stock liquidity and these studies have been conducted especially in developed economies. In Türkiye, Karamustafa and Karakaya (2004), Canbaz (2019), Güzel and Şekeroğlu (2021) and Yılmaz (2023) examined the relationship between stock market liquidity with Turkish data. We believe that both the small number of studies in Türkiye and the macroeconomic indicators, different liquidity measures and different methods used in our study will make the study unique and make a significant contribution to the gap in the literature.

Finally, liquidity, which is an important function of capital market development, financial market stability and stock market, has become a critical issue among academics, regulators and practitioners due to its possible relationship with various macroeconomic variables within the basic dynamics of the stock market. A comprehensive investigation of the relationship between macroeconomic policies and the stock market liquidity mechanism provides an important output for policy makers in terms of seeing the effects of the implemented economic stabilization policy on the markets. This is because once academic research in the field understands the impact of economic policies and trade rules on stock market dynamics, both policymakers and individual and institutional fund managers can better strategize on market characteristics and regulations to improve stock market liquidity and efficiency.

Given the results of the relationship between macroeconomic policies and stock market liquidity, it is recommended that more studies be conducted to understand this relationship, especially in emerging economies. These studies will provide more comprehensive findings and policy implications for regulators and market participants. In the future, researchers are advised to conduct new studies considering different countries, country groups, econometric methods and liquidity measures such as TURNEOVER, ROLL, HLCS, LOT, QSPREAD.

5. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

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7. AUTHOR CONTRIBUTIONS

TY, AA: Idea;

AA, TY: Design;

TY, AA: Processing and/or processing of resources;

TY: Analysis and/or interpretation;

AA, TY: Literature review;

TY, AA: Written by;

TY, AA: Critical review

8. ETHICS COMMITTEE STATEMENT

The methods and data used in the study do not require ethics committee approval.

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YEŞİL İMAJ ÖLÇEĞİNİN TÜRKÇE UYARLAMASI VE YEŞİL İNSAN KAYNAKLARI YÖNETİMİ UYGULAMALARININ YEŞİL İMAJA ETKİSİ¹



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ÖZ

Araştırmanın amacı, Chen (2008) tarafından geliştirilen yeşil imaj ölçeğini Türkçe'ye uyarlamak ve yeşil insan kaynakları yönetimi uygulamalarının yeşil imaj üzerindeki etkisini incelemektir. Sosyal Kimlik Teorisi ve yeşil işletme alanyazınından esinlenerek varsayımlar oluşturulan bu çalışmada, örgütte yeşil insan kaynakları yönetimi uygulamalarının varlığının, çalışanların örgütle ilgili yeşil imaj algıları üzerinde etkili olabileceği varsayılmaktadır. Araştırmanın evrenini, Karaman ilinde gıda ürünleri imalatı sektöründe faaliyet gösteren 91 firmanın çalışanları oluşturmaktadır (N= 14.990). Araştırmada kolayda örnekleme yöntemi kullanılmış ve 375 çalışan örnekleme dahil edilmiştir. Verilerin çözümlenmesinde SPSS ve AMOS programları kullanılmıştır. Araştırmanın sonucunda tek boyut ve 8 maddeden oluşan geçerli ve güvenilir bir yeşil imaj ölçeği elde edilmiştir. Ayrıca basit doğrusal regresyon analizi bulgularına göre, yeşil insan kaynakları yönetimi uygulamalarının yeşil imaj üzerinde anlamlı ve pozitif etkisi olduğu tespit edilmiştir.

Anahtar Kelimeler: Yeşil imaj, ölçek uyarlama, yeşil insan kaynakları yönetimi uygulamaları

JEL Kodları: M10, M12, M19

Alan: İşletme

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¹ İlgili çalışmanın etik kurallara uygunluğu beyan edilmiştir.

TURKISH ADAPTATION OF THE GREEN IMAGE SCALE AND THE EFFECT OF GREEN HUMAN RESOURCES MANAGEMENT PRACTICES ON GREEN IMAGE



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ABSTRACT

The purpose of research is to adapt the green image scale developed by Chen (2008) into Turkish and to examine the effect of green human resources management practices on green image. In this research, which is inspired by Social Identity Theory and green business literature, it is assumed that the presence of green human resources management practices in the organization may have an impact on employees' green image perceptions of the organization. The population of the research consists of employees of 91 companies operating in the food products manufacturing sector in Karaman province (N = 14,990). Convenience sampling method was used in the research and 375 employees were included in the sample. SPSS and AMOS programs were used to analyze the data. As a result of the research, a valid and reliable green image scale consisting of a single dimension and 8 items was obtained. In addition, according to the findings of simple linear regression analysis, it was determined that green human resources management practices had a statistically significant and positive effect on green image.

Keywords: *Green image, scale adaptation, green human resource management practices*

JEL Codes: M10, M12, M19

Scope: *Business administration*

Type: *Research*

1. GİRİŞ

Çevresel endişeler, iklim değişikliği, kaynakların hızlı tükenmesi, çevre kirliliği ve doğal çevrenin tahrip edilmesi gibi faktörler, işletmelerin kurumsal ve rekabet stratejilerinde çevresel konulara giderek daha fazla önem vermelerine neden olmaktadır (Molina-Azorin, López-Gamero, Tarí, Pereira-Moliner & Pertusa-Ortega, 2021, s. 1). Bu konuda devletler, örgütler, tüketiciler ve tüm kamuoyu her geçen gün daha fazla bilinçlenmekte ve çevreyi korumaya yönelik faaliyetler ve davranışlar göstermektedir. Kamuoyunun çevreye yönelik endişelerini göz önünde bulunduran örgütler strateji, politika ve uygulamalarını bu yönde şekillendirmeye çabalamaktadır (Durmuş & Erbaşı, 2023, s. 377). Bu çabalar yeşil işletme alanyazınının genişlemesine ve bu sayede güncel kavramların ortaya çıkmasına neden olmuştur.

Yeşil işletme alanyazını için oldukça güncel kavramlardan biri de yeşil imaj kavramıdır. Yeşil imaj, bir örgütün sürdürülebilir ve çevre dostu faaliyetler gerçekleştirdiğine yönelik insanlarda oluşturduğu algıdır. Özellikle son yıllarda tüketicilerin yalnızca mal veya hizmet kalitesine önem vermeyip tedarikçileri de inceliyor olması ve tercihlerinde çevresel farkındalıklarının etkisinin artıyor olması, yeşil imaj kavramının önemini de artırmaktadır. Dolayısıyla örgütler her geçen gün yeşil imajlarını yönetmeye yönelik arayışların içerisine girmeye başlamışlardır.

Yeşil kavramının işletme bilimindeki hızlı gelişimi beraberinde yeşil yönetim, yeşil örgütsel davranış, yeşil insan kaynakları yönetimi (YİKY), yeşil imaj gibi çeşitli kavramlar yönetim alanında ele alınmaya başlanmıştır. Fakat Türk yönetim yazınında bu kavramların daha güvenilir şekilde kullanılabilmesi için ölçülmesine yönelik arayışlara ihtiyaç bulunmaktadır (Erbaşı, 2021, s. 249). Bu arayışlar araştırmacıları kimi zaman ölçek geliştirmeye ve kimi zaman ölçek uyarlamaya itmektedir. Yeşil imaj kavramına yönelik alanyazın bu bakış açısıyla incelendiğinde; yabancı yazında az sayıda ölçek arayışının olduğu (Chen, Huang, Wang, Huang & Liao, 2017; Chen, 2008), yerli yazında kısıtlı sayıda çalışmanın olduğu, bu çalışmaların daha çok nitel araştırmalara konu edildiği ve yerli yazında nicel araştırma türünde desenlenen çalışmalarda ölçek kullanımı için yabancı yazına yönelindiği (Çavuşoğlu, 2021; Canöz & Ertek, 2020; Ecevit, 2018) görülmektedir. Sonuçta araştırmalar, yeşil imajı ölçmeye yönelik Türk iş örgütleri için geçerli ve güvenilir olduğu istatistiksel olarak kanıtlanmış bir ölçek ihtiyacını karşılayamamıştır. Bu nedenle araştırmamızda ilk olarak Chen (2008) tarafından geliştirilen yeşil imaj ölçeğinin Türkçe'ye uyarlanması amacı yer almaktadır.

Alan yazın için oldukça güncel olan yeşil imaj kavramının ölçümüne yönelik tartışmaların yanı sıra kavramın farklı örgütsel değişkenlerle ilişkisini

açıklayan çeşitli araştırma bulguları yer almaktadır (Sarko & Sukawati, 2021; Çavuşoğlu, Demirağ, Jusuf & Gunardi, 2020; Melé, Gómez & Sousa, 2020; Chen, Huang & Wang, 2018; Chrisjtmiko, 2018; Amores-Salvadó, Martín-de Castro & Navas-López, 2014; Jeong, Jang, Day & Ha, 2014; Chang & Fong, 2010; Chen, 2010). Buna rağmen alanyazında, örgüt içinde insan kaynaklarına yönelik gerçekleştirilen yeşil uygulamaların, çalışanlar perspektifinde yeşil imaj algısını ne yönde etkilediğini ortaya koyan bir araştırmaya rastlanmamıştır. Halbuki yeşil örgüt ortamlarının yeşil algı ve yeşil davranış üzerinde etkili olduğunu ortaya koyan çeşitli araştırma bulguları yer almaktadır (Erbaşı, 2017; Dumont, Shen & Deng, 2017; Erbaşı & Özalp, 2016; Zientara & Zamojska, 2016; Norton, Zacher & Ashkanasy, 2014; Cantor, Morrow & Montabon, 2012; Norton, Zacher & Ashkanasy, 2012; Crosbie & Houghton, 2011; Bartlett, 2011; Boiral, 2009; Barr, 2007).

Örgütlerin çevre odaklı politika ve uygulamaları sürdürülebilir kılmasındaki en önemli unsurlarından biri, sahip olduğu insan kaynaklarıdır. Buna göre geleneksel insan kaynakları yönetimi uygulamaları, yeşil uygulamalar ile bütünleştirilerek YİKY'e evrilmektedir. Çevre bilincinin artıyor olması, YİKY uygulamalarını da artırmaktadır. Buna göre YİKY uygulamaları, örgütlerdeki çevre dostu faaliyet ve süreçlerin başarısında itici bir güç ve önemli bir dayanak durumundadır. Sosyal Kimlik Teorisi ve yeşil işletme alanyazını, bizi YİKY uygulamalarının varlığının, çalışanların örgütle ilgili yeşil imaj algıları üzerinde etkili olabileceği varsayımına yöneltmektedir. Bu nedenle araştırmada, ölçek uyarlama arayışının yanı sıra YİKY uygulamalarının yeşil imaj üzerindeki etkisi de incelenmiştir.

2. KAVRAMSAL ÇERÇEVE

2.1. Yeşil İnsan Kaynakları Yönetimi Uygulamaları

İnsan kaynakları yönetimi, geleneksel işlevlerinin yanı sıra kuruluşların çevresel sürdürülebilirlik hedefleriyle uyumlu uygulamalar ve politikalar geliştirme sorumluluğunu üstlenmiştir. Bu bağlamda, insan kaynakları yönetimi, bir organizasyon için çevresel sürdürülebilirliği destekleyen önemli bir itici güç haline gelmiştir (Mandip, 2012, s. 244). Sürdürülebilirlik ve insan kaynakları yönetimi arasındaki ilişkiyi açıklayan birinci faktör; organizasyonun ekonomik ve sosyal çevresiyle ilişkisi, toplumsal ve ekolojik sürdürülebilirliği etkileyerek insan kaynakları yönetiminde sürdürülebilirliğin belirginleşmesine yol açmaktadır. İkinci faktör ise organizasyonun iç dinamikleri, işgücünün yaşlanması, sağlık sorunları gibi iç çevresel faktörlerin, insan kaynakları yönetiminin sürdürülebilirliğini teşvik etme zorunluluğudur (Ehnert & Harry,

2012, s. 223). Yeşil politikalar ve uygulamaların etkisiyle, yeni iş alanları ortaya çıkmakta ve bu rollerde çalışacak kişilerden yeni nitelikler, yetenekler, uzmanlıklar, bilgi ve beceriler beklenmektedir. Bu durum, geniş çaplı bir değişimi beraberinde getirerek insan kaynakları yönetiminin geleneksel yapısının YİKY'e dönüşmesi sonucunu doğurmaktadır (Yavuz, 2020, s. 2671).

YİKY; düşük maliyet, yüksek verimlilik ve çalışanların örgüte bağlılığı ile sonuçlanan sürdürülebilir uygulamaların teşvik edilmesi, sürdürülebilirlik konusunda çalışanların farkındalıklarının artırılması ve bu yönde çalışan katılımının sağlanması çabalarıdır (Mandip, 2012, s. 244). Başka bir deyişle YİKY uygulamaları örgütün çevresel performansının artırılması amacıyla, örgütün çevreye olan olumsuz etkilerinin azaltılması ve olumlu etkilerinin artırılması için uygulanan faaliyetlerdir (Arulrajah, Opatha & Nawaratne, 2015, s. 2). Özetle YİKY; sürdürülebilir hedefleri gerçekleştirmede çevreye dost, kaynak kullanımında çevreye duyarlı ve çevrenin korunmasına katkı sağlayan uygulamaların oluşturulması ve çalışanların bu hususta eğitimi, yönlendirilmesi ve katılımını içeren faaliyetler bütünüdür. Bu amaç kapsamında insan kaynakları planlaması, işgören bulma ve seçimi, kariyer yönetimi, performans değerlendirmesi, ücret, ödül ve ceza sistemleri, işgören eğitimi gibi insan kaynakları uygulamaları çevreci bir bakış açısıyla gerçekleştirilmektedir.

YİKY, çevresel plan ve politikaların belirlenmesini, bu politikaların çalışanlara iletilmesini, personelin bu konuda eğitilmesini, çevresel uygulamalara adapte olmalarının desteklenmesini ve yönlendirilmesini, ayrıca çevreye duyarlı çalışanların teşvik edilmesini içeren bir dizi faaliyetleri kapsamaktadır (Kim, Kim, Choi & Phetvaroon, 2019, s. 84). Kavram, organizasyonlarda etkin bir insan kaynakları sürecinin, çevresel etkileri en aza indirerek hatta çevreye katkıda bulunarak yönetilmesini hedefler. YİKY, bu çabaların gerçekleştirilmesi için kullanılan politikalar ve araçlar olarak tanımlanan YİKY uygulamalarıyla sağlanır. Bu uygulamalar, işletmelerin çevreye duyarlı bir şekilde insan kaynakları süreçlerini yönlendirmesini, çevresel sürdürülebilirliği desteklemesini ve çalışanlar arasında çevre bilincinin artırılmasını sağlamaktadır (Erbaşı, 2021, s. 249).

YİKY uygulamaları örgütün çevresel ve sürdürülebilir performansına katkı sağlamanın yanında çalışanların yeşil davranışlar sergilemesini, yeşil fikirler üretmesini, çalışan motivasyonunun artmasını ve çalışanların çevreye yönelik bağlılığının oluşmasını sağlamaktadır (Pham, Tučková & Phan, 2019, s. 447). İnsan kaynağı ve insan kaynakları yönetimi uygulamaları örgütte yeşil bir atmosfer oluşturmada önemli bir role sahiptir. Bu noktada örgütün insan kaynağını motive edici ve sürdürülebilir politikalar uygulamak oldukça önemlidir (Ahmad, 2015, s. 2). İnsan kaynakları yönetiminin yeşil hale gelmesi için; görev

ve sorumlulukların çevreyi korumaya yönelik olacak şekilde tekrar dizayn edilmesi, yeni işler ve pozisyonlar tasarlanması, iş tanımlarının örgütsel, çevresel, kişisel ve teknik açıdan ihtiyaçları karşılayacak şekilde yenilenmesi, çevresel sorunları başarılı bir şekilde yürütecek ekiplerin kurulması ve ekipler arası koordinasyonun sağlanması gerekmektedir (Arulrajah vd., 2015, s. 3). Çevreyle ilgili konular, sosyal sorumluluk, rekabet avantajı ve finansal performans gibi konularla ilişkili olması nedeniyle araştırmacı ve uygulayıcıların ilgisini çekmektedir. Bu konuda yönetici ve çalışanların rolü göz önünde bulundurulduğunda insan kaynakları yönetimi çevre yönetimine önemli katkılar sağlamaktadır (Molina-Azorin vd., 2021, s. 1).

2.2. Yeşil İmaj

İmaj, bireyin zihninde zamanla oluşan bir imge olarak tanımlanabilir. Bu imge, çeşitli unsurların etkileşimiyle kademeli olarak şekillenir (Dinçer, 1998, s. 2). Başkalarının zihninde oluşan bu etkileşim, nesneye olabildiği gibi kişiye veya topluluğa dair de olabilmektedir. Kişisel imaj kavramının temellerini oluşturan Goffman'a (1959, s. 4) göre birey, özel amaç ve kişisel çıkarları için kendisine dair başkalarının zihninde izlenim oluşturmaya çabalar. Buna göre imaj zamanla oluşan, birçok bileşenin bir araya gelmesiyle meydana gelen ve bilinçli şekilde yönlendirilebilen bir olgudur.

İmaj kavramı, örgütler açısından da kritik bir öneme sahiptir. Zira örgütün sunduğu ürün ve hizmetlerinin yanı sıra yürütmüş olduğu diğer faaliyetler, örgütün kamuoyu nezdindeki görüntüsünü ve örgüte dair algıları şekillendirmektedir. Örgüt imajı olarak adlandırılan bu durum, insanların zihinlerinde o örgüt ile ilgili oluşan tutum ve inançların toplamını ifade etmektedir (Gray, 1986, s. IX). Dowling (2001, s. 19) örgüt imajını; bir kişinin, organizasyon hakkında sahip olduğu bir dizi inanç ve duygudan oluşan genel değerlendirme şeklinde tanımlamaktadır.

Örgüt imajının, örgütün ürettiği mal ve hizmetlerin talep edilmesi, yatırımcıların şirket hisselerine yatırım yapma isteği ve nitelikli çalışanları örgüte çekme gibi faydaları bulunmaktadır (Steidl & Garry, 1997, s. 12). Güçlü bir örgüt imajı, yetenekli ve istekli çalışanları örgüte çekmesi yönüyle insan kaynakları açısından stratejik avantajlar sağlayabilmektedir (Altuğ, 2017, s. 16). Örneğin çevreye duyarlı ve sosyal sorumluluğa önem veren bir örgütte, örgütün sahip olduğu olumlu imaj nedeniyle çalışmaktan memnuniyet duyan bir çalışan, çalıştığı örgütle gurur duyar, daha üretken olur, müşterilerle daha iyi ilgilenir ve bunların tümü yine o örgütün imajına olumlu katkılar sağlayabilir (Moody, 1987, s. 23).

Değişen ve gelişen piyasa koşullarıyla birlikte, olumlu örgüt imajının

oluşumunda örgütün çevre duyarlılığı ve çevre dostu uygulamaları önemli hale gelmektedir. Günümüzde insanların çevre bilincinin artması, beklenti ve ihtiyaçlarının bu doğrultuda değişmesi, örgütleri bu konuda duyarlı olmaya itmekte (Chen, 2008, s. 532) ve örgütlerin bu yönde imaj oluşturma çabalarını artırmaktadır. Örgütün çalışanlar, müşteriler, tedarikçiler, rakipler, yatırımcılar, hissedarlar, medya, hükümet ve genel kamuoyu zihninde oluşan etkileşimini ifade eden örgüt imajının (Marquis, 1970, s. 2) çevresel hassasiyetleri de içine almasıyla “yeşil imaj” kavramı ortaya çıkmıştır. Wang, Wang, Xue, Wang & Li (2018, s. 427) yeşil imajı, bir örgütün çevresel taahhütler ve endişelerle ilgili tüketicilerin zihinlerinde oluşturduğu bir dizi algı olarak tanımlamaktadır. Örgütlerin çevre yönetimi uygulamaları yoluyla oluşturdukları yeşil imaj, örgütün ürettiği ürün ve hizmetlere nispeten daha fazla ücret talep etmesine ve rekabet avantajı elde etmesine katkı sağlayabilmektedir (Chen, 2008, s. 534).

Özetle yeşil imaj, örgütün çevre ile ilgili konularda kamuoyu nezdindeki oluşturduğu algıdır. Her geçen gün çevresel endişelerin artması ve insanlarda bu yönde farkındalığın oluşması, örgütlerin yeşil imaj oluşturma konusuna daha fazla önem vermesini gerektirmektedir. Bu doğrultuda örgütler, yeşil yönelimli politika, strateji ve uygulamaları devreye sokmakta ve kamuoyunun zihninde olumlu bir çevreci imaj oluşturmaya çabalamaktadır. Örgütün sahip olduğu yeşil imaj, müşterilerin örgütün üretmiş olduğu mal ve hizmetleri talep etmesi, yatırım yapma niyetinde olan kitlelerin örgütü tercih etmesi, çalışanların örgütte çalışmaya devam etmede istekli olması ve yeni iş başvurusu yapacak nitelikli kişilerin örgütü tercih etmesi gibi örgüte çok farklı avantajlar sağlayabilmektedir. Bu gibi birçok olumlu katkısı göz önünde bulundurulduğunda örgütler, yeşil imaj oluşturma konusuyla daha fazla ilgilenmeye ve bu konuda faaliyet ve politikalar uygulamaya başlamıştır. Yeşil imaj kavramının öneminin artması, araştırmacıların ilgisini de her geçen gün bu yöne doğru çekmektedir.

Yapılan araştırmalarda örgütün sahip olduğu yeşil imajın tüketicilerin örgüte dair tutumunu ve satın alma kararını (Jeong vd., 2014; Hwang & Lyu, 2020), daha fazla ücret ödeme fedakarlığını (Han, Hsu & Lee, 2009; Han, Hsu, Lee & Sheu, 2011; Hagmann, Semeijn & Vellenga, 2015), yeşil davranış sergilemesini (Lee, Hsu, Han, & Kim, 2010), yeşil müşteri memnuniyetini (Yıldız, 2012), yeşil güven, yeşil memnuniyet ve yeşil sadakatini (Martínez, 2015) olumlu şekilde etkilediği tespit edilmiştir. Başka bir çalışmada yeşil imaj çabalarının örgütün yeşil bilgi teknolojisi uygulamalarına olumlu katkılar sağladığı görülmüştür (Hu, Hu, Yen & Yen, 2022).

Gan, Yang, Liu, Cheng, Qin, Su ve Xia, (2021) yeşil imajın, örgütlerin çevre koruma yatırımlarını teşvik etmede olumlu etkileri olduğunu saptamıştır. Ma, Zhang ve Fang (2022) ise iş arayan Çinlilere yöneltilen anketlerden elde

edilen verilere göre yeşil imaj ile işveren çekiciliği arasında; kurumsal yeşil imaj ve algılanan yeşil değer arasında pozitif yönde anlamlı ilişki tespit etmişlerdir. Yapılan çalışmalara bakıldığında yeşil imajın kamuoyu üzerindeki etkisinin yanı sıra örgüt uygulamalarını da etkilediği görülmektedir.

Sosyal Kimlik Teorisine göre, bir örgüt ile çalışan arasındaki değer uyumu, çalışanın örgüt hakkındaki psikolojik sahiplenme duygusunu artırmaktadır. Buradan yola çıkarak örgütlerin içselleştirilmiş yeşil eğilimlerinin örgütsel bağlılığı artırdığı ve örgütlerde YİKY uygulamalarının olumlu bir kurumsal imaj oluşturma üzerinde önemli derecede etkisi olduğu iddia edilmektedir. Buna göre YİKY uygulamaları, çalışanların kurumlarıyla gurur duymalarını sağlamakta ve mevcut şirketlerinde çalışmak için değer temelli bir zemin oluşturmaktadır (Baykal & Bayraktar, 2022, s. 1). YİKY uygulamaları sayesinde çalışanların zihinlerinde oluşan bu olumlu iklimin, örgütle ilgili yeşil imaj algılarını da olumlu etkileyeceği varsayılmaktadır. Bu varsayımdan hareketle YİKY uygulamalarının yeşil imaj üzerindeki etkisini incelemek için aşağıdaki hipotez oluşturulmuştur:

H₁: Örgütteki YİKY uygulamaları, çalışanların yeşil imaj algısını pozitif yönde etkiler.

3. YÖNTEM

Araştırmanın birinci aşamasında ölçek uyarlama süreci yürütülmüştür. Bu aşamada ölçeği geliştiren yazardan izin alma işlemi, kapsam ve dil geçerliği, ölçeğin örneklem grubuna uygulanması ve faktör yapısının ortaya konması, faktör yapısının doğrulanması, güvenilirlik incelemesi olmak üzere beş alt aşamalı süreç takip edilmiştir (Erbaşı, 2021a, s. 623-624). Bu sıralamaya uygun olarak öncelikle ölçeği Türkçe'ye uyarlayabilmek için yazarından e-posta yoluyla izin alınmış ve araştırmacılar tarafından Türkçe'ye tercüme edilen 8 maddeli ölçeğin dil ve anlam uygunluğunu inceleyebilmek için uzman görüşlerine başvurulmuştur. Bu kapsamda her iki dile hâkim alanda en az doktora eğitim seviyesine sahip 4 uzmanın değerlendirmeleri alınmıştır. Uzman görüşlerinden yola çıkarak maddelerin kapsam geçerlik indeksleri hesaplanmış ve sonuçta kapsam ve dil geçerliği sağlanmıştır.

Araştırmada “Yükseköğretim Kurumları Bilimsel Araştırma ve Yayın Etiği Yönergesi”ne uyulmuştur. Yönergedeki “Bilimsel Araştırma ve Yayın Etiğine Aykırı Eylemler”den hiçbirisi gerçekleştirilmemiştir. Araştırmaya başlanmadan önce Selçuk Üniversitesi Sosyal ve Beşerî Bilimler Bilimsel Araştırma ve Yayın Etik Kurulunun 04.04.2023 tarih ve 04/61 numaralı kararıyla etik kurul raporu alınmıştır.

Karaman Bilim Sanayi ve Teknoloji İl Müdürlüğü verilerine göre Karaman ili sanayisinde faaliyet gösteren (sanayi sicil belgesine sahip) 469 firma ve 19.373 çalışan vardır. Bu firmaların %19.4'ünü (n=91) oluşturan gıda ürünleri imalatı sektörü, toplam çalışan sayısının %77.4'ünü (n=14.990) oluşturmaktadır. Karaman ili sanayisine ait sektörel dağılım ve çalışan sayılarına ilişkin bulgular Tablo 1'de sunulmuştur (Karaman Ticaret ve Sanayi Odası, 2020, s. 32).

Tablo 1: Karaman İli Sanayisi Sektörel Dağılımı ve Çalışan Sayıları (2020)

Sektör	Firma Sayısı	Çalışan Sayısı
Gıda Ürünleri İmalatı	91	14.990
Başka Yerde Sınıflandırılmamış Makine ve Ekipman İmalatı	79	821
Diğer Madencilik ve Taş Ocakçılığı	57	599
Elektrik, Gaz, Buhar ve Havalandırma Sistemi Üretim ve Dağıtım	55	402
Kauçuk ve Plastik Ürünlerin İmalatı	33	769
Fabrikasyonel Metal Ürünleri İmalatı	27	552
Mobilya İmalatı	25	350
Diğer Metalik Olmayan Mineral Ürünlerin İmalatı	24	253
Ağaç ve Mantar Ürünleri İmalatı	21	148
Diğer	6	1.021
Toplam	469	19.373

Kaynak: Karaman Bilim Sanayi ve Teknoloji İl Müdürlüğü Verileri (Karaman Ticaret ve Sanayi Odası, 2020, s. 32)

Bu araştırmanın evrenini, Karaman ilindeki gıda ürünleri imalatı sektöründe faaliyet gösteren 91 firmanın çalışanları oluşturmaktadır (N=14.990). Araştırmada kolayda örnekleme yöntemi kullanılmıştır. Araştırmanın örneklemi, Karaman ilindeki gıda ürünleri imalatı sektöründe faaliyet gösteren 91 firmanın n=375 çalışanından oluşmaktadır. 5'li likert ölçeği kullanılarak uygulanan anketler sonucunda ulaşılan verilere SPSS 21 programı aracılığıyla açıklayıcı faktör analizi (AFA) uygulanmıştır. AMOS 21 programı aracılığıyla doğrulayıcı faktör analizi (DFA) uygulanarak faktör yapısının doğruluğu incelenmiştir.

Araştırmanın ikinci aşamasında, işletmelerdeki YİKY uygulamalarının yeşil imaja etkisini incelemek üzere geliştirilen hipotez test edilmiştir. Bu aşamada kullanılan ölçeğin yakınsak geçerliliği ve güvenilirliği analiz edilmiştir.

Ayrıca AMOS 21 programı kullanılarak DFA uygulanmış ve ölçeğin yapısal geçerliği incelenmiştir. Hipotez testinin yapılabilmesi için basit doğrusal regresyon analizi uygulanmıştır.

Araştırmaya katılan örneklemde 233 kadın (%60.5) ve 152 erkek (%39.5) bulunmaktadır. Katılımcı çalışanların %62.9'u (242 kişi) ön lisans, %20.5'i (79 kişi) ortaokul veya lise, %7.5'i (29 kişi) lisans, %6.5'i (25 kişi) ilköğretim ve %2.6'sı (10 kişi) lisansüstü mezunudur. Katılımcıların %64.7'si (249 kişi) bekar ve %35.3'ü (136 kişi) evlidir. Katılımcıların %52.7'si (203 kişi) 15 yıldan az süredir, %32.5'i (125 kişi) 15-30 yıldır ve %14.8'i (57 kişi) 30 yıldan fazla süredir sektörde faaliyet gösteren bir şirkette çalışmaktadır. Ayrıca katılımcıların %27.3'ü (105 kişi) mikro (1-9 arası çalışanı olan), %26.5'i (102 kişi) küçük ölçekli (10-49 arası çalışanı olan), %26.2'si (101 kişi) orta ölçekli (50-249 arası çalışanı olan) ve %20.0'ı (77 kişi) büyük ölçekli (250'den fazla çalışanı olan) bir firmada çalışmaktadır. Katılımcıların yaş ortalaması 29.92 olup (min. 18, maks. 62, standart sapma 13.00) mesleki kıdem ortalaması 9.73 yıldır (min. 1, maks. 50, standart sapma 11.66).

4. BULGULAR

4.1. Ölçek Uyarlamaya ilişkin Bulgular

Martinez ve Pina (2005) tarafından yapılan bir araştırmada, Weiss, Anderson ve MacInnis (1999) tarafından önerilen 5 madde (itibar) ve Keller ve Aaker (1992) tarafından önerilen 3 madde (güvenilirlik) birleştirilerek kurumsal imaj ölçülmeye çalışılmıştır. Chen (2008) ise bu birleşmeyi esas alarak kurumsal imaj kavramını yeşil temasına entegre etmiş ve yeşil imaj kavramını ölçmeye odaklanmıştır. Türkçe'ye uyarlanmak üzere belirlenen bu ölçeği geliştiren Chen (2008) yeşil inovasyon, yeşil imaj ve yeşil temel yetenekler arasındaki ilişkileri incelemiştir. Araştırmada 2006 Tayvan Ticaret Rehberinden rastgele seçilen bilgi ve elektronik endüstrisindeki firmaların 136 CEO veya çevre koruma, pazarlama veya ar-ge departmanı yöneticilerinden veri toplanmıştır. Yazar araştırmasında 5 maddeden (saygınlık, profesyonellik, başarılı olma, tanınma, istikrarlı olma) oluşan "yeşil itibar" boyutu ve 3 maddeden (güvenilirlik, tutarlılık, müşterilere gösterilen ilgi) oluşan "yeşil güvenilirlik" boyutu olmak üzere 2 boyut ve 8 maddeli bir yeşil imaj ölçeği kullanmıştır.

Chen (2008) tarafından geliştirilen yeşil imaj ölçeğini Türkçe'ye uyarlamak için öncelikle maddelerin en düşük, en yüksek, ortalama, standart sapma, basıklık ve çarpıklık değerleri incelenmiş ve elde edilen bulgular Tablo 2'de sunulmuştur. Ortalama değerlerin 3.72 ile 4.01, çarpıklık -0.641 ile -0.945 ve basıklık 0.305 ile 1.827 aralığında olduğu tespit edilmiştir. Maddelerin basıklık ve çarpıklık değerleri ± 3 aralığında (Shao, 2002) belirlenmiştir. Yapılan

analizlerde yeşil imaj ölçeğine ilişkin elde edilen verilere ait değerlerin 45 derecelik normal Q-Q doğrusuna yakın konumda dağılım gösterdiği, histogram grafiklerinde ise normal dağılım eğrisi ile uyumlu olduğu görülmüştür.

Tablo 2: Ölçek Maddelerine İlişkin Betimsel İstatistikler

Madde No	En Düşük	En Yüksek	Ort.	SS	Çarpıklık	Basıklık
YI1	1.00	5.00	3.81	0.043	-0.692	0.621
YI2	1.00	5.00	3.87	0.046	-0.641	0.305
YI3	1.00	5.00	3.91	0.041	-0.884	1.544
YI4	1.00	5.00	3.72	0.047	-0.702	-0.494
YI5	1.00	5.00	3.91	0.041	-0.757	0.966
YI6	1.00	5.00	4.01	0.039	-0.945	1.804
YI7	1.00	5.00	4.01	0.036	-0.784	1.827
YI8	1.00	5.00	3.85	0.044	-0.701	0.559

Tablo 3'te normal dağılım sergilediği belirlenen verilere ait Kaiser Meyer Olkin (KMO) ve Bartlett değerlerine yer verilmiştir. KMO değeri yüksek (KMO=.913) ve Bartlett değeri anlamlı ($\chi^2=1828.151$, $df=28$, $p=.000$) olarak belirlenmiştir.

Tablo 3: KMO ve Bartlett değerleri

		Yeşil İmaj Ölçeği
Kaiser-Meyer-Olkin Örneklem Yeterliliğinin Ölçüsü	KMO Değeri	.913
	Yaklaşık Ki-Kare	1828.151
Bartlett Küresellik Testi	Serbestlik Derecesi	28
	Anlamlılık Derecesi	.000

Maddelerin anti imaj korelasyon katsayıları ve Pearson Korelasyon katsayılarına ait bulgular Tablo 4'te sunulmuştur. Sonuçta maddelerin anti-imaj korelasyon katsayılarının .950 ile .884 aralığında ($>.50$), maddeler arasındaki korelasyon değerlerinin .760 ile .398 aralığında ve istatistiksel açıdan anlamlı olduğu belirlenmiştir ($p<.01$).

Tablo 4: Ölçek Maddelerine Ait Anti-İmaj Korelasyon Katsayısı ve Ölçek Maddelerinin Kendi Arasındaki Korelasyon Değerleri

Madde Num.	Anti-İmaj Korelasyon Katsayısı	Maddeler Arası Korelasyon Değerleri							
		YI1	YI2	YI3	YI4	YI5	YI6	YI7	YI8
YI1	.935	1							
YI2	.898	.550**	1						
YI3	.903	.425**	.711**	1					
YI4	.950	.411**	.584**	.563**	1				
YI5	.925	.460**	.669**	.645**	.601**	1			
YI6	.895	.493**	.623**	.628**	.519**	.691**	1		
YI7	.884	.472**	.596**	.663**	.529**	.620**	.760**	1	
YI8	.947	.398**	.511**	.472**	.454**	.542**	.575**	.602**	1

** p=0.01 düzeyinde anlamlı.

Açımlayıcı faktör analizi (AFA) neticesinde elde edilen toplam açıklanan varyans Tablo 5'te sunulmuştur. Buna göre toplam varyansı %62.198 oranında açıklayan tek faktörlü bir model elde edilmiştir.

Tablo 5: Toplam Açıklanan Varyans

Faktör	Başlangıç Özdeğerleri			Rotasyon Sonrası Özdeğerler		
	Toplam	Varyans Yüzdesi	Kümülatif Yüzde	Toplam	Varyans Yüzdesi	Kümülatif Yüzde
1	4.976	62.198	62.198	4.976	62.198	62.198
2	.656	8.206	70.403			
3	.624	7.803	78.206			
4	.506	6.329	84.535			
5	.407	5.093	89.628			
6	.366	4.575	94.204			
7	.255	3.191	97.395			
8	.208	2.605	100.000			

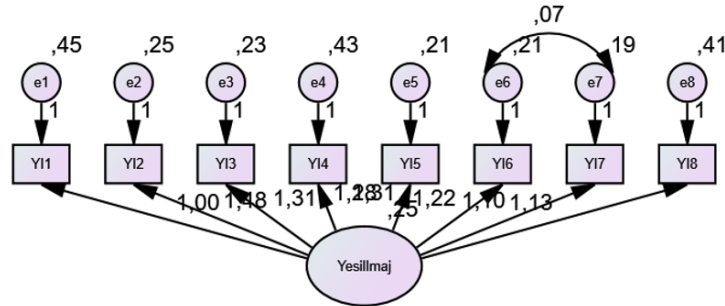
Elde edilen ölçek maddelerine ait faktör varyans değerleri ve maddelere ait yük değerleri Tablo 6'da sunulmuştur. Ölçek maddelerine ait ortak faktör varyans değerleri .718 ve .506 aralığında ($>.50$), en düşük ortak faktör varyans değeri .506 ile YI1 maddesinde, en yüksek ortak faktör varyans değeri .718 ile YI6 maddesinde belirlenmiştir. Ayrıca 8 madde tek faktör altında toplanmış, madde yük değerlerinin kabul edilebilir düzeyde olduğu ($>.40$), madde yük değerinin en

yüksek .847 (YI6), en düşük .653 (YI1) olduğu belirlenmiştir.

Tablo 6: Ölçek Maddelerinin Faktör Varyansları

Madde No	Ortak Faktör Varyans Değeri	Yük Değerleri
YI1	.506	.653
YI2	.700	.837
YI3	.670	.819
YI4	.543	.737
YI5	.700	.836
YI6	.718	.847
YI7	.703	.839
YI8	.515	.718

AFA bulgularına AMOS 21 programı aracılığıyla DFA uygulanması sonrası ulaşılan yapısal modele Şekil 1’de yer verilmiştir. Ölçeğe ait sadece bir uyum iyiliği indeks değeri (AGFI) uyumsuz olduğu için modifikasyon indeksleri incelenmiş ve yüksek kovaryansa sahip iki madde arasında (YI6 ve YI7) kovaryans kurulmuştur. Buna göre RMR=0.020, GFI=0.955, NFI=0.958, IFI=0.968, TLI=0.952, CFI=0.968 ve SRMR=0.030 iyi uyum değerlerinde, $\chi^2/SD=4.095$, AGFI=0.915 ve RFI=0.938 kabul edilebilir aralıklarda bulunmuştur.



Şekil 1: Ölçek Maddelerine İlişkin DFA Yapısal Modeli

Elde edilen yapının bileşik güvenirlik (CR), ortalama açıklanan varyans (AVE) ve cronbach alfa (α) değerleri incelenmiş ve bulgular Tablo 7’de

sunulmuştur. Tek faktöre ait bileşik güvenirlik değerinin ($CR > .70$), ortalama açıklanan varyans değerinin ($AVE > .50$) ve cronbach alfa değerinin ($\alpha > .70$) uygun olduğu görülmüş ve beklenen güvenirlik kriterlerinin sağlandığı anlaşılmıştır.

Tablo 7: Faktör Korelasyon, Cr ve α Değerleri

	Bileşik Güvenirlik (CR)	Ortalama Açıklanan Varyans (AVE)	Cronbach Alfa (α)
Yeşil İmaj	.928	.622	.909

** .01 düzeyinde anlamlı.

Tablo 8’de sunulan bulgulara göre ölçek maddelerinin madde-toplam korelasyon değerleri $r = .778$ ile $r = .567$ aralığında tespit edilmiş ($r > .30$, $p < .01$) ve madde ayırt edicilik indeksi değerlerinin tüm maddeler için alt ve üst %27’lik gruplara göre anlamlı farklılık gösterdiği belirlenmiştir ($p < .01$).

Tablo 8: Düzeltilmiş Madde-Toplam Korelasyonları ve T Testi Bulguları

Madde Numarası	Düzeltilmiş Madde-Toplam Korelasyonu	Maddenin Silinmesi Durumunda Cronbach Alfa Değeri	Alt ve Üst %27’lik Gruplara Ait t-testi Bulguları
YI1	.567	.909	1.200*
YI2	.776	.891	1.685*
YI3	.745	.894	1.476*
YI4	.656	.903	1.514*
YI5	.771	.892	1.504*
YI6	.778	.892	1.352*
YI7	.770	.893	1.209*
YI8	.630	.904	1.314*

* .01 düzeyinde anlamlı.

Yapılan analizler sonucunda elde edilen Türkçe’ye uyarlanmış yeşil imaj ölçeği Tablo 9’da sunulmuştur.

Tablo 9: Türkçe'ye Uyarlanan Yeşil İmaj Ölçeği

Lütfen aşağıdaki maddeleri çalıştığınız firmayla ilgili çevre yönetimi konusundaki görüşlerinizi düşünerek cevaplayınız. Size uygun gelen tek seçeneği işaretleyiniz. (X)		Kesinlikle Katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle Katılmıyorum
1.	Firma çevre yönetimi ile ilgili en iyi kıyas unsuru kabul edilir.	(5)	(4)	(3)	(2)	(1)
2.	Firma çevre yönetimi konusunda profesyoneldir.	(5)	(4)	(3)	(2)	(1)
3.	Firma çevre yönetimi konusunda başarılıdır.	(5)	(4)	(3)	(2)	(1)
4.	Firma çevre yönetimi konusunda tanınan köklü bir şirkettir.	(5)	(4)	(3)	(2)	(1)
5.	Firmanın çevre yönetimi konusundaki itibarı istikrarlıdır.	(5)	(4)	(3)	(2)	(1)
6.	Firma çevre yönetimi konusunda güvenilirirdir.	(5)	(4)	(3)	(2)	(1)
7.	Firma çevre yönetimi konusunda tutarlıdır.	(5)	(4)	(3)	(2)	(1)
8.	Firma çevre yönetimi konusunda müşterileri için endişe duymaktadır.	(5)	(4)	(3)	(2)	(1)

4.2. Hipotez Testlerine İlişkin Bulgular

Araştırmanın bu kısmında, YİKY uygulamalarının yeşil imaj üzerindeki etkisini inceleyebilmek için geliştirilen hipotezin testi yapılmıştır. Bu amaçla Dumont vd. (2017) tarafından geliştirilen ve Erbaşı (2021) tarafından Türkçe'ye uyarlaması yapılan YİKY uygulamaları ölçeğindeki maddelere ait normallik bulguları incelenmiştir. Verilerin çarpıklık ve basıklık değerleri incelendiğinde, maddelere ait çarpıklık değerlerinin -1.373 ile -.674 aralığında, basıklık değerlerinin 2.813 ile -.104 aralığında olduğu belirlenmiştir. Buna göre maddelerin basıklık ve çarpıklık değerleri ± 3 aralığında (Shao, 2002) bulunmuştur. Normal dağılım sergilediği belirlenen verilere ait yüksek KMO (KMO=.892) ve anlamlı Barlett değeri ($\chi^2=1567.658$, $df=15$, $p=.000$) belirlenmiştir. Tek faktörlü desenin toplam varyans açıklama oranı %70.687 olarak tespit edilmiştir.

YİKY uygulamaları ölçeğine ait yakınsak geçerlik ve güvenirlik bulgularına Tablo 10'da yer verilmiştir. Buna göre 6 maddenin tek faktör altında kabul edilebilir yük değerlerine sahip olduğu ($>.40$), tek faktöre ait bileşik güvenirlik değerinin ($CR>.70$), ortalama açıklanan varyans değerinin ($AVE>.50$) ve cronbach alfa değerinin ($\alpha>.70$) uygun olduğu görülmüş ve ölçeğin beklenen güvenirlik kriterlerini sağladığı tespit edilmiştir.

Tablo 10: Yeşil İnsan Kaynakları Yönetimi Uygulamaları Ölçeğinin Yakınsak Geçerliği ve Güvenirliliği

	Maddeler	Yükler	Bileşik Güvenirlilik (CR)	Ortalama Açıklanan Varyans (AVE)	Cronbach Alfa (α)
Yeşil İnsan Kaynakları Yönetimi Uygulamaları	YIKYU1	.716	.86	.50	.912
	YIKYU2	.712			
	YIKYU3	.764			
	YIKYU4	.717			
	YIKYU5	.641			
	YIKYU6	.691			

** .01 düzeyinde anlamlı.

Tek faktör ve 6 maddeli yapının sınanması için yapılan DFA neticesinde, yüksek kovaryans belirlenen iki madde arasında (YIKYU4 ve YIKYU6) kovaryans kurulmuştur. Sonuçta NFI=0.955, IFI=0.960, CFI=0.960 ve SRMR=0.04 iyi uyum değerlerinde, GFI=0.940, RFI=0.916 ve TLI=0.925 kabul edilebilir aralıklarda bulunmuştur. Uyum iyiliği indeks değerleri arasında yalnızca AGFI=0.843 değeri beklenen değerin altında belirlenmiştir.

Araştırmada geliştirilen hipoteze konu olan değişkenler arasındaki yapısal geçerliği görebilmek için faktörler arasındaki korelasyon değerleri incelenmiş ve Pearson korelasyonu bulgularına göre faktörler arasında yüksek düzeyde pozitif korelasyon belirlenmiştir. Faktörler arası korelasyon değerlerine ilişkin bulgular Tablo 11’de sunulmuştur.

Tablo 11: Faktörler Arası Korelasyon Bulguları

	Yeşil İnsan Kaynakları Yönetimi Uygulamaları
Yeşil İmaj	.696**

** .01 düzeyinde anlamlı.

Katılımcı çalışanların YİKY uygulamaları ve yeşil imaj algı düzeylerini belirleyen ortalama değerler Tablo 12’de sunulmuştur. Buna göre katılımcı çalışanların genel olarak yüksek düzeyde YİKY uygulamaları varlığı ($\bar{x}$ =4.0177) ve yüksek düzeyde yeşil imaj ($\bar{x}$ =3.8860) algısına sahip oldukları belirlenmiştir.

Tablo 12: Katılımcıların Yeşil İnsan Kaynakları Yönetimi Uygulamaları ve Yeşil İmaj Algı Düzeyleri

	En Düşük	En Yüksek	Ort.	SS
Yeşil İnsan Kaynakları Yönetimi Uygulamaları	1	5	4.0177	.72192
Yeşil İmaj	1	5	3.8860	.64452

Regresyon modelinin bulgularına geçmeden önce, regresyon varsayım testleri değerlendirilmiştir. Bu aşamada sırasıyla çoklu doğrusallık, hata terimlerinin normalliği, otokorelasyon ve varyans homojenliği değerlendirmeleri yapılmıştır.

İlk olarak, çoklu doğrusal bağlantı sorununun olup olmadığını görebilmek adına doğrusal bağlantı istatistikleri (collinearity statistics) incelenmiştir. Değişkenin bağımsızlık düzeyini ölçen tolerans=1.00 ve bir değişkendeki varyansın diğer değişkenle olan ilişkisi nedeniyle şişkinliğini ölçen varyans şişirme faktörü (VIF)=1.00 olarak belirlenmiştir. Genel olarak, tolerans değeri 0.10'un altına düştüğünde ve VIF değeri 10'un (bazı araştırmalara göre 5'in) üzerine çıktığında çoklu doğrusal bağlantı sorunu olduğu değerlendirilmektedir (Hair vd., 2010). Bağımsız değişkene ait tolerans değeri 0.10'un oldukça üzerinde ve varyans şişirme faktörü 5'in altındadır.

Çoklu doğrusal bağlantı sorunu, ayrıca araştırmada doğrusal bağlantı teşhisleri (collinearity diagnostics) ile de incelenmiştir. Bu kapsamda özdeğer=1.98, koşul indeksi=1.00 ve varyans oranı=0.01 olarak belirlenmiştir. Genel olarak, özdeğerin 0'a yakın olması, koşul indeksi'nin 10'un üzerinde olması ve varyans oranının 0.90'ın üzerinde olması durumunda çoklu doğrusal bağlantı sorunu olduğu değerlendirilmektedir (Hair vd., 2010). Elde edilen sonuçlara göre özdeğerin 0'dan uzak olduğu, koşul indeksinin 10'un çok altında ideal aralıklarda olduğu ve aynı bileşende yer alan değişkenlerin varyans oranının 0.90'ın çok altında olduğu görülmektedir. Bu durum, modeldeki değişkenlerin birbirleriyle yüksek düzeyde ilişki içinde olmadığını ve regresyon katsayılarının güvenilir biçimde tahmin edildiğini göstermektedir. Tüm bu veriler ışığında, beklentilerin yüksek düzeyde karşılandığı ve modelde çoklu doğrusal bağlantı (multicollinearity) sorunu olmadığı değerlendirilmiştir.

Bir başka regresyon varsayım testi olarak, regresyon modeline yönelik hata terimlerinin normalliğine yönelik inceleme yapılmıştır. Hata terimlerinin normalliği; histogram, Normal P-P Plot ve Kolmogorov-Smirnov testi ile incelenmiştir. Histogram çan eğrisi biçiminde olup, P-P grafiğinde noktaların diyagonal çizgiye yakın olduğu görülmüştür. Kolmogorov-Smirnov testi sonucu

$p=0.16$ (>0.05), hata terimlerinin normal dağıldığını göstermektedir.

Ayrıca hata terimleri arasındaki otokorelasyonun incelenmesi amacıyla Durbin-Watson testi bulguları da incelenmiştir. Elde edilen 1.87 değeri, kritik eşik olan 1.5-2.5 aralığında yer almakta olup, modelde otokorelasyon bulunmadığını (veya çok zayıf ve önemsiz düzeyde olduğunu) göstermektedir. Sonuçta pozitif veya negatif otokorelasyon riski bulunmamakta olup regresyon modelinin bağımsızlık varsayımını sağladığı desteklenmiştir.

Regresyon modelinin varyans homojenliği varsayımı ise, Dağılım Grafiği (Scatterplot) ile incelenmiştir. Noktaların yatay eksen boyunca rastgele dağılması, hata terimlerinin sabit varyansa sahip olduğunu (homoscedasticity) göstermektedir. Dolayısıyla varyans homojenliği varsayımının sağlandığı değerlendirilmiştir. Sonuçta, regresyon katsayılarının istikrarlı ve güvenilir şekilde tahmin edilebildiği desteklenmiştir.

Regresyon varsayım testlerine yönelik bulgular incelendikten sonra, örgütlerdeki YİKY uygulamalarının, çalışanların yeşil imaj algısı üzerindeki etkisini incelemek için basit doğrusal regresyon analizi yapılmıştır (Tablo 13). Yordanan değişken olan yeşil imaj ile yordayıcı değişken olan YİKY uygulamaları arasındaki korelasyon katsayısı incelendiğinde değişkenler arasında yüksek düzeyde olumlu ilişki ($r=0.696$) olduğu ve YİKY uygulamalarının, yeşil imajın önemli bir yordayıcısı olduğu belirlenmiştir ($R=0.696$, $R^2=0.484$, $p=.000$). Sonuçta YİKY uygulamaları, yeşil imaja ait varyansın %48.4'ünü açıklamaktadır.

Tablo 13: Yeşil İnsan Kaynakları Yönetimi Uygulamalarının Yeşil İmaj Üzerindeki Etkisine Ait Regresyon Analizi

Yordayıcı Değişken	B	Sh	β	t	p	r	r ²
Sabit	1.391	.134		10.396	.000	.696	.484
Yeşil İnsan Kaynakları Yönetimi Uygulamaları	.621	.033	.696	18.953	.000		
R=.696	R ² =.484	F _(1,383) =359.218			p=.000		

5. SONUÇ VE TARTIŞMA

Bu çalışmada, Chen (2008) tarafından geliştirilen yeşil imaj ölçeği Türkçe'ye uyarlanmış ve YİKY uygulamalarının yeşil imaja etkisi irdelenmiştir. İki aşamalı yürütülen araştırmanın ilk aşamasında geçerli ve güvenilir bir yeşil imaj ölçeği elde etme gayreti yer almaktadır. Yeşil imaj kavramı ile ilgili yerli

alan yazında çok kısıtlı sayıda araştırma olmakla birlikte nicel araştırma türünde desenlenen çok az sayıda araştırma (Çavuşoğlu, 2021; Ecevit, 2018) bulunmaktadır. Bu araştırmaların birinde (Ecevit, 2018), Chen vd. (2017) tarafından geliştirilen yeşil marka imajı ölçeği, diğerinde ise (Çavuşoğlu, 2021), Chen (2010) tarafından geliştirilen yeşil marka imajı ölçeği kullanılmıştır. Türkçe alan yazında yeşil imaj kavramına yönelik geliştirilmiş bir ölçeği kullanan başka bir araştırmaya rastlanmamıştır. Kullanılan her iki ölçek de firmaların markalarına odaklanmış ölçeklerdir. Sonuçta araştırmalar, yeşil imajı ölçmeye yönelik Türk iş örgütleri için geçerli ve güvenilir olduğu istatistiksel olarak kanıtlanmış bir ölçek ihtiyacını karşılayamamıştır. Firma markalarından bağımsız olarak ortaya konulmuş bir yeşil imaj ölçeği geliştirme arayışına girilmiş, Chen (2008) tarafından geliştirilen ölçeğe ulaşılmca bu ölçeğin Türkçe'ye uyarlanmasına karar verilmiştir. Sonuçta 8 maddeden oluşan tek boyutlu geçerli ve güvenilir bir yeşil imaj ölçeğine (Tablo 9) ulaşılmıştır.

Araştırmanın ikinci aşamasında YİKY uygulamalarının yeşil imaj üzerindeki etkisini incelemeye odaklanılmıştır. Elde edilen basit doğrusal regresyon analizi bulguları, YİKY uygulamalarının yeşil imaj üzerinde istatistiksel açıdan anlamlı ve pozitif etkisi olduğu yönündedir. Buna göre çalışanların zihninde örgüt ile ilgili oluşan yeşil imaj algısı, %48.4 oranında YİKY uygulamalarından etkilenmektedir. Sonuçta araştırma kapsamında oluşturulan H_1 (Örgütteki YİKY uygulamaları, çalışanların yeşil imaj algısını pozitif yönde etkiler) hipotezi kabul edilmiştir. Araştırmada Sosyal Kimlik Teorisi ve yeşil işletme alanyazınından esinlenerek oluşturulan örgütte YİKY uygulamalarının varlığının, çalışanların örgüt ile ilgili yeşil imaj algıları üzerinde etkili olabileceği varsayımını doğrulanmıştır. Örgütlerde YİKY uygulamalarına yönelim arttıkça çalışanların örgüte ilişkin yeşil imaj algısında önemli düzeyde artış meydana gelmektedir. Sonuçlar, çalışanların örgütleri hakkındaki olumlu yeşil imaj algıları için YİKY'nin önemini ortaya koymuştur.

Araştırmada elde edilen YİKY uygulamalarının, çalışanların yeşil imaj algısı üzerindeki yüksek düzeyli ve olumlu etkisine yönelik bulgu; YİKY stratejilerinin, örgütlerin çevreye duyarlı olduğuna yönelik algılanmasında güçlü bir rol oynadığını göstermektedir. Elde edilen katsayının büyüklüğü, yalnızca istatistiksel değil aynı zamanda pratik olarak da anlamlı bir ilişkiye işaret etmektedir. Bu bulgu, çalışanların çevre dostu uygulamaları sadece işlevsel bir süreç olarak algılamadıklarını, aynı zamanda örgütsel imajın ayrılmaz bir parçası olarak değerlendirdiklerini ortaya koymaktadır.

Araştırmanın, yeşil imaj ile ilgili bir ölçeği Türkçe'ye uyarlayarak alanyazına kazandırması ve YİKY uygulamalarının yeşil imaj üzerindeki etkisini ortaya koyması bakımından alan yazına katkı sağladığı düşünülmektedir. Türk

işletme alanyazınında yeşil kavramının daha fazla yer edinmesi için çalışmaların sadece akademik düzeyde değil aynı zamanda iş dünyasında da desteklenmesi gerekmektedir. Yeşil uygulamaların işletme performansı üzerindeki etkilerini gösteren başarı hikayeleri ve somut veriler, işletme sahipleri ve yöneticileri için bu konunun önemini vurgulamada yardımcı olabilir. Bu bağlamda yeşil kavramının Türk iş örgütleri için daha güvenilir şekilde kullanımına yönelik uluslararası alanyazından uyarlanmış ve yerelleştirilmiş çalışmalar ile ölçüm araçlarının geliştirilmesi ve kavram üzerinde etkili olan değişkenlerin tespit edilmesine yönelik arayışlara girilmesi alan yazın açısından önemli adımlardır.

Araştırmanın birtakım sınırlılıkları bulunmaktadır. Araştırma bulguları, Karaman ilinde bulunan ve gıda ürünleri imalatı sektöründe faaliyet gösteren firmalarda kolayda örnekleme yöntemi kullanılarak ulaşılabilen 385 çalışandan elde edilen verilerle ortaya konulmuştur. Araştırma sonuçlarının genellenebilirliği, araştırmada tanımlanan evren ile sınırlıdır. Farklı sektörlerde ve farklı şehirlerde yapılacak uygulamalar, bu araştırmanın bulgularıyla karşılaştırma imkânı oluşturabilir. Ayrıca yapılan nicel araştırma, sonraki araştırmalarda yapılacak nitel araştırma veya karma araştırma yöntemleriyle zenginleştirilebilir.

Araştırma sonucunda yeşil imaj ölçeği Türkçe'ye uyarlanmıştır. Türkçe'ye uyarlanarak kazandırılan ölçeğin, yeşil imaj kavramı üzerine yapılacak çalışmalara katkı sağlayacağı umulmaktadır. Buna yönelik olarak uyarlanan ölçeğin, sonraki araştırmalarda farklı sektörlerde uygulamalara konu yapılması ya da farklı değişkenlerle arasındaki ilişkilerin incelenmesi mümkündür.

Bununla birlikte, örgütteki YİKY uygulamalarının çalışanların yeşil imaj algısı üzerindeki etkisine yönelik elde edilen pozitif yönlü ve yüksek etki büyüklüğü, yalnızca YİKY uygulamalarıyla açıklanamayabilir. Örneğin, çalışanların YİKY uygulamalarını nasıl yorumladığı, yalnızca uygulamaların varlığına değil aynı zamanda örgüte olan güvenlerine de bağlı olabilir. Bu bağlamda çalışanların örgüte duyduğu genel güven, çalışanların örgütsel adalet algısı, örgütsel vatandaşlık davranışları, örgütsel bağlılık düzeyleri, algılanan örgütsel etik ya da yöneticilerin çevre yönelimli liderlik davranışları gibi değişkenler bu ilişkiyi aracılık ya da ilişkiyi güçlendirme yoluyla etkiliyor olabilir. Bu nedenle, ileriki araştırmalarda araya giren değişkenler (örneğin örgütsel güven, örgütsel adalet, örgütsel vatandaşlık davranışı, örgütsel bağlılık, örgütsel etik, yöneticilerin çevre yönelimli liderlik davranışları) incelenerek modelin daha kapsamlı hale getirilmesi önerilmektedir.

6. ÇIKAR ÇATIŞMASI BEYANI

Yazarlar arasında çıkar çatışması bulunmamaktadır.

7. MADDİ DESTEK

Bu çalışmada herhangi bir fon veya destekten yararlanılmamıştır.

8. YAZAR KATKILARI

ŞD, AE: Fikir;

ŞD, AE: Tasarım;

ŞD, AE: Denetleme;

ŞD, AE: Kaynakların toplanması ve/veya düzenlenmesi;

ŞD, AE: Analiz ve/veya yorum;

ŞD, AE: Literatür taraması;

ŞD, AE: Yazıyı yazan;

ŞD, AE: Eleştirel inceleme

9. ETİK KURUL BEYANI VE FİKRİ MÜLKİYET TELİF HAKLARI

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EUROPEAN UNION AND GLOBAL EXPERIENCES IN COMBATING DISINFORMATION: A COMPARATIVE ANALYSIS¹



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ABSTRACT | This study aims to draw attention to the danger of disinformation, which has become a global risk. The main claim of the study is that increasing disinformation forms a global tendency toward regulating social media and digital platforms. Methodologically, a hybrid method was preferred in the study. While addressing disinformation initiatives, the case study method was used, and while presenting strategies to combat disinformation in and among countries, comparative analysis was employed. In the study, findings and conclusions were reached that there is a relationship of direct proportionality between the growth and diversification of social media and digital platforms and the increase in disinformation, and that a general tendency has emerged worldwide toward regulating social media and digital platforms. It is anticipated that the study will contribute to the literature in terms of examining disinformation, which has become a current and global problem, from its international dimensions.

Keywords: *European Union, disinformation, combating disinformation*

JEL Codes: *F55, K10, K33*

Scope *Public Administration*

Type: *Research*

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¹ Compliance with the ethical rules of the relevant study has been declared.

DEZENFORMASYONLA MÜCADELEDE AVRUPA BİRLİĞİ VE KÜRESEL DENEYİMLER: KARŞILAŞTIRMALI BİR ANALİZ



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ÖZ Bu çalışma global bir risk halini alan dezenformasyon tehlikesine dikkat çekmeyi amaçlamaktadır. Çalışmanın temel iddiası, artan dezenformasyon vakalarına bağlı olarak günümüzde sosyal medya ve dijital platformların regüle edilmesi yönünde küresel bir eğilim olduğu şeklindedir. Yöntemsel olarak çalışmada hibrit bir yöntem tercih edilmiştir. Dezenformasyon girişimleri ele alınırken vaka analizi (örnek olay) yönteminden, dezenformasyonla mücadele stratejilerini ülkeler nezdinde ve arasında ortaya koyarken karşılaştırmalı analizden yararlanılmıştır. Çalışmada teknolojik gelişmeler ve dezenformasyon artışı arasında doğru orantılı bir ilişki olduğu, dünyada sosyal medya ve dijital platformları regüle etme eğiliminin belirlediği, dezenformasyonla mücadelede stratejisinde bastırıcı mücadeleden önleyici mücadeleye doğru bir dönüşüm yaşadığı şeklindeki bulgu ve sonuçlara ulaşılmıştır. Dezenformasyon konusunun güncel olması, küresel bir sorun olarak belirmesi ve ayrıca uluslararası boyutlarıyla ele alınması gibi nedenlerle çalışmanın literatüre katkı sağlaması öngörülmektedir.

Anahtar Kelimeler: Avrupa Birliği, dezenformasyon, dezenformasyonla mücadele

JEL Kodları: F55, K10, K33

Alan: Siyaset Bilimi ve Kamu Yönetimi
Türü: Araştırma

1. INTRODUCTION

Disinformation is defined as false information that is deliberately and usually covertly disseminated to influence people, societies, governments or to conceal the truth (MerriamWebster, 2024). Disinformation, which brings about social, economic or political crises by distorting accurate information for various purposes, has shown a significant upward trend in recent years. The development and proliferation of technology has undoubtedly played a significant role in this upward trend.

Today, technology has gained an important place in the daily lives of individuals, societies and states. For people, technology provides convenience and speed, participation in public services and decisions, entertainment and hobbies. Technology facilitates social access to information, raises awareness and consciousness, and offers important opportunities and possibilities for economic and cultural development. For governments, technology contributes to important and vital administrative practices such as increased efficiency, transparency, accountability, security, rapid decision-making, closer communication and faster interaction with citizens. Although technology offers such multifaceted benefits, it can also lead to serious problems such as disinformation.

The most important reason for this is that, thanks to technology, disinformation can exist all over the world very quickly, regardless of time and place, and can put countries in serious difficulties. Especially with the proliferation of digital platforms and social media, it has become easier to spread disinformation, that is, information that has been deliberately manipulated for various purposes. Disinformation, which is backed by the benefits of technology, causes distortion of accurate information, individuals to make wrong decisions, social insecurity, disruption of public functioning and damage to democracies. Many countries that foresee the danger of disinformation have implemented significant legal and institutional regulations against it.

In recent years, the European Union (EU) has been an important link in this struggle. In order to reduce the effects of disinformation and to develop effective policies against this problem, the EU has developed various strategies, legal and institutional arrangements. Having outlined the general framework of its policies, the EU has left the individual regulations to the member states. In this direction, many EU members, particularly Germany and France, have taken measures against disinformation in recent years. In addition, many countries around the world, such as the UK, Russia, India, Australia and Brazil have implemented public policies to combat disinformation.

The main claim of the study is that the EU's anti-disinformation policies focus on the regulation of digital platforms and ecosystems while striking a

balance between freedom of expression and censorship. The most important conclusion from this study is that the EU's anti-disinformation policies aim to make social media platforms and other actors in the digital ecosystem more responsible. It was also found that the EU strikes a delicate balance in protecting democratic values while trying to prevent disinformation.

This article focuses on disinformation, which has recently gained an international dimension and has occupied the agenda of countries in this respect. The aim of the study is to clarify the problem of disinformation and the fight against disinformation through global experiences and also to raise awareness against this problem. In this context, the policies and strategies implemented by the European Union in the fight against disinformation are examined first, and then the countries that are engaged in the fight against disinformation independently within the member states of the union are discussed. Finally, a comparative analysis of the policies of the EU and other countries of the world in the fight against disinformation has been made in order to address the issue in a broader context. The comparative analysis reveals the similarities and differences between the anti-disinformation policies adopted in different geographies, while also revealing which are the most effective practices and strategies that can be implemented on a global scale in the fight against disinformation.

2. CONCEPT, FEATURES AND HISTORY

When we look at the etymology of the concept of disinformation, it is seen that it is the result of the combination of the Latin word "informem" (nominative informatio) (basic knowledge, concept, idea) with the prefix "-dis" meaning "negativity" or "contrast" (etymonline, 2024). With this combination, the concept started to be used in the sense of false information that is deliberately spread in order to mislead people or hide the truth (MerriamWebster, 2024). Disinformation refers to "misinformation (information) that intentionally aims to mislead the target audience" (Kırık & Tanrıverdi Yılmaz, 2018, p. 121). In other words, disinformation is the process of deliberately spreading false information and using it as a manipulation tool (Rid, 2020).

In the past, the concept of propaganda was preferred over the concept of disinformation. Propaganda has a deep-rooted historical background going back to Ancient Greece. In Ancient Greece, literature, poetry, theater, oratory, sculpture, architecture, legends and folk festivals were used as a form of propaganda (Taylor, 2003, p. 26). The propaganda was mostly about increasing loyalty to the existing regimes and sanctifying them. During the Roman Empire, on the other hand, propaganda was mostly used as a tool for wars and establishing superiority over other societies. Coins, literary works, monuments, monuments,

figures, sculptures and military qualities functioned as a kind of propaganda tool to spread the image of the emperor and the strong army (Hekster, 2007, p. 354). In this respect, propaganda has been used as a method of achieving certain results that cannot be achieved through pure military force, and as a means of gaining the internal loyalty and loyalty of other communities. In the Middle Ages, religious propaganda was used to gain support for the Crusades. Religious sermons, the Pope's letters inviting Christian geographies to war, and the calls of clergymen were used as important propaganda tools in this period, especially in wars for holy lands (Portnykh, 2019, p. 475). The first examples of modern propaganda techniques were put forward during the Napoleonic era. The views and opinions of the French people were systematically manipulated through newspapers, pamphlets, cartoons, plays, theaters, songs and public monuments, and such propaganda was used as a means of loyalty and commitment in the process of nation-state building and the formation of national identity (Forrest, 2004).

Propaganda made its most important breakthrough in the 20th century and showed its most memorable uses during the Cold War. During the two world wars and the social, political and economic rivalry of the bipolar world that lasted for nearly a century, propaganda had a worldwide impact. Therefore, propaganda has been one of the most important weapons in the arsenal of some countries (and especially superpowers such as the USA, Germany, the UK, the Soviet Union) in their social, political and economic wars throughout the 20th century. In other words, since the early days of the bipolar world, both poles have effectively used propaganda as a tool of unarmed warfare.

While propaganda was a more popular concept during the Cold War, today we see that disinformation has become a more widespread and popular concept. Although these two concepts are similar, there are some fundamental differences between them. Propaganda refers to the manipulation of the emotions and thoughts of the target audience in order to spread an ideology, and in this respect, it is a concept with a more political content and ideological aspect (Huang, 2015, p. 420). In other words, propaganda refers to a strategy used in a manipulative way to adopt a particular political view or a method used by two hostile countries to wear each other down. Propaganda and disinformation are similar in the sense that they distort information and do so for a specific purpose. However, propaganda differs from each other in that it has a more political orientation and disinformation has a broader purpose and use. Propaganda can take place within a public activity, in this respect it needs an ideology and a connection with a political power (Ellul, 1967, p. 1), but disinformation does not

need these and similar elements. Because disinformation can be used as a more independent and broader manipulation tool.

As mentioned earlier, the concept of disinformation is more widely used in today's digital age. In the digital age, disinformation has gained a new dimension in terms of speed, reach and scale through platforms such as the internet and social media, and such platforms have become ideal tools for spreading disinformation. In other words, disinformation has systematically proliferated, especially due to advances in technology and the proliferation of modern communication tools. Accordingly, disinformation has acquired many characteristics today.

Some of the characteristics of disinformation, which has become an extremely complex phenomenon, can be given as follows: It is deliberate, it distorts facts and accurate information, it is not accidental, it targets emotions, it is carried out for a specific purpose, it is based on anonymous and misleading sources, it occurs in a wide variety of types (visual, audio, etc.) and channels (X, Instagram, Snapchat, etc.). As can be seen, disinformation spreads rapidly through digital platforms, increasing its capacity to reach target audiences and making it a global problem. This has turned disinformation into a global problem that can affect not only individuals but also societies and even states.

3. METHOD AND FINDINGS

A hybrid method was preferred in the study. The case analysis (case study) method was used in addressing disinformation initiatives, and comparative analysis was used in presenting counter-disinformation strategies within and between countries. Case study, being a research methodology generally seen in the social sciences, is a method that enables putting forth generalizations and systematic analyses on one or several units, society, group, country, or events (Heale & Twycross, 2018, p. 1). The following steps are generally followed in case study methodology (Cassell & Symon, 2004, p. 323; Yin, 2017, pp. 14-15).

Planning stage: is the stage in which it is determined and planned which case will be handled (it can be a single case or more than one case, it can be similar, it can be a group).

Research design: is the stage where the road map to be followed in case analysis is drawn. Which data will be used, which data will be collected, which method will be used, what will be mentioned in the analysis are determined at this stage.

Preparatory phase: is the phase in which the researcher makes all the necessary preparations before starting the case analysis and determines in

advance which questions will shape the study (basic question sentences such as why, why, how, which?).

Data collection: is the stage where data is collected within the scope of the case study. Data can be obtained from legislation, official documents, archival records, surveys, literature, reports and statistics.

Analysis: is the stage where the collected data is subjected to analysis. The data collected must first of all be reliable and able to answer the research questions. In data analysis; descriptive analysis: Detailed description of the case (Kemp, Hort, & Hollowood, 2018), thematic analysis: Analyzing the data into specific thematic categories (Sovacool, Iskandarova, & Hall, 2023, p. 3), comparative analysis: The comparative analysis of multiple cases, objects, characteristics, methods, etc. (Porta & Keating, 2008, p. 202), causal analysis: Analyzing the cause-and-effect relationship between cases (Marini & Singer, 1988, pp. 349-351).

Sharing the results: This is the final stage of case analysis, where the findings and results of the research are compiled and systematized.

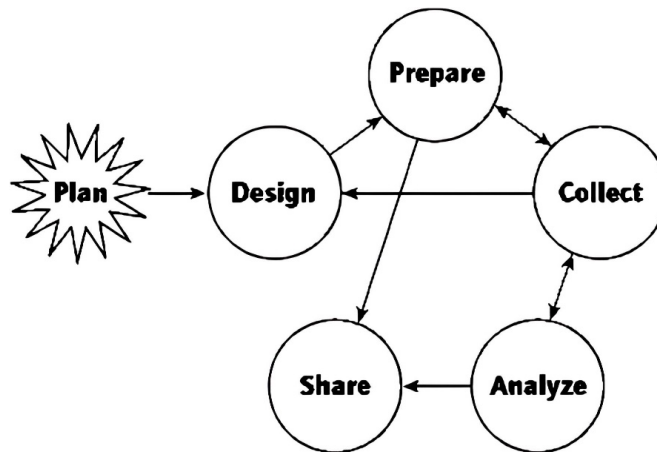


Figure 1: Case Study

Source: (Yin, 2017, p. 2)

This study has many objectives such as drawing attention to disinformation, which has become a global problem and the importance of combating disinformation, revealing new strategies in combating disinformation at the international level, analyzing global experiences with current disinformation

cases and finally raising awareness against disinformation. The study is expected to contribute to the literature by revealing the development of the disinformation phenomenon, its trends and mechanisms of struggle through comparative country examples.

Some of the findings and conclusions from the study are as follows:

- There is a direct proportional relationship between the digital transformation realized through technological advances and the increase in disinformation.
- Due to the increase in disinformation, both in the European Union and other countries, many legal and institutional regulations have been implemented in recent years.
- Disinformation mostly occurs on social media and digital platforms.
- Due to increasing disinformation attempts, there has been a tendency both in the European Union and in other countries around the world to regulate social media and digital platforms and also to impose various responsibilities on them.
- It is understood that the European Union's strategy in combating disinformation is preventive (taking measures to prevent disinformation from occurring) rather than suppressive (taking steps to address disinformation after it has occurred).

4. GLOBAL IMPACTS OF DISINFORMATION: AN ANALYSIS THROUGH CASE STUDIES

Under this heading, how disinformation affects countries at the global level is revealed through current cases. First, the disinformation strategies of the European Union are discussed, and then Germany and France, which make separate regulations within the member states, are discussed in this context. Then, countries that are not members of the European Union, such as the UK, Australia, India and Russia, which have been subjected to a lot of disinformation and have implemented important regulations in recent years, are discussed. In order to understand countries' efforts to combat disinformation, it is first necessary to clarify the dangers posed by disinformation and its impacts on countries. In this context, the effects of disinformation on countries can be broadly outlined as follows:

- **Impacts on Democratic Functioning and Processes**

Elections are of vital importance for societies to make healthy political choices. Disinformation can directly affect election results by directing voter behavior, especially during election periods. In such important periods, spreading

misleading information through fake accounts, creating public perception about candidates and thus influencing voter behavior are among the important disinformation attempts encountered recently (Barojan, 2021, pp. 63-64). In addition, disinformation has the potential to threaten electoral security and bring about social and ideological polarization.

Case Example: A study analyzed the dynamics of fake news on Twitter (X) during the presidential elections held in the US in 2016. Accordingly, 30 million tweets from 2.2 million users were analyzed over a 5-month period during the election process and it was found that 25% of them spread fake or extremely biased news (Bovet & Makse, 2019, p. 1). During these elections, it also came to the fore that Russia had purchased political advertisements to manipulate the US elections.

- **Negatively Impacts Public Health**

During crisis periods with national and international dimensions, such as pandemics, disinformation has caused the spread of anti-vaccination sentiments or fake treatment methods through false and misleading information, leading to weaknesses in the fight against the pandemic and an increase in the number of casualties.

Case Example: A 2023 study strikingly demonstrated the negative effects of disinformation on public health. At the beginning of the pandemic, during a period when no medical product had been developed for the treatment of the disease, it was observed that chlorine dioxide — a bleaching agent used for textiles or paper, which also has disinfectant properties — began to appear on social media platforms as a "miraculous cure." In this study, the spread of information about chlorine dioxide on Twitter (X) from December 1, 2019, to November 30, 2021, was analyzed using a graph network, and the results showed that messages promoting misinformation spread more widely compared to those based on more reliable information (Sauvayre, 2023, pp. 1-2).

- **Leads to the weakening of social trust and stability**

Disinformation especially affects public administration, public administrators, and politicians significantly. Disinformation affects public administration, public administrators and politicians very much. A possible disinformation attempt against the public administration can undermine trust in the government, official authorities, institutions and official data, and can also lead to social conflicts.

Case Example: In 2017, systematic hate speech on social media accounts led to massive social violence in Myanmar. In a study, social media posts between 2012 and 2017 were analyzed and it was found that a lot of disinformative content was shared between these dates, resulting in the rise of large social organizations,

racist discourse and ultra-nationalist tendencies (Schissler, 2024). Following these developments, the government intervened in the Myanmar region and approximately 1 million Muslims from Rakhine were forced to migrate.

- **Causes economic damage**

Disinformation has the potential to open the door to very important problems at the macro and micro levels. At the macro level, disinformation can mislead the economic forecasts of governments, disrupt market functioning and economic stability, and open the door to manipulative attacks through misleading and false financial information. At the micro level, it can affect the future strategies and expectations of companies, causing them to make wrong decisions, adversely affecting their credibility, causing firm losses, and causing investors to withdraw from the economy. In other words, disinformation can negatively affect businesses on a global scale, reduce sales, disrupt supply chains and operations, damage customer confidence and lead to reputational losses that are difficult to repair (Baltezarevic, 2024, p. 460). Especially in recent years, it has been determined that major manipulations have been made on stocks with false financial information spread by financial bots that have proliferated on social media (Petratos, 2021, pp. 765-766).

Case Example: In September 2008, an old article about the 2002 bankruptcy of the parent company of United Airlines was reposted on social media and many people had the false perception that the company had filed for a new bankruptcy. This caused a 76% drop in the company's shares within a few minutes and NASDAQ halted all trading, but even though the news turned out to be disinformation, the company closed the day 11.2% below its previous closing value (Carvalho, Klagge, & Moench, 2011).

- **Threatens national security and negatively affects international image**

Disinformation has both national and international effects. At the national level, disinformation is carried out with the aim of disrupting the social cohesion and dialogue of countries, exploiting social weaknesses, spreading conspiracy theories at the social level and enabling the spread of ideas that are not supported by facts (Sarts, 2021, pp. 23-25). Disinformation at the international level is often carried out by foreign states or non-state actors to deliberately spread false or unbalanced information in the target country and to create confusion in that country (Gerrits, 2018, p. 6). Therefore, disinformation attempts can cause internal unrest in the target country, open the door to social conflicts by manipulating the perception of different segments in that country, and negatively affect the international image by increasing conflicts between countries (Sohn, Edwards, & Petersen, 2024).

Case Example: In May 2017, there were many posts on social media through fake accounts and bots claiming that Qatar was covertly supporting Iran and also providing support to illegal armed organizations. The flow of negative information and disinformation against Qatar soon took its toll and in June 2017, some countries such as the United Arab Emirates (UAE), Bahrain, and Egypt, led by Saudi Arabia, decided to cut diplomatic relations with Qatar and imposed a blockade against it, resulting in the Gulf Crisis (Jones, 2019, pp. 1389-1390).

- **Damages the knowledge ecosystem**

The information ecosystem refers to the processes of producing, storing, disseminating, receiving and using information. The spread and proliferation of fake news causes the information ecosystem to erode over time. This situation makes it difficult for the public to access accurate information and leads to social conflicts (Wardle, 2024, pp. 334-335).

Example Case: During the Covid-19 pandemic, many unscientific WhatsApp and social media channels were identified about homemade medicines and traditional treatment methods for the treatment of coronavirus as an alternative to the scientific information provided by the official authorities (Kanozia, Kaur, & Arya, 2021). These disinformation channels disrupted the information ecosystem created by the official authorities and caused many problems in the fight against the pandemic.

4.1. The European Union in combating disinformation

The European Union (EU) has adopted various regulations to establish a set of standards and measures for member states to combat disinformation. The main purpose of these regulations is to ensure that member states become more resilient against disinformation. The European Union's first attempts to combat disinformation date back to 2015. In 2015, the European Council called for an action plan to counter disinformation campaigns coming from Russia, in cooperation with the Union's Member States and institutions. Two years later, in 2017, the European Commission established a High-Level Expert Group (HLEG) to advise on countering disinformation (Jerónimo & Sanchez Esparza, 2022, pp. 3-4).

The European Union took the next step in combating disinformation on 26.04.2018 with a communiqué entitled "Combating Online Disinformation: A European Approach" on 26.04.2018. The Communication is the result of extensive consultations with citizens and stakeholders by the European Commission, the executive body of the Union and the designer and coordinator of key policies. The Communication outlines the importance of combating disinformation, ways and means, measures to counter it and finally some

recommendations. The Communication argues that the European Union is based on democracy, free and independent media and freedom of opinion, but that disinformation undermines democratic processes, undermines trust in institutions and the media, and empowers radical and extremist ideas and activities.

Some remarkable details in the report are as follows (European Commission, 2018a, p. 6):

- Public awareness of disinformation needs to be raised.
- The spread of disinformation distorts public opinion and influences policy-making processes.
- Disinformation also often promotes radical and extremist ideas and activities.
- Disinformation can reduce trust in science and empirical evidence.
- Disinformation erodes trust in institutions, digital and traditional media and undermines democracies by preventing citizens from making informed decisions.
- There is no single best way to combat disinformation. Therefore, there should be no expectation that a single solution can address all disinformation challenges. At the same time, inaction is not an option.
- Areas such as climate change, migration, public safety, health and finance are among the critical issues that generate the most disinformation.

In response to these negative effects of disinformation, strategies to combat disinformation have also been proposed. Accordingly, some of these strategies include the creation of digital ecosystems based on transparency and prioritizing high-quality information, enhancing cooperation in all areas, empowering citizens against disinformation, and protecting democracies and policy-making processes.

Another important step taken by the European Commission to combat disinformation is the 'Action Plan against Disinformation' of 05.12.2018. The plan emphasized that disinformation poses a major challenge for European democracies and societies, undermines citizens' trust in democracy and institutions, causes polarization in public opinion, and sabotages democratic decision-making processes, and therefore must be tackled while remaining true to the values of the European Union (European Commission, 2018b, pp. 11-12).

This action plan envisages inter-country coordination and cooperation against disinformation. Accordingly: a) Improving the ability of Union institutions to detect, analyze and expose disinformation, b) Coordinating and strengthening joint responses to disinformation, c) Mobilizing the private sector to combat disinformation, d) Raising awareness and building public resilience...

are among the action plan's strategies to combat disinformation (European Commission, 2018b, p. 5). It is also envisaged that these strategies will be strengthened by other steps such as education and media literacy, supporting fact-checkers, researchers and civil society.

In the following period, the European Union introduced two more important regulations against disinformation. The first of these is the Disinformation Code of Practice dated June 16, 2022, and the other is the EU Digital Services Act, which entered into force on August 25, 2023. The Disinformation Code of Practice establishes self-regulatory standards for online platforms in the fight against disinformation. Accordingly, these platforms should prevent the spread of disinformation, guarantee the transparency of political advertisements, cooperate with fact-checkers, establish cross-platform cooperation on disinformative behaviors and practices, and facilitate researchers' access to data, cutting off disinformation disseminators' revenues from platforms, listing the tactics, techniques and procedures frequently used by disinformation actors, periodically updating this list, setting clear policies against them, and platforms empowering and informing researchers and users... such as the European Commission (European Commission, 2022).

Enacted in 2023, the EU Digital Services Act is one of the most comprehensive steps taken by the European Union to combat disinformation. It regulates a wide range of online intermediaries, content providers and platforms such as digital marketplaces, social networks, content sharing platforms, app stores and imposes obligations on them according to their level and size (Turillazzia, Taddeo, Floridi, & Casolaria, 2023). The aim of the law is to ensure the security, fundamental rights and freedoms of users, to prevent disinformation and the spread of illegal and harmful activities online, as well as to ensure a transparent online platform environment (European Commission, 2023). The law covers a wide range of large, medium and small platforms, including Amazon Store, Booking, Apple Store, Aliexpress, Google Play, Google Maps, YouTube, Facebook, X (Twitter), Instagram, Bing, Pinterest, TikTok... to name a few. The law aims to prevent both individual (e.g. violations of personal rights) and public harms (e.g. election processes).

This regulation imposes an obligation on digital platforms to monitor and remove illegal content, to share more data with researchers and auditors, to request less personal data, and to be more careful when sharing topics, content and posts related to sexual orientation, religious beliefs, race, migrants, children and young people.

Finally, the European Union has approved the Digital Markets Law, which supports and complements the Digital Services Law, to gradually enter into

force. This law was enacted to regulate and supervise digital companies, which have proliferated and diversified over time, to ensure their functioning in a certain order, to enable them to continue their existence under equal competitive conditions with each other, to impose various rights and obligations on them, and to create a fair, effective and transparent digital sector.

Considering all these legal regulations, the following conclusions can be drawn:

- With these legal regulations, the European Union Digital platforms do not have unlimited sovereignty and freedom, and disinformation is one of the biggest problems of the digital age.
- At the core of these legal regulations is the idea of preventing the negative impact on personal rights and public functioning, and regulating and controlling social media and digital platforms.
- With the regulations of the European Union, the strategy to combat disinformation has undergone a significant transformation. There has been a transformation from a reactive to a proactive strategy. Accordingly, instead of combating disinformation after it occurs, an understanding that envisages taking measures against disinformation before it occurs has been adopted.
- The European Union has emphasized freedom of expression in its regulations.
- The European Union has implemented regulations that impose responsibility on platforms that mediate disinformation as well as those that spread it. In this responsibility, which we can call "intermediary responsibility", digital platforms have important obligations in issues such as the detection, monitoring and control of the source of disinformation.
- When the regulations of the European Union are examined, it is seen that administrative sanctions such as fines rather than prison sentences come to the fore.

The European Union has set a general framework for combating disinformation and tried to establish a standard in this regard. Apart from these regulations, member states have also independently enacted disinformation laws and thus tried to adapt their domestic laws to the fight against disinformation. In the following sections, various legal regulations enacted by both EU and non-EU member states to combat disinformation are discussed.

- **Germany**

In recent years, as in the rest of the world, a number of significant regulations have been implemented in Germany as a result of the intense disinformation environment surrounding important issues such as migrants and political

elections. In Germany, the fight against disinformation generally proceeds along two lines. On the one hand, the active participation of civil society organizations in the process and raising public awareness on this issue, and on the other hand, the implementation of legal regulations.

Civil society initiatives are very active against disinformation. Some of these initiatives contribute to the fight against disinformation by debunking misinformation (Faktencheck21), some by disseminating reliable information (correctiv.org), and some by contributing to the development of digital media literacy (DigiBitS, Klicksafe) (Bayer, 2021).

The Network Enforcement Act (NetzDG), which was passed by parliament in October 2017 and entered into force on January 1, 2018, has been one of the important regulations in the fight against disinformation in Germany. The law contains binding provisions for internet platforms designed to enable users to share any content with other users for profit or to make such content available to the public. For example, social network providers that receive more than 100 complaints about illegal content within a calendar year are required to prepare reports on illegal content complaints on their platforms every six months. These reports must be published in the Federal Gazette and on the social network provider's website no later than one month after the end of the relevant six-month period.

According to the law, social media platforms with more than 2 million users (such as Facebook, Instagram, YouTube, Twitter (X) and Google) are obliged to remove or block illegal posts and content within 24 hours. They are also required to remove all illegal content within 7 days of its publication and to keep the removed or deleted content for at least 10 weeks. Platforms that fail to fulfill these obligations may be fined up to 5 million Euros depending on the nature of the offense.

The law is the first of its kind in Europe and imposes an obligation on social media platforms to remove, delete and block illegal content. However, the law has also been criticized. At the forefront of these criticisms is the emphasis on freedom of expression. The second criticism is the lack of a clear definition of what constitutes "clearly illegal" content, and the third is that the 24-hour period is considered too short to verify the accuracy of information.

- **France**

Two legal regulations enacted in recent years stand out in the fight against disinformation in France. The first of these came into force in 2018 and the other in 2020. Although both were enacted within the scope of combating disinformation, they differ from each other in terms of the areas and issues they

regulate. If we talk about their contents together with the reasons for their emergence respectively, we can say the following.

After 2015, a series of developments in France accelerated the steps to combat disinformation. Following the 2015 terrorist incidents, the clashes and the intensive disinformation attempts on social media platforms during the 2017 elections, the government submitted a draft law to the parliament in the form of the "Law on Combating Disinformation". However, after this bill was rejected twice, necessary amendments were made, the name of the bill was changed to the 'Law against Information Manipulation' and it was resubmitted to parliament (Guillaume, 2019, p. 3). The bill was adopted and became law on November 20, 2018.

This law focuses more on disinformation that occurs during election periods. The main objective of this law, which makes significant changes to the electoral law, is to ensure that electoral processes are conducted in a fair, open, transparent, impartial and stable manner. The law authorizes judges to order the immediate removal of "fake news" published during election campaigns. Accordingly, judges are authorized to stop the dissemination of fake or misleading news and information online for three months before the election. In addition, candidates, political groups and parties have the right to file a lawsuit against fake news on issues related to them and the relevant judge must rule on the application within 48 hours.

In addition, the law imposes obligations on social media platforms to prevent disinformation from disrupting public order or affecting the validity of an election. It requires online platforms to take measures against the dissemination of false, misleading and fraudulent information and to submit reports detailing these measures to the French National National Broadcasting Authority (CSA: Conseil supérieur de l'audiovisuel). Finally, the law authorizes the CSA to suspend broadcasting services to television controlled by a foreign government if it finds that it has deliberately broadcast false information. Another piece of anti-disinformation legislation is the Online Anti-Hate Act (also known as the Aviva Act²), which came into force on July 1, 2020. The Aviva Act essentially focuses on hate speech on social media platforms. It requires online platforms to remove content that incites hatred, racist or anti-religious rhetoric and actions within 24 hours from the time it is posted, and within one hour for more serious offenses such as terrorist acts or propaganda.³ The law also provides for administrative fines of up to €1.2 million for social media platforms that fail to fulfill these

² It is called the Avia Law because French parliamentarian Laetitia Avia led the drafting of the law.

³ This provision, which is one of the fundamental provisions of the law, was annulled by the French Constitutional Court.

obligations. What is noteworthy about this law is that it does not impose any penalties on individuals who spread disinformation, but instead provides for administrative fines on the social media platforms that facilitate it.

In addition to the above-mentioned countries, many EU member states, including Austria, Croatia, Cyprus, Czech Republic, Greece, Latvia, Lithuania, Malta, Romania, Slovakia, Malta, Romania and Slovakia, have implemented serious regulations against disinformation. Although these countries have not enacted a standalone disinformation law or a safe internet law like France and Germany, their criminal codes include various administrative and financial penalties for disinformation (Fathaigh, Helberger, & Appelman, 2021, p. 8).

For example, Latvia is the most recent of these countries to adopt a disinformation law. In 2024, amendments to the Criminal Code introduced criminal liability for attempts to influence the electoral process through digital technologies such as artificial intelligence and deep-fake video. Accordingly, a prison sentence of up to five years is foreseen for the deliberate production or dissemination of false and discrediting information about a political party, parliamentary, municipal council or European Parliament candidate using deep-fake technologies during the pre-election campaign period or on election day. However, lighter penalties, including community service, may also be imposed. Considering the European Union's strategies to combat disinformation and country case studies: It is seen that a multidimensional approach is adopted in the fight against disinformation. The components of this approach can be discussed under the following headings:

- **Public policy making:** The European Union has elevated the fight against disinformation to the level of public policy. In this context, disinformation was first identified as an important problem, the problem was defined, solution strategies were formulated, and then these strategies were implemented at the legal and institutional level.
- **Regulation:** The European Union in the fight against disinformation: European Approach to Combating Online Disinformation, Action Plan against Disinformation, Digital Services Act, Disinformation Code of Practice, Digital Markets Act, etc., the European Union has increased the responsibilities of digital platforms and regulated them. In this context, many responsibilities have been imposed on digital platforms, such as fact-checking, removing incriminating content, submitting periodic reports to the authorities, and sharing information with the authorities.
- **Development and dissemination of digital media literacy, basic education programs and awareness campaigns against disinformation:** Digital media literacy programs and trainings are

envisaged to ensure that both public administrators and citizens are resilient to disinformation initiatives and are able to take a critical approach to the information and content shared. In this context, in 2018, the European Commission established a High-Level Expert Group (HLEG) to advise on policy initiatives to counter fake news and disinformation spread online. This initiative was followed by the launch of the European Digital Media Observatory (EDMO) project in 2020. EDMO is a project to coordinate the fight against disinformation. While supporting digital media literacy and awareness campaigns, these two initiatives perform many functions such as mapping fact-checking organizations in Europe, mapping, supporting and coordinating research activities on disinformation at the European level, and providing support to public authorities (EDMO, 2024; HLEG, 2018).

- **Transparency and Accountability:** Social media platforms are envisaged to be transparent and accountable to both the public and public authorities. Accordingly, legal arrangements have been made to ensure that digital platforms are transparent and accountable to their interlocutors on issues such as membership requirements, advertising algorithm policies, personal information sharing, and content removal.
- **International Cooperation:** The fight against disinformation has ceased to be a phenomenon that countries can deal with alone in today's global world. Because with digitalization, it has become very difficult to identify and track the source and entrepreneur of disinformation. For this reason, the European Union envisages making the process more effective by establishing cooperation protocols with both countries and international organizations in the fight against disinformation. In this way, it aims to increase information sharing between countries, identify the source of disinformation, develop rapid response mechanisms and minimize the cross-border effects of disinformation.
- **International Standards:** The development of common rules and standards in the fight against disinformation through cooperation protocols and agreements between countries, in other words, placing the fight against disinformation on a global solidarity basis, is also among the basic predictions.
- **Legal Sanctions:** One of the most effective strategies to combat disinformation is legal sanctions. The European Union has regulated legal sanctions in criminal, administrative and financial dimensions and thus pursued a strategy of deterrence against disinformation.

- **Data Verification Networks - Fact Checkers - Rapid Alert System:** Verification networks and fact-checkers that detect, verify and publicize false information are important components of the fight against disinformation. The proliferation of such practices or the support of fact-checking organizations makes the fight against disinformation more effective and sustainable. This is because these practices increase the reliability of the information ecosystem, facilitate access to accurate information for individuals, societies and states, and create a stronger resistance to disinformation. In 2019, the European Union established the Rapid Alert System (RAS) to share insights and coordinate responses to disinformation campaigns among the Union institutions and Member States. The RAS is based on open-source information, as well as information from universities, fact-checking organizations, online platforms and international partners (European Union, 2019).

4.2. Other countries in combating disinformation

Disinformation, which is created, presented and disseminated in order to deliberately deceive individuals, societies and states for various purposes and causes significant damage as a result, is being fought against not only in the European Union but also in many countries around the world. In general, it is seen that a wide range of policies and strategies are implemented in countries outside the European Union. It is seen that the regulations are especially directed towards social media platforms and digital media. In the following sections of the study, the strategies and policies of some countries outside the European Union to combat disinformation are discussed.

- **United Kingdom**

As a result of the recent rise of far-right protests in the UK, anti-immigrant sentiment, the negative effects of social media platforms on children and young people, and finally the challenges posed by major social media platforms, a legal regulation was enacted. The Online Safety Act was submitted to the House of Commons on March 17, 2022 and then entered into force with Royal Assent on October 26, 2023. The Online Safety Act was enacted to implement a series of practices such as preventing illegal content from being seen in the first place and then ensuring that it is removed as soon as possible, making it mandatory to remove content that encourages harm to oneself or others, preventing children from accessing harmful and age-inappropriate content, developing practices for age control and limitation, and ensuring that digital platforms are transparent against risks and dangers.

In the law, posts that encourage child abuse, violence, harming oneself or others, suicide, the sale of illegal substances (such as drugs), or hate crimes are considered high-risk posts and platforms are obliged to remove them. Finally, the Office of Communications (Ofcom), which regulates and supervises the UK's communications, TV, fixed and mobile line, telecommunications, is responsible and authorized for the oversight and supervision of this law (Ofcom, 2024).

As can be seen, the law does not only include regulations for digital platforms and online content but also introduces a series of measures aimed at specific groups in society (children and young people). In other words, this law aims to impose an obligation on social media platforms to remove illegal content and to protect vulnerable individuals in the online environment (Dittel, 2022, p. 185).

- **India**

India is one of the countries with the highest number of internet users in the world due to its population. According to 2024 data, with more than 900 million internet users, India is the second largest online market in the world after China (Statista, 2024). Especially during the Covid-19 pandemic, many disinformation news on issues such as the emergence of the disease, its treatment, and vaccination have occupied the country's agenda. For example, while the number of false and fake news recorded in 2018 was 280 and 486 in 2019, it increased by 214% to 1527 in 2020, when the pandemic broke out (Ghosh, 2020, p. 10). Due to the increasing fake news and disinformative content in India, a “Bill on Prohibition of Fake News on Social Media” was prepared in 2023 to combat disinformation. This regulation provides for imprisonment from three to seven years, a fine or both imprisonment and fine for those who spread fake news or misleading information, endanger the sovereignty, unity and integrity of the country or public order.

- **Russia**

A number of laws against disinformation have been enacted in Russia since 2019. On 18.03.2019, the Law on Fake News and the Law on Disrespect for Authorities and the State, on 31.03.2020, the Covid-19 Fake News Law, on 04.03.2022, the Law on Disinformation on Military Activities (Sherstoboeva, 2024, p. 42). These laws aim to make the fight against disinformation more effective by amending various legal regulations such as the Criminal Code, the Code of Administrative Offenses and the Law on Information Technology and Information Protection. Accordingly, The Law on Fake News and the Law on Disrespect for Authorities and the State, which entered into force on 18.03.2019, are essentially amendments to some articles of the Law on Information, Information Technology and Information Protection, which entered into force in 2016. With these amendments, it paved the way for those who spread fake news and openly disrespect the authorities to be punished with administrative fines and

administrative detention for up to 15 days (Barata & Dairbekov, 2019). In 2020, with the Covid-19 pandemic affecting the whole world, there was an increase in disinformation news. Due to this situation, the Fake News Law entered into force on 31.03.2020. This law amends the Criminal Code and the Code of Administrative Offenses and imposes administrative and criminal sanctions on natural and legal persons who cause disinformation in extraordinary situations such as epidemics, disasters, emergencies. Recently, with the war in Russia against Ukraine, there has been an intense increase in disinformation news and posts. In response, amendments were made to the Criminal Code on 04.03.2022 and criminal liability was imposed on those who spread disinformation about the Russian army and the war.

- **USA**

Disinformation cases in the US are particularly intense during election periods. For example, during the US presidential elections in 2016, the revelation that Russia had purchased political advertisements to manipulate the US elections caused a huge repercussion in the country. The US, which has also experienced a great deal of disinformation on issues such as political corruption, climate change, electoral politics and the Covid-19 Pandemic, has implemented a series of regulations in response to these events. The first of these is The Honest Ads Act, which entered into force on October 19, 2017, and underlines that political advertisements cannot be purchased directly or indirectly by a foreign citizen in order to prevent disinformation in elections. Another legal regulation is the "Safe Web Act", which entered into force in 2020. With this law, it was tried to prevent sales to consumers with disinformation advertisements, false and distorted information.

In 2022, the Law on Education against Misinformation and Disinformation was drafted. This draft law Supporting information and media literacy education, establishing a commission to prevent misinformation and disinformation, and providing grants to non-profit organizations to combat misinformation and disinformation. Similarly, the Digital Citizenship and Media Literacy Act was introduced in 2022. This legislation includes provisions such as grants to state and local educational institutions, public libraries and qualified non-profit organizations to develop and promote media literacy and digital citizenship education for elementary and middle school students. This law aims to create disinformation awareness in the whole society, including young age groups.

In the US, regulations against disinformation have also been made at the state level. For example, in 2022, the Assembly Resolution No. 587 of the State of California came into force. The law obliges social media companies to inform

their users about the content and terms of their services, as well as the actions the company plans to take in case of violations of the terms, such as content removal or banning. It also requires platforms to be more vigilant about hate speech, racism, disinformation, harassment and foreign political interference. The law stipulates fines of up to \$15,000 per day per violation for companies that do not comply with the rules (Theofilos, 2024, pp. 132-133).

- **Australia**

Australia enacted the Online Safety Act in 2021 to limit the impact of online platforms, especially on children and young people. This law introduced a series of measures to make online platforms more trustworthy. In this context, regulations were made on many of these issues, such as removing harmful content such as violence, terrorism, racism, hate speech, educating the public about disinformation, promoting digital media literacy, holding providers more responsible for the safety of users. In the following period, a draft law was prepared and submitted to parliament in 2024, which envisages amendments to this law. This draft law envisages setting the minimum age limit on social media at 16, protecting children and young people from disinformation, and placing the responsibility for the harms of online platforms (such as Snapchat, TikTok, Instagram and X) directly on social media platforms, not just on parents or young people. It also provides for criminal sanctions for online safety violations and fines of up to \$49.5 million to combat systematic disinformation (Rowland, 2024).

As can be seen from the above-mentioned country case studies outside the European Union, the effects of disinformation have become one of the biggest threats of many states in the globalizing world. Countries have developed strategies to combat disinformation with different methods depending on their social, political and administrative realities. However, it should be noted that combating disinformation is a problem that requires cooperation not only at the national level but also at the global level. Especially in today's world where disinformation spreads rapidly with technological developments, it is seen that international cooperation, norms and standards should be determined and various practices should be implemented as well as the individual efforts of the countries. Sharing knowledge, experience and know-how among countries and adopting a multi-partner approach in the fight against disinformation will play a key role in the fight against disinformation.

5. COMPARATIVE ANALYSIS

In this study, the anti-disinformation policies of the European Union and other countries in the world are discussed. Under this heading, these policies are

generally presented through a comparative analysis. Comparative analysis is a method used to reveal similarities and differences, to make generalizations or to develop general models and finally to identify cause and effect relationships.

First of all, if we reveal the basic similarities: All the countries studied have imposed certain obligations on social media platforms. These obligations are generally in the form of removal of illegal content, self-regulation, openness and transparency. In addition, most legal regulations have been enacted to protect children and young people from the negative effects of social media and to prevent disinformation in electoral processes. Again, legal regulations indicate that the primary source of disinformation is social media and digital platforms.

Countries have envisaged different types of sanctions in the fight against disinformation. Some countries provide for fines, some for imprisonment, and some for both imprisonment and fines. For example, India and Russia provide for imprisonment, while the European Union provides for fines. Again, while the European Union strikes a balance between freedom of expression and censorship in the fight against disinformation, this issue has not been on the agenda in other countries. On the other hand, while the focus of the EU in combating disinformation (Germany and France) is on public order, electoral processes and illegal content, Australia and the UK focus on the online safety of children and young people. The US, on the other hand, has focused on media literacy and has put forward a more awareness and education-based fight. In terms of platform obligations, countries such as Germany, France and the UK demand content removal and reporting from platforms, while the US and Australia demand platforms to be more transparent and accountable. India and Russia stand out with tough regulations criminalizing the dissemination of disinformation and imposing criminal sanctions. In light of this information, the main factors shaping countries' strategies to combat disinformation are social problems and disinformation attempts against democratic and political processes.

Table 1: Comparison of Counter Disinformation Strategies

Countr y	Legal Regulati on	Disinfor mation Focus	Platform Obligati ons	Imprison ment	Fines	Focus Groups
Germa ny	- NetzDG	Removal and reporting of illegal content	Removal of illegal content within 24 hours, fines up to €5 million	No	Yes (up to €5 million)	General users and social media platforms
France	- Law against Information Manipulation - Avia Law	Preventing disinformation during election periods	Removing fake news during election periods, reporting to CSA	No	Yes (up to €1.2 million)	Electoral process, candidates and political groups
UK	- Online Safety Act	Protecting children and young people from harmful content online	Removal of harmful content, child protection measures	No	Yes	Children and young people
USA	- Honest Ads Act - Secure WEB Act - Law on Education against Misinformation and Disinformation	Disinformation in elections, social media regulations, media literacy	Transparency of political advertisements, media literacy training programs	No	Yes (\$15,000 daily fine)	Consumers, voters, educational institutions

Australia	- Online Safety Act	Online safety of children and young people and platform responsibility	Removal of harmful content online, platform responsibility	No	Yes (up to \$49.5 million)	Children and young people
India	- Bill to Ban Fake News on Social Media	Spreading fake news and disturbing public order	Imprisonment and fines for spreading fake news	Yes (3-7 years)	Yes	General users and social media platforms
Russia	-Fake News Act -Covid-19 Fake News Act - Disinformation of Military Activities Act	Fake news, disrespect for the government, military disinformation	Administrative penalties and detention for spreading false news	Yes (detention up to 15 days - imprisonment up to 15 years)	Yes	General users, media, government critics

6. CONCLUSION

Disinformation is the deliberate dissemination of false information for various purposes. Disinformation, which has the potential to cause social, political, and economic crises in a short time and on a large scale, has become widespread today and has increased its impact with advances in technology. Accordingly, many countries around the world, especially the European Union, have put into practice significant regulations and policies in the fight against disinformation. In this study, the phenomenon of disinformation, which has become an important problem all over the world, and the current course of the struggle carried out against it have been addressed. Within this scope, the findings and conclusions of the study are, in general terms, as follows.

There is a directly proportional relationship between the spread and increased use of social media and digital platforms and the rise of disinformation. As can be understood from the case examples addressed in the study, many large-scale disinformation attempts occur on these channels.

Another conclusion drawn from the study is that the course of the fight against disinformation proceeds along a thin line between democratic oversight and authoritarian intervention. Based on the legal regulations and policy documents presented in the study: some countries combat disinformation with deterrent policies (for example, EU policies), while other countries do so with punitive policies (for example, Russia, India).

In general, there is a worldwide tendency toward regulating social media and digital platforms (legal regulation and, within this framework, increasing responsibilities). In other words, the regulation policy pursued within the scope of combating disinformation is not specific to certain countries but has emerged as a general trend.

Considering the country examples included in the study and the policies they have pursued, it is seen that ensuring that social media and digital platforms have an accountable, auditable, more open, and transparent structure is at the center of the regulations made within the scope of combating disinformation.

The analyses and comparisons included in the study show that the fight against disinformation is not limited solely to technical and legal regulations; moreover, they indicate that countries also put into practice various policies such as increasing the level of individual and societal awareness, strengthening national and international cooperation, and spreading social-media literacy and awareness. Therefore, there is no single method for combating disinformation. As can be seen from the country examples provided in the study, the fight against disinformation today is carried out with a multifaceted approach that includes technological, economic, legal, and social combat strategies.

The study reveals that the fight against disinformation is not limited to certain countries but is on the agenda of almost all countries, and that many countries around the world, especially the European Union and its member states, have implemented significant public policies in this field.

7. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

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9. AUTHOR CONTRIBUTIONS

CA: Idea, Design, Supervision, Collecting and processing resources, Analysis and interpretation, Literature review, Writer, Critical Review

10. ETHICS COMMITTEE STATEMENT

Ethics committee approval is not required for the study

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THE IMPACT OF UNCERTAINTY IN GLOBAL GOLD AND OIL PRICES ON STOCK MARKET INDEX RETURNS: THE CASE OF THE MIST COUNTRIES¹



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ABSTRACT

The current study explores the impact of global gold price uncertainty on the stock markets of the MIST countries: Mexico, Indonesia, South Korea, and Türkiye. The study examined the crisis periods that started with the COVID-19 pandemic and continued with the Russia-Ukraine war, which caused uncertainty in gold and oil prices. Based on this, the study's data set consists of the daily closing prices between March 11th, 2020, and January 31st, 2023. The obtained data were analyzed using the Least Squares (ICC) and panel quantile regression (PQR) methods. There is a significant positive correlation between oil prices and oil volatility index with stock prices for the economies of Türkiye, Indonesia, and Mexico, and a significant negative correlation between gold prices and gold volatility index with stock prices for developing countries. There is also a significant positive relationship between gold and oil prices and stock prices for the developed country, South Korea's economy. A significant negative correlation has also been proposed between gold and oil volatility indices and South Korean stock prices. This study provides a novel contribution to the literature by examining the impact of simultaneous global crises namely the COVID-19 pandemic and the Russia-Ukraine war—on the stock market indices of MIST countries through the lens of uncertainty in both gold and oil markets. While most existing studies focus on a single commodity or analyze crises in isolation, this research distinguishes itself by investigating the combined effects of two major global shocks and incorporating both price and volatility-based uncertainty indicators. The findings suggest that policymakers should develop country-specific and differentiated financial stability policies by taking into account the uncertainties in gold and oil markets during crisis periods.

Keywords: Covid-19, Russia-Ukraine war, gold volatility, oil volatility index, stock market index, index, oil prices, gold prices, MIST countries, Panel Quantile Regression.

JEL Codes: G01, G11, G15

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¹ Compliance with the ethical rules of the relevant study has been declared.

KÜRESEL ALTIN VE PETROL FİYATLARINDAKİ BELİRSİZLİĞİN HİSSE SENETLERİ PİYASASI ENDEKS GETİRİLERİ ÜZERİNDEKİ ETKİSİ: MIST ÜLKELERİ ÖRNEĞİ



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ÖZ

Bu çalışma MIST ülkeleri olan

Meksika, Endonezya, Güney Kore ve Türkiye borsalarının küresel altın ve fiyatlardaki belirsizlikten etkilenip etkilenmediğini belirlemeye çalışmıştır. Çalışmada, Covid-19 pandemisi ile başlamış ve Rusya-Ukrayna savaşı ile devam etmekte olan, altın ve petrol fiyatlarında belirsizliğe neden olan kriz dönemleri incelenmiştir. Buna dayanarak, çalışmanın veri seti 11 Mart 2020 ile 31 Ocak 2023 arasındaki günlük kapanış fiyatlarından oluşmaktadır. Elde edilen veriler En Küçük Kareler (ICC) ve panel kantil regresyon yöntemleri kullanılarak analiz edilmiştir. Çalışmadan, Türkiye, Endonezya ve Meksika ekonomileri için petrol fiyatları ve petrol volatilite endeksi ile hisse senedi fiyatları arasında anlamlı ve pozitif bir korelasyon, gelişmekte olan ülkeler için altın fiyatları ve altın volatilite endeksi ile hisse senedi fiyatları arasında anlamlı ve negatif bir korelasyon olduğu sonucuna varılmıştır. Ayrıca, gelişmiş ülke Güney Kore ekonomisi için altın ve petrol fiyatları ile hisse senedi fiyatları arasında pozitif ve anlamlı bir ilişki olduğu sonucuna varılmıştır. Ayrıca Güney Kore ekonomisi için petrol volatilite endeksi ile altın volatilite endeksi ve hisse senedi fiyatları arasında anlamlı ve negatif bir ilişki olduğu tespit edilmiştir. Bu çalışma, COVID-19 pandemisi ve Rusya-Ukrayna savaşı gibi küresel krizlerin eşzamanlı olarak hem altın hem de petrol piyasalarında oluşturduğu belirsizliklerin MIST ülkeleri borsa endeksleri üzerindeki etkisini incelemesi açısından literatüre özgün bir katkı sunmaktadır. Literatürde çoğu çalışma ya sadece bir emtia üzerine odaklanmakta ya da krizleri tekil dönemler olarak ele almaktadır. Bu bağlamda, iki büyük küresel şokun ortak etkisini ve hem fiyat hem de volatilite düzeyinde belirsizlik göstergeleri kullanılarak yapılan analizler, çalışmanın özgün yönünü oluşturmaktadır. Elde edilen bulgular, politika yapıcıların kriz dönemlerinde altın ve petrol piyasalarındaki belirsizlikleri dikkate alarak ülke bazlı farklılaştırılmış finansal istikrar politikaları geliştirmesi gerektiğini ortaya koymaktadır.

Anahtar Kelimeler: Covid-19, Rusya-Ukrayna savaşı, altın volatilitesi, petrol volatilite endeksi, borsa endeksi, endeks, petrol fiyatları, altın fiyatları, MIST ülkeleri, panel kantil regresyonu

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1. INTRODUCTION

The stock markets are fundamental building blocks of economies concerning economic prosperity and long-term sustainability. Since it is challenging to determine when and to what extent the factors affecting stock prices will be influential, disclosing these factors along with stock prices may sometimes prove insufficient. In such situations, psychological behaviors tend to emerge among investors, and despite no change in market conditions, significant fluctuations in stock prices can occur due to the impact of these behaviors. Therefore, changes in stock prices depend on numerous economic variables. In this context, studies investigating the relationships between various macroeconomic indicators, including stocks, and making future inferences are becoming increasingly important for countries, investors, and financial circles (Sandal et al., 2017). Particularly in the last three years, following the COVID-19 crisis and the Russia-Ukraine war, global uncertainties have emerged; it is highly likely that factors such as oil and gold, which have wide trading volumes in the financial markets, significantly affect the volatility of stock returns (Engle and Patton, 2001; Bhowmik, 2013; Ma et al., 2016; Wei and Guo, 2016).

In December 2019, COVID-19 first appeared in China and was later declared a pandemic by the World Health Organization (WHO) on 11th March 2020. It has demonstrated its disruptive effects on the stability of the world's economies. To control the rate of spread of the COVID-19 pandemic, which is accelerating, and to minimize its adverse economic effects, all countries have had to take protective measures. The precautions taken to reduce the pandemic's spread have negatively impacted countries' economies, leading to a global crisis. To mitigate the consequences of this crisis, countries have promptly implemented monetary and fiscal policies (Küçükoğlu, 2021). These strict fiscal and monetary policies have caused changes in consumer spending and investment habits. The impacts of the COVID-19 pandemic began to decrease somewhat with the help of vaccines, but on February 24, 2022, the world economy was once again shaken when Russia declared war on Ukraine. Many European Union countries, especially the United States, began imposing sanctions against Russia. Following the sanctions, Russia, responsible for about 23.20% of global natural gas production, introduced price and shipment restrictions, resulting in production slowdowns and constraints in Europe and the United States. The ongoing Russia-Ukraine War, compounded by COVID-19, has dealt a heavy blow to the world's economies and is causing a recession in global economies. With the rise in global inflation due to the recession, countries have started to implement various measures, primarily interest rate hikes. The US Federal Reserve increased interest

rates by 25 basis points to 4.75% in early February 2023, signaling a probable continuation of the recession.

All of these global crises have caused uncertainty in oil and gold prices. The fluctuations in gold prices, known as a safe haven by financiers, can lead to changes in investment decisions. Similarly, fluctuations in oil prices, which are a fundamental input of production, can cause general price levels to rise, decreasing firm profit margins. This study was conducted to contribute to the literature with research results that could help investors make informed investment decisions in the current global crisis environment. The decrease in profit margins of companies traded on the stock market can cause changes in investors' investment decisions and cause a fall in the stock prices of these companies. The purpose of this research is to search whether the uncertainty in global oil and gold prices affects the stock markets of the MIST countries, namely Türkiye, South Korea, Mexico, and Indonesia. In line with this purpose, the study considers the crisis periods that started with the COVID-19, which caused uncertainty in gold and oil prices and continued with the Russia-Ukraine war. The study data set consists of daily closing prices between March 11th, 2020, and January 31st, 2023. The dataset begins on March 11, 2020, as this is the date when the World Health Organization (WHO) officially classified COVID-19 as a pandemic.

MIST countries (Mexico, Indonesia, South Korea, and Turkey) have been defined by Goldman Sachs as new emerging markets with high growth potential, following the BRIC countries (O'Neill, 2011). In the literature, it is emphasised that these countries have similar sensitivities to global economic shocks and hold significant positions among developing countries (Sevinç, 2022; Ender Baykut and Diyar, 2021). Additionally, the common structural characteristics of these countries, such as openness to foreign trade, commodity dependence, and investment attractiveness, provide a suitable sample for comparatively analysing the impacts of uncertainties on stock markets during crisis periods. Another reason for selecting these countries is that, according to the IMF classification, Turkey, Indonesia, and Mexico are among the developing countries with similar levels of development. Additionally, Turkey's location in Eurasia, Indonesia's in Asia, and Mexico's in the Americas enhance the generalisability of the findings. The inclusion of South Korea in the study is important as it has successfully managed the pandemic as a developed economy and provides a comparison opportunity with other MIST countries.

In the literature, the effects of uncertainties on financial markets are often assessed through individual commodities such as gold or oil, and the impacts of crises are frequently confined to isolated periods. For instance, studies such as Dontoh et al. (2024) examine the impact of COVID-19 on gold, oil, and stock

markets in oil-exporting African economies; Li *et al.* (2022) focuses on gold and oil markets during COVID-19 in G7 countries; and Yousef and Shehadeh (2020) analyze the effect of COVID-19 on gold price volatility. These works predominantly investigate either the COVID-19 pandemic or the effects of the Russia-Ukraine war exclusively. Moreover, most of these studies concentrate on developed or BRICS countries. Examples include Morina *et al.* (2024), who investigate the impact of the COVID-19 pandemic and Russia's invasion of Ukraine on gold markets in the G7; Memon *et al.* (2024), who provide evidence on the effects of the Russia-Ukraine war and COVID-19 pandemic on stock market efficiency and herding behavior in G20 countries; and Jareño *et al.* (2023), which explores the effects of the COVID-19 pandemic on the term structure connectedness of BRICS countries. In this context, the present study addresses a significant gap by jointly examining two major global crises and simultaneously analyzing both price- and volatility-based uncertainties in gold and oil markets. Furthermore, this analysis is conducted on the MIST countries, a relatively under-researched but strategically important group of emerging markets. Thus, this study offers a meaningful contribution to the literature on the asymmetric effects of global uncertainties on developing markets.

2. LITERATURE REVIEW

In the literature, the impact of uncertainties on financial markets is mostly evaluated solely through individual commodities such as gold or oil, and the effects of crises are generally limited to specific periods (Dontoh *et al.*, 2024; Li *et al.*, 2022; Yousef and Shehadeh, 2020). Or the effects of the Russia-Ukraine war are generally focused on developed countries or BRICS countries (Morina *et al.*, 2024; Memon *et al.*, 2024; Jareño *et al.*, 2023). In this context, the current study fills a significant gap in the literature by addressing both major global crises together and simultaneously analysing the price and volatility-induced uncertainties in the gold and oil markets. Additionally, this analysis has been conducted on the MIST countries, a relatively under-researched but strategically important group of emerging markets. In this respect, the study makes a significant contribution to the literature on the asymmetric effects of global uncertainties on emerging markets.

In the literature, rather than studies examining the impact of uncertainty in gold and oil prices on the stock markets of the MIST country group, there are more studies focused on the specific countries within the MIST group (Mexico, Indonesia, South Korea, and Turkey). Among these studies, Baek (2022) examined the asymmetric relationship between oil prices and exchange rates for the South Korean economy in the context of COVID-19. As a result of the study,

it was concluded that the COVID-19 pandemic was an important factor in influencing the asymmetric effect of oil prices on the KRW/USD exchange rate in both the short and long term. In their study, Salami et al. (2024) examined the impact of Russia's invasion of Ukraine on the BIST index, the Turkey real estate market index, the Turkey gold market, and the Turkey foreign exchange market. As a result of their studies, they concluded that there is a long-term cointegration relationship among the Turkish markets. The findings also indicate that the shock resulting from Russia's invasion of Ukraine had a positive effect on developed foreign currencies, while it had a negative impact on the currencies of developing countries like Turkey. In Tuna's (2022) study, using 363 days of recorded data from 11/03/2020 to 13/09/2021, the effects of the Covid-19 pandemic crisis on the volatility of oil prices, gold prices, and the VIX index on the Turkey BIST 100 index were examined using the Toda-Yamamoto causality test. As a result of the study, it was concluded that there was no causal relationship between oil prices, gold prices, and the VIX index with the BIST 100 index. In his 2021 study, Mutlu Çamoğlu examined the impact of the Covid-19 pandemic, oil prices, and exchange rates on the BIST petrochemical market. As a result of the study, it was concluded that the most significant determinant of the fluctuations in the BIST petrochemical index was the oil prices. Accordingly, while a shock in oil prices negatively affects the BIST petrochemical index, they noted that the petrochemical index responded positively to the shock in the pandemic index. Denie et al. (2024) in their study utilised data from February 24, 2022, to December 31, 2022, and from April 14, 2024, to April 30, 2024, to examine the impact of geopolitical developments on the Indonesian stock market, specifically the effects of oil, gold, and the DXY index, using the GARCH method. As a result of the study, they concluded that WTI oil price changes have significant positive effects on stock returns in Indonesia, gold price changes have insignificant positive effects on stock returns in Indonesia during geopolitical events, and the DXY Index has insignificant negative effects. In their study, Marwanti and Robiyanto (2021) examined the effects of volatility in oil and gold prices on Indonesian stock returns before and during the Covid-19 pandemic using the GARCH method. As a result of the study, they concluded that the volatility in oil and gold prices did not affect stock returns in either period. In their study, Lubis et al. (2021) examined the impact of the Covid-19 pandemic crisis on oil prices, gold, and currencies on the Indonesia Stock Exchange Index (JCI) using the Arch and Garch methods. As a result of the study, they concluded that crude oil prices did not have a significant effect on the JCI, gold prices had a significant and positive effect on the JCI, and the exchange rate did not have a significant effect on the JCI. In their study, Benavides et al. (2019) examined the impact of oil price

uncertainties on the Mexican stock market using the SVAR-MGARCH model, utilising data from 1975-2018. As a result of the study, they concluded that international oil price uncertainty does not have an instantaneous effect on stock market returns, but there are short-term asymmetric effects in response to positive and negative shocks in international oil prices.

A considerable body of research has analyzed the effect of gold and oil prices on stock returns, considering perspectives from developed and developing economies. Based on previous studies, Zeinedini et al. (2022) employed a method to evaluate the influence of global oil and gold prices on Iranian stock returns during the COVID-19 pandemic. Their analysis revealed no significant correlation between the Iranian stock market and global gold prices; however, a strong negative correlation was observed between OPEC oil prices and the Iranian stock market. Similarly, Chkili (2022) utilized a VAR model to examine the relationship between gold and oil prices and the Islamic stock market during turbulent periods, including the COVID-19 crisis. The study found a strong correlation with stock markets and crude oil prices. Furthermore, gold was identified as a safe haven during volatile market conditions, given the negative or nonexistent relationship between the gold market and the oil and stock markets. In another study, Ghanbari et al. (2022) noted the impact of foreign exchange rates, gold, and oil prices on the Tehran Stock Exchange. Their results indicated that the prices of the dollar, gold, and oil significantly influenced the overall price index of the Tehran Stock Exchange. Xiaozhong et al. (2022) conducted an Autoregressive Distributed Lag (ARDL) test to examine the effects of gold and oil price fluctuations on the Chinese stock market during the COVID-19 period, concluding that both gold and oil prices had a long-term negative impact on the Chinese stock market. Using a time-varying causality test, Zeren and Güngür (2021) assessed the relationship between the stock markets of BRICS-T nations and the prices of gold and Brent crude oil. Their findings suggested a bidirectional, time-varying causal relationship between these commodities and stock markets, with this relationship strengthening during periods of local and global crises. Similarly, Ocaklı (2020) applied Johansen Cointegration and Granger Causality tests to explore the causal link between oil and gold prices and the BIST100 index. The results indicated a long-term co-movement between the series and highlighted a unidirectional causality from the BIST100 index to gold, as well as from gold to oil. Shabbir et al. (2020), through an ARDL approach, analyzed the impact of gold and oil prices on the Pakistan Stock Exchange and concluded that these commodities significantly influenced the stock market. In a study focusing on the South African stock market, Morema and Bonga (2020) employed VAR-ADCC-GARCH methods and found significant volatility

spillover effects between the stock and gold markets, and between the oil and stock markets. Li and Du (2024) explored the dynamic interaction and asymmetric causality between oil and gold prices in the Chinese economy using the Granger Causality test. Their study concluded that changes in gold and oil prices exhibited a significant, fluctuating relationship with asymmetric causality. Finally, Tursoy and Faisal (2018) used the ARDL bounds testing approach to investigate the relationship among stock, oil, and gold prices in Türkiye. Their findings demonstrated a positive correlation between stock and crude oil prices, and a negative correlation between stock and gold prices, both in the short and long run. Similarly, Sandal et al. (2017), using Engle-Granger and Johansen cointegration tests, examined the causal relationship between the Borsa Istanbul (BIST 100) index and the prices of gold and crude oil, concluding that the series were not cointegrated, indicating no long-term equilibrium relationship.

Moreover, the analysis indicated an unidirectional relationship from gold prices to stock prices, with no causal relationships observed in other cases. Using a nonlinear ARDL approach, Raza et al. (2016) highlighted the asymmetric impacts of gold and oil prices, as well as their respective volatility, on the stock markets of developing countries. Their findings indicated that while gold prices positively influenced the stock values of major BRICS economies, they had a negative impact on the stock markets of Indonesia, Thailand, Chile, Malaysia, and Mexico. Additionally, the study suggested that the stock markets of developing nations were negatively affected by oil price declines and by fluctuations in gold and oil prices in both the short and long term. Similarly, Afsal and Haque (2016) examined the relationship between gold and stock prices in the Saudi Arabian economy. Their analysis found no dynamic relationship between the two variables. Gökmenoğlu and Fazlollahi (2015), employing the ARDL cointegration method, investigated the relationship between gold and oil prices and S&P 500 stock returns, concluding that a long-term equilibrium relationship existed among the variables. In another study, Baig et al. (2013) applied the Johansen and Juselius cointegration tests to examine the relationship between gold and oil prices and KSE100 returns. Their findings suggested that volatility in gold and oil prices negatively affects stock markets in developing countries over both the short and long term. Finally, Sreenu (2022) analyzed the impact of crude oil price uncertainty on stock returns in India using the quantile regression (QR) approach, offering further insight into the effects of commodity price volatility on stock market performance.

The volatility in oil prices had a detrimental effect on stock returns. Using a time-varying causality test, Bouslama (2023) evaluated the relationship between the crude oil market and the stock indices of BRICS countries within the

framework of financial crises from 2008 to COVID-19, using daily data from the period of November 14, 2010, to November 29, 2022. As a result of the study, volatility transmission is permanent, and the impact of crises is characterized by fractional cointegration between crude oil and financial markets. There are strong, bidirectional causal connections between the variables, and particularly positive short-term relationships.

3. METHODOLOGY

3.1. Data

This study was conducted to investigate the extent to which the stock markets of MIST countries (Mexico, Indonesia, South Korea, and Türkiye) are affected by uncertainty in global gold and oil prices. Also, the study considers crisis periods starting with the COVID-19 pandemic crisis that led to uncertainty in oil and gold prices, as well as the ongoing crisis resulting from the Russia-Ukraine War. As the first COVID-19 cases in each country occurred at different times (Indonesia on March 2nd, Türkiye on March 11th, Mexico on February 28th, and South Korea on January 20th), daily closing prices between March 11th, 2020, and January 31st, 2023, when Covid-19 was announced a pandemic by the WHO, were used to synchronize the data. Brent crude oil prices in dollars were obtained investing.com, and gold prices in dollars were obtained from onsaltinfiyati.com for the study variables. The gold volatility index was obtained from cboe.com and closing prices of the crude oil volatility index with closing prices of stock market indices were also obtained from investing.com. As the special days of the countries included in the study may differ, prices related to special days for oil, gold, and the stock market were not taken into account for data synchronization purposes. To stabilize variance and achieve normality, all variables considered in this research were transformed using natural logarithms. Table 1 summarizes the characteristics of the series.

Table 1: Variables of the Model

Country	Stock Market Index	Oil Prices (USD)	Gold Prices (USD)	Gold Volatility Index	Crude Oil Volatility Index
		lnOP	lnGO	lnOVZ	lnOVX
Türkiye	BIST100	https://tr.investing.com/	https://www.onsaltinfiyati.com/gecmis-yilla	https://www.cboe.com/us/indices/dashboard/gvz/	https://www.investing.com/
Mexico	IPC (MXX)				

South K.	KOSPI		rdaki-ons- altin- degerleri.php		w.in vest ing. com /
Indonesia	JKSE	Investing.com.			

The data used in the study were obtained from online data platforms such as Investing.com, CBOE (Chicago Board Options Exchange), and onsaltinfiyati.com. Among these sources, Investing.com is frequently referenced in academic research due to its extensive dataset on financial markets and its widespread global use. Similarly, CBOE is an original and reliable source, especially in terms of volatility indices (such as VIX, GVZ). Onsaltinfiyati.com, on the other hand, is a Turkey-based financial portal that provides historical data for gold prices. While the generally used sources are practical and widely accessible, it should be noted that there may be reporting errors or delays, especially in developing countries.

3.2. Model Specification

The research models were constructed as follows, taking inspiration from the studies of Lee and Zeng (2011), Tsai (2012), and Zeinedini et al. (2022).

$$\ln BIST100_t = c + \beta_1 \ln OP_t + \beta_2 \ln GP_t + \beta_3 \ln GVZ_t + \beta_4 \ln OVX_t + \varepsilon_t \quad (1)$$

$$\ln JKS_t = c + \beta_1 \ln OP_t + \beta_2 \ln GP_t + \beta_3 \ln GVZ_t + \beta_4 \ln OVX_t + \varepsilon_t \quad (2)$$

$$\ln KOSPI_{it} = c + \beta_1 \ln OP_t + \beta_2 \ln GP_t + \beta_3 \ln GVZ_t + \beta_4 \ln OVX_t + \varepsilon_t \quad (3)$$

$$\ln IPC(MXX)_{it} = c + \beta_1 \ln OP_t + \beta_2 \ln GP_t + \beta_3 \ln GVZ_t + \beta_4 \ln OVX_t + \varepsilon_t \quad (4)$$

t= March 11, 2020,....., January 31, 2023.

In the models, BIST100 represents the Turkish Stock Exchange, JKS refers to the Indonesian Stock Exchange, KOSPI denotes the South Korean Stock Exchange, and IPC MXX signifies the Mexican Stock Exchange. lnOP shows the logarithm of the Brent oil price, lnGP the logarithm of the gold bullion price, lnGVZ the logarithm of the gold volatility index, and lnOVX the logarithm of the crude oil volatility index. Likewise, logarithms of stock market indices were taken and included in the models.

3.3. Methodology

The study used the Ordinary Least Squares (OLS), a traditional approach, as well as the PQR by Koenker (2004) to identify the dependence structures of the variables under different market conditions. In traditional regression approaches, model estimates are made by defining the conditional mean of the dependent variable as a function of the independent variable. The regression equation can be easily constructed and interpreted with the OLS method. However, when the distribution of the dependent variable is asymmetric, the constant variance assumption of the OLS method is violated. In such a case, the problem of changing variance (heteroscedasticity) can arise due to the sensitivity of the mean to extremely low or high values (Tekin and Bastak, 2022). When the distribution of the dependent variable is asymmetrical, an alternative method, PQR, can be used to avoid the problem of varying variance. The quantile regression (QR) model proposed by Koenker and Bassett (1978), and subsequently extended by Koenker (2004), includes both cross-sectional and time effects. This framework further enables the application of PQR, as shown by Tekin and Bastak (2022).

Binder and Coad (2011) argued that the PQR is safer than traditional approaches. QR, which offers advantages over classical regression methods, enables conditional quantitative estimation and the prediction of specific points within the conditional distribution (Uygur and Han, 2021). Unlike OLS, which depends on accurate error term estimates, QR is more robust, especially in the presence of outliers (Koenker and Bassett, 1978). Additionally, unlike traditional regression, QR does not rely on distributional assumptions (Uygur and Han, 2021). Initially applied to cross-sectional data, the method has since been adapted for time series and panel data sets (Tekin and Bastak, 2022).

The panel linear regression equation to be used in the research is as described in equation 5. The QR equation is explained in equation 6.

$$y_{it} = \alpha_i + \beta(q)x'_{it} + u_{it} \quad i=1, \dots, N_1 \quad t=1, \dots, T \quad (5)$$

In the equation, (i) represents the stock market index of the countries, and (t) represents the time dimension. A dependent variable is identified by (y_{it}), while an independent variable is identified by (x). While (q) indicates the amount of conditional distribution (0 < q < 1), (α) represents the presence of fixed effects.

$$\min_{\beta, \alpha} \sum_{j=1}^J \sum_{t=1}^T \sum_{i=1}^N w_j p_{tj} (y_{it} - x_{it} \beta - \alpha_i) + \lambda \sum_{i=1}^N |\alpha_i| \quad (6)$$

In this context, the piecewise linear quantile loss function, as proposed by Koenker and Bassett (1978), is $ptj(u) = (Tj - u) \cdot \mathbb{I}(u \leq 0)$. W_j is a given relative weight. Weights determine the influence of individual quantities on the estimation of their effects. $\lambda|\alpha_i|$ serves to shrink the individual impact estimates towards zero to improve the performance of the estimation (Uygur and Han, 2021).

QR can be used when the distribution is normal as well as when the distribution is asymmetrical, thick-tailed, or truncated (Zeinedini et al., 2022). To see how the distribution is in this direction, the change graphs of the variables included in the research between March 11th, 2020, and January 31st, 2023, are given below. All variables generally show normal and/or close-to-normal distributions.

4. RESULTS AND DISCUSSION

In this section, analyses and interpretations related to the model of the study have been conducted.

Table 2: Descriptive statistics

	lnOP	lnGO	lnGV Z	lnOV X	lnBIST 100	lnJK SE	lnKO SPI	ln IPC (MX X)
Mean	1.8286 6	3.256 389	1.2696 5	1.676 215	3.2530 26	3.786 529	3.416 554	4.664 527
Std Dev.	0.1717 872	.0217 177	0.0838 347	.1500 972	0.2029 535	.0604 337	.0707 979	.0596 862
Min.	1.2862 32	3.168 571	1.1479 85	1.495 544	2.9193 08	3.595 235	3.163 65	4.518 043
Max.	2.1071 42	3.315 372	1.6900 19	2.512 084	3.7517 89	3.864 394	3.519 199	4.752 89
Skewness	0.0000	0.000 0	0.0000	0.000 0	0.0000	0.000 0	0.000 0	0.000 0
Kurtosis	0.1024	0.000 0	0.0000	0.000 0	0.3449	0.079 5	0.575 3	0.000 0
Jarque-Bera	269.2	152.3	516.4	458,9	84.52	90.47	37.39	95.67
Observations	746	746	746	746	746	746	746	746

Table 2 displays the descriptives for the variables and the outcomes of the Jarque-Bera test. These statistics furnish a thorough examination of the data's

inherent properties.

When Table 2 is examined, it is observed that the variable with the highest average is $\ln\text{IPC}(\text{MXX})$ with 4.664527, while the variable with the lowest average is $\ln\text{OP}$ with an average of 1.82866. It is observed that the variable with the highest standard deviation is the $\ln\text{BIST100}$ index with .2029535, while the variable with the lowest standard deviation is $\ln\text{GO}$ with .0217177. When examining the standard deviations of the dependent variable, which are the stock prices, it is observed that, except for the BIST100 index, the stock prices of the others are close to each other. In this case, we can say that the $\ln\text{JKSE}$, $\ln\text{KOSPI}$, and $\text{IPC}(\text{MXX})$ stock indices are similarly affected by uncertainties in global gold and oil prices, while the BIST100 index is more affected.

To test whether the series follows a normal distribution, the Skewness, Kurtosis, and Jarque-Bera tests are applied. When the results of the Skewness test are examined, it is observed that the coefficients of all variables are zero (0.000), meaning they are not asymmetric and not skewed to the right or left. In this case, it indicates that the series has a normal distribution. Similarly, when the Kurtosis results are examined, it is observed that the coefficient values fall within the threshold values of -1.5 to +1.5, which are accepted in the literature. This situation indicates that the series is not asymmetric, in other words, it is not platykurtic and has a normal distribution. To test whether the series follows a normal distribution, the Jarque-Bera test, which shows the statistical results of the error terms, was applied. As a result of the test, since the $\text{Chi}(2)$ values were greater than 0.05, the null hypothesis (H_0) stating that the error terms follow a normal distribution was not rejected, and therefore it was concluded that the series is normally distributed. When the series is normally distributed, traditional regression methods can be used, as well as the quantile regression method.

4.2. Test Results of Unit Root

Stationarity is an extremely important issue because when the series is not stationary, the spurious regression problem can arise. This situation is likely to lead to incorrect results and misinterpretations. To prevent this problem, the variables must be stationary. Table 3 shows the findings of the Augmented Dickey-Fuller (ADF) unit root test to evaluate the stationarity of the variables. The ADF test checks whether the statistical properties of a time series change over time, and thus it is a critical step in selecting the correct modelling method. Especially in econometric models, it is extremely important to conduct this test in order to obtain meaningful and reliable results.

Table 3: Results of the ADF Unit Root Test

Variable	Level	Fixed		Trend	
		Test statistic	P-Value	Test statistic	P-Value
lnOil Price	I(0)	10.0221	0.2635	7.5885	0.4747
	I(1)	288.3492	0.0000*	288.3492	0.0000*
lnGold Price	I(0)	30.6038	0.0002*	19.2048	0.0138**
	I(1)	-	-	-	-
lnGVZ	I(0)	7.7665	0.0206**	7.0495	0.0295**
	I(1)	-	-	-	-
lnOVX	I(0)	26.7162	0.0000*	20.5520	0.0000*
	I(1)	-	-	-	-
lnBIST100	I(0)	0.0454	0.9776	0.3155	0.8541
	I(1)	72.0873	0.0000*	47.0865	0.0000*
lnJKSE	I(0)	1.6499	0.4383	4.7969	0.0909
	I(1)	72.0873	0.0000*	53.174	0.0000*
lnKOSPI	I(0)	3.7419	0.1540	1.3283	0.5147
	I(1)	44.204	0.0000*	31.897	0.0000*
lnIPC (MXX)	I(0)	0.1083	0.9473	0.2002	0.9048
	I(1)	102.365	0.0000*	86.384	0.0000*

Table 3 indicates that the stationary levels of variables are investigated both with and without a trend. The lnGold Price, lnGVZ, and lnOVX variables are stationary at the level, while the other variables are not stationary at the level but become stationary when first-order differences are taken. In the following stages of the research, the stationary values of variables will be used. After ensuring the stationarity condition of the variables, the relationship between the variables was examined using both the OLS and PQR methods, and the results are given below.

Table 4. QR Test Results for The Turkish Economy (BIST100)

Variables	OLS	%25	%50	%75
lnOil Price	0.906*** (26.37)	0.677*** (27.36)	0.791*** (34.03)	0.942*** (14.22)
lnGold Price	-0.606** (-2.32)	- 0.739*** (-3.92)	-2.130*** (-4.12)	-2.045*** (-4.05)

lnGVZ	-0.312*** (-3.49)	-0.079 (-1.23)	-0.041 (-0.68)	0.049 (0.28)
lnOVX	0.292*** (5.75)	0.244*** (6.67)	0.208*** (6.03)	0.149 (1.52)
Cons	3.478*** (4.03)	-0.783 (-1.26)	1.199** (2.05)	7.930*** (4.76)
F	252.39	-	-	-
Prob.	0.000	-	-	-
Adj. R²	0.57	-	-	-
Pseudo R²	-	0.484	0.468	0.406

Note: * and ** represent statistical significance at the 5% and 1% levels, respectively.

Table 4 presents the OLS and QR results on the impact of oil and gold price uncertainty on the BIST100 index for the Turkish economy. The OLS results show a significant positive relationship between the BIST100 index and both oil prices and the oil volatility index. Specifically, a 1% increase in oil prices leads to a 0.91% increase in the BIST100 index, while a 1% rise in the oil volatility index causes a 0.29% increase. Conversely, a 1% increase in gold prices and gold volatility index results in a 0.61% and 0.31% decrease in the BIST100 index, respectively. These findings align with previous studies (Chkili, 2022; Karakuş, 2021; Kakacak et al., 2020; Tursoy and Faisal, 2018; Akgün et al., 2013; Küçükçolak et al., 2019; Gencer and Musoğlu, 2014).

The analysis suggests that rising oil prices, despite expectations of negative effects due to cost inflation, may increase companies' sales prices and equity, thereby attracting investors. In contrast, gold price increases generally lead to falling stock prices due to investor behavior during economic uncertainty, such as the Russia-Ukraine conflict and COVID-19, which boosts gold prices. These findings support the inverse relationship between gold and stock prices, reflecting investor preferences for safe assets in times of uncertainty.

Table 5. QR Test Results for The Indonesian Economy (JKSE)

Variables	OLS	%25	%50	%75
lnOil Price	0.323*** (65.36)	0.333*** (52.68)	0.346*** (41.51)	0.304*** (49.04)
lnGold Price	-0.075** (-2.00)	-0.133** (-1.98)	-0.150** (-2.36)	-0.157*** (-3.32)
lnGVZ	-0.045*** (-3.48)	-0.028*** (-1.70)	-0.019 (-0.86)	-0.088*** (-5.43)
lnOVX	0.003 (0.37)	-0.004 (-0.40)	0.006 (0.47)	0.015*** (1.68)
Cons	3.444*** (32.43)	3.256*** (20.45)	3.654*** (17.43)	3.841*** (24.65)
F	1683.25	-	-	-
Prob.	0.000	-	-	-
Adj. R²	0.900	-	-	-
Pseudo R²	-	0.747	0.674	0.613

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

Table 5 highlights the OLS and QR results on the effect of gold volatility index, crude oil volatility index, and global gold and oil price uncertainty on the JKSE index. The OLS results show a significant positive relationship between oil prices and the oil volatility index with the JKSE index, with a 1% rise in oil prices associated with a 0.32% increase in the JKSE index. A 1% increase in the oil volatility index results in a 0.003% increase in the JKSE index. In contrast, a 1% increase in gold prices and gold volatility index leads to a decrease of approximately 0.075% and 0.045%, respectively, in the JKSE index, consistent with previous studies (Alamgir and Amin, 2021; Octavia et al., 2018; Adam et al., 2015; Hadi et al., 2009). The model is significant with an R² value of 0.9009, indicating that 90.09% of the JKSE index is explained by the variables.

PQR results indicated that global oil price uncertainty has a significant

positive effect on the JKSE index across all quantiles (25%, 50%, and 75%), and global gold price uncertainty has a significant negative effect at all quantiles. The gold volatility index shows a negative effect on the JKSE index, significant only at the high (75%) quantile. Crude oil volatility index has a negative, though not significant, effect at the low (25%) quantile, but a positive, though not significant, effect at the medium (50%) and high (75%) quantiles. The findings for Indonesia's developing economy align with those for Türkiye, showing a positive impact of oil price uncertainty and a negative impact of gold price uncertainty on the stock market. These results show the findings in Table 4.

Table 6: QR Test Results for The South Korean economy (KOSPI)

Variables	OLS	%25	%50	%75
lnOil Price	0.032** (2.72)	0.079*** (5.80)	0.025 (1.12)	-0.025 (-1.59)
lnGold Price	0.311*** (3.50)	0.779*** (7.47)	0.368** (2.19)	0.281** (2.39)
lnGVZ	-0.242*** (-7.94)	-0.197*** (-5.53)	-0.313*** (-5.46)	-0.298*** (-7.40)
lnOVX	-0.220*** (-12.71)	-0.099*** (-4.86)	-0.232*** (-7.11)	-0.237*** (-10.37)
Cons	3.020*** (10.27)	1.112*** (3.23)	3.293*** (5.95)	3.358*** (8.65)
F	274.10	-	-	-
Prob.	0.000	-	-	-
Adj. R²	0.597	-	-	-
Pseudo R²	-	0.373	0.353	0.336

Note: * and ** represent statistical significance at the 5% and 1% levels, respectively.

Table 6 presents the results of both OLS and QR analyses regarding the impact of oil and gold volatility indices, as well as price uncertainties, on the KOSPI index. The OLS results indicate a positive association between the KOSPI index and both oil and gold prices, whereby a 1% increase in oil and gold prices is associated with a 0.0319% and 0.314% rise in the KOSPI index. In contrast, the oil and gold volatility indices exhibit a negative effect, and the model accounts for 59.67% of the variation in the KOSPI index. PQR results indicate that global oil price uncertainty has a significant positive effect at lower quantiles, but a negative effect at higher quantiles. Gold price uncertainty consistently exerts a positive effect across all quantiles, while gold volatility negatively impacts the KOSPI index at all quantiles. These findings challenge the conventional theory suggesting an inverse relationship between gold prices and the stock market, instead revealing a positive correlation. These results align with the findings of

studies by Tursoy and Faisal (2018), Chkili (2022), Karakuş (2021), Kakacak et al. (2020), Akgün et al. (2013), and Drake (2022).

Table 7: QR Test Results for The Mexican Economy IPC (MXX)

Variables	OLS	25%	50%	75%
lnOil Price	0.255*** (38.590)	0.023*** (19.580)	0.249*** (24.560)	0.251*** (48.580)
lnGold Price	-0.151*** (-3.010)	-0.163** (-1.790)	-0.229*** (-2.970)	-0.257*** (-6.530)
lnGVZ	-0.206*** (-11.970)	-0.302*** (- 9.710)	-0.297*** (-11.240)	-0.242*** (-17.970)
lnOVX	0.022** (2.250)	-0.071*** (- 3.990)	0.028* (1.890)	0.053*** (6.940)
Cons	3.809*** (24.280)	4.193*** (13.960)	3.796*** (14.860)	3.607*** (27.760)
F-statistic	838.830	-	-	-
Prob.	0.0000	-	-	-
Adj. R²	0.818	-	-	-
Pseudo R²	-	0.632	0.571	0.523

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

Table 7 presents the OLS and QR results on the impact of the gold volatility index, crude oil volatility index, and oil and gold price uncertainty on the IPC (MXX) index. According to the OLS results, there is a positive relationship between oil prices and the oil volatility index with the IPC (MXX) index, where a 1% increase in oil prices causes a 0.255% increase in the index, and a 1% increase in the oil volatility index causes a 0.220% increase. On the other hand, a 1% increase in gold prices leads to a 0.151% decrease in the IPC (MXX) index, and a 1% increase in the gold volatility index results in a 0.206% decrease. These findings are consistent with earlier research, such as Morales Fernández Rafaelly and Santillán-Salgado (2020), Santillán-Salgado et al. (2017), and Valdés et al. (2012), as well as Singhal et al. (2019) and Al-Ameer et al. (2018). In the QR analysis, global oil price uncertainty has a significantly positive impact on the IPC (MXX) index at high (75%), medium (50%), and low (25%) quantiles. Similarly, oil volatility index positively impacts the IPC (MXX) index at medium (50%) and high (75%) quantiles, while it has a negative effect at low (25%) quantiles. Additionally, gold prices and the gold volatility index have a significant negative effect on the IPC (MXX) index at all quantile levels. These results align

with the OLS findings and are consistent with the explanations in Table 4, reflecting the similar impact of oil price uncertainty in developing countries like Mexico and Türkiye.

5. DISCUSSION

This study aims to examine the effects of global gold price uncertainty on the stock markets of MIST countries. The research evaluated the impact of uncertainties in gold and oil prices during the crisis periods that began with the COVID-19 pandemic and continued with the effects of the Russia-Ukraine war on stock prices in these emerging and developed markets. As a dataset, daily closing prices from March 11, 2020, to January 31, 2023, were used, and the analyses were conducted using the ordinary least squares (OLS) and panel quantile regression (PQR) methods.

The findings of the study have revealed that, in terms of the economies of Turkey, Indonesia, and Mexico, oil prices and the oil volatility index are statistically significant and positively correlated with the stock markets. This situation indicates that the increase in oil prices has a positive effect on the stock markets of these countries and that an increase in uncertainty (volatility) in the oil market is observed along with an increase in market values. Countries like Turkey, Indonesia, and Mexico are both oil exporters and consumers. Among these countries, since Mexico is an oil-exporting country, it is thought that the increase in oil prices creates positive effects in the economy and thus contributes to the rise of the stock market. In net oil-importing countries like Turkey and Indonesia, the energy sector holds a significant share in stock market valuations, so increases in oil prices can lead to higher profits for energy companies, causing stock prices to rise. Similarly, in the economies of Turkey and Indonesia, the increase in the oil volatility index indicates increased market activity, which can create opportunities for some investors. Therefore, volatility can have a positive pricing effect during certain periods. As a result, it can be said that the positive and significant impact of oil prices and their volatility on stock markets in these countries is due to the energy sector, as well as the overall economic conditions and the increase in global demand, which positively affect market perceptions. In response to the rise in oil prices, a negative and statistically significant relationship has been identified between gold prices, the gold volatility index, and stock markets in emerging countries (Turkey, Indonesia, and Mexico). The perception of gold as a safe haven by investors, their shift from stocks to gold during crisis periods, and consequently the decline in stock markets support this outcome. On the other hand, in a developed economy like South Korea, a positive relationship has been identified between both gold and oil prices and stock prices. The reason for this can be explained by the economy's high integration with

global trade, strong sector structure, and institutional investor behaviours. Rising energy and gold prices in developed economies, along with signs of economic recovery, may have increased investor interest in stock markets. However, the existence of a negative relationship between gold and oil volatility indices and the South Korean stock markets is thought to be due to the increase in volatility triggering investors' risk-averse behaviour, leading them to exit the stock markets and consequently creating negative pricing pressure in the markets.

These results reveal that the effects of global commodity prices and uncertainties on stock markets in emerging (Turkey, Indonesia, and Mexico) and developed (South Korea) markets are shaped by different dynamics. In developing countries, the positive impact of oil prices on the market is due to the commodity-export-based economic structure of these countries, while the negative impact of gold on stock markets is more pronounced due to its safe-haven characteristic. On the other hand, in developed markets, economic diversity and market depth differentiate the impacts of both commodity prices and volatility indices. As a result, it can be said that the impact of uncertainties in gold and oil markets on stock markets during crisis periods shows heterogeneity on a country basis, and therefore, policymakers and investors should develop strategies taking into account the specific characteristics of each country. Especially for developing markets like the MIST countries, understanding how they are affected by global uncertainties is of critical importance for financial stability and risk management.

6. CONCLUSION

The escalation of economic uncertainty, triggered by the COVID-19 outbreak and the Russia-Ukraine war, has led to a rise in gold and oil prices, which have also affected countries' economies. Although this effect varies according to the development levels of countries, all countries' economies have been affected by these increases. Especially during times of crisis and war, the safe haven function of gold compared to other financial assets is being investigated, and these studies have highlighted the effects of COVID-19 in recent times (Demirdöğen and Emeç, 2022). Similarly, the increases and uncertainties in oil prices have been among the topics that have been researched and discussed in recent times. These developments constitute the motivation of the study.

In the study conducted with this motivation, the degree to which the stock markets of the MIST countries, namely Mexico, Indonesia, South Korea, and Türkiye, are affected by the uncertainty in global oil and gold prices has been examined. In line with this aim, the crisis periods starting with the Covid-19 pandemic crisis, causing uncertainty in oil and gold prices, and continuing with

the Russia-Ukraine war have been taken into account in the study. Accordingly, the study's data set consists of daily closing prices between March 11th, 2020, when COVID-19 was announced a pandemic by the WHO, and January 31st, 2023, when the study was conducted.

The analysis part of the research has two stages. The first is the stationarity condition of the series, which is expressed as a pre-test, and the second is the regression results showing the relationship between the variables. To address the spurious regression issue, the study initially assessed the stationarity of the variables with the Extended Dickey-Fuller (ADF) unit root test. The first-order differences of the non-stationary variables at the $I(0)$ level were taken, and the stationarity condition at the $I(1)$ level was met. Once the stationarity of the variables was confirmed, the relationship between them was analyzed using OLS and PQR tests. The OLS test revealed that a significant and positive relationship exists between stock prices and oil prices, and a significant and negative relationship exists between stock prices and gold prices in the developing economies of Türkiye, Indonesia, and Mexico. Likewise, the effect of oil price volatility on stock prices is significant and positive, and the effect of volatility in gold prices on stock prices is significant and negative for these developing countries' economies. For the advanced economy of South Korea, there is a significant and positive relationship between stock prices and both oil and gold prices. The study has concluded that there exists a significant and negative association between the volatility indices of oil and gold and the stock prices.

According to the PQR analysis, which provides a more detailed analysis, the impact of uncertainty in oil volatility index, gold and oil prices, and gold volatility index on the BIST 100 index in Türkiye at high (75%), medium (50%) and low (25%) quantile levels are similar to the results obtained from OLS. Accordingly, uncertainty in gold and oil prices has a similar effect on the JKSE index at low (25%), medium (50%), and high (75%) quantile levels for the Indonesian economy. Oil volatility index has a effect on the JKSE index at high (75%) quantile levels similar to the results obtained from OLS, while the effect of oil volatility index on the JKSE index is positive but insignificant at the (50%) quantile level and a negative and insignificant effect at the low (25%) quantile level. The gold volatility index has an effect on the JKSE index at low (25%) and high (75%) quantile levels similar to the results obtained from OLS, while the effect of the gold volatility index on the JKSE index at medium (50%) quantile levels is negative but insignificant.

For the Mexican economy, the impact of uncertainty in gold and oil prices and gold volatility index on the IPC (MXX) index at high (75%), medium (50%), and low (25%) quantile levels is similar to the results of the OLS. The effect of the oil volatility index on the IPC(MXX) index was negative and significant at the low (25%) quantile level, while it had a significant and positive effect at medium (50%) and high (75%) quantile levels.

In the case of the developed country South Korea, the effect of uncertainty in gold volatility index, oil volatility index, gold prices, and oil prices at high 75%, medium (50%), and low (25%) quantile levels varied according to the results of the OLS.

It is thought that the findings and implications of the study will significantly contribute to the literature. Because, in the literature, the effects of uncertainties on financial markets are generally evaluated through singular commodities like gold or oil, and the impacts of crises are mostly limited to specific periods. Again, most studies either focus solely on the effects of the COVID-19 pandemic or the effects of the Russia-Ukraine war separately. Additionally, the majority of the studies focus on developed countries or BRICS countries (Morina et al., 2024; Memon et al., 2024; Dontoh et al., 2024; Jareño et al., 2023; Li et al., 2022; Yousef and Shehadeh, 2020). This study, by addressing the Covid-19 and Russia-Ukraine global crisis together and simultaneously analysing both price and volatility-based uncertainties in the gold and oil markets, fills an important gap. Additionally, the analysis is conducted in MIST countries; these countries are relatively under-researched but strategically important emerging markets. Thus, the study is expected to make a significant contribution to the literature on the asymmetric effects of global uncertainties on emerging markets.

The limitations of this study are confined to the period immediately following the impacts of the COVID-19 pandemic and the Russia-Ukraine war, which may prevent a full reflection of long-term effects. Again, the analyses only examine the impact of uncertainties in oil and gold prices, and the effects of other important commodities or financial instruments (such as exchange rates, other precious metals, energy products, etc.) have not been included in the study. Additionally, since the study focusses solely on MIST countries, it may not be generalisable to other emerging or developed country markets.

Suggestions for Future Studies: In addition to oil and gold prices, the inclusion of other commodities such as copper and natural gas, as well as exchange rates, cryptocurrencies, and bond markets, in the study of the effects of uncertainties could broaden the scope of the research. To compare the responses of different market structures to uncertainties, a comparative analysis of emerging

and developed markets outside the MIST countries can be conducted. Not only price and volatility-based uncertainties, but also the use of different uncertainty indices such as economic policy uncertainty (EPU) and geopolitical risk (GPR) in the analyses can provide more comprehensive results.

Political Implications: The results of this study hold great significance for investors who are interested in investing in financial assets and real estate. The study provides information to investors who wish to diversify their investment portfolios by investing in oil, stock markets, and gold. By focusing on current issues such as gold, which is seen as a safe haven during times of crisis, the study is expected to benefit investment institutions, portfolio managers, and economic decision-makers.

1. Investors who seek to lower the systematic risk in their portfolios and are averse to risk may opt for diversification by investing in both gold and stocks, instead of relying solely on one type of asset or security.
2. Risk-taking investors are recommended to choose one of the assets in their portfolio rather than a combination of gold and stocks. In particular, results from developing countries revealed an inverse relationship between stock and gold prices.
3. To reduce their risk of losses in the stock market, investors who intend to invest in gold, which they regard as a safe haven, will be able to protect their portfolio from volatility in the stock market.
4. The study results are expected to assist policymakers in making decisions in the face of fluctuations and uncertainties in commodity and financial markets.

7. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

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9. AUTHOR CONTRIBUTIONS

F.P: Conceptualization, Methodology, Data Collection, Writing - Original Draft.

M.R.G: Methodology, Analysis and Interpretation, Writing - Critical Appraisal and Revision.

M.T: Literature Review, Analysis, Interpretation of Findings.

F.D: Data Collection, Visualization, Table and Graph Preparation.

A.B: Bibliography Editing, Writing - Proofreading and Language Editing

10. ETHICS COMMITTEE STATEMENT

Since the study did not include research involving human participants or animal subjects, approval from an ethics committee was not necessary.

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COOKING FUEL CHOICES: THE CASE OF TÜRKİYE¹



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ABSTRACT | This research seeks to examine how socio-demographic and economic variables influence the cooking fuel choices of households in Türkiye. This study employs a multinomial probit model to examine 47.529 households using data from the Turkish Statistical Institute's 2015–2018 Household Budget Survey. The analysis incorporates explanatory variables including household income, household size, dwelling type, heating system, educational attainment, and marital status. Income, household size and housing type are shown to be important in determining fuel choice. Households with central heating prefer cleaner fuels, while households with traditional heating systems use wood and coal. Policy recommendations include promoting cleaner cooking fuels through subsidies for low-income households and improving energy infrastructure in rural areas. The research highlights the importance of cleaner energy for households and the findings provide guidance on how best to shape energy policies for Türkiye.

Keywords: Cooking energy, energy preference, multinomial probit model

JEL Codes: Q40, Q41, C35

Scope: Business administration

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¹ It has been declared that the relevant study complies with ethical rules.

² This study is derived from the master thesis titled “Studying with multinomial probit model of the factors affecting energy consumption preferences of households in Turkey” written by Feyza DAHASERT under the supervision of Prof. Dr. Abdulkerim KARAASLAN.

YEMEK PİŞİRME YAKITI TERCİHLERİ: TÜRKİYE ÖRNEĞİ



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ÖZ Bu çalışma, Türkiye'deki hanelerin yemek pişirme yakıt tercihini etkileyen faktörleri incelemeyi amaçlamakta olup, sosyo-demografik ve ekonomik belirleyicilere odaklanmaktadır. Türkiye İstatistik Kurumu'nun Hanehalkı Bütçe Anketi (2015-2018) verilerini kullanarak Multinomial Probit Modeli ile gerçekleştirilen analiz, 47.529 haneyi kapsamaktadır. Çalışmada gelir, hanehalkı büyüklüğü, konut türü, ısıtma sistemleri, eğitim durumu ve medeni hal gibi değişkenler incelenmektedir. Bulgular, gelir, hanehalkı büyüklüğü ve konut türünün yakıt tercihlerinde önemli belirleyiciler olduğunu göstermektedir. Merkezi ısıtma sistemine sahip hanelerin daha temiz yakıtları kullanma olasılığının daha yüksek olduğu, buna karşın geleneksel ısıtma sistemlerine sahip hanelerin ise ağırlıklı olarak odun ve kömür kullandığı tespit edilmiştir. Politika önerileri arasında düşük gelirli haneler için temiz pişirme yakıtlarının sübvansesi edilmesi ve kırsal bölgelerde enerji altyapısının iyileştirilmesi yer almaktadır. Çalışma, haneler için daha temiz enerji seçeneklerinin önemini vurgulamakta ve Türkiye'deki enerji politikalarının şekillendirilmesine yönelik değerli öngörüler sunmaktadır.

Anahtar Kelimeler: Pişirme enerjisi, enerji tercihi, multinomial probit model

JEL Kodları: Q40, Q41, C35

Alan: İşletme

Türü: Araştırma

1. INTRODUCTION

Energy has emerged as an indispensable need for sustaining human life throughout history. In the early periods, people met their energy needs with traditional resources such as wood, coal, and dung, which were easily available and accessible in nature. However, the swift rise in the global population, coupled with the effects of technological progress, has led to a substantial increase in energy demand. As a result, the traditional resources used to meet this rising demand have become insufficient due to their limited availability in nature and the limitations of their use.

It has also been observed that these resources, which have become insufficient, also harm the surroundings and health. The use of wood, one of these harmful fuel types, leads to various negative effects such as soil erosion, desertification, and a reduction in forests (Danlami and Applanaidu, 2018, p. 266). Due to the excessive consumption of traditional resources in households, indoor air pollution levels are also significantly high, causing residents to suffer from respiratory diseases and, in some cases, even leading to fatalities (Hou et al., 2017, p. 538). There has been a transition towards more environmentally friendly fuels that pose reduced risks to both ecological systems and public health. As a result, people have turned to fuels, which are considered cleaner and less detrimental to human health. With the discovery of these energy sources, particularly developed countries have increasingly adopted these cleaner and more environmentally sensitive fuels. However, in rural areas and underdeveloped countries, energy types that threaten human health and the environment continue to be heavily consumed.

Individuals utilize various energy sources across all facets of contemporary life. Initially, one might think of fundamental requirements such as heating, illumination, cooking, and access to hot water. The extensive integration of clean energy sources is poised to significantly reduce environmental harm and safeguard human health. This concern underpins the rationale for the research. The apprehension surrounding this issue forms the foundation for the research. The objective of this research is to examine the socio-demographic, economic determinants that affect the choice of cooking fuel among households in Türkiye. Gaining insight into these elements will provide critical data for policymakers operating in this area.

This paper makes an original contribution by analyzing the socio-economic and demographic factors determining the cooking fuel preferences of households in Türkiye using a large data set. Using the Multinomial Probit Model, the analysis reveals the impact of not only economic indicators but also multidimensional factors such as housing characteristics, heating systems,

educational attainment and social habits on fuel preferences. With this approach, the paper elaborates on micro-level determinants, which have not been sufficiently addressed in the literature, and provides concrete and applicable recommendations for the development of energy policies. As a result, the findings of the study constitute a valuable resource for both academia and policymakers, emphasizing the importance of strategic interventions in the clean energy transition process.

2. LITERATURE REVIEW

The utilization of cooking fuels within households has emerged as a critical area of investigation across multiple nations, with a plethora of studies examining the determinants that affect fuel choices and the shift towards more environmentally friendly energy alternatives. Heltberg (2004) conducted an analysis covering eight countries using the multinomial logistic model. The research indicated that contemporary fuels are utilized more frequently in urban regions in contrast to their rural counterparts. Additionally, larger households were found to favor solid fuels. The results of Pundo and Fraser (2006) corroborate this observation, as they examined the selection of cooking fuels in Kisumu, Kenya, employing the multinomial logit model. Their research indicated that variables such as the educational levels of partners, their housing type, and the nature of meals prepared significantly affected fuel selection, with firewood emerging as the predominant fuel source.

Rao and Reddy (2007) and Farsi, Filippini, and Pachauri (2007) both identified key socio-economic factors such as per capita income, household size, and education levels as determinants in fuel preferences. Farsi, Filippini, and Pachauri (2007) further noted that lower household income is linked to increased firewood use, making the shift to cleaner fuels more challenging. Similarly, Akpalu, Dasmani, and Aglobitse (2011) highlighted that firewood and coal are predominant in developing countries, despite government policies promoting cleaner fuels such as LPG. The preference for traditional fuels, however, remains significant, as shown in the Living Standards Survey in Ghana.

Nnaji, Ukwueze, and Chukwu (2012) and Özcan, Gülay, and Üçdoğruk (2013) corroborated these findings in Nigeria and Türkiye, respectively. In both investigations, socio-demographic variables such as income and educational attainment were significant in shaping fuel preferences. Nnaji, Ukwueze, and Chukwu (2012) identified that income levels and the educational background of women are pivotal in fuel selection in rural Nigeria, where firewood continues to be the predominant cooking fuel. Similarly, Özcan, Gülay, and Üçdoğruk (2013) discovered that factors for instance, revenue, the size of the dwelling, and whether

individuals reside in urban or rural areas affect energy consumption behaviors in Türkiye.

Further studies, including Rahut, Das, De Groote, and Behera (2014) in Bhutan, Mensah and Adu (2015) in Ghana, and Nlom and Karimov (2015) in Cameroon, similarly emphasize the importance of socio-economic factors in fuel choice. Rahut et al. (2014) highlighted that urban areas tend to adopt cleaner fuel alternatives due to higher income levels, while rural areas largely depend on traditional biomass fuels.

Studies focusing on Nigeria Nnaji, Eze, Uzoma, and Nnaji (2021) and Tanzania Yongolo, Mkelenga, and Mpeta (2023) suggest that despite the preference for traditional fuels, the adoption of cleaner energy sources significant health and environmental benefits. Moreover, the implementation of government policies that advocate for cleaner energy alternatives is essential in altering these preferences. Al-Janabi, Woolley, Thomas, and Bartington (2021) highlighted that the shift towards clean energy has the potential to enhance public health, especially in pediatric populations.

In the context of heating, Çebi Karaaslan, Algül, and Karaaslan (2022) analyzed household preferences for heating fuels in Türkiye, finding that income, education, and household characteristics significantly affect fuel choices. Similar trends were observed in Tanzania, where education and income were shown to influence the preference for cleaner energy, although traditional fuels remain dominant. These studies collectively highlight the significant role that socio-economic factors, education, and government policies play in shaping household energy preferences and the transition toward cleaner fuels. The results indicate that as household income rises, there is a greater propensity for the integration of renewable energy sources Liao, Chen, Tang, and Wu (2019).

Emagbetere, Odia, and Oreko (2016) furthered this discourse by examining the determinants that affect household energy selection for cooking within the Ikeja region of Lagos State. Utilizing oral interviews and questionnaires as their methodological approach, the research revealed that kerosene and LPG are the predominant cooking fuels favored by households, while a limited number of household's resort to using wood, coal, or electricity. Education level, income level, and employment type were significant in determining fuel choice.

Akeh, Adamu, Adamu, and Ade (2023) investigated the cooking energy preferences among households in Northeast Nigeria, revealing that variables such as income, educational attainment, and geographical location significantly affect fuel selection. Households with lower income and larger sizes showed a preference for traditional fuels, including wood and coal, whereas those with

higher income and education levels were more inclined to utilize cleaner energy alternatives.

Tiwari, Jana, and Bandyopadhyay (2024) reported that households in India consider various factors—economic status, fuel cost, accessibility, and efficiency—When choosing energy sources for cooking and illumination. Their study showed that households using clean energy can access more efficient energy at a lower cost, emphasizing the significance of adopting clean energy sources.

In summary, although the shift towards cleaner energy sources is apparent in numerous urban settings, rural areas, particularly in developing nations, remain largely dependent on conventional fuels such as wood and coal. Socio-economic determinants, such as income levels, educational achievement, and the structure of households, consistently impact the selection of fuel types. It is imperative for policymakers to prioritize the promotion of cleaner energy options, enhance energy infrastructure, and tackle the socio-economic challenges that impede the transition to cleaner fuels.

3. METHODOLOGY

3.1. Data

The research utilized data sourced from the Household Budget Survey carried out by TurkStat during the years 2015, 2016, 2017, and 2018, encompassing a total of 47,529 household heads.

3.2. Variables

The dependent variable of the study pertains to the category of fuel utilized by households for cooking purposes. The categories of the dependent variable include solid fuels (wood, coal, dung), liquid fuels (LPG, fuel oil), natural gas, and electricity.

The "solid fuels" category for the dependent variable was grouped based on the studies of Mensah and Adu (2015), Emagbetere and Odia and Oreko (2016), Stabridis and Gameren (2018), Paudel and Khatri and Pant (2018), and Williams and Thompson et al. The "liquid fuels" category was grouped according to the studies by Özcan and Gülay and Üçdoğruk (2013), and Paudel and Khatri and Pant (2018). The "natural gas" and "electricity" options were considered separately, following the methodology of Özcan and Gülay and Üçdoğruk (2013).

The independent variables include the household head's demographics, household size, type of residence, income level, and energy sources for heating and hot water. Additionally, energy types are classified into traditional, transition, and advanced fuels.

In the groupings, “wood and dung” are categorized as “traditional fuels,” based on the studies of Heltberg (2004), Rahut and Das et al. (2014), Baiyegunhi and Hassan (2014), Nlom and Karimov (2015), Buba and Abdu et al. (2017), Joshi and Bohara (2017), Adusah-Poku and Takeuchi (2019), Nwaka and Uma and Ike (2020), and Lokonon (2020). The “transition fuels” category includes only “coal,” with its inclusion being influenced by the studies of Heltberg (2004), Rahut and Das et al. (2014), Nlom and Karimov (2015), and Buba et al. (2017). The “advanced fuels” category comprises “fuel oil, natural gas, LPG, and electricity,” and this grouping is based on the studies of Heltberg (2004), Rahut and Das et al. (2014), Mensah and Adu (2015), and the studies of Nlom and Karimov (2015), Joshi and Bohara (2017), Buba and Abdu et al. (2017), Adusah-Poku and Takeuchi (2019), Nwaka and Uma and Ike (2020), and Lokonon (2020). In addition, “fuel-oil” fuel type, which is one of the variables included in the two grouping questions, was evaluated in the category of advanced fuels because it is more harmless than coal and does not produce harmful substances such as dust and soot (Termodinamik.info, n.d.).

3.3. Multinomial Probit Model

Many studies have been conducted in the analysis of categorical data, starting with binary choice models. Following research on binary models, multinomial models with a nominal structure and a dependent variable having more than two preference options were explored. Two prominent models in this context are the Multinomial Logit Model (MNL) and the Multinomial Probit Model (MNP) (Altınışık, 2007, p. 20). The MNL model is constrained by the independence of irrelevant alternatives (IIA) assumption, which has led to challenges in numerous research endeavors. Consequently, the MNP was introduced as an alternative, characterized by the assumption that the error terms in the random utility framework follow a normal distribution. The MNP model was first introduced by Thurstone in 1927 (Maddala, 1986, p. 62). The main advantage of the MNP is its ability to account for correlated errors between choices, thereby eliminating the IIA constraint (Long, 1997, p. 184-185).

4. FINDINGS

A MNP was employed to ascertain the determinants affecting the fuel type selections made by households participating in the study. The model was tested for multicollinearity among the independent variables. Multicollinearity occurs when there is a strong relationship between some or all of the independent variables in regression models with more than two independent variables (Tari, 2012, p. 157). Variance Inflation Factors (VIF) were found to be no less than 5,

indicating that there is no multicollinearity problem (Çebi Karaaslan, 2021, p. 293).

Table 1 displays the results of the model estimation along with the Variance Inflation Factor (VIF) values. The dependent variable's liquid fuels category serves as the reference category. The results suggest that the VIF values for all independent variables are below 5, suggesting the absence of multicollinearity issues.

Marginal effects denote the variation in the predicted likelihood of selecting a particular fuel type for cooking as a result of a one-unit alteration in the independent variable. The findings related to the marginal effects for the MNP are displayed in Table 2.

Table 1: Multinomial Probit Model Analysis Results

Variables	Solid Fuels			Natural Gas			Electricity			Vif Value s
	β	Std. Error	P	β	Std. Error	P	β	Std. Error	P	
Constant	-2.037	0.233	0.000*	-3.336	0.265	0.000*	-2.154	0.332	0.000*	
Age	0.005	0.002	0.018**	-0.008	0.002	0.000*	-0.010	0.003	0.000*	2.02
Net Usable Are (m2)	-0.001	0.001	0.384	-0.001	0.001	0.006*	-0.000	0.001	0.876	1.22
Household Size	0.155	0.010	0.000*	0.077	0.013	0.000*	0.144	0.017	0.000*	1.44
Year (reference:2015)										
2016	0.030	0.060	0.621	-0.004	0.054	0.934	-0.085	0.085	0.316	1.54
2017	0.234	0.061	0.000*	-0.018	0.054	0.744	-0.234	0.083	0.005*	1.55
2018	0.250	0.076	0.001*	-0.151	0.058	0.009*	-0.393	0.107	0.000*	1.99
Annual Disposable Income (reference: level 1 income)										
level 2 income	-0.064	0.056	0.253	0.037	0.060	0.539	-0.180	0.098	0.067**	1.71

level 3 income	- 0.29 1	0.06 6	0.000*	0.06 1	0.06 2	0.320	- 0.20 3	0.11 0	0.064** *	2.03
level 4 income	- 0.18 3	0.08 7	0.035**	0.06 7	0.07 0	0.338	- 0.02 1	0.11 4	0.852	2.68
Type of Dwelling (reference: Apartment)										
Detached Housing	- 0.84 4	0.09 8	0.000*	0.78 0	0.04 6	0.000*	- 0.37 4	0.08 2	0.000*	2.11
Date of Construction of the Building (reference: 2001 and later)										
1960 and before	0.02 0	0.07 8	0.801	- 0.28 6	0.13 7	0.037**	- 0.56 0	0.16 4	0.001*	1.35
1961-1980	- 0.25 6	0.06 6	0.000*	- 0.21 3	0.05 8	0.000*	- 0.45 3	0.09 6	0.000*	1.58
1981-2000	- 0.25 0	0.05 9	0.000*	- 0.08 1	0.04 2	0.052** *	- 0.42 6	0.07 3	0.000*	1.46
Basic Heating System (reference: stove)										
Heating System	- 0.92 7	0.24 0	0.000*	0.50 6	0.06 4	0.000*	0.58 3	0.11 8	0.000*	2.05
Floor Heating System	- 0.98 7	0.34 0	0.004*	2.34 8	0.05 7	0.000*	0.33 5	0.14 3	0.019**	4.42
Electricity-Air Cond.	- 1.00 2	0.33 0	0.002*	- 3.49 1	0.11 3	0.000*	- 0.97 3	0.14 0	0.000*	1.76
Main Type of Fuel Used for Heating (reference: transition)										
Traditional Fuels	0.40 7	0.05 4	0.000*	- 0.03 3	0.06 6	0.615	0.40 0	0.10 5	0.000*	2.19
Advanced Fuels	0198	0246	0421	3105	0054	0000*	1.96 0	0.11 0	0.000*	4.24
Type of Fuel Used to Produce Hot Water (reference: traditional fuels)										
Transitional Fuel	- 0.19 2	0.11 0	0.081** *	0.00 2	0.34 5	0.995	0.64 7	0.25 4	0.011**	1.24
Advanced Fuels	- 1.45 2	0.05 0	0.000*	0.44 4	0.21 8	0.042**	0.08 4	0.17 8	0.635	1.38

Marial Status (refence: never married)										
Married	0.335	0.166	0.043**	0.322	0.096	0.001*	-0.538	0.131	0.000*	4.70
Divorced-Husband Died	-0.057	0.181	0.754	0.240	0.109	0.028**	-0.225	0.153	0.142	4.68
Educational Attainment (reference: no schooling-primary school)										
M. School	-2.201	0.059	0.001*	0.023	0.064	0.722	-0.412	0.100	0.000*	2.37
H. School	-0.513	0.091	0.000*	-0.115	0.073	0.113	-0.442	0.128	0.001*	1.84
Higher School	-0.410	0.115	0.000*	-0.335	0.074	0.000*	-0.0318	0.118	0.007*	3.19
Having a Credit Card Usage Habit (reference: none)										
There is	0.439	0.061	0.000*	-0.081	0.044	0.065**	0.006	0.075	0.940	1.46
Whether they have a Habit of Going to the Market (reference: no)										
There is	0.550	0.045	0.000*	-0.198	0.040	0.000*	0.321	0.067	0.000*	1.08
Wheter there is a Person who Saves (reference: no)										
Yes	-0.388	0.056	0.000*	0.053	0.043	0.218	-0.190	0.071	0.008*	1.18
Employment Status in the Survey Month (reference: not working)										
Working	-0.387	0.055	0.000*	0.197	0.051	0.000*	0.165	0.081	0.043**	1.58
*P<0.01; **p<0.05; ***p<0.10										

Table 2: Marginal Effects of the Model

Variables	Solid Fuels		Liquid Fuels		Natural Gas		Electricity	
	dy/dx	Std. Error	dy/dx	Std. Error	dy/dx	Std. Error	dy/dx	Std. Error
Age	0.030*	0.007	0.005*	0.001	-0.008*	0.002	-0.015**	0.006

Net usable area	0.0003	0.002	0.001*	0.0003	-0.001*	0.0005	0.001	0.002
Household size	0.333*	0.040	-0.058*	0.008	0.050*	0.013	0.220*	0.038
Year (reference: 2015)								
2016	0.125	0.210	0.025	0.031	-0.002	0.051	-0.183	0.181
2017	0.828*	0.214	0.027	0.031	-0.030	0.052	-0.526*	0.182
2018	1.123*	0.256	0.070**	0.035	-0.159*	0.058	-0.743*	0.240
Categorical Annual Disposable Income (TL) (reference: level 1 income)								
2nd level income	-0.225	0.193	-0.030	0.036	0.054	0.058	-0.439**	0.219
3rd level income	-0.986*	0.228	-0.003	0.038	0.104***	0.059	-0.495**	0.242
4th level income	-0.460	0.290	0.082**	0.042	-0.045	0.070	0.047	0.244
Type of dwelling (reference: Apartment)								
Detached housing	-3.665*	0.351	-0.455*	0.024	0.841*	0.044	-1.524*	0.176
Date of construction of the building (reference: 2001 and later)								
1960 and before	0.630**	0.308	0.220*	0.068	-0.258***	0.141	-0.932**	0.390
1961-1980	-0.359	0.222	0.146*	0.033	-0.152*	0.057	-0.733*	0.214
1981-2000	-0.562*	0.194	0.075*	0.026	-0.024	0.040	-0.821*	0.160
Basic heating system (reference: stove)								
Central heating	-3.450*	0.773	-0.184*	0.025	0.520*	0.060	0.784*	0.214
F. heating system	-7.027*	1.280	-1.337*	0.036	1.653*	0.041	-1.961*	0.320
Electricity-Air Cond.	-0.383	0.861	0.587*	0.020	-6.087*	0.289	-0.621**	0.288
Main type of fuel used for heating (reference: transition (coal))								
Traditional Fuels	1.055*	0.151	-0.031*	0.011	-0.118	0.092	0.890*	0.241
Advanced Fuels	-4.248*	0.857	-1.732*	0.028	2.512*	0.065	1.077*	0.247
Type of fuel used to produce hot water (reference: traditional fuels)								
Transitional fuel	-0.568	0.492	0.117	0.149	0.004	0.416	1.400**	0.590
Advanced fuels	-4.638*	0.352	-0.080	0.099	0.740*	0.260	-0.014	0.444
Marital status (reference: never married)								
Married	0.695	0.566	-0.206*	0.052	0.337*	0.103	-1.501*	0.254

Divorced	-0.509	0.629	- 0.115**	0.058	0.278**	0.115	- 0.684**	0.298
Educational attainment (reference: no schooling- primary school)								
M. School	-0.581*	0.207	-0.016	0.039	0.070	0.062	-0.922*	0.222
Higher School	-1.346*	0.316	0.072	0.044	-0.029	0.070	-0.796*	0.284
Higher School	- 0.668***	0.379	0.224*	0.044	-0.270*	0.074	-0.283	0.251
Having a credit card usage habit (reference: none)								
There is	1.517*	0.219	0.014	0.025	-0.127*	0.042	0.057	0.166
Whether they have a habit of going to the market (reference: none)								
There is	1.973*	0.167	0.072*	0.023	-0.282*	0.040	0.862*	0.148
Whether there is a person who saves (reference: no)								
Yes	-1.261*	0.191	0.003	0.026	0.114*	0.043	-0.433*	0.157
Employment status in the survey month (reference: not working)								
Working	-1.617*	0.209	-0.106*	0.030	0.226*	0.049	0.188	0.179
*P<0.01; **p<0.05; ***p<0.10								

As regards the marginal effect results from the MNP analyses presented in Table 2, holding other variables constant, a one-unit increase in the age of individuals in the household increases the probability of households preferring solid fuels for cooking by 3%. A one-unit increase in household size increases the probability of households preferring solid fuels for cooking by 33.3%. In 2017 and 2018, individuals are 82.8% and 112.3% more likely to prefer solid fuels for cooking in contrast to the reference category, respectively. Households in the third income level are 98.6% less likely to prefer solid fuels for cooking in contrast to the reference category. Those living in detached houses are 366.5% less likely to prefer solid fuels for cooking in contrast to the reference category. Individuals living in buildings constructed before 1960 are 63% more likely to prefer solid fuels for cooking in contrast to the reference category. Individuals living in buildings constructed between 1981-2000 are 56.2% less likely to prefer solid fuels for cooking in contrast to the reference category. Individuals who use central heating systems and floor heating systems as the main heating system in their households are 345% and 702.7% less likely to prefer solid fuels for cooking, respectively, in contrast to the reference category. Among the fuel types used for heating, those who use traditional fuels are 105.5% more likely to prefer solid fuels for cooking in contrast to the reference category. Those using advanced fuels for heating are 424.8% less likely to prefer solid fuels for cooking in contrast to the reference category. Individuals who use advanced fuels for hot

water are 463.8% less likely to prefer solid fuels for cooking in contrast to the reference category. Secondary school, high school, and college/undergraduate/graduate graduates are 58.1%, 134.6%, and 66.8% less likely to prefer solid fuels for cooking in contrast to the reference category, respectively. Households with credit card ownership are 151.7% more likely to prefer solid fuels for cooking than those without. Those who have the habit of going to the market are 197.3% more likely to prefer solid fuels for cooking than those who do not. In contrast to non-saver households, saver households are 126.1% less likely to prefer solid fuels for cooking. Lastly, those employed in the survey month are 161.7% less likely to prefer solid fuels for cooking than those not employed.

An increase of one year in the age of individuals, while controlling for other variables, results in a 0.5% rise in the likelihood that households will favor liquid fuels for cooking. An increase of one unit in the net usable area of a residence results in a 0.1% rise in the likelihood that households will favor liquid fuels for cooking. Conversely, an increase of one unit in household size leads to a 5.8% reduction in the probability of households opting for liquid fuels for cooking. In 2018, the probability of individuals preferring liquid fuels for cooking increases by 7% in contrast to the reference category. Households in the fourth income level are 8.2% more likely to prefer liquid fuels for cooking in contrast to the reference category. Households living in detached houses are 45.5% less likely to prefer liquid fuels for cooking in contrast to the reference category. Individuals living in buildings constructed before 1960, between 1961-1980, and between 1981-2000 are 22%, 14.6%, and 7.5% more likely to prefer liquid fuels for cooking in contrast to the reference category, respectively. The likelihood of individuals using central heating and floor heating systems as the main heating system in their households decreases by 18.4% and 133.7%, respectively, while the likelihood of individuals using electricity/air conditioning increases by 58.7% in contrast to the reference category. Among the fuel types used for heating, those who use traditional and advanced fuels are 3.1% and 173.2% less likely to prefer liquid fuels for cooking in contrast to the reference category, respectively. The likelihood of individuals who are married or divorced/widowed preferring liquid fuels for cooking decreases by 20.6% and 11.5%, respectively, in contrast to the reference category. College, undergraduate, and graduate graduates are 22.4% more likely to prefer liquid fuels for cooking in contrast to the reference category. Those with the habit of going to the market in the household are 7.2% more likely to prefer liquid fuels for cooking than those who do not. Lastly, individuals who are employed in the survey month are 10.6% less likely to prefer liquid fuels for cooking in contrast to those who are not employed.

An increase of one year in the age of individuals, while controlling for other variables, results in a 0.8% reduction in the likelihood that households will choose natural gas as their cooking fuel. An increase of one unit in the net usable area of a residence results in a 0.1% reduction in the likelihood that households will choose natural gas as their cooking fuel. A one-unit increase in household size increases the probability of households preferring natural gas for cooking by 5%. In 2018, the probability of individuals preferring natural gas for cooking decreases by 15.9% in contrast to the reference category. Households in the third income level are 10.4% more likely to prefer natural gas for cooking in contrast to the reference category. Households living in detached houses are 84.1% more likely to prefer natural gas for cooking in contrast to the reference category. Individuals living in buildings constructed before 1960, between 1961-1980, and between 1981-2000 are 25.8%, 15.2%, and 2.4% less likely to prefer natural gas for cooking in contrast to the reference category, respectively. The likelihood of individuals using central heating and floor heating systems as the main heating system in their households increases by 52% and 165.3%, respectively, while the likelihood of using electricity/air conditioning decreases by 608.7% in contrast to the reference category. Among the fuel types used for heating, those who use advanced fuels are 251.2% more likely to prefer natural gas for cooking in contrast to the reference category. Those who use advanced fuels for hot water are 74% more likely to prefer natural gas for cooking in contrast to the reference category. The likelihood of college, undergraduate, and graduate graduates preferring natural gas for cooking decreases by 27% in contrast to the reference category. Households that use credit cards are 12.7% less likely to prefer natural gas for cooking in contrast to those that do not. Households with the habit of going to the market are 28.2% less likely to prefer natural gas for cooking in contrast to those who do not have this habit. In contrast to households with non-savers, households with savers are 11.4% more likely to prefer natural gas for cooking. Finally, individuals employed in the survey month are 22.6% more likely to prefer natural gas for cooking in contrast to those who are not employed.

Holding all other variables constant, a one-year increase in individual age is associated with a 0.8% decline in the probability that households will opt for natural gas as their cooking fuel. Additionally, an increase of one unit in the net usable area of the home corresponds to a 0.1% decrease in the likelihood of households preferring natural gas for cooking. A one-unit increase in household size increases the probability of households preferring natural gas for cooking by 5%. In 2018, the probability of individuals preferring natural gas for cooking decreases by 15.9% in contrast to the reference category. Households in the third income level are 10.4% more likely to prefer natural gas for cooking in contrast

to the reference category. Households living in detached houses are 84.1% more likely to prefer natural gas for cooking in contrast to the reference category. Individuals living in buildings constructed before 1960, between 1961-1980, and between 1981-2000 are 25.8%, 15.2%, and 2.4% less likely to prefer natural gas for cooking in contrast to the reference category, respectively. The likelihood of individuals using central heating and floor heating systems as the main heating systems in their households increases by 52% and 165.3%, respectively, while the likelihood of using electricity/air conditioning decreases by 608.7% in contrast to the reference category. Among the fuel types used for heating, those who use advanced fuels are 251.2% more likely to prefer natural gas for cooking in contrast to the reference category. Those who use advanced fuels for hot water are 74% more likely to prefer natural gas for cooking in contrast to the reference category. The likelihood of college, undergraduate, and graduate graduates preferring natural gas for cooking decreases by 27% in contrast to the reference category. Households with credit card use are 12.7% less likely to prefer natural gas for cooking than those without credit cards. Households with the habit of going to the market are 28.2% less likely to prefer natural gas for cooking in contrast to those without this habit. In contrast to households with non-savers, households with savers are 11.4% more likely to prefer natural gas for cooking. Lastly, individuals who are employed during the survey month are 22.6% more likely to prefer natural gas for cooking in contrast to those who are not employed.

5. RESULTS

This research seeks to examine the socio-demographic and economic determinants that affect the choices of cooking fuel among households in Türkiye. Variables such as age, net area of the dwelling, household size, year, annual disposable income, type of dwelling, date of construction of the dwelling, primary heating system, type of fuel used for heating and hot water, marital status, and educational status were found to be statistically significant in determining household cooking fuel preferences. Additionally, factors such as credit card usage, market-going habits, saving habits, and employment status during the survey month also played a significant role. Overall, when analyzing all marginal effect results, factors such as age, household size, net area of the dwelling, type of dwelling, heating system used, credit card ownership, market-going habits, education level, marital status of the household head, construction date of the dwelling, and the fuel types used for heating and hot water were found to be statistically significant. These findings indicate that socio-economic and demographic factors play a crucial role in shaping households' cooking fuel preferences.

6. DISCUSSION AND CONCLUSION

When comparing the outcomes of this investigation with similar findings in the literature, several parallels emerge. Consistent with our results, the education level variable is found to be significant in studies by Pundo and Fraser (2006), Rao and Reddy (2007), Farsi and Filippini (2007), Nnaji, Ukwueze, and Chukwu (2012), Baiyegunhi and Hassan (2014), Nlom and Karimov (2015), Alem, Beyene, Köhlin, and Mekonnen (2016), Karimu, Mensah, and Adu (2016), Ifegbesan, Rampedi, and Annegarn (2016), and Emegbetere, Odia, and Oreko (2016). Similarly, the age variable was also found to be significant in the studies by Nnaji et al. (2012), Baiyegunhi and Hassan (2014), Nlom and Karimov (2015), and Karimu et al. (2016). Household size, another key factor in this study, is consistent with the findings of Rao and Reddy (2007), Karimu et al. (2016), and Ifegbesan et al. (2016).

Regarding income, the literature shows mixed results. While it is significant in studies such as Rao and Reddy (2007), Farsi and Filippini (2007), Nnaji et al. (2012), Baiyegunhi and Hassan (2014), Karimu et al. (2016), and Emegbetere et al. (2016), it is found to be insignificant in others, such as Pundo and Fraser (2006) and Nlom and Karimov (2015). In this study, the income variable was found to be significant, highlighting its critical role in determining access to cleaner and more modern fuel types.

Furthermore, factors such as the type of heating fuel and the type of fuel used for hot water, which are crucial to this research, highlight the direct correlation between energy accessibility and the selection of cooking fuel. These findings emphasize the importance of infrastructure and energy availability in shaping households' fuel preferences.

From a policy standpoint, the findings indicate that the government ought to implement measures to encourage the utilization of clean energy sources. This could be achieved through the provision of subsidies or by ensuring that these energy alternatives are accessible to consumers at more reasonable prices. When household income levels are insufficient and no improvements are made to the cost of clean fuels, households are likely to rely on more polluting and lower-cost alternatives. Without targeted interventions, the transition to clean energy will remain a challenge, particularly for lower-income households.

This study's outcomes yield important implications for the creation of policies that facilitate the transition to clean and modern energy solutions in households across Türkiye. To begin with, the government ought to introduce direct subsidies to enhance the accessibility of clean energy, thus lowering costs for consumers and promoting its use. Furthermore, targeted assistance programs must be established to aid low-income households in their transition to cleaner

energy alternatives. It is crucial to focus on investing in energy infrastructure to improve access to contemporary energy sources, including natural gas and electricity, particularly in rural areas. Given the profound influence that education exerts on energy-related choices, it is important to launch public awareness initiatives that highlight the advantages of clean energy sources to educate and involve the community. Social assistance programs and employment policies aimed at increasing household income could also lead to positive changes in energy preferences. Low-interest loans or microfinance support could be offered to low-income households to facilitate their transition to clean energy. Moreover, programs promoting the utilization of devices that minimize energy consumption should be implemented to reduce energy consumption costs. New residential buildings should be constructed with energy-efficient infrastructure, and incentives should be provided for the renovation of older homes with modern energy systems. The study also highlights the influence of consumer behavior, such as market shopping habits, on energy preferences. To address this, partnerships with local retailers and distribution points should be established to make clean energy sources more accessible.

Finally, to enhance environmental sustainability, renewable energy sources should be promoted, particularly in rural areas, through the widespread adoption of environmentally friendly technologies such as biogas and solar energy. Implementing these policies would not only increase environmentally conscious energy consumption and reduce carbon emissions but also improve households' living standards, contributing to economic and social development.

7. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

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9. AUTHOR CONTRIBUTIONS

AK, FD: Idea;

AK, FD: Design;

AK: Supervision;

FD: Collection and/or processing of resources;

AK, FD: Analysis and/or interpretation;

FD: Literature review;

AK, FD: Author of the article;

AK, FD: Critical review

10. ETHICS COMMITTEE STATEMENT

We declare that all ethical guidelines for authors have been followed by all authors. Ethical approval is not required.

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GÜRCÜKAPI URBAN TRANSFORMATION PROJECT: A MULTIDIMENSIONAL EVALUATION OF STAKEHOLDER PERCEPTIONS¹



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ABSTRACT | This study aims to assess the Gürcükapı Urban Transformation Project from a multidimensional perspective, focusing on the perceptions of property owners. The research examines various aspects, including identity, accessibility, equity, participation, diversity, environmental sensitivity, economic benefits, workplace features, and quality of life. In this study, a descriptive and cross-sectional research design was used to examine the beneficiaries' perceptions of the Gürcükapı Urban Transformation Project from a multidimensional perspective, with data collected through surveys and open-ended questions. Data collected from a survey of thirty-one property owners sheds light on how different dimensions of the transformation process were perceived. The results indicate that the project has been particularly successful in areas such as identity, accessibility, and equity, with high satisfaction observed regarding the preservation of local heritage and design compatible with the environment. However, there are identified areas for improvement, particularly in participation, economic benefits, and quality of life. The study suggests that future projects should be designed in a more inclusive and balanced manner. These findings provide valuable insights for policymakers and urban planners.

Keywords: Urban transformation, stakeholder perceptions, Gürcükapı urban transformation project

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¹ It has been declared that the relevant study complies with ethical rules.

GÜRCÜKAPI KENTSEL DÖNÜŞÜM PROJESİ: HAK SAHİPLERİNİN ALGILARININ ÇOK BOYUTLU DEĞERLENDİRMESİ



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ÖZ | Bu çalışma, Gürcükapı Kentsel Dönüşüm Projesi'ni, hak sahiplerinin algılarını çok boyutlu bir perspektiften değerlendirerek ortaya koymayı amaçlamaktadır. Araştırma, mülk sahiplerinin kimlik, erişilebilirlik, eşitlik, katılım, çeşitlilik, çevresel duyarlılık, ekonomik faydalar, işyeri özellikleri ve yaşam kalitesi gibi farklı boyutlardaki görüşlerini incelemektedir. Bu çalışmada, Gürcükapı Kentsel Dönüşüm Projesi'nin hak sahiplerinin algılarını çok boyutlu bir şekilde incelemek amacıyla betimsel ve kesitsel bir araştırma deseni kullanarak, anket ve açık uçlu sorularla veri toplanmıştır. Otuz bir mülk sahibinden elde edilen anket verileriyle, proje sürecinin çeşitli yönlerinin nasıl algılandığı ortaya konulmuştur. Sonuçlar, projenin özellikle kimlik, erişilebilirlik ve eşitlik gibi alanlarda başarılı olduğunu, yerel mirasın korunması ve çevreyle uyumlu tasarım gibi konularda yüksek memnuniyet sağlandığını göstermektedir. Ancak, katılım, ekonomik fayda ve yaşam kalitesi gibi alanlarda iyileştirme gerekliliği vurgulanmıştır. Çalışma, gelecekteki projelerin daha kapsayıcı ve dengeli bir şekilde tasarlanması gerektiğini önermektedir. Bu bulgular, politika yapıcılar ve şehir planlamacıları için önemli veriler sunmaktadır.

Anahtar Kelimeler: Kentsel Dönüşüm, Paydaş Algıları, Gürcükapı Kentsel Dönüşüm Projesi

JEL Kodları: R30, R38, D78

Alan: Kamu Yönetimi

Türü: Araştırma

1. INTRODUCTION

The global population's rise to one billion took thousands of years, but in just the past two centuries, this number has increased sevenfold, reaching approximately 8 billion (Taagepera & Nemčok, 2024; UNFPA, 2024). This dramatic population growth has been accompanied by an acceleration of urbanization. In 1950, around 30% of the world's population lived in urban areas (Giddens, 2012), while by 2022, this figure had risen to about 60% (UNCTAD, 2022). This shift highlights the urbanization dynamics of the current century. The rapid urbanization process on a global scale has brought with it a range of social, cultural, environmental, demographic, and economic challenges (Moglia et al., 2018). These challenges include factors negatively impacting urbanization, such as excessive and dense population mobility in cities, insufficient housing stock, transportation, environmental and infrastructure deficiencies, informal settlements, chaotic urban development, and uncontrolled growth. In response to these urban issues, both developed and developing countries have introduced the concept of urban transformation (Keleş, 2021).

Urban transformation projects have been widely implemented in recent years across the world to address the social, economic, and environmental challenges faced by major cities. These projects generally aim to transform the outdated and unhealthy urban structures, resolve infrastructure issues, and improve the quality of life, leading to significant changes in urban areas. In Türkiye, the recent surge in urban transformation projects, particularly in major cities, has deepened the discussions in this field. These projects are often implemented with the goals of renewing the building stock, fostering economic development, promoting social integration, and achieving environmental improvements. However, in many cases, the focus has been solely on the physical aspects of transformation, with insufficient attention given to the social, cultural, environmental, and economic impacts. In this context, it is crucial to analyze the effects of urban transformation projects in a more comprehensive manner in order to manage these projects more efficiently and inclusively.

This study evaluates the Gürcükapı Urban Transformation Project from a multidimensional perspective and to explore the perceptions and experiences of the stakeholders regarding the project. The study aims to address the opportunities and challenges encountered in such projects by considering the social, economic, environmental, and cultural dimensions of urban transformation.. This study conducts a comprehensive, multidimensional analysis of the Gürcükapı Urban Transformation Project, examining the perceptions and expectations of the stakeholders involved. The originality of this research lies in its evaluation of not only the physical dimension of urban transformation but also

its social, cultural, environmental, and economic impacts, thereby rendering its findings particularly significant. The findings of this study may offer valuable insights for the planning, implementation, and evaluation of ongoing and planned urban transformation projects in Türkiye.

2. HISTORICAL BACKGROUND OF URBAN TRANSFORMATION

The historical foundations of urban transformation have evolved in parallel with major societal changes that emerged during the 19th century (Gürler, 2003; Polat & Dostoglu, 2007). The processes of industrialization, factory production, and the spread of capitalism—originating in Western Europe and expanding to America and the rest of the world—triggered rapid and unprecedented urban growth (Swingewood, 1998; Çelebi, 2007; Ritzer, 2011). This rapid expansion of cities brought significant challenges such as overpopulation, irregular urbanization, inadequate infrastructure, and housing shortages (Kıray, 2000; Kıray, 2006; Giddens, 2012). These conditions negatively impacted the social and economic structures of urban life, contributing to the deterioration of living conditions, especially in rapidly growing industrial cities.

In response to these challenges, the first urban renewal and transformation efforts were initiated, grounded in the principles of modern urban planning. Notable early examples include the United Kingdom's Housing Acts and Baron Haussmann's renovation of Paris, which aimed not only to modernize urban infrastructure and public health systems but also to create more organized and socially cohesive urban environments (Jordan, 2015; Paccoud, 2016). These initiatives were not merely physical interventions; they reflected broader socio-political goals to reshape social order, hygiene, public health, and urban functionality (Polat & Dostoglu, 2007). During this early phase, urban transformation was closely aligned with the idea of modernity and state-led spatial control, often involving the clearance of so-called “unhygienic” districts and the construction of wide boulevards, transportation systems, and new public facilities. The goal was to make cities not only more efficient and livable but also symbolically representative of new political and economic regimes.

After the devastation of World War II, the significance of urban transformation increased markedly. European cities, many of which had been heavily damaged by war, became sites of large-scale reconstruction efforts. This period marked the rise of more integrated and comprehensive urban policies that included revitalization, renewal, improvement, preservation, legalization, and health restoration strategies (Douglas, 2006; Kocabaş, 2006; Longa, 2011; Zheng

et al., 2014; Evin, 2021; Keleş, 2021). These multi-pronged approaches highlighted the complex and interrelated dimensions of urban transformation. Today, urban transformation is widely acknowledged as a multifaceted intervention strategy aimed at improving cities' physical, environmental, economic, and social conditions (Yaman, 2014). It involves the rehabilitation of deteriorated urban fabrics, renewal of underutilized or risky zones, and enhancement of quality of life through long-term planning frameworks.

Contemporary urban transformation extends beyond addressing issues of poverty and informal housing. It encompasses adaptation to climate change, mitigation of disaster risks (particularly earthquakes and floods), conservation of cultural heritage, and the regeneration of brownfield sites and aging housing stock. This broadened understanding reflects an evolving urban agenda that is shaped by both global and local drivers. The success of urban transformation efforts depends on holistic and inclusive planning that takes into account not only physical renewal but also environmental sustainability, social equity, and public participation (Roberts, 2000). Projects must be developed in line with the specific needs of local communities and aim to address deep-rooted social inequalities. Social justice, equitable development, transparency, and participatory governance are now considered core principles in contemporary urban transformation discourse. Engaging residents and other stakeholders in decision-making processes fosters a sense of ownership and trust, which are essential for the long-term sustainability of transformation efforts.

In summary, the historical evolution of urban transformation demonstrates that while physical restructuring remains a central goal, the concept has increasingly integrated broader socio-spatial and ecological objectives. The modern approach to urban transformation reflects the complexity of urban systems and the need for comprehensive strategies that prioritize not only growth and efficiency, but also resilience, cultural continuity, and inclusive development.

2.1. Historical Development of Urban Transformation in Türkiye

Urban transformation in Türkiye has historically evolved in response to shifting socio-economic, legal, and spatial dynamics. Initially shaped by the consequences of rapid rural-to-urban migration in the mid-20th century, the process has transitioned from informal housing responses to an increasingly institutionalized and risk-oriented framework. Particularly between the 1950s and 1980s, Türkiye witnessed unplanned and accelerated urban growth resulting from internal migration, leading to the proliferation of informal settlements (*gecekondu*) in major metropolitan areas. The absence of a coherent housing strategy or effective urban planning mechanisms during this period produced a

fragmented urban structure characterized by infrastructural inadequacies and socio-spatial inequality (Tekeli, 1998; Kıray, 2007; Tekeli, 2011; Tekeli, 2016; Keleş, 2021). In an attempt to legalize and regulate these areas, the government enacted the Slum Law (Law No. 775) in 1966. However, despite providing legal status to informal settlements, the law was insufficient in curbing unregulated construction and failed to reverse the pattern of irregular urbanization (Şenyapılı, 2014; Tekeli, 2014; Yolcu, 2021).

From the 1980s onward, urban transformation began to be addressed through more formal legal and planning instruments. Laws such as No. 2805 (1983) and No. 2981 (1984) introduced mechanisms for zoning and rehabilitation in slum areas, marking the first significant legal framework for transforming informal settlements into multi-story residential structures (Ataöv & Osmay, 2007; Yolcu, 2021). The enactment of the Zoning Law (Law No. 3194) in 1985 further institutionalized urban transformation efforts by regulating land use and facilitating infrastructure development, particularly through Article 18, which allowed for land readjustment in unplanned neighborhoods (Erdoğan & Ergen, 2005; [Url-1](#)). During this period, the focus began to expand from mere legalization of the built environment to broader interventions such as environmental improvement and selective historic preservation, which also introduced early forms of gentrification.

In the early 2000s, Türkiye's urban transformation agenda gained significant momentum, driven by the increasing involvement of central government agencies, particularly the Housing Development Administration of Türkiye (TOKİ), and the growing influence of public-private partnerships. Legal reforms including the Metropolitan Municipality Law (Law No. 5216, 2004) and the Municipal Law (Law No. 5393, 2005) provided municipalities with enhanced authority to initiate and implement urban transformation projects, while also enabling them to incorporate social infrastructure into redevelopment processes ([Url-2](#); Öztürk et al., 2023). Law No. 5104 (2004), which facilitated the Northern Ankara Entrance Urban Transformation Project, and Law No. 5366 (2005), aimed at the renewal and preservation of historical and cultural assets, reflected a more diversified approach to transformation ([Url-3](#)). These legislative tools institutionalized urban regeneration not only as a solution to physical decay but also as a strategic tool for cultural commodification, economic stimulation, and urban rebranding.

A significant paradigm shift occurred with the enactment of Law No. 6306 on the Transformation of Areas Under Disaster Risk in 2012, which reframed urban transformation as a key national policy for disaster risk reduction. Motivated largely by Türkiye's vulnerability to seismic activity, the law

facilitated the identification and demolition of buildings at risk, while promoting their reconstruction under safer and more resilient standards (Suğur, 2014; Daşkiran & Ak, 2015; Uğur et al., 2016; Ağın & Çelik, 2022). However, the implementation of this framework revealed considerable challenges, including delays in the designation of risky areas, protracted administrative processes, and limited community engagement. Moreover, many urban transformation projects carried out under this law were criticized for accelerating real estate speculation and causing social displacement, raising concerns about the equity and inclusiveness of transformation practices.

In an effort to address these shortcomings, the Ministry of Environment and Urbanization introduced the Urban Transformation Action Plan in 2019. This plan sought to expand the scope of transformation by integrating disaster preparedness with broader urban development goals such as flood mitigation, relocation of industrial zones, and renewal of historic centers (Anadolu Agency, 2019). The devastating earthquakes in Elazığ and İzmir in 2020, followed by the catastrophic Kahramanmaraş-centered earthquakes in 2023, further underscored the necessity of urgent and proactive urban transformation interventions (Efe, Yıldızan & Kiriş, 2024). In response, Law No. 7471 was adopted in 2023 as an amendment to Law No. 6306, introducing the Urban Transformation Directorate to enhance centralized oversight over the planning, inspection, and evacuation of high-risk urban areas.

These developments signal a shift toward a more centralized urban governance model, where the role of local governments in transformation processes has been diminished in favor of state institutions such as TOKİ and the Ministry of Environment, Urbanization, and Climate Change. While this has enabled greater administrative capacity and responsiveness in the face of disaster risks, it has also raised concerns regarding the erosion of participatory governance and the democratic legitimacy of urban transformation processes. Although early efforts focused predominantly on informal settlements, contemporary transformation practices in Türkiye now encompass a broader agenda including risk mitigation, resilience building, environmental sustainability, and cultural heritage preservation.

In conclusion, urban transformation in Türkiye has progressed from reactive slum legalization efforts to proactive, strategic interventions grounded in disaster risk policy and spatial planning. Laws such as No. 5393 and No. 6306 provide the foundational legal framework guiding current practices. However, for urban transformation to achieve its stated goals of safety, inclusivity, and sustainability, it must move beyond physical restructuring and incorporate principles of social equity, public participation, and transparent governance.

Without these, transformation risks becoming an exclusionary process that prioritizes market logics over community well-being and spatial justice.

2.2. Transformation of Historical Areas and the Gürcükapı Urban Transformation Project

The urban transformation policy of Erzurum Metropolitan Municipality (EMM) aims to improve both the physical and social structures of the city. Taking into account the city's historical, cultural, and geographical characteristics, urban transformation projects are designed not only as spatial transformations but also as a means for social and cultural development. The primary goal of urban transformation in Erzurum is to eliminate risky and irregular constructions while preserving historical sites and creating a modern urban structure. EMM has adopted a "Preserved History, Transforming City" motto and has embraced an in-situ transformation model, focusing on revitalizing the city's historical areas (EMM, 2022a, 2022b). The preservation of historical areas, protection of registered monuments, and their revitalization are key objectives in this transformation.

One of the most significant urban renewal initiatives launched by EMM is the Gürcükapı Urban Transformation Project. The aim of this project is to modernize the existing building stock in the region, improve the quality of life, and strengthen the urban infrastructure. While the initial urban transformation projects in Erzurum concentrated on buildings at risk of disasters, the Gürcükapı project was designed as a broad social, economic, and environmental transformation process. This project not only focuses on physical renewal but also aims to improve the social structure of the area and promote economic development. The primary goals of the Gürcükapı Urban Transformation Project include:

- **Preservation of Historical and Cultural Heritage:** Key structures around the historical Gürcükapı Mosque will be uncovered and restored. These areas will be revitalized, ensuring that the historical heritage is preserved.
- **Revitalization of Commerce:** Gürcükapı Square, located on the historic Silk Road, is one of the city's most important commercial hubs. The transformation of this square aims to restore its role as a trade center, with modern and functional structures revitalizing the commercial life of the area.
- **Earthquake Risk and Safety:** The current structures consist of old, earthquake-vulnerable buildings. Their demolition and replacement with

modern, safe structures will be a crucial step in ensuring the safety of people and property.

- **Modern Buildings and Services:** New buildings will be designed with the input of architects and engineers, ensuring that the needs of residents and businesses are met, thus bringing the commercial and residential areas up to modern standards.

The transformation process in Gürcükapı Square has been formalized through specific legal foundations. In line with Article 73 of the Municipal Law No. 5393, EMM declared Gürcükapı Square as an urban transformation area on June 1, 2021, through the 346th Municipal Council decision. On October 14, 2022, with the approval of the Ministry of Environment, Urbanization, and Climate Change (Decision No. 4792040) and under Article 2 of the Disaster Risk Reduction Law No. 6306, the area was designated as a "reserve area." The urban transformation efforts in Gürcükapı Square gained momentum after this designation, proceeding in a planned manner with the following stages:

- **Identification of Property Ownership and Meetings:** The existing structures, land, and ownership rights in the transformation area were identified, and meetings were held with the property owners. Public informational meetings were also organized to gain support for the project.
- **Business Relocation and Agreement:** Before demolition, new business locations were proposed to the owners while ensuring the relocation of businesses from their original sites. Agreements were made regarding compensation, where the difference in cost between the demolition of existing businesses and the construction of new ones was settled.
- **Project Design and Planning:** Various project designs and zoning plans were developed for Gürcükapı Square. These designs considered both the needs of the local population and the historical fabric of the city.
- **Demolition and Construction:** After the planning and design phases, demolition of the existing structures began. Following this, new construction work commenced and was completed in approximately six months.
- **Delivery of New Business Premises:** After the new buildings were completed, new business premises and ownership titles were handed over to the rightful property owners.

Before the implementation of the project, there were 23 parcels and 113 stakeholders in the Gürcükapı Urban Transformation area. The area contained 34 businesses (three of which were owned by EMM) and 10 unregistered structures, totaling 44 independent units. There was also a five-unit apartment building that

was acquired via expropriation. The total parcel area was 3,382.82 m², while the debris area was 10,547.95 m². After the transformation, the total construction cost of the newly built area was approximately 63.37 million TL, with a total construction area of 13,628.15 m². The new development includes 41 independent business units and a 65-vehicle parking lot (2,106 m²). The business area belonging to individuals has been planned at a total of 7,840.70 m².

The Gürcükapı Urban Transformation Project was implemented as part of EMM's urban transformation policies, aiming to modernize the city while preserving its historical and cultural heritage. This project not only sought to eliminate disaster risks but also aimed to strengthen trade and create economic vitality in the region.

3. METHODOLOGY

The aim of this study is to evaluate the Gürcükapı Urban Transformation Project based on the perceptions and expectations of its beneficiaries. The research question of this study is: "What are the perceived impacts of the Gürcükapı Urban Transformation Project on its beneficiaries, and how do these perceptions vary across different dimensions of the project (e.g., identity, accessibility, equality, participation, environmental sensitivity, economic benefits, quality of life)?" This question aims to explore the diverse perceptions of the beneficiaries regarding the project, with a focus on how these perceptions differ across multiple aspects such as the project's impact on identity, accessibility, equity, and participation. By examining these dimensions, the study seeks to gain a comprehensive understanding of the beneficiaries' views on the urban transformation process, shedding light on both positive and negative aspects of the project and offering valuable insights for future urban planning and policy development.

The research design is based on a specific structure that aligns with the purpose and scope of this study. This study utilizes a descriptive and cross-sectional research design to examine the impact of the Gürcükapı Urban Transformation Project on the perceptions of its beneficiaries. The descriptive research design aims to identify participants' perceptions and expectations regarding the project and to define these perceptions across various dimensions. The cross-sectional design allows for data collection within a specific time frame, namely during the completion phase of the project.

The research collects quantitative data through surveys and aims to gain an in-depth understanding of participants' views through open-ended questions. This approach enables the evaluation of participants' perceptions across different dimensions, such as identity, accessibility, equality, participation, environmental

sensitivity, economic benefits, and quality of life. The collected data were evaluated through statistical analysis, and the differences in participants' perceptions were analyzed across these various dimensions. This research design aims to develop a comprehensive and multidimensional understanding of the Gürcükapı Urban Transformation Project.

The population of the research consists of the beneficiaries directly affected by the Gürcükapı Urban Transformation Project. A survey method was used for data collection in this study. The first section of the survey consists of 5 questions aimed at identifying basic demographic characteristics of the participants, such as age, gender, and educational status. The second section asks beneficiaries to evaluate the Gürcükapı Urban Transformation Project. In this section, 40 Likert-type scaled questions (ranging from 1 to 5) were used to assess the project's success level in relation to 10 main dimensions and their sub-criteria. These dimensions and criteria are designed to systematically capture participants' perceptions, expectations, and overall evaluations of the project.

Additionally, four open-ended questions were incorporated to gather participants' perspectives on the Gürcükapı Urban Transformation Project. The first question sought to understand how participants would describe the project in a single sentence, allowing for a concise reflection of their overall perception. The second question aimed to identify what participants considered to be the most significant justification for the project, thus providing insight into the underlying reasons they associate with its implementation. The third question focused on the stakeholders or institutions that participants trusted the most in safeguarding their rights during the transformation process, offering valuable information regarding the role of trust and authority in the context of urban renewal projects. Finally, the fourth open-ended question was about whether any civil society organizations emerged during the urban transformation process. These questions were designed to capture the multifaceted nature of the participants' perceptions and expectations related to the urban transformation process.

The survey form was developed by utilizing previous studies in the literature (Ertaş, 2011; Yıldız, 2018; Biler, 2019) and was presented to the beneficiaries for their opinions. The survey was administered through face-to-face interviews. Participants were informed about the purpose of the survey, confidentiality, and the voluntary nature of data collection, and it was emphasized that participation would be anonymous. Considering the total number of beneficiaries in the area, the total number of beneficiaries was determined to be thirty-four. The survey was conducted between January 2024 and February 2024, and one person could not be reached, while two people did not participate. As a

result, the survey was completed with thirty-one beneficiaries, reaching 91% of the population.

The validity of the study was ensured through expert evaluations of the survey, which confirmed its content and relevance. Additionally, a pre-test (pilot study) was conducted to assess the applicability and comprehensibility of the survey, leading to revisions of certain questions based on the pilot results. The reliability of the study was assessed using the internal consistency coefficient (Cronbach's Alpha), which yielded a value of 0.965, indicating a high level of consistency and reliability. After conducting statistical analyses, the reliability of the data was confirmed, ensuring that the results were consistent and dependable. Moreover, responses to the open-ended questions were analyzed using qualitative analysis, providing deeper insights into the beneficiaries' perspectives on the process.

The survey form consists of various criteria under 10 dimensions to assess the Gürcükapı Urban Transformation Project. Each dimension was supported by questions designed to evaluate different stages of the project. The dimensions and criteria were deductively developed based on a thorough review of the literature. This approach ensured that the framework was grounded in established theoretical and empirical studies, providing a solid foundation for the research. Table 1 presents a comprehensive set of dimensions and criteria used to evaluate the Gürcükapı Urban Transformation Area, which encompasses multiple aspects of urban planning and development.

Table 1: Dimensions and Criteria Used in the Evaluation of the Gürcükapı Urban Transformation Area

DIMENSION	CRITERIA
Quality of Life	Physical and aesthetic design of open spaces Implementation of security measures Provision of local employment opportunities Design of buildings enhancing human comfort
Diversity	Mixed-use and flexible development model Land use in a manner that protects the environment
Equity	Design suitable for the use of the disabled, elderly, and children
Process Management	Management of the process from start to finish
Participation	Societal participation in public decision-making processes
Accessibility	Appropriate design for pedestrian and public transport
Identity	Preservation of local characteristics Preservation of historical buildings Compatibility with the environment

Environmental Sensitivity	Conservation of energy resources Conservation of water resources Conservation of materials Protection of environmental and human health during construction stages Landscape design
Economic Benefit	Increase in property value due to transformation Enhancement of commercial potential
Workplace Features	Satisfaction with the facade of individual properties after transformation Satisfaction with the size of individual properties after transformation Satisfaction with the architectural features of individual properties

Each dimension included in the survey serves a specific purpose in evaluating the success and impact of urban transformation projects. The Quality of Life dimension seeks to enhance the living experience by creating healthier, safer, and more comfortable environments that promote well-being and social interaction. Diversity focuses on accommodating various needs and activities, fostering a dynamic and resilient urban space through mixed-use areas and the integration of diverse socio-economic groups. The Equity dimension ensures inclusivity by addressing the needs of vulnerable groups, promoting social equality, and ensuring equal opportunities for all residents. Process Management emphasizes the importance of overseeing the development process to meet goals, timelines, and quality standards while fostering community participation for greater efficiency and acceptance. The Participation dimension highlights the significance of involving the community in decision-making, ensuring that the transformation reflects the collective interests of residents and enhances social acceptance. Accessibility ensures that urban areas are easy to navigate for everyone, improving mobility and fostering social connections, while also supporting economic development. The Identity dimension preserves local culture, history, and community characteristics, ensuring that modernization respects the area's unique identity. Environmental Sensitivity advocates for sustainable, environmentally friendly practices, minimizing impact through resource efficiency, construction health considerations, and landscape design. The Economic Benefit dimension aims to create value for both local and national economies, enhancing property values and commercial potential. Finally, the Workplace Features dimension evaluates satisfaction with changes to individual properties, focusing on design, size, and functionality to meet business needs. Together, these criteria ensure a holistic approach to urban transformation, aiming for a balanced, inclusive, sustainable environment that promotes

community participation, accessibility, economic growth, and the preservation of local identity.

For the questions under each dimension, a Likert scale was used to measure the satisfaction levels of the participants. Participants rated each question on a scale from "1" (very poor) to "5" (very good). This analysis helped determine how each criterion was evaluated by the beneficiaries. The score distribution range was calculated using the following formula:

Distribution range = (Maximum value - Minimum value) / Number of degrees

Based on this calculation, the difference between the maximum value of 5 and the minimum value of 1 (4 points) was divided into 5 equal intervals, meaning each interval was calculated to be 0.8 points. Based on this calculation, the Likert scale values were categorized as in Table 2.

Table 2: Scoring Used in Evaluation

Score	Value	Score Range
5	Very Good	4.20-5.00
4	Good	3.40-4.19
3	Average	2.60- 3.39
2	Poor	1.80- 2.59
1	Very Poor	1.00- 1.79

The results were analyzed based on the average scores of each dimension and criterion, and meaningful insights regarding the perception of the Gürcükapı Urban Transformation Project by the property owners were obtained from these data. By utilizing the scoring system intervals, it is possible to determine which aspects of the project were more successful and which areas require further development. As a result, improvements needed in the implementation of the project were identified, and recommendations that may guide future urban transformation projects were developed.

The study has limitations in terms of its sample, participant biases, and temporal context. The research was conducted solely with property owners affected by the Gürcükapı Urban Transformation Project, which limits the generalizability of the results. Furthermore, participants' feedback was shaped by their personal experiences and perceptions. Therefore, different results may be obtained from other projects. Finally, since the Gürcükapı Urban Transformation

Project process has only recently been completed, long-term effects and outcomes were not within the scope of this study.

3.1. Ethical Approval

Ethical approval for the survey was granted by the Atatürk University Institute of Social Sciences Ethics Committee. In its meeting on 02.01.2024, the Ethics Committee of the Faculty of Social and Human Sciences at Atatürk University, under decision number 12, unanimously concluded that there were no ethical concerns regarding the rationale, objectives, approach, and methodology of the research. The Ethics Committee confirmed that the study could be conducted in compliance with scientific ethics. This decision was formally communicated via document number E.88656144-000-2400001830.

3.2. Limitations

This study has several limitations. Firstly, it focuses exclusively on the Gürcükapı Urban Transformation Project and the perceptions of stakeholders within that specific area. The study does not include the opinions of other key stakeholders, such as the general public, non-governmental organizations, and external actors like local governments and contractors. Additionally, the sample size of 31 stakeholders, while representing 91% of the targeted participants, may not adequately reflect the broader population affected by the project. A larger and more diverse sample could provide a more representative picture and capture a wider range of perspectives. Furthermore, the study is cross-sectional, assessing the project at a single point in time. A longitudinal study, evaluating the project over different phases or years, could offer deeper insights into the long-term effects of the transformation process. The scope of the study also excludes certain dimensions, such as long-term environmental impacts or public health effects, which would require more in-depth research. A follow-up study conducted at the project's completion or after additional phases would help capture changes and developments that occurred after the survey period.

4. FINDINGS

The descriptive analysis results regarding the demographic data of the participants in the Gürcükapı Urban Transformation Project survey are presented below (Table 3). According to these results, it can be observed that the majority of the project beneficiaries are middle-aged property owners who have been living in the area for a long time. Participants generally hold at least a secondary school or university degree, and the majority of participants are male.

Table 3. Demographic Data of the Beneficiaries of the Gürcükapı Urban Transformation Project

Variables	Groups	Frequency (n)	Percentage (%)
Gender	Male	29	93,55
	Female	2	6,45
Age	Under 30	2	6,45
	31-40	3	9,68
	41-50	9	29,03
	51-60	11	35,49
	Over 60	6	19,35
Education Level	Primary School	1	3,22
	Secondary School	8	25,81
	High School	13	41,94
	University	8	25,81
	Master's Degree	1	3,22
Time Spent in the Area	1 year	5	16,13
	10-19 years	8	25,80
	20-29 years	10	32,26
	30-39 years	3	9,68
	Over 40 years	5	16,13
Property Status	Property Owner	30	96,77
	Tenant	1	3,23
TOTAL		31	100

Based on responses to open-ended questions, the general opinions of the beneficiaries regarding the Gürcükapı Urban Transformation Project are predominantly positive. The participants perceive the project as a beneficial initiative that uncovers the historical fabric of the area, renovates the region by demolishing old buildings, and meets the city's needs. This positive perception highlights the project's dual aim of revitalizing both the physical environment and the city's cultural heritage.

Participants provided a range of responses to the question, "How would you describe the Gürcükapı Urban Transformation Project in one sentence?" Many emphasized the project's necessity for the area and its successful renewal efforts, such as "A much-needed, underdeveloped project," "A very necessary project for Gürcükapı," and "The area has been cleaned, and the appearance has improved." Others stressed its importance for urban development and the city's aesthetic, such as "A project that changes the appearance of the city," and "Beneficial for adding beauty to the city." However, some expressed critical views regarding ongoing issues, such as the municipality's perceived lack of accountability, with comments like, "A failure. Problems continue, the municipality is not taking responsibility, the heating system is problematic..." In

general, the responses reflect a combination of appreciation for the project's contribution to urban renewal and concerns about unresolved problems.

The question, "What do you think is the most important justification for the Gürcükapı Urban Transformation Project?" elicited responses focusing on the poor condition of the buildings and the need for renovation. Many respondents emphasized the outdated and deteriorating structures, citing issues like "The buildings had reached the end of their life," "The buildings were old and worn out," and "The buildings were not earthquake-resistant." Other responses highlighted the project's role in urban aesthetics and safety, such as "To beautify the city" and "To create a clean market with a historical appearance." Several participants underscored the necessity of renovation to address structural and functional deficiencies, with statements like, "The buildings had to be renewed," and "The existing buildings were inadequate in terms of both structure and functionality." Additionally, some responses pointed to the need to address irregular urban development, emphasizing the importance of transforming the area, which had been waiting for improvement for decades. Overall, the justifications provided reflect a combination of structural, safety, aesthetic, and urban planning concerns, signaling that the project was seen as crucial for improving both the physical condition and the image of the area.

In response to the question, "During the Gürcükapı Urban Transformation process, who or which institution did you trust the most in terms of protecting your rights?" many participants expressed trust in the Erzurum Metropolitan Municipality (EMM), while others also mentioned trust in higher authorities, such as the Ministry of Environment, Urbanization and Climate Change. However, some respondents indicated initial skepticism toward institutions and emphasized their desire to secure themselves through solid contracts. A few participants also raised concerns about discrepancies in project specifications, such as issues with building designs and measurements. In general, while many beneficiaries trusted local government bodies, there was an initial period of doubt that shifted as the project progressed.

Lastly, the beneficiaries of the Gürcükapı Urban Transformation Area did not establish any civil society organizations during the transformation process. Instead, they reported resolving their issues through direct communication with the municipality. This indicates that a strong trust relationship was established between the beneficiaries and the municipality, with participants expressing confidence in the municipality's solution-oriented approach.

4.1.10 Dimensions of Beneficiaries' Opinions on the Gürcükapı Urban Transformation Project

The perceptions and evaluations of the beneficiaries regarding the Gürcükapı Urban Transformation Project were examined under 10 dimensions. The data obtained from participants reflect the scores for each dimension as well as the general satisfaction levels of the participants. Below is the evaluation of each dimension, the average scores obtained, and an explanation of what these scores imply.

4.1.1. Quality of life

Within the scope of the Gürcükapı Urban Transformation Project, the "Quality of Life" dimension measures participants' views on various physical, security, and comfort aspects of the project. The scoring details for the Quality of Life dimension are listed in Table 4. Accordingly, 46.15% of participants evaluated the design of open spaces in terms of appearance and size as "very good," with the majority of the remaining responses falling under the "good" category. Opinions regarding the adequacy of security measures and crime prevention were generally positive, with 63.64% of participants rating security measures as good, and 26.52% rating them as very good. The evaluations regarding the creation of local job opportunities were more mixed. While 34.48% rated it as good, 31.03% gave a moderate assessment. There were also generally positive evaluations regarding the provision of natural lighting, ventilation, and comfort in the buildings.

Table 4: Scoring for the Quality of Life Dimension

Indicators	Survey Question	Beneficiaries' Evaluation (%)					Score
		1	2	3	4	5	
Design of open spaces (physical and aesthetic)	Open spaces were designed appropriately in terms of appearance and size	0,77	4,62	11,54	36,92	46,15	3,935
Security measures	Adequate measures were taken regarding security and crime prevention	0,00	3,03	6,82	63,64	26,52	3,968
Provision of local job opportunities	Local job opportunities were created	0,00	8,62	31,03	34,48	25,86	3,452
Building	Natural lighting	0,74	0,00	4,41	61,76	33,09	4,097

design for human comfort	was provided in the buildings						
	Natural ventilation was provided in the buildings	0,76	3,03	9,09	45,45	41,67	3,968
	Thermal, visual, and auditory comfort was provided in the buildings	1,49	2,99	6,72	32,84	55,97	4,065
Average Score							3,914

As a result, the overall score for the "Quality of Life" dimension, considering all criteria, was calculated as 3.914, and this dimension was rated as "good" (3.40-4.19). Participants indicated that the project had a positive impact on improving the quality of life. The infrastructure improvements, environmental arrangements, and modernization of living spaces within the project were well received by the beneficiaries. However, some participants complained about the inadequacy of social spaces and the limited green areas. Overall, it can be said that the quality of life within the scope of the project is positive and that this dimension has been successfully implemented.

To strengthen the Quality of Life dimension of the Gürcükapı Urban Transformation Project, where participants provided generally positive feedback, several focused improvements could further enhance resident satisfaction and well-being. While the design of open spaces, building comfort features, and security measures received favorable evaluations, certain aspects—such as the creation of local job opportunities and the availability of social and green spaces—were identified as areas needing improvement. To address these gaps, the project could prioritize the expansion and diversification of social spaces, such as public parks, community centers, and recreational areas, which would not only contribute to social cohesion but also provide critical green infrastructure. Additionally, promoting local economic development initiatives, such as incentivizing small businesses and supporting local entrepreneurship within the project area, could improve employment opportunities. Enhancing multi-functional open spaces that combine leisure, commerce, and cultural uses would further contribute to residents' quality of life. Overall, targeted enhancements in these areas would complement the project's physical improvements and support a more holistic, sustainable urban living environment.

4.1.2. Diversity

The "Diversity" dimension within the scope of the Gürcükapı Urban Transformation Project examines participants' views on the variety of uses, flexibility, and environmental sustainability aspects of the project. The scoring details for the Diversity dimension are listed in Table 5. According to the findings, participants gave positive evaluations on the design of buildings to allow for mixed and diverse uses, with 48.12% rating it as "good" and 41.35% rating it as "very good." Similarly, regarding whether the buildings were designed with enough flexibility to meet new needs, 46.51% rated it as "good," and 42.64% rated it as "very good." Opinions about the sufficient utilization of existing infrastructure incorporated into the project were also positive, with 53.96% of participants rating this criterion as "very good."

Table 5. Scoring for the Diversity Dimension

Indicators	Survey Question	Beneficiaries' Evaluation (%)					Score
		1	2	3	4	5	
Mixed-use and flexible development model	Buildings were designed to allow for mixed and diverse uses	0,00	6,02%	4,51	48,12	41,35	4,000
	Buildings were designed with enough flexibility to meet new needs	0,78	7,75	2,33	46,51	42,64	3,871
Use of land to protect the environment	Existing vegetation and trees were preserved	0,00	2,86	4,29	42,86	50,00	4,226
	Existing infrastructure was utilized	0,00	2,88	8,63	34,53	53,96	4,194
Average Score							4,072

As a result, the overall score for the "Diversity" dimension, considering all criteria, was calculated as 4.072, and this dimension was rated as "good" (3.40-4.19). Participants assessed the project as successful in terms of usage diversity, flexibility, and environmental sustainability. Specifically, most participants gave high ratings for environmental criteria such as the use of land in a way that protects the environment and the utilization of existing infrastructure. The mixed-use and flexible development model also received a positive evaluation. Overall, the project was successfully implemented in this dimension.

To further enhance the Diversity dimension of the Gürcükapı Urban Transformation Project, despite its positive evaluation, several targeted strategies can be implemented. While participants rated the mixed-use design, flexibility,

and environmental considerations favorably, continuous improvement can ensure sustained adaptability and resilience. Firstly, expanding the functional diversity of spaces to include more community-oriented uses—such as educational, cultural, and recreational facilities—can improve social integration and daily utility. Secondly, ensuring greater modularity in building design would allow users to easily adapt interior layouts to evolving needs, such as shifting between residential, commercial, or hybrid uses over time. Additionally, to strengthen environmental sustainability, integrating green roofs, vertical gardens, and rainwater harvesting systems can enhance the preservation of natural resources while aligning with climate-sensitive urban design principles. These measures would reinforce the project's success in offering a diverse, inclusive, and sustainable urban environment.

4.1.3. Equity

The "Equity" dimension examines participants' views on the accessibility and suitability of the project for groups such as people with disabilities, the elderly, and children. The scoring details for the Equity dimension are listed in Table 6. According to the findings, participants mostly gave positive evaluations regarding the project's suitability for people with disabilities, with 54.29% rating it as "good" and 42.86% rating it as "very good." The project's suitability for the elderly received similarly high evaluations. 53.90% of participants rated it as "good," and 42.55% rated it as "very good." The project's suitability for children was also assessed very positively. 67.15% of participants rated the design suitable for children as "good," and 29.20% rated it as "very good."

Table 6: Scoring for the Equity Dimension

Indicators	Survey Question	Beneficiaries' Evaluation (%)					Score
		1	2	3	4	5	
Suitability for people with disabilities, the elderly, and children	Designed for the use of people with disabilities	0,00	2,86	0,00	54,29	42,86	4,226
	Designed for the use of the elderly	0,00	1,42	2,13	53,90	42,55	4,258
	Designed for the use of children	0,00	1,46	2,19	67,15	29,20	4,129
Average Score							4,204

As a result, the overall score for the "Equity" dimension, considering all criteria, was calculated as 4.204, and this dimension was rated as "very good" (4.20-5.00). Based on the evaluations of the Equity dimension, the Gürcükapı Urban Transformation Project was assessed as highly suitable and accessible for groups such as people with disabilities, the elderly, and children. Participants

specifically noted that the designs for people with disabilities and the elderly were excellent, while the suitability for children was also highlighted as good. Overall, the project achieved excellent results in this dimension and demonstrated successful implementation in terms of accessibility.

To further strengthen the equity dimension of the Gürcükapı Urban Transformation Project, targeted enhancements can be introduced despite its already high performance. While the project was rated "very good" for its inclusivity toward people with disabilities, the elderly, and children, maintaining and improving equity requires continuous and adaptive strategies. First, periodic user experience evaluations involving these specific groups can provide more nuanced insights into real-life accessibility challenges. Second, increasing the number of universally designed facilities, such as tactile paving, ramps with appropriate gradients, accessible playgrounds, and shaded resting areas for the elderly, would reinforce physical inclusion. Lastly, integrating inclusive signage and digital tools (e.g., QR codes providing audio navigation for visually impaired users) could support a broader range of accessibility needs. These improvements would not only enhance the inclusiveness of the project but also ensure that urban spaces remain adaptable and welcoming to all user groups over time.

4.1.4. Process management

The "Process Management" dimension evaluates the management and implementation steps taken throughout the entire process of the Gürcükapı Urban Transformation Project, from its initiation to completion, based on participants' opinions. The scoring details for the Process Management dimension are listed in Table 7. According to the findings, participants expressed satisfaction with the overall management of the project and mostly believed that the process was well-managed. The project created the perception that the transformation expected by participants was successfully realized. Most participants felt that the project met their expectations. Additionally, participants stated that the municipality adhered to its commitments during the project and completed it on time. This created a perception of smooth process execution. Property owners reported that the title deed procedures were facilitated, and no significant obstacles were encountered in this regard. Participants considered the municipality-led execution of the project beneficial and efficient.

Table 7: Scoring for the Process Management Dimension

Indicators	Survey Question	Beneficiaries' Evaluation (%)					Score
		1	2	3	4	5	
Management of the process from start to finish	The transformation I envisioned before urban transformation was realized	0,00	6,25	9,38	59,38	21,88	4,000
	The municipality adhered to the committed time frame in the urban transformation	3,13	3,13	6,25	37,50	46,88	4,258
	It was easy for property owners to receive their title deeds after urban transformation	6,25	6,25	6,25	46,88	31,25	3,935
	Having the municipality lead the transformation was beneficial	0,00	3,13	9,38	25,00	59,38	4,452
Average Score							4,161

As a result, the overall score for the "Process Management" dimension, considering all criteria, was calculated as 4.161, and this dimension was rated as "good" (3.40-4.19). In terms of Process Management, the Gürcükapı Urban Transformation Project was managed successfully. Participants noted that the municipality adhered to its commitments and expectations throughout the transformation process, the project proceeded smoothly, and property owners easily acquired their title deeds. There was a general consensus that the municipality-led transformation was beneficial. Overall, this dimension achieved very good results, showcasing successful management.

To further enhance the effectiveness of process management in urban transformation projects like Gürcükapı, several key improvements could be implemented. While participants expressed high satisfaction, especially with the municipality's leadership and adherence to the timeline, some indicators—such as the ease of acquiring title deeds—received relatively lower scores, suggesting areas for refinement. First, the digitalization of administrative processes (e.g., online tracking systems for title deed applications and project milestones) could streamline bureaucratic procedures and reduce perceived complexity. Second, establishing dedicated communication and liaison units within municipalities could enhance stakeholder engagement, providing real-time updates and direct support for residents throughout the process. Finally, formalizing feedback mechanisms at each phase of the project would help capture and address grievances or suggestions in a timely manner, reinforcing transparency and trust

in the implementation process. These strategies would help institutionalize effective governance and improve stakeholder satisfaction in future urban transformation initiatives.

4.1.5. Participation

The "Participation" dimension evaluates the interaction and involvement of stakeholders, particularly property owners, in decision-making processes and information sharing during urban transformation projects. The scoring details for the Participation dimension are listed in Table 8. According to the findings, participants noted that stakeholder participation in the decision-making process was ensured, although some participants felt that they needed more information. Overall, there was a positive view regarding the participation aspect. Participants expressed general satisfaction with the information sharing during the urban transformation process, although some participants might have expected more communication. Property owners were largely able to comfortably express their requests and complaints to the municipality during the transformation process. However, some participants indicated that this communication process could have been more effective. Participants reported that their demands and expectations were largely met, but a few expressed that their expectations were not fully fulfilled.

Table 8: Scoring for the Participation Dimension

Indicators	Survey Question	Beneficiaries' Evaluation (%)					Score
		1	2	3	4	5	
Public participation in decision-making	Stakeholder participation in decision-making processes was ensured	0,00	1,54	13,85	61,54	23,08	3,871
	I was satisfied with the information sharing process during urban transformation	0,78	4,65	4,65	58,91	31,01	3,839
	I was able to express my requests and complaints regarding the urban transformation	0,00	3,13	18,75	46,88	31,25	3,613
	My demands/expectations regarding the urban transformation were met	0,83	1,65	32,23	36,36	28,93	3,903
Average Score							3,806

As a result, the overall score for the "Participation" dimension, considering all criteria, was calculated as 3.806, and this dimension was rated as "good" (3.40-4.19). In terms of participation, the Gürcükapı Urban Transformation Project performed well in involving property owners. Participants indicated that participation in decision-making, information sharing, and the ability to express complaints were generally ensured. However, some expectations for more information and improved communication channels remain. Overall, this dimension achieved good results and could be made more effective with improvements to increase participation.

To strengthen stakeholder participation in the Gürcükapı Urban Transformation Project, it is essential to develop more inclusive and transparent communication strategies. While the current approach was positively received overall, feedback indicates that some participants felt inadequately informed or insufficiently engaged. To address these concerns, participation can be enhanced by diversifying communication tools—such as using digital platforms, printed materials, and community meetings—to ensure that information is timely, accessible, and understandable to all beneficiaries. Additionally, establishing formalized participatory mechanisms, such as advisory or monitoring committees involving property owners and local representatives, would help institutionalize stakeholder involvement in decision-making processes. Educational workshops and orientation sessions can also increase residents' capacity to contribute meaningfully. Finally, by implementing a structured and responsive feedback system for handling concerns and complaints, the municipality can strengthen transparency, build trust, and transform participation from a procedural requirement into a genuine form of collaborative governance.

4.1.6. Accessibility

Accessibility is one of the most important aspects of an urban transformation project, as the adequacy of public transportation and pedestrian pathways directly impacts the project's usability and accessibility. The scoring details for the accessibility dimension are listed in Table 9. According to this, participants reported that the project area is highly suitable for pedestrian access. The width and safety of the pedestrian pathways have been provided at an adequate level for users, and positive feedback was given regarding pedestrian accessibility. Participants also made favorable evaluations regarding the project's suitability for public transportation. Easy access to public transport and improvements in this infrastructure have significantly increased the project's accessibility.

Table 9: Scoring of the Accessibility Dimension

Indicators	Survey Question	Beneficiaries' Evaluation (%)					Score
		1	2	3	4	5	
Suitability for pedestrian and public transportation	The design is suitable for pedestrian access	0,00	1,44	6,47	48,92	43,17	4,226
	The design is suitable for public transportation	0,00	1,38	2,07	41,38	55,17	4,387
Average Score							4,306

The overall score for the "Accessibility" dimension, considering all criteria, was calculated to be 4.306, and the project's effects in this dimension were rated in the "very good" (4.20-5.00) category. The Gürcükapı Urban Transformation Project demonstrates high success in the accessibility dimension. Participants stated that both pedestrian pathways and public transport systems have been well designed and ensure safe transportation. They also expressed satisfaction with the central location of the transformation area, as new workplaces are in close proximity to public transport lines. Furthermore, the pedestrian pathways were reported to be suitable, with areas accessible to people with disabilities. These results indicate that the project's overall accessibility goals have been successfully achieved and that it meets the public's transportation needs.

To further enhance accessibility in urban transformation projects such as Gürcükapı, improvements should prioritize stronger integration between pedestrian networks and public transportation systems. While current accessibility levels are evaluated as very good, especially in terms of design and proximity to transit routes, sustained success requires addressing finer details. Ensuring that sidewalks, crossings, and transit stops are barrier-free and fully accessible to individuals with disabilities will increase inclusivity. Expanding the frequency, reach, and reliability of public transport services in the area can also better accommodate growing demand and diverse user needs. Moreover, the addition of clear, multilingual signage and safe, illuminated pedestrian pathways would improve navigation and security for all users, including the elderly and children. These enhancements would support a more cohesive and equitable urban mobility environment.

4.1.7. Identity

Identity is one of the key dimensions of an urban transformation project, as the preservation of local features and the compatibility of the design with the environment affect the social and cultural acceptability of the project. The scoring details for the identity dimension are presented in Table 10. According to the

participants, the efforts made to preserve local identity in the project were evaluated very positively. The preservation of local features and identity in the area is seen as a significant success for the project. Historical buildings have been meticulously preserved, and works on architecturally and culturally significant buildings have been met with high satisfaction. This reflects the care taken in preserving the historical texture of the region. The project has been designed to be compatible with the surrounding architectural structures and physical features. Participants noted that the project is aesthetically and functionally aligned with the environment.

Table 10: Scoring of the Identity Dimension

Indicators	Survey Question	Beneficiaries' Evaluation (%)					Score
		1	2	3	4	5	
Preservation of local features	The identity and local features of the area were preserved	0,00	0,00	2,05	46,58	51,37	4,419
Preservation of historical buildings	Historical, architectural, religious, and culturally significant buildings were preserved	0,00	0,00	0,00	34,21	65,79	4,613
Compatibility with the environment	The area was designed to be compatible with surrounding architectural structures and physical features	0,00	0,00	4,29	45,71	50,00	4,367
Average Score							4,466

The overall score for the "Identity" dimension, considering all criteria, was calculated to be 4.466, and the project's effects in this dimension were rated in the "very good" (4.20-5.00) category. The preservation of local features and historical buildings, along with ensuring the design is compatible with the environment, are important factors that enhance the social and cultural values of the project. Participants stated that the project area was redesigned in harmony with both local identity and the surrounding environment.

To further strengthen the preservation of identity in urban transformation projects, efforts should prioritize continuous community engagement and context-sensitive design practices. While the Gürcükapı Project was rated very positively in this dimension, maintaining long-term cultural integrity requires active collaboration with local stakeholders to identify and preserve elements of architectural, historical, and cultural value. Future interventions should be guided by design principles that respect and reflect the unique character of the area, ensuring compatibility with traditional styles and urban textures. Complementary measures such as installing interpretive signage, organizing heritage-focused

community events, and integrating local narratives into the public realm can reinforce residents' sense of belonging and cultural continuity. These strategies can enhance both the symbolic and practical significance of place identity within urban transformation contexts.

4.1.8. Environmental sensitivity

Environmental sensitivity is an important dimension in urban transformation projects, reflecting the sensitivity to environmental preservation and sustainability. The scoring details for the environmental sensitivity dimension are presented in Table 11. In the Gürcükapı Urban Transformation Project, various designs and implementations were carried out with environmental factors in mind. Participants reported that energy-saving materials and equipment were used in heating and lighting to promote energy efficiency. However, participants expressed mixed opinions on this aspect, and energy conservation practices were sometimes rated at a moderate level. On the other hand, participants noted that appropriate equipment and technologies were used to reduce water consumption. This indicator, similar to energy conservation, was also evaluated positively, but there is still perceived room for further development. Regarding the use of local and natural building materials, participants provided favorable feedback. Additionally, the use of durable materials is considered an important factor contributing to environmental sensitivity. High satisfaction was reported regarding the focus on environmental and human health during the construction process, as well as waste management and environmental protection measures. Participants evaluated the environmental measures taken during construction very positively. The project also received high scores for its landscaping efforts, with environmentally compatible arrangements made. Participants noted that the area was also aesthetically well-designed.

Table 11: Scoring of the Environmental Sensitivity Dimension

Indicators	Survey Question	Beneficiaries' Evaluation (%)					Score
		1	2	3	4	5	
Energy conservation	Energy-saving materials and equipment were used in heating	0,00	3,17	23,81	41,27	31,75	3,806
	Energy-saving materials and equipment were used in lighting	0,00	3,01	13,53	42,11	41,35	4,000
Water	Equipment and	0,00	3,15	25,98	31,50	39,37	3,806

conservation	technology were used to reduce water consumption						
Material conservation	Local building materials were used	0,00	1,50	11,28	57,14	30,08	4,032
	Natural building materials were used	0,00	1,48	8,89	56,30	33,33	4,097
	Durable building materials were used	0,85	3,42	7,69	41,03	47,01	4,037
Environmental and human health protection during construction	Environmental and human health were protected during construction	0,00	0,00	8,39	39,16	52,45	4,323
	Waste management was effectively applied during construction	0,00	1,49	8,96	44,78	44,78	4,167
Landscaping	Appropriate landscaping arrangements were made in the area	0,00	1,42	4,26	48,23	46,10	4,258
Average Score							4,058

The overall score for the "Environmental Sensitivity" dimension, considering all criteria, was calculated to be 4.058, and the project's effects in this dimension were rated in the "good" (3.40-4.19) category. Positive feedback was received on energy savings, water conservation, material use, environmental and human health protection during construction, and landscaping. Environmental and health measures during construction, along with landscaping efforts, were the areas most highly rated. Overall, the actions taken concerning environmental sensitivity contribute positively to the project's sustainability.

To further strengthen environmental sensitivity in urban transformation projects, it is important to advance energy and water efficiency measures through smart systems and innovative technologies. While the Gürcükapı Project received positive feedback in this dimension, especially in landscaping and construction practices, there remains room for improvement in energy and water conservation. Broader integration of renewable energy solutions and efficient water reuse systems can enhance sustainability. Prioritizing the use of local, natural, and long-lasting materials not only reduces the environmental footprint but also supports the local economy. Additionally, incorporating ecological landscaping with native species can improve biodiversity and ecosystem health. These actions will contribute to more resilient and environmentally responsible urban environments.

4.1.9. Economic benefit

Economic Benefit is a dimension that evaluates the economic impacts of urban transformation projects, particularly their contributions to property value and commercial potential. The scoring details of the Economic Benefit dimension are listed in Table 12. According to the participants, there has been an increase in property values after the urban transformation, and they expressed satisfaction with this outcome. This indicator received a high score. Additionally, there have been observations that the number of visitors and customers increased after the transformation. However, this indicator received a slightly lower evaluation, as some participants mentioned that the transformation did not have as significant an impact on the commercial potential as expected.

Table 12: Scoring of the Economic Benefit Dimension

Indicators	Survey Question	Beneficiaries' Evaluation (%)					Score
		1	2	3	4	5	
The urban transformation project increases real estate value and commercial potential	The urban transformation increased the value of my property	0,00	3,13	3,13	21,88	68,75	4,613
	After the urban transformation, the number of visitors and customers increased.	0,00	6,25	65,63	12,50	12,50	3,323
Average Score							3,968

The overall score for the "Economic Benefit" dimension, considering all criteria, is calculated as 3.968, placing the effects of the Gürcükapı Urban Transformation Project in the "Good" (3.40-4.19) category. The Gürcükapı Urban Transformation Project has demonstrated positive performance in the Economic Benefit dimension, particularly in terms of property value increase and the improvement of commercial potential. However, some participants, who expected greater commercial impacts from the transformation, assigned lower scores to the increase in visitor and customer numbers. Overall, a good result has been achieved in terms of economic benefit, demonstrating the project's economic sustainability and success.

To enhance the economic benefits of the Gürcükapı Urban Transformation Project, targeted strategies could be implemented to more directly stimulate commercial activity. While the increase in property values has been widely appreciated, the relatively modest rise in customer and visitor numbers suggests a need for complementary measures—such as improving

signage, public spaces, and marketing support for new businesses. Incentives for small enterprises, event-based promotional activities, and improvements in accessibility to commercial areas could help attract more foot traffic. Strengthening the commercial infrastructure and visibility of business units within the transformed area would contribute to maximizing the project's economic potential and fostering long-term local economic development.

4.1.10. Workplace features

Workplace Features is a dimension that measures the impact of urban transformation projects on workplaces, evaluating participants' satisfaction with the facade, size, and architectural features of their workplaces. The scoring details of the Workplace Features dimension are listed in Table 13. According to the participants, they were generally satisfied with the facade of their workplaces. This feature indicates that the visual aspect of the project added value to the area. The level of satisfaction regarding the size of the workplaces was slightly higher, with participants expressing that their workplace needs were met and that they were satisfied with the size. Participants also generally expressed satisfaction with the architectural design of their workplaces, indicating a positive view of the project in both aesthetic and functional terms.

Table 13: Scoring of the Workplace Features Dimension

Indicators	Survey Question	Beneficiaries' Evaluation (%)					Score
		1	2	3	4	5	
The level of satisfaction with the facade, size, and architectural features of individual properties after the transformation.	Satisfaction with the facade, size, and architectural features of the individual property after the transformation	6,25	6,25	6,25	56,25	21,88	3,839
	Satisfaction with the size of individual property after urban transformation	3,13	3,13	9,38	56,25	25,00	4,000
	Satisfaction with the architectural features of individual property after urban transformation	0,00	18,75	3,13	37,5	37,5	3,968
Average Score							3,935

The overall score for the "Workplace Features Satisfaction" dimension, considering all criteria, is calculated as 3.935, placing the effects of the Gürcükapı Urban Transformation Project in the "Good" (3.40-4.19) category. In this

dimension, the Gürcükapı Urban Transformation Project has successfully ensured satisfaction. Participants provided positive feedback regarding the facade, size, and architectural design of their workplaces. Overall, this dimension is evaluated within the "Good" score range, showing that the project has been successful for workplace owners and has improved workplace conditions.

To further enhance satisfaction with workplace features in urban transformation projects like Gürcükapı, several targeted improvements could be considered. Although participants generally reported satisfaction with the facade, size, and architectural features, the variation in responses suggests room for refinement. Incorporating participatory design processes, where future occupants can provide input on interior layouts and functional needs, may lead to higher satisfaction levels. Additionally, offering customizable interior spaces, flexible layouts, and enhanced lighting and ventilation systems could improve usability and comfort. Ensuring that architectural features are not only aesthetically pleasing but also support operational efficiency and local business needs will help maximize long-term functionality and satisfaction.

5. CONCLUSION

This study provides a comprehensive evaluation of the Gürcükapı Urban Transformation Project through a multidimensional analytical framework encompassing physical, social, cultural, economic, and environmental aspects. Empirical findings, based on stakeholder feedback across ten key dimensions, offer a detailed understanding of the project's successes as well as areas necessitating further improvement. Quantitative results indicate that the project performs particularly well in the dimensions of Identity, Accessibility, and Equity, which scored 4.466, 4.306, and 4.204 respectively, situating them in the "very good" category (Table 14). These findings suggest that the project has effectively preserved local cultural heritage and architectural integrity, thereby fostering a strong sense of place and community ownership. Moreover, the alignment of design with the existing environment and enhanced accessibility features reflect successful integration of social inclusiveness and mobility enhancements, as evidenced by positive stakeholder evaluations regarding pedestrian pathways, public transportation, and facilities for vulnerable populations such as individuals with disabilities, children, and the elderly. Collectively, these achievements underscore the project's role in promoting social cohesion and environmental sustainability—two essential pillars of contemporary urban regeneration.

Table 14: Evaluation of the Gürcükapı Urban Transformation Project Across 10 Dimensions

Dimension	Average Score	Evaluation
Quality of Life	3,914	GOOD
Diversity	4,072	GOOD
Equity	4,204	VERY GOOD
Process Management	4,161	GOOD
Participation	3,806	GOOD
Accessibility	4,306	VERY GOOD
Identity	4,466	VERY GOOD
Environmental Sensitivity	4,058	GOOD
Economic Benefit	3,968	GOOD
Workplace Features	3,935	GOOD
General Average	4,089	GOOD

However, despite these notable strengths, the analysis reveals important challenges in the dimensions of Participation, Economic Benefit, Quality of Life, and Workplace Features, which received comparatively lower average scores ranging between 3.806 and 3.968, categorized as “good” (Table 14). These results imply that while physical transformations have been largely effective, the processes underpinning community engagement and economic revitalization warrant enhancement. In particular, feedback highlights insufficient stakeholder involvement during decision-making phases, potentially limiting the inclusiveness and legitimacy of the transformation process. Furthermore, although an increase in property values was observed, the expected growth in commercial activity and the equitable distribution of economic benefits were not fully achieved, signaling the need for more strategic economic policies aimed at fostering local entrepreneurship and job creation. Additionally, the moderate evaluations related to quality of life and workplace features emphasize the importance of adopting a holistic approach that goes beyond the built environment to address socio-economic factors such as safety, employment opportunities, and the functional adequacy of workspaces, all of which are crucial for translating physical improvements into meaningful community outcomes.

Integrating these insights, it is apparent that successful urban transformation requires a balanced emphasis on both tangible infrastructure improvements and the often less visible social, participatory, and economic

dimensions. The Gürcükapı project's achievements in preserving identity and enhancing accessibility demonstrate how sensitive design interventions can reinforce community attachment and improve urban functionality. Yet, the identified deficits in participatory processes and economic outcomes reveal systemic challenges in achieving equitable and inclusive transformation. This underscores the imperative to embed robust stakeholder engagement mechanisms and targeted economic strategies early in the project lifecycle to enhance project legitimacy and ensure fair distribution of benefits among diverse social groups. Moreover, the moderate scores concerning workplace features and quality of life call for heightened attention to post-construction socio-economic dynamics, such as safety and local employment, to fully realize the potential of urban renewal.

Building on these findings, future research should broaden its scope beyond stakeholder perceptions to include longitudinal assessments and multisectoral analyses involving local authorities, private sector participants, civil society, and the broader community. Such a comprehensive approach would yield a more holistic evaluation of urban transformation processes and the complex governance structures that shape them. Comparative studies across different urban contexts could further illuminate best practices and inform context-sensitive adaptations. Additionally, advancing participatory methodologies to engage a wider array of stakeholders more democratically should be a priority, addressing one of the key challenges identified in this study. Given the Gürcükapı project's success in environmental sensitivity, further exploration into sustainable urban practices—such as energy efficiency, green building technologies, and waste management—is warranted to strengthen ecological outcomes in future projects. Economic dimensions also merit deeper investigation, particularly focusing on the equitable distribution of transformation benefits through detailed analyses of local job creation, housing affordability, and market dynamics. Furthermore, infrastructure services including transportation, healthcare, and education remain critical to urban well-being and should be rigorously monitored to support residents' quality of life and economic participation. Finally, integrating smart city technologies and digital innovations offers promising avenues to enhance urban efficiency, sustainability, and liveability, representing a fruitful direction for subsequent research.

In conclusion, the Gürcükapı Urban Transformation Project exemplifies significant achievements in cultural preservation, accessibility, and environmental stewardship, while simultaneously highlighting critical areas for enhancement in participation, economic equity, and socio-economic well-being. This study contributes a robust multidimensional evaluative framework and empirically grounded insights that can inform more holistic, inclusive, and

effective urban transformation initiatives within Turkey and comparable contexts. By integrating diverse perspectives and embracing long-term, participatory approaches, future urban renewal projects can achieve more sustainable and socially just outcomes, ultimately advancing both scholarly understanding and practical policy-making in the field of urban transformation.

6. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

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This study did not benefit from any funding or support.

8. AUTHOR CONTRIBUTIONS

TB, AM: Fikir

TB, AM: Tasarım

TB: Denetleme

MY, ÇKK: Kaynakların toplanması ve işlenmesi

TB, AM, ÇKK: Analiz ve Yorum

MY: Literatür taraması

TB, AM, MY, ÇKK: Yazıyı yazan

TB: Eleştirel inceleme

9. ETHICS COMMITTEE STATEMENT

We declare that all ethical guidelines for authors have been followed by all authors. Ethical approval is not required.

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