EGE AKADEMİK BAKIŞ

EGE ACADEMIC REVIEW

Ekonomi, İşletme, Uluslararası İlişkiler
ve Siyaset Bilimi Dergisi

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Bibliometric Analysis Studies of Published in the Field of Volatility

Özkan ŞAHİN[1], Erkan BİL[2]

ABSTRACT

Volatility, used to determine the risk structure of financial markets or instruments, is one of the most used methods by researchers. In this study which is conducted to reveal the tag of volatility studies, 15,132 articles related to volatility between 1980 and 2023, scanned in the Web of Science database, were subjected to bibliometric analysis. As a consequence of the investigation, the details of the subject, such as the country with the highest number of publications, institutions, the most cited authors, articles, leading journals and keywords in the field, were revealed. As a consequence, it was determined that the authors worked on three basic subjects such as "stocks and stock markets", "exchange rates" and "macroeconomic indicators" on volatility. It has been observed that the main objectives of the studies are either to compare the performance of existing volatility estimation models or to develop new models by adding new variables.

Keywords: Bibliometric Analysis, Volatility, Web of Science, Finance, Risk.

JEL Classification Codes: C01, C38, G17

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INTRODUCTION

Volatility is a critical aspect frequently investigated by financial market analysts to discern whether fluctuations in investment instrument or market prices are random or driven by specific factors. Determining the scope, direction and degree of volatility as a result of the analysis is of great importance in guiding investors in their decision-making processes. Thus, the concept of risk is an important issue that financial investors consider and study. Risk emerges as an important issue when conducting research on volatility. Han (2011) seeks to address the puzzle inherent in the relationship between risk and return by acknowledging the stochastic nature of volatility. It emphasizes that volatility is very important for financial markets, arguing that the systematic risk in markets should be defined as volatility risk. Consequently, investors require a risk premium not only for assuming systematic risk but also for shouldering the volatility risk inherent in the investment.

Risk (risque), which is a French word, is defined as "*The Probability of Occurrence of An Event That May Lead to A Loss, A Damage or A Danger*" (Emhan 2009: 210). In other words, risk can also be defined as the difference between actual and expected situations. Financial risk can be divided into two main categories. The first of these is the non-systematic risk that can be minimized by the diversification of the investment portfolio and the systematic risk that the investor does not have any disposition on and arises from the current economy or the sector. Especially with the impact of globalization on financial markets, volatility has increased and this has increased the risk rate. However, at the same time, due to the increase in financial derivatives, the opportunities to minimize risk have increased with the opportunity of portfolio diversification. Although the most fundamental element in portfolio diversification is the measurement of risk, volatility modeling is one of the areas where new methods and techniques for risk measurement methods are researched.

Investors who analyze financial time series encounter many problems such as instability of price series, asymmetric effects on asset prices and returns, and volatility clusters (Akel, 2011: 22). Many models have been developed over time to address these problems on financial series. Volatility prediction models,

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including the Random Walk Model, Historical Average Model, Moving Average Model, and Weighted Average Model, assume constant returns over time and that the distribution of returns is independent of time. However, Engle (1982) introduced the AutoRegressive Conditionally Heteroscedastic (Arch) model, challenging the assumption of constant variance by proposing that variance changes with time. In this model, Engle formulates error terms in financial series as a function of the previous period's error terms. Bollerslev's (1986) development of the Expanded Arch (Garch 1.1) model itakes volatility estimation to a higher level by considering the variance changes over time based on past period variance. Although Garch models address some limitations, such as the symmetric reaction to market shocks, other models (Agarch, Arch-M, Augmented Arch, Egarch, Gjr-garch, Qgarch, Tarch, Ngarch, Igarch) have been developed to compensate for these shortcomings.

This study delves into the key issues for investors and academics analyzing financial markets through bibliometric analysis. The research consists of four main parts: an introductory section emphasizing the importance of the subject, a literature review presenting relevant studies that used bibliometric analysis, description of the methodology applied for the analysis of the data, and a concluding section summarizing findings such as the number of citations, keywords, leading institutions, journals, The conclusion section provides a comprehensive evaluation of the results of the study.

LITERATURE REVIEW

Although bibliometric analysis is a method used to understand many fields in depth, it is also used occasionally in the field of volatility. In this context, studies dealing with bibliometric analysis of volatility studies conducted for financial instruments or financial markets in the literature are briefly reviewed and presented below.

Depren, Kartal, and Depren (2018) conducted a bibliometric analysis on stock market volatility articles from 1975 to 2017 using the Web of Knowledge database and VOSViewer program. Analyzing 7,568 publications, the study explored the social network structure of authors, co-authorship patterns, keywords, and prominent institutions. The co-authorship analysis revealed a network centered in the USA and China. The authors determined the most frequently used keywords as "volatility", "stock market", "stock returns", "economy", "GARCH" and "financial crisis", and Jiqian Wang as the most mentioned author. On the other hand, they found that the network structure was wider.

Merediz-Solà and Bariviera (2019) conducted a bibliometric analysis of 1,162 articles published on Bitcoin and scanned in the WoS database. The authors determined the clustering of studies on Bitcoin, the topics covered and the leading authors in their studies. As a consequence, they determined that the studies conducted for Bitcoin showed an annual increase of 124%, and the citations between other publications occurred around a few articles.

Chen and Yang (2019) conducted a bibliometric analysis on volatility spread studies across financial markets using the WoS database and Citespace software. Their analysis involved citation analysis, information mapping, and cluster visualization. The authors determined that studies on volatility spread utilized clusters creating VAR models with diverse volatility indexes and multi-variable GARCH models. Most publications on the subject originated from the USA. Collaboration mapping indicated academic cooperation among European academics or institutions, while the authors observed a growing interest from Chinese academics and institutions in exploring volatility spillovers in financial markets.

Vianez, Martínez and Román (2020) conducted a bibliometric analysis of publications scanned in WoS and Scopus in the field of behavioral finance using SciMAT software. As a consequence, Malcom Baker and Jeffrey Wurgler, who conducted research on the impact of investor sentiment on stocks by the most prolific and cited authors in this field, determined "Journal of Banking & Finance" as the leading journal, the USA as the leading country and the National Bureau of Economic Research as the leading institution.

Sosa, Ochoa and Merigó (2020) conducted a bibliometric analysis of the articles scanned in WoS and Scopus on exchange rate volatility. In their analysis, prominent authors have mapped their reviews through VOSViewer software, examining institutions and countries. As a result, regarding exchange rate volatility; they determined that the leading author was Bahmani-Oskee, the university was the University of Wisconsin-Milwaukee, the institution was the National Bureau of Economic Research, and the region was the European continent.

METHODOLOGY

The purpose, scope, data set, and method used in this study, which was carried out in the field of volatility by

examining the publications scanned in the WoS database, are explained under the methodology title of the study.

The Aim of the Study

This study, which conducts a bibliometric analysis of publications on volatility, has two main purposes. The first aim of the study is to reveal the development and change of volatility, which has an important place in the academic literature, from past to present, to identify leading publications, journals, institutions, authors and countries and to compile the subject. The second most fundamental goal is to compile and present the most important resources that will help investors investing in financial markets understand the basic dynamics of volatility and to show new techniques that they can use to determine risk while investing. Thus, it will be ensured that the resources to be applied by researchers who want to work in the field of volatility are presented to researchers in a single study.

Method and Data Set

The term bibliometrics, first used by Alan Pritchard in 1969 in his article titled "Statistical Bibliography or Bibliometrics?" (Gaberli, 2023; 30), has become increasingly widespread in recent years. Bibliometric analysis is an analysis method that determines the profile of researchers and publications published in a particular field and determines details such as the progress of scientific knowledge over time and the point of focus (Hussain, Fatima, & Kumar, 2011).

Academics utilize bibliometric analysis for various purposes, such as revealing trends in article and journal performance, collaboration models and research components within a specific field (Donthu et al., 2021; Verma and Gustafsson, 2020). This method is valuable for providing researchers with rigorous interpretation of large volumes of unstructured data to decode and map accumulated scientific knowledge and the evolutionary nuances of established domains.

Bibliometric analyses fall into two categories: traditional bibliometric effects and modern visual and recorded mapping techniques (Kurutkan and Orhan, 2018; 2). Modern bibliometric techniques include performance analysis, which considers the contributions of the components studied, and science mapping, which focuses on the relationships between research components. Performance analysis commonly involves calculating annual or per-component publication and citation counts, where the number of publications indicates productivity, and citations measure impact. Science mapping techniques include citation analysis, co-citation analysis, bibliographic matching, co-word analysis, and co-authorship analysis (Baker et al., 2019; Tunger and Eulerich, 2018; Donthu et al., 2021; 287).

An additional method, the enrichment technique, enhances bibliometric results through network measurements, clustering, and visualization (Donthu et al., 2021; 290). The typical bibliometric analysis method comprises five steps: determining the study's purpose and scope, data collection, data screening and filtering, analysis, and interpretation (Radu et al., 2021; 3).

The data to be used in the study were obtained from the Web of Science (WoS) Core Collection database. The journal archive of the WoS Core Collection database dates back to the 1800s and includes 211 million records, more than 13 million data sets, and more than 115 million patents. Studies in the WoS Core Collection database covers a wide range of data, including biomedical sciences, natural sciences, engineering, social sciences, arts and humanities ("Clarivate", 2015). Another reason for selecting the WoS database is its more detailed coverage of social, arts, and humanities topics compared to the Scopus database (Karasözen et al., 2011: 244; Gaberli, 2023: 31).

To achieve the study's objectives, the scope was limited to publications in the WoS database. Searching for "volatility" yielded 81,260 sources, filtered to define the study's scope. The filters applied are as follows;

Table 1: Applied Filters and Statistics

Filter Option	Query	Number of Publications
Search	Volatility	81,260
Fields	Title	17.700
Publication Year	1980 - 2023	17,684
Documents Type	Article	15,346
Language	English	15,132

As a consequence, a total of 15,132 publications were obtained. All of the data obtained was used in scientific mapping and performance analysis, which are one of the bibliometric analysis techniques. When selecting data to undergo clustering analyses, there are various criteria. The most rominent measures are the number of publications and citations per year or per research constituent, wherein publication is a proxy for productivity, whereas citation is a measure of impact and influence (Donthu et al., 2021). Another factor that is effective in data selection is the Pareto Analysis technique. Pareto analysis, introduced by the Italian economist Vilfredo Pareto in the 19th century, suggests that some inputs contribute more significantly to the outcome of the study than others. In this context, including the most effective articles in the analysis will be sufficient to provide general information on the subject. The most effective articles in the field were determined as the most cited articles. As part of the bibliometric enrichment technique, the number of publications to undergo clustering analysis has been determined as the top 100 most-cited articles.

Two techniques, bibliometric and document analysis, were used to analyze the obtained publications. Utilizing bibliometric and document analysis techniques, software like CiteSpace and Wosviewer was employed to create network maps based on citations, covering authors, journals, institutions, countries, and keywords. The enrichment analysis focused on the three largest clusters, with the cluster coverage rate influencing the number of articles examined. When the cluster coverage rate reached around 50%, other articles in the cluster were not reviewed.

FINDINGS

15,132 publications on volatility have been handled by different disciplines such as economics, business finance, finance, mathematical methods, management, statistics, and environment. Economics is at the top of these fields, with 6,432 publications. The field of economics is followed by business finance with 4,885 publications, social sciences mathematical methods with 1,260 publications, mathematics interdisciplinary applications with 1,233 publications, statistics probability with 1,079 publications, management with 667 publications, environmental science with 545 publications, and business with 540 publications. When the number of

Table 2: 10 Most Cited Articles

Title	Authors	Source Title	Publication Year/ Volume/Issue	Tot. Cit.	Avg. per Year
On the relation between the expected value and the volatility of the nominal excess return on stocks	Glosten,LR; Jagannathan,R; Runkle,DE	Journal of Finance	1993/48/5	4,010	129,35
A closed-form solution for options with stochastic volatility with applications to bond and currency options	Heston, SL	Review of Financial Studies	2.06.1993	3,982	128,45
Better to give than to receive: predictive directional measurement of volatility spillovers	Diebold, FX.; Yilmaz,Kamil	International Journal of Forecasting	2012/28/1	2,285	190,42
The cross-section of volatility and expected returns	Ang,A;Hodrick,RJ;Xing,Y; Zhang, XY	Journal of Finance	2006/61/1	1,860	103,33
Modeling and forecasting realized volatility	Andersen,TG; Bollerslev,T; Diebold,FX; Labys, P	Econometrica	2003/71/2	1,763	83,95
Expected stock returns and volatility	French,KR; Schwert,GW; Stambaugh,RF	Journal of Financial Economics	1987/19/1	1,715	46,35
Measuring and testing the impact of news on volatility	Engle,RF; NG,VK	Journal of Finance	1993/48/5	1,639	52,87
Answering the skeptics: yes, standard volatility models do provide accurate forecasts	Andersen, TG; Bollerslev, T	International Economic Review	1998/39/4	1,612	62
The pricing of options on assets with stochastic volatilities	Hull, J; White, A	Journal of Finance	1987/42/2	1,608	43,46

Table 3: 10 Most Cited Journals

Source Name	Documents	Citations
Journal of Finance	87	24,179
Review of Financial Studies	66	16,246
Energy Economics	273	15,207
Journal of Econometrics	197	14,138
Journal of Financial Economics	84	12,530
Journal of Banking & Finance	213	8,545
Finance Research Letters	280	6,473
Journal of Futures Markets	335	6,438
Journal of International Money and Finance	115	5,305
Journal of Business & Economic Statistics	103	5,141

examined in the disciplines is added up, the total number of examined sources is less due to the fact that some papers appear in more than one fields.

When the publications were examined, it was determined that the first publication year was 1980. The article titled "*Estimation of Security Price Volatilities From Historical Data*" published by Garman, M. B. and Klass, M. J. in the Journal of Business today ranks 41th with 689 citations among the publications. During this period, the most publications were made in 1993, 1998, and 2003, with eight publications each.

The 10 most cited articles regarding studies in the field of volatility were examined in detail and presented in table 2. According to the analysis, it was determined that the most cited study was the article titled "*On The Relation Between the Expected Value and The Volatility of The Face Excess Return on Stocks*" by Glosten, L. R., Jagannathan, R. and Runkle, D. E. It was featured in the Journal of Finance in 1993 with 4,010 citations. The second most cited article is the article of Heston S. L.'s published in the Review of Financial Studies in 1993, with 3,982 citations, titled "*A Closed-Form Solution for Options with Stochastic Volatility with Applications to Bond and Currency Options*". Heston offers a closed-form volatility estimation model for estimating the price of European Call Options on financial assets with stochastic volatility. As a consequence, the model has shown that the volatility arising from option prices is not related to the future volatility forecast. It has been determined that the constructed model can be applied to other volatility-related problems (Heston, 1993). The third most cited article is Diebold, Francis X. and Yılmaz, Kamil's "*Better to Give Than to Receive: Predictive Directional Measurement of Volatility Spillovers*" article published in International Journal of Forecasting, with 2,285 citations.

The 10 most journals regarding studies in the field of volatility were examined in detail and presented in table 3. When the journals were published are examined, Journal of Finance is the journal with the most cited journal, with 24,179 citations. Journal of Finance magazine contains the article named "*On The Relation Between The Expected Value and The Volatility of The Nominal Excess Return on Stocks*" by Glosten, L. R., Jagannathan, R. and Runkle, D. E., which is ranked first among the most cited authors with 4,010 citations. The magazine also shows the feature of being the magazine that includes writers such as Andersen, one of the most published writers. The second most cited journal is Review of Financial Studies with 16,246 citations. The journal also includes the second most cited article, Heston S. L.'s "A Closed-Form Solution for Options with Stochastic Volatility with Applications to Bond and Currency Options". The third most cited journal is the Energy Economics, with 15,207 citations. Journal of Econometrics ranks fourth in the list of journals with the highest number of citation, with 14,138 citations. Journal of Financial Economics ranks fifth in the list of journal with the highest number of citation, with 12,530 citations.

Within the scope of the study, analyses were also conducted on which institutions or organizations own printed sources with publications in the field of volatility and from which country they originate. According to this; National Bureau of Economic Research ranked first with 16,254 citations to its 97 articles in the field of volatility. The average number of citations of articles was calculated as 167 citations per article. Duke University ranks second with 13,729 citations to its 83 articles. The average number of citations of articles was calculated as 165 citations per article. The institution in third place is determined as the University of Pennsylvania. The University of Pennsylvania received a total of 12,697

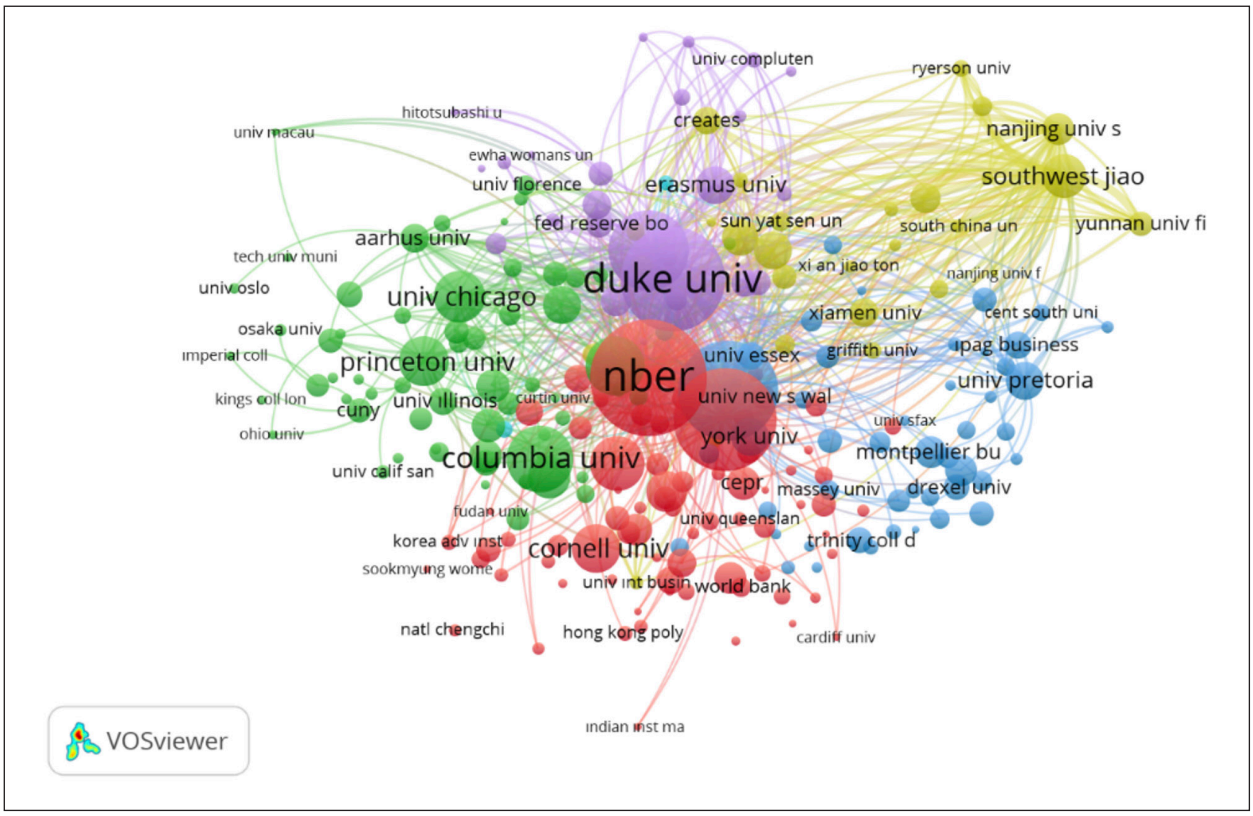

Figure 1: Network Map of Institutions

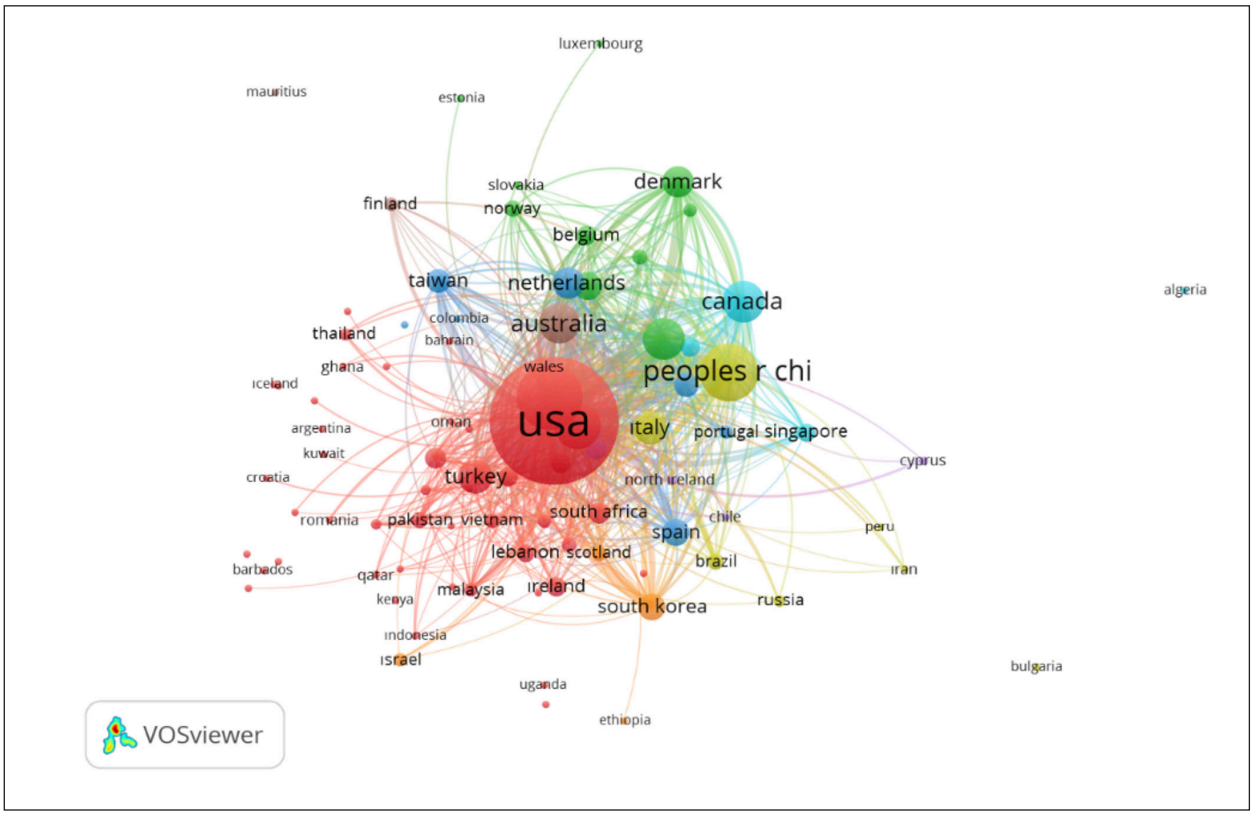

Figure 2: Network Map of Countries

citations from 32 publications on volatility. The average number of citations of publications was determined as 396. It has been determined that the organizations that broadcast the most in the institutions are in the USA. Figure 1 shows the network map that includes the links between the institutions of origin of the studies.

Table 4: 10 Most Cited Authors

Authors	Documents	Total Citations
Bollerslev, T.	37	9,663
Andersen, T. G.	27	8,839
Diebold, F. X.	13	9.330
Schwert, G. W.	7	4,309
Yılmaz, K.	4	4,147
Glosten, L.	1	4,010
Jagannathan, R.	1	4,010
Runkle, D.E.	1	4,010
Heston, L. S.	1	3,982
Engle, R. F.	8	3,083

When the publications in the field of volatility are analyzed on a country basis, it is seen that most broadcasts are made in the USA. 3,047 publications in this field were published in the USA. A total of 133,484 citations were made to 3,047 articles published in the USA, and the total ling strength is 53,403. The USA is also the only country with the feature of being a citation link with all other countries. The second country is England, with 33,550 citations to its 1,101 publications. And the total link strength is 21,612. The third country is China, with 27,326 citations to its 1,825 publications. And the total link strength is 24,460. France ranked fourth place with 16,578 citations to its 649 publications. And fifth place is Canada with 13,712 citations for its 505 publications. Figure 2 shows the network map that includes the links between the countries of origin of the studies.

When the publications in the field of volatility were examined on the basis of authors, it was determined that the author with the most citations is Bollerslev, T. with 9,663 citations. The author has 21 publications in the field of Volatility. Secondly, most cited author is Diebold, Francis X., who received 9,330 citations for their 13 publications. The third author with the highest number of citations is Andersen, T. G. with 8,839 citations and 27 publications. Table 4 presents the number of publications and citations of the top 10 authors in the field of volatility.

Figure 3 shows the network map that includes the links between the authors of the studies.

Keywords in publications are another subject analyzed. The keywords presented in the publications are extremely important in terms of providing basic information about the publication. While examining the keywords of the publications in the volatility field, the minimum number of occurrences was determined to be five. The keywords most commonly used were volatility, stochastic volatility, realized volatility, garch, volatility forecasting, option pricing, forecasting, implied volatility, volatility spillover and long memory. Figure 4 shows the network map that includes the links between the keyword of the studies.

When the studies conducted in the field of volatility are examined through bibliometric analysis, it has been determined that studies within the field of volatility encompass a broad spectrum, spanning from economic disciplines to finance, mathematics, and environmental science, thereby reflecting an interdisciplinary approach. Throughout the period from 1980 to the present day, there has been a noteworthy surge in publication activity, especially in the years 1993, 1998, and 2003.

The most cited article is identified as "*On The Relation Between The Expected Value and The Volatility of The Nominal Excess Return on Stocks*." This article has exerted a significant influence on volatility studies. Furthermore, noteworthy contributions are found in the works of Diebold and Nerlov on exchange rate volatility, along with Schwert's comparative analysis of macroeconomic variables and stock volatility. The Journal of Finance stands out as the most cited journal, encompassing important researchers and articles in the field.

As a result of the analysis of institutions, the National Bureau of Economic Research has been identified as the institution making the most significant corporate contributions in the field of volatility. The predominance of institutions contributing the most being typically based in the United States is noteworthy. On a country basis, the leading position of the United States demonstrates the influence of American institutions in global research on volatility. Additionally, notable academic contributions are observed from the United Kingdom, China, France, and Canada.

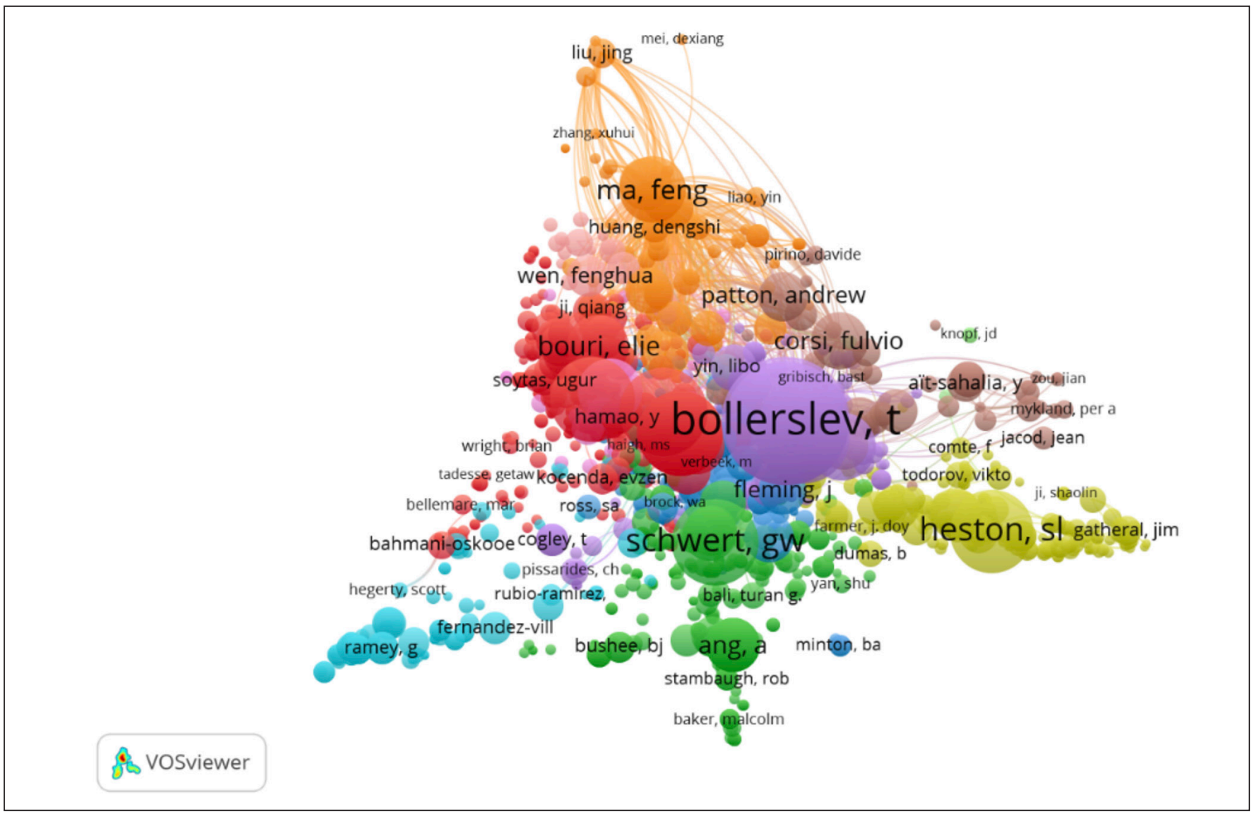

Figure 3: Network Map of Authors

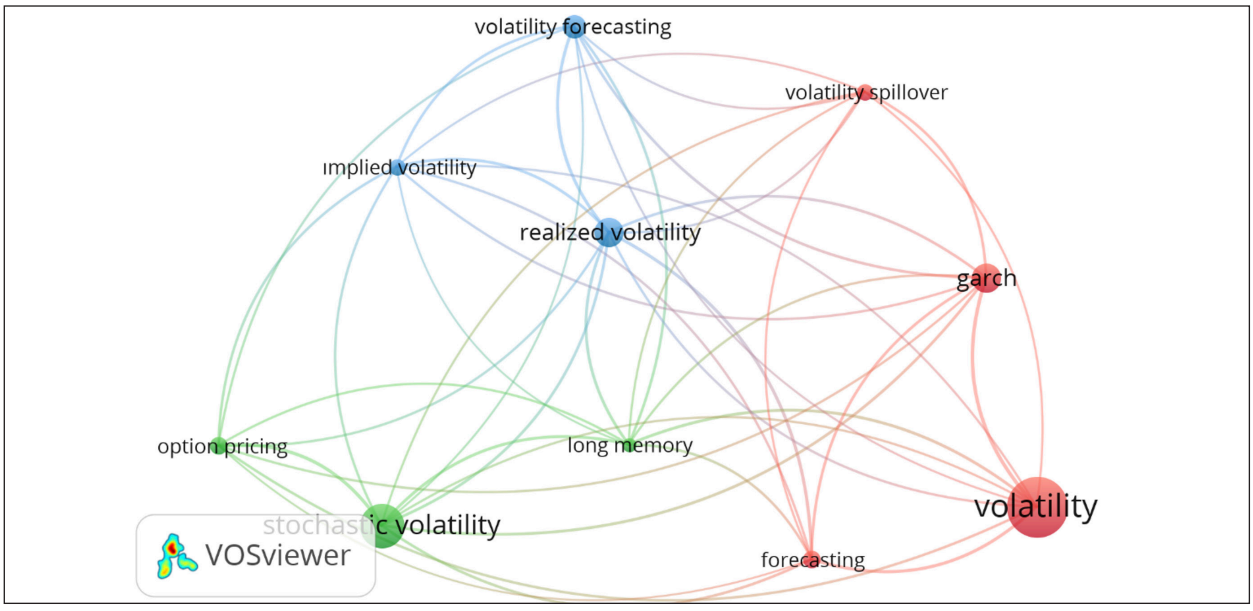

Figure 4: Network Map of Most Repeated Keywords

Finally, the analysis of keywords sheds light on the focal points of researchers. Terms such as volatility, stochastic volatility, option pricing, among others, reflect fundamental concepts in the literature. These findings emphasize that research in the field of volatility is diverse and underscore the impact of specific articles, journals, authors, and institutions in this domain.

The issue of clusters is extremely important in determining how the field is handled academically. For this reason, clusters in the volatility area have been analyzed in detail and presented in the next section.

Cluster Analysis

From 1980 to the end of 2023, 15,132 articles addressed the topic of volatility from various dimensions, that it shows clusters around certain main issues. These main

Table 5: Clustering of Volatility Publications

Cluster	Number of Authors	Silhouette	Label (TFIDF)	Label (LLR)	Label (MI)	Mean (Citation Year)
1	77	0.895	volatility	volatility forecast comparison	global macroeconomic causes (0.37); low-frequency volatility (0.37); spline-garch model (0.37)	2003
2	61	0,831	volatility	stock return volatility	global macroeconomic causes (0.42); emerging equity market volatility (0.42); low-frequency volatility (0.42)	1996
3	52	0,874	stochastic volatility	multivariate latent factor arch model	stochastic volatilities (0.41); global macroeconomic causes (0.41); emerging equity market volatility (0.41)	1985

clusters underwent detailed analysis through cluster analysis.

Silhouette analysis, assessing the separation distance between resulting clusters, was employed to determine the appropriate clustering algorithm for the dataset.

The Silhouette value, ranging from -1 to +1, helps evaluate the effectiveness of the clusters. A value close to +1 indicates that a data point is correctly clustered, close to 0 suggests potential misplacement, and close to -1 implies incorrect clustering (Ogbuabor and Ugwoke, 2018; Shahapure and Nicholas, 2020).

The tables resulting from the cluster analysis provide information on cluster coverage values, citation frequency based on the total count in the Web of Science (GCS), and citation frequency within the collection (LCS).

Table 5 summarizes the sizes, silhouette values, cluster labels, and average citation year values of the first three clusters formed by studies in the field of volatility.

The three largest clusters in table 5 have been analyzed in detail and presented below. By examining all authors' studies in the clusters, a wide range of information about clusters can be obtained. However, scientific knowledge

Table 5: First Largest Cluster The Most Fundemental Authors Table

Coverage	GCS	LCS	Bibliography
16	305	1	Patton, A. J. (2011). Volatility Forecast Comparison Using Imperfect Volatility Proxies. Journal of Econometrıcs, 160(1), 246-256
15	1230	1	Andersen, T. G., Bollerslev, T., Diebold, F. X. and Labys, P. (2003). Modeling and Forecasting Realized Volatility. Econometrica, 71(2), 579-625
11	554	1	Andersen, T. G., Bollerslev, T. and Diebold, F.X. (2007). Roughing It Up: Including Jump Components in The Measurement, Modeling and Forecasting of Return Volatility. Review of Economics And Statistics, 89(4), 701-720
9	668	1	Poon, S. H. and Granger, C. W. J. (2003). Forecasting Volatility in Financial Markets: A Review. Journal of Economıc Lıterature, 41(2), 478-539
8	235	1	Blair, B. J., Poon, S. H. and Taylor S. J. (2001). Forecasting S&P 100 Volatility: The Incremental Information Content of Implied Volatilities and High-Frequency Index Returns. Journal of Econometrics, 105(1), 5-26
6	595	1	Eraker, B., Johannes, M. and Polson, N. (2003). The Impact of Jumps In Volatility and Returns. Journal of Finance, 58(3), 1269-1300
6	253	1	Bandi, F. M. and Russell, J. R. (2006). Separating Microstructure Noise From Volatility. Journal of Financial Economics, 79(3), 655-692.
5	590	1	Corsi, F. (2009). A Simple Approximate Long-Memory Model of Realized Volatility. Journal of Financial Econometrics, 7(2), 174-196.
5	266	1	Ghysels, E., Clara, P. S. and Valkanov, R. (2006). Predicting Volatility: Getting The Most Out of Return Data Sampled At Different Frequencies. Journal of Econometrics, 133(1-2), 59-95.
5	267	1	Engle, R. F. and Rangel, J. G. (2008). The Spline-Garch Model For Low-Frequency Volatility And İts Global Macroeconomic Causes. Review of Financial Studies, 21(3), 1187-1222.

progresses rapidly thanks to today's increasing communication technologies. To efficiently gather pertinent information about the cluster, the Pareto analysis technique was employed, excluding authors with a coverage value below 5% from the cluster. This approach allows for the identification of clusters shaped by authors, their perspectives on volatility, developments in global literature on volatility, and the current state of the field.

First Largest Cluster (# 1): Volatility Prediction and Comparison

The largest cluster in the volatility analysis, Cluster #1, comprises 77 members with a silhouette value of 0.895. Three key criteria, TFIDF, LLR, and MI, guide the evaluation of works within this cluster. According to these criteria, the cluster is named "Volatility" under TFIDF, "Volatility Estimation and Comparison" under LLR, and "Global Macroeconomic Causes", "Low Frequency Volatility" and "Spline-Garch Model" under MI. While the Citespace program suggests the LLR panel for cluster naming, we will adopt the name "Volatility Estimation and Comparison" in alignment with the first cluster's predominant themes.

The articles of the authors in the first cluster were examined to create a 51% coverage rate. Patton, which has a high coverage rate of the first cluster; in 2011, he tried to take the work of Andersen and Bollerslev's (1998), Meddahi's (2001) and Hansen and Lunde's (2006) one step further with his article titled "Comparison of Volatility Forecast Using Imperfect Volatility Proxies". Firstly, he examined the effect of invisible variables in volatility calculations on volatility results. In particular, he used variables such as end-of-day return, intraday return, and actual variance to estimate volatility. Consequently, he determined that the choice of variables used in volatility estimation effectively calculated volatility accurately. In addition, the increase in data frequency increases the probability of giving accurate results in volatility estimation. Patton states that while defining a new variable set to be used in volatility models, it would be more useful to use new variables in the estimation of macroeconomic indicators.

In second place is the article "*Modeling and Forecasting Realized Volatility*" published in 2003 in Econometrica by Andersen, Bollerslev, Diebold, and Labys with a coverage rate of 15%. The article of Andersen et al., they are also the most cited article of the cluster, with a total of 1,763 citations to their articles, as mentioned above. In their studies, Andersen et al. worked on integrating high-frequency intraday data and volatility prediction models into a formation that will be used to predict low-frequency data. They carried out their studies with the help of Garch family models with data on the German mark, US Dollar and Japanese Yen between 1986-1999. They used the first 10 years of the considered period as the within-sample forecast interval and the remaining period as the out-of-sample forecast interval. Consequently, the developed model was determined as an easily applicable model even in multivariate situations. As a result, they stated that the determination of open volatility factors and the market-wide variables that underlie and are related to systematic volatility movements could help provide an important step towards a better understanding of the volatility economy.

In the third place, there is the article by Andersen, Bollerslev and Diebold published in 2007 titled "*Roughing It Up: Including Jump Components in The Measurement, Modeling, and Forecasting of Return Volatility*" with 11% coverage rate and 554 citations in total. Andersen et al. developed a nonparametric method to measure the jump in the volatility of return on assets in their work on volatility modeling based on the theoretical results they obtained from the literature. They concluded by using the Arch family models in their application with 30 years of data on Mark/Dollar exchange rate, S&P 500, and US Treasury Bill returns. As a consequence, they determined that most of the jumps in volatility were directly related to important news in the markets. They also found that the predictability of the volatility jump is more predictable in daily, weekly, and monthly return volatility than volatility non-jump.

Among the articles in the first cluster, the article ranked in fourth place according to the ranking of the highest coverage rate, with a rate of 9% and 736 citations total; it was published in the Journal of Economic Literature by Poon and Granger in 2003 and titled "*Forecasting Volatility in Financial Markets: A Review*". In their studies, Poon and Granger analyzed which volatility model was the best estimate based on 93 articles made in the last 20 years in the volatility field. At the point of estimation, they focused on the factors affecting the estimation result, such as the time interval and the markets considered. As a result, the studies comparing the Hisvol and Garch models determined that the Hisvol model gave results one step ahead of the Garch model. In addition, it was determined that Egarch and Gjr-garch, which are alternative Garch models, give more meaningful results in certain studies compared to the Garch model. Consequently, volatility in financial markets has been determined as a predictable phenomenon.

The analysis of the first cluster, comprising 51% of reviewed articles, revealed a focus on predictive performance in volatility estimation models. Especially, studies in which models in previous studies are re-analyzed and tried to be developed have a large place in the cluster. The cluster predominantly covers exchange rates and stock markets, with a total of 5,198 citations. In addition, the article "Modeling and Forecasting Realized Volatility" published in Econometrica in 2003 by Andersen, T.G, Bollerslev, T., Diebold, F.C and Labys, P. which is at the top of the general citation ranking with 1,763 citations, is included in the first cluster.

Second Largest Cluster (# 2): Stock Return Volatility

The second cluster in the volatility analysis, Cluster #2, comprises 61 members with a silhouette value of 0.831. Three key criteria, TFIDF, LLR, and MI, guide the evaluation of works within this cluster. According to these criteria, the cluster is named "Volatility" under TFIDF, "Stock Return Volatility" under LLR, and "Global Macroeconomic Reasons", "Growing Stock Market Volatility" and "Low Frequency Volatility" under MI. While the Citespace program suggests the LLR panel for cluster naming, we will adopt the name "Stock Market Volatility" in alignment with the first cluster's predominant themes.

The articles of the authors in the second cluster were analyzed to create a coverage rate of 46%. Andersen et al, which has a high coverage rate of the first cluster; in 2001, analyzed the correlation between the exchange rate volatility in the presence of high-frequency data with the help of the daily five-minute returns of the German Mark and the Japanese Yen with their article titled "The Distribution of Realized Exchange Rate Volatility". In addition, they used the squares of intraday returns as a simpler and new parameter that can be used in volatility calculations. As a result, they concluded that the relationship between exchange rates increases volatility. Another study result is that the persistence of volatility in the markets is high, and volatilities have no unit roots. The most specific part of the study is the first modeling that provides a nonparametric characterization of both unconditional and conditional distributions of bilateral exchange rate volatility.

Barndorff-Nielsen and Shephard (2002), in their article titled "Econometric Analysis of Realized Volatility and Its Use in Estimating Stochastic Volatility Models" with a coverage rate of 13%, focused on the asymptotic distribution of volatility errors in estimating stochastic volatility, using intraday five-minute data for the German Mark and the US Dollar. Nielsen and Shephard (2002) developed a more accurate model for estimating high-frequency data volatility by determining the difference between actual and integrated volatility, without resorting to simulation-intensive methods.

Andersen and Bollerslev (1998), in their article titled "Answering The Skeptics: Yes, Standard Volatility Models do Provide Accurate Forecasts" with a coverage rate of 9%, examined the validity and consistency of volatility estimates using high-frequency data, employing Arch and stochastic volatility models with spot market rates for

Table 6: Second Largest Cluster The Most Fundemental Authors Table

Coverage	GCS	LCS	Bibliography
15	842	1	Andersen, T. G., Bollerslev, T., Diebold, F. X. and Labys, P. (2001). The Distribution of Realized Exchange Rate Volatility . Journal of The American Statistical Association, 96(453), 42-55
13	762	1	Barndorff-Nielsen, O. E. and Shephard, N. (2002) Econometric Analysis of Realized Volatility and Its Use In Estimating Stochastic Volatility Models. Journal of The Royal Statistical Society, 64(2), 253-280
9	1062	1	Andersen, T. G. and Bollerslev, T. (1998) Answering The Skeptics: Yes, Standard Volatility Models Do Provide Accurate Forecasts, International Economic Review, 39(4), 885-905
9	510	1	Bekaert, G (2000) Asymmetric Volatility and Risk in Equity Markets, Review of Financial Studies, 13(1):1-42
9	439	1	Andersen, T. G. and Bollerslev, T. (1998) Deutsche Mark Dollar Volatility: Intraday Activity Patterns, Macroeconomic Announcements, and Longer Run Dependencies. Journal of Finance, 53(1), 219-265
7	282	1	Andersen, T. G. and Bollerslev, T. (1997) Heterogeneous Information Arrivals and Return Volatility Dynamics: Uncovering The Long-Run in High Frequency Returns. Journal of Finance, 52(3), 975-1005
2	361	1	Christensen, B. J. and Prabhala, N. R. (1998) The Relation Between Implied and Realized Volatility. Journal of Financial Economics, 50(2), 125-150

the US Dollar-German Mark and US Dollar-Japanese Yen. Contrary to prevailing literature beliefs that using high-frequency data is inconvenient for volatility estimation, Andersen and Bollerslev concluded that it is feasible with appropriate modeling. They emphasized the importance of correctly defining models for successful volatility predictions and proposed volatility assessment criteria, highlighting that structural methods for estimating volatility allow for more meaningful comparisons.

Bekaert and Wu (2000), in their article titled "Asymmetric Volatility and Risk in Equity Markets" with a coverage rate of 9%, examined the leverage effect on asymmetric volatility and risk premium explanations. Testing their reviews on different portfolios, the authors found that the leverage effect on volatility is small compared to the asymmetry caused by shocks in the Garch specification. However, their analysis found that negative shocks significantly increased conditional covariance, while positive shocks had a mixed effect on conditional covariance. They also state that although their results seem consistent, there may be other factors affecting these results.

As a result of detailed examinations of these four articles, it was determined that the authors in the cluster focused especially on the covering various aspects of exchange rates, volatility estimation, and risk premium disclosures, revealed a cluster focus on the estimation of exchange rates and factors affecting volatility in stock markets. The cluster garnered a total of 5,795 citations, featuring influential articles such as "Modeling and Forecasting Realized Volatility" (1,763 citations) and "Answering The Skeptics: Yes, Standard Volatility Models do Provide Accurate Forecasts" (1,612 citations), thereby comprising a significant body of work by notable authors.

Third Largest Cluster (# 3): Stock Return Volatility

The third largest cluster in the volatility analysis, Cluster #3, comprises 52 members with a silhouette value of 0.874. Three key criteria, TFIDF, LLR, and MI, guide the evaluation of works within this cluster. According to these criteria, the cluster is named "Volatility" under TFIDF, "Stock Return Volatility" under LLR, and "Global Macroeconomic Reasons", "Growing Stock Market Volatility", "Growing Stock Market Volatility" and "Low Frequency Volatility" under MI. While the Citespace program suggests the LLR panel for cluster naming, we will adopt the name "Stock Market Volatility" in alignment with the first cluster's predominant themes.

The third cluster's authors, with a 51% coverage rate, aimed to enhance forecast performance. Diebold and Nerlov, which has a high coverage rate of the first cluster; in 1989, analyzed the need for multivariate specification due to univariate limitations with their article titled "The Dynamics of Exchange-rate Volatility - A Multivariate Latent Factor ARCH Model". They proposed using latent variables to overcome the challenges posed by a large number of variables in Arch modeling. The study revealed a robust link between information quality, market volatility, and it is easier to interpret volatility when the markets are relatively calm. Among the authors in the third cluster, Diebold and Nerlov, authors of the article with the highest coverage rate, focused on improving forecasting performance, as an example in their article titled The Dynamics of Exchange-Rate Volatility - A Multivariate Latent Factor Arch Model.

Schwert's article, "Stock Volatility and The Crash of '87" (1990), with 424 citations, covered 14% of the second cluster. Analyzing stock return volatility from 1885 to the 1987 market crash, Schwert focuses on the impact of the 20% stock price drop during the crisis on market returns volatility. Conclusively, he notes that stock volatility peaked before the crisis, gradually returning to normal afterward. Schwert observes higher stock volatility during the 19th and early 20th-century banking panics and he determined that negative shocks have more effects on volatility than positive shocks.

Thirdly Schwert's article, "Why Does Stock-Market Volatility Change Over Time" (1989), with 1,437 citations, comprises 11% of the third cluster. In his study, Schwert examined the correlation between macroeconomic variables (inflation, money emission, industrial production) and stock market volatility from 1857 to 1987. He noted the unusually high volatility during the Great Depression (1929-1939), but also stated that macroeconomic variables alone were not sufficient to explain the volume of financial assets. Schwert identifies a link between interest rates, corporate bond yield volatility, and stock return volatility. Overall, he observes higher stock volatility and increased operating leverage during economic recessions. None of the analyzed variables dominate in explaining stock volatility, concluding a relationship between Schwert's operational activities and stock volatility.

The publication with the highest coverage, with 427 citations, in the fourth place is Wiggins's article titled "Option Values Under Stochastic Volatility-Theory and Empirical Estimates" published in the Journal of Financial Economics in 1987. Wiggins assessed stock volatility by focusing on stochastic processes using numerical

Table 7: Third Largest Cluster The Most Fundemental Authors Table

Coverage	GCS	LCS	Bibliography
18	259	1	Diebold, F. X. and Nerlove, M. (1989) The Dynamics of Exchange-Rate Volatility – A Multivariate Latent Factor Arch Model. Journal of Applied Econometrics, 4(1), 1-21
14	344	1	Schwert, G. W. (1990) Stock Volatility and The Crash of 87. Review of Financial Studies, 3(1), 77-102
11	1080	1	Schwert, G. W. (1989) Why Does Stock-Market Volatility Change Over Time. Journal of Finance, 44(5), 1115-1153
8	370	1	Wiggins, J. B. (1987) Option Values Under Stochastic Volatility - Theory and Empirical Estimates. Journal of Financial Economics, 19(2), 351-372
7	1353	1	French, K. R., Schwert, G. W. and Stambaugh, R. F. (1987) Expected Stock Returns and Volatility. Journal of Financial Economics, 19(1), 3-29
7	567	1	Stein, E. M and Stein, J. C. (1991) Stock-Price Distributions With Stochastic Volatility - An Analytic Approach. Review of Financial Studies, 4(4), 727-752
6	470	1	Pagan, A. R. and Schwert, G. W. (1990) Alternative Models For Conditional Stock Volatility. Journal of Econometrics, 45(1-2), 267-290
6	277	1	Melino, A and Turnbull, S. M. (1990) Pricing Foreign-Currency Options With Stochastic Volatility. Journal of Econometrics, 45(1-2), 239-265
5	388	1	Ross, S. A. (1989) Information And Volatility - The No-Arbitrage Martingale Approach To Timing and Resolution Irrelevancy. Journal of Finance, 44(1), 1-17
2	1243	1	Hull, J and White, A. (1987) The Pricing of Options on Assets with Stochastic Volatilities. Journal of Finance, 42(2), 281-300

methods. It derives statistical estimators for the volatility process parameters and estimates the index parameters using these derived statistical estimators. Estimated option values deviate significantly from Black-Scholes values in most cases; this emphasizes that Black-Scholes dominates out-of-the-money options in long-term index options.

When four articles covering 51% of the articles in the third largest cluster were examined, it was revealed that the cluster focused on the development of new model proposals. The authors in this cluster strive to create new volatility estimators using long-term stock market data. They analyze the relationships between macroeconomic variables and stock market volatility, comparing the estimation performances of univariate and multivariate volatility models. In the exploration of new statistical methods, efforts are made to determine fundamental effects like asymmetric impact and leverage ratio. The total number of citations in this cluster amounts to 7,973, featuring notable works such as French, K. R., Schwert G. W., and Stambaugh R. F.'s "Expected Stock Returns and Volatility" (1,716 citations), Hull, J. and White, A.'s "The Pricing of Options on Assets With Stochastic Volatilities" (1,607 citations), and Schwert G. W.'s "Why Does Stock-Market Volatility Change Over Time" (1,437 citations).

In summary, the cluster analyzes performed; it has revealed the different approaches and basic issues that the authors focus on regarding volatility. The first cluster focused on comparing volatility forecasting models using different parameters and developing new models. Researchers who want to analyze the performance of volatility forecasting models under different conditions can benefit from the information in the first cluster. The second cluster identified focuses on the stock and foreign exchange markets, the determination of the volatility of exchange rates, especially the US Dollar, the German Mark, and the Japanese Yen, and their relations with other financial instruments. For those interested in researching exchange rates and stocks, exploring publications in the second cluster is recommended. The third cluster investigates the volatility of macroeconomic indicators by addressing the relationship between stock markets and macroeconomic indicators. Authors in this group strive to enhance volatility forecast performance by incorporating new variables. Researchers approaching volatility from a macro perspective may find valuable contributions from authors in the third cluster. One of the most common points in all clusters is the studies to improve the volatility forecast performance or compare the performance of existing volatility prediction models. In general, researchers have tested which volatility forecasting models perform best under different market conditions or have carried out studies on incorporating new variables into statistical models to improve existing models.

CONCLUSION

This study, which conducts a bibliometric analysis of articles in the field of volatility, aims to contribute to financial research by delving into trends and significant findings in the literature. With the bibliometric analysis performed, knowledge gaps in the literature were identified, different perspectives in the literature were revealed in order to understand the inherently complex structure of the financial world, and the literature was enriched by identifying possible opportunities for researchers. The conducted studies indicate a growing focus on research related to exchange rates and macroeconomic factors, particularly those influenced by global economic uncertainties and technological developments. According to the findings obtained as a result of the bibliometric analysis study, studies carried out in the field of volatility are mostly aimed at determining how stocks, exchange rates and macroeconomic factors are affected by global economic uncertainty and technological developments. In particular, Heston's (1993) study and Glosten, Jagannathan and Runkle's (1993) study stand out as the most cited publications. In their work, the authors contribute to the understanding of uncertainties in financial markets by addressing fundamental questions in the field of volatility. The articles in question are highly cited; this can be attributed to reasons such as addressing current issues according to their periods, developing advanced mathematical models and using unique data sets. The topics covered by new researchers in these articles are; conducting interdisciplinary studies to analyze the impact of new parameters on volatility in more detail, by adapting them to current market conditions and by taking advantage of new technological approaches, especially big data analytics, artificial intelligence and deep learning, will contribute to the literature. Results from journal analysis highlight the Journal of Finance as the most cited journal, it is possible to attribute this to the effective publishing policy, quality editorial process and selectivity of the journal. Although the National Bureau of Economic Research (NBER) is one of the leading institutions publishing on volatility, the majority of publishing institutions are universities. In the publications, it has been determined that while universities address the issue of volatility from an academic perspective, institutions outside universities, such as NBER, use the issue of volatility as a strategic tool to achieve their goals. NBER's prominence in volatility research also strengthens the leadership of the United States on a country basis. This leadership, attributed to the country's comprehensive and dynamic financial markets, is further enhanced by NBER's expertise and pioneering contributions. Therefore, participating in volatility research at US-based institutions offers the opportunity to collaborate with global researchers and thus develop volatility studies worldwide. In addition, researchers focusing on journals that stand out with their effective research, such as the Journal of Finance, can increase the visibility of their studies and the recognition of authors. In future studies, researchers will be able to conduct joint volatility studies with experts from different disciplines such as economics, finance, statistics and engineering, which will allow them to look at the complex structure of volatility from different perspectives and develop more creative solutions. Volatility forecast models developed by taking advantage of the opportunities of developing technologies, especially big data analytics, artificial intelligence and deep learning, will contribute to the creation of more accurate models in the dynamic market structure.

The use of cluster analysis in understanding the development and major themes of volatility literature allows future researchers to efficiently navigate and synthesize existing knowledge. Studies on issues such as the development of volatility forecasting models, exchange rate volatility, and the effect of macroeconomic indicators on volatility, identified as the main focus points through cluster analyses, help determine the primary research areas for scholars and develop strategies to mitigate market volatility. When the articles in the clusters were examined in detail, it was determined that the articles on volatility underscores their substantial contributions to financial literature by challenging established assumptions in traditional financial theory. Specifically, critiques of the normal distribution assumption reveal volatility's tendency to deviate from this norm, especially in certain periods. Revisiting assumptions of data independence and constant variance highlights the inadequacy of traditional notions in capturing the intricacies of financial market dynamics. Criticisms toward the Rational Expectations Hypothesis emphasize the need for reassessment, emphasizing the impact of irrationality and emotional reactions on price formation. The analysis emphasizes the importance of adapting volatility models to specific market conditions and asset classes. In high volatility periods, Garch family models, stochastic volatility models, and regime-switching models excel, capturing sudden market changes and nonlinear responses to price fluctuations. Conversely, simplicity takes precedence in low volatility environments, with stochastic volatility models, constant volatility models, and Garch (1,1)

performing better. The research suggests that asset class differences influence model effectiveness, with Garch family models recommended for stocks, bonds, and exchange rates, Gacrh derivatives and stochastic volatility models for cryptocurrencies, and stochastic volatility and regime-switching models for commodities. Long-term analyses benefit from constant volatility and econometric models, while short-term analyses favor quickly updated variance estimates from stochastic volatility and Garch derivatives. Novel approaches like Data Mining and Machine Learning Integration, Adaptive Models and Artificial Intelligence, Time Series Analysis and Parameter Optimization, Sensitivity and Risk Management, Alternative Financial Models, and Multiple Model Integration offer more accurate and comprehensive volatility forecasts, compensating for traditional model's limitations. The analysis advocates for a reconsideration of data frequencies and modeling approaches, suggesting that high-frequency data and alternative techniques may enhance accuracy in volatility predictions. This critical perspective deepens our understanding of financial markets and opens avenues for refining traditional financial theory. Based on both the clusters identified around fundamental topics in the volatility literature and the detailed analyses of articles within these clusters, future researchers in volatility studies are encouraged to integrate insights from studies on volatility prediction models, exchange rates, and macroeconomic indicators into new research. Exploring the psychological aspects of investor behavior, utilizing alternative modeling techniques, including high-frequency data, and adopting an interdisciplinary approach will enhance our understanding of market dynamics and pave the way for more comprehensive and nuanced research, addressing the complexities of financial markets and volatility.

As a result of the examination of volatility studies, future study topics that could contribute to the literature were determined and presented below. For future studies in this context;

* Strengthening volatility modeling through the integration of new data sets, advanced statistical methods, machine learning techniques, and a more detailed examination of socioeconomic factors.

* Exploring the impact of emerging financial instruments, particularly digital assets, on volatility to guide investors in understanding and evaluating the volatility of digital assets.

* Investigating the capacity of social media to predict volatility in financial markets through news and sentiment analysis, along with assessing the impact of social media on investor behavior.

* Expanding bibliometric analysis using different databases and alternative methodologies in future studies to address the limitations.

* Examining the relationship between volatility and social and environmental factors, such as climate change, global events, and pandemics, to help investors create sustainable investment strategies.

* Understanding the effects of investor behavior and emotional reactions on volatility in financial markets in more detail, exploring how stock trading decisions influence volatility, and minimizing these effects.

* Conducting a comparative analysis of regional and global factors to understand how volatility differs on a regional or country basis, particularly focusing on the effects of regional economic factors and policies on volatility.

* Exploring volatility factors in developing economies and evaluating forecasting models specific to these economies to contribute to the literature on volatility.

* Investigating how new methodologies like machine learning, artificial intelligence, and big data analytics can be applied in volatility forecasting, providing future researchers with innovative perspectives.

* Promoting interdisciplinary research collaboration across economics, finance, statistics, and engineering to better understand the complexity of volatility and evaluate it from various perspectives.

As a result, the in-depth bibliometric analysis study comprehensively evaluates the trends and important findings in the literature in the field of volatility and offers researchers new study opportunities that will fill existing knowledge gaps and close gaps in the literature. It is important to foster collaboration between experts from various disciplines to increase knowledge in this field, strengthen financial decision-making processes and respond more effectively to future uncertainties. Investors' risk perception and sensitivity to market conditions should also be examined in detail. In this

context, future research could be expanded to include individual and institutional investors to understand the effects of investor behavior on volatility in more detail. In addition, research evaluating the effects on the general stability of the financial system, taking into account the risk management strategies of financial institutions and the compliance of regulators with these strategies, can also make a significant contribution. In this way, knowledge gaps on volatility can be filled more quickly and a more resilient economic environment against fluctuations in financial markets can be created. Considering the limitations of bibliometric analysis, it is important to note that future studies could extend a similar analysis by using different databases and applying alternative methodologies. It is also necessary to update the literature on volatility and conduct more specific research focusing on new trends, especially considering evolving technology and market conditions. At this point, advanced analyzes and applications on volatility have the potential to place industry practice on more solid foundations. In conclusion, this study provides a basis for in-depth understanding of the current situation in the field of volatility and direction for future research. Understanding and effectively managing fluctuations in financial markets is of critical importance for global economic stability. Therefore, constantly updating and expanding research on volatility requires the joint efforts of professionals in the financial sector, regulators and academics.

REFERENCES

Akel, V. (2011), Kriz dönemlerinde finansal piyasalar arasindaki volatilite yayilma etkisi, *1. Basım, Detay Yayıncılık, Ankara*

Andersen, T. G. and Bollerslev, T. (1998). Answering the skeptics: Yes, standard volatility models do provide accurate forecasts. *International Economic Review, 39*(4); 885-905

Andersen, T. G., Bollerslev, T., Diebold, F. X. and Labys, P. (2001). The distribution of realized exchange rate volatility. *Journal of American Statistical Association, 96*(453); 42-55

Andersen, T. G., Bollerslev, T., Diebold, F. X. and Labys, P. (2003). Modeling and forecasting realized volatility. *Econometrica, 71*(2); 579-625

Andersen, T. G., Bollerslev, T. and Diebold, F. X. (2007). Roughing it up: Including jump components in the measurement, modeling, and forecasting of return volatility. *Review of Economics and Statistics, 89*(4); 701-720

Baker, H. K., Kumar, S. and Pandey, N. (2019). Thirty years of the global finance journal: A bibliometric analysis. *Global Finance Journal, 47*

Barndorff-Nielsen, O. E. and Shephard, N. (2002). Econometric analysis of realized volatility and its use in estimating stochastic volatility models. *Journal of The Royal Ststistical Society Series B-Statistical Methodology, 64*; 253-280

Bekaert, G. and Wu, G. J. (2000). Asymmetric volatility and risk in equity markets. *Review of Financial Studies, 13*(1); 1-42

Bollerslev, T. (1986). Generalized autoregressive conditional heteroskedasticity. *Journal of Econometrics, 31*(3); 307-327

Chen, J., and Yang, L. (2019). A bibliometric review of volatility spillovers in financial markets: Knowledge bases and research fronts. *Emerging Markets Finance and Trade, 57*(5); 1358-1379

Christensen, B. J. and Prabhala, N. R. (1998). The relation between implied and realized volatility. *Journal of Financial Economics, 50*(2); 125-150

Clarivate Academia. (2015). Web of Science platform. *Web of Science: Summary of Coverage*. (*https://clarivate.libguides.com/webofscienceplatform/coverage*).

Depren, Ö., Kartal, M. T., ve Depren, S. K. (2018). Borsalarda oynaklık üzerine yayınlanmış akademik çalışmaların bibliyometrik analizi. *Bankacılık ve Sermaye Piyasası Araştırmaları Dergisi, 2*(6), 1-15.

Diebold, F. X. and Nerlove, M. (1989). The dynamics of exchange-rate-volatility-amultivariate latent factor Arch model. *Journal of Applied Econometrics, 4*(1); 1-21

Diebold, F. X. and Yılmaz, K. (2012). Better to give than to receive: Predictive directional measurement of volatility spillovers. *International Journal of Forecasting, 28*(1); 57-66

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N. and Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research, 133*; 285-296.

Emhan, A. (2009). Risk yönetim süreci ve risk yönetmekte kullanilan teknikler. *Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi, 23*(3); 209 -220

Engle, R. F. (1982). Autoregressive conditional heteroskedasticity with estimates of the variance of U.K. inflation. *Econometrica 50*(4); 987-1007

French, K. R., Schwert, G. W. and Stambaugh, R. F. (1987). Expected stock returns and volatility. *Journal of Financial Economics, 19*(1); 3-29

Gaberli, Ü. (2023). Tourism growth: A bibliometric analysis from the web of science (WoS) database. *Sosyal Bilimler Metinleri, 1*; 28-39

Garman, M. B. and Klass, M. J. (1980). On the Estimation of Security Price Volatilities from Historical Data. *The Journal of Business, 53*(1); 67-78

Glosten, L. R., Jagannathan, R. and Runkle, D. E. (1993). On the relation between the expected value and the volatility of the nominal excess return on stocks: *Journal of Finance, 48*(5); 1779-1801

Han, Y. (2011). On the relation between the market risk premium and market volatility. *Applied Financial Economics, 21*(22); 1711-1723.

Heston, S. L. (1993) A closed-form solution for options with stochastic volatility with applications to bond and currency options. *The Review of Financial Studies, 6*(2); 327-343

Hull, J. and White, A. (1987). The pricing of options on assets with stochastic volatilities. *The Journal of Finance, 42*(2); 281-300

Hussain, A., Fatima, N. ve Kumar, D. (2011). Bibliometric analysis of the 'Electronic Library' Journal (2000-2010). *Webology, 8*(1); 1-11.

Karasözen, B., Gökkurt, B. Ö. ve B, U. Z. (2011). WoS ve Scopus veri tabanlarının karşılaştırması. *Türk Kütüphaneciliği, 25*(2); 238-260.

Kurutkan, M. N. ve Orhan, F. (2018). Bilim Haritalama, Bibliyometrik Analiz ve Kitap ile İlgili Genel Hususlar (Der.). *Sağlık Politikası Konusunun Bilim Haritalama Teknikleri ile Analizi. Ankara: IKSAD Publishing House.*

Merediz-Solà, I. and Bariviera, A. F. (2019). A bibliometric analysis of bitcoin scientific production. *Research in International Business and Finance, 50*; 294-305.

Ogbuabor, G. and Ugwoke, F. N. (2018). Clustering algorithm for a healthcare dataset using silhouette score value. *International Journal of Computer Science & Information Technology (IJCSIT), 10*(2); 27-37.

Patton, A. J. (2011). Volatility forecast comparison using imperfect volatility proxies. *Journal of Econometrics, 160*(1); 246-256

Poon, S. H. and Granger, C. W. J. (2003). Forecasting volatility in financial markets: A review. *Journal of Economic Litarature, 41*(2); 478-539

Radu, V., Radu, F., Tabirca, A.I., Saplacan, S. I. and Lile, R. (2021). Bibliometric analysis of fuzzy logic research in international scientific databases. International *Journal of Computers Communications & Control, 16*(1)

Schwert, G. W. (1989). Why does stock-market volatility change over time. *Journal of Finance, 44*(5); 1115-1153

Schwert, G. W. (1990). Stock volatility and the crash of 87. *Review of Financial Studies, 3*(1); 77-106

Shahapure, K. R. and Nicholas, C. (2020). Cluster quality analysis using silhouette score. 2020 IEEE 7th International Conference on Data Science and Advanced Analytics (DSAA), Sydney, NSW, Australia; 747-748

Sosa, M. F., Ochoa, E. A. and Merigó, J. M. (2020). Exchange rate and volatility: A bibliometric review. *International Journal of Finance & Economics, 27*(1), 1419-1442

Tunger, D. and Eulerich, M. (2018). Bibliometric analysis of corporate governance research in German-speaking countries: applying bibliometrics to business research using a custom-made database. *Scientometrics, 117*; 2041-2059

Verma, S. and Gustafsson, A. (2020). Investigating the emerging COVID-19 research trends in the field of business and management: A bibliometric analysis approach. *Journal of Business Research, 118*, 253-261.

Vianez, J. P, Martínez, R. G. and Román, C, P. (2020), A bibliometric analysis of behavioural finance with mapping analysis tools. *European Research on Management and Business Economics, 26*(2); 71-77

Wiggins, J. B. (1987). Option values under stochastic volatility-theory and empirical estimates. *Journal of Financial Economics, 19*(2); 351-372

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The Role of Structural Reforms on the Price and Financial Stability: Evidence from a Multi-Country PSTR Model

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ABSTRACT

This paper investigates the effects of structural reforms on 84 developed and developing countries between 2002 and 2018 through the Panel Smooth Transition Regression model. In doing so, it attempts to determine if structural reforms have an impact on price stability in real sectors and on financial stability in financial sectors. This research shows that structural reforms have a significant impact on price and financial stability, despite the fact that the regimes are shaped by the value of the output gap threshold that varies between countries. Based on these results, structural reforms can help to improve price and financial stability to the extent that they can eliminate supply-demand imbalances, prevent systemic risks, and improve expectations by supporting new monetary policy strategies.

Keywords: Structural Reforms, Price Stability, Financial Stability, MONA-Database, Nonlinear Panel Data Analysis, PSTR.

JEL Classification Codes: C13, E52, F41, G15

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INTRODUCTION

Economic conjuncture after 2007-2008 global financial crisis reactivates the two different policy proposals to eliminate the problems arising from supply and demand structures and to converge to potential sustainable growth rates in developing and developed countries: structural reforms in real and financial sectors (Agnello et al., 2015; Swaroop, 2016) and monetary policy designs for financial and price stability (Fouejieu, 2017; Sethi and Acharya, 2020). Amidst the global financial crisis, developed and developing countries continued to increase their budget deficits and debt stock, which reduced fiscal policy flexibility and accelerated efforts to achieve potential sustainable growth rates with monetary policies (Vredin, 2015). Furthermore, the global financial crisis that occurred when the output and inflationary gap were relatively close to the equilibrium value also showed that there may be bubbles in financial asset prices, and that monetary policies in terms of price stability alone cannot eliminate financial risks (Borio, 2014). In developed and developing countries, these conditions restrain the effectiveness of monetary and fiscal policies in aligning with potential sustainable growth rates, resulting in the conclusion that traditional policy sets have been responsible for nearly all possible policies (CBRT, 2016). Since traditional policies have not been as effective as before, international organizations, including the International Monetary Fund (IMF), the Organization for Economic Co-operation and Development (OECD), and the World Bank (WB), have recommended stronger structural reforms (IMF, 2015; Ullrich, 2019) and new monetary policy designs (Vredin, 2015) in comparison to the pre-global financial crisis for developed and developing countries, in particular (Rieth and Wittich, 2020).

Structure reforms and new monetary policy designs can reduce the output and inflationary gap in developed and developing countries, thereby contributing to convergence to sustainable growth rates. By reducing market constraints and providing productivity (Anderson et al., 2014) as well as efficient resource allocation (Ostry et al., 2009), structural reforms reduce supply-side constraints and increase investments. Demand-side reforms, however, direct consumption, investment, and saving decisions with effective policies (Bouis et al., 2012; and reduce wage and price controls to strengthen

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markets against endogenous and exogenous shocks (Fischer and Stiglbauer, 2018). In this context, structural reforms reduce the output gap by boosting total factor productivity, which drives actual and potential supply growth (De Almeida and Balasundharam, 2018). Moreover, it can reduce the inflationary gap (De Haan and Parlevliet, 2018) by limiting the uncertainty caused by wage-price rigidities on the demand side (Van Riet, 2006). As part of new monetary policy designs, the balance value of the inflationary gap is ultimately considered by central banks when making monetary policy decisions. Micro and macroprudential measures are used to limit the adverse effects of financial risks on price stability (Sethi and Acharya, 2020; Özatay, 2012). New monetary policy designs thus limit the mismatch between exchange rates and capital flows that is determined by global risk appetite for financial sector assets through microprudential measures, and by supply-demand imbalance through macroprudential measures (Başçı and Kara, 2011). In fact, uncertainty in the market can facilitate the implementation of reforms that would not otherwise be implemented (Bonfiglioli et al., 2022). As a result, new monetary policy designs that promote price stability and financial stability help reduce the inflationary gap by limiting the negative effects of financial risks on the actual and targeted inflation outlook (Karanovic and Karanovic, 2015).

To address this issue, the main objective of this paper is to examine how structural reforms in the real sectors of goods-services-labour markets influence price stability, as well as the financial sectors of money and capital markets on financial stability. In this paper, the main argument is that structural reforms in real sectors support price stability. Financial sector reforms, on the other hand, contribute to financial stability by supporting new monetary policy designs, although these effects can differ based on regimes shaped by the output gap. This paper examines the potential impact of structural reforms on price stability and financial stability for the 84 countries[1] classified by the IMF-2020 country classification for 2002-2018 by using the Panel Smooth Transition Regression (*PSTR*) model, which is based on nonlinear panel data analysis and taking into account the cross-sectional dependency, as opposed to linear panel data analysis used in existing studies.

Having introduced the paper, Section 2 discusses structural reform indicators and a literature review. Section 3 presents the empirical analysis and econometric methodology. The findings of the paper are presented in Section 4. Lastly, Section 5 provides a general discussion, policy implications, and recommendations for future studies.

LITERATURE REVIEW: STRUCTURAL REFORM INDICATORS

There are several reform indicators calculated by international organizations[2], but they are proxy indicators that can be indirectly calculated. In some recent studies, examining the shortcomings of these indicators, reform indicators are used as indices based on the number of IMF-MONA reforms that have been successfully and directly implemented in the real and financial sectors (Kouamé and Tapsoba, 2019). In the IMF-MONA database, reform data are derived from comparable information about the objectives and results of Fund-supported regulations that support structural reforms in real and financial sectors in IMF members participating in the MONA programme[3].

The studies on the effects of structural reforms that became popular again after the 2008 financial crisis can be traced back to the 1990s, when the foreign debt structure and economic conditions deteriorated and reform programs gained prominence and wide currency both in developed and developing countries. During the 1990s,

[1] The MONA Database does not include major countries like the G7, so all countries were analyzed together regardless of their development levels in this paper as prices and financial stability are relatively similar.

[2] For example: Economic, Financial Sector, Capital Account, Current Account, Trade, Product Market and Agricultural Liberalization Indexes by IMF (2008); Employment Protection Legislation, Product Market Regulation, Energy, Transport and Communications Regulation Indexes by OECD; Internal and External Markets Liberalization Index, Privatization Index and Banking Reform Index, Labor Market Regulations Index by World Bank (1996); and Liberalization and Privatization Index and Banking and Credit Reform Indexes by EBRD (2010).

[3] The approval and investigating of structural reforms in the IMF-MONA database bases on various policy commitments agreed with the authorities of the countries in the MONA programme. These commitments are classified in four different categories as Prior Actions (PA), Quantitative Performance Criteria (QPC), Indicative Targets (IT) and Structural Benchmarks (*SB*). *SB* presents the reform measures, which are critically important for the countries to achieve their reform targets and generally nonmeasurable, during the investigating these reforms by IMF board. *SB*, which differ in real and financial sectors, are defined as structural reforms in countries included in the MONA program. Furthermore, it is assumed that the *SB* include reform proposals in the related sectors. *SB* in real sectors consist of reforms aimed at controlling wages and prices in the markets and eliminating problems such as restrictions of the entry and exit to goods-service-labour markets; regulating the public revenues and expenditures; managing the budget balance and external borrowing; liberalizing markets; increasing the transparency of economic statistics. However, *SB* in financial sectors comprise of reforms aimed at auditing the financial institutions; decreasing the regulation in the financial system; and regulating the international trade policies, foreign exchange, and capital systems (IMF-MONA, 2020).

most studies examined the interaction channels between structural reforms and micro and macroeconomic variables. In the 2000s, however, studies examining the effects of structural reforms on macroeconomic variables became more popular (IMF, 2015). Although there have been differing results regarding country, regional, sector, and firm structure, the type and sectors of reforms, and the empirical method, structural reforms are generally considered to be related to both micro and macroeconomic economic variables (IMF, 2015). In this context, empirical studies show that structural reforms increase firm employment and partial factor productivity on a micro level and economic growth and total factor productivity on a macro level.

The existing empirical studies on structural reforms since the 2000s employ two different methods to explore their effects on macroeconomic and microeconomic variables. First, Dynamic Stochastic General Equilibrium-DSGE models (Annicchiarico et al., 2013; Papageorgiou and Vourvachaki, 2017; Campagne and Poissonnier, 2018; Gomes, 2018; Grauwe and Ji, 2020) simulate the impact of structural reforms on micro and macroeconomic variables under certain assumptions through various scenarios. Second, Ordinary Least Squares-OLS (Aksoy, 2019; D'Costa et al., 2019; Ostry et al., 2009; Campos and Horváth, 2012; Bouis et al., 2012; Prati et al., 2013; Babecky and Havranek, 2014; Brancaccio et al., 2018; Égert and Gal, 2018), Generalized Method of Moments-GMM (D'Costa et al., 2019; Campos and Kinoshita, 2008; Barlow, 2010; Swiston and Barrot, 2011; Bouis et al., 2012; Christiansen et al., 2013; Babecky and Havranek, 2014; Norris et al., 2016), Dynamic Ordinary Least Squares-DOLS (Égert and Gal, 2018), Vector Auto-Regression-VAR (De Almeida and Balasundharam, 2018), and Logit/Probit (Cuervo-Cazurra and Dau, 2009) models in terms of linear panel data analysis empirically examine the long-term effects of structural reforms on micro and macroeconomic variables.

Micro-level empirical studies examine the effects of structural reforms on economic variables, including productivity, employment, and exports. The results of these studies indicate that structural reforms increase partial factor productivity in the region (Norris et al., 2016), sector (D'Costa et al., 2019), and firm (De Almeida and Balasundharam, 2018) while enhancing firm employment (De Almeida and Balasundharam, 2018) and firm export (Cuervo-Cazurra and Dau, 2009). Macro-level studies also examine how structural reforms affect economic indicators such as economic growth, total factor productivity, investment, employment, unemployment, inflation, and foreign direct investment. According to these studies, structural reforms generally contribute to economic growth (Ostry et al., 2009; Swiston and Barrot, 2011; Campos and Horváth, 2012; Bouis et al., 2012; Christiansen et al., 2013; Prati et al., 2013; Babecky and Havranek, 2014; Papageorgiou and Vourvachaki, 2017; Campagne and Poissonnier, 2018; Aksoy, 2019), total factor productivity (Christiansen et al., 2013; Norris et al., 2016; Égert and Gal, 2018), domestic investments (Christiansen et al., 2013; Annicchiarico et al., 2013), foreign direct investments (Campos and Kinoshita, 2008), and employment (Bouis et al., 2012; Égert and Gal, 2018); decrease in the rate of inflation (Barlow, 2010; Gomes, 2018; Grauwe and Ji, 2020), and unemployment (Bouis et al., 2012), and enhance the functional distribution of income (Brancaccio et al., 2018).

Based on the literature review, there is only one study that estimates structural reform indicators based on the IMF-MONA database. According to Kouamé and Tapsoba (2019), the micro effects of structural reforms on partial factor productivity (labor productivity) in 37 developing countries are empirically analyzed using a nonlinear multilevel mixed-effect model. The results of this study indicate that structural reforms increase labour productivity. In this study, however, structural reform indicators of the real and financial sectors were examined at the macro level through a nonlinear panel data analysis methodology to examine price stability and financial stability, respectively, for 84 developed and developing countries using the PSTR model.

DATA AND METHODOLOGY

Dependent Variables

In this study, 84 developing and developing countries[4] are included out of 104 countries for the 2002-2018 period when data is available on the IMF-MONA database. The study has two dependent variables: price stability (*PRS*) and financial stability (*FNS*). *PRS* is generated by the inflation rate, while financial stability is generated by various variables[5] related to the financial markets. The stability of prices was calculated not only by

[4] Please see Appendix A for sampled countries. Some countries are excluded from the analysis because the data about structural reform in Chile, Equatorial Guinea, Mexico, Morocco, Poland, Serbia-Montenegro and Yugoslavia; tahe data about interest rate or macroeconomic variables related to financial stability in Afghanistan, Comoros, Congo (the Democratic Republic of), Djibouti, El Salvador, Ethiopia, Iraq, Kosovo, Liberia, Mauritania, Montenegro, Solomon Islands and Yemendo are not available.

[5] These variables such as bank credit to bank deposits (%); liquid assets to deposits and short term funding (%); bank capital to total assets (%); bank regulatory capital to risk-weighted assets (%) are generated as index through principal component analysis/min-max approach.

using inflation data, but also by using inflation's standard deviation. *PRS* represents the annual percentage change in Consumer Price Index-CPI (2010=100) that is obtained from the World Development Indicator 2020 (World Bank, 2020) database. For Argentina, Bosnia and Herzegovina, Mozambique, and Sierra Leone, which do not have CPI data, *PRS* is calculated based on the GDP Price Deflator Index (2010=100).

FNS symbolized as a financial stability index is generated as an index through Min-Max (MM) approach by collecting from the Global Financial Development Database 2020 (WB-GFDD, 2020) as an index variable. By using indicators[6] related to financial system stability, it has been determined the level of development of the financial system in terms of accessibility, depth, efficiency, and stability. MM approach is used to derive financial stability indices because it normalizes indicators of financial markets and distributes them in a particular order (Albulescu, 2010; Kondratovs, 2014; Arzamasov and Penikas, 2014; Karanovic and Karanovic, 2015). A MM approach, which enables the measurement of certain indicators of financial stability in the same unit and size, is based on the following equation (Nardo et al., 2005; OECD, 2008):

$$MM = \left(\frac{X_t - X_{Min}}{X_{Max} - X_{Min}}\right) \quad (1)$$

Equation 1 presents an indicator of financial stability with Minimum (X_Min) and Maximum values (X_Max) over time (t), while MM represents the financial stability index. Taking into account these explanations, the *FNS* variable is generated by the MM approach based on Equation 2. As part of the derivation of the *FNS* variable, the following indicators were collected from the GFDD database: 1-) Bank Z-Score; 2-) Bank Credit to Bank Deposits (%); 3-) Liquid Assets to Deposits and Short-Term Funding (%); 4-) Nonperforming loans to gross loans (%); 5-) Capital to Total Assets (%); 6-) Bank Regulatory Capital to Risk-Weighted Assets (%); 7-) Provisions to Nonperforming Loans (%); 8-) Stock Price Volatility.[7]

$$FNS_c = \left(\frac{FNS_{ct} - FNS_{Min,c}}{FNS_{Max,c} - FNS_{Min,c}}\right) \quad (2)$$

As shown by equation 2, (c) and (t) represent the country and year, respectively, and (FNS_{ct}) represents an indicator of financial stability (one of eight associated with financial system stability). In equation 2, terms ($FNS_{Min,c}$) and ($FNS_{Max,c}$) indicate the minimum and maximum values of an indicator of financial stability. As part of the model, (FNS_{ct}) also represents a financial stability index ranging from 0 to 1. As suggested in the GFDD database, the arithmetic averages of eight indicators of the stability of a country's financial system were analyzed separately in order to calculate variable (FNS_{ct}).

In summary, a preliminary analysis of data availability identified 33 countries (the first three indicators); four countries (the first four indicators); 24 countries (the first seven indicators); and 23 countries (the first eight indicators) that have continuous data for the period 2002-2018. The second stage involves separately calculating financial stability indicators as an index using Equation 2. *FNS* is generated as the arithmetic average of the financial stability indices for the sample for 2002-2018 in the third stage. FNS is indexed between 0 and 1, so if the variable approaches 1, financial stability has increased.

Threshold Variables

The threshold variable is the output gap defined as the difference between actual and potential production levels. As part of the new monetary policy designs, taking financial stability as well as price stability into consideration, it is important to examine the inflationary pressures arising from demand structure in order to follow up on output gaps and to keep output gaps at a level that will not result in an increase in the inflation rate. Therefore, it is aimed at determining the effects of structural reforms in the real and financial sectors on price and financial stability, respectively, in different regimes shaped by the value of the output gap threshold, through the *PSTR* model when the output gap is given.

In order to estimate the output gap, filtering techniques and a production function approach are used. The cyclical components of filter-based methods such as Hodrick-Prescott and Kalman, however, pose uncertainty problems; while production function-based approaches, which measure output gap according to labor, capital, and technology, are valid under different assumptions. Accordingly, the potential GDP growth rate for the entire sample is calculated by taking the actual GDP growth rate (Orphanides and Norden, 2002; Hamilton, 2017). Therefore, it is aimed to eliminate the effects of the problems of filtering techniques that arise from the overestimation or underestimation and the uncertainties

[6] For more details about indicators, please see (WB GFDD, 2020).

[7] For detailed information about the scope of the GFDD database and these indicators, see WB-Global Financial Development Database and GFDR (2020).

that may arise from the validity of the production function based on certain assumptions on the potential GDP growth rate; and to determine if the potential GDP growth rate is directly comparable to the actual GDP growth rate. Consequently, the *output gap*, symbolized as *OPG*, is determined by the real GDP change values with the 2010 base year collected from the WDI database. As a first step, the average values of the economic growth rate, which is expressed as a percentage change in real GDP, were calculated. Following that, the *OPG* variable is created by subtracting the average economic growth rate values from the annual economic growth rate values (taking the difference from the average).

Independent Variables

The study has four independent variables: *structural reforms in the real sector* (*RSR*) and *financial sector* (*FSR*), *money market interest rate*s (*MIR*) and *broad money supply* (*MS* - % of GDP). While *MIR* and *MS* are collected from IMF International Financial Statistics 2020 (IMF-IFS, 2020), structural reform data are derived from IMF-MONA. Accordingly, the *RSR* and *FSR* data are obtained from the IMF-MONA database by classifying according to their definitions and codes and generated as an index through the *ZS* approach using the data-related *SB* which are successfully implemented, implemented with delay, and modified structural benchmarks.

Based on the Centered-Reduced Normalization method, the *ZS* approach allows the classification of data in a particular order when numerical differences are high (OECD, 2008). Normalization of a specific variable (X) by the *ZS* approach, which is characterized by its average (μ) and standard deviation (σ), comprised of successful *SB* data in real and financial sectors from the IMF-MONA database, based on the following equations (Nardo et al., 2005; OECD, 2008):

$$ZS = \left(\frac{(X - \mu)}{\sigma}\right) \tag{3}$$

According to Equation 3, when the variable (X) is assumed to be composed of successful *SB* data, the value of the *ZS* index will have a normal distribution with a mean of 0 and a standard deviation of 1.

With this standardization, the real and financial sectors can be measured in the same units with similar sizes (average and standard deviation), so that the effects of structural reform can be statistically significant compared (Kouamé and Tapsoba, 2019). In keeping with these explanations, the RSR and FSR variables, which are calculated with successful *SB* data for the sample, are generated as indexes using the *ZS* approach, as seen in the following equation.

$$\text{Structural Reform Index}_{\text{ct}} = \left(\frac{\left(SB_{ct} - SB_{\mu t}\right)}{SB_{\sigma t}}\right) \tag{4}$$

(SB_{ct}) presents the total number of successful *SB* of a particular country from the sampled (c) in the (t) year. The terms of ($SB_{\mu t}$) and ($SB_{\sigma t}$) indicate the average and standard deviation of the number of successful *SB*s in all sampled countries in a particular (t) year. If the number of successful *SB*s for the sample in a particular year is equal to the average number of SBs, the $Structural\ Reform\ Index$ takes 0; otherwise, it takes a value different from 0 as how much it is above the average.

RSR and FSR variables are collected using Equation 4 in two different ways to verify the reliability and consistency of the indices. The first method involves calculating the real and financial structural reform indices as $RSR\text{-}1$ and $FSR\text{-}1$ by considering the approval date and initial end date during the test process of successful *SB* data. In the first stage of the first method, date ranges for the period of 2002-2018 are determined (usually three years, but sometimes two or one year), followed by categorizing the structural reforms within those dates into the real and financial sectors corresponding to those reforms. A second stage involves extending structural reforms in accordance with the approval and initial end dates. These are the first two stages of the first method, where numbers of real and financial reforms are calculated based on date ranges in the test. The third stage utilizes Equation 4 to calculate the structural reform indices ($RSR\text{-}1$ and $FSR\text{-}1$) in the financial and real sectors. Using the method used by Kouamé and Tapsoba (2019), the calculation of structural reform indices in the real and financial sectors is based on the effects of structural reforms on the test process.

According to the second method, $RSR\text{-}2$ and $FSR\text{-}2$ are calculated as follows. In the first stage, test dates of structural reforms are determined, with the number of structural reforms categorized into real and financial reforms based on the years they were implemented. In the second stage, $RSR\text{-}2$ and $FSR\text{-}2$ for each sector are calculated separately through the ZS approach using Equation 4. In this way, it aims to calculate the structural reform indices for both real and financial sectors, based on the year-based effects of structural reforms.

Lastly, the variable of *MIR* includes the annual values of monetary policy-related for 28 countries, money market for 27 countries, lending for 22 countries, and discount interest rates for 7 countries.

Model and Methodology

The *PSTR* model is used in examining the nonlinear relationships between variables in panel data analysis (Gonzalez et al., 2005), while Panel Transition Regression (*PTR*) model is used in changing assumptions that modelling of the transition process between regimes (Hansen, 1999). The *PTR* model assumes that the variable defined as the threshold drives the transition between regimes, but the effects of the threshold variable on the dependent variable are based on the regime below and above the threshold. In other words, the coefficients of independent variables differ depending on what variable is used as a threshold. *PTR* models assume that while coefficients of independent variables change abruptly in transition between regimes, the regimes are acutely separated depending on threshold values (Hansen, 1999; Gonzalez et al., 2005). The *PSTR* model, however, allows the transition process of coefficients of independent variables by stating that these assumptions can be realized not abruptly, but over time (Gonzalez et al., 2005).

In this study, when the output gap is the threshold variable, the *PSTR* models, which are to be used to determine the effects of structural reforms in real sectors on price stability and structural reforms in financial sectors on financial stability, can be divided into two regimes as follows:

$$PRS_{it} = \mu_i + \beta_0 RSR_{it} + \beta_1 MIR_{it} * g(OGP_{it}; \gamma, c) + \varepsilon_{it} \quad (5)$$

$$FNS_{it} = \mu_i + \beta_0 FSR_{it} + \beta_1 MIR_{it} * g(OGP_{it}; \gamma, c) + \varepsilon_{it} \quad (6)$$

In Equations 5 and 6, (i) and (t) indicates the number of section units and time size of the panel, (ε) denotes the error term and (μ) represents the fixed effect coefficients of the units. Model 1 shows how structural reforms in the real sector affect price stability, whereas Model 2 shows how structural reforms in the financial sector affect financial stability. Due to the fact that structural reforms in the real and financial sectors are represented by variables calculated by two different methods as *RSR-1*, *RSR-2, FSR-1, and FSR-2*, the study estimates two different variations of Model 1 and Model 2, A and B.

In the equations, *OPG* represents the threshold variable, which is defined as the output gap in Models 1 and 2, (c) and (y) represent the parameters of the threshold variable and the slope parameter, respectively. Equations 5 and 6 also use the term of $g(OGP_{it};\gamma,c)$ as a transition function and define it as a logistic function as follows:

$$g(OGP_{it}; \gamma, c) = \left[1 + exp\left(-\gamma \prod_{j=1}^{m} (OGP_{it} - c)\right)\right]^{-1} \quad (7)$$

The term (c) indicates the parameter of the threshold variable between the two-regime corresponding to the regimes of $g(OGP_{it};\gamma,c)$=0 and $g(OGP_{it};\gamma,c)$=1 . The slope parameter in the form of (y), with (γ>0) in the equation, indicates the level of the change in the values of the transition function in the logistic form, and the transition between regimes. The transition function $g(OGP_{it};\gamma,c)$ between regimes changes abruptly when the slope parameter approaches infinity ($\gamma \to \infty$) in the equation, and the threshold variable parameter transition (c) between regimes occurs instantly when the slope parameter approaches infinity. If this is the case, equations *5* and *6* should be estimated using the *PTR* model. In the case of approaching of the slope parameter to zero ($\gamma \to 0$), the transition function becomes equal to a constant, and when the equation is $g(OGP_{it};\gamma,c)$, transition function transforms into a form containing the effects of the horizontal section units in the panel by reducing to a linear function. This requires estimating equations *5* and 6 using the *PSTR* model, which gives a cross-sectional view of the panel (Gonzalez et al., 2005; Fouquau et al., 2008).

Equations *5* and *6* depend on the parameters of the transition function defined in Equation 7. In the regression, if the transition function takes the values ($g(OGP_{it};\gamma,c) = 0$) and ($g(OGP_{it};\gamma,c) = 1$), then the independent variables take the values (β_0) and $\beta_0 + \beta_1$, respectively. However, if transition function takes the values between $0 < g(OGP_{it};\gamma,c) < 1$, the parameters of the independent variables in the regression take the values created from the weighted averages of (β_0) and (β_1). Therefore, the *PSTR* model is better for determining whether independent variables have a positive impact on dependent variables (Fouquau et al. 2008). Additionally, if equations 5 and 6 define two regimes, they can be expanded to multi-regimes. In this case, the *PSTR* model with multi-regime can be generated by expanding the equations according to the other regime numbers.

Three successive stages are involved in the estimation of *PSTR* models. In the first stage, a simple Taylor expansion is applied to the transition function (replacing ($g(OPG_{it};\gamma,c)$ with ($\gamma = 0$)) in equations

5 and 6 to investigate the linearity of the models under the null hypotheses of linearity in the form of $\gamma = 0$ or $\beta_0 = \beta_1$. These hypotheses are investigated by Lagrange Multipliers (LM), LM Fisher Tests (LMF), and Likelihood Ratio Tests (LRT), all of which are based on standard F-type nonlinearity tests statistics. There are different assumptions used when calculating residuals and degrees of freedom for the model and determining whether the transition function is nonlinear (Colletaz and Hurlin, 2006). The rejection of the null hypothesis of linearity indicates that regime change (r) (threshold effect) is important in models, and this rejection requires the use of the *PSTR* model. Having determined that the models are not linear, the second stage involves determining the number of regime changes (r) in the models. This stage tests the null hypothesis of $r = r^* = 1$ (the model consists of one regime) against the alternative hypothesis of $r = r^* + 1$ (the model consists of two regimes). This process is repeated until the null hypothesis is accepted. In the third stage, the fixed effects of the section unit in the panel are subtracted from the time average, and the transformed equations are estimated using the nonlinear OLS method (Fouquau et al., 2008; Duarte et al., 2013).

EMPIRICAL FINDINGS

A description of the variables used in the models is provided in Table 1 when the output gap is the threshold variable.

After descriptive statistics, firstly, the cross-sectional dependency (CD) of variables among countries in the panel in terms of model and model variables is analyzed by using Lagrange Multiplier (LM) tests developed by Pesaran (2004) by taking into account the time (t) and unit (n) dimensions. In addition to affecting the consistency of estimation results, CD tests can have a significant impact on the selection of unit root tests (Menyah et al., 2014). Additionally, CD in models/model variables is also analyzed by the LM and CD-LMadj tests developed by Pesaran et al. (2008) that can adjust the deviations in the LM test by adding the mean and variance of the panel units (Pesaran, 2004; Pesaran et al., 2008). Table 2 shows the LM test results for the models and model variables. As seen in Table 2, the probability values of LM and LMadj test statistics calculated in the form of Constant + Trend (CT) for the models and model variables are less than 0.01 and it is therefore rejected at a significance level of 1% that "there is no CD in the model and model variables." This suggests that the CD between panel units should be taken into account when using analysis methodology (Baltagi 2008).

Using the CD between panel units, unit root tests are performed after determining the CD in order to analyze whether or not the model is stationary. For panel data analysis to avoid spurious regressions, the variables need to be stationary and not contain unit roots (Tatoğlu, 2013). Therefore, the stationarity of the variables is tested by Cross-Sectional Augmented Dickey-Fuller (CADF) (Pesaran, 2007), and panel unit root test (UO) (Ucar and Omay, 2009). CADF and UO tests show that all variables are stationary at [I(0)] with 1% or 5% significance levels, as shown in Table 3. In this case, the CIPS test statistics in the form of CT are greater than the absolute value at 0.01 or 0.05 significance levels and the hypothesis that "the variables have unit roots" has been rejected. Similarly, the UO test statistics in the form of Demeaned and Detrended (DD) for model variables are less than 0.05 of the probability values and the hypothesis that "variables follow the linear unit root process" has been rejected.

Table 1: Descriptive Statistics (2002-2018)

Statistics	Mean	Median	Maximum	Minimum	Std. Dev.	Skew-ness	Kurto-sis
PRS	2.400	-0.539	81.00	-20.61	6.483	4.067	39.88
FNS	3.621	-0.085	296.78	-87.76	30.428	2.359	15.94
OPG	6.900	0.180	111.15	-72.96	5.850	1.934	129.11
MIR	0.337	-1.173	511.11	-1391.09	57.853	-7.814	248.62
RSR-1	-0.000	-0.517	6.070	-0.851	0.976	1.976	7.992
RSR-2	0.003	-0.462	8.603	-0.790	0.996	2.430	11.65
FSR-1	0.048	-0.466	9.871	-0.733	1.086	2.996	17.19
FSR-2	0.025	-0.460	7.251	-0.580	1.014	2.565	10.59
Obs	1428	1428	1428	1428	1428	1428	1428

Note: In the Table, Std. Dev. is the abbreviation of the standard deviations of the variables and Obs. indicates the number of observations on the panel.

Table 2: CD-LM Test Results

Test Statistics (CT)							
Variables	**CD-LM**	**CD-LM$_{adj}$**	**L**	**Models**	**CD-LM**	**CD-LM$_{adj}$**	**L**
PRS	69.56[a][0.000]	249.63[a][0.000]	3	——	——	——	—
FNS	15.48[a][0.000]	252.31[a][0.000]	3	——	——	——	—
OPG	31.65[a][0.000]	359.32[a][0.000]	2	——	——	——	—
MIR	23.63[0.000]	14.07[a][0.000]	1	——	——	——	—
RSR-1	17.15[a][0.000]	476.01[a][0.000]	1	Model 1A	46.72[a][0.000]	43.76[a][0.000]	2
RSR-2	9.76[a][0.000]	476.01[a][0.000]	1	Model 1B	47.02[a][0.000]	47.97[a][0.000]	2
FSR-1	16.15[a][0.000]	476.01[a][0.000]	1	Model 2A	4.87[a][0.000]	6.57[a][0.000]	2
FSR-2	12.10[a][0.000]	476.01[a][0.000]	1	Model 2B	4.87[a][0.000]	6.82[a][0.000]	2

Note: The "[a]" sign indicates that there is a CD in the variable/model at 1% significance level. The "L" column presents the optimal lag lengths determined with the Schwarz information criterion. The values in the square brackets "[]" show the probabilities of the test statistics.

Table 3: CADF and UO Panel Unit Root Test Results

Test Statistics			**CT**		**DD**	
			CIPS		**UO**	
Variables			**Level**	**L**	**Level**	**L**
PRS			-2.65[b]	3	-2.36[b][0.010]	2
FNS			-2.67[b]	3	-1.91[b][0.049]	2
OPG			-2.64[b]	2	-2.34[b][0.030]	2
MIR			-2.69[b]	1	-2.24[b][0.010]	2
RSR-1			-2.85[a]	1	-2.68[b][0.049]	2
RSR-2			-3.02[a]	1	-2.55[b][0.010]	2
FSR-1			-2.92[a]	1	-2.14[b][0.043]	2
FSR-2			-2.67[b]	1	-2.34[b][0.040]	2
Critical Values	% 1	% 5	-2.74	-2.60		

Note: The "a" and "b" signs indicate that the variables are stationary at 1% and 5% significance level, respectively. CIPS Critical Table Values indicate the values taken from Pesaran (2007) studies, according to T and N conditions. For the "L" column and the square "[]" brackets, see Table 2.

Table 4: Tests for the Linearity

Threshold Variables (OPG)	**Model -1**		**Model-2**	
H_0:r=0 H:r=1	**Model 1A**	**Model 1B**	**Model 2A**	**Model 2B**
LM	7.670[b][0.022]	7.682[b][0.021]	5.062[b][0.040]	6.171[b][0.046]
LMF	3.623[b][0.027]	3.629[b][0.027]	2.987[b][0.042]	2.992[b][0.045]
LRT	7.690[b][0.021]	7.703[b][0.021]	5.071[b][0.039]	6.184[b][0.045]

Note: H_0 and H_1 hypotheses are calculated under the assumption that the LM and LRT and LMF test statistics show an asymptotic distribution of $X^2\ (mK)$ and F(mK,TN * N - m(K+1)) respectively. The symbol "r" indicates the number of transition functions in the models, the sign "[b]" indicates the significance level of 5% and the values in the square brackets "[]" indicate the test statistics probabilities.

Table 5: Tests for the Remaining Non-Linearity of The PSTR Models

Threshold Variables (*OPG*)	Model-1		Model-2	
H_0:r=1 H_1:r=2	Model 1A	Model 1B	Model 2A	Model 2B
LM	0.523[0.770]	0.309[0.857]	0.523[0.770]	0.595[0.743]
LMF	0.245[0.783]	0.145[0.865]	0.245[0.783]	0.279[0.757]
LRT	0.523[0.770]	0.309[0.857]	0.523[0.770]	0.595[0.743]

Note: For the symbols and abbreviations in the table, see Table 4.

Table 6: Estimated Results of The PSTR Model

	Model 1				Model 2			
Threshold Variables (*OPG*)	Model 1A		Model 1B		Model 2A		Model 2B	
	Parameters		Parameters		Parameters		Parameters	
	Regimes		Regimes		Regimes		Regimes	
Variables	r=1	r=2	r=1	r=2	r=1	r=2	r=1	r=2
RSR-1	2.084[b] [0.989]	-1.872[b] [0.885]	—	—	—	—	—	—
RSR-2	—	—	2.534[a] [1.110]	-2.417[b] [1.111]	—	—	—	—
FSR-1	—	—	—	—	5.521[b] [2.499]	-5.617[b] [2.617]	—	—
FSR-2	—	—	—	—	—	—	6.751[a] [2.319]	-7.169[a] [2.528]
MIR	0.063[a] [0.024]	-0.051[b] [0.024]	0.055[a] [0.022]	-0.053[b] [0.023]	-0.202[a] [0.081]	0.214[a] [0.081]	-0.223[b] [0.098]	0.234[a] [0.098]
LP ()	-5.222		-5.111		-8.133		-8.113	
SP ()	3.079		3.244		1.629		2.504	
AIC	3.71		3.71		6.79		6.79	
BIC	3.74		3.73		6.81		6.82	
RSS	58023.084		57945.725		1255435.753		1255593.588	

Note: Values in square brackets "[]" show the standard errors of the coefficients, the signs "a" and "b" indicate that the coefficients are significant at 1% and 5% significance level, respectively. The abbreviations *AIC*, *BIC* and *RSS* indicate Akaike Information Criterion, Bayes Information Criterion and Error Squares Total calculated for the models, respectively.

The three successive steps of the *PSTR* model estimation process begin with determining the stationarity of variables. The first step is to determine whether the regime change in the models is significant by analyzing the linearity of the *PSTR* by LM, LMF, and LRT tests as seen in Table 4. The probability values of the LM, LMF, and LRT test statistics are less than 0.05, and the linear hypotheses have been rejected at a 5% level of significance. The results indicate that *PSTR* models contain at least one nonlinear regime change (threshold effect), which is accepted with alternative hypothesis. A linear model cannot be used to estimate the effects of real and financial structural reforms on price and financial stability.

In the second stage, the number of regime changes (threshold number) in the models is determined through LM, LMF, and LRT tests. Based on table 5, the null hypothesis that "the model contains a threshold effect" cannot be rejected at the 1% significance level when the probability values of the LM, LMF, and LRT test statistics are greater than 0.05. This indicates that the *PSTR* model contains a threshold and should be estimated as a two-regime model. In the third stage, when the output gap is the threshold variable, the results of the *PSTR* models are estimated for the entire sampled countries, as presented in Table 6.

When the *PSTR* findings in Table 6 are examined in terms of the slope parameters (*SP*) in Model 1 and Model

2, the *SP* is relatively close to zero for Model 1A (3.079), Model 1B (3.244), Model 2A (1.629), and Model 2B (2.504). *PSTR* is a consistent estimator for all models because the transition process between regimes is gradual and regimes are separated smoothly from one another.

As a threshold variable in Model 1 and Model 2, when the *PSTR* findings in Table 6 are analyzed in terms of the output gap and its *transition parameters* (*LP*), it can be seen that the *LP*s for Model 1A (-5.222) and Model 1B (-5.111) and Model 2A (-8.133) and Model 2B (-8.113) are similar in size. These findings require the analysis of the effect of structural reforms in real sectors (*RSR-1* and *RSR-2*) on the *PRS* and structural reforms in financial sectors (*FSR-1* and *FSR-2*) on FNS under two different regimes that are below and above these thresholds.

In this context, when the *PSTR* findings in Table 6 are analyzed in terms of Model 1, it is shown that *RSR-1* (2.084), *RSR-2* (2.534), and *MIR* (0.063 and 0.055) are positive and statistically significant when the output gap is below the threshold value of (-5%) in the first regime (r = 1). The results indicate that a one-unit increase in structural reforms in real sectors and money market interest rates leads to an increase in the price stability variable from 2.084 to 2.534 and (0.055 to 0.063) in the first regime, where the negative output gap increased. The findings show that structural reforms in the real sector and an increase in money market interest rates at the same time adversely affect price stability during economic recessions because they increase deviations in inflation.

Alternatively, when the *PSTR* findings in Table 6 are analyzed in light of Model 1, it becomes apparent that *RSR-1*s (-1.872), *RSR-2*s (-2.417), and *MIR*s (-0.051 and -0.053) are statistically significant and negative in the first regime (r = 2) when the output gap exceeds the threshold value. According to these results, a one-unit increase in structural reforms in real sectors and money market interest rates decreases the price stability variable by (-1.872 to -2.417) and (-0.051 to -0.053), respectively, in the second regime, where the negative output gap decreased. The findings show that structural reforms in real sectors and an increase in the simultaneous interest rate in the money markets positively affect price stability during economic expansion periods by decreasing the deviations in the inflation rate when financial and structural reforms are implemented.

According to *PSTR*, in terms of model 2 in table 6, the variables *FSR-1* (5.521), *FSR-2* (6.751), and *MIR* (-0.202 and -0.223) are statistically significant at r=1, where the output gap is below (-8%) threshold. According to these results, an increase of one unit in structural reforms and money market interest rates in the first regime, where the output gap widens, leads to an increase in financial stability variables (5.521 to 6.751) and a decrease in financial stability variables (-0.223 and -0.202). It has been shown that real structural reforms in the financial sectors support financial stability but that increases in simultaneous interest rates on money markets increase financial fragility when real structural reforms are given.

Alternatively, Table 6 presents that the *FSR-1* (-5.617), *FSR-2* (-7.169), and *MIR* (0.214 and 0.234) variables are statistically significant at r=2, where the output gap is above the threshold value of (-8%). These findings indicate that when structural reforms in financial sectors are increased by one unit and money market interest rates are increased in the second regime, where the negative output gap decreases, the financial stability variables decrease between (-5.617 to -7.169) and increase (0.214 to 0.234). In real structural reforms, the findings show that while structural reforms in financial sectors increase financial fragility, an increase in the simultaneous interest rate in the money markets supports financial stability.8

RESULT AND DISCUSSION

This study examined the effects of structural reforms on price and financial stability by analyzing how structural reforms and new monetary policy designs reduced the output gap and inflationary gap after the global financial crisis of 2007-2008 in developed and developing countries. Based on *PSTR* models, it has been determined that the output gap contains a negative threshold value (-5%); structural reforms in real sectors and money market interest rates influence price stability in two different regimes that are below and above this threshold value. In the first regime, it has been determined that the variables of structural reform and money market interest rates in real sectors have a negative impact on the price stability variable during the economic recession. When a negative

[8] With the new monetary policy designs, developed and emerging central banks can direct the relationship between price stability and financial stability through the money supply channel as well as the interest channel. Considering this situation, the models in which *MIR* is used as the control variable in Equations 5 and 6 in the study were reanalyzed using *MS* variable as the control variable and the *PSTR* model methodology, where consistency (robustness) was determined in the Appendix B. The findings show that the effects of real sector structural reforms on price stability and financial sector structural reforms on financial stability are similar compared to regimes in case the money supply is variable in control as presented in Appendix B. In this regard, the model(s) estimated in the study are consistent with the findings and show structural reforms have a significant impact on price and financial stability when the interest rate or money supply is used as monetary policy instruments.

output gap is given and structural reforms are given, these findings indicate that the structural reform regulations in real sectors, which are implemented concurrently with the economic recession, and the increases in interest rates in the money market result in a greater contraction in total supply than total demand and deterioration of expectations in contrast to general expectations. Due to this process, inflationary pressures can be created on general prices through increased costs and deteriorating expectations, and inflationary pressures can surpass deflationary pressures. Accordingly, this result indicates that structural reform regulations in real sectors and rising money market interest rates during the recession cause price instability by increasing inflation deviations (Borio, 2014).

When negative output gaps are given and structural reforms in financial sectors are given, these findings indicate that structural reform regulations in real sectors, implemented simultaneously with the economic recession, and increased interest rates in the money market, can balance the demand-side inflationary pressures and improve expectations, as similar results with Barlow (2010), Gomes (2018), and Grauwe and Ji (2020) have shown. The result shows that structural reforms in the real sector and increases in interest rates in the money market are able to compensate for inflationary pressures caused by increasing demand and better expectations. Hence, structural reform regulations in real sectors and contractionary monetary policy support price stability by reducing inflation deviations.

The output gap has been determined to create a negative threshold value (-8%) in *PSTR* models that analyze the effects of structural reforms in financial sectors on financial stability. In the two different regimes occurring below and above this threshold, structural reforms in the financial sectors and money market interest rates affect financial stability. In the first-regime, where the negative output gap is below the threshold value of (-8%), structural reform in the financial sector and money market interest rate have a positive and negative effect on price stability, respectively. Based on these findings, structural reforms in the financial sector can reduce systemic financial risks (Sethi and Acharya, 2020; Özatay, 2012) if they are implemented simultaneously with an economic recession. When there is a negative output gap and structural reforms are implemented in real sectors, the money market interest rate may increase as well. Thus, structural reform regulations in the financial sector contribute to financial stability if they can be managed as signals that uncontrolled systemic risks will not be allowed. Furthermore, contractionary monetary policies restrict access to finance, resulting in cash flow difficulties and deterioration in balance sheets during economic recessions by increasing the marginal cost of money. In response to the deterioration in the financial sector, market actors perceive uncertainty and trust to be increasing, which results in financial risk. As a result, a rise in money market interest rates can increase financial vulnerability, resulting in financial instability.

On the other hand, in the second-regime, where the negative output gap is above the threshold value of (-8%) in *PSTR* models, it has been found that the variables of structural reform in the financial sectors and money market interest rate have a negative and positive effect on the financial stability variable, respectively. Based on these findings, structural reform regulations are unable to compensate for systemic financial risks that may occur during economic expansions if they are not implemented in the financial sector simultaneously with the economic expansion in a way that is appropriate for scope, communication, time, and credibility; a contractionary monetary policy promotes financial stability. This result can be evaluated as structural reform regulations in financial sectors, along with increases in the policy interest rate implemented simultaneously with the economic expansion, can contribute to financial stability to the extent that they can prevent systemic financial risk and reduce financial vulnerabilities (Karanovic and Karanovic, 2015).

Based on the results of all *PSTR* models, the structural reforms in the real and financial sectors have significant effects on price stability and financial stability for the sample countries between 2002 and 2018. These effects can, however, be altered by regimes shaped by the output gap. According to the results, structural reforms in real sectors contribute to price stability only during times of economic expansion, while structural reforms in financial sectors contribute to financial stability only during times of economic recession. Accordingly, structural reforms in the real and financial sectors need to be implemented at the right time. These reforms can also contribute to improving price and financial stability to the extent that they eliminate supply-demand imbalances, prevent systemic risks, and positively affect a deterioration in expectations by enabling new monetary policy designs. Results such as these can also be observed in Sethi and Acharya (2020), Özatay (2012), Karanovic and Karanovic (2015), and Başçı and Kara (2011).

A policymaker in sampled countries should apply the structural reforms that aim to regulate the goods-

services-labour and money-capital markets by considering the equilibrium conditions during the economic recession and expansion in order to provide price and financial stability when the output gap is given. Therefore, policymakers should be informed to apply structural reforms in a way that these reforms can eliminate supply-demand imbalances, prevent systemic risks, and positively affect a deterioration in expectations with the right timing and scope in order to provide price and financial stability at the level of the output gap is given. As for the limitations, this paper contains data from 84 countries, each with a different level of development, institutional structure, and macroeconomic structure. Due to this, the results of this paper show heterogeneous countries. In future studies, homogeneity will be considered regarding the level of development, the institutional, and legal structure of sampled countries.

REFERENCES

Agnello, L., Castro, V., Jalles, J. T. and Sousa, R. M., 2015. What Determines the Likelihood of Structural Reforms? *European Journal of Political Economy*, 37: 129-145.

Aksoy, T., 2019. Structural Reforms and Growth in Developing Countries. *Journal of Economic Policy Reform,* 22(4): 325-350.

Albulescu, C. T., 2010. Forecasting the Romanian Financial System Stability Using a Stochastic Simulation Model. *Romanian Journal of Economic Forecasting*, 13(1): 81-98.

Anderson, D., Hunt, B. and Snudden, S., 2014. Fiscal Consolidation in the Euro Area: How Much Pain Can Structural Reforms Ease? *Journal of Policy Modeling*, 36(5): 785-799.

Annicchiarico, B., Di Dio, F. and Felici, F., 2013. Structural Reforms and the Potential Effects on the Italian Economy. *Journal of Policy Modeling,* 35(1): 88-109.

Arzamasov, V. and Penikas, H., 2014. A Financial Stability Index for Israel. *Procedia Computer Science*, 31: 985-994.

Babecky, J. and Havranek, T., 2014. Structural Reforms and Growth in Transition: A Meta-analysis. *Economics of Transition*, 22(1): 13-42.

Baltagi, B. H., 2008. *Econometric Analysis of Panel Data*. 4th Edition. John Wiley & Sons, West Sussex.

Barlow, D., 2010. How Did Structural Reform Influence Inflation in Transition Economies? *Economic Systems*, 34(2): 198-210.

Başçı, E. and Kara, H., 2011. Finansal İstikrar ve Para Politikası. İktisat İşletme *ve Finans*, 26(302): 9-25.

Bonfiglioli, A., Crinò, R., and Gancia, G. (2022). Economic Uncertainty and Structural Reforms: Evidence from Stock Market Volatility. *Quantitative Economics*, 13(2), 467-504.

Borio. C., 2014. The Financial Cycle and Macroeconomics: What Have We Learnt? *Journal of Banking & Finance*, 45: 182-198.

Bouis, R., Causa, O, Demmou, L., Duval, L. and Zdzienicka, A., 2012. The Short-Term Effects of Structural Reforms. OECD Economics Department Working Papers, No: 949: 2-62.

Brancaccio, E., Garbellini, N. and Giammetti, R., 2018. Structural Labour Market Reforms, GDP Growth and the Functional Distribution of Income. *Structural Change and Economic Dynamics*, 44: 34-45.

Campagne, B. and Poissonnier, A., 2018. Structural Reforms in DSGE Models: Output Gains but Welfare Losses. *Economic Modelling*, 75: 397-421.

Campos, N. F. and Horváth, R., 2012. Reform Redux: Measurement, Determinants and Growth Implications. *European Journal of Political Economy*, 28(2): 227-237.

Campos, N. F., and Kinoshita, Y., 2008. Foreign Direct Investment and Structural Reforms: Evidence from Eastern Europe and Latin America (No. 3332). *IMF*, Available at: https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Foreign-Direct-Investment-and-Structural-Reforms-Evidence-from-Eastern-Europe-and-Latin-21639.

CBRT, (2016). The effects of structural reforms on economic growth, Central Bank of Turkey Republic. Available at: https://www.tcmb.gov.tr/wps/wcm/connect/62478b27-9dd8-4351-a979-30ed6461cf9e/TCMB2016_1.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-62478b27-9dd8-4351-a979-30ed6461cf9e-m5ljXaM. [Accessed in September 2020].

Christiansen, L., Schindler, M. and Tressel, T., 2013. Growth and Structural Reforms: A New Assessment. *Journal of International Economics*, 89(2): 347-356.

Colletaz, G. and Hurlin, C. 2006. Threshold Effects of the Public Capital Productivity: An International Panel Smooth Transition Approach. *LEO, Université d'orléans*, Working Paper, N1/2006.

Cuervo-Cazurra, A. and Dau, L. A., 2009. Structural Reform and Firm Exports. *Management International Review*, 49(4): 479-507.

D'Costa, S., Garcilazo, J. E. and Oliveira, M. J., 2019. Impact of Macro-structural Reforms on the Productivity Growth of Regions: Distance to the Frontier Matters. *Papers in Regional Science*, 98(1): 133-166.

De Almeida, L. A. and Balasundharam, V., 2018. On the Impact of Structural Reforms on Output and Employment: Evidence from a Cross-country Firm-level analysis. *International Monetary Fund, 2018*.

IMF Working Paper, WP/18/73, 1-35. Avaialble at: https://www.imf.org/en/Publications/WP/Issues/2018/04/06/On-the-Impact-of-Structural-Reforms-on-Output-and-Employment-Evidence-from-a-Cross-country-45786. [Accessed in September 2020].

De Grauwe, P. and Ji, Y., 2020. Structural Reforms, Animal Spirits, and Monetary Policies. *European Economic Review*, 124, 103395: 1-29.

De Haan, J. and Parlevliet, J., 2018. Structural Reforms: An Intrdoduction. In: De Haan, J., Parlevliet, J. (Eds): *Structural Reforms: Moving the Economy Forward*, Springer International Publishing AG, pp. 1-20.

Duarte, R., Pinilla, V. and Serrano, A. 2013. Is There an Environmental Kuznets Curve for Water Use? A Panel Smooth Transition Regression Approach. *Economic Modelling*, 31: 518-527.

EBRD, 2010. Transition Report 2010: Recovery and Reform. *European Bank for Reconstruction and Development*: 1-163. Available at: https://www.ebrd.com/downloads/research/transition/tr10.pdf. [Accessed in September 2020].

Égert, B. and Gal, P. 2018. The Quantification of the Effects of Structural Reforms in OECD Countries. In: De Haan, J., Parlevliet, J. (eds): *Structural Reforms: Moving the Economy Forward*, Springer International Publishing AG, pp. 38-60.

Fischer, K. and Stiglbauer, A., 2018. Structural Reforms for Higher Productivity and Growth. *Monetary Policy and the Economy*, Q2/18: 132-152.

Fouejieu, A., 2017. Inflation Targeting and Financial Stability in Emerging Markets. *Economic Modelling*, 60: 51-70.

Fouquau, J., Hurlin, C. and Rabaud, I., 2008. The Feldstein-Horioka Puzzle: A Panel Smooth Transition Regression Approach. *Economic Modelling*, 25: 284–299.

GFDR, 2020. Global Financial Development Report 2019-2020: Bank Regulation and Supervision a Decade after the Global Financial Crisis, *The World Bank Group, 2020*. Available at: https://openknowledge.worldbank.org/handle/10986/32595. [Accessed in September 2020].

Gomes, S., 2018. Euro Area Structural Reforms in Times of a Global Crisis. *Journal of Macroeconomics*, 55: 28-45.

Gonzalez, A., Terasvirta, T., and Van, Dijk D., 2005. Panel Smooth Transition Regression Models. *SSE/EFI Working Paper Series in Economics and Finance*, WP No. 604, Stockholm.

Hamilton, J. 2017. Why You Should Never Use the Hodrick-Prescott Filter. *NBER Working Paper*, No: 23429.

Hansen, B. E., 1999. Threshold Effects in Non-Dynamic Panels: Estimation, Testing, and Inference. *Journal of Econometrics*, 93: 345–368.

IMF, 2015. Structural Reforms and Macroeconomic Performance: Initial Considerations for The Fund. *IMF*, 1-62. Available at: http://www.imf.org/external/pp/ppindex.aspx.

IMF, 2008. Structural Reforms and Economic Performance in Advanced and Developing Countries. IMF, 1-49. Available at: https://www.imf.org/external/np/res/docs/2008/pdf/061008.pdf.

IMF-IFS, 2020. International Financial Statistics. Available at: https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b

IMF-MONA, 2020. Monitoring of Fund Arrangements, *MONA Database*. Available at: https://www.imf.org/external/np/pdr/mona/index.aspx.

Karanovic, G., and Karanovic, B., 2015. Developing an Aggregate Index for Measuring Financial Stability in the Balkans. *Procedia Economics and Finance*, 33: 3-17.

Kondratovs, K., 2014. Modelling Financial Stability Index for Latvian Financial System. *Regional Formation and Development Studies*, 8(3): 118-129.

Kouamé, W. A. and Tapsoba, S. J., 2019. Structural Reforms and Firms' Productivity: Evidence from Developing Countries. *World Development*, 113: 157–171.

Menyah, K., Nazlioglu, S. and Wolde-Rufael, Y., 2014. Financial Development, Trade Openness and Economic Growth in African Countries: New Insights from a Panel Causality Approach. *Economic Modelling*, 37: 386-394.

Nardo, M., Saisana, M., Saltelli, A., Tarantola, S., Hoffman, A. and Giovannini, E., 2005. Handbook on Constructing Composite Indicators: Methodology and User Guide OECD Statistics Working Papers, No. 2005/03. Paris: OECD Publishing. Available at: https://ec.europa.eu/eurostat/ramon/statmanuals/files/Constructing_Composite_Indicators_2005.pdf. [Accessed in September 2020].

Norris, E. D. and Ho, G. and Kyobe, A., 2016. Structural Reforms and Productivity Growth in Emerging Market and Developing Economies. *IMF*. Available at: https://www.imf.org/external/pubs/ft/wp/2016/wp1615.pdf. [Accessed in September 2020].

OECD, 2008. Handbook on Constructing Composite Indicators: Methodology and User Guide. Paris: OECD Publishing. Available at: https://www.oecd.org/sdd/42495745.pdf. [Accessed in September 2020].

Orphanides, A. and Van, Norden S., 2002. The Unreliability of Output Gap Estimates in Real-Time. *The Review of Economics and Statistics*, 84: 569–583.

Ostry, J. D., Prati, A. and Spilimbergo, A., 2009. Structural Reforms and Economic Performance in Advanced and Developing Countries (No. 268). *IMF Occasıonal Paper*, No: 268: 1-53. Available at: https://www.imf.org/en/Publications/Occasional-Papers/Issues/2016/12/31/Structural-Reforms-and-Economic-Performance-in-Advanced-and-Developing-Countries-22594. [Accessed in September 2020].

Özatay, F. 2012. An exploration into new monetary policy. İktisat İşletme *ve Finans*, 27, 315: 51-75.

Papageorgiou, D. and Vourvachaki, E., 2017. Macroeconomic Effects of Structural Reforms and Fiscal Consolidations: Trade-offs and Complementarities. *European Journal of Political Economy*, 48: 54-73.

Pesaran, M. H., 2004. General Diagnostic Tests for Cross Section Dependence in Panels. *IZA Discussion Paper No. 1240*: Institute for the Study of Labor IZA: 1-39.

Pesaran, M. H., 2007. A Simple Panel Unit Root Test in The Presence of Cross-Section Dependence. *Journal of Applied Econometrics*, 22(2): 265-312.

Pesaran, M. H., Ullah, A., and Yamagata, T., 2008. A Bias-Adjusted LM Test of Error Cross-Section Independence. *The Econometrics Journal*, 11(1): 105-127.

Prati, A., Onorato, M. G. and Papageorgiou, C., 2013. Which Reforms Work and Under What Institutional Environment? Evidence from a New Data Set on Structural Reforms. *Review of Economics and Statistics*, 95(3): 946-968.

Rieth, M. and Wittich, J., 2020. The Impact of ECB Policy on Structural Reforms. *European Economic Review*, 122, 103361.

Sethi, D. and Acharya, D., 2020. Monetary Policy and Financial Stability: The Role of Inflation Targeting. *Australian Economic Review*, 53(1): 50-75.

Swaroop, V., 2016. World Bank's Experience with Structural Reforms for Growth and Development. World Bank, *MFM Discussion Paper*, No: 11: 1-15. Available at: https://openknowledge.worldbank.org/handle/10986/24360.

Swiston, A. J. and Barrot, L. D., 2011. The Role of Structural Reforms in Raising Economic Growth in Central America. *IMF Working Papers*: 1-20. Available at: https://www.elibrary.imf.org/doc/IMF001/12258-9781463923273/12258-9781463923273/Other_formats/Source_PDF/12258-9781463937652.pdf.

Tatoğlu, F. Y., 2013. İleri *Panel Veri Analizi-Stata Uygulamalı*, 2. Baskı, Beta, İstanbul.

Ucar, N. and Omay, T., 2009. Testing for Unit Root in Nonlinear Heterogeneous Panels. *Economics Letters*, 104: 5–8.

Ullrich, K., 2019. Structural Reforms – Easier Said than Done. *KfW Research Focus on Economics*. Available at: https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-Fokus-Volkswirtschaft/Fokus-englische-Dateien/Fokus-2019-EN/Focus-No.-260-August-2019-Structural-reforms.pdf.

Van, Riet A., 2006. Monetary Policy and Structural Reforms in the Euro Area. In: *European Trade Union Confederation. Structural Reforms and the European Macro-Economic Policy*, pp. 55-62. Available at: https://www.etuc.org/sites/default/files/Structural_reforms_EN-2_1.pdf.

Vredin, A., 2015. Inflation Targeting and Financial Stability: Providing Policymakers with Relevant Information. *Bank for International Settlements-BIS Working Papers*, No: 503: 1-39. Available at: https://www.bis.org/publ/work503.pdf.

World Bank, 1996. World Development Report 1996: From Plan to Market. *World Bank*: 1-241. Available at: https://elibrary.worldbank.org/doi/pdf/10.1596/978-0-1952-1107-8.

World Bank, 2020. Doing Business 2020. *World Bank*: 1-135. Available at: https://openknowledge.worldbank.org/bitstream/handle/10986/32436/9781464814402.pdf.

Appendix A: Sampled Countries

Albania	Bulgaria	Cyprus	Guinea	Lesotho	North Macedonia (Republic of)	Sri Lanka
Angola	Burkina Faso	Dominica	Guinea-Bissau	Madagascar	Pakistan	St. Kitts and Nevis
Antigua and Barbuda	Burundi	Dominican Republic	Haiti	Malawi	Paraguay	Suriname
Argentina	Cameroon	Ecuador	Honduras	Maldives	Peru	Tajikistan
Armenia	Cape Verde	Egypt	Hungary	Mali	Portugal	Tanzania
Bangladesh	Central African Republic	Gabon	Iceland	Moldova	Romania	Togo
Barbados	Chad	Gambia	Ireland	Mongolia	Rwanda	Tunisia
Belarus	Colombia	Georgia	Jamaica	Mozambique	Sao Tome and Principe	Turkey
Benin	Congo (Republic of)	Ghana	Jordan	Nepal	Senegal	Uganda
Bolivia	Costa Rica	Greece	Kenya	Nicaragua	Serbia	Ukraine
Bosnia and Herzegovina	Cote D'Ivoire	Grenada	Kyrgyz Republic	Niger	Seychelles	Uruguay
Brazil	Croatia	Guatemala	Latvia	Nigeria	Sierra Leone	Zambia

Appendix B: Estimated Results of The PSTR Model

	Model 3				**Model 4**			
Threshold Variables (*OPG*)	**Model 3A**		**Model 3B**		**Model 4A**		Model 4B	
	Parameters		Parameters		Parameters		Parameters	
	Regimes		Regimes		Regimes		Regimes	
Variables								
RSR-1	0.438[b] [0.201]	-0.549[b] [0.270]	—	—	—	—	—	—
RSR-2	—	—	6.137[a] [2.405]	-5.948[a] [2.396]	—	—	—	—
FSR-1	—	—	—	—	1.093[b] [0.542]	-2.721[b] [1.337]	—	—
FSR-2	—	—	—	—	—	—	0.416[b] [0.204]	-3.524[b] [2.075]
MS	-0.085[a] [0.022]	-0.213 [0.151]	-0.123[b] [0.061]	0.017 [0.114]	-0.276[a] [0.075]	0.637[a] [0.239]	-0.273[a] [0.075]	0.618[a] [0.236]
LP ()	4.368		-8.344		2.959		2.960	
SP ()	2.114		20.541		8.701		8.546	
AIC	3.70		3.70		6.78		6.78	
BIC	3.73		3.72		6.81		6.81	
RSS	5.7492.000		57342.407		1250306.383		1255593.588	

Note: For the symbols and abbreviations in the table, please see Table 6.

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The Internet Usage Rate in Turkey: A Machine Learning Approach

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ABSTRACT

Most studies on measuring coverage bias in internet surveys use internet access as a critical measurement variable. However, access to the internet does not mean that individuals are using it. Therefore, using the internet usage rate as a key variable is crucial to get an accurate overview of the internet coverage of a population. This study closes these gaps by using a better indicator for measuring the internet usage rate. It is the first study measuring the internet usage rate in Turkey by using the real internet usage rate of the population and applying a machine learning algorithm. The results exposed significant differences in socio-demographic characteristics when internet users were compared with non-users. Furthermore, the coverage bias associated with internet users remained different for several demographic categories. The results of web-based surveys based on the actual internet usage rate are crucial for the scientific community and marketers.

Keywords: Internet Usage Rate, Socio-Economic Factors, Turkey, Machine Learning.

JEL Classification Codes: C45, C55, C83, D19, M30, L86

Referencing Style: APA 7

INTRODUCTION

According to the World Bank, 45.8% of the world's population uses the internet (Worldbank, 2018). However, home access penetration has not reached 100% even within the EU, ranging from 97% in the Netherlands to 45% in Italy, with an overall mean penetration of 70% for the EU (Eurobarometer, 2017). Furthermore, even in nations with high-level internet coverage, access is unequally dispersed over the inhabitants, with very well-educated and younger people more likely to have an internet connection (Mohorko et al., 2013). Thus, Hwang and Fesenmaier (2004) conclude that internet-centred surveys can only represent active users.

Therefore, the population with no internet access and usage is still a major issue in internet surveys, leading to a central issue in web-based surveys: under coverage. This is a consequence of the„digital divide", the discrepancy in the rate of internet access between demographic groups, e.g., differences related to gender, age, or education level (Couper, 2000). Researchers must consider digital inequality's impact on involvement when using internet surveys. Researchers applying online surveys should examine issues regarding respondents' representation of the target population, specifically nonresponse and coverage error (Robinson et al., 2015; Couper et al., 2007).

Based on this limited review, it is evident that the coverage error of internet surveys is closely related to access to the internet (Schaefer and Dillman, 1998). Thus, some people consider that if most of the population actively uses the internet, then internet users could be assumed to represent the general public (i.e. Yun and Trumbo, 2000). However, assuming that all individuals with internet access are capable and have sufficient facilities to participate in an internet survey can lead to an underestimation of potential coverage errors (Sterret et al., 2017).

Besides simple internet access, users must also have a requisite skill level to complete web-based tasks (van Deursen and van Dijk, (2009). Internet proficiency or adeptness can differ between socio-demographic groups (Hargittai and Hsieh, 2012; Mossberger et al., 2010; Stern et al., 2009). Previous researchers have shown that

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individuals without the skill to finish a web-based survey tend to be socially, politically, and economically different from those with sufficient access and proficiency to finish an internet-based survey (Selwyn, 2004; Mossberger; Sterret et al., 2017).

Coverage of internet surveys significantly increases as more individuals have the opportunity to get online; however, this coverage is still far from complete population coverage since internet access does not necessarily mean that people are using the internet. Actual usage is generally lower than the internet access rate (TUIK, 2017). Therefore, measuring internet usage at the point of access is important. Regardless of the means of data gathering, e.g., web surveys, social media surveys, or online panels, a lack of comprehensive understanding of internet adoption can lead to imprecise estimations (Robinson et al., 2015).

This research aims to highlight significant socio-demographic differences between people who use the internet and those who do not by comparing these two groups in an emerging country like Turkey. This research aims to evaluate different socio-demographic characteristics using the internet usage rate. Therefore, the findings of this study will indicate that there is a possibility that coverage error might be reduced by weighting the information obtained from web-based surveys conducted in Turkey concerning certain socio-demographic characteristics.

To address this question, we used the Information and Communication Technology (ICT) Usage Survey on Households and Individuals from TUIK (Turkish Statistical Institute) for the period 2011–2017, which provides data on the demographic variables of both internet users and non-internet users. The findings are important for researchers and users of internet surveys since no previous study has examined the effects of actual internet usage and internet survey bias in the case of an emerging market such as Turkey.

We concentrate on two critical gaps in the literature: From a research standpoint, we move beyond the typical dominant focus on digitized welfare in industrialized countries to investigate the influence of socio-demographic factors on internet usage. In practice, our approach reacts to market and governmental decision-makers requests to decrease the determinants, increasing the digital divide in society while promoting activities to reduce digital disparities.

The originality of this study will pique the interest of managers, politicians, and researchers. From a scientific standpoint, this study will be a management and social research trailblazer. We will combine traditional statistical methods with machine learning models to build a framework for policymakers, managers, and the scientific community. From this standpoint, this study will be one of the first to use machine learning technology in a socio-economic setting. The findings will allow public officials to modify policies to increase internet adoption in society and reduce the digital divide. Furthermore, firms' market researchers and managers can apply to their marketing activities the consequences of actual internet use and the bias of online surveys in the case of a growing market like Turkey. This study will provide a foundation for governments, businesses, and scientific researchers.

In the following sections, we estimate the fraction of Internet users in Turkey and analyze the difference between Internet access and regular internet users. Then, we will examine to what magnitude internet users differ from the overall population of Turkey. By applying binary logistic regression, we will identify the portion of socio-demographic characteristics that distinguish internet users from non-internet users within the socio-demographic categories. Furthermore, we apply a machine learning technique to get deeper insights into socio-demographic effects on internet usage rates. Finally, we will discuss the challenges of the internet usage rate in the context of the practical use of web-based surveys.

RELATED LITERATURE REVIEW

The process of gathering primary data has radically transformed within the last two decades, a change that can be seen in internet survey research (Robinson et al. 2015). The era of global connectivity and increased internet access has made web-based surveys a popular sampling technique for scientists and businesses.

Most research assessing coverage bias in internet surveys utilizes internet access as a key measurement variable. Couper et al. (2018) investigated the socio-demographics of mobile phone and internet coverage in combination and independently. They examined the impact of different coverage levels. Their research has consequences for potential coverage biases that could appear when changing to an internet-based data-gathering method, either for follow-up investigations or to replace the primary in-person data collection.

García-Mora and Mora-Rivera (2023) aimed to estimate the effect of internet access on poverty for a section of rural Mexicans residing in distinct regions. They used a quasi-experimental methodology to discover that Internet access is an additional method for poverty reduction. Additionally, they showed that internet access could help increase the proportion of rural residents living above the poverty line.

Built on a Propensity Score Matching method, Mora-Rivera and -Mora (2021) indicated that policy measures should be taken to resolve topics that restrict Internet access for persons and households with greater social defenselessness, thereby causative to a decrease in the shortage stages practised by a significant portion of households with high levels of poverty.

Valentín-Sívico et al. (2023) showed that Internet access at home improves the value of life for households and expands their social and economic chances. Their study resulted in two main conclusions: first, variations in internet use for education, employment, and health could not be straight accredited to internet interference; and second, the internet interference was linked with paybacks from the capability to apply several devices.

Martínez-Domínguez and Mora-Rivera (2020) seek to identify the socio-economic and demographic factors that encourage the rural population to acquire and utilize the internet. Using an econometric model to account for the possibility of selection bias, findings suggest that the likelihood of Internet use is greater among people with digital abilities and women. Internet usage patterns alter by level of education, age, nature of employment, and location. Young populations are more prone to engage in virtual actions for enjoyment, whereas adults use the internet for communication, information, and e-business. These results offer verification of the extant digital split regarding Internet access and utilization.

Byaro et al. (2023) applied a generalized quantile regression approach to observe the association between health effects and internet use. The results demonstrate the diverse impact of health expenditures, income, and market on health results and carbon dioxide releases within quantiles. These indicate a diminishing return on investment or increased health outcomes at a particular level.

The internet has a significant effect on research methods. Its use for systematic data gathering is expanding because it offers cost efficiency, time savings, and access to different and large populations (Hays, Liu, and Kapteyn, 2015). Data acquisition via internet surveys continues to become more popular as rates of internet access rise (Sterret et al., 2017; Worldbank, 2018).

Respondent anonymity has peaked with Amazon's Mechanical Turk, and the idea of paid surveys has exploded with the birth of internet panel websites. Though these Web sites require memberships, fake demographic profiles may be created while registering. Knowing who responds to such surveys is virtually impossible, even if e-mail addresses are collected.

With the emergence of paid surveys, researchers began to be concerned about professional respondents providing lower-quality data, based on the assumption that professional respondents' extrinsic motivation—getting paid—would lead them to respond with minimal cognitive effort. This assumption was recently tested by de Leeuw and Mathijsse (2016), who could not find empirical evidence that professional respondents produce data of lower quality.

The quality of a survey depends on its complete measurement of the probability sample (Groves, 2006). Though Internet infiltration into households maintains a fast pace in the EU, the penetration is nevertheless far from complete and varies widely from country to country, even within the EU (Eurobarometer, 2017). Internet-based surveys may only frame internet users and cannot be generalized to the general public.

In recent years, some scholars have researched population coverage in internet surveys. However, the analysis of internet coverage rates in developed countries has primarily been examined for highly industrialized nations such as the United States and members of the European Union (e.g., Mohorko et al., 2013; Sterrett et al., 2017; Vicente & Reis, 2012; Yeager et al., 2011; Heerwegh & Loosveld, 2008). Thus, the importance of digital inequality for response rates in internet surveys is still unclear in newly industrialized countries and emerging markets such as Turkey (Boddin, 2016; Robinson et al., 2015; Stern, Bilgen, & Dillman, 2014). In recent years, survey research has faced a massive drop in participation across different survey modes, especially in interview-based measurement methods such as telephone surveys. In the early days of the world wide web, internet-based surveys seemed like an optimal solution to this issue. Several scholars thought that internet or social media surveys would substitute paper and pencil and telephone surveys and solve the problem of recruiting participants via traditional mail, telephone, or in-person surveying (Robinson et al. 2015).

Studies exploring the discrepancies between the populations of internet users and non-users have found some attitudinal, demographic, and behavioral variations between the two. For instance, in the Netherlands, non-internet users are older, live in a single household, and have a migration background. Similarly, German non-internet users are likely less educated and slightly older than internet users (Eckman, 2016). Furthermore, some personality differences were also identified between German internet users and non-users (Eckman, 2016). Differences in age, income, race, college education, and urbanity between Internet and non-user households have also been reported in the US (Couper, 2000).

Pew Research Center phone studies have noted a growth in internet acceptance, which has increased from 14% of US residents in 1995 to 89% in 2015. (Pew Research Center, 2015). Thus, one in ten adults has no internet access, leaving uncertainty in the survey's results.

The report's authors conclude that this is an outcome of the fact that the non-web survey group constituted a small part of the target population (Pew Research Center, 2015). However, it could also result from the nature of the researched topic, where the differences between internet- and non-internet-using respondents are insignificant. Moreover, even the Pew Center's researchers conclude that though 90% of Americans use the internet, web surveys are not free from a modest bias (Pew Research Center, 2015).

Not to be confused with other types of non-observations, it should be highlighted that not all bias from non-observations is equivalent. The reasons for not having internet access may differ from those that impact involvement amongst chosen test members. Therefore, bias as a result of undercoverage may be extremely distinct in extent and direction from bias due to nonresponses. Further, the motives for exclusion from the structure and nonresponse can be distinct, and the two may also vary in their demographic (Peytchev et al., 2011) and behavioral characteristics.

MODEL SPECIFICATIONS AND DATA ANALYSIS

Since 2004, studies on information and communication technology (ICT) usage by individuals and households have been conducted by TUIK (the Turkish Statistical Institute). This is the primary database on ICT usage in Turkey; the questionnaires are adapted and modified from model questions from Eurostat regarding conditions and needs in Turkey (TUIK, 2017). Data is collected through computer-assisted face-to-face interviews containing questions about internet usage and demographic variables (TUIK, 2017). Face-to-face interview processes are more effective than other survey modes at achieving coverage of a high percentage of the populace (e.g., Groves and Lyberg, 2010).

Several studies analyzed the coverage error of internet surveys in Europe and the United States by using a dataset that used face-to-face interviews to examine Internet access (Heerwegh and Loosveldt, 2008; Vicente and Reis, 2012; Mohorko et al., 2013; Tourangeau et al., 2013). Face-to-face interviews linked with address-based sampling as a survey method has led to the greatest extent of population coverage (Vicente and Reis, 2012; Sterrett et al., 2017).

The ICT applied an address-based sampling method, using in-person interviews to ask about the internet usage rates of individuals (TUIK, 2017). Identical questions regarding internet usage rates administered in in-person interviews every year offered us a unique opportunity to compare internet users and non-internet users based on socio-demographic factors over time. Most studies on coverage bias in web-based surveys have used online data (Vicente & Reis, 2012). In contrast, this study uses data gathered in person, which offers theoretical coverage of the entire population. Therefore, it allows us to estimate the possible coverage bias of non-internet users.

Furthermore, we applied a machine learning algorithm to get deep insights regarding the socio-demographic classifications of internet users. We used a decision tree approach that also applied a classification system. A classification represents a relationship between input data and output data. As a supervised technique in data mining, classification determines the proper class labels for an unlabeled test case from a training dataset with associated training labels (Aggarwal, 2014). Classification involves target marketing, credit approval, systematic medical analysis, fraud detection, and scientific research (Mitchell et al., 1990; Hastie et al., 2013).

Decision trees classify samples by ordering them from the tree's root to the leaves. Each node on the tree contains the test of the example's feature (attribute), and each branch from that node relates to a value of that feature. A sample is classified by starting from the root and going to different branches according to the value of the feature at each node and reaching the leaves. Each leaf specifies a target value.

Given training vectors $x_i \in R^n, i = 1, \ldots, l$, and a label vector $y \in R^l$, a decision tree recursively separates the feature space so that samples with identical labels or similar target values are clustered. Let Q_m represent the data at node with samples. If a target is a classification result taking on values $0,1,\ldots,K\text{-}1$, for node m, let

$$p_{mk} = \frac{1}{n_m} \sum_{y \in Q_m} I(y = k),$$

be the ratio of class k observations in node m (Zhang, 2021). We use Entropy measures of impurity as the following,

$$H(Q_m) = -\sum_k p_{mk} \log(p_{mk}).$$

RESULTS

Estimates of Internet Access and User Rates in Turkey, 2011–2017

Data from a total of 130,723 respondents from 2013–2017 is analyzed. We start our analysis by comparing internet access and accurate internet usage rates during the study period (Figure 2).

The ratio of internet users increased from 48.9% in 2013 to 66.8% in 2017, a change of 17.9%. In contrast, internet access increased from 49.1% in 2013 to 80.7% in 2017, a mean increase of 31.6%. The increase in the internet usage rate implies a decrease in coverage error in web-based surveys based on the sampling frame. The distinctions between internet usage and household internet access in terms of internet coverage seem to be an obvious source of potential coverage errors in internet-based surveys focusing only on household internet access.

Disparities Between the Internet-User and Non-Internet-User Populations

For survey researchers, the low internet user rates reported in Table 1 are not a problem if the covered population delivers the same results as the general population (Fricker, 2008). However, data sampling may not cover the general population; therefore, we evaluate the variations between internet users and non-users.

Given the variables of the TUIK questionnaire regarding socio-demographics, we analyze age, gender, education degree, employment status, region of residence, family income, and family size. The results suggest noticeable differences between the population using mobile internet and those without mobile internet access. The internet user population in Turkey for the study period was noticeably younger than non-users.

While 25.6% of internet users were 16 to 24 years old, the applicable coverage rate in the non-user group was 5.7%. Furthermore, internet users were more likely to live in western Turkey. For instance, in region TR1

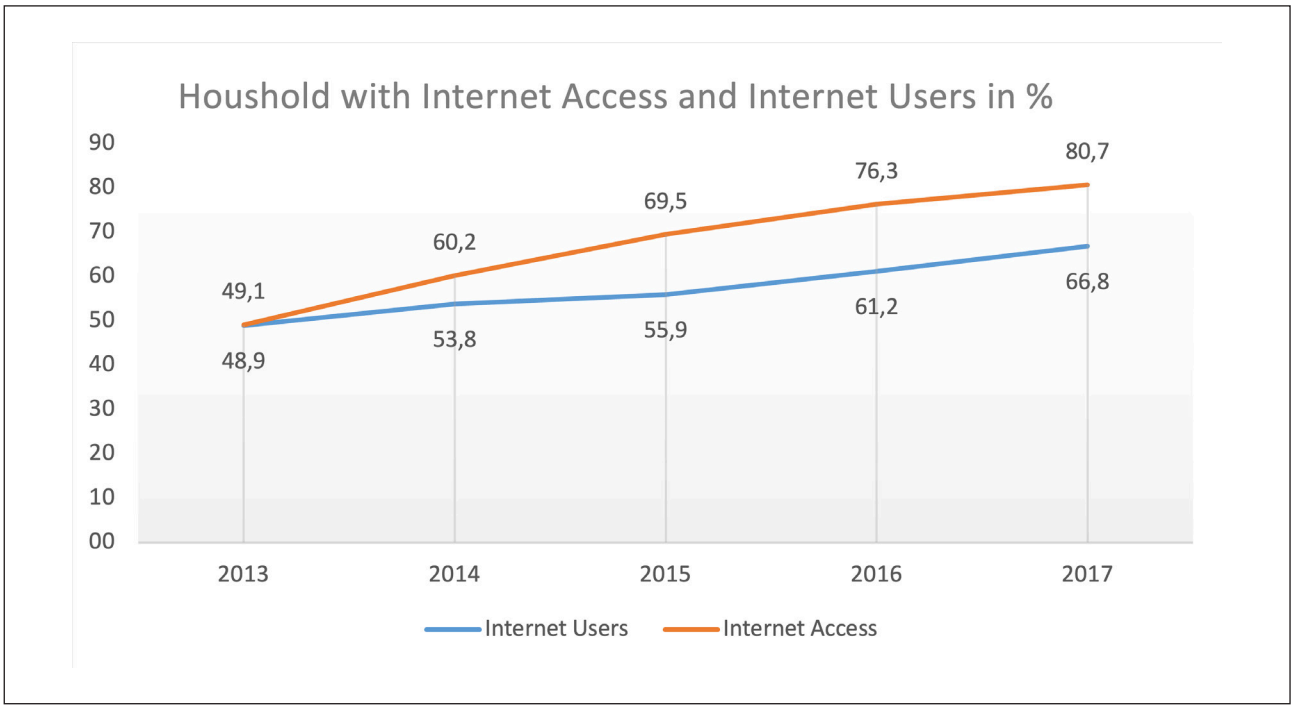

Figure 1: Household internet access and internet user rates in Turkey from 2011 to 2017.

Table 1: Socio-Demographic Characteristics of Internet Users and Non-Internet Users

	2013		2017		Differences 2013-2017	
	Internet	Non-Internet	Internet	Non-Internet	Internet	Non-Internet
Socio-Demographic characteristics	48.90%	51.1%	66.8%	33.2%	**17.9%**	**-17.9%**
Age categories						
16 - 24	31.17%	8.68%	25.6%	5.7%	-5.62%	-2.97%
25 - 34	33.04%	16.10%	28.9%	8.4%	-4.12%	-7.70%
35 - 44	21.86%	20.08%	24.8%	15.5%	2.89%	-4.54%
45 - 54	9.94%	23.35%	13.8%	23.6%	3.89%	0.28%
55 - 64	3.31%	19.70%	5.6%	27.2%	2.29%	7.48%
65 - 74	0.68%	12.09%	1.4%	19.5%	0.69%	7.45%
Total	100.00%	100.00%	100.0%	100.0%	0.00%	0.00%
Gender						
Male	60.09%	39.51%	56.0%	37.5%	-4.07%	-2.00%
Female	39.91%	60.49%	44.0%	62.5%	4.07%	2.00%
Total	100.00%	100.00%	100.0%	100.0%	0.00%	0.00%
Education Status						
Did not finished school	1.09%	28.06%	2.6%	34.1%	1.50%	6.05%
Primary school	16.60%	53.26%	21.1%	51.5%	4.53%	-1.79%
Secondary School	26.06%	10.93%	25.8%	8.8%	-0.31%	-2.08%
High School	32.24%	6.47%	26.9%	4.6%	-5.32%	-1.85%
Higher Education	24.01%	1.29%	23.6%	1.0%	-0.40%	-0.33%
Total	100.00%	100.00%	100.0%	100.0%	0.00%	0.00%
Working Status						
Working	56.07%	29.96%	52.8%	24.8%	-3.30%	-5.16%
Not Working	43.93%	70.04%	47.2%	75.2%	3.30%	5.16%
Total	100.00%	100.00%	100.0%	100.0%	0.00%	0.00%
Region of Residence						
TR1	23.09%	13.91%	23.4%	12.8%	0.27%	-1.10%
TR2	5.11%	4.48%	4.3%	4.8%	-0.80%	0.32%
TR3	13.59%	13.15%	13.1%	13.5%	-0.52%	0.30%
TR4	11.58%	8.97%	10.2%	9.6%	-1.38%	0.61%
TR5	11.77%	7.99%	11.1%	7.2%	-0.70%	-0.77%
TR6	11.01%	13.59%	13.0%	12.5%	1.98%	-1.10%
TR7	4.83%	5.39%	4.8%	5.2%	-0.03%	-0.20%
TR8	5.03%	7.27%	5.4%	6.8%	0.33%	-0.45%
TR9	2.95%	4.15%	3.0%	4.0%	0.09%	-0.16%
TRA	1.64%	3.14%	1.7%	3.6%	0.07%	0.42%
TRB	2.93%	6.23%	3.4%	6.1%	0.47%	-0.12%
TRC	6.46%	11.73%	6.7%	14.0%	0.23%	2.24%
Total	100.00%	100.00%	100.0%	100.0%	0.00%	0.00%
Family Income (Monthly)						
0-999	17.37%	47.98%	3.5%	13.5%	-13.87%	-34.46%
1000-1999	33.33%	33.82%	25.9%	42.9%	-7.45%	9.08%
2000-3999	36.39%	16.12%	43.6%	34.6%	7.24%	18.52%
4000-5999	9.63%	1.61%	17.3%	7.1%	7.63%	5.53%
6000-7999	1.91%	0.24%	5.4%	1.1%	3.46%	0.88%
8000-9999	0.36%	0.06%	1.5%	0.2%	1.10%	0.13%
10000 and above	1.02%	0.17%	2.9%	0.5%	1.89%	0.31%
Total	100.00%	100.00%	100.0%	100.0%	0.00%	0.00%
Household size						
1	3.52%	5.42%	4.0%	5.6%	0.52%	0.17%
2	39.96%	34.74%	12.4%	21.2%	-27.61%	-13.52%
3	24.05%	23.21%	21.6%	15.6%	-2.40%	-7.64%
4	19.61%	18.67%	27.3%	15.5%	7.66%	-3.14%
5	7.51%	8.59%	15.7%	12.0%	8.21%	3.42%
>6	5.35%	9.37%	19.0%	30.1%	13.62%	20.71%
Total	100.00%	100.00%	100.0%	100.0%	0.00%	0.00%

(Istanbul), 23.4% are internet users, and 12.8% are non-users (2017). There is an inequality between gender (male and female) and working status (working vs. not working) in the internet usage rate (56% vs. 44%). The internet-using population was also, on average, far more educated than the remaining portion of the general population. In summary, internet users in Turkey tend to be under 45 years of age, more male and better educated than non-users, residing in western Turkey, and living in a household of 3–4 persons with a monthly income between 2,000 and 4,000 TL.

The Effect of Socio-Demographic Variables on Internet Usage Rates

One of the objectives of this study is to identify to what extent the absence of non-internet users from internet-based surveys can generate a bias regarding demographic variables. In this step, we apply a binary logistic regression model to evaluate the influence of socio-demographic variables on internet usage rates. A logistic regression examination identifies the most important socio-demographic and economic factors separating internet users and non-users by analyzing the key drivers of the independent variables: age, gender, educational status, working status, region of residence, monthly household income, and household size relative to the internet use rate.

The research model is estimated using SPSS version 25 for a binary logistic regression evaluation. The binary logistic regression model is executed using a dichotomous dependent variable. The dependent variable was coded as 0 for "non-internet user" or 1 for "internet user". Table 2 shows the effects of the binary logistic regression on variables predicting internet usage rate.

Several demographic and socio-economic features are coded as independent variables of the logistic regression model, including gender (1 = male, 2 = female), age coded from 1 to 6 to categorize different age ranges from 16 on (1 = 16–24, 2 = 25–34, 3 = 35–44, 4 = 45–54, 5 = 55–64, and 6 = 65–74), education status (from "Did not attend School", "Primary School", "Secondary School", "High School" and "Higher Education", coded as 1 to 5), and working status (1 = working, 2 = not working). The different regions in Turkey (Appendix) are categorized from 1–12. The number of living people in the household is coded from 1–6, with 7 used for all households with 7 or more members. The socio-economic factor of household income was coded from 1–7 for different income ranges (1 = 0-999, 2 = 1000–1999, 3 = 2000–3999, 4 = 4000–5999, 5 = 6000–7999, 6 = 8000–9999, and 7 = 10000 and above).

Overall model fit is estimated using the Nagelkerke R2 statistic and the Hosmer–Lemeshow test. The latter defines the accuracy of the distribution of the detected measures, comparing the observed figures with the expected figures (Hosmer et al., 2013). Its estimates follow a chi-square ($\chi 2$) distribution; its results indicate that all non-significant p values fit our model well. The Wald test is used for a significance test of each variable. Finally, following a conservative recommendation, we estimate the rate of correct case categorizations and determine values above the threshold of 60% as acceptable and values over 70% as good (Hair, Black, Babin, & Anderson, 2014).

The overall model is statistically significant ($\chi 2$ (34) = 88221.808, $p < 0.0001$). Hence, the model effectively differentiates respondents between internet users and non-users. The Nagelkerke R2 equals 0.656; our models can describe around 65% of the variance. The result of the Hosmer–Lemeshow test is significant; regarding model accuracy, our model can predict nearly 84% of cases correctly (see Table 2). We further examine the data by applying logistic regressions to determine the likelihood of each predictor impacting the likelihood of being an internet user.

Estimations of the binary logistic regression model show the probability of being an internet user (Table 2). The estimated model proposes that the possibility of being an internet user varies by age, gender, education status, working status, region of residence, household income, and household size. The likelihood of being an internet user is higher among younger age classes. Assuming all variables are constant in odds estimates, for every Internet user aged 65–74, we measured almost 100 individuals between 16 and 25 (odds ratio = 98.833:1) and more than three (3.292:1) individuals aged 55–64 years. The pattern is linear: the odds ratio of being an internet user declines as the age category increases. An individual's educational status is crucial to the odds of being an internet user—the odds of being an internet user increase with an increase in education level. The working status also significantly affects internet user status (odds ratio = 1.3:1).

The region of residence is also relevant. Living in regions TR1 through TR9 has a significant positive association with being an active internet user. The odds ratio for these regions is at least 1.2 times higher than the reference region TRC. Residence in region TRB has a negative influence on being an internet user; the odds ratio is smaller than 1 and, therefore, the probability of being an internet user is lower than living in region

Table 2: Effect of Socio-demographic Variables on Internet Usage Rate

VARIABLES OF INTERNET USER	β Estimate	Standard error	P value	Odds Ratio
AGE CATEGORIES (ref. 65-74)				
16-24	4.593***	0.056	0.000	98.833
25-34	3.919***	0.053	0.000	50.334
35-44	3.364***	0.052	0.000	28.909
45-54	2.222***	0.051	0.000	9.222
55-64	1.192***	0.052	0.000	3.292
GENDER (ref. female)				
Male	0.773***	0.020	0.000	2.166
EDUCATION STATUS (ref. Higher Education)				
Did not finished school	-4.489***	0.054	0.000	0.011
Primary school	-3.112***	0.045	0.000	0.045
Secondary School	-2.067***	0.047	0.000	0.127
High School	-1.219***	0.047	0.000	0.296
WORKING STATUS (ref. Not Working)	0.263***	0.020	0.000	1.301
Working				
IBBS_1_REGION (ref. TRC)				
TR1	0.568***	0.037	0.000	1.765
TR2	0.377***	0.045	0.000	1.458
TR3	0.405***	0.038	0.000	1.500
TR4	0.517***	0.040	0.000	1.677
TR5	0.393***	0.040	0.000	1.481
TR6	0.392***	0.038	0.000	1.480
TR7	0.260***	0.043	0.000	1.297
TR8	0.239***	0.042	0.000	1.270
TR9	0.182***	0.047	0.000	1.199
TRA	-0.091	0.047	0.052	0.913
TRB	-0.132**	0.042	0.002	0.877
HOUSEHOLD MONTHLY INCOME (ref. 10000 and above)				
0-999	-2.639***	0.125	0.000	0.071
1000-1999	-1.647***	0.124	0.000	0.193
2000-3999	-0.958***	0.124	0.000	0.384
4000-5999	-0.421**	0.127	0.001	0.656
6000-7999	0.026	0.150	0.863	1.026
8000-9999	0.157	0.223	0.481	1.170
HOUSEHOLD SIZE (ref. 7 and above)				
1	1.597***	0.063	0.000	4.938
2	0.843***	0.037	0.000	2.323
3	0.888***	0.036	0.000	2.431
4	0.887***	0.035	0.000	2.428
5	0.737***	0.037	0.000	2.090
6	0.468***	0.042	0.000	1.598
Constant	-0.369**	0.138	0.007	0.691
*p < 0.05; ** p < 0.01; *** p < 0.001				
Nagelkerke R Square:	0.656			
Hosmer and Lemeshow Test	$\chi 2$ (8) = 127.948 (Sig.:0.000)			
Correct Classification	83.9			

TRC (odds ratio: 0.877:1), though living in TRA is not significant. Household income is a significant predictor of belonging to the internet user population. Lower-income significantly negatively affects internet users. The odds ratio is lower than 1 for all income categories lower than 6000 TL; incomes higher than 6000 TL have no significant effect on being an internet user. Finally, the number of members in the household is also correlated with being an active web user. Individuals living in a single-person household are nearly five times more likely to be internet users than members of households with seven or more members. A positive association is also found for other household categories.

The Classification of Socio-Demographic Variables on Internet Usage Rates

The machine-learning analysis decision tree underscores the importance of education. Education is the most critical variable for distinguishing between internet and non-internet users. The decision tree's first (and thus most important) branch directly predicts Internet usage classification. In the first path, if the age is below 46.5, it reinforces an internet user classification. Furthermore, the decision tree analysis reinforces the importance of internet access.

Conversely, if education is low and internet access is given, then age does not influence being an internet user. The second path is that if education is high, internet access is given, and the age is over 43.5, internet usage is forced to be yes. The classification is still an internet user if internet access is not given. If internet access is provided and the person is over the age of 43,5 years, the person is classified as a non-internet user. Gender, working status, region, household income, and size are not decision tree nodes.

DISCUSSION

The present study focuses on understanding internet usage rates in newly industrialized countries or emerging markets, such as Turkey (Boddin, 2016), where no previous study has estimated the effect of socio-demographic variables on internet usage.

Based on the TUIK ICT data, this investigation made it possible to analyze coverage errors. The results indicate that Internet surveys are increasingly attractive as more Turkish people have access to the internet. The ICT Usage Survey on Households and Individuals reveals that the rate of adults in Turkey who have internet access increased from 49.1% in 2013 to 80.7% in 2017; in the same time frame, the internet usage rate increased from 48.9% to 66.8%. These disparities could lead to coverage errors involving those using the internet and non-users, leading to major concerns for those administering Internet surveys.

Similar to the study conducted by Couper et al. (2018), which examined the socio-demographic factors associated with Internet and smartphone coverage, the present results also exposed substantial dissimilarities in socio-demographic variables when Internet users were compared with non-users. Age is the strongest predictor of internet use; gender, working status, educational level, the region's residence, household income, household size, and marital status are (in order) the strongest predictors of internet use. Therefore, internet users cannot be an absolute variable since their characteristics vary with socio-economic and demographic determinants.

The effect on coverage bias size is another challenge when measuring internet survey efficiency since the extent of coverage bias varies across socio-demographic

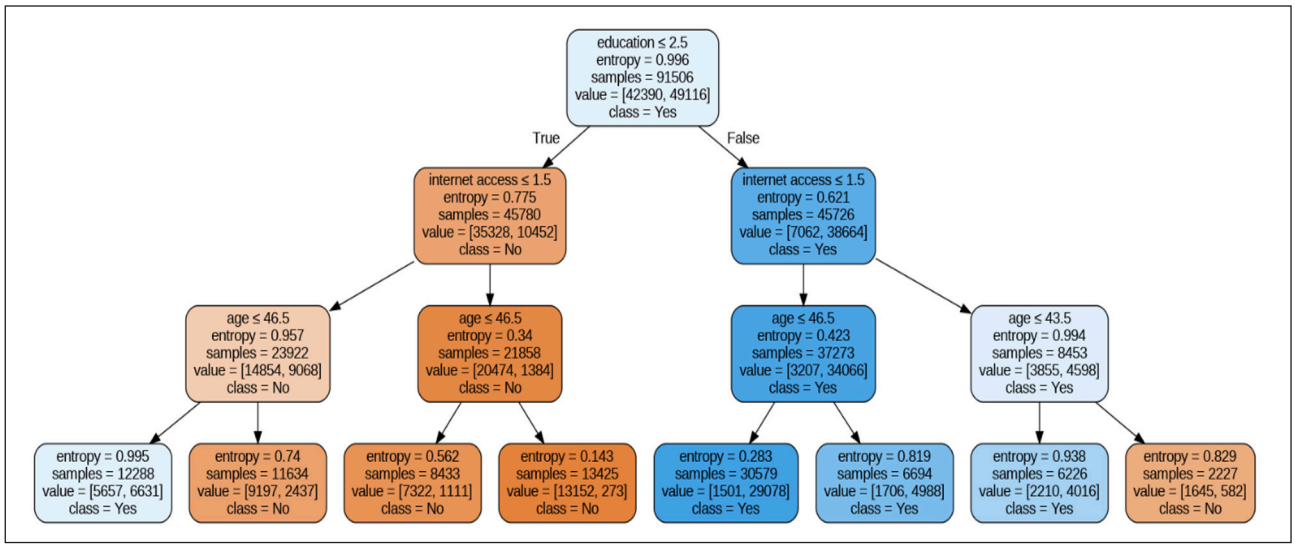

Figure 2: Decision Tree

measures. These results indicate that web-based surveys' precision level is related to the population distribution, which is connected to these socio-demographic variables in the sample frame.

In agreement with other studies on coverage error in Internet surveys in other countries (e.g., Mohorko, de Leeuw, & Hox, 2013; Sterrett et al., 2017), this paper shows possible issues regarding Internet-based surveys in Turkey. Like Vicente & Reis (2012), the present study shows that scrutinizing non-internet users' representation is vital to ensure survey quality. The dissimilarities in socio-demographic and economic appearances among internet and non-internet users indicate possible coverage errors in internet-based surveys relating to gender, age, education, working situation, region of residence, income, and household size. Consequently, using internet users as the sampling population for surveys may lead to systematic under-coverage, for instance, of older people aged 65–74 and females without a university degree. Therefore, similar to Couper et al. (2018) results, this study's findings have significant implications for potential coverage biases that could emerge during the transition to a Web-based data collection method, whether for subsequent surveys or as a substitute for the initial in-person data collection process.

These factors implicate various behaviors and attitudes, so excluding such groups can produce different results. Our outcomes reveal potential sub-populations that are underrepresented in internet-only sampling. Furthermore, the results recommend that weighting the information from web-based surveys in Turkey for specific socio-demographic factors could decrease coverage error. In the next step, an examination of the differences in survey results based on a weighting of the vulnerable socio-demographic variables for the general public group and subgroup should be conducted.

The results of this study also expose substantial dissimilarities in socio-demographic variables when internet users are compared with non-internet users. Age is the strongest predictor of internet use; gender, working status, educational level, the region's residence, household income, household size, and marital status are other strong predictors of internet use. Thus, internet users cannot be used as an absolute variable since their characteristics vary with socio-economic and demographic determinants.

Our results are similar to Valentín-Sívico et al. (2023) findings. They did not find a direct causal relationship between internet intervention and changes in internet use for employment, education, and health.

Drops in coverage errors related to educational status and age are comparable to those detected in Europe and the United States (Mohorko et al., 2013; Sterrett et al., 2017). This study shows that the relative Internet coverage error related to gender, age, education, household size, and income in Turkey declined considerably from 2013 to 2017, and the proportion of decline differs across the explanatory variables.

Furthermore, the study is aligned with the outcome of Martínez-Domínguez and Mora-Rivera (2020). They revealed that the utilization patterns of the internet exhibit variations based on factors such as age, educational attainment, occupational characteristics, and geographical location. The propensity for young individuals to partake in online activities primarily for entertainment is contrasted with adults' inclination to utilize the internet for information acquisition, communication, and engaging in electronic commerce.

CONCLUSION

Our research paper explores the potential coverage biases that may occur during the transition from traditional face-to-face data collection to a web-based mode. This includes both follow-up surveys and the complete replacement of in-person data collection. The findings above underscore the existing regional variations within Turkey and imply that governments must formulate more effective and focused public policies that tackle the unequal distribution of Internet adoption. Implementing these policy enhancements would enable governments to optimize the potential advantages of the internet, particularly in nations such as Turkey. The results offer empirical support for a digital divide in Turkey, explicitly concerning Internet penetration and usage. The impact of internet utilization and adoption on health effects is also examined. It is recommended to prioritize strategies, policies, or laws about internet use and adoption that guarantee the accessibility of digital tools, such as computers and mobile phones, for internet connectivity. The study's policy implications are expected to provide valuable guidance for policymakers to enhance internet connectivity, encouraging further evaluation research. The necessity for communities to maintain economic competitiveness is progressively reliant on the presence of high-speed broadband infrastructure. Robust evaluations play a pivotal role in ensuring the efficacy of government funds and providing valuable insights for future allocations of infrastructure

expenditure. Community-level assessments serve as valuable tools for local elected representatives and decision-makers, enabling them to identify the potential effects of internet access on their community and make informed projections.

The outcomes of this research have a variety of implications for academic scientists. Even though the proportion of Turkish people with home internet access has increased in recent years, internet usage is still far behind the access rate. Researchers still must consider possible coverage bias when carrying out internet-only surveys.

The possible coverage error of important socio-demographic variables essential to internet-based surveys makes it crucial to use various survey methods to frame the sample and assess a broader and more representative population. Therefore, postal, phone or face-to-face surveys offer a chance to contact the non-internet user and reduce coverage errors across the population.

Furthermore, measuring the advantages and disadvantages of applying weight adjustments that reflect dissimilarities in internet usage rates within a demographic is valuable. Turkish non-internet users continue to be a separate segment of the population, which must be considered during survey design to allow scientists to make valid assumptions about the general population.

The findings of this study have significant implications for informing the design of future studies conducted through internet-based platforms. This paper provides recommendations for the identification of suitable outcome variables, the implementation of effective recruitment strategies, and the selection of optimal timing for surveys.

Moreover, future studies should explore the factors of the digital divide in society to reduce the coverage bias in internet-based surveys. It is suggested that researchers could investigate the correlation between internet accessibility and various health outcomes. This can be achieved by incorporating additional health indicators and examining different time frames. Additionally, employing diverse econometric methodologies and accounting for additional confounding factors could enhance the validity of the findings. In order to provide decision-makers with more precise implications that are specific to each country, it is recommended that future research incorporates nation-specific studies.

One notable strength of this study is its utilization of logistic regression analysis and a machine learning methodology. Furthermore, a significantly large sample size was incorporated into each respective methodology. Regarding limitations, it is essential to acknowledge that this study employed a cross-sectional survey design, which introduces the possibility of recall and social desirability biases. Moreover, the machine learning techniques utilized in this research can be effectively employed, for example, in analyzing product preference and predicting demand. Hence, investigating applications utilizing current and real-time data, particularly in E-commerce and related industries, represents distinct avenues of research emphasis, with internet connectivity assuming a crucial role.

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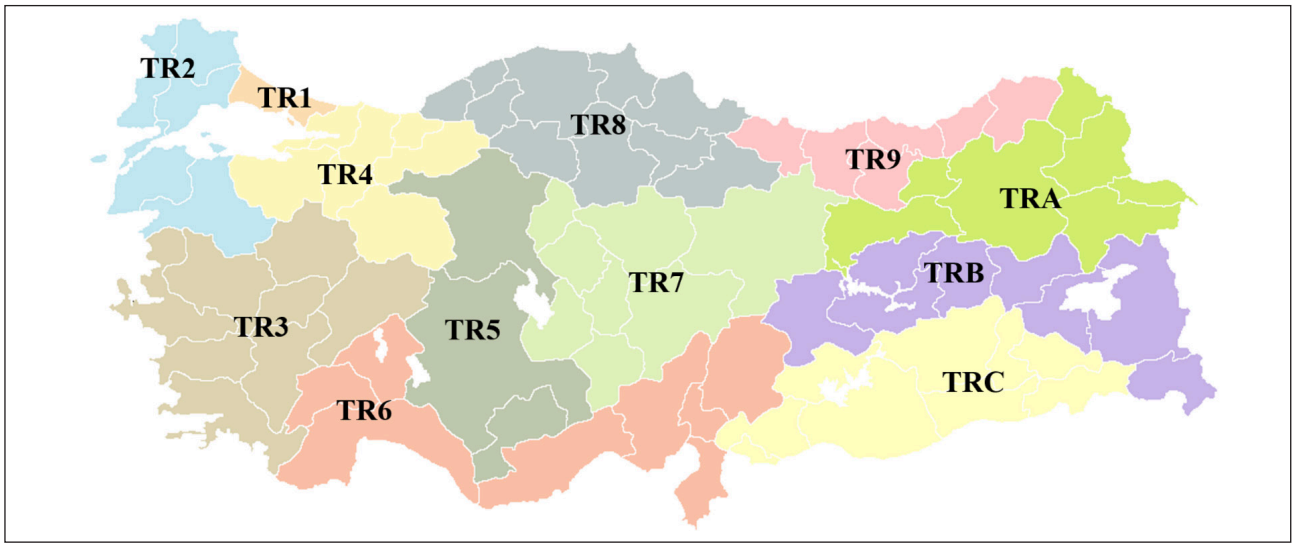
APPENDIX

NUTS Statistical Regions of Turkey



TR1	Istanbul Region	TR7	Central Anatolia Region
TR2	West Marmara Region	TR8	West Black Sea Region
TR3	Aegean Region	TR9	East Black Sea Region
TR4	East Marmara Region	TRA	Northeast Anatolia Region
TR5	West Anatolia Region	TRB	Central East Anatolia Region
TR6	Mediterranean Region	TRC	Southeast Anatolia Region

REFERENCES

Aggarwal, C.C. (2014) Data Classification: Algorithm and Applications, CRC Press, New York.

Boddin, Dominik. 2016. "The Role of Newly Industrialized Economies in Global Value Chains." IMF Working Papers 16 (207): 1. https://www.imf.org/external/pubs/ft/wp/2016/wp16207.pdf (Accessed August 15, 2018).

Couper, Mick P. 2000. "Review: Web Surveys: A Review of Issues and Approaches." Public Opinion Quarterly 64 (4): 464–94. https://academic.oup.com/poq/article-pdf/64/4/464/5414708/640464.pdf.

Couper, Mick P. 2000. "Web Surveys." Public Opinion Quarterly 64 (4): 464–94.

Couper, Mick P., Arie Kapteyn, Matthias Schonlau, and Joachim Winter. 2007. "Noncoverage and nonresponse in an Internet survey." Social science research 36 (1): 131–48.

de Leeuw, Edith, and Suzette Mathijsse. 2016. "Professional Respondents in Online Panels | Insights Association." https://www.insightsassociation.org/article/professional-respondents-online-panels (August 6, 2018).

Eckman, Stephanie. 2016. "Does the Inclusion of Non-Internet Households in a Web Panel Reduce Coverage Bias?" Social Science Computer Review 34 (1): 41–58.

Eurobarometer. 2017. "E-Communications and Digital Single Market: Report.: Special Eurobarometer 432." [en]. Publications Office of the European Union. July 27. https://publications.europa.eu/en/publication-detail/-/publication/57889a55-8fb6-11e8-8bc1-01aa75ed71a1/language-en (September 26, 2018).

Fricker, Ronald D. 2008. "Sampling Methods for Web and E-mail Surveys." In The SAGE handbook of online research methods, eds. Nigel Fielding, Raymond M. Lee and Grant Blank. 1 Oliver's Yard, 55 City Road, London England EC1Y 1SP United Kingdom: Sage pub, 195–216.

Groves, R. M., and L. Lyberg. 2010. "Total Survey Error: Past, Present, and Future." Public Opinion Quarterly 74 (5): 849–79.

Groves, Robert M. 2006. "Nonresponse Rates and Nonresponse Bias in Household Surveys." Public Opinion Quarterly 70 (5): 646–75.

Hair, Joseph F., William C. Black, Barry J. Babin, and Rolph E. Anderson. 2014. Multivariate data analysis. Always learning. Harlow, Essex: Pearson.

Hastie, T., Tibshirani, R. and Friedman, J. (2013) The Elements of Statistical Learning: Data Mining, Inference, and Prediction, Springer, New York.

Hargittai, Eszter, and Yuli P. Hsieh. 2012. "Succinct Survey Measures of Web-Use Skills." Social Science Computer Review 30 (1): 95–107.

Hays, Ron D., Honghu Liu, and Arie Kapteyn. 2015. "Use of Internet Panels to Conduct Surveys." [eng]. Behavior research methods 47 (3): 685–90.

Heerwegh, D., and G. Loosveldt. 2008. "Face-to-Face versus Web Surveying in a High-Internet-Coverage Population: Differences in Response Quality." Public Opinion Quarterly 72 (5): 836–46.

Hosmer, David W., Stanley Lemeshow, and Rodney X. Sturdivant. 2013. Applied logistic regression [eng]. 3rd ed. Wiley series in probability and statistics. Hoboken, NJ: Wiley.

Hwang, Yeong-Hyeon, and Daniel R. Fesenmaier. 2004. "Coverage Error Embedded in Self-Selected Internet-Based Samples: A Case Study of Northern Indiana." Journal of Travel Research 42 (3): 297–304.

Mitchell, T., Buchanan, B., DeJong, G., Dietterich, T., Rosenbloom, P., & Waibel, A. (1990) 'Machine learning', Annual Review of Computer Science, Vol. 4, No. 1, pp.417–433.

Mohorko, Anja, Edith de Leeuw, and Joop Hox. 2013. "Internet Coverage and Coverage Bias in Europe: Developments Across Countries and Over Time." Journal of Official Statistics 29 (4): 609–22.

Mossberger, Karen, Caroline J. Tolbert, and Ramona S. McNeal. 2010. Digital citizenship: The internet, society, and participation. 2nd ed. Cambridge, Mass.: MIT Press.

Pew Research Center. 2015. "Coverage Error in Internet Surveys: Who Web-Only Surveys Miss and How That Affects Results." Pew Research Center. 20150922. http://www.pewresearch.org/2015/09/22/coverage-error-in-internet-surveys/ (July 31, 2018).

Peytchev, Andy, Lisa R. Carley-Baxter, and Michele C. Black. 2011. "Multiple Sources of Nonobservation Error in Telephone Surveys: Coverage and Nonresponse." Sociological Methods & Research 40 (1): 138–68.

Robinson, Laura, Shelia R. Cotten, Hiroshi Ono, Anabel Quan-Haase, Gustavo Mesch, Wenhong Chen, Jeremy Schulz, Timothy M. Hale, and Michael J. Stern. 2015. "Digital inequalities and why they matter." Information, Communication & Society 18 (5): 569–82.

Schaefer, David R., and Don A. Dillman. 1998. "Development of a Standard E-Mail Methodology: Results of an Experiment." Public Opinion Quarterly 62 (3): 378.

Selwyn, Neil. 2004. "Reconsidering Political and Popular Understandings of the Digital Divide." New Media & Society 6 (3): 341–62.

SPSS Statistics, version 25 (IBM Corp., Armonk, NY, USA)

Stern, Michael J., Alison E. Adams, and Shaun Elsasser. 2009. "Digital Inequality and Place: The Effects of Technological Diffusion on Internet Proficiency and Usage across Rural, Suburban, and Urban Counties." Sociological Inquiry 79 (4): 391–417.

Stern, Michael J., Ipek Bilgen, and Don A. Dillman. 2014. "The State of Survey Methodology." Field Methods 26 (3): 284–301.

Sterrett, David, Dan Malato, Jennifer Benz, Trevor Tompson, and Ned English. 2017. "Assessing Changes in Coverage Bias of Web Surveys in the United States." Public Opinion Quarterly 81 (S1): 338–56.

Tourangeau, Roger, Frederick G. Conrad, and Mick Couper. 2013. The science of web surveys [eng]. Oxford: Oxford Univ. Press.

TUIK: Turkish Statistical Institute. Information and Communication Technology (ICT) Usage Survey on Households and Individuals, 2017.

van Deursen, A.J.A.M., and J.A.G.M. van Dijk. 2009. "Improving digital skills for the use of online public information and services." Government Information Quarterly 26 (2): 333–40.

Vicente, Paula, and Elizabeth Reis. 2012. "Coverage Error in Internet Surveys: Can Fixed Phones Fix It?" International Journal of Market Research 54 (3): 323–45.

Worldbank. 2018. "Individuals using the Internet (% of population) - World Bank Open Data." https://data.worldbank.org/indicator/IT.NET.USER.ZS (August 7, 2018).

Yeager, David S., Jon A. Krosnick, LinChiat Chang, Harold S. Javitz, Matthew S. Levendusky, Alberto Simpser, and Rui Wang. 2011. "Comparing the Accuracy of RDD Telephone Surveys and Internet Surveys Conducted with Probability and Non-Probability Samples." Public Opinion Quarterly 75 (4): 709–47.

Yun, Gi W., and Craig W. Trumbo. 2000. "Comparative Response to a Survey Executed by Post, E-mail, & Web Form." Journal of Computer-Mediated Communication 6 (1): 0.

Zhang, Y. (2021). An interactive machine learning approach to integrating physician expertise into delirium prediction model development (Order No. 28770345). Available from ProQuest Dissertations and Theses Global. (2607315462). Retrieved from https://www.proquest.com/dissertations-theses/interactive-machine-learning-approach-integrating/docview/2607315462/se-2

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A Re-Evaluation of How Well Each Country is Doing in Terms of Achieving The SDGs: An Objective Approach Based on Multi-Criteria-Decision-Analysis

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ABSTRACT

Adopting Agenda 2030, the UN issued a set of sustainable development report consisting of 17 goals. The indices created by these goals are beneficial in defining the position of a particular country across the years; however, it is relatively complex to compare its position to other countries. This is not just because it requires an extensive analysis but also because the weight of each goal must be different. It is hard to determine which goal is more important than the others, as it differs from one specialist to another. Then how should we determine the goal weights without falling into the trap of subjective suggestions? That is our question for this research paper. Therefore, we use the multiple-criteria decision-making approach (MCDM) in order to characterise each country's position more accurately. Doing so, we get diverse weights instead of just using the SDGs' arithmetical averages. Therefore, our findings show slightly different rankings than the UN's SDG report 2022.

Keywords: Multiple-criteria decision-making, Entropy, Aras, Sustainable Development Goals.

JEL Classification Codes: D7, C44, Q01

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INTRODUCTION

SUSTAINABLE DEVELOPMENT

A broad notion, "development" can be interpreted in many different ways, from the strictly economic to the more social and environmental. Within the development context sustainable development has gained the attention of economist and therefore policy makers. Sustainable development encapsulates multiple dimensions covering socio-economic, ecological, technical and ethical perspectives. When translating sustainability policies into practical action, it becomes crucial to address fundamental issues such as what aspects are to be sustained and for whose benefit. Sustainability issues inherently involve significant conflicts and tensions. In order to address these issues The General Assembly of United Nations endorsed the Sustainable Development Goals also known as SDGs. The 2030 Agenda for Sustainable Development consists of 17 SDGs focusing on the improvement of the overall situation in the world, at the UN Sustainable Development Summit in September 2015. Therefore, policy makers are forced to consider the sustainability and long-term economic, social, and environmental implications. These SDGs offer a framework for international development initiatives to realise a more sustainable and inclusive society by the year 2030. Here is a succinct description of each SDG in the table 1.

These goals emphasise the need for inclusive and sustainable economic growth, the eradication of poverty, the creation of jobs, innovation, and responsible consumption and production practises in order to provide a more sustainable future for all. However integrating social and environmental issues into financial decisions requires complex decision-making processes that require new methods and best practises.

A sophisticated decision-making process that considers various factors and trade-offs between objectives is necessary to achieve all the SDGs. The 2030 Agenda framework's implementation began in 2016. Since then, a growing number of recommendations, frameworks, methodological evaluations, and academic research on this topic have been published. The studies have shown quite a wide range of results that are contradictory due to the weaknesses of the assessment of the goals

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Table 1. SDGs' Descriptions	
SDG	Description
SDG1: No Poverty	By encouraging inclusive economic growth, social safety programmes, and equal access to economic opportunities, the goal strives to end extreme poverty and lower overall poverty rates.
SDG2: No Hunger	This goal aims to end hunger, improve food security, and advance sustainable agriculture. It highligts the need for increased agricultural productivity, investment in rural infrastructure, and fair distributions of resources.
SDG3: Good Health and Well-Being	This goal focuses to ensure that everyone leads healthy lives and is in good well-being. It addresses issues including disease prevention, mental health, and healthcare access, placing emphasis on the significance of universal health coverage.
SDG4: Quality Education	This goal aspires to offer all people a quality education that is inclusive and egalitarian. It places a strong emphasis on expanding educational options, raising educational standards, and promoting lifelong learning.
SDG5: Gender Equality	This goal encourages gender equality and female empowerment by placing a strong emphasis on giving women and girls the same rights, opportunities, and involvement in economic activities, decision-making processes, and society at large.
SDG6: Clean Water and Sanitation	This goal focuses on ensuring that everyone has access to clean water and sufficient sanitary facilities. To assist sustainable water resource management, it addresses water shortages, water efficiency, and wastewater treatment.
SDG7: Affordable and Clean Energy	This goal aims to guarantee that everyone has access to affordable, dependable, and sustainable energy. It supports increased energy infrastructure, energy efficiency, and renewable energy sources.
SDG8: Decent Work and Economic Growth	This goal places a strong emphasis on full and productive employment, inclusive economic growth, and decent labour for all. It emphasises economic diversity, entrepreneurship, labour rights, and job development.
SDG9: Industry, Innovation and Infrastructure	The goal aims to promote inclusive and sustainable infrastructure development, industrialization, and innovation. It places a strong emphasis on spending money on infrastructure, advancing technology, and encouraging environmentally friendly business practises
SDG10: Reduced Inequalities	This goal addresses inequities both inside and between nations. It emphasises lowering income inequality, fostering social inclusion, and guaranteeing equitable chances for everyone, especially marginalised and vulnerable groups.
SDG11: Sustainable Cities and Communities	The focus of this goal is on building inclusive, secure, robust, and sustainable urban communities. It encourages access to affordable housing, efficient urban infrastructure, and sustainable urban development.
SDG12: Responsible Consumption and Production	The goal promotes environmentally friendly patterns of consumption and production. It places a strong emphasis on resource efficiency, waste minimization, environmentally friendly purchasing, and sustainable use of natural resources.
SDG13: Climate Action	This goal aims to combat the effects of climate change. It advocates for catastrophe preparedness procedures, adaption tactics, and resilience building.
SDG14: Life Below Water	This goal is concerned with protecting and utilising marine resources and oceans sustainably. The protection of coastal habitats and challenges like marine pollution and overfishing are covered.
SDG15: Life on Land	The goal encourages the preservation, restoration, and sustainable use of terrestrial ecosystems. Deforestation, biodiversity loss, and sustainable land management techniques are all covered.
SDG16: Peace, Justice and Strong Institutions	Access to justice, effective and responsible institutions, and peaceful and inclusive societies are the three pillars of this goal. It deals with matters like lessening violence, battling corruption, and advancing the rule of law.
SDG17: Partnerships for the Goals	This goal highlights the value of international collaboration for sustainable development. To mobilise resources and spread knowledge to accomplish the SDGs, it calls for more cooperation between governments, corporations, civil society, and other stakeholders.

Source: https://unstats.un.org/sdgs/report/2020/#sdg-goals. Accessed: 10/03/2023

(Stafford et al., 2017). While some studies only focus on the achievement of a particular SDG, others take few of them. Also, in some studies researchers study a group of countries or one single country. (Lim et al. 2016; Stafford-Smith et al. 2017; Schwerhoff and Sy 2017; Fullman et al, 2017; Salvia et al. 2019; Sims et al. 2019; Allen et al. 2020.).

We don't often see all countries are taken into consideration at the same time. In contrast to earlier studies, which frequently concentrated on particular groups of countries, our goal is to include every nation at once for all SDGs. The traditional SDG index can produce erroneous and possibly deceptive country rankings because it computes simple arithmetic averages for each SDG. In contrast, our strategy makes use of Multi-Criteria Decision Making (MCDM) methodologies, which modify the weights given to each goal according on how important they are. We arrive at a subjective ranking for each nation using these techniques, which contrasts with the ranks provided in UN publications. We reevaluate the goals and their relative importance based on weights determined using the Entropy technique. We then include these results into the ARAS methodology to create a new rating of countries that more accurately represents how well they are doing in terms of achieving the SDGs.

By using these techniques, we hope to provide a more thorough and nuanced knowledge of how nations are doing in terms of achieving the SDGs, while also supporting a more accurate evaluation of nations' successes in sustainable development and taking into account the various relevance of each objective.

THE MULTI CRITERIA DECISION MAKING (MCDM) AND ITS APPLICATIONS IN THE SDG CONTEXT

Within a long-term perspective, decision-making procedures should concurrently consider decisions' effects on the economy, society, and environment. It requires complex decision-making processes, where new ideas and best practises must be created and put into practise, to make judgements that are deeper than the financial aspect by combining social and environmental issues.

Due to its subjective criterion weighting analysis, the MCDM method is the most prominent decision-making instrument. MCDM evaluates a set of alternatives based on multiple, typically contradictory decision criteria (Ishizaka & Nemery, 2013; Greco et al., 2016). Multi-Criteria Decision Analysis (MCDA) is a technique used to manage difficult and complicated policy decision-making issues. It recognises that conflicts frequently arise as a result of diverse objectives of actors in an economy. MCDA intends to resolve these conflicts by organising the interests of these actors into practical and quantifiable criteria. It allows for the aggregation of group preferences across multiple criteria and provides a framework for evaluating the performance of alternative policy options based on these criteria. In essence, MCDA facilitates the making of well-informed decisions by systematically weighing multiple perspectives and objectives (Brett et. al. 2019). A selection of the pertinent research papers are mentioned in this area.

MCDM methods have demonstrated their usefulness in assisting decision-makers in assigning criteria weighs and prioritize goals in various geographical and cultural contexts particularly under uncertainty (Ringius et al. 1998; Bell et al., 2001; Gamboa, 2006; Garmendia and Stagl, 2010).

The literature suggests utilization of MCDM methods enhances the adaptability and precision of decision-making processes when prioritizing of SDGs to be included in a country's 2030 Agenda. Karaşan and Kahraman (2018) created the Interval-Valued Neutrosophic EDAS method. The method was used to select the SDGs in which Turkey should begin investing in the context of the national 2030 Agenda. Oliveira et al. (2019) presented a systemic and contextual framework designed to prioritize SDGs for the Brazilian 2030 Agenda. Their approach integrated two fuzzy MCDM methods (fuzzy AHP and fuzzy TOPSIS) along with prospective structural analysis (PSA) and network theory tools. In another study, Resce and Schiltz (2020) developed a MCDM approach to assess the performance of European countries in achieving the SDGs. They employed the Hierarchical Stochastic Multicriteria Acceptability Analysis (HSMAA) method. According to Benítez and Liern (2020), introducing the new unweighted TOPSIS (uwTOPSIS) method propose a solution to address the challenge of assigning weights to sustainability criteria when ranking alternatives related to the SDGs.

Researchers use MCDM techniques to cope with the assessment of a set of alternatives in terms of numerous, frequently competing, decision criteria since the techniques give decision-makers the flexibility to take decisions while simultaneously taking all the criteria and objectives into account (Zavadskas and Turskis, 2011). It is especially helpful in the context of the SDGs since it enables simultaneous consideration of the impact of alternatives on the economy, society, and environment

throughout the decision-making process. By using these techniques, it is possible to reach a consensus and make a more solid and long-lasting conclusion.

In accordance with a set of decision criteria, MCDM aims to offer a choice, rating, description, classification, and sorting of alternatives. There are various methods to perform MCDM analysis such as ARAS, TOPSIS, COCOSO, AHP/ANP, ELECTRE, PROMETHEE, and MAUT (Stanujkic et. al., 2020). The focus in this study is mostly on Entropy based ARAS and TOPSIS.

The main purpose of our study is to evaluate all SDG goals and all the countries at the same time employing a Multi-Criteria Decision-Making approach, which consists of entropy, ARAS and TOPSIS methods. By doing this, we are able to evaluate the SDGs objectively because the entropy technique weights each goal in accordance with its significance without the need for an outside, subjective intervention. Depending on the weight of the SDGs, the ranking of the countries will be more straightforward and more reliable. We propose the application of the hybrid model based on the Entropy and ARAS methods.

DATA AND METHODOLOGY

The 17 indicators pertaining to the 17 SDGs for the years 2002–2021 are introduced for the purposes of illustrating and evaluating the applicability of the suggested hybrid model. To exclude the outliers, the evaluation was conducted by removing the countries with scores equal to 0 and 100[1]. We, as well, run the analysis excluding some[2] of the SDGs in order to include all countries. Hence, we have two different data set one having all SDGs but excluding the countries with outliers, and, the other one with all countries excluding the SDGs with outliers.

We analyse each of the aforementioned years separately, averaging 5 years. Additionally, we split the time period in half and provide the average results for the first ten years and the last ten years. For the sake of presenting a brief -and easy to read- study we demonstrated the computational procedure only for data of five years averages. The results of other sets are stated verbally.[3]

[1] Azerbaijan, Burundi, Burkina Faso, Brunei Darussalam, Botswana, Central African Republic, Congo Dem. Rep., Switzerland, Djibouti, Estonia, Kazakhstan, Luxembourg, Madagascar, Malaysia, Namibia, Niger, Qatar, Russian Federation, Somalia, South Sudan, Chad, Thailand, Uruguay, South Africa are excluded from the study.

[2] The excluded SDGs are: SDG 1, SDG 4, SDG 9, SDG 10, SDG 13

[3] Available upon request from the authors of this paper.

Entropy Method

Entropy was first proposed by Rudolf Clausius in 1865 and is referred to as a criterion of disorder and dispersion in thermodynamics. Entropy, the second rule of thermodynamics, asserts succinctly that all systems left to their own devices and subject to the natural forces of the universe will eventually degenerate and become disordered. Law of entropy is expressed as the most economic among all other laws of physics (Georgescu-Roegen, 1971). Moreover, the method contributed notably to the economics science by emphasising the essentiality of including ecological issues in the field of economic growth in recent years entropy economics also has been helpful in econometric methods (Jakimowicz, 2020).

Shannon (1948) gave this idea a new meaning and named it information entropy. Therefore now entropy is defined as a measure of the uncertainty connected to random variables, according to information theory. (Bakir and Atalik, 2018; Zhang et. al., 2011). Without relying on the decision-makers' subjective assessments of the criteria's relative relevance, the entropy technique uses the values of the alternatives to determine the weights of the criteria in an objective manner. (Karaatli, 2016). The following are the stages in the process used to calculate the weights for the objective criteria (Zhu and Tian, 2020; Arsu, 2021; Karami and Johansson, 2014; Shemshadi et al.,2011):

1st stage: The decision matrix is constructed at this stage. D is a representation of the decision matrix and contains the elements x_{ij} (the value of the i th alternative according to the j th criterion). Equation (1) describes the Decision matrix.

$$H(Q_m) = -\sum_{k} p_{mk} \log(p_{mk}). \quad (1)$$

where m denotes number of alternatives and, n is the number of criteria.

2nd stage: The values taken from the different units are normalized in this stage. Each value is standardized to take a value between [0, 1] throughout the normalization procedure. For normalization, we use Equation (2).

$$p_{ij} = \frac{x_{ij}}{\sum_{i=1}^{m} x_{ij}} \qquad \forall\, i, j \text{ için} \quad (2)$$

3rd stage: At this stage, entropy values regarding the criteria's () and differentiation degrees () are determined. Entropy values are calculated using Equation (3), and degrees of differentiation are calculated using Equation (4).

$$e_{ij} = -\frac{1}{\ln(m)} \sum_{j=1}^{n} [p_{ij} \,.\, \ln\,(p_{ij})] \qquad \forall\, i, j\ için \quad (3)$$

$$d_j = 1 - e_{ij} \qquad \forall\, j\ için \quad (4)$$

4th stage:

We finally determine the weights of the criteria using the Equation (5)

$$w_{ij} = \frac{d_j}{\sum_{j=1}^{n} d_j} \qquad \forall\, j\ için \quad (5)$$

Entropy Method Results: Weighing the Criteria

In this section we apply the stages of entropy to obtain the Entropy criteria weights to apply in ARAS method. We first calculate the decision matrix, then the normalised matrix. Thirdly we determine the entropy values regarding the criteria's) and differentiation degrees to obtain the Entropy criteria weights.

1. Stage: Decision Matrix[4]

The decision matrix constructed first that contains the elements of presented in Table 1. The values are calculated for the first five years' average of our data set to set an example.

2. Stage: Normalisation of decision matrix

Normalized values [0, 1] are obtained by dividing each value in the decision matrix by the sum of their corresponding column. Table 2 demonstrates the normalised decision matrix for a few countries for the first five years' average.

3. Stage: Determining the entropy values regarding the criteria's (ej) and differentiation degrees (dj)

Initially, each value in the normalised decision matrix is multiplied by its natural logarithm to determine the entropy values (*ej*) of the criteria shown in the Table 3. Using the results from equation-3, entropy values are calculated. In this case, m is the number of alternatives (countries), therefore, we obtain $ln(m) = ln(140) = 0{,}2024$. Then the differentiation degrees are found using the equation $dj = 1\text{-}ej$.

Table 1. Decision Matrix.

Code	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9
AFG	91,4171	38,4163	22,2085	1,6330	20,8603	33,3091	33,3433	33,2753	2,0869
ALB	94,3185	42,6799	75,0475	75,9987	38,3408	70,4172	73,3787	54,6064	5,1634
DZA	94,4630	49,1057	71,6182	57,0913	30,0288	61,3807	60,4940	56,5526	9,6108
AGO	25,1790	48,9669	24,1958	38,9058	44,0592	46,2678	41,5413	57,2963	0,8303
ARG	97,1360	68,3199	79,2473	92,9593	74,0689	77,1719	69,2639	58,6727	15,8195
…	…	…	…	…	…	…	…	…	…
YEM	91,7239	40,5514	40,7646	33,7522	6,5354	29,0258	31,2856	51,0588	5,7139
ZMB	7,2175	55,7883	22,0321	42,2349	46,2399	47,5133	55,5481	48,3635	1,9807
ZWE	28,6597	42,6293	22,4813	60,2485	60,5025	50,1970	59,6492	56,9148	5,8709
Code	**SDG 10**	**SDG 11**	**SDG 12**	**SDG 13**	**SDG 14**	**SDG 15**	**SDG 16**	**SDG 17**	
AFG	80,8852	26,9864	97,7586	99,2130	58,9315	51,8360	44,8566	35,6560	
ALB	83,0793	78,2525	88,3580	86,0660	33,9878	67,8200	69,3695	59,7019	
DZA	97,0150	72,7997	91,8681	87,3493	69,7909	53,9464	67,1352	57,0520	
AGO	15,4930	32,8651	95,2543	94,0143	66,5728	66,5036	43,1384	54,0385	
ARG	34,5328	73,4971	83,9506	87,1123	63,8611	56,9992	59,3441	55,2916	
…	…	…	…	…	…	…	…	…	
YEM	69,1090	50,0116	96,7554	96,5875	64,1650	42,5525	45,4307	64,1881	
ZMB	19,0422	61,2384	96,4269	98,0163	66,1295	69,4888	49,5617	46,1346	
ZWE	33,9810	72,6315	95,9196	96,9247	66,1295	72,2076	46,3157	38,0435	

Source: Author's calculations based on Sachs et.al. 2020. The values are obtained five-year averages from 2002 to 2006.

[4] The tables with the whole country set is available upon request from the authors.

Table 2. Normalised Decision Matrix.

Code	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9
AFG	0,0091	0,0048	0,0026	0,0002	0,0029	0,0037	0,0039	0,0037	0,0007
ALB	0,0094	0,0053	0,0087	0,0079	0,0054	0,0079	0,0085	0,0060	0,0017
DZA	0,0094	0,0061	0,0083	0,0060	0,0042	0,0069	0,0070	0,0062	0,0032
AGO	0,0025	0,0061	0,0028	0,0041	0,0062	0,0052	0,0048	0,0063	0,0003
ARG	0,0097	0,0085	0,0092	0,0097	0,0104	0,0086	0,0080	0,0065	0,0052
…	…	…	…	…	…	…	…	…	…
YEM	0,0091	0,0050	0,0048	0,0035	0,0009	0,0033	0,0036	0,0056	0,0019
ZMB	0,0007	0,0069	0,0026	0,0044	0,0065	0,0053	0,0065	0,0053	0,0007
ZWE	0,0029	0,0053	0,0026	0,0063	0,0085	0,0056	0,0069	0,0063	0,0019
Code	**SDG 10**	**SDG 11**	**SDG 12**	**SDG 13**	**SDG 14**	**SDG 15**	**SDG 16**	**SDG 17**	
AFG	0,0097	0,0028	0,0082	0,0088	0,0068	0,0060	0,0049	0,0046	
ALB	0,0100	0,0081	0,0074	0,0076	0,0039	0,0078	0,0075	0,0076	
DZA	0,0116	0,0076	0,0077	0,0077	0,0081	0,0062	0,0073	0,0073	
AGO	0,0019	0,0034	0,0080	0,0083	0,0077	0,0077	0,0047	0,0069	
ARG	0,0041	0,0077	0,0070	0,0077	0,0074	0,0066	0,0065	0,0071	
…	…	…	…	…	…	…	…	…	
YEM	0,0083	0,0052	0,0081	0,0085	0,0074	0,0049	0,0049	0,0082	
ZMB	0,0023	0,0064	0,0081	0,0087	0,0077	0,0080	0,0054	0,0059	
ZWE	0,0041	0,0076	0,0081	0,0086	0,0077	0,0083	0,0050	0,0049	

Source: Authors' calculation based on Sachs et.al. 2020.

Table 3. Entropy values (ej) and Differentiation Degrees (dj)

Code	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9
AFG	-0,0428	-0,0255	-0,0154	-0,0015	-0,0172	-0,0209	-0,0215	-0,0205	-0,0050
ALB	-0,0439	-0,0277	-0,0415	-0,0383	-0,0282	-0,0382	-0,0406	-0,0307	-0,0109
DZA	-0,0439	-0,0310	-0,0400	-0,0305	-0,0231	-0,0342	-0,0348	-0,0316	-0,0182
AGO	-0,0150	-0,0310	-0,0166	-0,0223	-0,0316	-0,0273	-0,0257	-0,0320	-0,0022
ARG	-0,0449	-0,0404	-0,0433	-0,0449	-0,0477	-0,0411	-0,0388	-0,0326	-0,0274
…	…	…	…	…	…	…	…	…	…
YEM	-0,0429	-0,0266	-0,0254	-0,0199	-0,0064	-0,0186	-0,0204	-0,0291	-0,0118
ZMB	-0,0052	-0,0344	-0,0153	-0,0239	-0,0328	-0,0279	-0,0325	-0,0279	-0,0048
ZWE	-0,0167	-0,0277	-0,0156	-0,0319	-0,0407	-0,0291	-0,0344	-0,0318	-0,0121
ej	0,9763	0,9963	0,9842	0,9813	0,9874	0,9926	0,9904	0,9972	0,9023
dj	0,0237	0,0037	0,0158	0,0187	0,0126	0,0074	0,0096	0,0028	0,0977
Code	**SDG 10**	**SDG 11**	**SDG 12**	**SDG 13**	**SDG 14**	**SDG 15**	**SDG 16**	**SDG 17**	
AFG	-0,0450	-0,0165	-0,0394	-0,0415	-0,0341	-0,0306	-0,0260	-0,0246	
ALB	-0,0459	-0,0392	-0,0364	-0,0371	-0,0218	-0,0379	-0,0369	-0,0372	
DZA	-0,0518	-0,0370	-0,0375	-0,0375	-0,0390	-0,0316	-0,0359	-0,0359	
AGO	-0,0117	-0,0194	-0,0386	-0,0398	-0,0376	-0,0373	-0,0252	-0,0344	
ARG	-0,0227	-0,0373	-0,0349	-0,0375	-0,0363	-0,0330	-0,0325	-0,0350	
…	…	…	…	…	…	…	…	…	
YEM	-0,0397	-0,0274	-0,0391	-0,0407	-0,0365	-0,0261	-0,0262	-0,0394	
ZMB	-0,0139	-0,0322	-0,0390	-0,0411	-0,0374	-0,0386	-0,0282	-0,0303	
ZWE	-0,0224	-0,0369	-0,0388	-0,0408	-0,0374	-0,0398	-0,0266	-0,0259	
ej	0,977498	0,993377	0,997636	0,990757	0,997725	0,996277	0,995999	0,99492	
dj	0,022502	0,006623	0,002364	0,009243	0,002275	0,003723	0,004001	0,00508	

Source: Authors' calculation based on Sachs et.al. 2020.

Table 4. Criterion Weights

Weight	**SDG 1**	**SDG 2**	**SDG 3**	**SDG 4**	**SDG 5**	**SDG 6**	**SDG 7**	**SDG 8**	**SDG 9**
wj	0,0957	0,0151	0,0638	0,0755	0,0508	0,0297	0,0389	0,0113	0,3941
% Values	9,57	1,51	6,38	7,55	5,08	2,97	3,89	1,13	39,41
Weight	**SDG 10**	**SDG 11**	**SDG 12**	**SDG 13**	**SDG 14**	**SDG 15**	SDG 16	SDG 17	
wj	0,0908	0,0267	0,0095	0,0373	0,0092	0,0150	0,0161	0,0205	
% Values	9,08	2,67	0,95	3,73	0,92	1,5	1,61	2,05	

4. Stage: Determining the Entropy criteria weights

Each degree of differentiation value is divided by the overall differentiation value to produce criterion weights.

The Entropy technique determines that Goal 9 (39.41%) is the most significant criterion, as shown in Table 4. This criterion is followed by criteria of Goals 1, 10, 4, 3, 5, 7, 13, 6, 11, 17, 16, 2, 15, 8, 12 and 14 respectively. Same results are obtained for each 5-year averages.[5]

ARAS Method

The ARAS (Additive Ratio Assessment) method, one of the multi-criteria decision-making techniques, was first introduced to the literature by Zavadskas and Turskis in 2010.

Using a variety of criteria, this method ranks the decision alternatives according to the utility function value. Taking a variety of criteria into account, this method ranks the decision alternatives according to the utility function value.

According to ARAS method, the relative effects of the weights and values of the criteria are directly related to the utility function used to calculate the relative efficacy of an alternative in the decision problem. The ARAS method is based on a set of clear-cut mathematical calculations. Despite being a novel approach, it is clear that this technique makes it simple to compare the alternatives and is widely used in the literature (Aras and Yildirim, 2020).

The following are the steps of the ARAS method (Yildirim, 2015; Ayçin, 2019; Zavadskas et. al., 2010):

1st stage: The decision matrix is set at this step as we did in the Entropy step. Decision matrix is denoted by X and contains the elements X_{ij} (the value of the th alternative according to the th criterion). The decision matrix is represented in Equation (6).

$$X = [x_{ij}]_{mxn} \qquad i = 0,1,2,\dots,m \;;\; j = 1,2,3,\dots,n \tag{6}$$

Where X_{0j} denotes optimal value of the jth criterion, m is the number of alternatives and, n is the number of criteria.

If a criterion's optimal value is unknown, Equation (7) is applied if it is a benefit criterion, and Equation (8) is applied if it is a cost criterion.

$$x_{0j} = max_i x_{ij} \tag{7}$$

$$x_{0j} = max_i x_{ij} \tag{8}$$

2nd stage: The values that are derived from various units are normalised at this stage. As a result, each value is standardised to take a value between [0, 1].

In the normalisation process Equation (9) is employed for the benefit criteria, and Equation (10) is applied for the cost criteria.

$$\bar{x}_{ij} = \frac{x_{ij}}{\sum_{i=0}^{m} x_{ij}} \tag{9}$$

$$\bar{x}_{ij} = \frac{1/x_{ij}}{\sum_{i=0}^{m} x_{ij}} \tag{10}$$

By replacing the new values derived from equation (9) and equation (10)'dan into equation (11) we obtain normalised decision matrix.

$$\bar{X} = [\bar{x}_{ij}]_{mxn} \qquad i = 0,1,2,\dots,m \;;\; j = 1,2,3,\dots,n \tag{11}$$

3rd stage: Normalised decision matrix is weighted at this stage. The values of the weighted normalised decision matrix are generated by using the criterion weights in the equation (12) obtained by the entropy method. In Equation (12), weighted normalised decision matrix values are produced using the criterion weights acquired by the entropy method.

$$\hat{x}_{ij} = \bar{x}_{ij} \,.\, w_j \tag{12}$$

We generate normalised weighted decision matrix by entering the values obtained from equation (12) into equation (13).

$$\hat{X} = [\hat{x}_{ij}]_{mxn} \qquad i = 0,1,2,\dots,m \;;\; j = 1,2,3,\dots,n \tag{13}$$

[5] The results can be found in the appendix.

4th stage: At this stage, the optimality function values for each alternative are determined by substituting the weighted normalised decision matrix values in Equation (14).

$$S_i = \sum_{j=1}^{n} \hat{x}_{ij} \qquad i = 0,1,2,\dots,m \;;\; j = 1,2,3,\dots,n \qquad (14)$$

5th stage: Now, we can calculate the utility degree by proportioning the optimality function value of a decision alternative to the optimality function value of the best alternative. The utility degree is determined using equation (15).

$$K_i = \frac{S_i}{S_0} \qquad i = 0,1,2,\dots,m \qquad (15)$$

The utility function takes values between [0, 1]. Therefore, we are able to rank the alternative performances from best to worst.

Aras Method Results: Re-Ranking the Countries

1. Stage: Decision Matrix

The aspects of the criteria and the optimal values are determined upon creating the decision matrix demonstrated in the Table 5. In this case, all are benefit criterion. The optimal value is equal to the maximum value of the relevant criterion for benefit-criteria, and the minimum value of the relevant criterion for cost-criteria.

2. Stage: Normalisation of decision matrix

Table 6 depicts each value in the decision matrix, including the optimal value, is divided by the sum of the values in its column to produce the normalised values [0, 1].

3.stage: Weighted Normalised Decision Matrix

We multiply the criterion weights generated by Entropy method by normalised matrix, in order to produce weighted decision matrix shown in the Table 7.

Table 5. Decision matrix.

Code	**SDG 1**	**SDG 2**	**SDG 3**	**SDG 4**	**SDG 5**	**SDG 6**	**SDG 7**	**SDG 8**	**SDG 9**
AFG	91,4171	38,4163	22,2085	1,633	20,8603	33,3091	33,3433	33,2753	2,0869
ALB	94,3185	42,6799	75,0475	75,9987	38,3408	70,4172	73,3787	54,6064	5,1634
DZA	94,463	49,1057	71,6182	57,0913	30,0288	61,3807	60,494	56,5526	9,6108
AGO	25,179	48,9669	24,1958	38,9058	44,0592	46,2678	41,5413	57,2963	0,8303
ARG	97,136	68,3199	79,2473	92,9593	74,0689	77,1719	69,2639	58,6727	15,8195
…	…	…	…	…	…	…	…	…	…
YEM	91,7239	40,5514	40,7646	33,7522	6,5354	29,0258	31,2856	51,0588	5,7139
ZMB	7,2175	55,7883	22,0321	42,2349	46,2399	47,5133	55,5481	48,3635	1,9807
ZWE	28,6597	42,6293	22,4813	60,2485	60,5025	50,197	59,6492	56,9148	5,8709
Optimal	99,9405	82,5810	91,9784	99,6663	90,3751	94,8937	98,8856	90,8171	90,0051
Code	**SDG 10**	**SDG 11**	**SDG 12**	**SDG 13**	**SDG 14**	**SDG 15**	**SDG 16**	**SDG 17**	
AFG	80,8852	26,9864	97,7586	99,213	58,9315	51,836	44,8566	35,656	
ALB	83,0793	78,2525	88,358	86,066	33,9878	67,82	69,3695	59,7019	
DZA	97,015	72,7997	91,8681	87,3493	69,7909	53,9464	67,1352	57,052	
AGO	15,493	32,8651	95,2543	94,0143	66,5728	66,5036	43,1384	54,0385	
ARG	34,5328	73,4971	83,9506	87,1123	63,8611	56,9992	59,3441	55,2916	
…	…	…	…	…	…	…	…	…	
YEM	69,109	50,0116	96,7554	96,5875	64,165	42,5525	45,4307	64,1881	
ZMB	19,0422	61,2384	96,4269	98,0163	66,1295	69,4888	49,5617	46,1346	
ZWE	33,981	72,6315	95,9196	96,9247	66,1295	72,2076	46,3157	38,0435	
Optimal	100,0000	94,3721	98,7729	99,2663	83,7532	92,6512	94,5207	100,0000	

Source: Authors' calculation based on Sachs et.al. 2020.

Table 6. Normalised Decision Matrix

Code	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9
AFG	0,0090	0,0047	0,0026	0,0002	0,0029	0,0037	0,0038	0,0036	0,0007
ALB	0,0093	0,0052	0,0087	0,0078	0,0053	0,0078	0,0084	0,0060	0,0017
DZA	0,0093	0,0060	0,0083	0,0059	0,0042	0,0068	0,0069	0,0062	0,0031
AGO	0,0025	0,0060	0,0028	0,0040	0,0061	0,0051	0,0048	0,0062	0,0003
ARG	0,0096	0,0084	0,0091	0,0096	0,0103	0,0086	0,0080	0,0064	0,0051
…	…	…	…	…	**…**	**…**	**…**	**…**	**…**
YEM	0,0090	0,0050	0,0047	0,0035	0,0009	0,0032	0,0036	0,0056	0,0018
ZMB	0,0007	0,0068	0,0025	0,0044	0,0064	0,0053	0,0064	0,0053	0,0006
ZWE	0,0028	0,0052	0,0026	0,0062	0,0084	0,0056	0,0068	0,0062	0,0019
Optimal	0,0099	0,0101	0,0106	0,0103	0,0126	0,0105	0,0114	0,0099	0,0288
Code	**SDG 10**	**SDG 11**	**SDG 12**	**SDG 13**	**SDG 14**	**SDG 15**	**SDG 16**	**SDG 17**	
AFG	0,0096	0,0028	0,0081	0,0087	0,0068	0,0059	0,0048	0,0045	
ALB	0,0098	0,0081	0,0074	0,0075	0,0039	0,0077	0,0075	0,0075	
DZA	0,0115	0,0075	0,0076	0,0077	0,0080	0,0061	0,0072	0,0072	
AGO	0,0018	0,0034	0,0079	0,0082	0,0076	0,0076	0,0046	0,0068	
ARG	0,0041	0,0076	0,0070	0,0076	0,0073	0,0065	0,0064	0,0070	
…	…	…	…	…	…	…	…	…	
YEM	0,0082	0,0052	0,0081	0,0085	0,0074	0,0049	0,0049	0,0081	
ZMB	0,0023	0,0063	0,0080	0,0086	0,0076	0,0079	0,0053	0,0058	
ZWE	0,0040	0,0075	0,0080	0,0085	0,0076	0,0082	0,0050	0,0048	
Optimal	0,0119	0,0097	0,0082	0,0087	0,0096	0,0106	0,0102	0,0126	

Source: Authors' calculation based on Sachs et.al. 2020. The values are constructed for the 5 years average of 2002 and 2006. We calculate the normalised decision matrix for all 5 years averages from 2002 to 2021.

Table 7. Weighted normalised decision matrix.

Code	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9
AFG	0,000863	0,000071	0,000163	0,000013	0,000148	0,000110	0,000149	0,000041	0,000263
ALB	0,000890	0,000079	0,000552	0,000592	0,000271	0,000232	0,000327	0,000067	0,000652
DZA	0,000892	0,000091	0,000527	0,000445	0,000212	0,000202	0,000270	0,000070	0,001213
AGO	0,000238	0,000091	0,000178	0,000303	0,000312	0,000153	0,000185	0,000071	0,000105
ARG	0,000917	0,000126	0,000583	0,000725	0,000524	0,000254	0,000309	0,000072	0,001997
…	…	…	…	…	…	…	…	…	…
YEM	0,000866	0,000075	0,000300	0,000263	0,000046	0,000096	0,000140	0,000063	0,000721
ZMB	0,000068	0,000103	0,000162	0,000329	0,000327	0,000157	0,000248	0,000060	0,000250
ZWE	0,000271	0,000079	0,000165	0,000470	0,000428	0,000166	0,000266	0,000070	0,000741
Optimal	0,000944	0,000153	0,000676	0,000777	0,000639	0,000313	0,000441	0,000112	0,011364
Code	**SDG 10**	**SDG 11**	**SDG 12**	**SDG 13**	**SDG 14**	**SDG 15**	**SDG 16**	**SDG 17**	
AFG	0,000870	0,000074	0,000078	0,000324	0,000062	0,000089	0,000078	0,000092	
ALB	0,000894	0,000215	0,000070	0,000281	0,000036	0,000116	0,000121	0,000155	
DZA	0,001044	0,000200	0,000073	0,000285	0,000074	0,000092	0,000117	0,000148	
AGO	0,000167	0,000091	0,000076	0,000307	0,000070	0,000114	0,000075	0,000140	
ARG	0,000371	0,000202	0,000067	0,000284	0,000067	0,000098	0,000103	0,000143	
…	…	…	…	…	…	…	…	…	
YEM	0,000743	0,000138	0,000077	0,000315	0,000068	0,000073	0,000079	0,000166	
ZMB	0,000205	0,000169	0,000077	0,000320	0,000070	0,000119	0,000086	0,000119	
ZWE	0,000366	0,000200	0,000076	0,000316	0,000070	0,000124	0,000080	0,000098	
Optimal	0,001076	0,000260	0,000078	0,000324	0,000088	0,000159	0,000164	0,000259	

Source: *Authors' calculation based on Sachs et.al. 2020.*

Table 8. Percentage weights of SDGs

2002-2006	%weight	2007-2011	%weight	2012-2016	%weight	2017-2021	%weight
SDG 9	39	SDG 9	39	SDG 9	32	SDG 9	25
SDG 1	10	SDG 1	11	SDG 1	11	SDG 10	14
SDG 10	9	SDG 10	9	SDG 10	11	SDG 1	12
SDG 4	8	SDG 4	7	SDG 4	6	SDG 4	6
SDG 3	6	SDG 3	6	SDG 3	6	SDG 3	5
SDG 5	5	SDG 5	5	SDG 13	5	SDG 13	5
SDG 7	4	SDG 13	4	SDG 5	5	SDG 5	5
SDG 13	4	SDG 7	4	SDG 7	4	SDG 11	4
SDG 6	3	SDG 6	3	SDG 11	4	SDG 7	4
SDG 11	3	SDG 11	3	SDG 6	3	SDG 6	3
SDG 17	2	SDG 17	2	SDG 17	3	SDG 17	3
SDG 16	2	SDG 15	2	SDG 15	2	SDG 16	3
SDG 2	2	SDG 16	2	SDG 16	2	SDG 15	3
SDG 15	2	SDG 2	1	SDG 2	2	SDG 2	2
SDG 8	1	SDG 8	1	SDG 8	2	SDG 8	2
SDG 12	1	SDG 12	1	SDG 12	1	SDG 12	2
SDG 14	1	SDG 14	1	SDG 14	1	SDG 14	2

Source: Authors' calculation based on normalised decision matrix.

Table 8 shows how certain SDGs are weighted in terms of percentages. The coloration depicts how heavily each SDG is weighted. The table shows that the weight of SDG9 -industry, innovation and infrastructure- has dropped over decades. SDG14, which focuses on life below water, hasn't gained much significance throughout the years. The weight doesn't necessarily

4. Stage: Optimality Function – Utility Degree and Ranking

First the values of the optimality utility function (Si) are calculated for each decision alternative using Equation 14. Then utility degree values ($K_{i)}$ are determined using equation (15).[6]

Finally, we rank the countries based on the utility degrees. In Table 9, we compare the results of the Entropy-ARAS technique with the rankings found in the UN SDG 2022 report. In the first 5 years average Australia, Korea, Singapore, Israel, USA are not in the first 20 of the new list. Likewise, the report's list omits Slovenia, Hungary, Czech Republic, Latvia. And the rest of the countries are in the different places in the list. Looking at the last 20 countries for the first 5 years average in the table 10 we can observe that Malawi, Uganda, Ethiopia, Sub-Saharan Africa, Mauritania aren't included in the UN report's list. On the other hand, Gambia, Cote d'Ivoire, Papua New Guinea, Oceania, Rwanda actually ranked better according to the new list.

ROBUSTNESS ANALYSIS

Rankings derived using the TOPSIS and ARAS methods based on Entropy criterion weights, provide similar outcomes. Table 11 demonstrates the Spearman's Rank correlation coefficient between the ranks obtained using the two methods.

The correlation is quite strong between the results obtained by ARAS and TOPSIS methods and significant at the 1% significance level.

[6] Table A.III. 1 in Appendix A.III demonstrates the optimality function values (Si) and utility degree values (Ki).

Table 9. Comparison of country rankings based on UN 2030 report and Entropy-ARAS method.

2002-2006				2007-2011				2012-2016				2017-2021			
UN report		**Entropi-ARAS**		**UN report**		**Entr-pi-ARAS**		**UN report**		**Entropi-ARAS**		**UN report**		**Entropi-ARAS**	
SWE	1	1	SWE	SWE	1	1	SWE	FIN	1	1	SWE	FIN	1	1	DNK
NOR	2	2	FIN	FIN	2	2	FIN	SWE	2	2	DNK	DNK	2	2	SWE
JPN	3	3	DNK	DNK	3	3	DNK	DNK	3	3	FIN	SWE	3	3	FIN
FIN	4	4	NOR	NOR	4	4	JPN	NOR	4	4	KOR	NOR	4	4	AUT
DNK	5	5	AUT	AUT	5	5	KOR	AUT	5	5	NOR	DEU	5	5	NOR
NLD	6	6	NLD	IRL	6	6	NOR	DEU	6	6	JPN	AUT	6	6	DEU
AUS	7	7	DEU	DEU	7	7	NLD	GBR	7	7	DEU	FRA	7	7	BEL
CAN	8	8	IRL	NLD	8	8	DEU	IRL	8	8	NLD	GBR	8	8	NLD
KOR	9	9	GBR	GBR	9	9	AUS	FRA	9	9	AUT	IRL	9	9	FRA
DEU	10	10	JPN	JPN	10	10	SGP	NLD	10	10	BEL	POL	10	10	KOR
GBR	11	11	FRA	FRA	11	11	AUT	SVN	11	11	FRA	CZE	11	11	ISL
SGP	12	12	ISL	BEL	12	12	GBR	BEL	12	12	GBR	SVN	12	12	JPN
ISR	13	13	CAN	ESP	13	13	IRL	CZE	13	13	AUS	NLD	13	13	GBR
USA	14	14	BEL	CZE	14	14	FRA	JPN	14	14	IRL	LVA	14	14	ESP
IRL	15	15	SVN	SVN	15	15	USA	POL	15	15	USA	BEL	15	15	IRL
AUT	16	16	HUN	CAN	16	16	CAN	LVA	16	16	SGP	JPN	16	16	CZE
BEL	17	17	ESP	HUN	17	17	ISR	ESP	17	17	CAN	ESP	17	17	CAN
FRA	18	18	CZE	ISL	18	18	BEL	ISL	18	18	ESP	ISL	18	18	AUS
ISL	19	19	LVA	POL	19	19	ESP	ITA	19	19	ISR	PRT	19	19	ISR
ESP	20	20	KOR	KOR	20	20	ITA	CAN	20	20	ITA	HUN	20	20	SVN
…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
GMB	121	121	CMR	NGA	121	121	MWI	ETH	121	121	CIV	UGA	121	121	MLI
SDN	122	122	TGO	CMR	122	122	UGA	LSO	122	122	MLI	ZMB	122	122	ZWE
CIV	123	123	ZMB	ZMB	123	123	AFG	YEM	123	123	SSA	SWZ	123	123	HTI
AFG	124	124	SWZ	ETH	124	124	CIV	COG	124	124	UGA	NGA	124	124	LSO
PNG	125	125	LSO	MWI	125	125	CMR	NGA	125	125	LSO	MLI	125	125	CMR
BEN	126	126	MWI	UGA	126	126	BEN	MWI	126	126	HTI	PNG	126	126	STP
CMR	127	127	UGA	TGO	127	127	MLI	UGA	127	127	CMR	SSA	127	127	SSA
OCE	128	128	ETH	HTI	128	128	PNG	HTI	128	128	OCE	MWI	128	128	OCE
LSO	129	129	SSA	AGO	129	129	OCE	TGO	129	129	PNG	MOZ	129	129	GIN
MLI	130	130	GIN	MRT	130	130	LSO	MLI	130	130	MWI	HTI	130	130	TGO
GIN	131	131	COG	MLI	131	131	SWZ	OCE	131	131	GIN	COG	131	131	SLE
LBR	132	132	MRT	COG	132	132	RWA	SSA	132	132	SLE	SLE	132	132	PNG
TGO	133	133	MLI	SSA	133	133	GIN	AGO	133	133	SWZ	YEM	133	133	LBR
RWA	134	134	AGO	MOZ	134	134	LBR	MOZ	134	134	LBR	OCE	134	134	SWZ
MOZ	135	135	BEN	GIN	135	135	MOZ	GIN	135	135	AGO	AFG	135	135	ZMB
SWZ	136	136	MOZ	BEN	136	136	TGO	SLE	136	136	TGO	GIN	136	136	MWI
ZMB	137	137	LBR	LBR	137	137	ZMB	BEN	137	137	ZMB	BEN	137	137	BEN
AGO	138	138	SLE	SDN	138	138	AGO	LBR	138	138	COG	AGO	138	138	COG
SLE	139	139	AFG	AFG	139	139	COG	AFG	139	139	BEN	LBR	139	139	MOZ
COG	140	140	SDN	SLE	140	140	SLE	SDN	140	140	MOZ	SDN	140	140	AGO

Table 11. Spearman's ranking coefficients of correlation

Correlations				
			ARAS	TOPSIS
Spearman's rho	ARAS	Correlation Coefficient	1,000	,992**
		Sig. (2-tailed)	.	,000
		N	163	163
	TOPSIS	Correlation Coefficient	,992**	1,000
		Sig. (2-tailed)	,000	.
		N	163	163
** Correlation is significant at the 0.01 level (2-tailed).				

CONCLUSION

The pursuit of growth and development have long been the primary objective for nations worldwide. However, it has become increasingly evident that development must be pursued in a sustainable manner because resources, particularly vital ones like fresh water, are depleting. This realisation has prompted nations to adopt measures that prioritize both the planet's well-being while pursuing their own economic development.

Sustainable Development Goals (SDGs), established by the United Nations, being among these measures is the focus of our study. Diverging from traditional approaches, our research does not assume that the goals are equally weighted. Instead, we employ Multi-Criteria Decision Making (MCDM) approach re-evaluate the rankings of the countries from a more objective standpoint in the SDG context.

By utilising Entropy- ARAS method, we determine different weights for each SDG. For instance, Goal 9 which pertains to Industry, Innovation and Infrastructure, carries the highest weight while Goal 14 focused on Life Below Water bears the lowest weight. Additionally, we observe a notable increase in the weight assigned to SDG 14 over the past two decades.

Furthermore, our study highlights that the utilisation of MCDM methods enhances the adaptability and precision of decision-making process when prioritizing targets for the inclusion of SDGs in a country's 2030 Agenda. This approach allows decision-makers to effectively weigh criteria and prioritize targets, even in the presence of uncertainty. The countries' ranks are modified after applying Entropy-ARAS method to determine the criteria weights to the rankings, which is a more objective method than simply taking the goal's simple average to determine the SDG index.This methodology enhances the accuracy and fairness of the rankins, accounting for the diverse importance of each goal and offering valuable insights into countries' progress toward sustainable development.

Countries should integrate the SDGs into their national development plans, policies and strategies while prioritizing specific goals based on their national context, needs and challenges.

REFERENCES

Allen, C., Reid, M., Thwaites, J., Glover, R., & Kestin, T. (2020). Assessing national progress and priorities for the Sustainable Development Goals (SDGs): Experience from Australia. Sustainability Science, 15, 521-538.

Aras, G., & Yildirim, F. M. (2020). Sosyo-ekonomik refah düzeyinin belirlenmesinde alternatif bir endeks çalışması: ARAS yöntemi ile G-20 ülkeleri uygulaması. Business and Economics Research Journal, 11(3), 735-751.

Arsu, T, Finansal Performansin Entropi Tabanli Aras Yöntemi ile Değerlendirilmesi: BIST Elektrik, Gaz ve Buhar Sektöründeki Işletmeler Üzerine Bir Uygulama. Hacettepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 39(1), 15-32.

Ayçin, E. (2019). Çok kriterli karar verme: Bilgisayar uygulamalı çözümler. Nobel Akademik Yayıncılık, Ankara.

Bakir, M., & Atalik, Ö. (2018). Evaluation of Service quality in airlines by entropy and ARAS methods. Journal of Business Research Turk, 10(1), 617-638.

Bell, M.L., Hobbs, B., Elliott, E.M., Ellis, H., Robinson, Z. (2001). An evaluation of multi-criteria methods in integrated assessment of climate policy. Journal of Multi-Criteria Decision Analysis 10(5), 229–256.

Benítez, R.; Liern, V. (2020). Unweighted TOPSIS: A new multicriteria tool for sustainability analysis. International Journal of Sustainable Development & World Ecology, 1–13.

Brett C., Hernán B., Navroz K. D., Srihari D., Radhika K., Serban S., Theodor S. and Marta T. (2019) Multi-criteria decision analysis in policy-making for climate mitigation and development, Climate and Development, 11:3, 212-222.

Fullman, N., Barber, R. M., Abajobir, A. A., Abate, K. H., Abbafati, C., Abbas, K. M., ... & Dubey, M. (2017). Measuring progress and projecting attainment on the basis of past trends of the health-related Sustainable Development Goals in 188 countries: an analysis from the Global Burden of Disease Study 2016. The Lancet, 390(10100), 1423-1459.

Gamboa, G. (2006). Social multi-criteria evaluation of different development scenarios of the Aysén region, Chile. Ecological Economics, 59(1), 157–170.

Garmendia, E., Stagl, S. (2010). Public participation for sustainability and social learning: concepts and lessons from three case studies in Europe. Ecological Economics. 69(8), 1712–1722.

Georgescu-Roegen, N. (1993). The entropy law and the economic problem. Valuing the Earth: Economics, ecology, ethics, 75-88.

Greco, S., Ehrgott, M., & Figueira, J.-R. (2016). Multiple criteria decision analysis. State of the Art Surveys. Ney York: Springer.

https://unstats.un.org/unsd/methodology/m49/ (Accessed 01/02/2023)

Ishizaka, A. and Nemery, P., 2013. Multi-criteria decision analysis: methods and software. John Wiley & Sons.

Jakimowicz, A. (2020). The role of entropy in the development of economics. Entropy, 22(4), 452.

Karaatli, M. (2016). Entropi-Gri ilişkisel analiz yöntemleri ile bütünleşik bir yaklaşim: Turizm sektöründe uygulama. Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 21(1), 63-77.

Karami, A., & Johansson, R. (2013). Utilization of multi attribute decision making techniques to integrate automatic and manual ranking of options. Journal of information science and engineering, 30(2), 519-534.

Karaşan, A.; Kahraman, C. (2018). A novel interval-valued neutrosophic EDAS method: Prioritization of the United Nations National Sustainable Development Goals. Soft Computing, 22, 4891–4906.

Lim, S. S., Allen, K., Bhutta, Z. A., Dandona, L., Forouzanfar, M. H., Fullman, N., ... & Chang, J. C. (2016). Measuring the health-related Sustainable Development Goals in 188 countries: a baseline analysis from the Global Burden of Disease Study 2015. The Lancet, 388(10053), 1813-1850.

Oliveira, A.; Calili, R.; Almeida, M.F.; Sousa, M. A. (2019) systemic and contextual framework to define a country's 2030 Agenda from a foresight perspective. Sustainability , 11, 6360.

Resce, G.; Schiltz, F. (2020). Sustainable development in Europe: A multicriteria decision analysis. Rev. Income Wealth.

Ringius, L., Asbjørn, T., Holtsmark, B. (1998) Can multi-criteria rules fairly distribute climate burdens? OECD results from three burden sharing rules. Energy Policy 26(10), 777–793

Sachs, J., Lafortune, G., Kroll, C., Fuller, G., Woelm, F., (2022). From Crisis to Sustainable Development: the SDGs as Roadmap to 2030 and Beyond. Sustainable Development Report 2022. Cambridge: Cambridge University Press.

Salvia, A. L., Leal Filho, W., Brandli, L. L., & Griebeler, J. S. (2019). Assessing research trends related to Sustainable Development Goals: Local and global issues. Journal of cleaner production, 208, 841-849.

Schwerhoff, G., & Sy, M. (2017). Financing renewable energy in Africa–Key challenge of the sustainable development goals. Renewable and Sustainable Energy Reviews, 75, 393-401.

Shemshadi, A., Shirazi, H., Toreihi, M., & Tarokh, M. J. (2011). A fuzzy VIKOR method for supplier selection based on entropy measure for objective weighting. Expert systems with applications, 38(10), 12160-12167.

Sims, N. C., England, J. R., Newnham, G. J., Alexander, S., Green, C., Minelli, S., & Held, A. (2019). Developing good practice guidance for estimating land degradation in the context of the United Nations Sustainable Development Goals. Environmental Science & Policy, 92, 349-355.

Stafford-Smith, M., Griggs, D., Gaffney, O., Ullah, F., Reyers, B., Kanie, N., ... & O'Connell, D. (2017). Integration: the key to implementing the Sustainable Development Goals. Sustainability science, 12, 911-919.

Stanujkic, D., Popovic, G., Zavadskas, E. K., Karabasevic, D., & Binkyte-Veliene, A. (2020). Assessment of progress towards achieving Sustainable Development Goals of the "Agenda 2030" by using the CoCoSo and the Shannon Entropy methods: The case of the EU Countries. *Sustainability*, *12*(14), 5717.

Yildirim, B. F. (2015). Çok kriterli karar verme problemlerinde ARAS yöntemi. Kafkas Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 6(9), 285-296.

Zavadskas, E. K., & Turskis, Z. (2011). Multiple criteria decision making (MCDM) methods in economics: an overview. Technological and economic development of economy, 17(2), 397-427.

Zavadskas, E. K., Turskis, Z., & Vilutiene, T. (2010). Multiple criteria analysis of foundation instalment alternatives by applying Additive Ratio Assessment (ARAS) method. Archives of civil and mechanical engineering, 10(3), 123-141.

Zhang, H., Gu, C. L., Gu, L. W., & Zhang, Y. (2011). The evaluation of tourism destination competitiveness by TOPSIS & information entropy–A case in the Yangtze River Delta of China. Tourism Management, 32(2), 443-451.

Zhu, Y., Tian, D., & Yan, F. (2020). Effectiveness of entropy weight method in decision-making. Mathematical Problems in Engineering, 2020, 1-5.

APPENDIX

A.I. Spearman's ranking coefficients of correlation for the first data set[7]

Table A.I. 1 Corelation between ARAS and TOPSIS method for the years between 2002 and 2006

Correlations				
			ARAS	TOPSIS
Spearman's rho	ARAS	Correlation Coefficient	1,000	,995**
		Sig. (2-tailed)	.	,000
		N	163	163
	TOPSIS	Correlation Coefficient	,995**	1,000
		Sig. (2-tailed)	,000	.
		N	163	163
**. Correlation is significant at the 0.01 level (2-tailed).				

Table A.I. 2 Corelation between ARAS and TOPSIS method for the years between 2007 and 2011

Correlations				
			ARAS	TOPSIS
Spearman's rho	ARAS	Correlation Coefficient	1,000	,995**
		Sig. (2-tailed)	.	,000
		N	163	163
	TOPSIS	Correlation Coefficient	,995**	1,000
		Sig. (2-tailed)	,000	.
		N	163	163
**. Correlation is significant at the 0.01 level (2-tailed).				

Table A.I. 3 Corelation between ARAS and TOPSIS method for the years between 2012 and2016

Correlations				
			ARAS	TOPSIS
Spearman's rho	ARAS	Correlation Coefficient	1,000	,995**
		Sig. (2-tailed)	.	,000
		N	163	163
	TOPSIS	Correlation Coefficient	,995**	1,000
		Sig. (2-tailed)	,000	.
		N	163	163
**. Correlation is significant at the 0.01 level (2-tailed).				

Table A.I. 4 . Corelation between ARAS and TOPSIS method for the years between 2017 and 2021

Correlations				
			ARAS	TOPSIS
Spearman's rho	ARAS	Correlation Coefficient	1,000	,995**
		Sig. (2-tailed)	.	,000
		N	163	163
	TOPSIS	Correlation Coefficient	,995**	1,000
		Sig. (2-tailed)	,000	.
		N	163	163
**. Correlation is significant at the 0.01 level (2-tailed).				

[7] SDG 1, SDG 4, SDG 9, SDG 10, SDG 13 are excluded in the first data set

Tables AI.1, AI.2, AI.3, AI.4 depict the correlation between the results obtained by ARAS and TOPSIS methods. They all present a high degree of correlation providing the robustness check for our findings.

A.II. Spearman's ranking coefficients of correlation for the second data set[8]

Table A.II. 1 Corelation between ARAS and TOPSIS method for the years between 2002 and 2006

Correlations				
			ARAS	TOPSIS
Spearman's rho	ARAS	Correlation Coefficient	1,000	,992**
		Sig. (2-tailed)	.	,000
		N	163	163
	TOPSIS	Correlation Coefficient	,992**	1,000
		Sig. (2-tailed)	,000	.
		N	163	163
**. Correlation is significant at the 0.01 level (2-tailed).				

Table A.II. 2 Corelation between ARAS and TOPSIS method for the years between 2007 and 2011

Correlations				
			ARAS	TOPSIS
Spearman's rho	ARAS	Correlation Coefficient	1,000	,994**
		Sig. (2-tailed)	.	,000
		N	163	163
	TOPSIS	Correlation Coefficient	,994**	1,000
		Sig. (2-tailed)	,000	.
		N	163	163
**. Correlation is significant at the 0.01 level (2-tailed).				

Table A.II. 3 Corelation between ARAS and TOPSIS method for the years between 2012 and 2016

Correlations				
			ARAS	TOPSIS
Spearman's rho	ARAS	Correlation Coefficient	1,000	,994**
		Sig. (2-tailed)	.	,000
		N	163	163
	TOPSIS	Correlation Coefficient	,994**	1,000
		Sig. (2-tailed)	,000	.
		N	163	163
**. Correlation is significant at the 0.01 level (2-tailed).				

[8] Azerbaijan, Burundi, Burkina Faso, Brunei Darussalam, Botswana, Central African Republic, Congo Dem. Rep., Switzerland, Djibouti, Estonia, Kazakhstan, Luxembourg, Madagascar, Malaysia, Namibia, Niger, Qatar, Russian Federation, Somalia, South Sudan, Chad, Thailand, Uruguay, South Africa are excluded in the second data set.

Table A.II. 4 Corelation between ARAS and TOPSIS method for the years between 2017-2021

Correlations				
			ARAS	TOPSIS
Spearman's rho	ARAS	Correlation Coefficient	1,000	,992**
		Sig. (2-tailed)	.	,000
		N	163	163
	TOPSIS	Correlation Coefficient	,992**	1,000
		Sig. (2-tailed)	,000	.
		N	163	163
**. Correlation is significant at the 0.01 level (2-tailed).				

Tables AII.1, AII.2, AII.3, AII.4 demonstrate the correlation coefficients for the 5-years averages from 2002 to 2021. We find a strong correlation between the ranks produced by the ARAS and TOPSIS methods, with all correlation coefficients being significant at the 1% level.

A.III. Optimality function values (Si) and utility degree values Ki

Optimality function values (Si) and utility degree values Ki are calculated using Equation 14 and 15. Table A.III.1. demonstrate the values only for the 5 years average of 2002-2006 as an example.

Table A.III. 1 Optimality function values (Si) and utility degree values Ki.

Code	S_i	K_i	Ranking	Code	S_i	K_i	Ranking
SWE	0,017377	0,974812	1	DZA	0,005955	0,334029	71
NOR	0,015843	0,888731	2	BIH	0,005931	0,332692	72
JPN	0,015823	0,887607	3	PAN	0,005764	0,323321	73
FIN	0,015809	0,886848	4	KGZ	0,005659	0,317423	74
DNK	0,015412	0,864532	5	MDV	0,005644	0,31659	75
NLD	0,01525	0,855455	6	IRN	0,005573	0,312644	76
AUS	0,014966	0,839551	7	ALB	0,005551	0,311388	77
CAN	0,014919	0,836881	8	TKM	0,005499	0,308481	78
KOR	0,01483	0,831888	9	COL	0,005496	0,308307	79
DEU	0,014791	0,8297	10	LKA	0,005492	0,308053	80
GBR	0,014703	0,824773	11	UZB	0,005433	0,304764	81
SGP	0,014601	0,819041	12	SYR	0,005399	0,302847	82
ISR	0,014338	0,804318	13	PHL	0,005394	0,302562	83
USA	0,014284	0,801303	14	SLV	0,005358	0,300589	84
IRL	0,014183	0,795618	15	MNG	0,00534	0,29953	85
AUT	0,014162	0,794407	16	IRQ	0,005337	0,299361	86
BEL	0,01406	0,788694	17	DOM	0,00526	0,29505	87
FRA	0,013992	0,784889	18	PRY	0,005114	0,286885	88
ISL	0,013183	0,739534	19	TJK	0,005084	0,285169	89
ESP	0,012804	0,718253	20	IDN	0,005075	0,284668	90
ITA	0,012668	0,710604	21	IND	0,004949	0,277631	91
SVN	0,010839	0,608041	22	ETH	0,004896	0,27464	92
CZE	0,010547	0,591665	23	BOL	0,004868	0,273073	93
KWT	0,00964	0,540773	24	GAB	0,0048	0,269278	94
MLT	0,0096	0,538526	25	GUY	0,004703	0,26382	95
POL	0,009504	0,533112	26	NPL	0,004651	0,260884	96
PRT	0,009444	0,529778	27	NIC	0,004635	0,259996	97
HUN	0,009282	0,520665	28	BGD	0,00455	0,255214	98
CHN	0,0092	0,51609	29	GHA	0,00454	0,254652	99
SVK	0,00916	0,513831	30	SUR	0,004517	0,253371	100
HRV	0,009139	0,512687	31	BLZ	0,00448	0,251297	101
GRC	0,009087	0,509754	32	GTM	0,004428	0,248406	102
TUR	0,009038	0,506995	33	HND	0,004368	0,24501	103

CYP	0,008951	0,502133	34	BTN	0,004338	0,243366	104
BRA	0,008894	0,498907	35	STP	0,004282	0,240225	105
ARE	0,008403	0,471404	36	PAK	0,004274	0,239748	106
LTU	0,008168	0,458205	37	YEM	0,004229	0,237206	107
LVA	0,007982	0,447783	38	MMR	0,004185	0,234757	108
EGY	0,007697	0,431785	39	TZA	0,004169	0,23385	109
BLR	0,007659	0,429665	40	SEN	0,004114	0,230778	110
MNE	0,007542	0,423066	41	KEN	0,004001	0,224456	111
BGR	0,007478	0,419496	42	ZWE	0,003986	0,223589	112
BHR	0,007416	0,416025	43	HTI	0,003924	0,220138	113
CHL	0,007115	0,399101	44	LAO	0,003891	0,218276	114
SRB	0,007109	0,398777	45	MRT	0,003867	0,216921	115
CRI	0,007089	0,397688	46	NGA	0,003807	0,213556	116
UKR	0,007066	0,396358	47	KHM	0,003796	0,212946	117
JAM	0,006996	0,392427	48	MWI	0,003789	0,212531	118
VNM	0,006981	0,391585	49	UGA	0,003615	0,202774	119
TUN	0,006965	0,390737	50	GMB	0,003601	0,20198	120
BRB	0,00695	0,389886	51	SDN	0,003543	0,198726	121
LBN	0,006919	0,388145	52	CIV	0,003534	0,198229	122
SAU	0,006868	0,385245	53	AFG	0,003488	0,195657	123
PER	0,00686	0,384803	54	PNG	0,00348	0,195194	124
ARG	0,006844	0,383917	55	BEN	0,003473	0,194846	125
FJI	0,006789	0,380837	56	CMR	0,003438	0,192849	126
MKD	0,00665	0,373066	57	Oceania	0,003425	0,192137	127
JOR	0,006575	0,368828	58	LSO	0,003206	0,179845	128
ROU	0,006513	0,365348	59	MLI	0,00319	0,178958	129
CUB	0,006438	0,361137	60	GIN	0,003146	0,176462	130
MEX	0,006305	0,353662	61	LBR	0,003144	0,176343	131
OMN	0,006293	0,353033	62	TGO	0,003091	0,173412	132
MDA	0,006218	0,348813	63	RWA	0,003073	0,172375	133
VEN	0,006173	0,346278	64	MOZ	0,003033	0,170149	134
GEO	0,006147	0,344815	65	SWZ	0,002939	0,164887	135
MUS	0,006111	0,342795	66	ZMB	0,002868	0,160888	136
MAR	0,006095	0,341892	67	AGO	0,002673	0,14995	137
ECU	0,006085	0,341326	68	SLE	0,002631	0,147595	138
ARM	0,006057	0,339749	69	COG	0,002594	0,145514	139
TTO	0,006021	0,337779	70	Optimal	0,017827	1	

A.IV. Country Codes

Table A. IV. 1 Country Codes mostly based on International Standard ISO 3166-1, Codes for the representation of names of countries and their subdivisions--Part 1: Country codes, ISO 3166-1: 2006 (E/F), International Organization on Standardization (Geneva, 2006). Authors used different coding for Sub-Saharan Africa

AFG	Afghanistan	GHA	Ghana	NOR	Norway
ALB	Albania	GRC	Greece	Oceania	Oceania
DZA	Algeria	GTM	Guatemala	OMN	Oman
AGO	Angola	GIN	Guinea	PAK	Pakistan
ARG	Argentina	GUY	Guyana	PAN	Panama
ARM	Armenia	HTI	Haiti	PNG	Papua New Guinea
AUS	Australia	HND	Honduras	PRY	Paraguay
AUT	Austria	HUN	Hungary	PER	Peru
BHR	Bahrain	ISL	Iceland	PHL	Philippines
BGD	Bangladesh	IND	India	POL	Poland
BRB	Barbados	IDN	Indonesia	PRT	Portugal
BLR	Belarus	IRN	Iran, Islamic Rep.	ROU	Romania
BEL	Belgium	IRQ	Iraq	RWA	Rwanda
BLZ	Belize	IRL	Ireland	STP	Sao Tome and Principe
BEN	Benin	ISR	Israel	SAU	Saudi Arabia
BTN	Bhutan	ITA	Italy	SEN	Senegal
BOL	Bolivia	JAM	Jamaica	SRB	Serbia
BIH	Bosnia and Herzegovina	JPN	Japan	SLE	Sierra Leone
BRA	Brazil	JOR	Jordan	SGP	Singapore
BGR	Bulgaria	KEN	Kenya	SVK	Slovak Republic
KHM	Cambodia	KOR	Korea, Rep.	SVN	Slovenia
CMR	Cameroon	KWT	Kuwait	ESP	Spain
CAN	Canada	KGZ	Kyrgyz Republic	LKA	Sri Lanka
CHL	Chile	LAO	Lao PDR	Africa	Sub-Saharan Africa
CHN	China	LVA	Latvia	SDN	Sudan
COL	Colombia	LBN	Lebanon	SUR	Suriname
COG	Congo, Rep.	LSO	Lesotho	SWE	Sweden
CRI	Costa Rica	LBR	Liberia	SYR	Syrian Arab Republic
CIV	Cote d'Ivoire	LTU	Lithuania	TJK	Tajikistan
HRV	Croatia	MWI	Malawi	TZA	Tanzania
CUB	Cuba	MDV	Maldives	TGO	Togo
CYP	Cyprus	MLI	Mali	TTO	Trinidad and Tobago
CZE	Czech Republic	MLT	Malta	TUN	Tunisia
DNK	Denmark	MRT	Mauritania	TUR	Turkey
DOM	Dominican Republic	MUS	Mauritius	TKM	Turkmenistan
ECU	Ecuador	MEX	Mexico	UGA	Uganda
EGY	Egypt, Arab Rep.	MDA	Moldova	UKR	Ukraine
SLV	El Salvador	MNG	Mongolia	ARE	United Arab Emirates
SWZ	Eswatini	MNE	Montenegro	GBR	United Kingdom
ETH	Ethiopia	MAR	Morocco	USA	United States
FJI	Fiji	MOZ	Mozambique	UZB	Uzbekistan
FIN	Finland	MMR	Myanmar	VEN	Venezuela, RB
FRA	France	NPL	Nepal	VNM	Vietnam
GAB	Gabon	NLD	Netherlands	YEM	Yemen, Rep.
GMB	Gambia	NIC	Nicaragua	ZMB	Zambia
GEO	Georgia	NGA	Nigeria	ZWE	Zimbabwe
DEU	Germany	MKD	North Macedonia		

Coding in this study is based on International Standard ISO 3166-1 as seen on the table A.IV.1. However, for the purpose of fitting in the large tables into the pages we changed Sub-Saharan Africa code to SSA.

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Determining Consumer's Perceptions of Sales Promotion Tools by Latent Class Analysis

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ABSTRACT

According to the Regulatory Focus Theory, some people need to approach situations with positive consequences, while others prefer to avoid situations with negative consequences. It is argued that promotion-focused consumers are inclined to products with emphasis on hedonic benefit, while prevention-focused consumers are oriented towards products with emphasis on utilitarian benefit. Sales promotion tools provide a number of hedonic and utilitarian benefits in addition to monetary savings through some motivations according to the promotion and prevention focus of individuals. This study was conducted to determine individuals' attitudes towards the products they purchase thanks to sales promotion tools through latent class analysis. The data required for the analysis were obtained by face-to-face survey method with 1006 consumers who voluntarily participated in the research with convenience sampling. According to the findings of the analysis, it has been understood that there are 3 classes that are sensitive to price discount as sales promotion tool in cleaning products, while there are 4 classes that are sensitive to buy-one-get-one-free as a sales promotion tool.

Keywords: Regulatory Focus, Promotion Tools, Latent Class, Hedonic Value, Utilitarian Value.

JEL Classification Codes: M30, M10

Referencing Style: APA 7

INTRODUCTION

Studies conducted today have concluded that sales promotion tools directly affect the purchasing behavior of consumers. According to researches, different-focused consumers exhibit different behaviors for sales promotion tools (Meo, Abbas, Sajjad, Rizwan, Bukhari, & Hameed, 2014:202-216; Krishnan & Bhandare, 2010:40-49). Promotional packages, loyalty discounts, coupons, price discounts, sample products, memberships, sweepstakes and events that make up sales promotion tools provide a number of hedonic and utilitarian benefits together with monetary savings for consumers (Gedenk, Neslin & Ailawadi, 2006:347). Hedonic benefits can be can be exemplified as value, entertainment, and discovery, while savings, quality products, and ease of shopping for utilitarian benefits (Chandon, Wansink & Laurent, 2000:65-81). Monetary and non-monetary sales promotion tools may differ in terms of consumer perceptions. Doing shopping with hedonic motivations may prefer coupon discounts instead of price discounts (Schindler, 1992:446). Chandon et al. (2000) analyzed that hedonic and utilitarian perceptions of consumers may differ according to sales promotion tools. Monetary sales promotion tool, which is one of the sales promotion tools, is more effective for utilitarian products, but less effective for hedonic products. It has been concluded that sales promotion tools are more effective when used with appropriate products. The Regulatory Focus Theory (RFT), developed by Higgins (1997), is a widely used motivation theory. Regulatory focus reveal the differences between the promotion and prevention attitudes that constitute the self-regulatory focus in the process of achieving the goals of the individual. While promotion-focused individuals are motivated to achieve desired or dreamed states, prevention-focused individuals are motivated to avoid loss and discord (Pham & Chang, 2008:229-232).

Regulatory focus act as a filter in the consumer's decision-making mechanism, directing people's attention to certain types of information. Promotion-focused individuals look for positive signals in the messages they want to convey while seeking information or evaluating. Prevention-focused individuals focus on

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This study is derived from the doctoral thesis titled "Researching The Factors Affecting The Perceptions Of Consumers For Sales Promotional Tools Through Regulatory Focus Theory", which was entered to the Thesis Center of the Council of Higher Education with the thesis number 678819.

negative signals to avoid making faults and negative consequences (Kirmani & Zhu, 2007:688-701). Promotion-focused consumers, who are more open to change, attach more importance to innovative characteristics and tend to buy more new products than prevention-focused consumers (Herzenstein, Posavac & Brakus, 2007:251-260). Since promotion-focused individuals tend to gain, such individuals are more susceptible to the hedonic aspects of consumption. Therefore, promotion-focused individuals are more possible to feel hedonic satisfaction. Since prevention-focused individuals are more susceptible to losses, they tend to utilitarian values more (Arnold & Reynolds, 2009:308-320).

Studies revealing the effects of regulatory focus on consumer perceptions and purchasing behaviors towards sales promotion tools are extremely limited (Pham & Chang, 2008; Ramanathan & Dhar, 2010: Zhu, Miao, Wang, & Li, 2023). It is thought that this study will make important contributions to the literature by means of factors such as the performance of the sales promotion tools applied based on the consumer characteristics (Hawkes, 2009:333-342; Li, Sun & Wang, 2007:413-421). Also, in this study the effect of the sales promotion tools applied in for different product categories on consumer purchasing behavior is explained by the promotion and prevention focus dimensions that form the regulatory focus theory. Accordingly, in study, the determination of purchasing possibilities for consumers with which profile in case of which sales promotion tool is applied with latent class analysis.

LITERATURE REVIEW

Regulatory Focus Theory

Regulatory focus theory provides researchers in many fields a wide range of information and a perspective based on how people approach desires and avoid pain (Higgins, 1997:1280-1300; Foerster, Higgins & Idson, 1998:1115-1131). Regulatory focus theory is based on the idea that people are motivated by vital requirements. Since the theory is based on the past experiences of individuals, it is argued that the decisions made by individuals are related to their previous experiences (Crowe & Higgins, 1997:117-132).

Regulatory focuses describe the individual's self-regulatory modes in pursuit of goals and the discrepancies among their promotion and prevention attitudes. Higgins (1997)'s regulatory focus theory tries to explain the psychological orientation of individuals about how they approach their goals. According to the theory, some people have a strong need for situations with positive consequences, while others prefer to avoid situations with negative consequences. According to Higgins (1997), prevention and promotion motivational systems are effective in targeting goals. The purpose of prevention system is to be vigilant and maintain safety. With this reason, avoiding negative consequences makes people with a high prevention-focus happy, while the presence of negative consequences and the losses caused by these results cause pain and unhappiness to prevention-focused individuals. Responsibilities, doing what needs to be done on time, duties, and protection and safety needs motivate the prevention-focused. People with a dominant promotion focus tend to take action by taking advantage of achievements, gains, desires, self-development, ideals and all kinds of motivations to achieve.

Regulatory focus shows its effect on individuals' product searches, social relations, preferences and strategies they use. In a study on the differences between promotion-focused and prevention-focused individuals, it was understood that while promotion-focused consumers seek a wider range of desires and wishes on the global platform with alternative methods, prevention-focused consumers normally do this on local platforms (Pham & Higgings, 2005:6). Crowe and Higgins (1997) concluded that promotion-focused individuals tend to produce more criteria and alternatives when making purchasing decisions than prevention-focused individuals. The effect of this on consumer shopping behavior is that promotion-focused consumers evaluate product characteristics and qualities more than prevention-focused consumers while benefiting from the shopping experience or third-party resources (Crowe & Higgins, 1997: 117-132).

Many studies related to regulatory focus theory and purchasing behavior offer a perspective viewpoint. For example, factors such as easy return of a purchased goods and low shipping charges attract prevention-focused consumers in terms of minimizing possible losses. On the other hand, factors such as the quality of the purchased goods and shipping insurance indicate trust in the seller and motivate promotion-focused consumers (Shao, Chang & Zhang, 2013:3-4). Prevention-focused consumers think that making an uncontrolled decision about shopping is an inefficient and risky decision. On the contrary, promotion-focused consumers are more susceptible to attractive aspects of the product as they are more inclined to make progress, reach their goals and seize opportunities (Higgins, 1997:1280-1300; Kim & Kim, 2016:387-401).

Hedonic and Utilitarian Value

Sales promotion tools provide benefits to consumers not only to save money but also to have fun and pleasure (Kwok & Uncles, 2002). Such benefits allow the consumer to spend more, as well as having a good time for shopping, which the consumer sees as a social activity (Renwarin, 2019:191-206).

The utilitarian perception of value is defined as the general determination and evaluation of the benefit obtained by the consumer. Hedonic value deals with consumer purchases associated with the shopping process, entertainment and pleasure play (Childers, Carr, Peck, & Carsond, 2001:511-535). While it is argued that promotion-focused consumers tend to consider the hedonic benefit of the product, it is argued that prevention-focused consumers are more likely to consider the utilitarian benefit of the product (Chernev, 2004:141-150; Roy & Ng, 2012:81-88).

Utilitarian perception is related to the function and usefulness of the product (Mano & Oliver, 1993:451-466). Quality, savings and convenience are related to utilitarian perception (Ailawadi, Neslin & Gedenk, 2001:71-89; Chandon et al. 2000:65-81). Consumers with a high utilitarian value perception have goal-oriented purchasing behaviors and they take purchasing action to achieve a specific need or goal. The most important goal of consumers with utilitarian value in purchasing is to reach the purchase purpose in a timely and efficient form (Childers et al., 2001:511-535). Consumers with high hedonic value perception will tend to hedonic products more, and consumers with high utilitarian value perception are expected to tend more towards utilitarian products (Chandon et al., 2000:65-81). Another study examined effects of hedonic and utilitarian values on consumers' online shopping behaviors. Consumers who turn to hedonic shopping tend to attract the feelings of fun, pleasure and elegance in the 20-29 age group. On the other hand, utilitarian shopping inclined consumers prefer online shopping more in terms of time saving and ease of purchase. As a result, it was concluded that there are important differences between consumers with high utilitarian value and consumers with high hedonic value in the young age group (Kale, 2018:263-270).

When the literature is examined, it is understood that the regulatory focus theory and the utilitarian-hedonic value concepts are used together in a few studies. The multifaceted use of the latent class theory in this study has brought to mind the question of what types of latent classes can be in consumer perceptions of sales promotion tools. In this study, by determining consumers' latent classes and hedonic utilitarian value perceptions, it was tried to determine which sales promotion tools they turned to in which product section. Accordingly, it is thought that significant contributions will be made to the literature regarding the marketing of consumer segments with the determined latent classes.

Sales Promotion Tools

Sales promotion is one of the marketing programs used to maintain customer relations in order to inform the consumer and remind them of various information. Retailers need a tool to speed up consumers' purchasing processes. Sales promotion is one of the marketing mix elements and has the driving force in delivering marketing campaigns to the consumer (Kotler & Keller, 2018: 600; Kotler & Armstrong, 2012: 396).

There are many sales promotion practices in the literature. These applications direct consumers' purchasing attitudes. In addition, previous sales promotion activities used by consumers affect their orientation towards other sales promotion practices in their next shopping experience (Bridges, Briesch, & Yin, 2006: 295). Osman, Fah and Foon (2011) investigated the effects of sales promotion tools such as coupons, buy one get one free and price discounts on students' purchasing attitudes. Researchers emphasized in their studies that the sales promotion tools most preferred by consumers are buy one get one free and price discounts.

Ubeja (2014) investigated consumers' behavior towards gifted product offers. The researcher reported that the consumers participating in his study, especially young individuals, are very conscious of sales promotion tools, and that these individuals between the ages of 20-30 are very prone to switch brands to retailers that offer gifts and exchange offers.

Lindholm (2008) investigated in his study whether consumers were influenced by special promotions on their birthdays. As a result of his study, the researcher observed that the number of purchasing transactions of consumers increased during sales promotion practices, and that there was a decrease in the number of purchasing transactions of consumers when the sales promotion application ended.

Sales promotion practices are one of the easiest ways for supermarkets to compete. These applications are frequently used by supermarkets to market a new product or increase the sales of an existing product (Jaradat, Jaradat, & Yassine, 2011: 1684). There is a widely

accepted view that sales promotion tools increase sales. As mentioned above, such applications are frequently used, especially in supermarkets. Before determining the sales promotion tools used in the study, the most used sales promotion tools were determined by taking photographs in popular supermarkets in the province where the study would be conducted. Accordingly, sales promotion practices such as price discounts, buy one get one free, gift product giving and sample product distribution are included in the study. In this study, when the latent class analysis results are examined, in order to increase the readability of the article, price discount and buy one get one free sales development tools, which are the most prominent latent classes and are relatively more widely used in supermarkets, are included.

METHOD

In this study, effects of price discounts and buy-one-get-one-free sales promotion tools on consumers' shopping behavior were investigated. The study includes cleaning products, cosmetics and personal care products of corporate food retailers among retailing businesses.

The universe of the research consists of consumers who reside in Kahramanmaraş and shop at the markets here. The population of Kahramanmaraş province consists of 1.154.102 people as of 2019. In this province, the population of Onikişubat district, one of the central districts, consists of 407.956 people, while the population of Dulkadiroğlu district, another central district, consists of 224.531 people (TUİK, 2019). Due to reasons such as not being able to access the entire universe due to time and cost constraints and not having a list of all consumers that make up the universe, the sample of the research, that is, the participants participating in the research, consisted of consumers who shopped in supermarkets between 01.01.2019 and 01.08.2019. The consumers surveyed in the study were selected according to the non-random judgmental sampling method. In the survey study, it was made in the leading markets of the province such as Akmansoy, Özçam, Marvit Gross, Ayranpınar, Migros and Lider markets. A survey was conducted in front of ten different markets in total. Since the markets are spread in two separate districts in the province of Kahramanmaraş, it can be said that the data set, which includes 1000 participants, 500 from each of these districts, is large enough to reveal latent classes. In the study, it was aimed to increase the participation rate by telling the participants that if they participated in the survey, the study would be used for scientific purposes and the existing data would never be shared with third parties. Accordingly, in the study, surveys were collected using face-to-face interview technique with consumers residing in the central districts of Kahramanmaraş, and a total of 1100 surveys were reached. On the other hand, some surveys were eliminated because they were thought to be inaccurate, and the remaining 1006 surveys were included in the research.

The data were analyzed with help of the SPSS 22.0 'Statistical Package for The Social Science' statistical package program, which is one of the programs widely used by most researchers in today. Descriptive statistics (frequency, percentage and arithmetic mean), exploratory factor analysis and latent class analysis were used to analyze results in research. Latent Gold 5.1 program was used in the section where the purchasing attitudes of consumers with which demographic structure were determined in case of which sales promotion tool was used in the research.

The Latent Class Analysis

The aim of the Latent Class Analysis (LCA) is to analyze multivariate data as well as creating appropriate models. In principle, latent class analysis is a multivariate regression model in which continuous or categorical data based on observed variables (Bartholomew, Knott, 1999:121; Skrondal, Rabe-Hesketh, 2004:324). Examination of the latent data from observed continuous or categorical data of consumers is possible with the latent class analyzes (Lanza, Flaherty & Collins, 2003:165).

LCA models were developed by Lazarsfeld and Henry (1968) and started to be used for classification in social and behavioral sciences. With developments in statistical calculations, the number of researchers using LCA has increased in recent years. Latent class analysis has come into use in medical (Rindskopf, 2002) and marketing (Zenor & Srivastava 1993; Dias & Vermunt 2007). With LCA, investigators obtain information about possible latent classes based on the relationships between observed variables (Tekle, Gudicha, & Vermunt, 2016:209-224).

In this analysis, structures that have been the subject of psychology such as personality, intelligence, interest and attitude cannot be observed directly. For example, a student who immediately understands what he/she has read and is successful in his/her studies is considered to be intelligent. It is seen that only a student who enjoys a certain subject or lesson has a positive attitude towards that lesson through his/her willingness to study. As in the examples, whether the observable behaviors are caused by an latent structure belonging to the person or not is examined with the latent variable models (Güngör Culha & Korkmaz, 2011: 191).

In the use of latent class analysis (LCA), the most appropriate number of classes must be determined. The number of latent class determines the fit of the model. Having more latent classes makes it easier to examine observed sequences. However, the rise in the number of latent groups causes the model to emerge, making it difficult to fit the model and increases the number of measured parameters (Lin & Dayton, 1997:249-264). For this reason, it is necessary to ensure data compatibility with the model with the most appropriate class and the least parameter (Vermunt & Magidson, 2013: 71). Although the Latent Class Analysis (LCA) does not directly determine the number of latent classes, it contains multiple statistics that show whether the model is compatible or not (Lin & Dayton, 1997: 262).

Measurement Tools Used in Research

It was decided to utilize regulatory focus theory to understand consumers' motivations. It is thought that regulatory focus theory plays a decisive role in consumers' purchasing behavior. Exploratory factor analysis in this study, which includes regulatory focus, utilitarian and hedonic value perceptions, quality and economic purchasing, variables with cross-loads were determined and excluded from the study. In terms of the variables in the survey, five variables measuring the promotion focus (Cronbach's α =.908) and four variables measuring the prevention focus (Cronbach's α =.782) dimension obtained by utilizing the studies of Higgins, Friedman, Harlow, Idson, Ayduk, and Taylor (2001), were used in this study.

Table 1: Demographic Characteristics of Participants

Variables	Frequencies (N)	Percentages (%)	Variables	Frequencies (N)	Percentages (%)
Gender			**Education Status**		
Female	379	37,7	Primary education	42	4,2
Male	627	62,3	High school	153	15,2
Total	1006	100,0	Associate degree	143	14,2
Marital status			Bachelor's degree	535	53,2
Single	390	38,8	Postgraduate	133	13,2
Married	616	61,2	Total	1006	100,0
Total	1006	100,0	Shopping Frequency		
Age			In 1-3 days	503	50,0
18 years and under	33	3,3	Weekly	314	31,2
19-23 years old	164	16,3	For 15 days	105	10,4
24-28 years old	147	14,6	Monthly	84	8,4
29-33 years old	134	13,3	Total	1006	100,0
34-38 years old	153	15,2	**Average monthly spending**		
39-43 years old	134	13,3	125₺ and below	449	44,6
44-48 years old	88	8,7	Between 126-250₺	264	26,2
49-53 years old	103	10,2	Between 251-375₺	130	12,9
54 years and older	50	5,1	Between 376-500₺	77	7,7
Total	1006	100,0	Between 501-625₺	34	3,4
Job			Between 626-875₺	12	1,2
Officer	339	33,7	876₺ and above	40	4,0
Worker	179	17,8	Total	1006	100,0
Self-employed	98	9,7	**Average Monthly Income**		
Retired	65	6,5	0-2000	172	17,1
Student	178	17,7	2001-4000	286	28,4
Housewife	44	4,4	4001-6000	257	25,5
Notworking	59	5,9	6001-8000	157	15,6
Other	44	4,3	8001 and above	134	13,4
Total	1006	100,0	Total	1006	100,0

Table 2: Exploratory Factor Analysis Results for Determining the Dimensions of Regulatory Focus Theory

Factor	Question Statement	Factor Weights	Explained Variance
Promotion Focus	Compared to most people, are you typically unable to get what you want out of life?	0,88	
	Do you often do well at different things that you try?	0,74	
	I feel like I have made progress toward being successful in my life.	0,78	0,41
	I have found very few hobbies or activities in my life that capture my interest or motivate me to put effort into them.	0,90	
	When it comes to achieving things that are important to me, I find that I don't perform as well as I ideally would like to do	0,80	
Prevention Focus	Growing up, would you ever "cross the line" by doing things that your parents would not tolerate?	0,81	
	Did you get on your parents' nerves often when you were growing up?	0,79	0,27
	Growing up, did you ever act in ways that your parents thought were objectionable	0,71	
Kaiser-Meyer-Olkin Scale Validity			0,81
Bartlett's Test of Sphericity		**Chi-Square**	4699,51

In the literature review, it was observed that hedonic and utilitarian value perceptions have a relationship with regulatory focuses. In order to reveal this connection, in this study was used the study of Chandon, Wansink, & Laurent (2000) on seven variables measuring utilitarian value perception (Cronbach's α = .898) and three variables measuring hedonic value perception (Cronbach's α = .855).

In line with the purpose of the study, it was desired to examine consumers' purchasing attitudes. When a literature review was conducted on purchasing attitudes, Bakewell and Mitchell (2003) examined the shopping attitudes of consumers and divided consumers into five segments as "recreational quality seekers, recreational discount seekers, shopping and fashion uninterested, trend setting loyals, confused time/money conserving". Osman, Fah and Foon (2011) adapted consumer's attitudes to their own studies by utilizing these segments. Using the variables used by Osman, Fah and Foon (2011), a preliminary survey was conducted on 150 people in this study. After examining the data with exploratory factor analysis, variables with cross-loading factor loadings were removed. When the remaining variables were examined, purchasing attitudes were renamed as "Economic Purchase Attitude" and "Quality Purchase Attitude". In the study were included three variables to determine the consumer's quality purchasing dimension (Cronbach's α = .882) and three variables to determine the economic purchasing dimension (Cronbach's α = .839).

RESEARCH FINDINGS

Participant Characteristics

Gender, marital status, age, education level, shopping frequency, average income and average spending information were asked to the consumers in the survey conducted for the consumers shopping behavior in the supermarkets and living in Kahramanmaraş. Information on demographic characteristics of consumers is given in Table 1 with frequencies and percentages.

When the table is examined, 37.7% of consumers in survey are women and 62.3% are men. When marital status of the respondents is examined, 38.8% are single and 61.2% are married. When the participants are examined in terms of age, the total participants aged 18 and under, aged between 44-48 and over the age of 54 constituted 17% of the general participation, while the respondents aged 19-23 formed the most participation with a rate of 16.3%. 33.7% of the respondents were officer, 17.7% were students and 17.8% were workers. 53.2% of the respondents, that is, the majority of them, have a bachelor's degree.

Knowing consumer demographic information was an important auxiliary information for the latent class analysis conducted in this study. In addition, knowing the regulatory focus and hedonic-utilitarian value perceptions of consumers and determining which sales promotion tools they prefer from which products helped to obtain a good consumer profile in this study. In this study, clues will be obtained

Table 3: Exploratory Factor Analysis Results for the Determination of Utilitarian and Hedonic Value Dimensions

Factor	Question Statement	Factor Weights	Explained Variance
Utilitarian Value	I think I made a profitable purchase by taking advantage of promotions.	0,76	
	I see promotions as practices that relieve my budget.	0,75	
	With my savings from promotions, I can buy a better product than I always use.	0,72	
	I gain the opportunity to purchase these products through promotions on more expensive and quality products.	0,70	0,45
	Promotions relax my budget and give me the opportunity to buy higher quality products.	0,75	
	When I take advantage of promotions, I consider myself a very adept shopper.	0,70	
	I spend less time and effort shopping by watching promotions.	0,71	
Hedonic Value	I follow promotions such as sweepstakes, contests, and gifts with pleasure.	0,77	
	I find promotions such as sweepstakes and contests enjoyable.	0,90	0,21
	I think that promotions such as sweepstakes, contests, and gifts create a pleasant and exciting atmosphere in stores.	0,77	
Kaiser-Meyer-Olkin Scale Validity			0,83
Bartlett's Test of Sphericity		**Chi-Square**	5492,78

about which consumer profiles can purchase which products, so that supermarkets can have an idea about the various products they intend to sell in the future.

Analysis Method

When examining data, first of all, validity and reliability analyzes of the data were made. In determining the criteria created by the variables in the scale, exploratory factor analysis was performed. Kaiser-Meyer-Olkin (KMO) scale validity and Bartlett's Test of Sphericity (sphericity test) were applied to determine whether the data set was appropriate for analysis.

Reliability levels for the regulatory focus dimensions were determined as 0.908 α value of Cronbach Alpha for the promotion-focused dimension and 0.782 α value of Cronbach Alpha for the prevention-focused dimension. It was determined that the promotion and prevention-focused dimensions were unidimensional, and the factor loadings of items under factor are given in Table 2.

Reliability levels for the utilitarian and hedonic value perception dimensions were determined as 0.898 α value of Cronbach Alpha for the utilitarian value dimension and 0.855 α value of Cronbach Alpha for the hedonic value dimension. It was determined that the utilitarian and hedonic value dimensions were unidimensional, and factor loads in variables under factor are given in Table 3.

Reliability levels for the economic and quality purchase dimensions were determined as 0.839 α value of Cronbach Alpha for the economic purchase dimension and 0.882 α value of Cronbach Alpha for the quality purchase dimension. It was determined that the economic and quality purchase dimensions were unidimensional, and factor loadings in items under factor are given in Table 4.

Table 4: Exploratory Factor Analysis Results for the Determination of Quality and Economic Purchasing Dimensions

Factor	Question Statement	Factor Weights	Explained Variance
Economic Purchasing	I look very carefully to find the best value for money.	0,815	
	I buy as much as possible at sale prices	0,858	0,30
	I should spend more time deciding on the products and brands I buy	0,722	
Quality Purchasing	Once I find a product I like, I buy it regularly	0,81	
	In general, I try to get the best overall quality	0,98	0,48
	I usually buy well-known brands	0,757	
Kaiser-Meyer-Olkin Scale Validity			0,72
Bartlett's Test of Sphericity		**Chi-Square**	3102,94

Table 5: Compliance Index Analysis of Perception of Price Discount Applied in Cleaning Products

Model Type	Likelihood-ratio (L^2)	AIC	BIC	Number of Parameters (Npar)	Degrees of freedom (Df)
1 Class	7233,3357	7450,8457	7509,8105	12	994
2 Class	7024,7005	7274,2105	7411,7951	28	978
3 Class	**6901,9980**	**7183,5080**	**7399,7124**	**44**	**962**
4 Class	6796,8110	7110,3210	7405,1452	60	946
5 Class	6713,6864	7059,1964	7432,6404	76	930
6 Class	6629,7777	7007,2877	7459,3515	92	914

Determination of Latent Classes According to the Preferences of Promotion and Prevention Focused Consumers for Sales Promotion Tools

In the study, it is aimed to determine latent classes of consumer attitudes towards sales promotion tools applied on different product groups according to their promotion and prevention focus characteristics, according to promotional product purchasing, hedonic/utilitarian value perceptions and quality/economic purchasing attitudes. In order to statistically evaluate consumers' attitudes towards sales promotion tools, consumers were asked which sales promotion tools they preferred in which product categories in their shopping.

This study was conducted on basic food products, cosmetics-cleaning products and delicatessen products. When the data obtained was examined, it was understood that latent classes were more evident, especially in cleaning and cosmetic products. For this reason, cleaning and cosmetics departments were also included in the study in order to increase the readability of the article.

Latent Class Estimates of Consumer Perceptions for the Sales Promotion Tool of Price Discount in Cleaning Products

It has been a interesting subject to examine according to their latent classes of the differences of consumers' attitudes towards promotional products according to their regulatory focus. The fit index analysis using the Latent Gold 5.1 program to determine the latent classes of consumers is given in Table 5 The most appropriate model was selected by using the obtained information criterion values. In this context, it was decided to choose the smallest value (7399.71) of the Bayes Information Criteria (BIC) statistic. When the values were examined, it was decided that the most suitable model with Akaike Information Criteria (AIC) 7183.50 parameter number (Npar) 44, maximum likelihood chi-square ratio ($L^{2)}$ 6901.99 and finally the degree of freedom (Df) 962 was the 3-class model. The selection of the most suitable model with the least class is important for better analysis of the data in latent class analyses.

After choosing the most suitable model to latent class analysis, the average values of regulatory focus, value perceptions and purchasing dimensions, which constitute the dimensions of the research, are given in Table 6. According to the table, average of prevention-focused consumers in 1st and 2nd classes, and mean of the promotion-focused consumers in 3rd class, is higher than the others. The average value table is used in latent class nomenclature.

When the Table 7 is examined, considering the sensitivity, insensitivity and indecision of consumers' interest in price discounted products, it was decided to name the consumers in the 1st class as prevention indecisive, the consumers in the 2nd class as prevention sensitive, and the consumers in the 3rd

Table 6: Average Values of Dimensions According to Perception of Price Discount Applied in Cleaning Products

Dimensions	1. Class	2. Class	3. Class
Promotion Focus	3,26	3,53	3,93
Prevention Focus	3,56	3,97	3,07
Hedonic Value Perception	2,68	2,25	3,48
Utilitarian Value Perception	2,99	4,17	3,86
Economic Purchase	3,58	4,43	4,19
Quality Purchase	3,68	4,00	4,29
Price Discount	3,01	3,83	3,21

Table 7: Parameter Estimates of Price Discount Sales Promotion Tool in Cleaning Products

Dimensions/ Demographic characteristics		Total Participants n=1006							
		1.Class Prevention Indecisive		2.Class Prevention Sensitive		3. Class Promotion Indecisive		ANOVA (One Way)	
		n	%	n	%	n	%	F	Sig.
Class Participations		399	39,6	363	36	245	24,4		
Price Discount Attitude	I do not agree	47	11,8	2	0,7	47	18,8		
	I'm undecided	206	51,7	64	17,6	134	55,1	80,9	p < 0.001
	I agree	146	36,5	297	81,7	64	26,1		
Utilitarian Value Perception	I do not agree	98	24,6	1	0,4	9	3,6		
	I'm undecided	200	50,2	39	10,7	62	25,4	267,6	p < 0.001
	I agree	101	25,2	323	88,9	174	71,0		
Hedonic Value Perception	I do not agree	200	50,3	229	63,1	34	13,8		
	I'm undecided	130	32,7	112	30,9	78	32,1	149,9	p < 0.001
	I agree	69	17,0	22	6,0	133	54,2		
Quality Purchase Attitude	I do not agree	49	12,4	20	5,6	1	0,5		
	I'm undecided	92	23,0	47	12,9	21	8,5	37	p < 0.001
	I agree	258	64,6	296	81,5	223	91,0		
Economic Purchase Attitude	I do not agree	58	14,7	0	0,0	3	1,4		
	I'm undecided	95	23,7	9	2,5	24	9,6	131,7	p < 0.001
	I agree	246	61,6	354	97,5	218	89,0		
Gender	Female	84	21,0	177	48,8	118	48,3		
	Male	315	79,0	186	51,2	127	51,7		
Marital Status	Single	181	45,5	95	26,1	114	46,7		
	Married	218	54,5	268	73,9	131	53,3		
Age	23 years and under	89	22,3	54	14,8	55	22,4		
	24-33 years old	47	11,9	51	14,1	48	19,7		
	34-38 years old	106	26,7	99	27,2	83	33,5		
	39-48 years old	53	13,1	52	14,4	29	11,9		
	49 years and older	104	26,0	107	29,5	30	12,4		
Income	0-2000₺	65	16,4	59	16,2	48	19,5		
	2001-4000₺	118	29,3	96	26,6	73	29,7		
	4001-6000₺	89	22,4	96	26,3	72	29,5		
	6001- 8000₺	59	14,8	64	17,7	34	13,9		
	8001₺ and above	68	17,1	48	13,2	18	7,4		
Job	Officer	117	29,4	141	38,8	81	33,2		
	Worker-Self-employed	138	34,5	82	22,5	58	23,7		
	Retired- Student	105	26,3	70	19,4	68	27,8		
	Housewife- Not Working	39	9,8	70	19,3	38	15,3		
Education	Primary Education	30	7,6	11	3,2	0	0,1		
	High School	82	20,6	55	14,9	17	6,9		
	Associate degree	56	14,0	56	15,6	31	12,6		
	Bachelor's degree	205	51,3	184	50,7	146	59,8		
	Postgraduate	26	6,5	57	15,6	51	20,7		
Shopping Frequency	In 1-3 days	189	47,5	174	47,9	140	57,3		
	Weekly	129	32,3	117	32,4	68	27,7		
	For 15 days	45	11,2	35	9,6	25	10,2		
	Monthly	36	9,0	37	10,1	12	4,8		
Average Spending	125₺ and below	186	46,5	173	47,8	90	36,9		
	Between 126- 250₺	105	26,4	96	26,3	63	25,8		
	251₺ and above	64	16,1	42	11,5	24	9,9		
	376₺ and above	44	11,0	52	14,4	68	27,4		

Table 8: Consumers Sensitive to Price Discount Sales Promotion Tool in Cleaning Products

Dimensions/ Demographic characteristics	2.Class Prevention Sensitive
Utilitarian Value Perception	High
Hedonic Value Perception	Low
Quality Purchase Attitude	High
Economic Purchase Attitude	High
Gender	Female/Male
Marital Status	Married
Age	49 years and older
Income	2001-6000₺
Job	Officer
Education	Bachelor's degree
Shopping Frequency	1-3 days
Average Spending	up to 125₺

Table 9: Fit Index Analysis of Buy-One-Get-One-Free Application in Cleaning Products

Model Type	Likelihood-ratio (L^2)	AIC	BIC	Number of Parameters (Npar)	Degrees of freedom (Df)
1 Class	7275,5934	7493,1034	7552,0683	12	994
2 Class	7068,7291	7318,2391	7455,8237	28	978
3 Class	6888,5010	7170,0110	7386,2155	44	962
4 Class	**6763,2982**	**7076,8083**	**7371,6325**	**60**	**946**
5 Class	6706,5046	7052,0146	7425,4587	76	930
6 Class	6623,3710	7000,8810	7452,9448	92	914

class as promotion indecisive. In addition, ANOVA test results according to price discount attitude, utilitarian value perception, hedonic value perception, quality purchasing attitude and economic purchasing attitude of each class are also included in the table. The p values of the ANOVA test performed according to each class are given in the table.

The latent classes of consumers' perceptions of the price discounted sales promotion tool applied in cleaning products are presented in Table 4.7. When the table is analyzed, the conditional probabilities of the classes can be explained as follows:

2. Class Prevention-Sensitive: In this class, where there are more prevention-focused consumers, the probability of purchasing cleaning products through price discount is 81%. The class consists of individuals with 73% probability of being married, 38% probability of being officer, 66% probability of bachelor's degree and postgraduate education, 1-3 days of shopping frequency with a high probability of shopping up to 125₺.

According to the results of the conditional probabilities, the profiles of consumers sensitive to promotional products in case of price discounts for cleaning products are given in Table 8.

Only the options with the highest probabilistic values sensitive to price discount are included in the table. When evaluated in general, majority of married and prevention-focused consumers are more sensitive in case of price discounts in cleaning products.

Latent Class Estimates of Consumer Perceptions for Buy-One-Get-One-Free Sales Promotion Tool in Cleaning Products

Latent classes were determined in order to analyze the effect of buy-one-get-one-free sales promotion tool in cleaning products on consumer perceptions. In analysis, when fit index analysis in Table 9 was examined, it was decided that the smallest value of the Bayes Information Criteria (BIC) statistic was 7371.63 and the 4-class model was the most appropriate model.

Table 10: Average Values of Dimensions According to Perception of Buy-One-Get-One-Free Sales Promotion Tool Applied in Cleaning Products

Dimensions	1. Class	2. Class	3. Class	4. Class
Promotion Focus	3,53	3,65	3,46	3,95
Prevention Focus	3,20	3,85	3,75	3,06
Hedonic Value Perception	2,82	2,46	1,86	3,77
Utilitarian Value Perception	2,92	4,23	3,55	3,79
Economic Purchase	3,59	4,51	3,89	4,08
Quality Purchase	3,55	4,18	3,72	4,38
Buy-One-Get-One-Free	2,95	3,70	2,38	3,91

After choosing the most suitable model to latent class analysis, average values of the dimensions of regulatory focus, value perceptions and purchasing, which constitute the dimensions of research, are given in Table 4.10. According to table, the average value of promotion-focused consumers in 1st and 4th classes, and mean of the prevention-focused consumers in 2nd and 3rd classes, is higher than the others.

In the average value table, the classes of consumers are named according to their promotion and prevention focus values. In Table 11, the class names were determined as promotion indecisive, prevention-sensitive, prevention-insensitive, and promotion-sensitive, respectively, according to consumers' attitude to purchase promotional products. The p values of the ANOVA test performed according to each class are given in the table.

The latent classes of consumers' perceptions of the buy-one-get-one-free sales promotion tool applied in cleaning products are presented in Table 11 When the latent classes are examined, conditional probabilities can be explained as follows:

2. Class Prevention Sensitive: This class consists of consumers with high attitude to purchase promotional products, low hedonic value, high utilitarian value, and high probability of purchasing economic and quality products. The class consists of consumers who are 60% probability to be women and married, 75% probability to have bachelor's degree and postgraduate education, and spend an average of 125₺ and below with a frequency of 1-3 days.

4. Class Promotion Sensitive: The most basic characteristics of this class are the majority of promotion-focused consumers who tend to promotional products, the high level of utilitarian and hedonic value, and the high probability of purchasing both quality and economic products.

Based on these results, Table 12 shows the most prominent characteristics of the latent classes sensitive to promotional products in the case of applying buy-one-get-one-free sales promotion tool in cleaning products.

It is understood that when buy-one-get-one-free sales promotion tool is applied to cleaning products, consumers with a high utilitarian value level, generally married, especially between 34-38 years old, and officer, are more likely to purchase quality and economic products.

Table 11: Parameter Estimates of Buy-One-Get-One-Free Sales Promotion Tool in Cleaning Products

Dimensions/ Demographic characteristics		Total Participants n=1006									
		1.Class Promotion Indecisive		2. Class Prevention Sensitive		3.Class Prevention Insensitive		4. Class Promotion Sensitive		ANOVA (One Way)	
		n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**F**	**Sig.**
Class Participations		320	31,7	296	29,4	205	20,6	185	18,3		
Buy-One-Get-One-Free Attitude	I do not agree	93	28,9	26	8,7	104	51,2	11	6,0		
	I'm undecided	137	42,8	95	31,7	76	36,6	50	27,0	95,3	p < 0.001
	I agree	90	28,3	175	59,6	25	12,2	124	67,0		
Utilitarian Value Perception	I do not agree	86	27,0	1	0,3	15	7,6	5	2,8		
	I'm undecided	159	49,4	18	6,1	80	39,0	46	24,6	154	p < 0.001
	I agree	75	23,6	277	93,6	110	53,4	134	72,6		
Hedonic Value Perception	I do not agree	107	33,6	161	54,1	186	90,7	9	4,9		
	I'm undecided	138	43,0	109	37,3	18	9,0	55	29,6	162,9	p < 0.001
	I agree	75	23,4	26	8,6	1	0,3	121	65,5		
Quality Purchase Attitude	I do not agree	40	12,5	4	1,3	27	13,2	0	0,0		
	I'm undecided	91	28,2	32	10,9	30	14,8	6	3,4	45,9	p < 0.001
	I agree	189	59,3	260	87,8	148	72,0	179	96,6		
Economic Purchase Attitude	I do not agree	48	14,9	0	0,0	11	5,3	4	2,0		
	I'm undecided	71	22,0	5	1,7	33	16,0	19	10,1	69,6	p < 0.001
	I agree	201	63,1	291	98,3	161	78,7	162	87,9		
Gender	Female	81	25,2	179	60,2	39	19,2	81	43,7		
	Male	239	74,8	117	39,8	166	80,8	104	56,3		
Marital Status	Single	182	57,2	116	39,3	27	12,9	64	34,8		
	Married	138	42,8	180	60,7	178	87,1	121	65,2		
Age	23 years and under	98	30,6	65	22,0	9	4,2	25	13,6		
	24-33 years old	50	15,8	63	21,2	9	4,5	24	13,1		
	34-38 years old	85	26,5	86	28,9	47	23,0	70	37,7		
	39-48 years old	37	11,4	37	12,7	27	13,3	33	17,7		
	49 years and older	50	15,7	45	15,2	113	55,0	33	17,9		
Income	0-2000₺	66	20,6	67	22,5	21	10,1	19	10,3		
	2001-4000₺	111	34,7	82	27,7	53	26,3	39	20,9		
	4001-6000₺	70	21,8	72	24,4	55	26,8	59	32,4		
	6001- 8000₺	30	9,4	45	15,1	46	22,4	37	19,7		
	8001₺ and above	43	13,5	30	10,3	30	14,4	31	16,7		
Job	Officer	55	17,4	99	33,5	102	49,5	83	44,8		
	Worker-Self-employed	107	33,5	57	19,4	62	30,3	50	27,1		
	Retired- Student	113	35,4	72	24,3	30	14,8	28	15,0		
	Housewife-Not Working	45	13,7	68	22,8	11	5,4	24	13,1		
Education	Primary Education	18	5,7	5	1,8	18	9,0	0	0,0		
	High School	65	20,4	25	8,6	50	24,3	13	6,8		
	Associate degree	49	15,2	40	13,4	34	16,4	21	11,3		
	Bachelor's degree	172	53,6	165	55,5	91	44,4	107	58,3		
	Postgraduate	16	5,1	61	20,7	12	5,9	44	23,6		
Shopping Frequency	In 1-3 days	150	47,0	170	57,3	84	40,8	99	53,6		
	Weekly	104	32,6	85	28,8	68	33,7	56	30,0		
	For 15 days	37	11,7	18	6,1	30	14,4	20	10,8		
	Monthly	29	8,7	23	7,8	23	11,1	10	5,6		
Average Spending	125₺ and below	170	53,4	165	55,5	68	33,2	46	24,8		
	Between 126- 250₺	80	25,2	70	23,5	57	27,7	57	30,8		
	251₺ and above	48	14,5	21	7,5	37	17,9	24	13,3		
	376₺ and above	22	6,9	40	13,5	43	21,2	58	31,1		

Table 12: Consumers Sensitive to Buy-One-Get-One-Free Sales Promotion Tool in Cleaning Products

Dimensions/ Demographic characteristics	2.Class Prevention Sensitive	4. Class Promotion Sensitive
Utilitarian Value Perception	High	High
Hedonic Value Perception	Low	High
Quality Purchase Attitude	High	High
Economic Purchase Attitude	High	High
Gender	Female	Male
Marital Status	Married	Married
Age	34-38 years old	34-38 years old
Income	2001-4000₺	4001-6000₺
Job	Officer	Officer
Education	Bachelor's degree	Bachelor's degree
Shopping Frequency	1-3 days	1-3 days
Average Spending	up to 125₺	Between 126-250₺

Latent Class Estimates of Consumer Perceptions for Price Discount Sales Promotion Tool in Cosmetic Products

It is aimed to determine the consumer perceptions towards price discount applications in cosmetic products and to investigate the latent classes with the obtained data. When the fit index analysis in Table 13 was examined, it was decided that the minimum value of Bayes Information Criteria (BIC) was 7503.05 and the 3-class model was the most suitable model in study.

Averages of regulatory focus, hedonic/utilitarian value perceptions and economic/quality purchasing dimensions are given in Table 14. According to table, there are promotion-focused consumers in 1st and 3rd classes, and prevention-focused consumers in 2nd class. The names of the latent classes were determined according to the average values and these names are shown in Table 15. The classes included in the latent class analysis were named as promotion-insensitive, prevention-sensitive, and promotion-sensitive, respectively.

Table 13: Fit Index Analysis of Price Discount Perception in Cosmetic Products

Model Type	Likelihood-ratio (L^2)	AIC	BIC	Number of Parameters (Npar)	Degrees of freedom (Df)
1 Class	7383,8540	7598,5914	7657,5563	12	994
2 Class	7177,5129	7424,2503	7561,8349	28	978
3 Class	**7008,1096**	**7286,8470**	**7503,0515**	**44**	**962**
4 Class	6913,8740	7224,6114	7519,4356	60	946
5 Class	6844,7202	7187,4577	7560,9017	76	930
6 Class	6731,2907	7106,0282	7558,0920	92	914

Table 14: Average Values of Dimensions According to Perception of Price Discount Sales Promotion Tool Applied in Cosmetic Products

Dimensions	1. Class	2. Class	3. Class
Promotion Focus	3,50	3,59	3,88
Prevention Focus	3,34	4,03	3,07
Hedonic Value Perception	2,46	2,31	3,49
Utilitarian Value Perception	3,02	4,25	3,76
Economic Purchase	3,59	4,50	4,12
Quality Purchase	3,56	4,11	4,29
Price Discount	2,80	3,56	4,02

Table 15: Parameter Estimates of Price Discount Sales Promotion Tool in Cosmetic Products

Dimensions/ Demographic characteristics		Total Participants n=1006							
		1.Class Promotion Insensitive		2. Class Prevention Sensitive		3. Class Promotion Sensitive		ANOVA (One Way)	
		n	%	n	%	n	%	F	Sig.
Class Participations		426	42,4	306	30,4	274	27,2		
Price Discount Attitude	I do not agree	174	40,8	44	14,3	19	7	134,2	p < 0.001
	I'm undecided	142	33,5	87	28,4	58	21		
	I agree	110	25,7	175	57,3	197	72		
Utilitarian Value Perception	I do not agree	96	22,5	0	0,2	12	4,3	253,2	p < 0.001
	I'm undecided	210	49,4	23	7,5	68	24,7		
	I agree	120	28,1	283	92,3	194	71		
Hedonic Value Perception	I do not agree	233	54,6	191	62,2	40	14,5	166,1	p < 0.001
	I'm undecided	135	31,8	97	32	88	32		
	I agree	58	13,6	18	5,8	146	53,5		
Quality Purchase Attitude	I do not agree	62	14,5	9	2,9	0	0	73,4	p < 0.001
	I'm undecided	103	24,2	34	11,3	21	8		
	I agree	261	61,3	263	85,8	253	92		
Economic Purchase Attitude	I do not agree	58	13,6	0	0	4	1,4	126	p < 0.001
	I'm undecided	95	22,2	6	2	26	9,5		
	I agree	273	64,2	300	98	244	89,1		
Gender	Female	96	22,5	151	49,4	132	48,2		
	Male	330	77,5	155	50,6	142	51,8		
Marital Status	Single	144	33,8	89	29	157	57,4		
	Married	282	66,2	217	71	117	42,6		
Age	23 years and under	71	16,6	53	17,2	74	26,9		
	24-33 years old	43	10	47	15,2	58	21,1		
	34-38 years old	113	26,8	84	27,7	88	32,1		
	39-48 years old	64	14,9	42	13,8	28	10,3		
	49 years and older	135	31,7	80	26,1	26	9,6		
Income	0-2000₺	64	15,1	51	16,7	57	20,7		
	2001-4000₺	122	28,6	79	25,9	85	31		
	4001-6000₺	99	23,2	80	25,9	79	28,8		
	6001- 8000₺	67	15,7	55	18	35	12,8		
	8001₺ and above	74	17,4	41	13,5	18	6,7		
Job	Officer	132	31,1	119	38,8	88	32,1		
	Worker-Self-employed	146	34,2	64	20,8	67	24,5		
	Retired- Student	99	23,1	58	19,3	86	31,3		
	Housewife-Not Working	49	11,6	65	21,1	33	12,1		
Education	Primary Education	33	7,7	9	2,8	1	0,2		
	High School	85	19,8	43	14,1	25	9,3		
	Associate degree	63	14,8	46	15,2	33	12,1		
	Bachelor's degree	213	50,2	157	51,3	165	60		
	Postgraduate	32	7,5	51	16,6	50	18,4		
Shopping Frequency	In 1-3 days	183	42,9	153	50,1	167	60,9		
	Weekly	146	34,1	98	31,8	71	26		
	For 15 days	54	12,8	25	8,2	26	9,4		
	Monthly	43	10,2	30	9,9	10	3,7		
Average Spending	125₺ and below	174	40,9	157	51,3	118	43		
	Between 126- 250₺	120	28,3	76	24,9	67	24,6		
	251₺ and above	71	16,6	33	10,9	26	9,5		
	376₺ and above	61	14,2	40	12,9	63	22,9		

Table 16: Consumers Sensitive to Price Discount Sales Promotion Tool in Cosmetic Products

Dimensions/ Demographic characteristics	2.Class Prevention Sensitive	3. Class Promotion Sensitive
Utilitarian Value Perception	High	High
Hedonic Value Perception	Low	High
Quality Purchase Attitude	High	High
Economic Purchase Attitude	High	High
Gender	Female/Male	Female/Male
Marital Status	Married	Single
Age	34-38 years old	34-38 years old
Income	2001-6000₺	2001-4000₺
Job	Officer	Officer
Education	Bachelor's degree	Bachelor's degree
Shopping Frequency	1-3 days	1-3 days
Average Spending	up to 125₺	up to 125₺

When the 3-class model determined in latent class analysis in Table 15 is examined, the classes with the highest probability of purchasing promotional products are the 2nd and 3rd classes, and these classes consist of prevention and promotion-focused consumers. When these classes are examined;

2. Class Prevention Sensitive: The most basic characteristic of this class is that the prevention-focused consumers are in the majority, the hedonic value level is very low and the utilitarian value level is high. Consumers in this class are more likely to buy quality and economic products. When the class is analyzed in terms of demographic characteristics, it is composed of married people with a probability of 71%, and consumers aged 46 and over with a probability of 26%.

3. Class Promotion Sensitive: The main characteristic of this class is its high hedonic value and utilitarian value. In addition, quality and economic purchasing attitudes are high.

Based on these results, Table 16 shows the most distinctive characteristics of the latent classes sensitive to promotional products in case of price discount promotion in cosmetic products.

If the price discount sales promotion tool is applied to cosmetic products, it is understood that consumers with a high utilitarian value level, between the ages of 34-38 and who are officer, are more probability to purchase quality and economic products.

Latent Class Estimates of Consumer Perceptions for Price Buy-One-Get-One-Free Sales Promotion Tool in Cosmetic Products

In order to determine the consumer perceptions of buy-one-get-one-free application in cosmetic products, questions were asked to the consumers about whether they would buy promotional products if they were applied for buy-one-get-one-free application in cosmetic products. When the fit index analysis in Table 17 was examined, it was decided that the minimum value of Bayes Information Criteria (BIC) was 7521.17 and the 2-class model was suitable for the purpose of the study.

Table 17: Fit Index Analysis of Buy-One-Get-One-Free Perception in Cosmetic Products

Model Type	Likelihood-ratio (L^2)	AIC	BIC	Number of Parameters (Npar)	Degrees of freedom (Df)
1 Class	7416,4748	7633,9848	7692,9497	12	994
2 Class	7209,8209	7459,3309	7596,9155	28	978
3 Class	**7023,4635**	**7304,9736**	**7521,1780**	**44**	**962**
4 Class	6938,2497	7251,7598	7546,5840	60	946
5 Class	6833,1987	7178,7088	7552,1528	76	930
6 Class	6771,6164	7149,1264	7601,1902	92	914

Table 18: Average Values of Dimensions According to Perception of Buy-One-Get-One-Free Sales Promotion Tool Applied in Cosmetic Products

Dimensions	1. Class	2. Class	3. Class
Promotion Focus	3,52	3,57	3,86
Prevention Focus	3,37	4,01	3,07
Hedonic Value Perception	2,42	2,29	3,52
Utilitarian Value Perception	3,00	4,25	3,79
Economic Purchase	3,64	4,47	4,08
Quality Purchase	3,50	4,16	4,31
Buy-One-Get-One-Free	2,53	3,42	3,79

Averages of regulatory focus, hedonic/utilitarian value levels and economic/quality purchasing dimensions are given in Table 18. According to table, average of promotion-focused consumers in 1st and 3rd classes, and mean of the prevention-focused consumers in 2nd class, is higher than the others.

Considering the averages of promotion focus, prevention focus and buy-one-get-one-free promotion perception in study in Table 18, 3 classes were observed in Table 19 in analysis. Names of classes were determined as promotion-insensitive, prevention-sensitive, and promotion-sensitive.

In Table 19, it is understood that three different latent classes for consumers' attitudes emerge when buy-one-get-one-free promotion is applied in cosmetic products. When the classes with the possibility of purchasing promotional products are examined;

2. Class Prevention Sensitive: When the prevention-focused consumers who tend to buy promotional products are examined, the most basic characteristic of this class is that the hedonic value of the consumers is very low and the utilitarian value is high. Another characteristic of the class is the high probability of purchasing quality and economic products. When the class is examined in terms of demographic characteristics, it consists of consumers who are married with a probability of 72%, majority of whom are among the ages of 34-38 and 49 years old and over.

3. Class Promotion Sensitive: The main characteristics of this class are that the majority of consumers are promotion-focused and consumers have a high attitude to purchase promotional products. Consumers of this class have lower utilitarian value perception and higher hedonic value perception compared to consumers in the 2nd class. In addition, this class consists of younger consumers compared to class 2.

Based on these results, Table 20 shows the most distinctive characteristics of the latent classes sensitive to promotional products in case of buy-one-get-one-free promotion in cosmetic products.

It is understood that when buy-one-get-one-free sales promotion tool is applied to cosmetic products, consumers with a high utilitarian value level and 34-38 years old are more likely to purchase quality and economic products.

Table 19: Parameter Estimates of Buy-One-Get-One-Free Sales Promotion Tool in Cosmetic Products

Dimensions/ Demographic characteristics		Total Participants n=1006							
		1.Class Promotion Insensitive		2. Class Prevention Sensitive		3. Class Promotion Sensitive		ANOVA (One Way)	
		n	%	n	%	n	%	F	Sig.
Class Participations		422	41,9	300	29,8	284	28,3		
Buy-One-Get-One-Free Attitude	I do not agree	197	46,7	55	18,5	28	9,7		
	I'm undecided	143	33,8	99	33	74	26,3	115,5	p < 0.001
	I agree	82	19,5	146	48,5	182	64		
Utilitarian Value Perception	I do not agree	97	23	0	0	11	3,9		
	I'm undecided	214	50,7	22	7,5	65	22,8	245,5	p < 0.001
	I agree	111	26,3	278	92,5	208	73,3		
Hedonic Value Perception	I do not agree	236	55,9	191	63,5	36	12,8		
	I'm undecided	136	32,1	93	31,2	92	32,5	188,4	p < 0.001
	I agree	50	12	16	5,3	156	54,7		
Quality Purchase Attitude	I do not agree	66	15,6	5	1,8	0	0,1		
	I'm undecided	109	25,9	32	10,5	18	6,3	89,2	p < 0.001
	I agree	247	58,5	263	87,7	266	93,6		
Economic Purchase Attitude	I do not agree	56	13,4	0	0	5	1,9		
	I'm undecided	86	20,1	10	3,2	33	11,5	91,7	p < 0.001
	I agree	280	66,5	290	96,8	246	86,6		
Gender	Female	84	19,8	162	54	133	46,9		
	Male	338	80,2	138	46	151	53,1		
Marital Status	Single	146	34,6	84	28	160	56,3		
	Married	276	65,4	216	72	124	43,7		
Age	23 years and under	70	16,6	51	17,2	76	26,7		
	24-33 years old	40	9,5	46	15,3	61	21,4		
	34-38 years old	110	26,1	88	29,1	90	31,5		
	39-48 years old	62	14,5	40	13,3	32	11,5		
	49 years and older	140	33,3	75	25,1	25	8,9		
İncome	0-2000₺	64	15,2	51	17,1	57	20		
	2001-4000₺	119	28,3	78	26	88	31,1		
	4001-6000₺	95	22,4	82	27,3	80	28,2		
	6001- 8000₺	70	16,5	51	17,1	37	12,8		
	8001₺ and above	74	17,6	38	12,5	22	7,9		
Job	Officer	129	30,7	122	40,7	87	30,7		
	Worker-Self-employed	140	33,1	63	21,1	74	26,1		
	Retired- Student	102	24,2	54	17,8	88	30,8		
	Housewife-Not Working	51	12	61	20,4	35	12,4		
Education	Primary Education	33	7,9	9	2,9	0	0,1		
	High School	76	18	43	14,3	34	12,1		
	Associate degree	64	15,2	44	14,6	35	12,2		
	Bachelor's degree	219	51,7	151	50,7	165	58		
	Postgraduate	30	7,2	53	17,5	50	17,6		
Shopping Frequency	In 1-3 days	168	39,9	155	51,7	180	63,2		
	Weekly	150	35,5	94	31,3	70	24,7		
	For 15 days	58	13,8	22	7,3	25	8,9		
	Monthly	46	10,8	29	9,7	9	3,2		
Average Spending	125₺ and below	178	42,3	149	49,8	121	42,7		
	Between 126- 250₺	118	27,8	77	25,5	70	24,6		
	251₺ and above	68	16,1	33	11,1	29	10,2		
	376₺ and above	58	13,8	41	13,6	64	22,5		

Table 20: Consumers Sensitive to Buy-One-Get-One-Free Sales Promotion Tool in Cosmetic Products

Dimensions/ Demographic characteristics	2.Class Prevention Sensitive	3. Class Promotion Sensitive
Utilitarian Value Perception	High	High
Hedonic Value Perception	Low	High
Quality Purchase Attitude	High	High
Economic Purchase Attitude	High	High
Gender	Female	Male
Marital Status	Married	Single
Age	34-38 years old	34-38 years old
Income	4001-6000₺	4001-6000₺
Job	Officer	Retired-Student- Officer
Education	Bachelor's degree	Bachelor's degree
Shopping Frequency	1-3 days	1-3 days
Average Spending	up to 125₺	up to 125₺

CONCLUSION

When the literature is examined, it can be said that there is a conceptual relationship between hedonic and utilitarian perception and sales promotion tools (Schindler, 1992:431-451; Chandon et al., 2000:65-81; Santini et al., 2015:423), between hedonic and utilitarian value perceptions and promotion and prevention focuses which create regulatory focuses (Arnold & Reynolds, 2009:308-320; Lee, Liu & Cheng, 2018:789-805), and finally between regulatory focus and sales promotion tools (Ramanathan & Dhar, 2010: 542-552).

In latent class analysis, it was understood that in case of price discount in cleaning products, there are three different classes and only one of these three classes is sensitive to promotional products. It has been observed that purchase probability of consumers in prevention sensitive latent class is higher than the other classes in the case of applying a price discount sales promotion tool in cleaning products. In the prevention sensitive latent class, consumers with high utilitarian value, low hedonic value, married and officer are more likely to purchase promotional products than consumers with other demographic characteristics.

It has been understood that four different latent classes are formed in the case of buy-one-get-one-free application in cleaning products, and two classes out of these four classes are sensitive to the sales promotion tool. Among these classes, mostly women and married consumers, who are in the prevention sensitive latent class, have a low hedonic value and a high utilitarian value, and are more possible to purchase products with sales promotion. Consumers with high utilitarian and hedonic value levels, high married rates, and average shopping of 376₺ and above are in the majority in the latent class of promotion-sensitive. Consumers with such characteristics are also more likely to purchase products with sales promotion.

In the case of applying the price discount sales promotion tool in cosmetic products, it has been understood that three different latent classes are formed and two classes out of these three classes are sensitive to the sales promotion tool. Among these classes, consumers in the prevention sensitive latent class with low hedonic value perception, high utilitarian value perception, mostly married, officer, 34-38 years old, shopping for 125₺ on average are more likely to purchase. Consumers who are in the promotion-sensitive latent class, have a high hedonic and utilitarian value perception, are between 34-38 years old, are officer, have a high probability of economic and quality purchasing, and shoppers up to 125₺ on average are more likely to purchase.

It has been understood that three different latent classes are formed in the case of buy-one-get-one-free application in cosmetic products, and two classes out of these three classes are sensitive to the sales promotion tool. Consumers in the prevention-sensitive latent class have a high utilitarian value perception and a low hedonic value perception, mostly married, between 34-38 years old, officer, and shopping up to 125₺ on average, are more likely to purchase. Consumers in the promotion-sensitive latent class with a high hedonic and utilitarian value perception, single and male-dominated, aged 34-38, officer, retired and students, with a high probability of economic and quality purchase, and shopping up to

125₺ on average, are more likely to purchase. Promotion-sensitive latent class consists of consumers with less utilitarian value perception and more hedonic value perception than prevention-sensitive latent class.

Prevention-focused individuals focus on negative signals to avoid making mistakes and negative consequences (Kirmani & Zhu, 2007: 689). In this context, prevention-focused individuals are more sensitive to losses and shocks and are more oriented towards utilitarian values. Because the utilitarian perception of value is based on precise and concrete data regarding success or failure (Arnold & Reynolds, 2009: 312). Prevention-focused consumers are more likely to consider the utilitarian benefit of the product (Chernev, 2004: 114; Roy & Ng, 2012: 82). When the results obtained in this study were examined, it was observed that the study was similar to literature studies. In the study, it was determined that when price reductions and buy one get one free sales promotion tools were applied in cleaning and cosmetic products, the utilitarian value perception level of prevention-sensitive latent classes was high and the hedonic value perception level was low.

Imagination and pleasure are the main factors of hedonic consumption (Hirschman & Holbrook, 1982: 94). Experiencing these factors requires the desire, dreaming, broad thinking and deep abstraction characteristics of the promotion focus (Higgins 1997: 1283; Arnold & Reynolds, 2009: 312). Promotion-focused consumers are better at focusing on the hedonic benefit of the products they purchase. In the study, when the latent class analyzes were examined, it was seen that the hedonic value level of the promotion-sensitive latent class was high in case of buy one get one free in cleaning products and in case of buy one get one free and price discount in cosmetic products.

Contribution of the study to the literature

With this study, it was concluded that latent class analysis can be used in the field of marketing. Accordingly, in the study, through the latent class analysis, it was tried to become more clear which consumers purchased the products sold in supermarkets. With this study, it is aimed for corporate supermarkets to better understand the consumers who prefer them, to improve the quality of the products they offer to consumers, and to directly appeal to certain consumers through various advertisements and promotions for the products. In addition, the study tried to show that latent class analysis can be used to determine utilitarian and hedonic value perceptions from consumer behaviors.

Therefore, it was understood in the study that it is possible to obtain strong empirical evidence on the effect of regulatory focus theory on consumers' purchasing behavior from products to which sales promotion tools are applied.

Considering the dimensions of regulatory focus, hedonic value perception, utilitarian value perception, economic purchasing and quality purchasing, determining the latent classes of consumers provides the opportunity for supermarket managers to predict which consumers may turn to which sales promotion tools. Thus, consumers' perceptions of the sales promotion tools applied in the supermarket departments can be explained with the regulatory focus theory. With the help of latent class analysis, supermarkets operating in an intensely competitive environment can reduce their costs and increase their profitability rates.

Conceptually, this study allows examining the effects of regulatory focus on consumers' attitudes to purchase products for which sales promotion tools are applied, based on their perceptions of sales promotion tools.

Limitations and Future Lines of Research

Due to time and cost constraints, which are the main constraints of the study, the sample of the study consisted of consumers shopping at markets operating in Kahramanmaraş province. Therefore, it is not possible to make a generalization about the universe in the study based on the data obtained with the non-random sampling method. In future research on the subject, the conceptual structure can also be tested using data obtained by random sampling method. Due to current limitations, this study included consumers who shop at traditional markets. Therefore, in future studies, various studies can be conducted on consumers who shop from online markets. Additionally, future research can be conducted for various departments such as clothing, sports and outlet departments, which could not be included in the study due to significant limitations.

REFERENCES

Ailawadi K.L., Neslin A.A. & Gedenk K., (2001). Pursuing the value conscious consumer: store brands versus national brand promotion. *Journal of Marketing, 65 (1), 71-89*.

Arnold, M. J., & Reynolds, K. E. (2009). Affect and retail shopping behavior: Understanding the role of mood regulation and regulatory focus. Journal of Retailing, 85(3), 308-320.

Bakewell, C., & Mitchell, V. W. (2003). Generation Y female consumer decision-making styles. International Journal of Retail and Distribution Management, 31(2), 95-106.

Bartholomew, D., & Knott, M. (1999). Latent Variable Models and Factor Analysis. 2nd edition. London: Arnold.

Bridges, E., Briesch, R., & Yin, C. K. (2006). Effects of prior brand usage and promotion on consumer promotional response. Journal of Retailing, 82(4), 295-307.

Chandon, P., Wansink, B., & Laurent, G. (2000). A benefit congruency framework of sales promotion effectiveness. Journal of Marketing, 64(4), 65-81.

Chernev, A. (2004). Goal-attribute compatibility in consumer choice. Journal of Consumer Psychology, 14(1), 141-150.

Childers, T. L., Carr, C. L., Peck, J., & Carsond, S. (2001). Hedonic and utilitarian motivations for online retail shopping behavior. Journal of Retailing, 77, 511-535.

Crowe, E. & Higgins, E. T. (1997). Regulatory focus and strategic ınclinations: promotion and prevention in decision-making. Organizational Behavior and Human Decision Processes, 69(2), 117-132.

Dias, J.G., & Vermunt, J.K. (2007). Latent classmodeling of website users' search patterns: implications for online market segmentation. J Retail Consum Serv 14, 359-368.

Foerster, J., Higgins, E. T. & Idson, L. C. (1998). Approach and avoidance strength during goal attainment: regulatory focus and the "goal looms larger" effect. Journal of Personality and Social Psychology, 75(5), 1115-1131.

Gedenk, K., Neslin, S. A. & K. L. Ailawadi (2006). "Sales promotion" in retailing in the 21st Century. Manfred Krafft and Murali K. Mantrala (Eds), Berlin: Springer.

Güngör Culha, D., Korkmaz, M. (2011). Örtük sınıf analizi ile bir örnek uygulama. Eğitimde ve Psikolojide Ölçme Değerlendirme Dergisi, 2(2), 191-199.

Hawkes, C., (2009). "Sales promotions and food consumption," Nutrition Reviews, 67(6), 333-342.

Herzenstein, M., Posavac, S., & Brakus, J. (2007). Adoption of new and really new products: The effects of self-regulation systems and risk salience. Journal of Marketing Research, 44(2), 251-260.

Higgins, E. T. (1997). Beyond pleasure and pain. American Psychologist, 52(12), 1280-1300.

Higgins, E. T., Friedman, R. S., Harlow, R. E., Idson, L. C., Ayduk, O. N., & Taylor, A. (2001). Achievement orientations from subjective histories of success: Promotion pride versus prevention pride. European Journal of Social Psychology, 31(1), 3-23.

Jaradat, A.S., Jaradat, M., & Yassine, L.A. (2011). Promotion objectives, strategies and tools. Journal of Contemporary Research in Business, 3(2), 1682-1694.

Kale, D., (2018). The impact of utilitarian and hedonic value on online shopping behavior (unpublished). International Conference on Digital Innovation: Meeting the Business Challenges, 263-270.

Kim, S. & Kim, J., (2016). The influence of hedonic versus utilitarian consumption goals on the compromise effect. Marketing Letters, 27(2), 387-401.

Kirmani, A., & Zhu, R. (2007). Vigilant against manipulation: The effect of regulatory focus on the use of persuasion knowledge. Journal of Marketing Research, 44(4), 688-701.

Kotler, P. & Armstrong, G., (2012). Principles of Marketing (14th ed.). United States: Pearson Prentice Hall.

Kotler, P. & Keller, K. L. (2018). Pazarlama Yönetimi. (Çev. İbrahim Kırcova), Beta Yayıncılık.

Krishnan, M. & Bhandare, U. (2010). Retail advertising and promotional strategies in growing consumer market. Abhinav Journal of Research in Commerce & Management, 1(1), 40-49.

Kwok, S. & Uncles, M. (2015). Sales Promotion Effectiveness: the impact of consumer differences at an ethnic-group level. Journal of Product & Brand Management, 170-186.

Lanza, S. T., Flaherty, B. P., & Collins, L. M. (2003). Latent class and latent transition analysis. J. A. Schinka, W. F. Velicer & I. B. Weiner (Ed.), Handbook of psychology: Research methods in psychology Vol.2 Hoboken, New Jersey: John Wiley & Sons.

Lindholm, O. (2008). The influence of sales promotion on consumer behavior in financial services. Department Of Marketing And Management, Master's Thesis, Helsinki School Of Economics.

Lazarsfeld, P.F., & Henry, N.W. (1968). Latent Structure Analysis. Houghton Mifflin, Boston.

Lee, H., Liu, S., & Cheng, Y. (2018). Positive or negative? The influence of message framing, regulatory focus, and product type. International Journal Of Communication,12, 789-805.

Li, S., Sun, Y., & Wang, Y. (2007). 50% off or Buy one get one free? frame preference as a function of consumable nature in dairy products. The Journal of social psychology, 147, 413-421.

Lin, T. H., & Dayton, C. M. (1997). Model selection information criteria for non-nested latent class models. Journal of Educational and Behavioral Statistics, 22(3), 249-264.

Mano, H. & Oliver, R.L. (1993). Assessing the dimensionality and structure of the consumption experience: Evaluation, feling, and satisfaction. Journal of Consumer Research, 20(3), 451-466.

Meo, A., Abbas, M., Sajjad, M., Rizwan, M., Bukhari, S., & Hameed, M. (2014). The impact of promotional tools on sales promotion. Journal of Public Administration and Governance, 4(2), 202-216.

Osman, S., B. C. Yin-Fah, & Y. S. Foon (2011). Simulation of sales promotions towards buying behavior among university students. International Journal of Marketing Studies, 3(3), 78- 88.

Pham, M. T. & Chang H. H. (2008). Regulatory focus and regulatory fit in consumer search and consideration of alternatives. Advances in Consumer Research, 35, 229-232.

Pham, M. T. & Higgins E. T. (2005). Promotion and prevention in consumer decision-making: State of the art and theoretical propositions, in Inside Consumption: Frontiers of Research on Consumer Motives, Goals, and Desires, S. Ratneshwar and David Glen Mick (ed.), London, UK: Routledge,

Ramanathan, S. & Dhar, S. K. (2010). The effect of sales promotions on the size and composition of the shopping basket: Regulatory compatibility from framing and temporal restrictions. Journal of Marketing Research, 47(3), 542-552.

Renwarin, J. (2019). The evaluation of sales promotion in Jakarta. Retail Business, Jurnal Manajemen, 23, 191-206.

Rindskopf, D. (2002). The use of latent class analysis in medical diagnosis. Proceedings of the Annual Meeting of the American Statistical Association.

Roy, R, & Ng, S. (2012). Regulatory focus and preference reversal between hedonic and utilitarian consumption, Journal of consumer behaviour, 11(1), 81-88.

Santini, F. O., Sampaio, C. H., Perin, M. G., & Vieira, V. A. (2015). An analysis of the influence of discount sales promotion in consumer buying intent and the moderating effects of attractiveness. Revista de Administração (São Paulo), 50(4).

Schindler, R. M. (1992). A coupon is more than a low price: Evidence from a shopping simulation study. Psychology & Marketing, 9(6), 431-451.

Shao, B., Chang, L., & Zhang, L. (2013). The effect of online return shipping insurance and regulatory focus on consumer behavior. Proceedings of 23rd International Business Research Conference.

Skrondal, A., & Rabe-Hesketh, S. (2004). Generalized Latent Variable Modeling: Multilevel, Longitudinal and Structural Equation Models. Boca Raton, FL: Chapman & Hall.

Tekle, F. B., Gudicha, D.W. & Vermunt, J.K. (2016). Power analysis for the bootstrap likelihood ratio test for the number of classes in latent class models. Adv Data Anal Classif, 10, 209-224.

TUİK, 2019. Hane halkı tüketici dağılımları, http://www.tuik.gov.tr/UstMenu.do?metod=temelist (Erişim: 01.01.2020).

Ubeja, S. (2014). Study of sales promotion mix on customer satisfaction with reference to shopping malls in Indore. Global Journal of Finance and Management, 6(3), 245-252.

Vermunt, J. K. & Magidson, J. (2013). LG-Syntax User's Guide: Manual for Latent GOLD 5.0 Syntax Module. Belmont, MA: Statistical Innovations Inc.

Zenor, M. J, & Srivastava, R.K. (1993). Inferring market structure with aggregate data: a latent segment logit approach. J Mark Res 25, 369-379.

Zhu, P., Miao, C., Wang, Z. & Li, X. (2023) Informational cascade, regulatory focus and purchase intention in online flash shopping, Electronic Commerce Research and Applications, 62, https://doi.org/10.1016/j.elerap.2023.101343.

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The Determinants of Prices of Fan Tokens as a New Sports Finance Tool

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ABSTRACT

In the Covid-19 era, the income sources of sports clubs decreased, but the importance of fan tokens as new communication, management, and income source for sports clubs increased with Blockchain technology. For this reason, we examined the relationships between fan token prices and club success, transaction volume, and attractiveness factors and tried to be revealed the important determinants of fan token prices. First of all, cross-section dependence, homogeneity, and unit root tests carried out to determine the most suitable methods for panel data model. Then the durbin test was performed and it was concluded that the variables were cointegrated. Finally, the PMG/ARDL test and it was observed that the most important determinants of fan token prices were club success and transaction volume, respectively. While these factors affect fan token prices positively, the effect of the attractiveness factor is seen as less important and negative compared to other factors. In addition, in the error correction model established, the existence of a long-term equilibrium relationship between the variables was confirmed. It was concluded that the short-term deviations returned to the equilibrium after approximately 21 days.

Keywords: Fan Token, Sports Finance, Club Success, Google Trends, Euro Club Index.

JEL Classification Codes: G12, G15, G4, Z23

Referencing Style: APA 7

INTRODUCTION

Due to the Covid-19 epidemic worldwide, sports clubs have experienced great income losses. The postponement of the 2020 European Football Championship caused the clubs to postpone their gains from such organizations. In addition, the clubs were deprived of another important source of income because the matches were held without spectators so that the virus does not spread. Football clubs faced a very difficult process financially with the decrease in stadiums, sponsorships, and broadcaster revenues. In the face of all these developments, the importance of social distance all over the world has made the digitalization of all kinds of communication compulsory. Tremendous growth has occurred in the cryptocurrency sector with the effect of increasing digitalization during the epidemic period, and Blockchain technology has become a new communication, governance, and income source for sports clubs. First launched as a blockchain-based app in late 2019, Socios.com has provided the ability to connect with sports organizations through fan tokens minted as exchangeable digital assets on the Chiliz blockchain (Chiliz, n.d.). Chiliz, a blockchain fintech company, has collaborated with more than 60 sports organizations as well as World giants such as Juventus, Paris-Saint Germain, AS Roma, and FC Barcelona. Fan token holders enjoy privileges such as VIP rewards as well as participating in club decision-making processes. For example, Juventus FC fans were able to choose the congratulatory song and the first official car of the team. AS Roma fans had the opportunity to ask questions to during a live briefing. Paris Saint-Germain fans were able to vote for the club's annual awards (GSIC, 2021).

While fan token holders have the right to participate in the decision-making processes of clubs, sports clubs can also raise funds from fan token sales. For example, the AC Milan club generated more than US $6 million in digital revenue from the first sale of fan tokens (IWF, 2021). In the news of Reuters (2021), it was stated that a part of the fee of the world-famous star Lionel Messi, who was transferred to France's largest football club Paris-Saint Germain, will be paid as PSG fan tokens. In the news of Marca (2022), it was mentioned that fan tokens will be the second-largest source of income for the sports industry. The total value of the fan token market is around US $300 Million as of February 2022, and Socios' presence is growing rapidly with the participation of formula one giants, leading e-sports teams, UFC and NBA teams (Chliz, n.d.).

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Most of the studies in the literature are related to major cryptocurrencies other than fan tokens. In research on Bitcoin and other major cryptocurrencies, in general, factors such as supply and demand, trading volume, exchange rate, gold price, oil price, attractiveness measured via Twitter, Wikipedia, and Google Trends, hash rate, and Dow Jones industrial average are associated with cryptocurrency prices (Kaminski, 2014; Yelowitz and Wilson, 2015; Georgoula et al., 2015; Kristoufek, 2015; Ciaian, Rajcaniova and Kanc, 2016; Wang, Xue and Liu, 2016; Zhu, Dickinson and Li, 2017; Sukamulja and Sikora, 2018; Panagiotidis, Stengos and Vravosinos, 2018; Sovbetov, 2018; Guizani and Nafti, 2019). In addition to these studies, Kwon (2021) revealed that the consumer sentiment index, US economic policy uncertainty index, exchange rate, and corporate bond index returns have significant effects on Bitcoin price.

Since fan tokens are quite new, there are limited studies on fan tokens in the literature (Demir et al., 2022; Scharnowski et al., 2023; Vidal-Tomás, 2022). When these studies were examined; Demir et al. (2022) found that the UEFA Champions League match results led to abnormal returns on fan token prices, but investors did not act similarly against domestic matches and European matches. Scharnowski et al. (2023) found no correlation between stocks of publicly listed sports clubs and fan token returns. They revealed that fan token prices determinants are football match results and investor interest as measured by Google Trends. On the other hand, Vidal-Tomás (2022) revealed that investors can reduce their risks through diversification with fan tokens. In this study, besides club success, the effect of transaction volume and attractiveness factors on fan token prices was analyzed by following the relevant cryptocurrency literature. Hash rate and supply-demand data for fan tokens could not be included in the study as it is not available. Unlike similar studies in the literature, this study focuses on the effects of a sustainable club success, not the effect of a single football match on fan token prices. This is because it is thought that the one-match success of a favorite team or a team that has guaranteed to leave or not to leave the group will have a limited effect on fan token prices.

Fan tokens have not yet received the necessary attention in the scientific world in terms of sports finance, despite being accepted around the world, being adopted by important sports clubs, being the subject of world-renowned magazines and news organizations, and an ever-growing ecosystem. Fan tokens have increasingly become a tool of sports management due to their potential to interact with fans, involve fans in management processes, and raise funds. For these reasons, the study aims to trying to determine the factors associated with fan tokens, which we believe to be a new management tool in terms of sports finance and to make inferences about the future of fan tokens. Thus, it is aimed to benefit the fund management of sports clubs, the support of fans to support their teams more appropriately, the investment decisions of investors and researchers. The findings will be able to reveal which factor is more important for fan token predictions. Due to all these explanations, in the next parts of the study, the relationships between fan token prices and club success, transaction volume, and attractiveness factors were tried to be revealed and important determinants of fan token prices were tried to be determined.

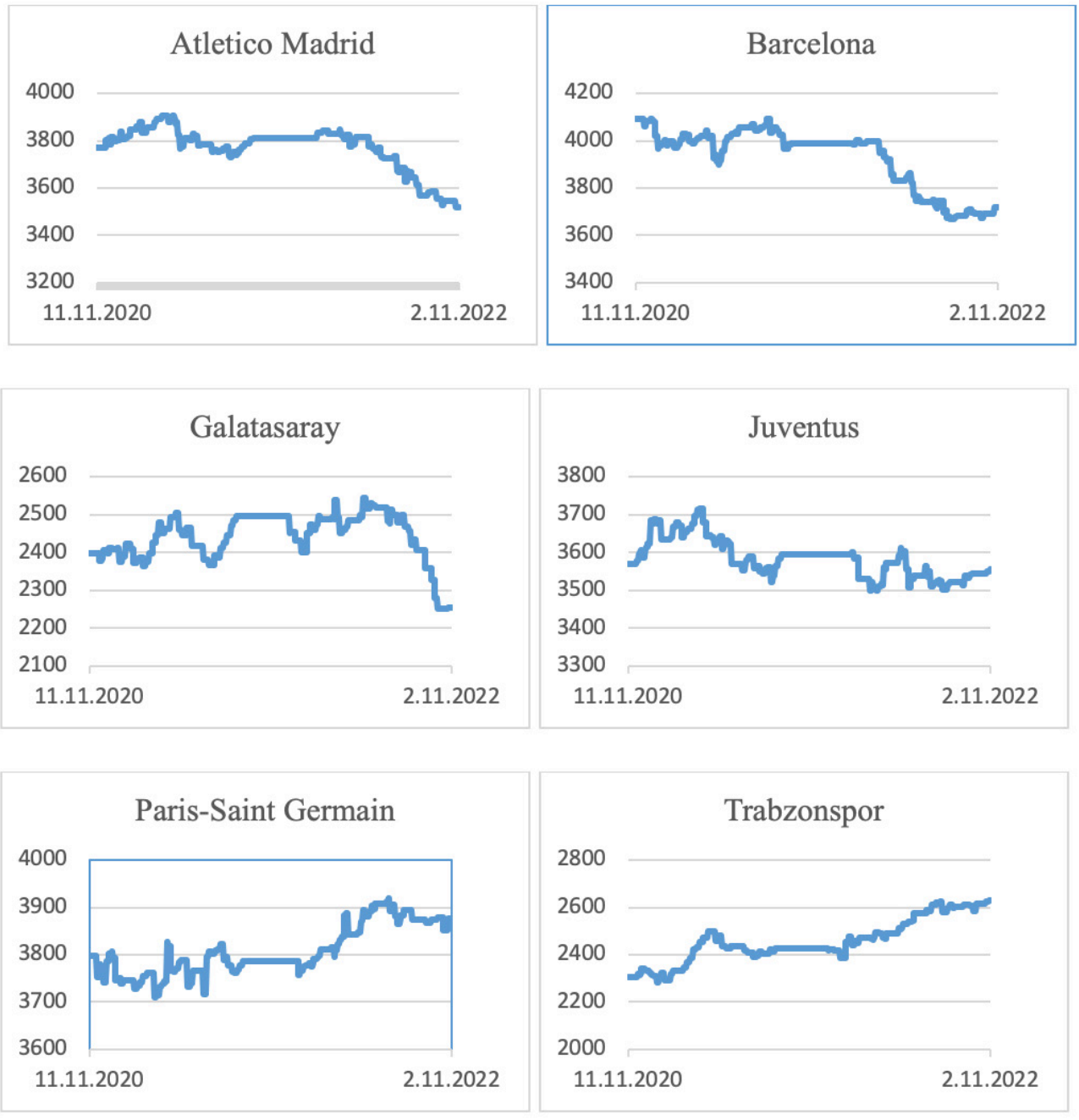
DATASET AND RESEARCH MODEL

In the study, a balanced panel data model was created using 458-day data for the period 11.11.2020-11.02.2022 to investigate the determinants of fan token prices. The fact that many of the fan tokens have just entered circulation and the insufficiency of historical data has caused the selection of the relevant period. For fan tokens, which are fairly new and have specific characteristics that differ from Bitcoin, the impact of a limited number of factors can be analyzed. This is because the historically available supply-demand data for Bitcoin in the current literature is not yet available for fan tokens. In addition, the lack of mining feature of fan tokens means that there is no hash rate for fan tokens. On the other hand, to investigate the effects of global factors on fan tokens, the data on Bitcoin closing prices, CCi30 index, and Dow Jones sector averages are neither stationary at the level of I(0) nor at the first difference I(I) for the period examined. For these reasons, this study is an early research report for relatively new fan tokens and includes the aforementioned limitations. In line with the existing literature, the applicable factors for fan token prices are transaction volumes and attractiveness factors. For this reason, transaction volumes of fan tokens as a factor of use in trade and Google Trends data of sports clubs as an attractiveness factor were used in the model. In addition, due to the relevance of fan tokens to the sports sector, Euro Club Index (ECI) data are included in the model as an indicator of club success.

$$FAN_{it} = ATT_{it} + SUCCESS_{it} + VOL_{it} + \varepsilon_{it} \quad (1)$$

Closing prices (FAN_{it}) and transaction volumes (VOL_{it}) of fan tokens, Google Trends data (ATT_{it}) and ECI data ($SUCCESS_{it}$) were obtained from https://coinmarketcap.com/, https://trends.google.com/ and Hybercube Business Innovation, respectively.[1] The natural logarithms

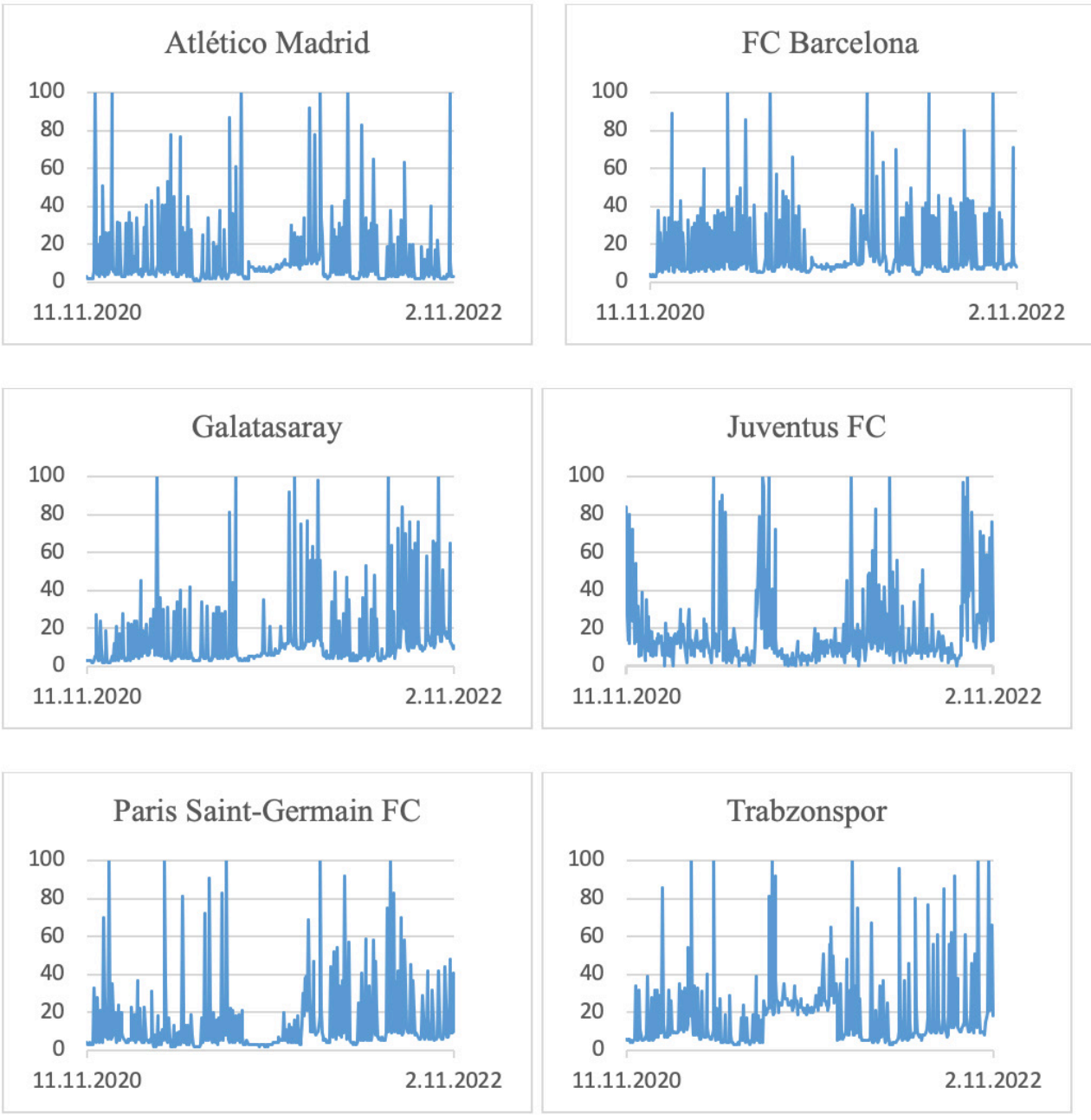
[1] We thank Mr. John Kleppe, consultant at Hybercube Business Innovation, for his assistance in providing the ECI data.



Graph 1. Historical ECI values for the review period

of all data were used within the scope of the study. To limit this analysis to the market capitalized rates of fan tokens, we collected the daily close price of Paris Saint-Germain (PSG), FC Barcelona (BAR), Juventus (JUV), Trabzonspor (TRA), Atletico Madrid (ATM), Galatasaray (GAL) from CoinMarketCap. This selection criterion is a common method for studies on cryptocurrencies (see: Wang, Andreeva and Martin-Barragan, 2023; Bouri and Jalkh, 2023; Bhambhwani, Delikouras and Korniotis, 2023). The fan tokens examined include fan tokens related to sports clubs in Spain, Italy, Turkey and France. Fan tokens are global and each fan token can be purchased by investors in different countries. Therefore, the results have a general implication, not a national one.

Euro Club Index (ECI): It is anticipated that there will be a positive relationship between fan token prices and club success, and the most important determinant of fan token prices will be club success. This is because the clubs that achieve successful results in sports competitions have more fans and therefore more investor potential. Also, while success may encourage investors to invest, fans resentful of the club as a result of failure are likely to dispose of their assets. ECI was chosen as an indicator of the club's success. ECI scores, which measure the success of clubs according to the results of national and international competitions, calculate a cumulative score by adding the new competition result to the previous competition results. ECI was developed by Hypercube

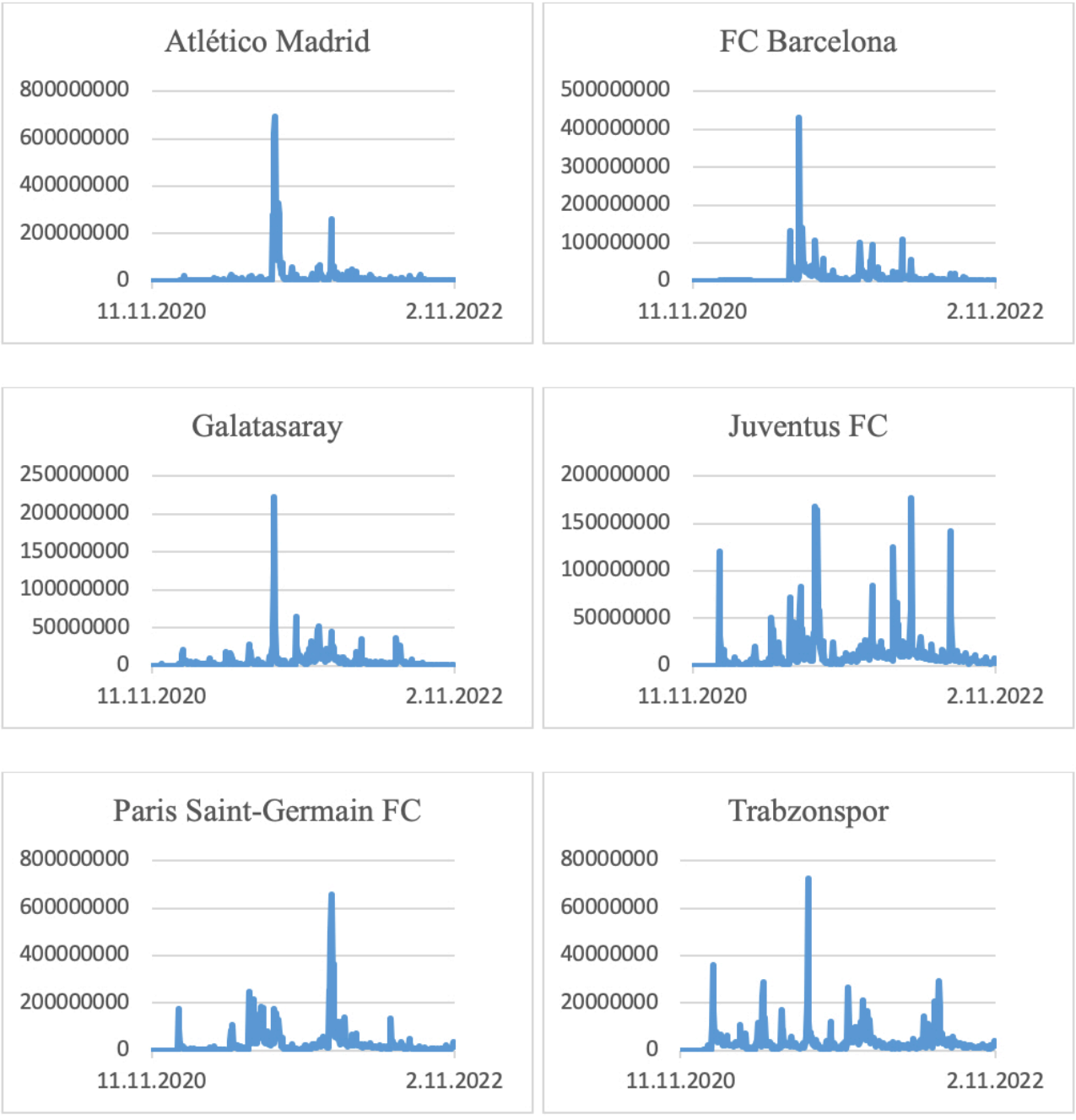


Graph 2. Historical Google Trends data for the review period

which is in close collaboration with Infostrada Sports. Information about ECI is given in Hybercube, which states that ECI is a solid indicator of a club's sporting power, which is the key to their brand value, transfers, and sponsorships.

Updated ECI values reflect changes in clubs' playing strength. A better-performing club rises in ECI, while a worse-performing club declines in ECI. The important advantage of ECI is that a strong club does not place a high ECI value on a victory against a weak team. Therefore, when favorite teams win, their ECI goes up a few points, while a weak club gets a higher ECI when they beat a strong club. The historical ECI values of the clubs included in the research for the research period are shown in Graph 1.

In Graph 1, it is seen that the clubs with the highest ECI values for the review period are Barcelona, Paris Saint-Germain, Atletico Madrid, Juventus, Trabzonspor, and Galatasaray, respectively. The period of May-August, where the ECI values do not change, shows the periods when the matches were not played. There are big differences between the ECI values of the clubs. However, these differences are not significant for the study. It is the changes in the ECI values that are important for the study. It is noteworthy that the ECI values of Atletico Madrid, Barcelona, and Galatasaray clubs decreased gradually in the 2021-2022 season, the ECI values of Paris Saint-Germain and Trabzonspor gradually increased, and the ECI value of Juventus remained almost flat. ECI



Graph 3. Historical trading volume data for the review period

does not designate clubs as successful or unsuccessful based on the result of a single match but is an indicator of sustainable success. It is expected that the increase/decrease in fan token prices of clubs rose/fell in ECI after a good/bad season.

Attractiveness: Google, Twitter, and Wikipedia sources have been used in many studies to measure the investment attractiveness of cryptocurrencies. To measure Bitcoin's investment attractiveness: Ciaian, Rajcaniova, and Kancs (2016) used Wikipedia; Sovbetov (2018) and Yelowitz and Wilson (2015) used Google Trends; Kristoufek (2015) used Google Trends and Wikipedia; Kaminski (2014) used Twitter; Georgoula et al. (2015) used Twitter and Wikipedia. Although the search engines used for the attractiveness factor have changed, generally positive relationships have been found between the Bitcoin price and the attractiveness factor in the studies. In this study, inquiries about sports club names were examined, not inquiries at a certain cryptocurrency level unlike the studies in the literature. The reason for this is to catch the level of following of the sports club that the fans are passionate about and the popularity of the club. Therefore, the relationship between the popularity of sports clubs in searches and the fan token prices of sports clubs is tried to be determined. Google Trends data was used to measure the popularity of sports clubs in searches. Google Trends

search terms and daily search volumes for the research period are shown in Chart 3.

Google Trends scores search words from 0-100 based on their search volume. In Graph 2, it is seen that Google Trends data is highly changeable daily. A club, which is very popular by reaching 100 points from time to time, may lose its popularity completely after a day. On the graph, it is seen that the Google search volumes for all clubs decreased in the May-August 2021 period. This is because the clubs go on vacation after the leagues are over. There may be an increase in the search volume of the clubs on match days. Therefore, it is highly probable that the football club with a negative result on the match day will also achieve high scores in search volumes. In this way, a team that falls in ECI can rise in Google Trends.

Volume: Trading volumes are often used as a measure of the use of cryptocurrencies in trade (Kaminski, 2014; Kristoufek, 2015; Wang, Xue and Liu, 2016; Kwon, 2021). The studies examined, it is understood that while there were positive and significant relationships between the trading volume and Bitcoin price in the early stages of Bitcoin, these relationships decreased with the maturation of the market. However, since fan tokens are relatively new cryptocurrencies compared to Bitcoin, it is expected that there will be strong positive relationships between trade volume and fan token prices, as in the early stages of Bitcoin. Historical transaction volume data of fan tokens for the research period are shown in Graph 3.

In Graph 3, it is seen that the transaction volumes of fan tokens related to sports clubs other than Paris-Saint Germain FC reached the maximum level between April and May 2021. However, the high transaction volumes realized in the April-May 2021 period generally did not recur during the review period and gradually decreased. PSG fan token transaction volume reached its maximum level in August 2021 and gradually moved away from this level in the following periods. Another noteworthy situation is the transaction volume data of the Juventus Fan token. Among the examined clubs, only the trading volume of Juventus fan tokens repeated the high trading volume values in May 2021 in September, October, and December 2021 periods.

METHODOLOGY

The study first used Pesaran and Yamagata (2008) Delta test for the homogeneity of slope coefficients of fan token prices, transaction volumes, attractiveness and club success variables. In this test, it is assumed that the error terms are distributed independently, and heterogeneous variance is allowed (Bersvendsen and Ditzen, 2021, p. 53).

Based on Pesaran and Yamagata (2008), the hetorogeneous panel data model with $k = k_1 + k_2$ regressors can be expressed as follows;

$$y_{i,t} = \mu_i + \beta'_{i1} x_{i1,t} + \beta'_{i2} x_{i2,t} + \varepsilon_{i,t} \quad (2)$$

The cross-sectional dimension in the model is represented by $i=1,...,N$, and the time dimension by $t=1,...,T$. μ_i is the unit-specific constant. β_{i1} and β_{i2} are vectors of unknown slope coefficients $k_1 x\ 1$ and $k_2 x$, respectively. $x_{i1,t}$ and $x_{i2,t}$ are vectors containing extrinsic regressors $k_1 x\ 1$ and $k_2 x\ 1$ respectively. In this case, the slope homogeneity hypotheses;

$$H_0: \beta_{i2} = \beta_2 \ for\ all\ i\ values$$

$$H_1: \beta_{i2} \neq \beta_2 \ for\ some\ values\ of\ i$$

The delta and adjusted delta test are as follows (Pesaran and Yamagata, 2008, p. 57);

$$\tilde{\Delta} = \sqrt{N}\left(\frac{N^{-1}\tilde{S}_2 - k}{\sqrt{2k}}\right) \quad (3)$$

$$\tilde{\Delta}_{adj} = \sqrt{N}\left(\frac{N^{-1}\tilde{S}_2 - E(\tilde{z}_{iT})}{\sqrt{Var(\tilde{z}_{iT})}}\right) \quad (4)$$

$$Var(\tilde{z}_{iT}) = \frac{2k_2(T-k-1)}{T-k_1+1} \quad (5)$$

The weighted difference between the pooled estimate and the cross-section specific estimate is known as $\tilde{S}_2$.

The CD test recommended by Pesaran (2004) was used to test the cross-sectional dependence. CD test is a powerful test for panel data models with or without heterogeneous and structural breaks (Pesaran, 2004, p. 18). The degree of bidirectional cross-section dependence in the panel is measured by factor loads Y_i and Y_j. The test hypotheses are as follows (Pesaran, 2004: 13);

$$H_0: \gamma_i = 0,$$

and the opposite hypothesis is shown as;

$$H_0: \gamma_i \neq 0 \ (for\ some\ i\ values) \quad i = 1, \dots \dots N$$

CD test statistics are shown by Pesaran (2004, p. 17) as follows;

$$CD = \sqrt{\frac{2}{N(N-1)}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\sqrt{T_{ij}}\,\hat{p}_{ij}\right)} \quad (6)$$

where T_{ij} is the number of observations for which the correlation coefficient is calculated, p_{ij} is the binary

correlation coefficients. Under the null hypothesis that there is no cross-sectional dependence when $T_i > k+1$, $T_{ij} > 3$, and N are large enough, the distribution conforms to the $CD \sim N(0,1)$ distribution.

CIPS test, which was suggested by Pesaran (2007) and created by taking the arithmetic average of the CADF test statistics, and allowing cross-sectional dependence, was used.

CIPS test statistics shown in equation (9) are obtained by taking the arithmetic average of the results obtained from the CADF test statistics (Pesaran, 2007: 276);

$$CIPS(N,T) = N^{-1}\sum_{i=1}^{N} t_i(N,T) \quad (7)$$

After these tests, the Durbin-Hausman test, which allows cross-sectional dependence and was developed by Westerlund (2008), was used and the cointegration relationship between the variables was revealed. The dependent variable was found to be stationary at the first difference $\mathrm{I}(\mathrm{I})$ and the independent variables at the level $\mathrm{I}(0)$ or the first difference $\mathrm{I}(\mathrm{I})$. The Durbin test can be used under these conditions.

Finally, in our study, the pooled mean group (PMG) test recommended for heterogeneous panel models by Pesaran, Shin, and Smith (1999) was applied to determine the coefficients of the variables. In this method, regardless of whether the variables are $\mathrm{I}(0)$ or $\mathrm{I}(1)$, the variables must not be $\mathrm{I}(2)$. The estimation of an ARDL(p,q,,,q) model with time dimension $t = 1, \dots, T$ and group dimension $i = 1, \dots, N$ can be expressed as follows (Pesaran, Shin, & Smith, 1999: 623) ;

$$y_{it} = \sum_{j=1}^{p} \lambda_{ij} y_{i,t-j} + \sum_{j=0}^{q} \delta'_{ij} x_{i,t-j} + \mu_i + \varepsilon_{it} \quad (8)$$

Here x_{it} $(kx1)$ is the vector of explanatory variables for group μ_i and represents the fixed effect. λ_{ij} is the lagged coefficients of the dependent variables, δ'_{ij} and $kx1$ are the coefficient vectors. The error correction form (ECM) of the equation can be derived as:

$$\Delta y_{it} = \theta_{it} y_{i,t-1} + \beta'_i x_{i,t} + \sum_{j=1}^{p-1} \lambda^*_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \delta^{*\prime}_{ij} \Delta x_{i,t-j} + \mu_i + \varepsilon_{it} \quad (9)$$

Here, the error correction rate of the tuning term is calculated as $\theta_i = -(1 - \sum_{j=1}^{p} \lambda_{ij})$, $\beta_i = \sum_{j=0}^{q} \delta_{ij}$. When $\theta_i = 0$, there is no long-term relationship. If the variables revert to a long-run equilibrium, this parameter is predicted to be strongly negative. β'_i shows the coefficient of the long-term relationships between the variables. $y_{i,t-j}$ and $x_{i,t-j}$ represent the j-term lagged values of the variables and Δ represent the first differences of the variables. λ^*_{ij} and δ^*_{ij} are obtained with the help of the following equations;

$$\lambda^*_{ij} = -\sum_{m=j+1}^{p} \lambda_{im} \qquad j = 1,2,\dots,p-1 \quad (10)$$

$$\delta^*_{ij} = -\sum_{m=j+1}^{q} \delta_{im} \qquad j = 1,2,\dots,q-1 \quad (11)$$

These equations provide the short-run dynamics corresponding to the long-run dynamics defined in the cointegration equation. In order to talk about the existence of a long-term equilibrium, the ECM parameter must be found to be negative and significant.

FINDINGS

The slope coefficients were heterogeneous vis-à-vis Delta test, a cross-section dependency in all our variables vis-à-vis Pesaran (2004) CD-test and the variables were stationary in their first differences vis-à-vis Pesaran (2007) CIPS-test results in the established model. These results on the preconditions of our analysis are presented in Tables 1a-1b and 1c in the Appendix 1.

According to the Durbin-Hausman test results shown in Table 1, it is seen that the $H_0: \emptyset_i = 1$ hypothesis is rejected for both group statistics and panel statistics. Therefore, it is possible to say that the panel data model created is cointegrated and there is at least one cointegration relationship between the groups in the panel.

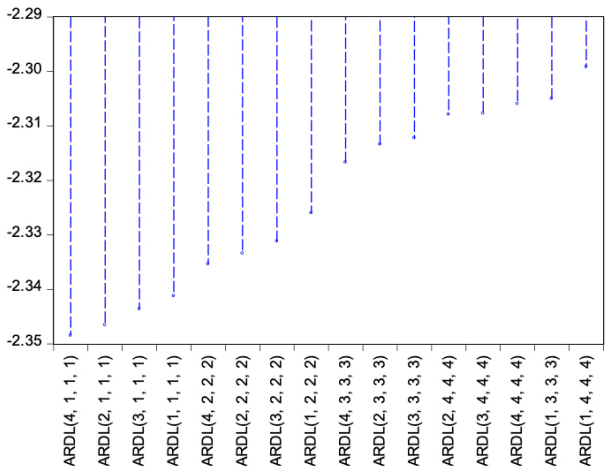
Hannan-Quinn Criterion (HQC) was used to determine the appropriate lag length before the ARDL limit test is applied. The lag length information of the 16 most suitable selected models is shown in Graph 4.

As can be seen in Graph 4, the most suitable model according to the HQC is the ARDL (4,1,1,1) model. Therefore, this model was taken as the basis for the analyzes carried out. Information on the PMG/ARDL test results performed for our model is shown in Table 2.

Table 1. Durbin-Hausman Cointegration Results

	Statistic	p-value
DH_g	-0.101	0.000
DH_p	3.322	0.000

Note: DH_g shows the group statistics for the Durbin Hausman test, and DH_p shows the panel statistics.



Graph 4. The 16 Most Suitable Models

When the long-term relationships of the ARDL (4,1,1,1) model in Table 2 are examined, it is seen that the SUCCESS, ATT and VOL variables are significant at the 1% level. Looking at the signs of the coefficients obtained from the test result, it is seen that club success and transaction volume affect fan token prices positively, while the attractiveness factor based on Google Trends negatively affects fan token prices. As can be seen from the results, the most influential factor on fan token prices is club success. Increasing of 1% in club success leads to an increase in fan token prices of approximately 3.5%. A 1% increase in Google search volumes causes a 0.14% decrease in fan token prices, while a 1% increase in transaction volumes causes an approximately 0.28% increase in fan token prices.

When the short-term relationships for the ARDL (4.1,1,1) model in Table 6 are examined, it is seen that the ECM (-1) error correction term coefficient is -0.048340 and significant. According to these results, the existence of a long-term equilibrium relationship is confirmed. This result indicates that if a shock occurs in the variables, the short-term deviations will be corrected by approximately 4.8% the next day. Therefore, short-term deviations come to equilibrium after about 21 days.

When the coefficients related to the short-term relationships in Table 8 are examined, it is seen that the D(ATT) and D(VOL) variables are significant at the 1% level. Therefore, a 1% increase in Google search volumes causes a decrease of approximately 0.0056% in fan token prices in the short term, while a 1% increase in transaction volumes causes an increase of approximately 0.045% in fan token prices in the short term. The coefficients of club success and fan token price first, second and third differences were found to be statistically insignificant.

Tablo 2. PMG/ARDL Test Results

Variable	Coef.	Std. Er.	t-stat.	p value
	Long Run Eq.			
SUCCESS	3.507878	0.703043	4.989561	0.0000
ATT	-0.136023	0.031675	-4.294316	0.0000
VOL	0.282356	0.019731	14.30996	0.0000
	Short Run Eq.			
ECM (-1)	-0.048340	0.013955	-3.464051	0.0005
D(FAN(-1))	-0.006187	0.047134	-0.131266	0.8956
D(FAN(-2))	-0.027593	0.025545	-1.080202	0.2801
D(FAN(-3))	0.065513	0.037675	1.738874	0.0822
D(SUCCESS)	0.591008	0.473255	1.248815	0.2118
D(ATT)	-0.005666	0.001374	-4.123708	0.0000
D(VOL)	0.045168	0.004910	9.199954	0.0000
C	-1.451921	0.416545	-3.485630	0.0005

Note: The maximum lag length was taken as 4. ECM (-1) represents the error correction term coefficient. Fan tokens are denoted as FAN, Euro Club Index as SUCCESS, trading volume as VOL and attractiveness factor as ATT.

ROBUSTNESS CHECK

There are studies showing that the price of Fan tokens can be affected by the price of other cryptocurrencies or the main cryptocurrencies used to purchase them (Demir and Aktaş, 2022; Scharnowsk, Scharnowski and Zimmermann, 2023). For this reason, we included the prices of Chiliz, a token used to purchase fan tokens, and Bitcoin, the largest cryptocurrency, in the PMG/ARDL model to test the robustness of the results. The results we obtained in Table 2 can be compared to Appendix 1, Table 1d. The results are in line with our previous findings. It was found that the results obtained are not driven by the prices of Chiliz and Bitcoin and are therefore robust to changes in the prices of other cryptocurrencies.

CONCLUSION AND DISCUSSION

In this study, long and short-term relationships between fan token prices, club success, transaction volume and attractiveness factors were tried to be revealed. As a result of the analysis, it has been determined that fan token prices are in a long-term equilibrium relationship with club success, transaction volume and attractiveness factors.

The most important determinant of the fan token price in the long-term equation was the club success. This situation shows the importance of sustainable success for the sports clubs. Continued long-term success or failure is significantly reflected in fan token prices. For this reason, it is recommended that sports clubs that have not yet issued fan tokens or have not released their entire supply to the market should wait for a season in which the club is progressing successfully. Entering the market at the right time will contribute to raising more funds for the sport club. The second most important determinant of fan token prices is transaction volumes. Transaction volumes are positively reflected in fan token prices in both the long and short term. For this reason, it is important for clubs to research the market where the fan tokens will be listed and try to list fan tokens on exchanges with high number of users and transaction volume. In addition, in order to increase the use of fan tokens in commerce, it is recommended that clubs provide more privileges for fan token holders and organize events frequently. The attractiveness factor negatively effects fan token prices both in the long and short term. This situation makes us think that the bad news about the clubs is on the agenda more than the good news. Therefore, it can be deduced that every negativity related to the clubs, which had a particularly turbulent and bad season, is closely followed by the fans and that these negativities are reflected in the fan token prices. For this reason, it is recommended that club managers focus on policies and measures to ensure unity of purpose from the lowest business unit to the highest business unit in order not to share in-club conflicts and disagreements with the media.

The fact that Google search volumes and club success effect fan token prices suggests that fan tokens can be considered as an emotional investment tool for investors. In addition, fan tokens come to the fore as a new source of funding for sports clubs after the loss of income during the Covid-19 epidemic. The market value of fan tokens is expected to increase exponentially in the future due to the growing ecosystem of fan tokens, the financial need of sports clubs, and the emotional attachment of fans. Therefore, finally, our advice for fan token investors is to invest in fan tokens of sports clubs that they believe will have a successful season, are listed on major exchanges in terms of trading volume, and where intra-club conflicts are minimal. In future studies on fan tokens, it is recommended to investigate whether fan tokens can be seen as an alternative investment tool to sports stocks and to investigate the effectiveness of fan tokens in participating in the management decisions of the fans.

Additionally, the study has some limitations. ECI values do not change during off-season periods. Therefore, the findings regarding ECI are valid for in-season periods. In addition, the attractiveness factors captured by Google Trends may vary greatly on clubs' match days and on dates when there is important good and bad news about the clubs. Therefore, the results of this study indicate that bad news is searched more in search engines. However, the maximum value for Google Trends data is 100, which means that all clubs with a value of 100 are at the same search level. However, this may not actually be the case. This is one of the important limitations of the study. Therefore, different attractiveness factors can be used in future studies. For example, X or Wikipedia.

REFERENCES

Bhambhwani, S. M., Delikouras, S. and Korniotis, G. M. (2023). Blockchain characteristics and cryptocurrency returns. Journal of International Financial Markets, Institutions and Money, 86, 1-18. Doi: 10.1016/j.intfin.2023.101788

Bersvendsen, T. and Ditzen, J. (2021). Testing for slope heterogeneity in Stata. The Stata Journal, 21(1), 51-80. Doi: 10.1177/1536867X211000004

Bouri, E. and Jalkh, N. (2023). Spillovers of joint volatility-skewness-kurtosis of major cryptocurrencies and their determinants. International Review of Financial Analysis, 90, 1-17. Doi: 10.1016/j.irfa.2023.102915

Chiliz (n.d.). Chiliz $CHZ - Driving Socios.com forward. Avaliable at: https://www.chiliz.com/en/our-story/

Ciaian, P., Rajcaniova, M. and Kancs D. (2016). The economics of Bitcoin price formation. Applied Economics, 48(19), 1799–1815. Doi: 10.1080/00036846.2015.1109038

CoinMarketCap (n.d.). Historical data [Data], Avaliable at: https://coinmarketcap.com/

Demir, E., Ersan, O. and Popesko, B., (2022). Are Fan Tokens Fan Tokens? Finance Research Letters, 102736. Doi: 10.1016/j.frl.2022.102736

Demir, M. A. and Aktaş, R. (2022). The relationship between fan tokens and cryptocurrencies: An empirical evıdence. International Journal of Economic and Administrative Studies, 37, 55-70. Doi: 10.18092/ulikidince.1112054

Georgoula, I., Pournarakis, D., Bilanakos, C., Sotiropoulos, D. and Giaglis, G.M. (2015). Using Time-Series and Sentiment Analysis to Detect the Determinants of Bitcoin Prices, MCIS 2015 Proceedings. 20, Avaliable at: https://aisel.aisnet.org/mcis2015/20

GoogleTrends (n.d.). Discover what topics are searched all over the World [Data], Avaliable at: https://trends.google.com/

GSIC (2021). The sports industry and the digital transformation: 5 years ahead [Report]. Avaliable at: https://sport-gsic.com/

Guizani, S. and Nafti, I. K. (2019). The determinants of Bitcoin price volatility: An investigation with ARDL model. Procedia Computer Science, 164, 233-238. Doi: 10.1016/j.procs.2019.12.177

Hypercube (n.d.). Euro Club Index (ECI) [Data], Avaliable at: https://www.euroclubindex.com/

IWF (2021). AC Milan crypto launch raises $6m as early trading volumes top $50m [Newsletter], Avaliable at: https://www.insideworldfootball.com/

Kaminski, J. C. (2014). Nowcasting the Bitcoin market with Twitter signals. Working Paper, Doi: 10.48550/arXiv.1406.7577

Kristoufek, L (2015) What Are the Main Drivers of the Bitcoin Price? Evidence from Wavelet Coherence Analysis. PLoS ONE, 10(4), 1-15. Doi: 10.1371/journal.pone.0123923

Kwon, J. H. (2021). On the factors of Bitcoin's value at risk, Financial Innovation, 7, 1-31. Doi: 10.1186/s40854-021-00297-3

Marca (2022). Fan Tokens to become second largest source of revenue for sports industry [Newsletter]. Avaliable at: https://www.marca.com/

Panagiotidis, T., Stengos, T. and Vravosinos, O. (2018) On the determinants of bitcoin returns: A LASSO approach. Finance Research Letters, 27, 235-240. Doi: 10.1016/j.frl.2018.03.016

Pesaran, M.H. (2004). General diagnostic tests for cross-sectional dependence in panels. Cesifo Working Paper No. 1229, 1-39. Avaliable at: https://www.cesifo.org/

Pesaran, M.H. (2007). A simple panel unit root test in the presence of cross-section dependence, Journal of Applied Econometrics, 22, 265-312. Doi: 10.1002/jae.951

Pesaran, M.H. and Yamagata, T. (2008). Testing slope homogeneity in large panels, Journal of Econometrics, 142(1), 50-93. Doi: 10.1016/j.jeconom.2007.05.010

Pesaran, M.H., Shin, Y. and Smith, R.P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. Journal of the American Statistical Association, 94(446), 621-634. Doi: 10.2307/2670182

Reuters (2021). Messi joins crypto craze as gets part of PSG fee in fan tokens [Newsletter]. Avaliable at: https://www.reuters.com/

Scharnowski, M., Scharnowski, S. and Zimmermann, L., (2023). Fan Tokens: Sports and Speculation on the Blockchain, Journal of International Financial Markets, Institutions & Money, 89, 1-27. Doi: 10.1016/j.intfin.2023.101880

Sovbetov, Y. (2018). Factors influencing cryptocurrency prices: Evidence from Bitcoin, Ethereum, Dash, Litcoin, and Monero. Journal of Economics and Financial Analysis, 2(2), 1-27. Doi: 10.1991/jefa.v2i2.a16

Sukamulja, S. and Sikora, C. O. (2018). The new era of financial innovation: The determinants of Bitcoın's price. Journal of Indonesian Economy and Business, 33(1), 46-64. Doi: 10.22146/jieb.30646

Vidal-Tomás, D., (2022). Blockchain, sport and fan tokens. Munich Personal RePEc Archive. MPRA Paper No. 111350. https://mpra.ub.uni-muenchen.de/111350/

Wang, J., Xue, Y., and Liu, M. (2016). An analysis of bitcoin price based on VEC model. International Conference on Economics and Management Innovations.

Wang, Y., Andreeva, G. and Martin-Barragan, B. (2023). Machine learning approaches to forecasting cryptocurrency volatility: Considering internal and external determinants. International Review of Financial Analysis, 90, 1-21. Doi: 10.1016/j.irfa.2023.102914

Westerlund, J. (2008). Panel cointegration tests of the fisher effect. Journal of Applied Econometrics, 23, 193-233. Doi: 10.1002/jae.967

Yelowitz, A. and Wilson. M. (2015). Characteristics of Bitcoin users: an analysis of Google search data. Applied Economics Letters, 22(13), 1030-1036. Doi: 10.1080/13504851.2014.995359

Zhu, Y., Dickinson, D. and Li, J. (2017). Analysis on the influence factors of bitcoin's price based on VEC model. Financial Innovation, 3(1), 1-13. Doi: 10.1186/s40854-017-0054-0.

Appendix 1. Preliminary model checks

Table 1a. Delta Test Results

	Statistic	p-value
$\tilde{\Delta}$	33.813	0.000
$\tilde{\Delta}_{adj}$	33.999	0.000v

Table 1b. Cross-section Dependency Test Results

Variables	CD-test	p-value
FAN	51.14	0.000
SUCCESS	-6.25	0.000
ATT	17.98	0.000
VOL	59.57	0.000

Table 1c. Unit Root Test Results

I(0)			I(I)		
	Specification without trend			**Specification without trend**	
Variable	Zt-bar	p-value	Variable	Zt-bar	p-value
FAN	-1.175	0.120	DFAN	-11.975***	0.000
SUCCESS	1.959	0.975	DSUCCESS	-11.975***	0.000
ATT	-11.975***	0.000	DATT	-11.975***	0.000
VOL	-11.975***	0.000	DVOL	-11.975***	0.000
	Specification with trend			**Specification with trend**	
Variable	**Zt-bar**	**p-value**	**Variable**	**Zt-bar**	**p-value**
FAN	-1.029	0.152	DFAN	-11.982***	0.000
SUCCESS	-0.177	0.430	DSUCCESS	-11.982***	0.000
ATT	-11.982***	0.000	DATT	-11.982***	0.000
LNVOL	-11.982***	0.000	DVOL	-11.982***	0.000

Note: "***" indicate 1% significance levels.

Table 1d. Robustness check

Variable	Coef.	Std. Er.	t-stat.	p value
	Long Run Eq.			
SUCCESS	3.267837	0.804681	4.061032	0.0001
ATT	-0.140124	0.035944	-3.898377	0.0001
VOL	0.279872	0.026909	10.40052	0.0000
CHZ	0.024048	0.026292	0.914649	0.3605
BTC	-0.002734	0.083405	-0.032777	0.9739
	Short Run Eq.			
ECM (-1)	-0.044425	0.012302	-3.611249	0.0003
D(FAN(-1))	-0.023918	0.044848	-0.533319	0.5939
D(FAN(-2))	-0.035863	0.029138	-1.230809	0.2185
D(FAN(-3))	0.060606	0.033223	1.824238	0.0682
D(SUCCESS)	0.438466	0.455764	0.962046	0.3361
D(ATT)	-0.004277	0.001092	-3.914510	0.0001
D(VOL)	0.045595	0.005471	8.334323	0.0000
D(CHZ)	0.329566	0.030207	10.91010	0.0000
D(BTC)	0.007778	0.007960	0.977133	0.3286
C	-1.243957	0.340278	-3.655704	0.0003

Note: The maximum lag length was taken as 4. ECM (-1) represents the error correction term coefficient. The most suitable model according to the HQC is the ARDL (4,1,1,1,1,1) model.

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Can Sustainability Reporting Make A Difference?: A Qualitative Analysis on Sustainability Reports of BIST Listed Agri-Food Companies in Turkey

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ABSTRACT

Agri-business is a huge industry, including all operations from farm-level production to storage, manufacture, and distribution of agricultural commodities. This fact, together with worsening social and environmental conditions and pandemic crises, has added to a change in the perception of agriculture in economic construction. The following decades will most probably witness a resurgence of agriculture-based development recipes fed by social, environmental, and governance dimensions of sustainability. This article searches for the sustainability reports of agri-business firms listed in BIST in Turkey. A sampling includes 11 out of 64 listed agri-business firms having recent sustainability reports, which are examined by qualitative data analysis techniques with MAXQDA software. The first argument our findings support is that the agri-food sector is lagging in sustainability reporting compared to other sectors. Second, companies are more ready to comply with issues that are legally regulated. Third, environmental problems are more addressed than social and economic sustainability standards. This study also shows the relative unimportance of topics such as child labor, pesticide use, supply chain traceability, women entrepreneurship, and geographical indication, which can have positive impacts on the Turkish agricultural space if big companies integrate these topics more into their sustainability reporting processes. This article contributes to the literature on sustainability in general and reporting in the agri-food sector in particular.

Keywords: Sustainability reports, Agri-business, Turkey, BIST, Qualitative Analysis, MAXQDA.

JEL Classification Codes: Q13, M14, L21

Referencing Style: APA 7

INTRODUCTION

Sustainability has been triggering heated public and scholarly discussions in recent times. Despite the earlier efforts to define the term, the interest in the topic entered a new phase in 2015, when the United Nations announced Sustainable Development Goals. After that moment, all related parties including public institutions, non-governmental organizations, international institutions, governments, companies, producers, and consumers begun to direct more focus attention to sustainability. One of the outcomes of this trend is that companies begin to publish non-financial reports, called sustainability reports, to play a responsible business role, inform stakeholders, and show their consciousness. Although reporting is still an ongoing and optional process, an increasing number of companies allocate sources for this aim.

This article investigates the sustainability reports of agriculture-related firms listed in BIST in Turkey. Within a broader question about whether reporting can make a difference, we present the current situation of sustainability in big Turkish agri-business firms. BIST company lists are searched for agriculture-related industries, and it is seen that there are 11 out of 64 firms publishing sustainability reports. The most recent reports of these companies are studied through thematic and frequency analysis. Coding and analysis are done by MAXQDA software. GRI 13 agricultural industry standards are used to understand economic, social, and environmental aspects of sustainability from the perspective of these firms. Also, we determine certain codes selected from recent literature about agricultural transformation to see their relevance in reports.

Below, first, we will discuss the emergence of sustainability as a concept. This part presents changes in its meaning and policy implications. Then, we track the sustainability reporting from its emergence to standardization efforts. A short discussion of different standards and the absence of any legal requirement

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for companies to publish reports make sustainability reporting still an ongoing yet potentially growing area. The third part is about sustainability in agri-business. In recent years, food safety and food security concerns, greater public interest in the ecological, social, and health risks, and alarming climate changes heat the discussion around agribusiness and sustainability. This part presents the current debate by specifying economic, social, and environmental barriers to ensure sustainability in agribusiness. The fourth part investigates sustainability reporting in agribusiness. It reviews the literature about different agriculture-related companies from different countries, including Turkey, and shows the slowness of the agricultural industry in reporting efforts. It is also seen that environmental issues place more emphasis on reporting efforts than social and economic items. Having this background, the fifth part presents the original research of this article by explaining sampling, data analysis, and findings. In conclusion, we gather our results and contribution.

DEFINING SUSTAINABILITY

Sustainability has been defined from different perspectives since its emergence. As the term earlier emerged in the 1980s, it was common to think within limits perspective addressing the harms given by consumption society to the world by pushing its limits. Over time, the focus has converged from limits to a more human welfare perspective underlining the quality of life and maintenance of well-being (Waseem & Kota, 2017). Reflecting this gradual change, sustainable development was first defined in the Brundtland Report, published by the United Nations (1987), as "*Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*"

Following the UN definition of the term, governmental and non-governmental organizations have worked on ways to reach the broader aim. As political scientist Meadowcroft (1997) writes, there have been institutional challenges to planning for sustainable development in these earlier phases. These challenges invite newer attempts to redefine the term and translate it into policies. These efforts have also triggered discussions about what nature is and how it can be protected. Socio-cultural and historical differences among countries have added to the difficulty of reaching a one-for-all definition. In time, an adaptive management perspective is proposed, as well-known scholars of the area Norton (2007) did, to underline the importance of community response and social learning for a successful policy orientation.

In the last decade, the sustainability agenda has been labeled by alarming environmental situations, global warming, and climate change. Providing a recent definition, the U.S. Environmental Protection Agency (2023) states that "*Sustainability is based on a simple principle: Everything that we need for our survival and well-being depends, either directly or indirectly, on our natural environment.*" This definition underlines the necessity to create a "productive harmony" between humans and nature for present and future generations.

From the early days of the 1987 Brundtland Report, sustainability is defined basically as a policy concept. This document has been about humanity's wishes for growth and development on the one hand, and the other, limited natural sources. Over time, the concept has been reinterpreted to include three dimensions: social, economic, and environmental (Kuhlman & Farrington, 2010). The World Summit of 2005 held in New York identified three components of sustainable development and admitted their interdependency and mutual reinforcement (Morelli, 2011; Vifell and Soneryd, 2012). In recent years, the three-dimensional approach has been the most common way of operationalization of the abstract concept into real-life policies and measurement of specified dimensions.

The turning point, however, came in 2015 when the Paris Agreement was signed to prevent global warming and the UN defined Sustainable Development Goals (Ilhan, 2021). The Sustainable Development Goals (SDGs), also known as the Global Goals, are adopted as a universal call for action to end poverty, protect the planet, and ensure that all people live in peace and prosperity by 2030 (UN, 2023). The 2030 Agenda includes 169 targets within 17 sustainable development goals to realize the desired future for human development. Among these seventeen goals, the ones, especially about responsible production, inclusion, decent work, gender, climate, and water, are important for business life. More specifically, Target 12.6 encourages large and transnational companies as well as governments to adopt sustainable practices and integrate sustainability information into their reporting cycles (van der Lugt et al., 2020).

EMERGENCE OF SUSTAINABILITY REPORTS

In the 1970s, the first wave of corporate responsibility emerged with the publication of "social reports" by multinational companies, mostly in the USA and Western Europe. However, in the 1980s, this social reporting lost momentum and interest as it was not institutionalized. At the end of the 1980s, non-financial reports containing environmental elements reappeared (Kolk, 2010).

Companies began to include environmental issues in their annual reports by the early 1990s. However, environmental explanations had been criticized for being biased by just presenting positive actions, which was raising reliability questions resultantly. Following the increasing interest in sustainable development and corporate social responsibility, companies have now begun to turn their environmental statements into corporate social responsibility or corporate sustainability reports by using the "Triple Bottom Line" (Gao, 2011). Elkington, who first used the concept of "Triple Bottom Line" in 1994 regarding sustainability reporting, stated that businesses should go beyond traditional financial reporting and instead report in a triple dimension as economic, social, and environmental (Elkington, 1997).

Concerns about sustainability have become highly relevant to society. For this reason, it is increasingly becoming a part of management decisions, accounting, and reporting practices in both private and public institutions. The purpose of sustainability (performance) management is primarily to harmonize environmental and social goals with business strategies, and then to integrate relevant information in the sustainability reporting of the firms (Dienes et al., 2016). According to the Global Reporting Initiative (GRI), sustainability reporting is the practice of public reporting on an organization's economic, environmental, and/or social impacts and therefore its positive or negative contributions to the goal of sustainable development (GRI 101, 2016).

Companies may prefer to publish sustainability reports or not due to their different motivations. Reasons for publishing include promoting the utilization of environmental strategy, creating awareness about environmental conditions in the organization, the ability to communicate the corporate message inside and outside the organization, and enhancing credibility and reputation benefits thanks to a high degree of transparency. However, they may prefer not to publish sustainability reports due to doubts about the advantages it will bring to the organization, that competitors do not publish reports, it is too expensive, customers are not interested and believe that it will not increase sales, damage the company's reputation, and face legal sanctions (Kolk, 2010). In addition to these different motivations, external developments also affect the attitudes of businesses towards sustainability reporting.

One of these external developments is the growing activation of financial market regulators and stock markets in the field of sustainability. Behind this development lies the demand of data users and analysts for relevant, reliable, comparable, and easily accessible information. Stakeholders are increasingly demanding information useful for decision-making as regulations shape new markets where sustainability data becomes valid. As a result, large and publicly traded companies remain the main target of reporting provisions around the world. This trend is supported by the stock market's new listing requirements. In addition, sector-specific and thematic reporting provisions are becoming widespread (van der Lugt et al., 2020).

Institutions can benefit from various tools in sustainability reporting such as frameworks, standards, ratings, and indexes. Frameworks are generally based on principles, initiatives, or guidelines provided to help companies explain their sustainability efforts. GRI, SIGMA project, and Carbon Disclosure Project (CDP) are some examples of these frameworks. Standards have similar functions to frameworks, but they are available in the form of more formal documents describing requirements, specifications, or features that can be used to ensure that sustainability efforts are carried out consistently, such as AA100 or ISO14001. Ratings and indexes are third-party evaluations of a company's sustainability performance like the Asian Sustainability Rating or Dow Jones Sustainability Index (Siew, 2015). Among these, the GRI framework is the most widely accepted one. KPMG report (2022) states that GRI remains the most used reporting standard globally with increased adoption across both the N100 and G250. Despite GRI's prevalence, it should be said that other standards are also used by having geographical differences, which eventually make it difficult to compare companies and markets regarding their sustainability performances.

GRI Standards include GRI 101 Foundation as the starting point, GRI 102 General Disclosures to report contextual information about an organization, GRI 103 Management Approach to report the management approach for each material topic of GRI 200 Economic, GRI 300 Environmental and GRI 400 Social (GRI 101, 2016). Economic disclosures include thirteen indicators under six dimensions, environmental disclosures include thirty indicators under eight dimensions, and social disclosures include thirty-four indicators under nineteen dimensions. Some of the dimensions, procurement practices, anti-corruption and anti-competitive behavior, energy, water, biodiversity, emissions, child labor, human rights assessment, and local communities can be mentioned.

As mentioned, sustainability reporting is optional for companies. Neither it has a unique standard to use nor

is there a regulation to make it effective. Even though some companies have been taking more responsibility and making an effort to be more accountable for their operations, a lot of them are not still in this movement. In addition to the companies' intent and actions, standards for measuring the triple bottom line of sustainability have been also under continuous change most importantly because of technological improvements. Finally, sectoral and geographical differences are to be taken into account to reach effective reporting for different stakeholders. Keeping these in mind, we would like to narrow our focus on sustainability in agriculture-related business and reporting in that sector.

SUSTAINABILITY IN AGRI-BUSINESS

Agribusiness is defined as all activities from farms to final consumers of agricultural products. Ioris (2018: 1648) states that Davis and Goldberg, who are thought of as the inventors of the term, defined agribusiness as "*multiple operations involving the manufacture and distribution of farm supplies and the storage, processing, and distribution of agricultural commodities.*" From then on, the concept has transformed a lot which resulted in a fluidity of the term. Recently, it has been used very broadly to contain direct and indirect activities linked with agriculture. Agribusiness is now one of the largest production sectors in the world in terms of output value, employment, and international trade.

The main function of agribusiness is to produce food in sufficient quantity and quality to maintain a healthy population. Food security and biodiversity are direct consequences of sustainability in agricultural businesses. In recent years, it has become clear that economic and technological development in agribusiness has not only environmental, social, and institutional impacts but also fundamental nutritional and regional consequences (Wisniewska, 2015). Severe global problems in the food cycle, rising awareness about the ecological, social, and health risks, and alarming climate developments make the modus operandi of agribusiness one of the most controversial sectors.

In line with consciousness towards sustainability, the agribusiness sector is attracting more public attention and resultantly facing increasing pressure to change sustainable management practices. One of the reasons for this development is being of the agribusiness sector in the intersection of various economic and social interests of different parties. The disparities between business realities of modern farm practices and consumer needs or other stakeholders' expectations. For example, intensive livestock farming has been criticized for its high emissions, effects on the nutrient surplus in high animal density areas, long-distance animal transport, and low animal welfare standards. Traditional high-input arable farming has been accused of causing erosion, biodiversity loss, pesticide residues, and nitrate emissions (Friedrich et al., 2012).

Together with these, there have been rising health and ecological concerns in consumer behavior. Resultantly, policy interventions of governmental authorities and management's choices in the agri-food market are mainly aimed at drawing more attention to both food-product quality and environmental protection. Thus, the importance of creating rapid and appropriate responses

Table 1: Barriers to Sustainable Agribusiness

<table>
<tr><td rowspan="11">Sustainable Barriers</td><td>Economic</td><td>Environmental</td><td>Social</td></tr>
<tr><td rowspan="2">Inadequate financial support</td><td>Poor government policies and regulations on climate change</td><td>Lack of technical know-how</td></tr>
<tr><td>Huge post-harvest loss</td><td>Inherent domestic institution constraints</td></tr>
<tr><td rowspan="3">Extreme poverty</td><td>Land acquisition constraints</td><td>Gender inequality</td></tr>
<tr><td>Strong food insecurity</td><td>Insufficient scientific research</td></tr>
<tr><td>Difficulty in adopting new sustainable agribusiness practices</td><td>Political interferences</td></tr>
<tr><td rowspan="3">Collateral handicap</td><td>Rampant soil erosion</td><td rowspan="3">Underdeveloped social infrastructure to support agribusiness</td></tr>
<tr><td>Excessive pollution</td></tr>
<tr><td>Insufficient innovative ideas for sustainability application</td></tr>
</table>

Reference: Brenya et al. (2022).

to sustainability requirements is rising. Along with the growing awareness and public attention for different aspects of the sector, the innovations in knowledge management have also positively contributed to this goal. Big data management has shown its power to provide information on not only food safety and traceability but also product compliance meeting the standards. Technology helps the consumer in demonstrating the transparency of the activities as well as the product quality it provides (Morea et al., 2022).

The whole economic construction including firms, governments, and non-governmental organizations has understood the significance of sustainability more in the last decade. Sustainable practices in the agribusiness sector are expected to become more established in the coming years. Regulators, politicians, investors, and big players in the sector have started to give priority to sustainability in agribusiness on issues such as nature protection, equality, and social justice in agribusiness. On the other hand, there are economic, social, and environmental barriers to ensuring sustainability in agribusiness. Depending on a comprehensive literature review, Brenya et al. (2022) explain these difficulties as seen in Table 1.

The table presents different barriers in a nutshell. It includes not only general issues such as poverty and gender equality but also problems specific to the agribusiness sector such as collateral handicaps, land acquisition constraints, huge post-harvest loss, or underdeveloped social infrastructure. Such an analytical description of the problems depending on the recent literature underlines the necessity to search sector-specific situations in different countries more, as underlined in the article.

SUSTAINABILITY REPORTING IN AGRIBUSINESS

In line with the increasing interest in sustainability in agribusiness, companies in this sector have started to act and publish sustainability reports. To understand the role of sustainability reporting in agri-business, Topp-Becker and Ellis (2017) analyze sixteen reports of the companies selected from the US agricultural supply chain. One of the conclusions of this study is the slowness of the agricultural industry in reporting efforts, which is in line with the previous studies suggesting that agribusiness' response to sustainability has been reactive, not proactive. Moreover, scholars show sustainability reporting changes according to industry segments, such as the input sector, food manufacturers, and retailers, and aspects of economic, social, and environmental. They show that input suppliers have the highest prevalence in reporting, which includes environmental information disproportionately more than other elements of the triple bottom line, economic and social.

Buallay (2021) aims to investigate the relationship between sustainability reporting and financial performance in the food industry. She summarizes different positions in the literature, such as arguing for positive, negative, and neutral relations. Depending on regression analysis on a sample comprised of 1426 observations from 31 different countries for a decade, she concludes that there is a significant relationship between economic, social, and governance (ESG) and financial performance (ROE). Yet, ESG and operational performance (ROA) and market performance (TQ) are not significantly related. Buallay underlines the important role of the food sector in adopting sustainability goals not only for environmental and social reasons but also to perform better in financial terms.

Jindřichovská et al. (2020) conducted a case study on the sustainability reports published between 2014 and 2018 by Cargill, a US multinational agri-food company. They see the quick adaptation of CSR and sustainability reporting by the company to better communicate with its stakeholders. Another case study belongs to Bocken, Morales, and Lehner (2020) on Oatly, a Swedish food company offering plant-based dairy alternatives. The scholars use in-depth interviews conducted with firm representatives and sustainability reports of the company as data sources for understanding the possibility of sufficiency business strategies in the food industry. They conclude that the focus on scaling up the business at Oatly has priority before other sufficiency strategies.

Paarlberg (2022) examines the food packaging industry in the Netherlands to reveal the reasons behind the sustainability reporting practices of companies. According to the results of the case study, stakeholder management, social pressure, and regulatory pressure push companies to publish sustainability reports. Also, corporate size, ownership structure, and visibility affect the structure and quality of sustainability reports. On the other hand, although moral duty, media reputation, and human resource management affect participation and strategies for sustainability, it has been found to have a lower impact on sustainability reporting.

A study of food retailers in Spain examines the extent of participation in SDG 12 (Vallet-Bellmunt, et al., 2023). As a result of the content analysis on the non-financial reports and disclosures of the retailers, the researchers

show that while SDG 12.4 (management of chemicals and wastes) and SDG 12.2 (efficiency of natural resources) targets have more comprehensive disclosures, SDG 12.5 (promoting a circular economy) and SDG 12.8 (sustainable consumption) targets have weaker disclosures. The study shows that food retailers in Spain regard sustainable production as more significant than sustainable consumption.

Westerholz and Höhler (2022) examine the effect of organizational form on sustainability reporting. The study compares cooperative dairies and investor-owned dairies in Germany by analyzing the statements and reports on the websites of the organizations. The analysis shows that the sustainability reports of the cooperatives are of higher quality than the investor-owned dairies. However, while cooperatives have more comprehensive reports in terms of social and environmental aspects, it has been seen that the reports of investor-owned dairies on animal ethics are more comprehensive.

In a study conducted on listed companies in France (Mnif Sellami et al., 2019), the determinants of the demand for sustainability report assurance (transparency and accuracy of information on sustainability) are investigated. Depending on the sustainability and annual reports of the companies, it is seen that although ownership concentration does not affect sustainability report assurance, companies with corporate participation and corporate social responsibility committees are more likely to provide sustainability report assurance. However, the pressure created by stakeholders has a positive effect on the demand for sustainability report assurance refillable packaging.

Turkish companies have been producing sustainability reports as their global counterparts. In a study conducted on companies in the Fortune 250 List in Turkey, reporting on environmental and social issues increased significantly in the period from 2004 to 2014. Another argument of the same study is that the culture of sustainability reporting has spread from international companies to local companies (Ensari et al., 2016). The tendency to publish sustainability reports in Turkish firms is also noted by Ertan (2018) showing the increasing number of reports since 2005, most of which are using GRI reporting standards.

These reports of Turkish companies have been examined from different aspects, such as corporate reputation (Özçelik et al., 2015; Arslan and Albayrak, 2019), corporate social responsibility (Şardağı and Coşkun, 2020), financial performance (Düzer & Önce, 2017; Dağıstanlı & Çelik, 2023), industrial differences (Yıldız, 2022; Başkaya & Taş, 2021), ownership structure (Doğan, 2021), enterprise-scale (Şahin & Çankaya, 2018; Gümrah & Büyükipekçi, 2019) or BIST Sustainability Index (Kocamış & Yıldırım, 2016).

There are also certain scholarly works published in Turkish investigating sustainability reports with a focus on agri-business. Akkan and Bozkurt (2020) focus on food retailers during the pandemic period and analyze six reports, two of which are annual reports and four sustainability reports. Researchers focus on the social aspect and identify four dimensions, human resource practices and decent work, human rights, society, and product responsibility, whether they are included in the reports or not. While Migros has the best score for inclusion of social dimensions in its non-financial reporting, Metro and Carrefoursa strikingly score low despite their multinational status, as the study concludes. Another research belongs to Yiğit and Yiğit (2016) analyzing the status of big companies in the food and beverage industry regarding their sourcing practices. Depending on open-source documents of the companies and interviews with firm representatives, they conclude the companies' insufficiency of valuing sustainability.

RESEARCH METHODOLOGY

Research Design

This article attempts to understand the current situation in sustainability reporting in the Turkish agri-food industry. To reach this aim, we search for BIST companies in the related sectors and make a qualitative study on their most recent sustainability reports. The reason for focusing on BIST companies is the availability of open-source data belonging to those firms since they are listed. Another reason for our BIST focus is that the more corporate and bigger the firm, the higher the tendency to address sustainability issues, as shown in van der Lugt et al. (2020), Sierra-García et al. (2015), and Ensari et al. (2016).

Sampling is started by checking out agri-food firms in the BIST lists. Three companies are listed under agriculture, forestry, and fishing; thirty-six are under food, beverage, and tobacco; and twenty-five are under wholesale and retail trade. After having this list of 64 companies, we have searched their websites for sustainability reports. This research shows that only 13 of them have open-to-public sustainability reports. Among the remaining 51 firms, 13 of them have some explanations about sustainability on their websites, yet, still, neither of these thirteen has a full

report, and hence is not included in the analysis. Two of the thirteen companies having an available sustainability report are also excluded from the analysis. The reason for the first exclusion is that one is just providing a checklist document to the Capital Markets Board of Turkey showing the company's status regarding sustainability reporting. The second company's report is excluded because that company was recently acquired by a multinational and the provided report is full of the main firm's international operations, not specific to Turkey.

Table 2: Companies Included in The Sample

Company	Year	Reporting Standard
Ülker	2021	GRI Basic GRI Food Sector Appendix
Türk Tuborg	2021	GRI Basic
Şok	2021	GRI Basic GRI Food Sector Appendix
Pınar Süt	2021	GRI Basic
Migros	2022	GRI Integrated
Kerevitaş	2021	GRI Basic GRI Food Sector Appendix
Coca-Cola	2022	GRI Integrated
Carrefour	2021	GRI Basic
Bizim Toptan	2021	GRI Basic
Bim	2021	GRI Basic
Anadolu Efes	2021	GRI Basic

Our sample includes eleven companies operating in agriculture-related industries and listed in BIST. The sustainability reports of these 11 firms are taken from their websites in March and April 2023. Their most recent reports are included in the analysis so nine reports are from 2021 and two from 2022. Regarding reporting standards, two of them use GRI Integrated Standards and the remaining nine GRI Basic. Among these nine, three of them state that they benefit also from GRI Food Sector Standards, which have still been piloted as specified GRI. Table 2 shows detailed information about our sample.

Data Analysis

This article presents a qualitative analysis of the most recent sustainability reports of agri-food companies listed in BIST. Qualitative research is a research design that usually emphasizes words rather than quantification in the collection and analysis of data. Especially in recent years, there has been an increasing interest in studies following qualitative research in different social science areas despite certain methodological criticisms about reliability and validity (Bryman, 2012: 380-412). Emphasis on seeing through the eyes of the people being studied and on describing the context and process are thought as the most important advantages of qualitative research. Ethnography, interviews, focus groups, language studies, and document searches are the main research methods of qualitative design. Among these, this study uses documents as sources of data.

Bryman (2012: 544) underlines by referencing Scott's work that a qualitative design using documents should assess the quality of the documents with four main criteria authenticity, credibility, representativeness, and meaning. The agri-food companies' sustainability reports are authentic in the sense that they are genuinely produced by the company itself; representative in the sense that the company opens them to public usage; and credible in the sense that the company declares the content. Regarding credibility, it should also be noted that some of the companies in the sample such as Ülker and Anadolu Efes provide limited assurance forms given by independent auditor firms. The last assessment criterion of meaning is also satisfied by the reports since the evidence is clear and comprehensible as they are presented according to the current standards of sustainability reporting. As a result, sustainability reports can be used as reliable and valid sources of data.

This article includes eleven sustainability reports of agri-food companies depending on the selection criteria clarified above. While coding the documents, we use the classification of GRI 13 Agriculture, Aquaculture, and Fishing Sectors standards. The analysis below first presents three dimensions of economic, social, and environmental standards of GRI 13. Following, a frequency analysis of selected codes is presented. The codes we selected for analysis due to their importance for the agri-food sector are sustainable agriculture, cooperative, woman entrepreneur, STEM, palm oil, small producer, good agriculture, woman farmer, native seed, and geographical indication product. This selection depends on the recent topics heatedly discussed in the literature for sustainable agriculture in general and structural

adjustment of agriculture, agricultural organization, women empowerment, and crop quality in particular (McMichael, 2013; Friedmann, 2009; Goodman & Watts, 1997; Bernstein, 2017; OECD, 2021). MAXQDA software is used for developing themes, codes, dimensions, and other visual tools.

FINDINGS AND DISCUSSION

All eleven documents are 1,375 pages long including 430,607 words. The longest is the integrated report of Migros with 342 pages and the shortest to Kerevitaş and Bizim Toptan with 46 pages. Figure 1 shows the word cloud of all quantitative data analyzed. Word cloud is a visual tool to show the relative frequency of words in documents. While producing the figure, we eliminate irrelevant words such as prepositions, conjunctions, or propositions, and clear the data. As seen in Figure 1, sustainability, management, corporate, integrated, and Turkey are the most common words in the reports as they seem bigger and more central than others. Following, energy, woman, GRI, employee, product, waste, value, and food are also used a lot in the reports.

Figure 1: Word Cloud of Sustainability Reports

The analyzed eleven reports have different structures as they are not using a predefined format. In general, economic, social, and environmental topics are stated with different headlines such as "100 percent contribution to economy and business" in Türk Tuborg's report, "Taking care of our employees," in Pınar Süt's report, "We are increasing our social impact" in Anadolu Efes's report and "It will do good for our planet" in Migros's report. Some of them highlight the topic of quality in goods and services like BİM, some innovations like Ülker, and some stakeholders like Kerevitaş as they present these topics as separate headlines.

The informative nature is underlined in the reports meaning that they are not independently audited. Yet, while Ülker and Anadolu Efes present limited assurance reports from an independent auditor, Migros, and Coca-Cola state their reports have been independently audited. Nine of the eleven reports present GRI disclosure tables at the end while two of them, namely Türk Tuborg and Kerevitaş reports, do not have such type a summary. A general overview of the data shows that three reports are exclusive with their comprehensive content, Carrefour's sustainability report and integrated reports of Migros and Coca-Cola. In line with the focus of this study, two important policies of these companies are worth mentioning. First, Carrefour creates a "Food Transition Index" for inner evaluation of the change in fifteen different topics like sustainable farming, animal welfare, local producers, and gender equality. Second, Coca-Cola has its own "Principles of Sustainable Agriculture" policy aiming at all "direct suppliers, intermediary processors, producing farms and labor agencies" to protect social and environmental standards for human and workplace rights, environment and ecosystems, animal health and welfare, and farm management systems. Keeping this general overview of the reports, we can now present the findings and results reached by thematic analysis by codes and themes and frequency analysis.

The sustainability reports published by eleven companies are analyzed in three-dimensional (economic, social, and environmental standards) and one-dimensional (all standards) within the framework of the standards of GRI 13 (GRI 13, 2022). In addition, apart from the GRI 13 framework, the themes that we find important for the agri-food sector and create for this study have been analyzed. The findings obtained as a result of the analysis are as follows.

Table 3 shows the total number of disclosures belonging to GRI 13 standards and agrifood sector-focused key themes in companies' sustainability reports. While there are 4140 disclosures belonging to GRI 13 standards, 388 disclosures are found in agrifood sector-focused key themes. The distribution by the company shows that Pınar Süt (n=930), Coca-Cola (n=765), and Migros (n=653) have the highest number of disclosures in GRI 13 standards while Bizim Toptan (n=75) and Şok (n=108) have the least. In addition, the companies with the highest number of disclosures in agrifood sector-focused key themes are Migros (n=134), Pınar Süt (54),

Table 3: Total GRI 13 Standards and Agrifood Sector-Focused Key Themes Disclosures in Companies' Sustainability Reports

Company	The number of Disclosures belonging to GRI 13 Standards	**Company**	**The number of Disclosures belonging to Agrifood Sector Focused Key Themes**
Pınar Süt	**930**	**Migros**	**134**
Coca-Cola	765	Pınar Süt	54
Migros	653	Coca-Cola	48
Carrefour	395	Anadolu Efes	35
Anadolu Efes	351	Ülker	30
Türk Tuborg	268	Carrefour	27
Ülker	233	Kerevitaş	23
Kerevitaş	214	Türk Tuborg	12
Bim	148	Şok	11
Şok	108	Bim	10
Bizim Toptan	75	Bizim Toptan	4
Total	**4140**	**Total**	**388**

Table 4: Analysis of GRI 13 Standards in the Economic Dimension

Standards	**Number of Disclosures**	**Percentage of Disclosures**	**Number of documents including the code**
Anti-corruption	101	82,11	11
Economic inclusion	10	8,13	5
Anti-competitive behavior	6	4,88	4
Supply chain traceability	3	2,44	3
Public policy	3	2,44	2
Total	**123**	**100,00**	**-**

Table 5: Analysis of GRI 13 Standards in the Social Dimension

Standards	**Number of Disclosures**	**Percentage of Disclosures**	**Number of documents including the code**
Non-discrimination and equal opportunity	167	18,27	11
Employment practices	163	17,83	11
Food safety	145	15,86	11
Animal health and welfare	92	10,07	8
Food security	83	9,08	10
Freedom of association and collective bargaining	81	8,86	8
Occupational health and safety	78	8,53	9
Local communities	39	4,27	10
Living income and living wage	31	3,39	5
Child labor	25	2,74	7
Forced or compulsory labor	10	1,09	4
Rights of Indigenous Peoples	0	0,00	0
Land and resource rights	0	0,00	0
Total	**914**	**100,00**	**-**

and Coca-Cola (n=48), and the ones with the least are Bizim Toptan (n=4) and Bim (n=10).

Table 4 shows the frequency analysis of GRI 13 standards in the economic dimension. Among 123 total disclosures, the most frequently seen item is the anti-corruption standard (n=101), constituting %82,11 of the standards in the economic dimension. On the other hand, the number of references to public policy and supply chain traceability standards (n=3) is the lowest. Disclosures on supply chain traceability are included in the sustainability reports of three companies, Anadolu

Table 6: Analysis of GRI 13 Standards in the Environmental Dimension

Standards	**Number of Disclosures**	**Percentage of Disclosures**	**Number of documents including the code**
Water and effluents	1247	40,19	11
Waste	1004	32,36	11
Emissions	387	12,47	11
Climate adaptation and resilience	223	7,19	11
Biodiversity	127	4,09	9
Soil health	58	1,87	9
Natural ecosystem conversion	50	1,61	10
Pesticides use	7	0,23	4
Total	**3103**	**100,00**	**-**

Table 7: Analysis of All GRI 13 Standards

Standards	**Number of Disclosures**	**Percentage of Disclosures**
Water and effluents	1247	30,12
Waste	1004	24,25
Emissions	387	9,35
Climate adaptation and resilience	223	5,39
Non-discrimination and equal opportunity	167	4,03
Employment practices	163	3,94
Food safety	145	3,50
Biodiversity	127	3,07
Anti-corruption	101	2,44
Animal health and welfare	92	2,22
Food security	83	2,00
Freedom of association and collective bargaining	81	1,96
Occupational health and safety	78	1,88
Soil health	58	1,40
Natural ecosystem conversion	50	1,21
Local communities	39	0,94
Living income and living wage	31	0,75
Child labor	25	0,60
Forced or compulsory labor	10	0,24
Economic inclusion	10	0,24
Pesticides use	7	0,17
Anti-competitive behavior	6	0,14
Supply chain traceability	3	0,07
Public policy	3	0,07
Land and resource rights	0	0,00
Rights of Indigenous Peoples	0	0,00
Total	**4140**	**100,00**

Efes, Bizim Toptan, and Şok, and on public policy in two companies' reports, Anadolu Efes and Carrefour.

Table 5 shows the frequency distribution of GRI 13 standards in the social dimension. As seen, the highest frequency belongs to the nondiscrimination and equal opportunity standard (n=167, % 18.2). This is followed by employment practices (n=163, % 17.83) and food safety (n=145, % 15.86). Sustainability reports of all eleven companies contain disclosures of these three standards. On the other hand, no disclosure is found for the rights of indigenous peoples and land and resource rights standards.

Table 8: Analysis of Agrifood Sector-Focused Codes

Themes	Number of Disclosures	Percentage of Disclosures	Number of documents including the code
Certificate	194	50,00	11
Sustainable agriculture	103	26,55	9
Cooperative	37	9,54	6
Woman entrepreneur	13	3,35	5
STEM	12	3,09	5
Palm oil	10	2,58	3
Small producer	6	1,55	3
Good agriculture	5	1,29	3
Woman farmer	3	0,77	2
Native seed	3	0,77	2
Geographical indication product	2	0,52	2
Total	**388**	**100,00**	**-**

Table 6 shows the frequency distribution of GRI 13 standards in the environmental dimension. Among a total of 3103 references, the highest frequency is seen in the water and effluents standard (n=1247, % 40.19). This is followed by the waste standard (n=1004, % 32.96). In addition to these two, emissions and climate adaptation and resilience are the other two standards included in all of the reports in the sample. On the other hand, the pesticide use standard has the lowest frequency referenced only seven times in only four companies' reports, namely Bim, Carrefour, Kerevitaş, and Migros.

When the GRI standards are examined in three dimensions of economic, social, and environmental separately, it is seen that the most reference is given to the environmental dimension (n=3103). This is followed by the social dimension (n=914) and the economic dimension (n=123). However, when the standards are examined in one dimension, it is seen that the water and effluents (n=1247), waste (n=1004), and emissions (n=387) are the ones taking the highest frequency. Table 7 shows all standards regardless of their dimension sorted according to their frequency.

In addition to the GRI 13 Framework, we create themes specific to the agri-food sector and search for these themes in the sustainability reports. Table 8 shows the frequency distribution of agrifood sector-focused key themes. As seen, the certificate is the most frequently referred disclosure (n=194) included in all eleven reports. Sustainable agriculture (n=103) is second included in 9 of the reports. The third key theme is cooperation with 37 references, yet it is strikingly less frequent than the first two. Gender theme is found in two separate keywords for woman entrepreneur and woman farmer. While the first is used in five reports with a relatively low reference number of 13, the second is seen in just two reports (Migros and Pınar Süt) with just three references. Other two topics taking relatively little attention are the native seed (n=3) and geographical indication product (n=2) themes. Both themes are seen in just two reports, Migros and Carrefour.

As seen in the above analysis of sustainability reports, anti-corruption is referred to most in the economic dimension. Since corruption is illegal, it has serious sanctions by regulatory authorities. In this respect, it can be said that companies take care both to comply with the law and to protect their image before society. For the social dimension, the highest frequency is seen in the nondiscrimination and equal opportunity code. This is followed by employment practices and food safety. Accordingly, it can be said that companies care about human rights within the framework of sustainable development and integrate their human resources policies into sustainability. At the same time, their focus on food safety is an important development in sustainable agriculture.

In the environmental dimension, water and effluents, waste, and emissions issues have the most emphasis. It can be said that companies try to comply with these three standards due to strict supervision both on a global and national basis. These environmental results are in parallel with the study of Vallet-Bellmunt, et al. (2023).

The sustainability reports of agri-business-related Turkish companies show that they focus on the environmental dimension the most and the economic dimension the least. When the standards are evaluated in one dimension, water, and effluents, waste has the highest mention among the twenty-six subdimensions.

Institutional theory can be helpful to explain this result. The fact that water effluents and waste standards are included more than others in sustainability reports can be attributed to the fact that the audits and sanctions related to these standards are strong and the stakeholders are more demanding in this regard. According to the institutional theory, companies need to be accepted by their environment to continue their lives (Sözen & Basım, 2015). Therefore, as supported by previous studies on sustainability (Paarlberg, 2022; Vallet-Bellmunt et al., 2023; Westerholz & Höhler, 2022; Mnif Sellami et al., 2019; Topp-Becker & Ellis, 2017), it can be said that companies progress based on institutionalization, and thus, they mostly act reactively. In parallel, it can be stated that water effluents and waste standards have been institutionalized.

The least important topics in the sustainability reports, which have less than 50 references in total in all reports, are local communities, living income, child labor, forced labor, economic inclusion, pesticide use, anti-competitive behavior, supply chain traceability, public policy, land and resource rights and rights of indigenous people. Even the last two codes, land and resource rights and rights of indigenous people have no reference at all. Some of the least attended topics, such as child labor, economic inclusion, pesticide use, or land and resource rights, are important for the specific configuration of Turkish agriculture (Günaydın, 2009; Gürsoy & Dodurka, 2016; Gümüş & Wingenbach, 2016). The interest of agribusiness firms on these topics can be game changers in fundamental problems of farms. Such an interest will prove itself to measure basic indicators, quantify different aspects of multilayered social problems, and be helpful for the formulation of exemplary policies. More inclusion of these issues in sustainability reports in near future will be a good way of showing that interest for the firms.

The codes we select to analyze also present interesting results. As shown, the reports mostly focus on certificates and sustainable agriculture. Certification is an application that increases the efficiency and reliability of processes in sustainable agriculture, hence, in the long run, the topics will keep their importance in the shaping of the Turkish agri-food sector (Keyder & Yenal, 2011; Kenanoğlu & Karahan, 2002; Çakırlı Akyüz & Theuvsen, 2021). The scale problem of agriculture has long been discussed and cooperatives are thought one of the best ways of overcoming this (Westerholz & Höhler, 2022; Sönmez & İzgi, 2022). Following this trend, 6 out of 11 reports address this issue to show the importance of cooperatives and larger-scale organization of agricultural production for reaching sustainability aims. On the other hand, native seed and geographical indication products are just mentioned in two reports. Both topics have greater importance in sustainable agriculture, product quality, and protection of traditional know-how (Joshi, 2021; Kan & Kan, 2020). Therefore, agri-business companies may pay more attention to these themes for stakeholder awareness, policy formation, and gaining comparative advantage.

Finally, for the codes generated for this article, it is seen that gender issue has a relatively unimportant place in sustainability reports. This is striking also concerning the rising awareness about rural women empowerment and the promotion of women cooperatives as solutions to basic structural problems (OECD, 2021; Özsayın & Korkmaz, 2021; Kurtege Sefer, 2020). Gender incentives given by these big companies to their backward sectors, especially agriculture and processing will improve the conditions of the rural population in general and rural women in particular. Hence, greater addressing of gender issues in entrepreneurship and farming practices has the potential to feed the sustainability agenda further for agri-business firms.

CONCLUSION

Kenneth P. Pucker (2021), who was formerly COO of Timberland and now a senior lecturer at the Fletcher School, wrote an article titled "Overselling Sustainability Reporting" and published in Harvard Business Review. In that article, Pucker discusses the measurement and reporting efforts of the last two decades about sustainability, which have eventually come short of preventing neither environmental damage nor social inequality. He identifies several problems reporting suffers such as lack of mandates and auditing, specious targets, opaque supply chains, complexity, confusing information, and inattention to developing countries. His rich and insightful piece ends the necessity to "change the system" by including for example an "incentive for the agriculture industry to transition from spewing carbon to sequestering it."

Pucker's article is thought-provoking for the research question of this article, that of whether reporting can make a difference in agriculture-related business or not. Agri-business is a huge industry including all operations from farm-level production to storage, manufacture, and distribution of agricultural commodities. FAO estimates that agrifood systems employ around 1.23 billion people in 2019 all over the world. Moreover, almost half the world's population has some kind of linkage with the

households in agrifood systems (FAO, 2023). This fact together with worsening social and environmental conditions and pandemic crises have added to change in the perception of agriculture in economic construction. By now, the earlier prescriptions of neoliberal doctrine about dismissing agriculture as an unproductive sector inherent with economies of scale problems have recently been abandoned. The following decades will most probably witness a resurgence of agriculture-based development recipes having been informed by social, environmental, and governance dimensions of sustainability. Such a background makes researching the current picture of agribusiness from the lenses of sustainability reports more relevant. This relevance increases for Turkey, which is still a significant country in agriculture and related industries.

This article examines the sustainability reports of agriculture-related firms listed in BIST in Turkey. A detailed search of BIST company lists and their reporting status shows that there are 11 out of 64 agri-business firms publishing sustainability reports. We examine the most recent reports of these companies, which are 1,375 pages long including 430,607 words in total. Qualitative methods including thematic and frequency analysis are applied by MAXQDA software. Both GRI 13 agricultural industry standards of 26 items and self-selected codes of 11 items are used to understand different aspects of sustainability. While there are 4140 disclosures belonging to GRI 13 standards, 388 disclosures are found in agrifood sector-focused codes in total.

Our findings show first that there is no one-fit-all standard and content in sustainability reports. Two of the eleven reports are integrated reports, which have the most comprehensive content, while some others are just seen as public relations material with limited content. This flexibility is most probably because of an absence of any legal requirements for reporting and plurality of standards. An overview of all reports shows that the integrated reports of Coca-Cola and Migros and the sustainability report of Carrefoursa have the most comprehensive content.

Coding results that the most frequently referred topic is the anti-corruption standard in the economic dimension, the non-discrimination and equal opportunity standard in the social dimension, and water and effluents standard and waste in the environmental dimension. The lowest number of codes are seen in the public policy and supply chain traceability standards in the economic dimension, the rights of indigenous peoples, and land and resource rights standards in the social and the pesticides used in the environment. A cross-check of dimensions shows that environmental standards have the highest frequency by far compared to economic and social codes. The analysis created for this study reveals that certificate and sustainable agriculture are the most popular terms, and native seed and geographical indication products are the least.

Our findings support three specific arguments in the literature. First, the agri-food sector is lagging to catch up sustainability reporting compared to other sectors. As seen, a very small part of whole listed companies is publishing reports. Second, companies are more ready to comply with issues legally regulated. It is not a coincidence that anti-corruption, non-discrimination, and equal opportunity and water and effluents, waste, and emissions are the most frequently mentioned codes as all represent a certain kind of legal enforcement. Third, environmental problems are more addressed than social and economic sustainability standards. This study also shows the relative unimportance of topics such as child labor, economic inclusion, pesticide use, supply chain traceability, land and resource rights, women entrepreneurship, and geographical indication, which can have positive impacts on Turkish agricultural space. A backward push of big companies through integrating these topics into their sustainability reporting process is highly likely to create incremental and pivotal changes in the sector as a whole.

This article presents a qualitative analysis of sustainability reports of big agri-food companies listed in BIST in Turkey. By doing so, it contributes to the literature on sustainability in general and reporting in the agri-food sector in particular. Yet, it has its limitations. First, the sample contains both food processors and retailers. They have different strategic priorities as well as different sustainability focuses. Further research is better to compare these different market positions and their impact on sustainability policies. Another limitation is about the company scales. As this study focuses on the biggest and the most competitive ones, sustainability issues have been at least addressed and produced some real results. Yet, the agro-food sector is characterized by small- and middle-size enterprises, especially in Turkey. Their position regarding sustainability aims cannot be known for now. The following studies may design investigations on these several SMEs in the food sector. Last but not least, sustainability organization in firms also needs to be studied later as the quality and content of reporting will be affected by human resources. As a last word, despite the importance of the research agenda around the theme and while formulating newer studies, Pucker's warnings about overselling of reporting will surely be kept in mind for keeping our feet on the ground.

REFERENCES

Akkan, E., & Bozkurt, M. (2020). "COVID-19 Süreci ve Sürdürülebilirlikte Sosyal Boyutun Önemi: Türkiye'de Faaliyet Gösteren Gıda Perakendecilerinin Finansal Olmayan Raporları Üzerine Bir İçerik Analizi." Sosyal Bilimler Araştırmaları Dergisi, 15(2), 536-547.

Arslan, Z. and Albayrak, R. S. (2019). "Sürdürülebilirlik Raporlarının Kurumsal Marka Bakış Açısı ile Analizi: Arçelik Örneği." Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 21 (2) , 467-492 . DOI: 10.16953/deusosbil.421050

Başkaya, A. V. and Tas, O. (2021). "Finansal Olmayan Raporlama ve Bist Sürdürülebilirlik Endeksi Şirketlerinde Bir Çalışma." PressAcademia Procedia, 13 (1), 12-16.

Bernstein, H. (2017). "Political Economy of Agrarian Change: Some Key Concepts and Questions." RUDN Journal of Sociology, 17(1), 7-18. doi: 10.22363/2313-2272-2017-17-1-7-18

Bocken, N., Morales, L. S., & Lehner, M. (2020). "Sufficiency Business Strategies in the Food Industry—The Case of Oatly." Sustainability, 12(3), 824.

Brenya, R., Akomea-Frimpong, I., Ofosu, D. and Adeabah, D. (2022), "Barriers to sustainable agribusiness: a systematic review and conceptual framework", Journal of Agribusiness in Developing and Emerging Economies, 13(4), 570-589. https://doi.org/10.1108/JADEE-08-2021-0191.

Bryman, A. (2012). *Social research methods*. Oxford University Publishing. Oxford.

Buallay, A. (2021). "Sustainability reporting and agriculture industries' performance: worldwide evidence", Journal of Agribusiness in Developing and Emerging Economies, 12(5), 769-790. https://doi.org/10.1108/JADEE-10-2020-0247

Çakırlı Akyüz, N. and Theuvsen, L. (2021). "Organic agriculture in Turkey: status, achievements, and shortcomings." Organic Agriculture 11, 501–517. https://doi.org/10.1007/s13165-021-00362-2

Dağıstanlı, H. A. & Çelik, İ. (2023). "Sürdürülebilirlik Raporlaması ve Firma Performansı: BIST Sürdürülebilirlik Endeksi Üzerine Bir Uygulama.""Dumlupınar Üniversitesi Sosyal Bilimler Dergisi, (76), 1-16.

Dienes, D., Sassen, R., & Fischer, J. (2016). "What are the Drivers of Sustainability Reporting? A Systematic Review." Sustainability Accounting, Management and Policy Journal, 7(2), 154-189.

Doğan, M. (2021). "Relationship Between Sustainability Report, Financial Performance, and Ownership Structure: Research on The Turkish Banking Sector." Istanbul Business Research, 50 (1), 7 7-102. Retrieved from https://dergipark.org.tr/tr/pub/ibr/issue/64325/976599

Düzer, M., & Saime, Önce. (2017). "Kurumsal Sürdürülebilirlik Raporlaması ve Finansal Performans: BIST'te İşlem Gören Şirketler için Karşılaştırmalı bir Analiz." Bilecik Şeyh Edebali Üniversitesi Sosyal Bilimler Dergisi, 2(2), 637-648.

Elkington, J. (1997). Cannibals with Forks: The Triple Bottom Line of 21st Century Business. Capstone.

Ensari, M., Erdil, M., & Genç, H. (2016). Trends in Sustainability Reporting between 2004-2014 by Fortune 250: Turkey Case. European Journal of Sustainable Development Research, 1(1), 38-43.

Ertan, Y. (2018). Türkiye'de Sürdürülebilirlik Raporlaması (2005-2017). Journal of Accounting and Taxation Studies, 11(3), 463-478.

FAO (2023). Almost half the world's population lives in households linked to agrifood systems. https://www.fao.org/newsroom/detail/almost-half-the-world-s-population-lives-in-households-linked-to-agrifood-systems/en (Access date: 24 August 2023)

Friedmann, H. (2009). Discussion: moving food regimes forward: reflections on symposium essays. Agriculture and Human Values 26 (4), 335-344.

Friedrich, N., Heyder, M., & Theuvsen, L. (2012). Sustainability management in agribusiness: Challenges, concepts, responsibilities, and performance (No. 1020-2016-81734, pp. 530-546).

Gao, Y. (2011). CSR in an emerging country: a content analysis of CSR reports of listed companies. Baltic Journal of Management. Vol. 6 No. 2, pp. 263-291. https://doi.org/10.1108/17465261111131848

GRI 101 (2016). GRI 101: Foundation. https://www.globalreporting.org/standards/media/1036/gri-101-foundation-2016.pdf

GRI 13 (2022). Agriculture, Aquaculture and Fishing Sectors. https://www.globalreporting.org/search/?query=GRI+13

Goodman, D. and Watts, M. eds. (1997). Globalizing Food Agrarian Questions and Global Restructuring. Routledge.

Gümrah, A. & Büyükipekçi, S. (2019). Türkiye'de Sürdürülebilirlik Raporlamasi: 2008-2017 Yılları Arası Yayınlanmış Sürdürülebilirlik Raporlarının İncelenmesi. Muhasebe Bilim Dünyası Dergisi , 21 (2) , 305-323 .

Gümüş, S.G., Wingenbach, G. (2016). The Child Labor Problem in Turkish Agriculture: What Can We Do?. Social Indicators Research 127, 1193–1215. https://doi.org/10.1007/s11205-015-0999-1.

Günaydın, G. (2009). Türkiye Tarım Politikalarında 'Yapısal Uyum': 2000'li Yıllar. Mülkiye Dergisi, 33(162), 175–221.

Gürsoy, Ö. B., and Dodurka, B. Z. (2018). "Türkiye'de Kırsal Yoksulluğun Güncel Durumunun Eleştirel Bir Değerlendirmesi." In Türkiye'nin Büyük Dönüşümü, ed. Osman Savaşkan and Mehmet Ertan, pp. 445 -471 (İstanbul: İletişim Yayınları).

EPA. (2023) https://www.epa.gov/sustainability/learn-about-sustainability

Ilhan, U. D. (2021). Business Strategy for Sustainable Development in the Digital Era: Green Management. In Financial Ecosystem and Strategy in the Digital Era: Global Approaches and New Opportunities, eds. Umit Hacioglu and Tamer Aksoy, pp. 99-120. (Cham: Springer).

Ioris, A. A. (2018). The politics of agribusiness and the business of sustainability. Sustainability, 10(5), 1648.

Jindřichovská, I., Kubíčková, D., & Mocanu, M. (2020). Case study analysis of sustainability reporting of an agri-food giant. Sustainability, 12(11), 4491.

Joshi, B. K. (2021). Indigenous Seeds, Seed Selection and Seed Bank for Sustainable Agriculture. Grassroots Journal of Natural Resources, 4(4), 13-26.

Kan, M., & Kan, A. (2020). "Qualitative and quantitative analysis of the geographical indication system in Turkey." J. Glob. Innov. Agric. Soc. Sci, 8(2), 114-123.

Kenanoğlu, Z. and Karahan, Ö. (2002). "Policy implementations for organic agriculture in Turkey", British Food Journal, Vol. 104 No. 3/4/5, pp. 300-318. https://doi.org/10.1108/00070700210425732.

Keyder, Ç., and Yenal, Z. (2011). "Agrarian Change under Globalization: Markets and Insecurity in Turkish Agriculture." Journal of Agrarian Change, 11(1), 60-86.

Kocamış, T. U., & Yıldırım, G. (2016). Sustainability reporting in Turkey: Analysis of companies in the BIST sustainability index. European Journal of Economics and Business Studies, 2(3), 41-51.

Kolk, A. (2010). Trajectories of sustainability reporting by MNCs. Journal of World Business, 45(4), 367-374.

KPMG. (2022). Big shifts, small steps. Survey of Sustainability Reporting 2022. https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2023/04/big-shifts-small-steps.pdf

Kuhlman, T., & Farrington, J. (2010). What is sustainability? Sustainability, 2(11), 3436-3448.

Kurtege Sefer, B. (2020), "A gender- and class-sensitive explanatory model for rural women entrepreneurship in Turkey", International Journal of Gender and Entrepreneurship, Vol. 12 No. 2, pp. 191-210. https://doi.org/10.1108/IJGE-07-2019-0113

McMichael, P. (2013). Food Regimes and Agrarian Questions. Practical Action Publishing. http://www.jstor.org/stable/j.ctt1hj553s

Meadowcroft, J. (1997). Planning for sustainable development: Insights from the literatures of political science. European Journal of Political Research, 31(4), 427-454.

Mnif Sellami, Y., Dammak Ben Hlima, N., & Jarboui, A. (2019). "An Empirical Investigation of Determinants of Sustainability Report Assurance in France." Journal of Financial Reporting and Accounting, 17(2), 320-342.

Morea, D., Fortunati, S., Cappa, F. and Oriani, R. (2022). "Corporate social responsibility as a catalyst of circular economy? A case study perspective in Agri-food", Journal of Knowledge Management, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/JKM-06-2022-0451

Morelli, John (2011). "Environmental Sustainability: A Definition for Environmental Professionals," Journal of Environmental Sustainability, Vol. 1: Iss. 1, Article 2. DOI: 10.14448/jes.01.0002

Norton, B. G. (2007). Ethics and sustainable development: an adaptive approach to environmental choice. Handbook of sustainable development, 27-44.

OECD. (2021). Gender and the Environment: Building Evidence and Policies to Achieve the SDGs, OECD Publishing, Paris, https://doi.org/10.1787/3d32ca39-en.

Özçelik, F., Öztürk, B. A., & Gürsakal, S. (2015). Corporate Sustainability: A Research on Firms that Issue Sustainability Reports in Turkey. Business and Economics Research Journal, 6(3), 33.

Özsayın, D., & Korkmaz, M., (2021). Role of Rural Women in Organic Farming: A Case Study from Turkey. New Medit: Mediterranean Journal of Economics, Agriculture and Environment, vol.20, no.5, 17-32.

Paarlberg, V. (2022). To report or not to report; corporate sustainability in the Dutch food packaging sector. Research on the driving forces for engagement with corporate sustainability and sustainability reporting (Unpublished MA Thesis, Radboud University)

Pucker, K. P. (2021) Overselling Sustainability Reporting. Harvard Business Review. https://hbr.org/2021/05/overselling-sustainability-reporting (Access Date: 21 March 2023)

Sierra-García, L., Zorio-Grima, A., and García-Benau, M. A. (2015). "Stakeholder Engagement, Corporate Social Responsibility and Integrated Reporting: An Exploratory Study." Corp. Soc. Responsib. Environ. Mgmt., 22: 286–304. doi: 10.1002/csr.1345.

Siew, R. Y. (2015). A Review of Corporate Sustainability Reporting Tools (SRTs). Journal Of Environmental Management, 164, 180-195.

Sönmez, B., & İzgi, B. B. (2022). Market Structure in Olive and Olive Oil: Comparison of Italy and Turkey in terms of Cooperatives & Good Agricultural Practices. Academic Studies on Social and Economic Issues, ed. Berna Balcı İzgi and Gülay Örmeci Güney, pp. 135-85.

Sözen, C. and Basım, H.N. (2015), Örgüt Kuramları, Beta Basım A.Ş., Ankara, Turkey.

Şahin, Z. & Çankaya, F. (2018). KOBİ'lerde Sürdürülebilirlik Raporlaması ve Türkiye Örneği. Anadolu Üniversitesi Sosyal Bilimler Dergisi, 18 (4), 117-132.

Şardağı, E. and Coşkun, G. (2020). "A Research on Sustainability Reports of Business in Terms of Corporate Social Responsibility." Ege Academic Review, 20 (4), 247-263. DOI: 10.21121/eab.671077.

Topp-Becker, J., & Ellis, J. D. (2017). The role of sustainability reporting in the agri-food supply chain. Journal of Agriculture and Environmental Sciences, 6(1), 17-29.

UN (1987). Report of the World Commission on Environment and Development: Our Common Future https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf

UN (2023). Sustainable Development Goals. https://www.undp.org/sustainable-development-goals?gclid=EAIaIQobChMI-qiE6LSg_gIV-QYGAB15SQ-YEAAYAiAAEgIALvD_BwE

Vallet-Bellmunt, T., Fuertes-Fuertes, I., & Flor, M. L. (2023). Reporting Sustainable Development Goal 12 in the Spanish food retail industry. An analysis based on Global Reporting Initiative performance indicators. Corporate Social Responsibility and Environmental Management, 30(2), 695-707.

van der Lugt, C., van de Wijs, P. P., & Petrovics, D. (2020). Sustainability Reporting Policy: Global Trends in Disclosure as the ESG Agenda Goes Mainstream. Carrots & Sticks.

Vifell, Å.C. and Soneryd, L. (2012), Organizing matters: how 'the social dimension' gets lost in sustainability projects. Sustainable Development, 20: 18-27. https://doi.org/10.1002/sd.461

Waseem, N., & Kota, S. (2017). Sustainability definitions—An analysis. In Research into Design for Communities, Volume 2: Proceedings of ICoRD 2017 (pp. 361-371). Springer Singapore.

Westerholz, H. K., & Höhler, J. (2022). Corporate social responsibility reporting in the food industry—Comparison of co-operatives and investor-owned dairies. Corporate Social Responsibility and Environmental Management, 29(1), 211-222.

Wisniewska, J. (2015). The concept of sustainable development in agribusiness. Intercathedra, 31(3), 104-114.

Yıldız, S. (2022). Sürdürülebilirlik Performansının Çok kriterli karar verme yöntemleri ile ölçümü (Master's thesis, Alanya Alaaddin Keykubat Üniversitesi, Lisansüstü Eğitim Enstitüsü).

Yiğit, S. & Yiğit, A. M. (2016). Responsible Sourcing Practices In Turkey, The Case Of Food And Beverage Industry. Ordu Üniversitesi Sosyal Bilimler Enstitüsü Sosyal Bilimler Araştırmaları Dergisi. 6 (15), 463-477.

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Measuring The Competitiveness of Türkiye's Industries Against The European Union According to the Technology Intensity: An Evaluation within the Framework of the Customs Union Revision

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ABSTRACT

Identifying the industries with competitive power and knowing their places in the world market regarding proper policy implementations is essential. This paper aims to determine the normalized competition levels of Türkiye against the European Union (EU) countries in the context of industries with different technology intensities and to evaluate these industries within the scope of the planned Customs Union (CU) revision. For this purpose, firstly, the static comparison of Ballassa's Revealed Comparative Advantage (BRCA) index is calculated for 1990-2021. After, the dynamic comparison of Normalized Revealed Comparative Advantage (NRCA) index is calculated for 1990-2021. Analysis was made by considering the temporal comparison variation of NRCA. According to the research findings, the CU adversely affects competitiveness in low and medium-low technology sectors where Türkiye is competitive. The results show the importance and necessity of the CU revision.

Keywords: European Union, Customs Union, Competition Power, Balassa Index, Normalized Revealed Comparative Advantage.

JEL Classification Codes: F13, F15, F53

Referencing Style: APA 7

INTRODUCTION

With globalization, all the countries of the world have become integrated with each other. The liberalization of goods and services movements, along with the competition between countries, has increased the importance of foreign trade strategies. During the economic integration process, countries made agreements among themselves and pursued policies aimed at eliminating discrimination. The stages are listed as Free Trade Area, Customs Union (CU), Common Markets, Economic Unions and Full Economic Unions.

In the CU, member countries remove tariffs and quantitative restrictions on trade among themselves, while a common tariff is applied to trade with third countries. It is more difficult for member countries to agree on a mutual external tariff than in free trade areas, as they cede some of their sovereignty in trade policy to a supranational entity. Therefore, there are many free trade zones between countries that mutually remove tariffs and quantitative restrictions on trade (Jovanović, 2015, p. 8).

The first step in Türkiye's integration with the EU was its appeal to the European Economic Community (EEC) in 1957. Then, the process started with the Ankara Agreement signed in 1963, it became a member of the CU in 1966 and by applying for full membership in 1987, the status of a member country was gained in 1999. The status of a negotiator country has continued since 2005. Türkiye has a different attribute among the countries that are members of the CU. This attribute is that it is the first country to join the CU without becoming a full member of the EU. Türkiye has a different attribute among the countries that are members of the CU. This attribute is that it is the first country to join the CU without becoming a full member of the EU.

In the context of the CU theory, one of the dynamic effects that the union provides to the member countries is its effect on competition. With globalization, the

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phenomenon of competition has increased its importance and gaining advantage by gaining competitive power, especially for developing countries has become an important element for a sustainable economy. The technology density of products has become important in measuring the level of competitiveness because it creates high added value. Countries with a high-tech production structure gain a competitive advantage compared to other countries.

With the collaboration of the CU, the removal of obstacles to trade with EU countries has made Türkiye's largest trading partner. The removal of restrictions on industrial goods with the implementation of the CU began to increase Turkey's competitiveness with member countries. However, it has recently been claimed that the CU has started to harm the Turkish economy. If this thesis is correct, the issue of CU revision becomes extremely important in order to eliminate the negativities that arise since Türkiye's full membership to the EU is not possible in the imminent future. Due to this importance, the study aims to determine Türkiye's competitiveness levels against EUcountries in the context of industries with different technology intensity and to evaluate these industries within the content of the planned CU revision. In this context, firstly, the Revealed Comparative Advantage (BRCA) indices of Türkiye and 14 EU countries were calculated, and then the NRCA indices were calculated and analyzed. The study fills an important gap in the literature and provides evidence for policy designers by providing an assessment of the importance of the planned CU revision by determining the competitiveness of the industries discussed in terms of technology intensity. In this context, the study consists of seven chapters. After the introduction, the foreign trade structure of Türkiye and EU countries is discussed. Afterwards, the effect of the CU on foreign trade and the necessity of its revision were emphasized. Following this, a literature review was conducted. In the analysis part of the study, the competitiveness of Türkiye and the EU was measured. The study was completed with the results and recommendations section.

LITERATURE REVIEW

There are many studies in the literature to measure Türkiye's international competitiveness.[1] While many sectors are analyzed in studies, some studies also include the impact of the CU of different sectors and countries. These studies differ from each other according to sectors, periods, country groups examined and the index used. In the following section, studies are grouped according to the indices used and a literature review is included.

In his study, Lohrmann (2000) examined the impact of the CU on Türkiye's competitiveness with the help of the RCA index, considering the period 1994-1997. The study concluded that Türkiye still has an advantage in labor-intensive industries, but it is on a decreasing trend. It has been suggested that the reason for this decrease is that countries such as China, Indonesia and Malaysia, which have cheap labor force, have expanded their textile and clothing production capacity. Utkulu and Seymen (2004) examined Türkiye's competitiveness against 15 EU countries in their study. An analysis was made for the period 1990-2003, including different types of RCA. In the study, Türkiye's clothing and clothing accessories; rubber manufacturers; tobacco; vegetables and fruit; sugar, sugar preparations, honey; oilseeds and oily fruits; in textile yarn, fabrics and related product groups were concluded that it was advantageous. In addition, as an important finding in the study, it was determined that the competitiveness in these sectors has weakened with the CU. Aynagöz-Çakmak (2005) researched the comparative advantage of the Turkish textile and clothing industry by using Balassa's RCA index and Vollrath's competitiveness index. Vergil and Yıldırım (2006) analyzed Türkiye's competitiveness in the EU in their study. Panel data analysis covering the period 1993-2002 was performed by obtaining the RCA index. The study concluded that while the CU positively affects Türkiye's competitiveness in high-tech and research-intensive goods that are difficult to imitate, it negatively affects its competitiveness in capital-intensive and intermediate technology goods. In addition, it has been revealed that the CU relationship supports the catch-up paradigm with its competitiveness in high-tech and research-intensive goods that are difficult to imitate, its competitiveness in capital-intensive and intermediate technology goods supports the polarization theory. In his study, Altay (2008) examined Türkiye's competitiveness in the EU market by considering the sectors in the SITC grouping. For the period 1995-2007, Export Similarity index, Balassa and Vollrath index were used. The study concluded that Türkiye has competitive strength in labor and raw material intensive sectors, and its closest competitors are China, India, Indonesia, Italy, Poland, Romania, Portugal, Israel, Thailand, Sya and Morocco. Türker (2009) examined the impact of the CU on Türkiye's competitiveness by considering the sectors in the SITC grouping in his study. The RCA method was used for two sub-periods: 1990-1995 and 1996-2005. In the study, it was found that the CU

[1] In addition, there are many studies in the literature investigating the factors affecting competitiveness. For detailed information on this subject, you can refer to the study of Aydın and Kara (2022).

did not increase Türkiye's competitiveness and that although the competitive power was positively affected in some groups, it was a low competitive power. Şimşek and Sadat (2009) examined Türkiye's competitiveness in the Economic Cooperation Organization market in their study. For the years 1997-2005, the competitiveness in raw material and labor intensive sectors was analyzed using Balassa and Vollrath indices. The study concluded that while Türkiye is advantageous in labor-intensive industries, it is disadvantaged in raw material-intensive industries.

Şimşek et al. (2010), in their study, Türkiye's competitiveness against the EU was examined in terms of technology classification. Different trade measures were used for the period 1993-2008. The study concluded that Türkiye is advantageous in raw material and labor intensive goods, disadvantaged in R&D intensive goods, and relatively advantageous in capital intensive goods. Assadzadeh et al. (2013) investigated the competitiveness between Türkiye and Iran for the textile and clothing industries in their study. They used RCA and Trade Map (TM) index, considering the period 2001-2009. The study concluded that Türkiye has a strong comparative advantage in ready-made clothing and textile. According to the TM index, while Iran was the country that lost its superiority, Türkiye became the winner in both sectors. In his study, Eşiyok (2014) examined the competitiveness and intra-industry trade between Türkiye and the EU according to technology intensity. Balassa index was used for the period 2008-2013. The study concluded that Türkiye's competitiveness in high-tech sectors is low and intra-industry trade is based on low-medium and medium-high technology. Study findings have shown that Türkiye maintains its competitive advantage in certain product groups, but the advantage is gradually decreasing. In his study, Özdamar (2014) examined the structure and competitiveness of Türkiye's EU trade by dividing the manufacturing industry into technology intensities. He carried out his analysis with the help of various indices, considering the period 1996-2012. As a result of the study, it was found that while Türkiye's EU exports are medium-low, its imports are medium-high technology level, high-technology and medium-high technology industries are also disadvantaged, low-technology industries are high, and medium-low technology industries are competitive at borderline value. It has been found that intra-industry trade between Türkiye and the EU has increased, except for low-tech industries, and that sectors other than high-tech industries have returned to an intra-industry structure since 2002. In his study, Akis (2017) examined Türkiye's competitiveness in the chemical industry of Croatia, Hungary, Latvia, Lithuania and Poland, which are EU members. RCA index was used for the period 2007-2015. The study concluded that while Croatia, Hungary and Lithuania are advantageous, Türkiye, Poland and Latvia are at a disadvantage. In his study, Kalaycı (2017) examined Türkiye's competitiveness with the countries with which it has FTAs in foreign trade. RCA index was used for the period 2012-2016. The study concluded that while Türkiye is advantageous in beverages and tobacco, live animals and foodstuffs, beverages and tobacco and various manufactured goods; it is disadvantaged in inedible raw materials excluding fuel, animal, vegetable fats and oils, candles, and chemical industry and related industrial products not mentioned elsewhere. In his study, Ünlü (2018) examined the competitiveness between Türkiye and BRICS according to the technology intensity of the manufacturing industry. RCA index was used for the period 1996-2017. The study concluded that the country with the highest competitiveness in high-tech goods is China. The effects of the FTAs signed by Türkiye on its trade with the party countries by Ateş and Seymen (2019), bilateral foreign trade data for the period 1980-2017, export and import growth rates, bilateral concentration index, sectoral-bilateral trade concentration index and announced analyzed using the comparative advantage index (RCA). According to the results obtained, it is seen that the EU actively uses FTAs in order to liberalize foreign trade. It has been observed that Türkiye's inclusion in the CU without being a member of the EU not only caused it not to be able to protect its own interests as a commercial party in the FTA negotiations signed by the EU, but also prevented it from pursuing an independent economic integration and FTA policy. Erkan et al. (2020) used the Balassa index to identify the export competitiveness of countries in their study covering the period 2000-2017. According to the outcome obtained, it was concluded that the per capita income variable negatively affects the export competitiveness of major manufacturing goods. Kuşat and Denli (2021) examined the competitiveness between Türkiye and BRICS countries in their study. The RCA index was obtained for the period 2008-2019. The findings of the study showed that Türkiye has an advantage in food and livestock goods. When evaluated from a country perspective, it has been resolved that Türkiye has a greater competitive advantage over Brazil and South Africa. Ateş and Dilekoğlu (2021) analyzed bilateral foreign trade between Eurasian Economic Union member countries and Türkiye for the period

2010-2019. In their studies, they concluded that Türkiye's Preferential Trade Agreements with member countries including certain products and product groups could be beneficial in terms of foreign trade diversification.

Edward and Schoer's (2002) pioneering work for dynamic RCA was first implemented by Ekmen-Özcelik and Erlat (2013). Later, in their study, Ekmen-Özçelik and Erlat (2014) evaluated Türkiye's competitive status in the EU-15 market compared to its competitors outside the EU-15, both statically and dynamically, for the period 1996-2010. They based their evaluation on the RCA index (Balassa 1965) and dynamic RCA (Edwards and Schoer 2002) analysis. They concluded that although countries are heterogeneous in terms of product diversity in which they have comparative advantages, the main source of export income is the RCA sectors. In addition, motor vehicles, construction materials, textile products, plumbing and fittings, fruit and vegetable products are the sectors with the highest RCA parameter in Türkiye, and Bulgaria, Czech Republic, Egypt, India, Morocco and Poland are Türkiye's main sectors in these sectors. This is another result reached in the study in which it has rivals. Ekmen-Özçelik (2015) investigated Türkiye's export performance in the Greek market and Greece's export performance in the Turkish market using RCA and the dynamic RCA index. Güneş and Tan (2017) calculated and compared both static and dynamic RCA of 14 common sectors for both Türkiye and Russia for the years 2007-2010 and 2011-2014. RCA results show that Russia is statically more disadvantaged than Türkiye, but Russia has more sectors in the rising star category. While Türkiye has a dynamic comparative advantage in six sectors, Russia has a dynamic comparative advantage in 11 sectors. This study followed the approaches of Ekmen-Özçelik and Erlat (2013) by calculating Balassa's (1965) static RCA and Edwards and Shoer's (2002) dynamic RCA index. Following the studies of Tunca and Güneş (2021), Edwards and Schoer (2002), Ekmen-Özçelik and Erlat (2013), they calculated the sectoral export competitiveness for Türkiye using both static and dynamic RCA.

Demir et al. (2017) examined the machinery and transportation equipment trade activity of fourteen selected Asian countries with a stochastic frontier gravity model. In addition to many variables, the NRCA index is also included in the model. In his study, Demir (2019) calculated the comparative advantage between a the clothing, utomotive, textile, iron and steel, electrical machinery and fruit-vegetable sectors with the NRCA index for the years 2009-2017. In the comparative advantage analysis conducted for these sectors, it was found that the sector with the strongest expertise is the Clothing Apparel and Their Accessories sector, while the weakest is the Electrical Machines, Devices and Tools and its Parts sector. Demir (2020a) examined the effect of the NRCA index in Türkiye's pharmacology industry exports on pharmacological product exports for the period 2005:02-2019:12. As a result of the study, it was deduced that the affecting factors were only the industrial production index and NRCA had no effect on exports. Finally, Demir (2022) examines the competitive situation in Türkiye's hazelnut trade with three variations of NRCA (cross-goods, cross-country and temporal comparisons).

When the literature is summarized, it can be seen that although many indices have been used in studies, Balassa's RCA index is still widely used, and Dynamic and Normalized RCA indices are included in a few studies. The point that differentiate this study from other studies is the calculation of the static competitiveness of the manufacturing industries of Türkiye and 14 EU countries according to different technology intensities with the help of the BRCA index, as well as the addition of the variation of the NRCA index over time to the study. Thanks to this variation of the NRCA index, taking into account the increase or decrease in the competitive situation compared to the previous year becomes very important in evaluating the planned CU revision.

MEASURING THE NORMALIZED COMPETITIVENESS OF TÜRKİYE AND EU COUNTRIES

In this section, firstly, the method and data set used to measure Türkiye's competitiveness with EU countries are introduced, and in the following subsection, the analysis findings are shared.

Method and Dataset

There are many indices in the literature to measure competitiveness. As can be seen from the literature review, the most used approach in determining competitiveness between countries is BRCA. The RCA approach, first proposed by Liesner, was developed by Balassa (1965) and became popular under the name BRCA (Balassa's revealed comparative advantage) index. Since it is difficult to determine the price and non-price factors of countries and products in measuring comparative advantages, Balassa focused on exports instead of imports when evaluating comparative advantages, which

was explained on the grounds that the relative export performance would not deteriorate as long as the same tariff was applied to all exporters (Balassa, 1965, p. 104). In many studies in the applied literature, the BRCA index is often used to determine the relative ranking of a country's comparative advantage for different goods. Moreover, this index by Balassa (1965) considers the idea of comparative advantage from a static perspective. It is generally insufficient to explain comparative advantages that change over time (Ekmen-Özçelik and Erlat, 2014, p. 23).

After the BRCA index, many disclosed comparative advantage indices were developed to eliminate the shortcomings of this index[2]. However, although these indices have eliminated some deficiencies related to the BRCA index, their inadequacy in analyzing comparative advantages that have changed over time has not been overcome. Thereupon, Edwards and Schoer (2002) developed the Dynamic RCA index to analyze comparative advantages that change over time. This index of Edwards and Schoer (2002) is the relative change of the BRCA index and analyzes the relative trends in the share of goods 'j' in country 'i' and world exports. In 2009, Yu et al. (2009) developed the NRCA index, which will allow BRCA to make comparisons across areas (goods and regions/states/countries) and time. The NRCA index can reveal the degree of comparative advantage and comparison across goods, countries and time periods (Demir, 2020a, p. 910). Thus, the NRCA index can display the trade trend of a country (Demir, 2020b: 379). The NRCA index calculates the rate of shift from the neutral comparative advantage level in terms of the relative scale of a country's real exports relative to the world export market (Yu et al, 2009; p.268; Demir,2020a; p.380). In other words, NRCA normalizes the deviation of a country's actual exports from its neutral level with a space-invariant scale variable 'E', thus ensuring comparability across goods, countries and time dimensions (Yu et al., 2009; p. 274). A cross-good comparison of NRCA scores compares the relative level of specialization a country has in the two goods in question, and a cross-country comparison compares the relative performance of two countries in a good. Temporal comparison of NRCA scores allows comparing the change in the actual export level of a single good of a country with the expected change in the export level of this good that the country would have under the comparative advantage neutral situation. In this respect, since this study aims to determine Türkiye's competitiveness levels against EUcountries over time in the context of industries with different technology intensity and to evaluate these industries within the scope of the planned CU revision, the temporal comparison variation of the NRCA index is included.

In order to derive the NRCA index, it is first necessary to show the calculation of the BRCA index, which is the basic index;

$$BRCA_j^i = (E_j^i/\mathrm{E_j}) \,/\, (E^i/\,\mathrm{E}) \tag{1}$$

In the formula, variable E represents exports, variable 'i' represents the country, and variable 'j' represents the goods or industry. E_j^i refers to the exports of good 'j' of country 'i', $\mathrm{E_j}$ refers to the exports of good j by all countries, E^i refers to the total exports of country 'i', and E refers to total world exports (Yu et al., 2009, p. 268). If this index compares the share of the country's exports in a good or industry in total exports with that of other countries, being less than one indicates a comparative disadvantage for that good, and being greater than one indicates that it has a comparative advantage (Şimşek & Sadat, 2009, p. 139, Utkulu & Seymen). , 2004, p. 9). According to Equation 1, values 0 and 1 are the neutral comparative advantage points of the BRCA index.

In neutral comparative advantage, country i's exports of good 'j' are expressed as $\hat{E}_j^i$ and equal to $E^i\mathrm{E_j} \,/\, E$. Country i's main export of good 'j' in the world is E_j^i and is normally different from $\hat{E}_j^i$. This difference can be expressed as follows (Demir, 2022, p. 910):

$$\Delta E_j^i \equiv\ E_j^i -\ \hat{E}_j^i = E_j^i - (E^i\mathrm{E_j}) \,/\, \mathrm{E} \tag{2}$$

ΔE_j^i is normalized by dividing by E, and the NRCA index is obtained as follows:

$$NRCA_j^i \equiv \Delta E_j^i/\mathrm{E}\ = E_j^i/\,\mathrm{E} - \mathrm{E_j}E^i/\mathrm{EE} \tag{3}$$

In order to compare NRCA over time, the change of the index between time t+1 and time t is calculated as follows:

$$\Delta NRCA_{j,t+1}^i \equiv NRCA_{j,t+1}^i - NRCA_{j,t}^i = \left(\frac{E_{j,t+1}}{E_{t+1}} - \frac{E_{j,t}^i}{E_t}\right) - \left(\frac{E_t^i}{E_t}\frac{E_{j,t}}{E_t} - \frac{E_{t+1}^i}{E_{t+1}}\frac{E_{j,t+1}}{E_{t+1}}\right) \tag{4}$$

The formula $\left(\frac{E_t^i}{E_t}\frac{E_{j,t}}{E_t} - \frac{E_{t+1}^i}{E_{t+1}}\frac{E_{j,t+1}}{E_{t+1}}\right)$ shows the change in exports of good 'j' of country 'i' between time t+1 and time t. $\frac{E_t^i}{E_t}\frac{E_{j,t}}{E_t}$ shows in period t and $\frac{E_{t+1}^i}{E_{t+1}}\frac{E_{j,t+1}}{E_{t+1}}$ shows the expected export level of good 'j' in case of

[2] For detailed information, see Yu et al. (2009), Laursen (2015) and Demir (2022) studies can be consulted.

comparative neutral comparative advantage of country 'i' in period t+1.

Therefore $\left(\frac{E_t^i}{E_t}\frac{E_{j,t}}{E_t} - \frac{E_{t+1}^i}{E_{t+1}}\frac{E_{j,t+1}}{E_{t+1}}\right)$ is the comparative advantage between the periods t and t+1, and the change in the export level that country 'i' should have in goods 'j' in order to maintain its neutral status is obtained. If the value of $\Delta NRCA_{j,t+1}^i$ is greater than zero, it means that country 'i' increases its comparative advantage in good 'j' between time t and t+1, and if the value is less than zero, it means that its comparative advantage decreases (Yu et al., 2009, p. 275).

The study in which these methods are used covers the period 1990-2021. Since some of the countries in the European Union became members of the EU after 1996, 14 of the 27 member countries with no missing data were included in the analysis. In addition, the official start of the Czech Republic was January 1, 1993, Estonia was August 31, 1994, Latvia was August 21, 1991, Lithuania was March 11, 1990, and Slovakia was January 1, 1993, so it was excluded from the analysis due to lack of data. Thus, the time-dependent change in the competitiveness of Türkiye's industries with different technology intensity for the post-CU period is discussed. NACE Rev. prepared by Eurostat for manufacturing industry products according to technology intensity. It has been adapted to ISIC Rev.4 classification, taking into account the 2 3 classification. Due to lack of data, the sectors "Reproduction of recorded media (18.2)" and "Repair and installation of machinery and equipment (33)" were excluded from the analysis. Industries were examined in 4 groups: high technology, medium-high technology, medium-low technology and low technology. All sectors were separated according to their technology intensity and calculated by adding them together and taking their average. While sectoral import and export data of Türkiye and the EU were acquired from the OECD database, total import and export data were acquired from the World Bank database.

Empirical Findings

Table 1 shows the average of Türkiye's sectoral competitiveness in the manufacturing industry for the period 1990-2021. Türkiye's ''Wearing apparel manufacturing", ''Food products manufacturing", ''Textile manufacturing", ''Furniture manufacturing, other manufacturing", ''Wood and products of wood, except manufacture of furniture'', ''Leather and related products", 'Tobacco products", ''Paper and paper products", ''Manufacture of other non-metallic mineral products", ''Building of ships and boats", ''Manufacture of fabricated metal products", ''Manufacture of rubber and plastic products", ''Manufacture of basic metals", ''Manufacture of coke and refined petroleum products", ''Manufacture of weapons and ammunition", ''Manufacture of electrical equipment", ''Manufacture of motor vehicles, trailers and semi-trailers", ''Manufacture of machinery and equipment nec", ''Manufacture of chemicals and chemical products", ''Manufacture of air and spacecraft and related machinery" and ''Manufacture of computer, electronic and optical products '' are seen that competitive power is high. The first four sectors with the highest competitiveness are ''Wearing apparel manufacturing", "Textile products", "Weapons and ammunition manufacturing" and "Basic metals manufacturing", respectively. The reason for this situation is that Türkiye has factor equipment suitable for the production of these four sectors.

The four sectors with the lowest competitiveness are "Manufacture of basic pharmaceutical products and pharmaceutical materials", "Medical and dental instruments and supplies ", "Printing and reproduction of recorded media" and "Beverage products". It is seen that as the technology intensity used in production increases, competitiveness decreases.

Annex 2 lists the competitiveness of EU countries in the manufacturing industry by sector. Considering the industries with the highest competitiveness in Türkiye, Finland was the country with the lowest advantage in "wearing apparel" and "textile products" among EU countries. While the disadvantaged country in "weapons and ammunition manufacturing" is the Netherlands, it is Denmark in "basic metals manufacturing". Considering the four sectors with the lowest competitiveness, Denmark in "Manufacture of basic pharmaceutical products and pharmaceutical preparations ", Netherlands in "Medical and dental instruments and supplies ", Austria in "Printing and reproduction of recorded media" and France are the countries with the highest advantage in "Beverage products".

Among the 27 manufacturing industries considered, Austria "Building of ships and boats", Belgium "Building of ships and boats" and "Manufacture of air and spacecraft and related machinery", Denmark "Manufacture of air and spacecraft and related machinery" '', Finland ''Manufacture of tobacco products", Wearing apparel", ''Manufacture of leather and related products" and ''Manufacture of air and spacecraft and related machinery", Netherlands ''Manufacture of weapons and ammunition", Hungary ''Building of ships and boats", and ''Manufacture of air and spacecraft and related

Table 1: Türkiye's Manufacturing Industry Competitiveness BRCA (1990-2021 Average)

LOW-TECHNOLOGY	
Wearing apparel	25.43
Textile	19.17
Manufacture of food products	5.71
Tobacco products	4.20
Manufacture of furniture	3.42
Leather and related products	2.23
Wood and products of wood, except manufacture of furniture	1.83
Paper and paper products	1.74
Printing and reproduction of recorded media,	0.77
Beverages	0.76
MEDIUM-LOW TECHNOLOGY	
Manufacture of basic metals	8.63
Manufacture of other non-metallic mineral products	7.89
Building of ships and boats	6.14
Manufacture of fabricated metals products, excepts machinery and equipment	4.72
Manufacture of rubber and plastic products	4.35
Manufacture of coke and refined petroleum products	3.64
MEDIUM-HIGH TECHNOLOGY	
Manufacture of weapons and ammunition	9.52
Manufacture of electrical equipment	4.36
Manufacture of motor vehicles, trailers and semi-trailers	3.44
Manufacture of chemicals and chemical products	1.92
Manufacture of machinery and equipment n.e.c.	1.52
Manufacture of other transport equipment	0.88
Manufacture of medical and dental instruments and supplies	0.69
HIGH-TECHNOLOGY	
Manufacture of air and space vehicles and related machinery	1.22
Manufacture of computer, electronic and optical products	1.22
Manufacture of basic pharmaceutical products and pharmaceutical preparations	0.60

Source: Calculated and arranged by us using OECD data.

Table 2: Competitiveness of EU Countries and Türkiye BRCA (1990-2021 Average)

	Low-Technology	Medium-Low Technology	Medium-High Technology	High-Technology
Germany	2.98	3.41	4.43	4.59
Austria	5.35	4.30	6.24	3.17
Belgium	3.75	3.95	4.66	3.29
Denmark	4.78	3.93	2.99	4.52
Finland	6.41	6.55	3.44	2.48
France	4.08	3.39	3.63	7.66
Holland	4.55	4.14	3.27	4.31
Spain	3.66	5.18	3.84	2.62
Sweden	4.59	3.72	3.55	4.33
Italy	5.55	5.29	5.35	2.62
Hungary	3.16	2.88	3.80	4.16
Poland	5.67	8.10	3.48	1.92
Portugal	9.38	5.09	3.54	1.77
Greece	6.08	7.69	1.47	2.10
EU Average	**5.00**	**4.83**	**3.84**	**3.54**
Türkiye	**6.53**	**5.90**	**3.19**	**1.01**

Source: Calculated and arranged by us using OECD data.

machinery", Portugal ''Manufacture of air and spacecraft and related machinery", Greece ''Manufacture of machinery and equipment n.e.c.", "Manufacture of motor vehicles, trailers and semi-trailers", " Manufacture of other transport equipment" and "Manufacture of medicaland dental instruments and supplies" have a disadvantage in the manufacturing.

In Table 2, BRCA indices obtained according to the technology intensity used in the manufacturing industry of Türkiye and EU countries are presented as the average of the 1990-2021 period.

When Türkiye and EU countries are compared, the first three countries with the highest competitiveness within the framework of low-tech product production are Portugal, Türkiye and Finland, respectively. The country with the lowest advantage is Hungary. In terms of medium-low technology production, the countries with the highest competitiveness are Poland, Greece and Finland. Hungary is the country with a low advantage. The country with the highest competitiveness in medium-high technology production is Austria, followed by Italy, Belgium and Germany, respectively. The country with the lowest advantage is Greece. Finally, in the production of high-tech products, France, Germany and Denmark are in the most advantageous position, respectively, while Türkiye is the country with the least advantage.

Although Türkiye has the highest competitive advantage in low-tech product production, it is seen that it has the lowest competitive advantage among EU countries in high-tech product production.

Table 3 includes NRCA data of Türkiye's sectoral competitiveness in the manufacturing industry for 1991 and 2021. It is seen that Türkiye's competitive power has increased in "Manufacture of medical and dental instruments and supplies", which is one of the sectors using medium-high technology, and in "Manufacture of basic pharmaceutical products and pharmaceutical preparations", which is one of the sectors using high technology. However, although Türkiye's manufacturing industry structure is suitable for low and medium-low technology sectors, the outcome show that its competitiveness has not increased. This situation is an indicator of the negative effects that arise due to being a member of the CU but not being a member of the EU.

It is seen that Türkiye's competitiveness in the manufacturing industry has decreased in most sectors. The sectors that attract the most attention are ''Manufacture of motor vehicles, trailers and semi-trailers", ''Manufacture of machinery and equipment n.e.c.", ''Manufacture of chemicals and chemical products", ''Textile products", "Manufacture of basic pharmaceutical products and pharmaceutical preparations" and " Manufacture of basic metals". Although the factor endowment is suitable, it is seen that competitiveness decreases in sectors with low technology intensity.

Table 4 presents the NRCA indices of EU countries and Türkiye for the years 1991 and 2021.

When the competitiveness of EU countries and Türkiye on the basis of technology is examined, it is seen that the competitiveness is decreasing for all sectors. However, it was concluded that only France's high technology competitiveness increased.

Considering the EU average, the highest decrease in competitiveness is in Medium-High Technology, followed by Low Technology, Medium-Low Technology and High Technology, respectively. For Türkiye, the highest decrease is again in Medium-High Technology, followed by Low Technology, Medium-Low Technology and High Technology, respectively.

In Annex 3, the competitiveness of EU countries and Türkiye in the manufacturing industry is included separately for all sectors.

In terms of Low Technology, the country that increases its competitiveness the most in "food products manufacturing", "wearing apparel" and "textile manufacturing" is Finland, also Finland, Greece and Türkiye in "beverage products manufacturing", Finland, Sweden and Hungary in "tobacco products manufacturing", Finland and Greece in the "manufacture of leather and related products", Greece in the "manufacture of Wood and products of wood, except manufacture of furniture" and "manufacture of paper and paper products" .

In terms of Medium-Low Technology, Austria is the country that has increased its competitiveness the most in the "manufacture of coke and refined petroleum products", Greece in the "manufacture of plastic and rubber products" and "manufacturing of fabricated metal products", and Greece in the "manufacture of other non-metallic products". Finland and Greece in the "manufacture of mineral products" and Portugal in the "manufacture of basic metals".

In terms of Medium-High Technology, the country that has increased its competitiveness the most in the "manufacture of chemicals and chemical products", "manufacture of electrical equipment", "manufac-

Table 3: Türkiye's Manufacturing Industry Competitiveness (Temporal Comparison)		
LOW-TECHNOLOGY	NRCA	
	1991	2021
Wearing apparel	0.00866	0.00455
Beverages	0.00332	0.00241
Manufacture of food products	0.01902	0.01300
Textile	0.00963	0.00215
Manufacture of furniture	0.01037	0.00752
Leather and related products	0.00457	0.00284
Wood and products of wood, except manufacture of furniture	0.00306	0.00188
Tobacco products	0.00096	0.00053
Paper and paper products	0.00928	0.00362
Printing and reproduction of recorded media,	0.00073	0.00009
MEDIUM-LOW TECHNOLOGY		
Manufacture of other non-metallic mineral products	0.00636	0.00269
Building of ships and boats	0.00153	0.00133
Manufacture of fabricated metals products,	0.01025	0.00626
Manufacture of rubber and plastic products	0.00895	0.00675
Manufacture of basic metals	0.01711	0.01092
Manufacture of coke and refined petroleum products	0.00649	0.00621
MEDIUM-HIGH TECHNOLOGY		
Manufacture of weapons and ammunition	0.00020	0.00014
Manufacture of electrical equipment	0.01326	0.01102
Manufacture of motor vehicles, trailers and semi-trailers	0.03671	0.02111
Manufacture of machinery and equipment n.e.c.	0.03373	0.02026
Manufacture of medical and dental instruments and supplies	**0.00170**	**0.00275**
Manufacture of chemicals and chemical products	0.02763	0.01933
Manufacture of other transport equipment	0.00148	0.00112
HIGH-TECHNOLOGY		
Manufacture of air and space vehicles and related machinery	0.00745	0.00344
Manufacture of computer, electronic and optical products	0.02104	0.01441
Manufacture of basic pharmaceutical products and pharmaceutical preparations	**0.00462**	**0.01359**

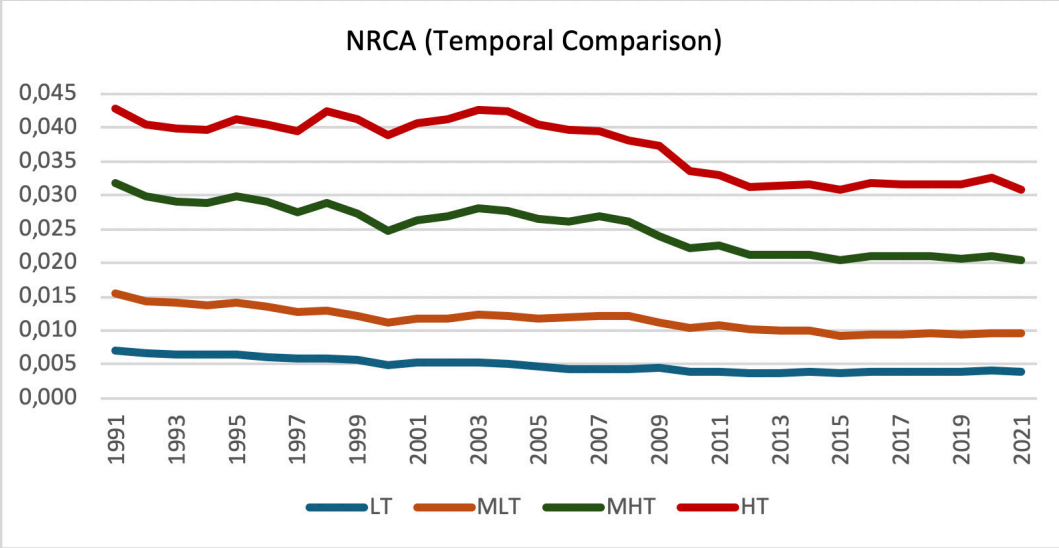
Source: Calculated and arranged by us using OECD data.

Table 4: Competitiveness of EU Countries and Türkiye (NRCA)

	Low-Technology		Medium-Low Technology		Medium-High Technology		High-Technology	
	1991	2021	1991	2021	1991	2021	1991	2021
Germany	0.00559	0.00320	0.00599	0.00455	0.00921	0.00686	0.00727	0.00652
Austria	0.00688	0.00395	0.00821	0.00577	0.01588	0.01075	0.01077	0.01021
Belgium	0.00647	0.00385	0.00748	0.00563	0.01504	0.01042	0.01053	0.00965
Denmark	0.00679	0.00396	0.00836	0.00593	0.01614	0.01098	0.01073	0.01013
Finland	0.00683	0.00403	0.00836	0.00589	0.01617	0.01102	0.01089	0.01049
France	0.00602	0.00361	0.00722	0.00559	0.01366	0.01004	0.00883	0.00891
Holland	0.00629	0.00353	0.00758	0.00540	0.01510	0.00998	0.00980	0.00885
Spain	0.00684	0.00378	0.00809	0.00559	0.01568	0.01048	0.01077	0.01013
Sweden	0.00677	0.00396	0.00815	0.00583	0.01575	0.01080	0.01047	0.01016
Italy	0.00585	0.00349	0.00735	0.00527	0.01433	0.00994	0.00995	0.00962
Hungary	0.00703	0.00403	0.00849	0.00592	0.01635	0.01079	0.01103	0.01018
Poland	0.00704	0.00377	0.00842	0.00565	0.01635	0.01060	0.01104	0.01012
Portugal	0.00689	0.00401	0.00847	0.00592	0.01632	0.01106	0.01099	0.01047
Greece	0.00702	0.00406	0.00848	0.00592	0.01641	0.01115	0.01105	0.01049
EU Average	**0.00659**	**0.00380**	**0.00790**	**0.00563**	**0.01517**	**0.01035**	**0.01029**	**0.00971**
Türkiye	**0.00696**	**0.00386**	**0.00845**	**0.00569**	**0.01639**	**0.01082**	**0.01104**	**0.01048**

Source: Calculated and arranged by us using OECD data.

Chart 1: Türkiye's Competitiveness According to Technology Intensity (NRCA)



Source: Calculated and arranged by us using OECD data.

ture of machinery and equipment n.e.c.", "manufacture of motor vehicles, trailers and semi-trailers" is Greece and in the "manufacture of medical and dental instruments and supplies" are Portugal, Greece and Türkiye.

In terms of High Technology, the country that has increased its competitiveness the most in the "manufacture of basic pharmaceutical products and pharmaceutical materials" is Türkiye, in "manufacturing of computer, electronic and optical products" is Greece and in "manufacturing of air and space vehicles and related machinery" is Hungary.

Chart 1 shows the change in Türkiye's NRCA competitiveness between 1991 and 2021 according to all technology intensities. It is observed that there have been fluctuations in Türkiye's competitiveness in terms of all technologies, decreasing from 1991 to 2021. However, in recent years, it has been observed that the decline in competitiveness has been decreasing, not sharp.

DISCUSSION: NECESSITY OF THE CUSTOMS UNION REVISION

The Ankara Agreement, which initiated the integration process between Türkiye and the EU, aimed to gradually establish the CU. In this context, three periods have been planned for Türkiye's development towards full membership: preparation, transition and final period. During the preparation period, commercial "facilities, financial opportunities and credit support were provided to strengthen Türkiye's economic structure. The transition period started with the registry into force of the Added Protocol in 1973. In the protocol, Türkiye's legal legislation was tried to be harmonized with the EU's legislation on issues such as competition and tax, and it was aimed to realize a CU covering industrial goods (Ay, 2019, p. 167). When it came to the final stage, with the signing of the Association Council Decision in 1995, the CU was completed to include only industrial products and processed agricultural products and entered into force in 1996.

Considering the dynamic effects of the CU, it has had a positive effect on the level of competition and efficiency in Türkiye's manufacturing sector, diversified the production structure and led to the production of quality products. The assimilation of technical infrastructure, intellectual property and competition rules harmonized with the EU has increased Türkiye's integration with the world by increasing its competitiveness in the foreign market (ABB, 2019). Additionally, the EU has become Türkiye's largest trading partner. While Türkiye's exports to the EU increased with the CU, there was a significant increase in its imports.

Although the target was full membership in the near future when the CU process started, twenty-six years have passed and full membership to the EU has still not been achieved. Therefore, some problems arose and the necessity of revision was proven by the findings obtained in this study.

The evaluation report prepared by the European Commission to the World Bank and published in 2014 played an important role in the CU revision process. Following this report, it was announced that a meeting was held with the European Commission in Brussels on 12 May 2015 and an agreement was reached to start the

process (Nas, 2020). According to the World Bank report, with the change in the global economy, some design-related problems have emerged in the CU. Therefore, it was stated that changes needed to be made so that both parties could benefit from the new environment. Accordingly, the factors that make the CU revision necessary can be listed as follows (Nas, 2020; Utkulu, 2019; Kabaalioğlu, 2010):

- Being limited to industrial products and processed agricultural products,
- The EU has made many Free Trade Agreements (FTAs),
- Türkiye not taking part in the decision-making mechanism,
- Quota and toll problems in road transportation,
- Visa problem.

The CU should not be limited to industrial products and processed agricultural products. It should be changed especially to include agricultural products and the service sector. In the World Bank's report, primary agricultural products were examined under four scenarios. It is based on a very comprehensive FTA in the first scenario, low quotas on imports in the second scenario, expansion of the CU in the third scenario, and acceptance of the EU common agricultural policy in the fourth scenario. It has been stated that economic welfare in both Türkiye and the EU increases in these four scenarios. The most profitable option was the scenario in which the CU was expanded. Thus, it was estimated that Türkiye's exports of vegetables, fruits, shellfish, vegetable oils and dairy products would increase, and import increases would be in wheat, vegetables, fruits, shellfish and meat products (Eren, 2018, p. 11-12). An expansion to include agricultural products will lead to a harmonization process in food safety, veterinary and phytosanitary issues and will benefit Türkiye in terms of sustainable development, while production quality will increase and costs will decrease with reforms in agriculture. The services sector has an important place in Türkiye's development. Sectors such as tourism and transportation are of great importance. Therefore, Türkiye has a high opportunity to increase its trade with the EU in this field. On the other hand, it also has a special importance for full membership in the EU. Since agriculture and service trade are not included in the CU with the EU, great losses occur in the agreements made by the EU with third countries.

The number of FTAs that the EU has made with third countries is increasing. This situation negatively affects Türkiye's interests. Since Türkiye is not a member of the EU, it cannot sit at the table in FTA negotiations and therefore cannot take part in the decision-making mechanism, thus asymmetric situations arise. This situation is harmful because the agreements signed between the EU and third countries are not generalized specifically for Türkiye. While countries that have signed an FTA with the EU due to the CU have the right to bring the goods in question to Türkiye duty-free, the ability of Turkish goods to go to other countries duty-free depends on additional agreements. Therefore, as the FTA between the EU and other countries increased, Türkiye became disadvantaged and its competitive power decreased. Since there are many FTAs today, the need for revision has increased. Especially the talk of the Transatlantic Trade and Investment Partnership Agreement (TTIP), a mega regional agreement in 2013, increased concerns for Türkiye and made revision necessary. The World Trade Organization's inability to find a solution to structural problems and to reach a multilateral trade agreement for many years has brought mega regional agreements to the agenda. TTIP aims to facilitate both trade and investments by removing trade barriers between the USA and the EU. Due to the CU, while US products come freely from the EU to the Turkish market, customs duties will continue to be applied to Türkiye's exports to the USA. Therefore, the trade balance with the USA will be negatively affected. On the other hand, products produced in Türkiye will lose their competitiveness in the US market against products produced in the EU. In addition, since this agreement will lead the USA and the EU to establish global norms, they will need to act in accordance with the newly determined regulations. This will bring about a costly process. Therefore, it has become important for Türkiye to sign an FTA with the USA (Akman, 2013, p.2). However, the de facto halt of TTIP negotiations due to disagreements has saved time for Türkiye.

The existence of road transport quotas and transit permits on goods within the scope of the CU restricts the free movement of goods. Despite the CU, EU countries introduced quotas for third country trucks in 2001, which negatively affected both Türkiye 's transportation sector business potential and export opportunities to the EU. The bilateral agreements made by Türkiye with EU countries were mostly insufficient to meet the need due to the determined transportation quotas (Cengiz and Kurtbağ, 2015, p. 20). Therefore, these quotas and permits need to be liberalized to ensure the free movement of goods.

Another asymmetric situation that negatively affects Türkiye is the visa regime. While most citizens of EU countries can easily obtain a visa to Türkiye without a

visa or with reasonable fees at the border, Turkish citizens can obtain a visa with a lot of paperwork and high fees. Another problem is that visa deadlines are short. Since this situation is costly, it is perceived as an obstacle to trade by businessmen and other professionals (World Bank, 2014, p. 86). While trade is free in goods within the scope of the CU, visa barriers for importers and exporters trading these goods in Türkiye cause a significant disadvantage.

When the change in Türkiye's competitiveness over the years according to its technology intensity in Chart 1 is examined, it experienced its first sharp decline in 1997 with the membership of the CU in 1996, and although there were fluctuations, its competitiveness continued with a decreasing trend until 2021. The fact that the CU is limited to industrial products and processed agricultural products, the EU's numerous FTAs, the introduction of quotas by EU countries on third country trucks in 2001, and the visa barrier have negatively affected its superiority, especially in low and medium-low technologies, where it has a competitive advantage.

Considering these evaluations as a whole, Türkiye needs to have full membership in the EU in order to solve the problems arising from the CU. However, since full membership is not possible in the short term, the scope of the CU should be revised by expanding and deepening in order to eliminate the negativities that arise.

CONCLUSION

With the liberalization of foreign trade, countries have turned to various agreements in order to improve both their economic and commercial relations. Thanks to economic integration, dynamic effects such as increased industrialization speed, technological developments, economies of scale and changes in competitiveness emerge. While member countries gain advantages thanks to the trade blocs formed by the countries, it is also seen that the dynamic effects that emerge during the dynamic process cause disadvantages. Increasing globalization and technological developments have brought the concept of competitiveness to the fore, and by measuring competitiveness, it can be revealed whether countries have an advantage or disadvantage in selected sectors.

In the study, firstly, the BRCA index was calculated by taking into consideration the competitiveness of Türkiye and EU countries and the technology density in the manufacturing industry. NACE Rev. Sectors were determined based on the 2 3 classification and separated according to technology intensity. In the analysis conducted for the 1990-2021 period, it was concluded that Türkiye has an advantage in the low and medium-low technology manufacturing industry, while it has a lower advantage in the medium-high and high technology manufacturing industry. However, in recent years, it has been observed that competitiveness has increased in the manufacturing of high-tech air and space vehicles and related machinery. The sectors with the highest competitiveness are the manufacturing of wearing apparel, food products, textile products, other non-metallic mineral products, basic metals and building of ships and boats. These results are similar to Utkulu and Seymen (2004), Altay (2008), Şimşek and Sadat (2009), Şimşek et al. (2009), Eşiyok (2014), Özdamar (2014), Kalaycı (2017), Kuşat and Denli (2021). Türkiye, which has an advantage in 21 of the 26 manufacturing industries considered in the analysis, has a high competitive power in these industries, especially in low-technology industries, compared to EU countries. The fact that competitive power is in low-technology industries shows that they specialize in products with low added value.

After calculating the BRCA index, the NRCA index was calculated by considering the years 1990-2021. It is seen that Türkiye's competitiveness has increased in the " medical and dental instruments and supplies" sectors, which are medium-high technologies, and "Basic pharmaceutical products and pharmaceutical preparations" sectors, which are high technologies. When

looked at as BRCA, it is advantageous in 21 sectors, but when looked at from a temporal perspective, it is seen that it maintains its advantageous situation in only 2 sectors and loses its advantage in other sectors. This finding is evidence of the negative effects that arise over time due to being a member of the CU but not the EU. As discussed before, one of the most important reasons why the CU negatively affects Türkiye's competitiveness, especially in the low and medium-low technology sectors where it has an advantage in competition, can be shown as the FTAs that the EU has made with other countries. The reason for the increased competitiveness in medium-high and high-technology sectors can be clarified by the catch-up paradigm. The catch-up paradigm is based on the argument that increased trade will increase the competitiveness of developing countries such as Türkiye in terms of capital-intensive and high-technology goods. As stated in the study of Vergil and Yıldırım (2006), it can be explained by the catch-up paradigm, which argues that the CU will increase competitiveness in high-tech sectors by reducing the costs of accessing technology.

The CU initially had positive effects on the Turkish economy. It is possible to list these effects as increasing productivity by developing the manufacturing industry, producing higher quality products due to competition, and reducing costs and increasing efficiency in production due to following technological developments. With these effects, Türkiye's trade volume in the EU market has increased. However, today, admissioning the CU without full membership to the EU has caused disadvantages and problems on Türkiye's side. Being limited to processed agricultural products and industrial products, as emphasized in the studies of Ateş and Seymen (2019), the fact that the EU has signed a large number of FTAs, not being involved in the decision-making mechanism, the problem of quotas and tolls in road transportation and the visa problem has made necessitate the revision of the CU.

When the CU process started, Türkiye's goal was to achieve full membership in the EU in the near future. However, this did not happen and problems began to arise due to the CU. Although Türkiye still has competitive power in the low and medium-low technology sectors since its membership in the CU, it can be seen that there has been a decline. There has also been an increase in competitiveness in sectors using medium-high technology, but the desired success has not been achieved and we remain at a disadvantage. The disadvantageous situation continued in high-tech sectors. Therefore, these results in low-tech sectors with high competitiveness support the conclusion that the CU causes undesirable situations on Türkiye. In order to prevent these undesirable situations, the revision of the CU is an important and urgent issue. The CU caused Türkiye's competitiveness to decrease and led to it becoming an open market. In particular, the FTA agreements made by the EU and third countries have put Türkiye at a disadvantage and deeply affected its competitiveness. While high customs duties are applied to Turkish products, the products of third countries enter Türkiye duty-free and the duty-free entry of third countries into the EU market leads to a competitive disadvantage. Therefore, since full membership to the EU does not seem possible in the near future, the revision of the CU with the EU will be in favor of Türkiye instead of continuing the CU in its current form. However, in order to make a sustainable contribution to economic growth in the long term, it is necessary to closely monitor technological developments and develop high-tech industries by giving importance to R&D studies. Using technological methods in production in the manufacturing industry and increasing quality, producing products with high added value and thus reducing Türkiye's dependence on imports by producing its own products will positively affect both competitiveness and foreign trade deficit.

REFERENCES

ABB. (2019). *Gümrük Birliği*. https://www.ab.gov.tr/gumruk-birligi_46234.html, (Erişim Tarihi: 24.12.2021).

Ateş, E. & A.D. Seymen (2019). Türkiye'nin İmzaladığı Serbest Ticaret Anlaşmaları: İki Yanlı-Sektörel Bir Analiz ve Dış Ticaret Politikası Açısından Bir Değerlendirme. *Sosyoekonomi*, 27(42), 255-282.

Ateş, E. ve Dilekoğlu, S (2021). Türkiye'nin Dış Ticaret Çeşitlendirmesinde Yeni Bir Pazar: Avrasya Ekonomik Birliği. *Manas Sosyal Araştırmalar Dergisi*, 10(1), 253-271.

Akçay, E.A. (2017). Pozitif Gündem ve Sonrasındaki Gelişmeler Işığında Türkiye-AB İlişkileri. *Uluslararası İktisadi ve İdari İncelemeler Dergisi*, (19), 43-58.

Akis, E. (2017). Competitiveness Analysis of The Turkish Chemical Industry: A Comparison with The Selected European Union Countries. *Journal of Economics, Finance and Accounting*. 4(2), 129-137.

Akman, M. S. (2013). AB-ABD Transatlantik Ticaret ve Yatırım Ortaklığı (TTIP) ve Türkiye. *Türkiye Ekonomi Politikaları Araştırma Vakfı*. Rapor No. R201305.

Altay, H. (2008). Karşılaştırmalı Üstünlükler Teorisi Kapsamında Türk Endüstrilerinin Avrupa Birliği (15) Pazarındaki Rekabet Gücü Düzeylerinin İncelenmesi: 1995-2007. *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi*, (21), 215-239.

Assadzadeh, A., Behbudi, D., Miyarkolaie, N. F. & Moghadam, H. M. (2013). A Study of The Revealed Comparative Advantage in The Textile and Clothing Industries Between Iran and Turkey. *International Journal of Economics and Finance Studies*. 5(2), 95-107.

Ay, S. (2019). Türkiye'nin Avrupa Birliği Çıkmazı: Gümrük Birliği Anlaşması Çerçevesinde Değerlendirmeler. *TESAM Akademi Dergisi*. 6(2), 161-174.

Aynagöz, Ö. (2002). Gümrük Birliği Teorisinin Gelişimi. *Ekonomik Yaklaşım*, 13(44), 23-39.

Aynagöz, Ç. Ö. (2005). Açıklanmış Karşılaştırmalı Üstünlükler ve Rekabet Gücü: Türkiye Tekstil ve Hazır Giyim Endüstrisi Üzerine Bir Uygulama. *Ege Akademik Bakış*. 5(1), 65-76.

Balassa, B. (1965). Trade Liberalisation and "Revealed" Comparative Advantage. *The Manchester School*, 33(2), 99-123.

Cengiz, C. & Kurtbağ, Ö. (2015). Türkiye-AB Gümrük Birliği'nde Yaşanan Güncel Sorunlar ve Bunlara Olası Çözüm Önerileri. *Akademik Yaklaşımlar Dergisi*, 6(2), 1-33.

Demir, M. A. (2019). Normalleştirilmiş Açıklanmış Karşılaştırmalı Üstünlükler Endeksi Yaklaşımı ile Türkiye'de Sektörler Arası İhracat Rekabetinin Analizi. *Econder I. Uluslararası İktisat, İşletme ve Sosyal Bilimler Kongresi Bildiri E-Kitabı*, 18-20 Ekim 2019, 321-332.

Demir, M. A., Bilik, M. & Utkulu, U. (2017). The Impact Of Competıtıveness On Trade Effıcıency: The Asıan Experıence By Usıng The Stochastıc Frontıer Gravıty Model. *Eurasian Journal of Economics and Finance*, 5(4), 1-15. DOI: 10.15604/ejef.2017.05.04.001.

Demir, M. A. (2020a). Türkiye'nin Farmakoloji Sanayindeki Mukayeseli Üstünlüğünün Sektörün İhracatı Üzerine Etkisi: Zaman Serisi Analizi. *Bingöl Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 20, 509-530.

Demir, M.A. (2020b). Spor Ürünleri Ticaretinde Ülkeler Arası Rekabet Analizi. İçinde İ.Y. Gök & F. Dayı (Eds.), *Sporda Finansal, Ekonomik ve Sosyal Araştırmalar* (ss. 373-398). Ankara: Nobel Bilimsel Eserler.

Demir, A. (2022). Türkiye'de Fındığın 2016-2021 Dönemi İçin Rekabet Durumu: Normalleştirilmiş Açıklanmış Karşılaştırmalı Üstünlük Endeksinin Üç Varyasyonu İle Analiz. Finans Ekonomi ve Sosyal Araştırmalar (FESA) Dergisi, 7(4) , 907-914 / DOI: 10.29106/fesa. 1178221

Edwards, L., & W. Schoer. (2002). Measures of Competitiveness: A Dynamic Approach to South Africa's Trade Performance in the 1990s. *South African Journal of Economics*, 70(6), 1008-1046.

Ekmen-Özçelik, S. & Erlat, G. (2013). Turkey's Comparative Advantages and Dynamic Market Positioning in the EU market. *Topics in Middle Eastern and African Economies*, 15(2), 42-70.

Ekmen-Özçelik, S. & Erlat. G. (2014) Turkey's Comparative Advantages and Dynamic Market Positioning in the EU Market. *Emerging Markets Finance and Trade*, 50(5),18-41, http://dx.doi.org/10.2753/REE1540-496X500502

Ekmen-Özçelik, S. (2015). An Economic Analysis of Mutually Beneficial Export Potential Between Greece and Turkey. *4th International Conference in Quantitative and Qualitative Methodologies in The*

Economic and Administrative Science, pp: 93-102. Athens: 21-22 May 2015.

Eren, S. (2018). Türkiye-AB Gümrük Birliği'nin Modernizasyonu ve Türk Tarımına Olası Etkileri. İktisadi Kalkınma Vakfı Değerlendirme Notu. 208, Şubat.

Erkan, B., Kara, O., Bozduman E. T. (2020). Impact of Macroeconomic Indicators on Export Competitiveness in Shanghai Cooperation Organization Countries. İzmir İktisat Dergisi. 35 (3). 443-455. Doi: 10.24988/ije.202035301

Eşiyok, B. A. (2014). Türkiye-AB Arasında Dış Ticaretin Teknolojik Yapısı, Rekabet Gücü ve Endüstri-İçi Ticaret: Ampirik Bir Değerlendirme. *Ankara Avrupa Çalışmaları Dergisi*, 13(1), 91-124.

Eurostat. (2021). *Extra-EU Trade in Goods*. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Extra-EU_trade_in_goods#Evolution_of_extra-EU_trade, (Erişim Tarihi: 15.12.2021).

Güneş, S. & Tan, M. (2017). Static and Dynamic Revealed Comparative Advantage: A Comparative Analysis of Turkey and Russia. İktisadi Yenilik Dergisi, 4(3), 22-38.

Jovanović, M. N. (2015). *The Economics of International Integration*. Second Edition. Cheltenham, Northampton: Edward Elgar Publishing.

Kabaalioğlu, H. (2010). Turkey-EU Customs Unıon: Problems And Prospects. *Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 12(2), 47-57.

Kalaycı, C. (2017). Serbest Ticaret Anlaşmalarının Türkiye'nin Dış Ticaretine Etkileri: Açıklanmış Karşılaştırmalı Üstünlükler Endeksi Uygulaması. *Uluslararası Ekonomi ve Yenilik Dergisi*, 3(2), 133-147.

Kuşat, N & Denli, E.A. (2021). Açıklanmış Karşılaştırmalı Üstünlüklere Göre Türkiye - BRICS Rekabet Gücü Analizi (2008-2019). *KOCATEPEİİBFD*, 23(1), 94-111.

Laursen, K. (2015). Revealed Comparative Advantage and the Alternatives as Measures of International Specialization. *Eurasian Business Review*, 5(1), 99-115.

Lohrmann, A.M. (2000). Development Effects of the Customs Union Between Turkey and the European Union Catching up–or the Heckscher Ohlin–Trap. *Russian and East European Finance and Trade*, 36(4), 26-44.

Michalopoulos, C. & Tarr, D. (2004). Are Customs Unions Economically Sensible In The Commonwealth Of Independent States. *World Bank Document*, https://openknowledge.worldbank.org/bitstream/handle/10986/25932/111778-WPPUBLIC-customsTARR-MIC.pdf?sequence=1&isAllowed=y, (Erişim Tarihi: 16.12.2021).

Nas, Ç. (2020). *Gümrük Birliği Neden Güncellenmeli?*. https://www.perspektif.on line/gumruk-birligi-neden-guncellenmeli/, (Erişim Tarihi: 24.12.2021).

Özdamar, G. (2014). İmalat Sanayisinde Türkiye'nin AB ile Ticaretinin Yapısı ve Rekabet Gücü: Teknoloji Düzeylerine Göre Bir İnceleme. *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi*, (41), 11-30.

Şimşek, N. & Sadat, S.A. (2009). ECO Pazarında Türkiye: 1997-2005 Dönemi Rekabet Gücü Analizi. *Sosyoekonomi*, 10(10), 135-158.

Şimşek, N., Seymen, D. & Utkulu, U. (2010). Turkey's Competitiveness in The EU Market: a Comparison of Different Trade Measures. *Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 12(2), 107-139.

Tepeli, E. & Aydın, A.H. (2015). Avrupa Birliği ve Türkiye-Avrupa Birliği İlişkilerinin Gelişme Trendi. *Sütçü İmam Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 5(1), 29-44.

Ticaret Bakanlığı. (2022). *En Fazla İhracat Yapılan 20 Fasıl*. https://ticaret.gov.tr/data/5d63d89d13b8762f7c43a738/3-En%20Fazla%20Ihracat%20Yapilan %2020%20Fasil. pdf, (Erişim Tarihi: 14.01.2022).

Ticaret Bakanlığı. (2022). *Yanı Başımızdaki Dev Pazar Avrupa Birliği*. https://ticaret.gov.tr/dis-iliskiler/avrupa-birligi/yani-basimizdaki-dev-pazar-avrupa-birligi, (Erişim Tarihi: 31.10.2022).

TUİK. (2021). *Dış Ticaret İstatistikleri, Kasım 2021*. https://data.tuik.gov.tr/Bulten/ Index?p=Dis-Ticaret-Istatistikleri-Kasim-2021-37423, (Erişim Tarihi: 15.12.2021).

Türker, O. (2009). Gümrük Birliği Sonrası Türkiye'nin Dış Ticaretinin Rekabet Gücü. *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, (32), 281-302.

Utkulu, U (2019). Gümrük Birliği'nin Türkiye'nin Dış Ticaretine ve Ekonomisine Yansımaları. Uysal, Y., N.A Balaylar & N. Keskin (Eds.) *Türkiye Ekonomisi Üzerine Seçme Yazılar* içerisinde, 253-262.

Utkulu, U. & Seymen, D. (2004). Revealed Comparative Advantage and Competitiveness: Evidence for Turkey vis-*à*-vis the EU/15. *European Trade Study Group 6th. Annual Canference*, Nottingham, September.

Ünlü, F. (2018). İmalat Sanayinin Rekabet Gücündeki Değişimin Teknoloji Yoğunluğuna Göre Ölçülmesi: Türkiye Ve BRICS Ülkeleri Örneği. *Akademik Araştırmalar ve Çalışmalar Dergisi*, 10(19), 422-441.

Vergil, H. & Yıldırım, E. (2006). AB-Türkiye Gümrük Birliğinin Türkiye'nin Rekabet Gücü Üzerindeki Etkileri. *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, (26).

Yıldırım, E. & Dura, C. (2007). Gümrük Birliği'nin Türkiye Ekonomisi Üzerindeki Etkileri Konusundaki Literatüre Bir Bakış. *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, (28), 141-177.

Yu, R., Cai, J. & Leung, P. (2009). The normalized revealed comparative advantage index. *The Annals of Regional Science*, 43, 267-282.

World Bank (2014). *Evaluation of the EU – TURKEY Customs Union*. Report No. 85830-TR, https://documents1.worldbank.org/curated/en/298151468308967367/pdf/858300ESW0P1440disclosed090260140TR.pdf, (Erişim Tarihi: 25.12.2021).

APPENDICES

APPENDIX 1. NACE REV. for the Manufacturing Industry. 2 3 Codes

Technology Intensity	NACE REV. 2 3 Code	Name of the Sector
Low-Technology	10	Manufacture of food products
	11	Beverages
	12	Tobacco products
	13	Textile
	14	Wearing apparel
	15	Leather and related products
	16	Wood and products of wood, except manufacture of furniture
	17	Paper and paper products
	18	Printing and reproduction of recorded media, except for duplication of recorded media
	31	Manufacture of furniture
	32	Other manufacturing excluding the manufacture of medical and dental instruments and materials
Medium-Low Technology	19	Manufacture of coke and refined petroleum products
	22	Manufacture of rubber and plastic products
	23	Manufacture of other non-metallic mineral products
	24	Manufacture of basic metals
	25	Manufacture of fabricated metals products, excepts machinery and equipment, except for the manufacture of weapons and ammunition
	30.1	Building of ships and boats
Medium-High Technology	20	Manufacture of chemicals and chemical products
	25.4	Manufacture of weapons and ammunition
	27	Manufacture of electrical equipment
	28	Manufacture of machinery and equipment n.e.c.
	29	Manufacture of motor vehicles, trailers and semi-trailers
	30	Manufacture of other transport equipment
	32.5	Manufacture of medical and dental instruments and supplies
High-Technology	21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
	26	Manufacture of computer, electronic and optical products
	30.3	Manufacture of air and space vehicles and related machinery

Source: Eurostat.

ANNEX 2. Competitiveness of EU Countries in the Manufacturing Industry BRCA (1990-2021 Average)

Technology Intensity	Code	Germany	Austria	Belgium	Denmark	Finland	France	Holland
Low-Technology	10	2.59	2.76	5.14	11.54	1.25	4.34	7.49
	11	1.56	4.85	3.05	3.43	1.08	11.80	3.66
	12	4.10	1.31	2.94	3.65	0.30	1.46	13.11
	13	3.13	4.06	4.94	3.05	1.32	3.17	2.40
	14	2.32	2.85	2.25	6.03	0.91	3.29	2.57
	15	1.72	3.46	2.07	2.38	0.98	4.49	2.29
	16	2.74	15.15	3.39	4.67	22.06	2.41	1.39
	17	3.32	7.16	2.71	1.90	31.82	2.93	2.72
	18	5.12	6.90	5.48	5.20	2.10	3.51	6.51
	31+32	3.20	5.03	5.53	5.99	2.24	3.44	3.37
Medium-Low Technology	19	1.70	1.13	6.55	2.99	7.10	2.57	11.13
	22	4.44	5.28	4.19	3.53	2.81	4.08	2.98
	23	3.31	5.02	3.89	3.28	2.67	3.44	1.75
	24	3.72	6.36	5.68	1.44	7.87	3.67	2.81
	25	4.38	7.29	2.87	4.29	3.19	3.09	2.65
	30.1	2.90	0.73	0.53	8.05	15.63	3.47	3.54
Medium-High Technology	20	4.19	2.31	7.41	2.33	2.93	5.18	5.91
	25.4	1.92	11.11	9.50	1.70	4.96	2.47	0.68
	27	5.06	5.18	1.85	4.72	4.74	3.73	2.40
	28	5.56	5.16	2.35	4.37	4.66	3.08	2.85
	29	5.94	4.07	4.06	0.88	1.38	3.83	1.29
	30	4.03	12.18	2.28	2.06	1.49	3.24	3.18
	32.5	4.34	3.68	5.15	4.85	3.91	3.90	6.61
High-Technology	21	4.11	4.48	6.89	8.87	1.16	5.01	3.69
	26	4.68	3.49	2.02	3.89	5.71	4.01	7.74
	30.3	4.97	1.54	0.95	0.79	0.58	13.95	1.49

Source: Calculated and arranged by us using OECD data.

ANNEX 2 (CONTINUED). Competitiveness of EU Countries in the Manufacturing Industry BRCA (1990-2021 Average)

Technology Intensity	Code	Spain	Sweden	Italy	Hungary	Poland	Portugal	Greece
Low-Technology	10	5.48	1.61	3.24	4.57	5.80	3.40	8.46
	11	5.60	1.93	5.65	2.31	1.33	8.92	3.94
	12	1.33	1.25	1.47	1.62	10.05	9.15	16.27
	13	3.82	1.63	7.19	2.41	3.65	10.33	5.89
	14	4.57	1.51	8.37	4.85	6.63	15.12	13.49
	15	5.97	0.88	14.52	4.48	3.34	16.29	2.43
	16	2.91	14.17	2.08	4.01	11.51	17.19	1.54
	17	3.14	15.64	2.71	2.23	4.30	8.01	1.47
	18	1.29	3.92	2.64	2.16	2.47	1.75	5.92
	31+32	2.53	3.34	7.64	2.98	7.61	3.64	1.34
Medium-Low Technology	19	5.24	5.80	3.58	3.13	3.41	5.80	24.22
	22	3.98	3.04	4.56	4.42	5.46	4.95	2.94
	23	7.16	1.92	7.20	3.92	5.79	9.58	6.07
	24	4.44	5.39	4.38	2.37	5.82	2.21	7.20
	25	3.98	3.88	5.83	3.32	6.75	6.03	2.50
	30.1	6.30	2.28	6.16	0.13	21.34	1.94	3.22
Medium-High Technology	20	3.71	2.33	2.73	2.82	2.86	2.29	2.47
	25.4	4.43	2.85	9.00	1.70	2.66	7.49	3.03
	27	3.51	4.01	4.57	7.69	5.46	4.01	2.36
	28	2.19	4.45	6.73	2.64	2.21	1.36	0.86
	29	6.71	4.11	2.54	5.77	4.04	4.18	0.33
	30	4.77	2.81	7.05	3.96	5.57	4.28	0.61
	32.5	1.58	4.32	4.83	2.02	1.54	1.18	0.65
High-Technology	21	3.13	5.61	3.53	3.04	1.28	1.32	3.36
	26	1.81	5.61	2.17	8.99	3.21	3.00	1.52
	30.3	2.92	1.78	2.15	0.45	1.26	0.98	1.43

Source: Calculated and arranged by us using OECD data.

APPENDIX 3. Competitiveness of EU Countries and Türkiye in the Manufacturing Industry NRCA (1990-2021 Average)

Technology Intensity	Code	Germany	Austria	Belgium	Denmark	Finland	France	Holland
Low-Technology	10	0.01202	0.01445	0.01321	0.01366	0.01468	0.01258	0.01192
	11	0.00236	0.00257	0.00251	0.00261	0.00265	0.00162	0.00242
	12	0.00055	0.00077	0.00073	0.00076	0.00078	0.00074	0.00050
	13	0.00395	0.00509	0.00464	0.00518	0.00525	0.00463	0.00496
	14	0.00534	0.00625	0.00604	0.00619	0.00637	0.00571	0.00600
	15	0.00293	0.00324	0.00318	0.00329	0.00333	0.00292	0.00316
	16	0.00188	0.00204	0.00215	0.00224	0.00208	0.00212	0.00223
	17	0.00466	0.00578	0.00578	0.00608	0.00521	0.00551	0.00571
	18	0.00018	0.00027	0.00027	0.00028	0.00029	0.00025	0.00023
	31+32	0.00655	0.00815	0.00749	0.00818	0.00842	0.00756	0.00783
Medium-Low Technology	19	0.00617	0.00697	0.00613	0.00691	0.00683	0.00644	0.00509
	22	0.00539	0.00757	0.00720	0.00773	0.00781	0.00683	0.00731
	23	0.00323	0.00406	0.00387	0.00415	0.00419	0.00370	0.00404
	24	0.00946	0.01238	0.01145	0.01292	0.01260	0.01136	0.01211
	25	0.00546	0.00754	0.00749	0.00780	0.00789	0.00714	0.00746
	30.1	0.00114	0.00143	0.00142	0.00136	0.00133	0.00127	0.00132
Medium-High Technology	20	0.01567	0.02227	0.01924	0.02238	0.02241	0.01882	0.01934
	25.4	0.00021	0.00022	0.00017	0.00023	0.00023	0.00022	0.00023
	27	0.00780	0.01171	0.01172	0.01188	0.01196	0.01064	0.01148
	28	0.01547	0.02506	0.02484	0.02544	0.02560	0.02338	0.02433
	29	0.01807	0.03056	0.02879	0.03144	0.03142	0.02732	0.03057
	30	0.00094	0.00119	0.00124	0.00129	0.00130	0.00116	0.00121
	32.5	0.00154	0.00214	0.00199	0.00214	0.00217	0.00194	0.00184
High-Technology	21	0.00690	0.00924	0.00822	0.00910	0.00952	0.00812	0.00870
	26	0.01378	0.02001	0.01963	0.02008	0.01992	0.01769	0.01664
	30.3	0.00380	0.00589	0.00585	0.00593	0.00595	0.00339	0.00573

Source: Calculated and arranged by us using OECD data.

ANNEX 3 (CONTINUED). Competitiveness of EU Countries and Türkiye in the Manufacturing Industry NRCA (1990-2021 Average)

Technology Intensity	Code	Spain	Sweden	Italy	Hungary	Poland	Portugal	Greece	Türkiye
Low-Technology	10	0.01366	0.01456	0.01345	0.01453	0.01422	0.01462	0.01457	0.01434
	11	0.00245	0.00262	0.00226	0.00264	0.00264	0.00259	0.00265	0.00265
	12	0.00077	0.00078	0.00076	0.00078	0.00073	0.00077	0.00076	0.00077
	13	0.00500	0.00520	0.00412	0.00524	0.00518	0.00511	0.00523	0.00482
	14	0.00605	0.00633	0.00480	0.00630	0.00617	0.00606	0.00624	0.00560
	15	0.00305	0.00332	0.00192	0.00329	0.00328	0.00316	0.00333	0.00330
	16	0.00222	0.00199	0.00218	0.00228	0.00217	0.00219	0.00231	0.00230
	17	0.00589	0.00520	0.00569	0.00610	0.00599	0.00601	0.00614	0.00610
	18	0.00029	0.00028	0.00027	0.00029	0.00029	0.00029	0.00029	0.00029
	31+32	0.00819	0.00823	0.00655	0.00840	0.00809	0.00841	0.00848	0.00834
Medium-Low Technology	19	0.00652	0.00667	0.00633	0.00696	0.00689	0.00692	0.00678	0.00688
	22	0.00746	0.00768	0.00687	0.00777	0.00761	0.00780	0.00788	0.00772
	23	0.00381	0.00416	0.00330	0.00418	0.00409	0.00412	0.00419	0.00407
	24	0.01223	0.01237	0.01150	0.01293	0.01261	0.01296	0.01290	0.01245
	25	0.00756	0.00770	0.00666	0.00791	0.00767	0.00787	0.00798	0.00780
	30.1	0.00132	0.00140	0.00120	0.00144	0.00126	0.00143	0.00143	0.00139
Medium-High Technology	20	0.02154	0.02221	0.02094	0.02245	0.02229	0.02254	0.02260	0.02247
	25.4	0.00022	0.00023	0.00019	0.00024	0.00023	0.00023	0.00024	0.00023
	27	0.01162	0.01175	0.01058	0.01184	0.01177	0.01207	0.01217	0.01193
	28	0.02533	0.02503	0.02109	0.02587	0.02578	0.02604	0.02611	0.02593
	29	0.02856	0.03039	0.02929	0.03086	0.03073	0.03121	0.03160	0.03101
	30	0.00120	0.00127	0.00104	0.00128	0.00126	0.00129	0.00130	0.00130
	32.5	0.00216	0.00212	0.00191	0.00219	0.00218	0.00220	0.00220	0.00220
High-Technology	21	0.00916	0.00910	0.00868	0.00944	0.00950	0.00953	0.00952	0.00954
	26	0.02002	0.01942	0.01922	0.01977	0.02014	0.02039	0.02053	0.02044
	30.3	0.00572	0.00585	0.00557	0.00596	0.00591	0.00595	0.00595	0.00593

Source: Calculated and arranged by us using OECD data.

APPENDIX 4. Türkiye's Competitive Power According to Technology Intensity Between 1991-2021 NRCA (Temporal Comparison)

	Low-Technology	Medium-Low Technology	Medium-High Technology	High-Technology
1991	0.00696	0.00845	0.01639	0.01104
1992	0.00661	0.00778	0.01554	0.01054
1993	0.00656	0.00761	0.01493	0.01087
1994	0.00637	0.00737	0.01512	0.01085
1995	0.00644	0.00764	0.01574	0.01141
1996	0.00616	0.00730	0.01557	0.01144
1997	0.00580	0.00688	0.01485	0.01198
1998	0.00593	0.00703	0.01591	0.01359
1999	0.00558	0.00656	0.01514	0.01407
2000	0.00489	0.00634	0.01359	0.01404
2001	0.00520	0.00660	0.01457	0.01430
2002	0.00528	0.00658	0.01498	0.01440
2003	0.00537	0.00692	0.01575	0.01465
2004	0.00500	0.00715	0.01550	0.01477
2005	0.00460	0.00716	0.01468	0.01409
2006	0.00436	0.00754	0.01427	0.01357
2007	0.00437	0.00782	0.01472	0.01255
2008	0.00424	0.00795	0.01400	0.01190
2009	0.00453	0.00656	0.01296	0.01322
2010	0.00388	0.00645	0.01182	0.01138
2011	0.00384	0.00688	0.01188	0.01032
2012	0.00363	0.00660	0.01103	0.00998
2013	0.00380	0.00625	0.01124	0.01012
2014	0.00385	0.00605	0.01139	0.01025
2015	0.00376	0.00549	0.01119	0.01036
2016	0.00394	0.00543	0.01165	0.01088
2017	0.00384	0.00558	0.01157	0.01068
2018	0.00382	0.00576	0.01150	0.01061
2019	0.00385	0.00550	0.01121	0.01108
2020	0.00412	0.00540	0.01146	0.01168
2021	0.00386	0.00569	0.01082	0.01048

Source: Calculated and arranged by us using OECD data.

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The Role of Turkish TV Series in the Formation of Perception about Turkey and Turkish People: The Cases of Bosnia and Herzegovina, Jordan and Kyrgyzstan

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ABSTRACT

We can say that television still plays an important role in the area of visual media. TV series, commercials and entertainment programs occupy a large place in the daily life of viewers. In particular, the perception, attitude and, accordingly, attitude change in viewers resulting from television series is a phenomenon that gives rise to curiosity in researchers. Therefore, this study aims to measure the level of perception about Turkey and Turkish people in viewers created by Turkish TV series broadcast abroad. The main claim of our research is that Turkish TV series can lead to a country and nation perception in viewers, while the viewers might develop an interest in and affinity with Turkey and Turkish people. In the framework of these arguments, a fieldwork was conducted in Bosnia and Herzegovina, Jordan and Kyrgyzstan, which was the research universe of the present study. In the light of the data obtained, the perceptions of the viewers about the personality traits of Turkish people, their perceptions of Turkey's power, life in Turkey and Turkey's active role were influential on the wish to have an affinity with Turkey. Increased interest in Turkey was found to have resulted in increased wish to have an affinity with Turkish people and Turkey.

Keywords: Turkish Soap Operas, Audience Researches, Intercultural Communication, Cultural Diplomacy, Soft Power.

JEL Classification Codes: Z00, Z10, Z11, Z13, Z19

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INTRODUCTION

Societies and history are products of communication. Living in a particular place is not just about spending time there. Living means to understand and share the discourses of the society in which one lives. Mass media, on the other hand, enables the formation of new and different cultural structures. Surely, in this process, people can generate a different structure by making use of their culture (Lundby & Ronning, 1991). Media plays an important role in the formation of the political sphere, the mediation of economic relations, the definition of the cultural sphere, i.e., the building of a societal structure as a whole. Therefore, when the audience doesn't directly contact with another culture, it relies more on the information coming from the media (Hall, 1989). Therefore, mass media is an important source of information for different cultures. When people cannot experience the information, they accept the messages delivered through the media as true (Zhang, 2015). Intercultural communication, which gathers pace through the media, has an extremely effective role in the recognition and conveyance of identities. The rapid change in technology, especially in communication technologies, makes it a necessity to communicate with other cultures. Therefore, the media provides people with information and ideas about different cultures, resulting in awareness of different societies about each other (Shuter, 2012).

The ability of the media to convey its message to large masses directs societies. It is easier for people to be influenced by an event given through the media. Despite technological developments, especially television is still highly influential (Dimbley & Burton, 1998). Television is the source of images and messages shared the most in history and the mainstream of the common symbolic environment into which people are born. Although new media technologies have come into play, the mass impact of television productions still continues (Gerbner et al., 2002). In addition to this, television series have also become a part of people's daily routines. Continuously presented to the audience every day, TV series affect the audience in many ways. Therefore, the level of perception of the relationship of fiction in TV series with reality is an object of interest.

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The TV series "Dallas", aired in the early 1980s, had a huge impact worldwide. Wondering why Dallas is watched, "Ien Ang" referred to readers' letters in his research on this issue. He sees the interest in the series as the ability for people to relate their own lives to the life of a Texas millionaire family. Saying that we may not be rich, but we may have more basic or human common denominators such as illness, health, happiness, sadness, he also emphasized the importance of the connection of the series with reality for himself (Storey, 2009). The audience, who spends their time having fun with the series, is also exposed to various messages. However, the messages that the audience receives from the TV series, such as getting rich quickly and living a luxurious life, make these productions even more attractive to the audience (Rohd, 2013).

Indeed, although the audience uses the media to escape from political and social reality (Katz, 1959), they confuse fiction with reality and are likely to react to the things they watch as if they were real. According to Van deen Haag, the audience wants to be influenced by fiction but doesn't want to loose touch with reality. Therefore, people are aware that the person they watch in a television series is an actor, and the movie they watch is a fictionalized production. The problem here is that people try to live this situation, which they know is fiction (Haag, 1963). In reality, series and similar entertainment programs are escapades in daily life. These materials reflected on the screen are substitute satisfactions for the viewer that cannot be obtained under normal conditions. What is important here is the narrative style of the series, which has something both disturbing and comforting for the viewer. It is repressed individuals who respond more creatively and interpretively to this process that has an impact on their lives. However, despite all this, individuals still distinguish between what they watch and evaluate the situation on their own terms (Giddens, 1991).

The series' effects in relation to cultural transformation are also a matter of discussion. McNeil and William Cran, who conducted research on the teen drama "clueless", set in a Los Angeles high school, reported the impact of the series on cultural transformation not only in the USA but also in many parts of the world. The slang speech that the girls, who are depicted as elite in the series, consciously use, began to be effective in the daily language, life, fashion and culture of California. After a while, this manner of speech and lifestyle became influential among young people in New York and London. In fact, California English has become the most spoken dialect not only in the USA but also in different English-speaking geographies. Yet another study shows that many hip hop artists in the USA have an influence on their white fans in the suburbs. It is determined that these people, who are under the influence of black masses in daily speech, imitate them with their gestures and facial expressions (Bolton, 2010).

Media and television series have a strong influence on identity and partnership building. For example, the audience attributed a strong meaning to Edgar Reitz's movie shot in 1984 "Heimat" and his following movie "Die zweite Heimat". These series turned into a television event at that time. Moreover, because they had a wide audience, people have watched these series in order not to be left out of discussions in their daily lives (Morley; Robins, 1995). Therefore, it is necessary to state that the influence of the media in the determination of people's cultural identities is undeniable. Media and series in it appear before the audience as an important factor in the formation or transformation of identity at the collective, cultural, individual and social levels and have an important potential. This potential is shaped in relation to the social, political, economic and cultural contexts.

In this context, the main view of our study is that there may be a relationship between TV series and the perception of the producer country and nation. In other words, it is the claim that Turkish TV series can create a concrete perception of Turkey and Turkish people on the audience, thus creating an interest and affinity towards Turkey and Turkish people. In particular, we can talk about a cultural affinity in nations that had common denominators in the past, despite the differences in social, political and economic fields. In this way, the study also tried to evaluate the cultural interactions between the nations through the TV series. Our aim was to try to understand the audience's perception of interest in and affinity with Turkey and Turkish people in Bosnia and Herzegovina, Jordan and Kyrgyzstan through Turkish TV series, and to determine the extent to which different and common aspects are effective in the formation of this perception.

TURKISH TV SERIES

The concepts of globalization, culture and cultural production have been recently defined in various ways. The concept of globalization, which can be defined as the movement and circulation of capital, people, products and services, symbols, meanings, has also entered the research field of intercultural communication studies after the 1980s (Barnett & Lee, 2003). In the 1980s, the world of communication began to transform with new technologies. Many things that were considered simple in social life today were considered a major developmental leap for that day. In the 1990s, with the

development of satellite broadcasting, media products became global at a faster pace (Castells, 2009). One of the products of this rapid change that started in the 1980s is the American series that have been circulated globally. Then, Latin American and Mexican TV series began to have audiences in many different countries. Chalaby emphasizes the importance of the geo-cultural region in the development of television on a global scale, drawing attention to the fact that global channels worldwide broadcast for groups that do not live in the same geographical area but show cultural unity (2005). For example, when it comes to television, Latin America is a country with its own characteristics. We can say that Spanish and Portuguese were dominant in this first region where colonialism began. Therefore, we can attribute the success of Mexican and Brazilian TV series to the influence of Spanish, as in the case where we can attribute the influence of American films to the fact that English is spoken in a wide geography. One of the reasons why Latin American TV series are popular in different regions is the common denominator of language, besides, we should add geocultural affinity (Sinclair, 2009). The fact that similar items attract people's attention, the quality of the productions, the effect of political influence in the international arena, the level of identification of the audience with the characters can also be shown among the reasons for the interest.

At the beginning of the 2000s, Turkish TV series, which gained momentum and popularity with the increase in the number of channels, the expansion of the internet network, and the emergence of digital platforms, began to be exported in a way that would create an area of influence on a global scale, especially in the Middle East and the Balkans. In addition to geographical proximity, historical partnership, political and diplomatic relations, it is noteworthy that even in societies where these partnerships do not exist, the perception of Turkey and Turkish is formed through Turkish TV series. It would not be wrong to say that Turkish TV series today have more influence than American and Latin American TV series of the 1980s and 1990s.

Series are also considered as a soft power element. Soft power is the ability of the attractive party to have the power of persuasion to establish a partnership. It can be said that a country that has this power is superior and effective in values, culture and politics (Gilboa, 2008). Local cultural products, such as art, music, and literature, which have their own characteristics, impress people with the attraction they create. Turkish series also create a soft power effect on the audience in the countries where they are broadcast (Nye, 2004). In terms of soft power, countries that have a cultural claim on a global scale, have an international influence on the media through their communication network, and inspire confidence in their national and international policies are considered to be in a more advantageous position (Nye, 2008).

The effects of TV series have also a significant repercussion in the popular media. For instance, evaluating the concept of soft power in the New York Times through Turkish TV series, Michael Kimmelman mentions that Turkey has had an impact on every aspect of Arabs' lives, from Morocco to Iraq, through TV series in a way that America could not even imagine (2010). Likewise, in her article entitled "How Turkish television is taking over the world" in the Guardian, Fatima Bhutto describes the impact of Turkish TV series in the world. Expressing that in terms of exports and global audience, Turkey comes after the USA, she mentions that Turkey has a large audience rate in Latin America, Korea, China and Russia. Talking about the popularity of the TV series entitled Muhteşem Yüzyıl, Bhutto states that the series, watched by 500 million people, caused an Arab tourist boom in Turkey (2019). The fact that Turkish TV series is a major export product means that the culture is brought to that country along with TV series.

Turkish TV series show some similarities with soap operas and productions of countries such as Egypt, Brazil and India, unlike America (Yanardağoğlu & Karam, 2012). Despite their similarities, Turkish series have their own characteristics and cannot be described as soap operas, telenovelas or period dramas. Turkish TV series is a popular genre that uses special places and music and has its own unique style of narration.

İzzet Pinto[1] states that Turkish series can be characterized as melodramas, unlike soap operas produced by Latin America and dramas produced by America, and that they are in great demand abroad. Saying that he first took the representation of the TV series "Binbir Gece" and began to sell it to the world, he states that "Binbir Gece" served as the locomotive in the start of the Turkish TV series frenzy in many countries. According to Pinto, "Gümüş» (Noor) series started this business in the Middle East (İnan, 2017).

When the TV series "Gümüş" aired in 2008, it received a great deal of attention in the Arab community. The majority of the followers of the series, which reached 85 million viewers, were women. According to Mazen Hayek, head of

[1] Founder and chairman of the board of Global Agency, one of the largest exporters of Turkish TV series.

commercial affairs, marketing and public relations at MBC, a Saudi private channel, 50 million of the 85 million viewers were women. In the second new Arab women's forum in Beirut, in relation to the viewer's trend described with respect to the TV series "Ihlamurlar Altında", it was stated that 39 million of the 76 million viewers were women. The modern lifestyle depicted in Turkish series attracts the Arab world and especially Arab women. The elements that most attracted the attention of the audience in the series were the modern and luxurious life and the free and modern female characters in this life (Aljammazi & Asil, 2017).

At the same time, the TV series Gümüş, which is claimed to cause many divorces due to the inappropriate behavior of Arab men, has been called the "Noor" (Gümüş) craze by many journalists. Some journalists, from a different perspective, changed the size of the event, seeing the existence of TV series as an effort by Turkey to[2] oppose the Shiites in the Arab world, and interpreted it as "The Return of the Ottomans" (Anas, 2014). The reason for the interest in Turkish TV series is not only the lifestyle of women. The cultural similarity and religious unity of the Arab society and the Turkish society, the similarity of the family structure due to the fact that they are patriarchal societies, are thought to be the reasons for the adoption of the TV series (Aljammazi & Asil, 2017). We also see that this cultural similarity is reflected in the names of the series characters. Arabs were able to easily change the names of the serial characters. "Mehmet" became "Muhannat"; "Gümüş" became "Nur"; "Polat Alemdar" has been changed to "Murat Alemdar" in many places. Even this is an indication of cultural similarity. The change was not considered strange by the audience.

AIM OF THE STUDY

The aim of the study was to measure the perceptions of the viewers of Turkish series from Jordan, Bosnia and Herzegovina and Kyrgyzstan in terms of some variables about Turkish people and Turkey. The main question of the study was to identify Turkish TV series viewers' (from three different regions (Middle East, Europe and Central Asia)) perceptions of Turkey and Turkish people through other thematic processes such as different roles, content, images, etc. in the TV series they watch.

Accordingly, perceptions of Turkish people's personality traits, Turkey's image of power, perception of life in Turkey, Turkey's active role, whether Turkey's active role influences interest in Turkey and the wish to have an affinity with Turkish people and Turkey were investigated through Turkish TV viewers' perceptions within the scope of the study.

SCALES, MODEL AND HYPOTHESES USED IN THE STUDY

After a literature search was made in this study, the scales thought to be most suitable for the purpose are shown in Table 1.

5 point Likert scale was used to answer the scales applied in this study. Evaluation options in the scale were: 1- Strongly Disagree, 2- Disagree, 3- Undecided, 4- Agree, and 5- Strongly Agree.

The research model used in this study is given in Figure 1.

The variables comprising the study model were perceptions of the personality traits of Turkish people, Turkey's image of power, perception of life in Turkey, Turkey's active role, the wish to have an affinity with Turkish people and Turkey, and the interest in Turkey. The hypotheses developed considering the aims of the study and the research model are as follows:

Table 1. Scales Used in the Study

Name of Scale	Number of Questions	Reference
Personality Traits of Turkish people	16	(Akyürek, 2012; Akyürek & Bilgiç, 2012; Verlegh, 2001).
Turkey's Image of Power	6	(Akyürek 2012; Akyürek & Bilgiç, 2012).
Perception of Life in Turkey	13	(Tuna, 2017; Akyürek 2012; Akyürek & Bilgiç, 2012).
Turkey's Active Role	7	(Akyürek, 2012).
Interest in Turkey	7	(Önder, 2017).
The Wish to Have an Affinity with Turkish People and Turkey	8	(Akyürek, 2012; Akyürek & Bilgiç, 2012).

[2] Similar comments were made by researchers in Iran. Iranian viewers follow Turkish series with high participation from Turkish channels via satellite or Persian channels broadcasting from outside Iran. At this point, a certain segment in Iran thinks that Turkish serials, which have a large audience, degrade cultural values in Iran, negatively affect religious and sectarian beliefs and the official language spoken in the country. Although the idea that TV series have a serious impact on Iranian society exists in society in general, there are also those who think that Turkey consciously pursues a political purpose through TV series, thus trying to establish a regional power in accordance with its historical background (Başar, 2020).

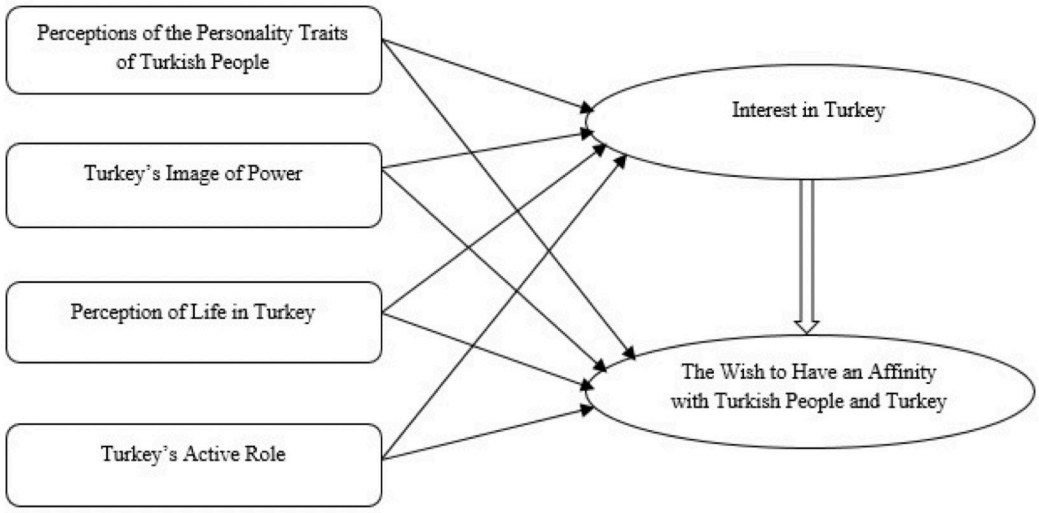

Figure 1: Research model

H1: Perceptions of the personality traits of Turkish people influence the interest in Turkey

H2: Turkey's image of power influences the interest in Turkey.

H3: Perception of life in Turkey influences the interest in Turkey.

H4: Turkey's active role influences the interest in Turkey.

H5: Perceptions of the personality traits of Turkish people influence the wish to have an affinity with Turkish people and Turkey.

H6: Perception of Turkey's power influences the wish to have an affinity with Turkish people and Turkey.

H7: Perception of life in Turkey influences the wish to have an affinity with Turkish people and Turkey.

H8: Turkey's active role influences the wish to have an affinity with Turkish people and Turkey.

H9: Interest in Turkey influences the wish to have affinity with Turkish people and Turkey.

H10: Respondents' perceptions of research variables differ significantly by country (Jordan, Bosnia and Herzegovina, Kyrgyzstan).

STUDY METHOD

The main population of the study was Turkish TV series viewers living in Jordan, Bosnia and Herzegovina and Kyrgyzstan. In other words, the basic prerequisite for participating in the study was to be a viewer of Turkish TV series. Our research was applied in these countries because they are in different geographies and Turkish TV series have remarkable viewing rates in these countries. The surveys of the study were conducted in Amman representing Jordan, Sarajevo representing Bosnia and Herzegovina, and Bishkek representing Kyrgyzstan. People aged 18 and over participated in the study. The field application of the study was performed face to face. After the deficient surveys were eliminated after the field application, 387 surveys from Jordan, 316 from Bosnia and Herzegovina and 356 from Kyrgyzstan were arranged in such a way as to be suitable for the analysis. In cases where the population information was not known exactly, the sample size of the study was determined with the formula $n=(\pi(1-\pi))/(e\div Z)^2$ with a 5% margin of error and the lower limit of 384 at the 95% confidence interval (Kurtuluş, 1998). In this respect, it was seen that the number of samples was sufficient.

The questionnaire developed under the study contained 76 expressions. The questionnaire was prepared in Turkish and then translated into the languages of the countries where the field application would be made, i.e. Arabic, Bosnian, Russian. In the translation of the questionnaire, support was received from people who speak that language and experts. For the data collection process of the study, a face-to-face survey method was used and convenience sampling method was preferred.

Before the questionnaire was finalized, a preliminary questionnaire was administered to 20 people in each country. In line with the criticisms from the respondents, necessary corrections were made in the questionnaire for the intelligibility of the expressions, and then the questionnaire was applied. An ethics committee report was obtained that the study did not have any ethical objections.

ANALYSIS AND EVALUATION OF DATA

Data obtained from the respondents after the field applications of the research in Jordan, Bosnia and Herzegovina, and Kyrgyzstan, SPSS 24.0 was used in order to realize the objectives determined under the study and test the hypotheses. Descriptive, frequency and crosstab analyses were conducted to determine socio-demographic characteristics of respondents in the study; reliability analysis, exploratory factor analysis were conducted to test the validity and reliability of the scales; regression analysis was used to detect the effects between variables, and Anova analysis and post hoc tests were conducted to determine differences in perceptions.

DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

A total of 1059 people from 3 different countries (namely 387 from Jordan, 316 from Bosnia and Herzegovina and 356 from Kyrgyzstan) enrolled in the study. Countries and their rates are shown in the chart below.

Crosstabs analysis, one of the descriptive statistics, was used in order to determine demographic characteristics of the respondents from Jordan, Bosnia and Herzegovina and Kyrgyzstan. As a result of the analysis, country based demographic characteristics of the respondents in terms of gender, age group, education level, monthly income, occupation and place of residence are shown in Table 2 by giving frequency and percentage values.

Table 2. The Respondents' Demographic Characteristics by Country

		Jordan (N= 387)		Bosnia-Herzegovina (N= 316)		Kyrgyzstan (N= 356)	
Characteristics	**Dimension**	**Frequency**	**Percentage (%)**	**Frequency**	**Percentage (%)**	**Frequency**	**Percentage (%)**
Gender	Female	262	69.9	205	65.1	170	48.4
	Male	113	30.1	110	34.9	181	51.6
Age Group	18-24	213	59.0	130	45	106	30
	25-31	69	19.0	79	27	94	27
	32-38	28	8.0	35	12	80	23
	39+	49	14.0	48	16	71	20
Educational Status	Primary school	3	1.0	8	3	60	17
	High School	66	17.0	91	29	47	13
	Associate Degree	71	19.0	145	46	66	19
	Bachelor's Degree	205	54.0	53	17	104	29
	Master's Degree	30	8.0	18	6	59	17
	PhD	6	2.0	0	0	18	5
Monthly Income	USD 1000 and less	174	56.0	44	15	173	53
	USD 1001-2000	79	25.0	38	13	58	18
	USD 2001-3000	40	13.0	84	29	55	17
	USD 3001-4000	13	4.0	74	25	16	5
	USD 4001 and more	4	1.0	52	18	27	8
Occupation	Public sector employee	41	11.0	36	12	58	17
	Private Sector	46	12.0	47	15	30	9
	Self-Employed	21	5.0	1	0	54	15
	Tradesman	10	3.0	17	5	8	2
	Housewife	35	9.0	11	4	21	6
	Farmer	2	1.0	4	1	12	3
	Student	197	51.0	106	34	55	16
	Worker	8	2.0	19	6	37	11
	Unemployed	4	1.0	19	6	12	3
	Retired	7	2.0	8	3	11	3
	Other	14	4.0	43	14	51	15
Localization	Rural Area*	30	8.0	116	40	89	25
	City	224	58.0	77	26	136	38
	Metropolis**	132	34.0	100	34	131	37

Notes *Small settlements such as a district, town, or village. **Settlements with a population of more than 1 million

When the findings in Table 2 are examined in terms of gender; the proportion of female responders was higher in Jordan (69.9%) and Bosnia and Herzegovina (65.1%), whereas the proportion of males (51.6%) was higher in Kyrgyzstan. When examined in terms of age group; in all three countries, the group with the highest percentage was the respondents aged between 18-24. In terms of percentage, the second highest group was the respondents aged 25-31 in all three countries. When examined in terms of educational status; the highest percentage of respondents had a bachelor's degree (54%) in Jordan, an associate degree (46%) in Bosnia and Herzegovina, and a bachelor's degree (29%) in Kyrgyzstan. The group with highest number of participants with a postgraduate degree was in Kyrgyzstan (22%), while the group with the lowest number of participants was in Bosnia and Herzegovina (6%). When analyzed in terms of monthly income; more than half of the respondents in Jordan (56%) and Bosnia and Herzegovina (53%) had an income level of USD 1000 and below, while 54% of the respondents in Bosnia and Herzegovina had an income level of USD 2001-4000. When examined in terms of profession; the group with the highest percentage was students in Jordan (51%) and Bosnia and Herzegovina (34%), while it was the group of civil servants in Kyrgyzstan (17%). The groups that followed the highest group in decreasing order were private sector employees and civil servants in the Jordan sample, private sector employees and the employees in other category in the Bosnia-Herzegovina sample, and students, self-employed and the employees in other category in the Kyrgyzstan sample.

When examined in terms of the settlements of the respondents; the country with the highest number of respondents living in rural areas was Bosnia and Herzegovina (40%), while the country with the highest number of urban respondents was Jordan (58%), and Kyrgyzstan (37%) was the country with the highest number of respondents living in a metropolitan area.

TURKISH TV SERIES WATCHED THE MOST BY RESPONDENTS

Crosstabs analysis, one of the descriptive statistics, was used in order to determine the Turkish series watched the most by the respondents from Jordan, Bosnia and Herzegovina and Kyrgyzstan. As a result of the analysis, the TV series watched the most by country were Kurtlar Vadisi (20.93%), Gümüş (10.34%), Kara Sevda (8.01%), Aşk-ı Memnu (6.72%) in Jordan, Muhteşem Yüzyıl (18.04%), Ezel (15.19%), Kurtlar Vadisi (14.56), Adını Feriha Koydum (8.54%) in Bosnia and Herzegovina, and Muhteşem Yüzyıl (38.87%), Binbir Gece (15.77%), Aşk ve Ceza (10.99%) and Kurtlar Vadisi (8.45%) in Kyrgyzstan.

Table 3. Turkish TV Series Watched the Most by Respondents

	Jordan	Bosnia-Herzegovina	Kyrgyzstan	Total
Reference	%	%	%	%
Kurtlar Vadisi	20.93	14.56	8.45	14.83
Binbir Gece	5.17	8.23	15.77	9.63
Karadayı	1.29	0.32	2.82	1.51
Kuzey Güney	3.88	3.80	0.00	2.55
Poyraz Karayel	1.81	0.00	0.00	0.66
Kara Sevda	8.01	0.00	0.00	2.93
Gümüş	10.34	3.48	0.85	5.10
Aşk ve Ceza	0.78	2.53	10.99	4.72
Muhteşem Yüzyıl	3.88	18.04	38.87	19.83
Aşk-ı Memnu	6.72	0.00	0.00	2.46
Gönülçelen	4.65	0.00	0.00	1.70
Ezel	4.13	15.19	8.45	8.88
Yaprak Dökümü	3.10	0.00	1.41	1.61
Ertuğrul	4.39	5.70	2.25	4.06
Asi	2.58	5.38	0.00	2.55
Kara Para Aşk	4.91	0.00	0.00	1.79
Sıla	0.52	3.16	0.00	1.13
Fatmagül'ün Suçu Ne	1.03	2.85	0.00	1.23
Ihlamurlar Altında	5.43	0.00	0.00	1.98
Kiralık Aşk	3.88	0.00	0.00	1.42

Kiraz Mevsimi	1.29	0.00	0.00	0.47
Çilek Kokusu	1.29	0.00	0.00	0.47
Acı Hayat	0.00	2.22	0.00	0.66
Adını Feriha Koydum	0.00	8.54	1.69	3.12
Küçük Kadınlar	0.00	0.63	0.00	0.19
Bir Bulut Olsam	0.00	0.32	0.00	0.09
Yalancı Bahar	0.00	5.06	5.92	3.49
Öyle Bir Geçer Zaman Ki	0.00	0.00	1.97	0.66
İffet	0.00	0.00	0.56	0.19

PERCEPTIONS OF RESPONDENTS TOWARDS RESEARCH VARIABLES

The country-based evaluations of the respondents regarding the variables of the study are presented in the tables by giving the arithmetic mean and standard deviation values.

As a result of the evaluations of the respondents on the personality traits of Turkish people, it was seen that the mean general perception of Jordanian respondents was 3.79, it was 3.51 and 3.49 for Bosnia-Herzegovina and Kyrgyzstan respondents, respectively. The expression with the highest mean perception was the expression that *Turkish people are helpful* with a mean value of 4.21 in the Jordan sample, whereas it was the expression that *Turkish people are hardworking/productive* with a mean value of 4.11 in Bosnia and Herzegovina, and the expression that *Turkish people obey the rules* with a mean value of 4.06 in Kyrgyzstan.

When the evaluations of the respondents on Turkey's image of power were examined; the mean general perception was 3.82 for the respondents from Jordan, whereas it was 4.09 and 3.51 for the respondents from Bosnia-Herzegovina and Kyrgyzstan, respectively. The expression with the highest mean perception was the expression that *Turkey has a dynamic population* with a mean value of 3.89 in the Jordan sample, whereas it was the expression that *Turkey has a developed economy* with a mean value of 4.27 in Bosnia and Herzegovina, and the expression that *Turkey has a developed economy* with a mean value of 3.61 in Kyrgyzstan. Therefore, it is clear

Table 4. The Evaluations of the Respondents on the Personality Traits of Turkish People

	Jordan		**Bosnia-Herzegovina**		**Kyrgyzstan**		**Total**	
Personality Traits of Turkish people	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
Aggressive	3.37	1.24	3.20	1.36	3.50	1.17	3.37	1.25
Humble	3.94	1.09	3.82	1.12	3.47	0.94	3.75	1.07
Hospitable	4.18	1.03	4.01	1.05	3.80	0.99	4.00	1.03
Helpful	4.21	1.01	3.98	1.02	3.70	0.98	3.97	1.03
Tolerant	4.06	1.04	3.93	1.12	3.47	1.03	3.82	1.09
Rough	3.24	1.23	3.02	1.33	3.20	1.05	3.17	1.20
Hardworking/Productive	4.27	0.97	4.11	0.95	3.60	1.06	4.00	1.04
Rational	4.07	1.03	4.09	0.88	3.19	1.07	3.76	1.09
Obedient	4.00	1.09	3.70	1.11	4.06	0.95	3.95	1.06
Punctual	4.32	1.02	3.75	1.02	3.77	0.84	3.99	1.00
Conservative/ Traditionalist	3.70	1.20	3.75	1.16	3.62	0.98	3.68	1.12
Fatalist	3.70	1.09	3.01	1.15	3.36	0.90	3.42	1.08
Religious	3.31	1.17	3.63	1.23	3.46	1.01	3.44	1.13
Cruel	3.21	1.22	2.93	1.36	3.10	1.07	3.11	1.21
Racist/Fascist	3.21	1.26	2.27	1.25	2.99	1.03	2.91	1.24
Honest	3.96	1.14	4.08	1.04	3.42	1.00	3.81	1.10
General Average	**3.79**	**0.63**	**3.51**	**0.53**	**3.49**	**0.48**	**3.62**	**0.58**

Table 5. The Respondents' Evaluations of Turkey's Power Image

	Jordan		Bosnia-Herzegovina		Kyrgyzstan		Total	
Turkey's Image of Power	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
Turkey is a regional power.	3.77	0.76	4.08	1.02	3.54	0.92	3.78	0.91
Turkey is a global power.	3.79	0.80	3.94	1.14	3.39	1.04	3.70	1.01
Turkey has a dynamic population.	3.89	0.72	4.03	0.93	3.60	0.98	3.83	0.89
Turkey has a developing economy.	3.88	0.78	4.25	0.98	3.58	1.07	3.88	0.98
Turkey has a developed economy.	3.86	0.76	4.27	0.97	3.61	0.98	3.89	0.94
Turkey has a strong army.	3.75	0.87	4.18	1.08	3.37	1.02	3.74	1.03
General Average	3.82	0.63	4.09	0.80	3.51	0.64	3.79	0.72

that Turkish TV series have social, economic and cultural effects on these societies. Especially many TV series include Istanbul-based outdoor shootings, the view of the Bosphorus, mansions, historical places, and the lifestyle that symbolizes the high standard of living, which seem to affect the perception of power in the audience. These effects may also be related to the internal dynamics of the aforementioned societies.

a mean value of 3.94 in Bosnia and Herzegovina, and the expression that *Turkey is a modern country* with a mean value of 3.83 in Kyrgyzstan. The concept of democracy, which is felt to be missing especially in the Middle East and perhaps even missed, seems to have a high mean value, especially for Jordanian respondents, in terms of perception of life in Turkey. Turkey went through a great change with the proclamation of the republic. Therefore,

Table 6. The Respondents' Evaluations of Perception of Life in Turkey

	Jordan		Bosnia-Herzegovina		Kyrgyzstan		Total	
Perception of Life in Turkey	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
The standard of living / quality of life in Turkey is high.	3.61	0.95	3.83	1.01	3.81	0.98	3.74	0.98
Safety of life is high in Turkey.	3.58	0.97	3.43	1.10	3.42	0.93	3.48	1.00
Turkey is a modern country.	4.02	0.75	3.94	0.99	3.83	0.90	3.93	0.88
Turkey is a secular republic.	3.88	0.97	3.82	0.98	3.50	0.99	3.73	1.00
There is a conservative family structure in Turkey.	3.30	0.98	3.16	1.03	3.46	0.95	3.31	0.99
Income distribution in Turkey is balanced.	3.27	0.88	3.10	0.97	3.44	0.93	3.28	0.93
Turkey is compatible with the changes (technological, cultural, architectural, etc.) in the world.	4.02	0.88	3.89	0.94	3.72	0.89	3.88	0.91
Regional development disparities are high in Turkey.	3.54	0.91	3.63	0.98	3.51	0.93	3.56	0.94
Family life in Turkey has degenerated.*	2.97	1.10	3.45	1.15	2.60	0.89	2.98	1.10
Different religions, cultures and identities can live comfortably in Turkey.	4.03	0.90	3.54	1.10	3.52	0.98	3.72	1.02
There is freedom of religion and belief in Turkey.	4.03	0.89	3.64	0.99	3.55	1.00	3.76	0.98
Human rights are important in Turkey.	4.04	0.94	3.67	1.01	3.39	1.02	3.71	1.03
Turkey has a developed democracy.	4.02	1.01	3.67	0.99	3.32	1.04	3.68	1.06
General Average	3.72	0.47	3.58	0.57	3.48	0.48	3.60	0.51

Note: *Reverse question.

When the evaluations of the respondents on perception of life in Turkey were examined; the mean general perception was 3.72 for the respondents from Jordan, whereas it was 3.58 and 3.48 for the respondents from Bosnia-Herzegovina and Kyrgyzstan, respectively. The expression with the highest mean perception was the expression that *Human rights are important in Turkey* with a mean value of 4.04 in the Jordan sample, whereas it was the expression that *Turkey is a modern country* with

there was an important detachment between Turkey and the Arab society. Therefore, although it is envisaged that the Arab society thinks that Turkey is detached from religious values, it seems that the perception in expressions related to religion, family and culture is high. It is determined that the way of life in TV series creates a perception that people are free to practice their beliefs in Turkey.

Table 7. The Respondents' Evaluations of Turkey's Active Role

	Jordan		Bosnia-Herzegovina		Kyrgyzstan		Total	
Turkey's Active Role	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
Turkey has an active role in the Middle East.	4.00	0.86	3.88	0.95	3.78	0.99	3.89	0.93
Turkey should play a more active role in the Middle East.	3.79	0.96	3.77	0.97	3.32	0.89	3.62	0.96
Turkey is a model for Muslim countries.	3.21	1.17	3.84	1.02	3.56	1.05	3.51	1.12
Turkey has an active role in the Balkans.	3.42	0.93	4.01	0.96	3.20	0.95	3.52	1.00
Turkey should play a more active role in the Balkans.	3.45	0.95	3.95	1.04	3.39	0.98	3.57	1.02
Turkey has an active role in Central Asia.	3.53	1.02	3.46	0.94	3.44	1.04	3.48	1.01
Turkey should play an active role in Central Asia.	3.59	1.05	3.56	0.94	3.46	1.13	3.54	1.05
General Average	3.57	0.77	3.77	0.71	3.45	0.68	3.59	0.74

When the evaluations of the respondents on Turkey's active role were examined; the mean general perception was 3.57 for the respondents from Jordan, whereas it was 3.77 and 3.45 for the respondents from Bosnia-Herzegovina and Kyrgyzstan, respectively. While the expression with the highest mean perception was the expression *Turkey has an active role in the Middle East* with a mean value of 4.00 in the Jordan sample, it was the expression *Turkey has an active role in the Balkans* with a mean value of 4.01 in Bosnia and Herzegovina and the expression that *Turkey has an active role in the Middle East* with a mean value of 3.78 in Kyrgyzstan.

that concepts such as Islam, democracy and freedom take place effectively in Turkey, along with its developing economic and technological infrastructure within the countries of the region, can be interpreted as a factor in Turkey being seen as a model. The influence of Russia should be taken into account in the fact that the mean values were lower in Kyrgyzstan than in Jordan and Bosnia and Herzegovina.

When the evaluations of the respondents on the variable of interest in Turkey were examined; the mean general perception was 3.64 for the respondents from

Table 8. The Respondents' Evaluations regarding the Variable of Interest in Turkey

	Jordan		Bosnia-Herzegovina		Kyrgyzstan		Total	
Interest in Turkey	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
My interest in Turkish literature increased.	3.41	1.21	3.80	1.15	3.68	1.15	3.61	1.18
My interest in Turkish music increased.	3.70	1.14	3.92	1.17	3.69	0.95	3.76	1.09
My interest in Turkish commercial products increased.	3.86	1.07	3.85	1.13	3.60	1.00	3.77	1.07
My interest in learning Turkish increased.	3.76	1.17	4.09	1.08	3.77	1.01	3.86	1.10
My interest in Turkish culture increased.	3.72	1.11	3.99	1.13	3.68	1.07	3.79	1.11
My interest in Turkish cinema increased.	3.56	1.28	3.71	1.19	3.56	1.00	3.61	1.17
My interest in Turkish history increased	3.42	1.29	3.86	1.19	3.46	1.14	3.56	1.23
General Average	**3.64**	**0.87**	**3.87**	**0.89**	**3.64**	**0.70**	**3.70**	**0.83**

After the 1980s, Turkey began to open up to the region and the world with economic and political breakthroughs. Jordan, Bosnia and Herzegovina and Kyrgyzstan are geographies and societies with which Turkey has had strong ties in the course of history. Turkey's interest in the Palestinian issue in the Middle East, its efforts for the integrity of Iraq and Syria; the relations with Bosnia and Herzegovina, especially during and after the Bosnian War, and Turkey's efforts to strengthen relations with the Turkic republics after the collapse of the USSR can be interpreted as increasing Turkey's prestige and effectiveness in these countries. In addition, the idea

Jordan, whereas it was 3.87 and 3.64 for the respondents from Bosnia-Herzegovina and Kyrgyzstan, respectively. The expression with the highest mean perception was the expression that *My interest in Turkish commercial products increased* with a mean value of 3.86 in the Jordan sample, whereas it was the expression that *My interest in learning Turkish increased* with a mean value of 4.09 in Bosnia and Herzegovina, and the expression that *My interest in learning Turkish increased* with a mean value of 3.77 in Kyrgyzstan.

Table 9. The Respondents' Evaluations regarding the Wish to Have an Affinity with Turkish people and Turkey

	Jordan		Bosnia-Herzegovina		Kyrgyzstan		Total	
The Wish to Have an Affinity with Turkish People and Turkey	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
I would like to have a Turkish friend.	4.05	0.99	4.24	0.98	3.88	1.07	4.05	1.02
I would like to have a Turkish neighbor.	3.96	1.00	3.94	1.08	3.60	0.96	3.83	1.02
I would like to share the same house/room with a Turkish student.	3.54	1.17	3.24	1.24	3.44	1.08	3.42	1.16
I would like to marry a Turk.	3.11	1.37	3.05	1.39	3.29	1.08	3.15	1.29
I would like to visit Turkey.	4.31	0.96	4.51	0.82	3.84	1.08	4.21	1.01
I would like to study in Turkey.	3.96	1.15	3.85	1.21	3.73	1.00	3.85	1.12
I would like to work in Turkey.	3.97	1.13	3.91	1.16	3.68	1.06	3.86	1.12
I would like to settle in Turkey.	4.04	1.07	3.59	1.32	3.55	1.15	3.75	1.19
General Average	**3.86**	**0.78**	**3.77**	**0.82**	**3.62**	**0.69**	**3.75**	**0.77**

When the evaluations of the respondents on the wish to have an affinity with Turkish people and Turkey were examined, the mean general perception was 3.86 for the respondents from Jordan, whereas it was 3.77 and 3.62 for the respondents from Bosnia-Herzegovina and Kyrgyzstan, respectively. The expression with the highest mean perception was the expression that *I would like to visit Turkey* with a mean value of 4.31 in the Jordan sample, whereas it was the expression that *I would like to visit Turkey* with a mean value of 4.51 in Bosnia and Herzegovina, and the expression that *I would like to have a Turkish friend* with a mean value of 3.88 in Kyrgyzstan.

Determining the Validity and Reliability of the Scales Used

Exploratory factor analysis and reliability analysis were performed to test the scales used in the study. As a result of the exploratory factor analysis for Turkey's personality traits scale, three factors were identified and designated as tolerant and hardworking, cruel and rough, conservative and obedient. Reliability values for each factor were 0.835, 0.755 and 0.720, respectively. Factor loads were not deleted because they were above 0.50. As a result of factor analysis, KMO values were positive as they were over 0.70 (0.860). Variance explanation rate was also appropriate as 53.2% >50%. According to the results of this analysis, the scale used was found to be valid and reliable. As a result of the exploratory factor analysis for Turkey's power image scale, a single factor emerged. The factor's reliability value was 0.843. Factor loads were not deleted because they were above 0.50. As a result of factor analysis, KMO values were positive as they were over 0.70 (0.859). Variance explanation rate was also appropriate since 56.2% >50%. According to the results of this analysis, the scale used was found to be valid and reliable. As a result of the exploratory factor analysis for perception of life in Turkey scale, three factors were identified and designated as perception of Turkey's democracy, perception of life in Turkey, perception of Turkey's socio-economic status. Reliability values for each factor were 0.820, 0.669 and 0.574, respectively. Factor loads were not deleted because they were above 0.50. As a result of factor analysis, KMO values were positive as they were over 0.70 (0.865). Variance explanation rate was also appropriate as 53.3% >50%. According to the results of this analysis, the scale used was found to be valid and reliable. As a result of the exploratory factor analysis for Turkey's active role scale, only one factor with a reliability value of 0.851 was identified. Factor loads were not deleted because they were above 0.50. As a result of factor analysis, KMO values were positive as they were over 0.70 (0.835). Variance explanation rate was also appropriate as 53.09% >50%. According to the results of this analysis, the scale used was found to be valid and reliable. As a result of the exploratory factor analysis for the interest in Turkey scale, only one factor emerged. The factor's reliability value is 0.855. Factor loads were not deleted because they were above 0.50. As a result of factor analysis, KMO values were positive as they were over 0.70 (0.874). Variance explanation rate was also appropriate as 53.90% >50%. According to the results of this analysis, the scale used was found to be valid and reliable.

As a result of the exploratory factor analysis for the perception of affinity with Turkish people and Turkey scale, only one factor emerged. The factor's reliability value is 0.839. Factor loads were not deleted because they were above 0.50. As a result of factor analysis, KMO values were positive as they were over 0.70 (0.838). Variance explanation rate was also appropriate as 61.64%

>50%. According to the results of this analysis, the scale used was found to be valid and reliable.

EXAMINING THE EFFECTS BETWEEN THE VARIABLES IN THE RESEARCH MODEL

Multiple regression analysis was performed in order to determine whether the independent variables of the research, including perception of Turkish people being tolerant and hardworking, perception of Turkish people being cruel and rough, perception of Turkish people being conservative and obedient, Turkey's image of power, perception of Turkey's democracy, perception of life in Turkey, perception of Turkey's socio-economic status and Turkey's active role, have any significant effect on the dependent variable, the interest in Turkey, and the results are given in Table 10.

According to the results of the multiple regression analysis, the established model is statistically significant (Sig.<0.005). The R^2 value in the model was 0.286, which means the independent variables account for the dependent variable, the interest in Turkey, at 28.6%. In view of the effects of independent variables; the perception of Turkish people being tolerant and hardworking (p=0.26), the perception of Turkish people being conservative and obedient (p=0.38) and Turkey's image of power (p=0.88) did not have any significant effect on the interest in Turkey. According to these results, H1a, H1c and H2 hypotheses were not supported. On the other hand; the perception of Turkish people being cruel and rough had a negative effect on the interest in Turkey (β=-0.08; p<0.05), perception of Turkey's democracy (β=0.08; p<0.05), perception of life in Turkey (β=0.16; p<0.05), perception of Turkey's socio-economic status (β=0, 10; p<0.05) and Turkey's active role (β=0.32; p<0.05) had a positive significant effect on the interest in Turkey. Accordingly, H1b, H3a , H3b , H3c and H4 hypotheses were supported.

According to the results of the multiple regression analysis, the established model is statistically significant (Sig.<0.005). The R^2 value in the model was 0.318, which means the independent variables account for the dependent variable, the wish to have an affinity with Turkey, at 31.8%. In view of the effects of independent variables; the perception of Turkish people being conservative and obedient (p=0.61) and Turkey's image of power (p=0.54) did not have any significant effect on the wish to have an affinity with Turkish people and Turkey.

Table 10. Results of Multiple Regression Analysis to Identify Variables Affecting Interest in Turkey

Dependent Variable: Interest in Turkey					
Independent Variables	**β**	**t**	**p**	**Tolerance**	**VIF**
Perception of Turkish People Being Tolerant and Hardworking[a]	0.04	1.14	0.26	0.63	1.59
Perception of Turkish People Being Cruel and Rough[b]	-0.08	-2.53	0.01*	0.90	1.10
Perception of Turkish People Being Conservative and Obedient[c]	0.03	0.88	0.38	0.62	1.60
Turkey's Image of Power	0.01	0.15	0.88	0.61	1.63
Perception of Turkey's Democracy[a]	0.08	2.14	0.03*	0.66	1.51
Perception of Life in Turkey[b]	0.16	4.09	0.00*	0.65	1.53
Perception of Turkey's Socio-Economic Status[c]	0.10	2.97	0.00*	0.79	1.27
Turkey's Active Role	0.32	8.79	0.00*	0.74	1.35
F	36.705				
Sig.	0.000				
R	0.535				
R^2	0.286				

*Has a significant effect at the 0.05 level. The symbols a, b, c indicated in some variables represent the order of their sub-variables after factor analysis.

According to these results, H5c and H6 hypotheses were not supported. On the other hand; the perception of Turkish people being cruel and rough had a negative effect on the wish to have an affinity with Turkey (β=-0.07; p<0.05), perception of Turkish people being tolerant and hardworking (β=0.16; p<0.05), perception of Turkey's democracy (β=0.17; p<0.05), perception of life in Turkey (β=0.16; p<0.05), perception of Turkey's socio-economic status (β=0.07; p<0.05) and Turkey's active role (β=0.24; p<0.05) had a positive significant effect on the wish to have an affinity with Turkey and Turkish people. In this context, H5a, H5b, H7a, H7b, H7c and H8 hypotheses were supported.

Table 11. Results of Multiple Regression Analysis for Determining the Variables Affecting the Wish to Have an Affinity with Turkish People and Turkey

Dependent Variable: The Wish to Have an Affinity with Turkish People and Turkey					
Independent Variables	**β**	**t**	**p**	**Tolerance**	**VIF**
Perception of Turkish People Being Tolerant and Hardworking[a]	0.16	4.25	0.00*	0.63	1.58
Perception of Turkish People Being Cruel and Rough[b]	-0.07	-2.34	0,02*	0.91	1.10
Perception of Turkish People Being Conservative and Obedient[c]	-0.02	-0.51	0.61	0.64	1.57
Turkey's Image of Power	0.02	0.61	0.54	0.61	1.63
Perception of Turkey's Democracy[a]	0.17	4.41	0.00*	0.65	1.53
Perception of Life in Turkey[b]	0.16	4.34	0.00*	0.66	1.51
Perception of Turkey's Socio-Economic Status[c]	0.07	2.06	0,04*	0.80	1.26
Turkey's Active Role	0.24	6.58	0.00*	0.73	1.37
F	42.602				
Sig.	0.000				
R	0.564				
R^2	0.318				

*Has a significant effect at the 0.05 level.

Table 12. Results of Simple Regression Analysis for Determining the Effect of Interest in Turkey on the Wish to Have an Affinity with Turkish People and Turkey

Dependent Variable: The Wish to Have an Affinity with Turkish People and Turkey					
Independent Variables	**β**	**t**	**p**	**Tolerance**	**VIF**
Interest in Turkey	0.56	20.9	0.00*	1.00	1.00
F	436.67				
Sig.	0.000				
R	0.563				
R^2	0.317				

*Has a significant effect at the 0.05 level.

According to the results of the multiple regression analysis, the established model is statistically significant (Sig.<0.005). The R^2 value in the model was 0.317, which means the independent variable accounts for the dependent variable, the wish to have an affinity with Turkish people and Turkey, at 31.7%. According to the results of the regression analysis, interest in Turkey had a positive significant effect (β=0.56; p<0.05) on the wish to have an affinity with Turkish people and Turkey. According to this result, H_9 hypothesis was supported.

INVESTIGATION OF THE DIFFERENCES BETWEEN THE RESPONDENTS' PERCEPTIONS OF THE VARIABLES IN THE RESEARCH MODEL BY COUNTRY

The Anova analysis was conducted to determine the differences between the respondents' perceptions of the variables of the research by country. The Tukey (post-hoc) test was used for multiple comparisons between countries in which differences were identified, and the results are shown in Table 13.

According to the results of the Anova analysis, there were significant differences (p<0.05) by country between the respondents' perceptions of the variables, including perception of Turkish people being tolerant and hardworking, perception of Turkish people being cruel and rough, perception of Turkish people being conservative and obedient, Turkey's image of power, perception of Turkey's democracy, Turkey's active role, the interest in Turkey and the wish to have an affinity with Turkish people and Turkey. According to these results, H_{10} hypothesis was supported for the variables including perception of Turkish people being tolerant and hardworking, perception of Turkish people being cruel and rough, perception of Turkish people being conservative and obedient, Turkey's image of power, perception of Turkey's democracy, Turkey's active role, the interest in Turkey and the wish to have an affinity with Turkish people and Turkey. The Tukey test, one of the multiple comparison tests, was used to determine between which countries there were differences for the variables with perception differences. On the other hand,

Table 13. Results of Anova Analysis for Determining the Differences between Perceptions of Research Variables by Country

Variables	F	p
Perception of Turkish People Being Tolerant and Hardworking[a]	54.611	0.000*
Perception of Turkish People Being Cruel and Rough[b]	17.178	0.000*
Perception of Turkish People Being Conservative and Obedient[c]	10.898	0.000*
Turkey's Image of Power	52.782	0.000*
Perception of Turkey's Democracy[a]	49.241	0.000*
Perception of Life in Turkey[b]	2.492	0.083
Perception of Turkey's Socio-Economic Status[c]	1.646	0.193
Turkey's Active Role	15.218	0.000*
Interest in Turkey	8.137	0.000*
The Wish to Have an Affinity with Turkish People and Turkey	8.786	0.000*

*There's a significant effect at the 0.05 level.

Table 14. Results of Multiple Comparison (Tukey) Analysis for Determining the Differences between Perceptions of Research Variables by Country

Variable	(I) Country	(J) Country	Difference between means (I-J)	Standard Error	Sig.
Perception of Turkish People Being Tolerant and Hardworking	Jordan	Bosnia-Herzegovina	.17094*	0.062	0.017
		Kyrgyzstan	.57039*	0.055	0.000
	Bosnia-Herzegovina	Jordan	-.17094*	0.062	0.017
		Kyrgyzstan	.39945*	0.064	0.000
Perception of Turkish People Being Cruel and Rough	Jordan	Bosnia-Herzegovina	.44906*	0.079	0.000
		Kyrgyzstan	0.063	0.070	0.646
	Bosnia-Herzegovina	Jordan	-.44906*	0.079	0.000
		Kyrgyzstan	-.38647*	0.082	0.000
Perception of Turkish People Being Conservative and Obedient	Jordan	Bosnia-Herzegovina	.29247*	0.063	0.000
		Kyrgyzstan	.13718*	0.056	0.038
	Bosnia-Herzegovina	Jordan	-.29247*	0.063	0.000
		Kyrgyzstan	-.15528*	0.065	0.046
Turkey's Image of Power	Jordan	Bosnia-Herzegovina	-.27025*	0.055	0.000
		Kyrgyzstan	.30741*	0.051	0.000
	Bosnia-Herzegovina	Jordan	.27025*	0.055	0.000
		Kyrgyzstan	.57766*	0.057	0.000
Perception of Turkey's Democracy	Jordan	Bosnia-Herzegovina	.35431*	0.057	0.000
		Kyrgyzstan	.53421*	0.055	0.000
	Bosnia-Herzegovina	Jordan	-.35431*	0.057	0.000
		Kyrgyzstan	.17990*	0.058	0.006
Turkey's Active Role	Jordan	Bosnia-Herzegovina	-.20213*	0.057	0.001
		Kyrgyzstan	0.120	0.055	0.072
	Bosnia-Herzegovina	Jordan	.20213*	0.057	0.001
		Kyrgyzstan	.32247*	0.059	0.000
Interest in Turkey	Jordan	Bosnia-Herzegovina	-.23486*	0.065	0.001
		Kyrgyzstan	0.000	0.062	1.000
	Bosnia-Herzegovina	Jordan	.23486*	0.065	0.001
		Kyrgyzstan	.23440*	0.067	0.001
The Wish to Have an Affinity with Turkish People and Turkey	Jordan	Kyrgyzstan	0.241*	0.057	0.000
	Bosnia-Herzegovina	Kyrgyzstan	0.152*	0.061	0.037

*There's a significant effect at the 0.05 level.

no significant differences were found in the perceptions of the respondents regarding the variables, perception of life in Turkey and perception of Turkey's socio-economic status ($p>0.05$). In this context, the H10 hypothesis was not supported for perception of life in Turkey and perception of Turkey's socio-economic status.

According to the results of the multiple comparison test, the Jordanian respondents' perception of the variables, including perception of Turkish people being tolerant and hardworking, perception of Turkish people being cruel and rough, perception of Turkish people being conservative and obedient, perception of Turkey's democracy, the wish to have an affinity with Turkey, were significantly higher than the respondents from Bosnia-Herzegovina and Kirgizstan. Bosnia-Herzogevinan respondents' perceptions were significantly higher than those of the respondents from Kirgizstan for the variables including perception of Turkish people being tolerant and hardworking, perception of Turkey's democracy, the wish to have an affinity with Turkish people and Turkey and significantly higher than those of the respondents from Jordan and Kirgizstan for the variables including Turkey's image of power, Turkey's active role and the interest in Turkey.

It was determined whether the independent variables of the research, including perception of Turkish people being tolerant and hardworking, perception of Turkish people being cruel and rough, perception of Turkish people being conservative and obedient, Turkey's image of power, perception of Turkey's democracy, Turkey's active role, perception of Turkey's socio-economic status and Turkey's active role, have any significant effect on the dependent variable, interest in Turkey. When the effects of independent variables were analyzed, the perception of Turkish people being tolerant and hardworking, perception of Turkish people being conservative and obedient and Turkey's image of power did not have any significant effect on the interest in Turkey. According to these results, H_1a, H_1c and H_2 hypotheses were not supported. On the other hand; the perception of Turkish people being cruel and rough had a negative effect on the interest in Turkey, perception of Turkey's democracy, perception of life in Turkey, perception of Turkey's socio-economic status and Turkey's active role had a positive significant effect on the interest in Turkey. Accordingly, H1b, H3a, H3b, H3c and H4 hypotheses were supported.

It was determined whether the independent variables of the research, including perception of Turkish people being tolerant and hardworking, perception of Turkish people being cruel and rough, perception of Turkish people being conservative and obedient, Turkey's image of power, perception of Turkey's democracy, perception of life in Turkey, perception of Turkey's socio-economic status and Turkey's active role, have any significant effect on the dependent variable, the wish to have an affinity with Turkish people and Turkey. Considering the effects of independent variables; perception of Turkish people being conservative and obedient and Turkey's image of power were found to have no significant effect on the wish to have an affinity with Turkish people and Turkey. According to these results, H5c and H6 hypotheses were not supported. On the contrary; the perception of Turkish people being cruel and rough had a negative effect on the wish to have an affinity with Turkey, whereas perception of Turkish people being tolerant and hardworking, perception of Turkey's democracy, perception of life in Turkey, perception of Turkey's socio-economic status and Turkey's active role had a positive significant effect on the wish to have an affinity with Turkey and Turkish people. In this context, H5a, H5b, H7a, H7b, H7c and H8 hypotheses were supported.

It was determined whether the independent variable, interest in Turkey, has a significant effect on the wish to have an affinity with Turkish people and Turkey. Interest in Turkey was found to have a positive significant effect on the wish to have an affinity with Turkish people and Turkey. According to this result, H9 hypothesis was supported.

CONCLUSION

The aim of this study was to measure the perceptions of foreign viewers of Turkish TV series about Turkish people and Turkey, based on certain variables. In the research, the respondents' perceptions of the variables including perceptions of Turkish people's personality traits, Turkey's image of power, perception of life in Turkey, Turkey's active role, interest in Turkey and the wish to have an affinity with Turkish people and Turkey were measured and effect analyses were conducted between the respective variables. The field application of the study was carried out in 3 countries, namely Jordan, Bosnia and Herzegovina and Kyrgyzstan. According to the results of the analysis made in line with the research model, the perception of Turkish people being cruel and rough had a negative effect on the interest in Turkey; perception of Turkey's democracy, perception of life in Turkey, perception of Turkey's socio-economic status and Turkey's active role had a positive significant effect on the interest in Turkey. The perception of Turkish people being cruel and rough had a negative effect on the wish to have an affinity with Turkish people and Turkey, whereas perception of Turkish people being tolerant and hardworking, perception of Turkey's democracy, perception of life in Turkey, perception of Turkey's socio-economic status and Turkey's active role had a positive significant effect on the wish to have an affinity with Turkey and Turkish people. In addition, interest in Turkey was found to have a positive significant effect on the wish to have an affinity with Turkish people and Turkey.

First of all, it is necessary to conduct detailed research that will evaluate the trends related to Turkish serials broadcast abroad from different perspectives and to take into account its results. Today, Turkish TV series are considered as productions with great popularity worldwide. The fact that Turkey ranks second in the export of TV series after the USA, which works professionally in soft power in particular, has a different meaning from the export of a few hours' productions for a certain fee. This was proven by the fact that the mean perception of the answers given to the expressions "my interest in Turkish music, Turkish commercial products, Turkish learning, Turkish culture, Turkish cinema, and Turkish history has increased" under the heading "interest" in the research was high in three countries. This means that Turkey and Turkish culture are known and followed in many parts of the world. Thus, this issue is thought to have a potential to influence many subjects ranging from culture to tourism, from trade to politics. The continuation of this success of Turkish TV series on a global scale has great importance in terms of the added value created through exports and more importantly, the perception of the country and nation formed through the TV series industry. Therefore, the development of short, medium and long-term strategies in this regard may be taken into consideration both by the sector and by Turkey. For this, it is necessary to carry out interdisciplinary and inter-organizational studies. Thus, the influence of Turkish TV series, which emerged spontaneously and became a soft power without being aware of it, can become a "TV series diplomacy" within cultural diplomacy in a controllable way.

The concept of power is defined in different ways. In interstate relations, power is the potential that a country can use for its ultimate goals. While brute force was the first thing that came to mind when power was mentioned in the past, today we see that the concepts of education, culture and technology come to the fore. According to Nye, who uses the concept of soft power in international relations, the behavior of different countries can be shaped by brute force, but you can shape their wishes with soft power (Nye, 1990). With the end of the great wars period, the competitive advantage in interstate relations has brought the concept of soft power to the fore (Wang & Lu, 2008). Although the concept of soft power is an ambiguous concept, it is now a term used by scientists, politicians and media analysts. In fact, an internet search has shown that there are tens of millions of sites that talk about the concept of soft power (Parmar & Cox, 2010). In short, soft power is the attainment of what is desired without the use of violence and without extra expenditure. This is due to the attractiveness of the political ideals and policies of those who use soft power. Therefore, soft power is to have the power of persuasion for the attractive party in order to create unity (Nye, 2004). The means for a country to have this power are through appeal in value, culture and politics (Gilboa, 2008). Soft power, which is fed from three sources: culture, politics and foreign policy, is associated with the cultural instruments of the country. Local cultural products with universal values such as literature, art and music encourage the target audience by their appeal (Nye, 2004). Television series are media products that can affect human thoughts (Busby & Klug, 2001). It is seen that Turkish TV series are appealing in the countries where they are broadcast and create a sense of identification in certain places, resutling in a soft power effect for Turkey. Series diplomacy, which is a soft power element, is a cultural rapprochement realized through series watched abroad. Turkish TV series, which act as cultural ambassadors for the audience in the countries

in which they are broadcast, convey Turkish culture, although they have different stories. Especially after the 2000s, Turkish TV series began to reach many parts of the world, especially the Middle East and the Balkans (Yeşil, 2015). The reason why it has a strong effect on the audience can be explained by different variables such as identity, historical and religious affiliation, as well as production quality (Yörük & Vatikiotis, 2013).

Series are important tools of popular culture. Therefore, series are also related to the tourism sector. TV series can also be included in the reasons that affect the preferences of people who make touristic trips in general. People have an idea about their destination through the TV series they watch. Therefore, series are of great importance in terms of creating a positive image (O'connor et al., 2008). Syrian journalist Daniel Abdulfattah stated in an interview that Turkey makes a daily profit of 1 million 200 thousand dollars. According to Abdulfattah, Turkey can carry out activities aimed at a positive image through Turkish TV series that are on the screen for six hours a day with their repetitions, without the cost of advertising, which is two thousand dollars per second in MBC (Yılmaz, 2010). Therefore, it can be evaluated within the framework of cultural diplomacy that the Ministry of Culture and Tourism and the Ministry of Economy make special plans for visits to Turkey to be made through the interest that may arise through TV series.

REFERENCES

Akyürek, S. (2012). Kazakistan'da *Türkiye* ve *Türk* algısı. Bilgesam Yayınları.

Akyürek, S., & Bilgiç, M. S. (2012). Kırgızistan'da Türkiye ve Türk Algısı. Bilgesam Yayınları.

Aljammazi, A., & Asil, H. (2017). The influence of Turkısh TV dramas on Saudi consumers' perceptıons, attıtudes and purchase intentions toward Turkish products. *International Journal of Academic Research in Business and Social Sciences*, 7 (1), 206-224.

Anas, O. (2014). Turkey's soft power challenges in the Arab world. *Akademik İncelemeler Dergisi,* 6 (2), 233-258.

Barnett, G. A., & Lee, M. (2003). Issues in intercultural communication research. In W.B. Gudykunst (Ed.), *Cross-Cultural and Intercultural Communication* (259-275). Sage Publications.

Başar, U. (2020). *İran* toplumu ve *Türk* televizyon dizileri. İran Araştırmaları Merkezi Yayınları.

Bhutto, F. (2019, September 13). *How Turkish TV is taking over the world*. The Guardian. https://www.theguardian.com/tv-and-radio/2019/sep/13/turkish-tv magnificent-century-dizi-taking-over-world

Bolton, K. (2010). Constructing the global vernacular: American English and the media. In K. Bolton, & J. Olsson (Eds.), *Media, Popular Culture, and The American Century* (125-155). Falth-Hassler.

Busby, G., & Klug, J. (2001). Movie-induced tourism: The challenge of measurement and other issues. *Journal of Vacation Marketing*, 7 (4), 316–332.

Castells, M. (2009). The rise of the network society: Information age: Economy, society, and culture volume 1. Wiley-Blackwell.

Chalaby, J. K. (2005). Towards an understanding of media transnationalism. In J. K. Cahalaby (Ed.), *Transnational Television Worldwide: Towards a New Media Order* (1-14). I.B.Tauris.

Dimbley, R., & Burton, G. (1998). More than words an introduction to communication. Publisher Routledge.

Gerbner, G., Gross, L., Morgan, M., Shanahan, J., & Signorielli, N. (2002). Growıng up wıth televısıon: Cultıvatıon processes. In J. Bryant, & D. Zillman (Eds.), *Media Effects Advances in Theory and Research* (43-67). Lawrence Erlbaum Associates.

Giddens, A. (1991). Modernity and self-identity: Self and society in the late modern age. Polity Press.

Gilboa, E. (2008). Searching for a theory of public diplomacy. *The Annals of the American Academy of Political and Social Science*, 616 (1), 55-77.

Haag Van Den, E. (1963). Of happiness and of despair we have no measure. In B. Rosenberg, & D. M. White (Eds.). *Mass Culture The Popular Arts In America* (504-537). Free Press.

Hall, S. (1989). Ideology and communication theory. In B. Dervin, B. J. O'Keefe, E. Wartella, & L. Grossberg, (Eds.), *Rethinking Communication, Volume 1 Paradigm Issues* (40-52). Sage Publications.

İnan, E. (2016). İzzet Pinto ile Söyleşi. *Episode Dergi*. 1 (1), 82-83.

Katz, E. (1959). Mass communications research and the study of popular culture: An editorial note on a possible future for this journal. *Studies in Public Communication*, 2, 1-6.

Kimmelman, M. (2010, June 18). *Turks Put Twist in Racy Soaps*. New York Times. https://www.nytimes.com/2010/06/18/arts/18abroad.html

Kurtuluş, K. (1998). Pazarlama Araştırmaları. İstanbul Üniversitesi İşletme Fakültesi Yayınları.

Lundby, K., & Ronning, H., (1991). Media culture communication: Modernity ınterpreted through media culture. In H. Ronning, & K. Lundby (Eds), Readings in Methodology, History and Culture (259-285). Norwegian University Press.

Morley, D., & Robins, K. (1995). Spaces of identity global media, electronic landscapes and

cultural boundaries. Taylor & Francis.

Nye, J. S. (1990). The changing nature of world power. *Political Science Quarterly*, 105 (2), 177-192.

Nye, J. S. (2004). Soft power: The means to success in world politics. PublicAffairs.

Nye, J. S. (2008). Public diplomacy and soft power. *The Annals of the American Academy of Political and Social Science*, 616 (1), 94-109.

O'Connor, N., Flanagan, S., & Gilbert, D. (2008). The integration of film-induced tourism and destination branding in Yorkshire, UK. *International Journal Of Tourism Research*, 10 (5), 423–437.

Önder, H. B. (2017). H*ükümetlerin* uluslararası hedef kitlelere ulaşmalarında stratejik halkla ilişkiler faaliyetlerinin etkisi: Alman toplumunda T*ürkiye* algısı *ü*zerine (2010-2013) ampirik bir araştırma. *Doktora Tezi*. İstanbul Üniversitesi.

Parmar, I., & Cox, M. (2010). Soft power and US foreign policy theoretical, historical and contemporary perspectives. Routledge.

Rohde, D. (2013). Beyond war: Reimagining America's role and ambitions in a new middle east, Penguin Books.

Shuter, R. (2012). Intercultural new media studies: The next frontier in intercultural communication. *Journal of Intercultural Communication Research*, 41 (3), 219-237.

Sinclair, J. (2009). Latin America's impact on world television markets. In G. Turner, & J. Tay (Eds.). *Television Studies After TV Understanding Television in the Post-Broadcast Era* (141-149). Routledge.

Storey, J. (2009). Cultural theory and popular culture an introduction. Pearson Longman.

Tuna, H. (2017). Medikal turizm kapsamında T*ürkiye'ye* gelen turistlerin tercih nedenleri *üzerinde Türk* dış politikasının etkisi ve *Türkiye* algısı. *Doktora Tezi*. Düzce Üniversitesi.

Verlegh, P. W. J. (2001). Country of origin effects on consumer product evaluations. *PhD thesis*. Wageningen University.

Wang, H., & Lu, Y. C. (2008). The conception of soft power and its policy implications: A comparative study of China and Taiwan. *Journal of Contemporary China*, 17, 425-447.

Yanardağoğlu, E., & Imad, N. K. (2013). The fever that hit Arab satellite television: Audience perceptions of Turkish TV series. *Global Studies in Culture and Power*, 20, 561-579.

Yeşil, B. (2015). Transnationalization of Turkish dramas: Exploring the convergence of local and global market imperatives. *Global Media and Communication*, 11 (1), 43-60.

Yılmaz, E., & Yalçın, Y. (2010). Türkiye ve ortadoğu ülkeleri arasında kültürel yakınlaşma aracı olarak popüler kültür ürünleri üzerine bir değerlendirme. In Y. Aktay, P. El-Sharkawy, & A. Uysal (Eds), *Değişen Ortadoğuda Kültür ve Siyaset Seçilmiş Tebliğler Kitabı* (301-328). Sde Yayınları.

Yörük, Z., & Vatikiotis, P. (2013). Soft power or illusion of hegemony: The case of the Turkish soap opera "Colonialism". *International Journal of Communication*, 7, 2361-2385.

Zhang, L. (2015). Stereotypes of Chinese by American college students: Media use and perceived realism. *International Journal of Communication*, (9) 1, 1-20.

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Analysis of Metaverse and Cryptocurrency Crimes in Forensic Accounting

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ABSTRACT

The purpose of this study is to collect data on crimes that encompass the technological and software aspects referred to as the "new generation," and to analyze case studies and legal incidents related to crimes committed within the scope of the metaverse and cryptocurrency.

The starting point of the study is the analysis of court decisions related to metaverse and cryptocurrency crimes. Within the scope of the study, thousands of court decisions have been scanned using text mining techniques. The keywords "metaverse," "bitcoin,""digital currency,""cryptocurrency," and "digital money" have been included in the search algorithm for the word corpus. Although no court decision containing the word "metaverse" was found, 37 decisions were identified in which the other terms from the word corpus were mentioned. The oldest decision dates back to July 12, 2019, while the most recent decision is dated March 23, 2023. In addition to the decisions of first-instance courts, the decisions of appellate and higher judicial authorities have also been examined within the framework of text mining studies.

Keywords: Metaverse, Bitcoin, Dijital Currency, Cryptocurrency Crimes, Dijital Money.

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INTRODUCTION

Metaverse is referred to as a digital world that resembles or mirrors the real world. In the metaverse, people interact with their digital shadows called avatars, which can perform various transactions and engage in commercial activities. This digital world is also considered a repository of metadata. As the use of such new technologies becomes more widespread, various legal issues arise, necessitating a rapid reconsideration of regulatory frameworks.

Forensic accountants are required to closely monitor technological advancements and take precautions against the possibility of criminals developing various methods by utilizing these new technologies. Concepts such as the Internet of Things, blockchain, big data, artificial intelligence, cryptocurrency, augmented virtual reality, non-fungible tokens (NFTs), decentralized finance (DeFi), and Industry 4.0 have emerged and gained attention. These concepts are believed to be a result of the digitization driven by the rapid advancements in computer, software, and internet technologies in recent years. With the development and widespread adoption of publicly accessible metaverse environments, forensic accountants are faced with a new type of crime. From a forensic accounting perspective, metaverse worlds can be evaluated from three different angles. Firstly, it is whether metaverse worlds introduce new dimensions to known internet crimes. Secondly, it is whether the virtual world and financial criminal behaviors can be acknowledged as a separate societal domain where forensic accountants can analyze and investigate. It can be argued that the findings of forensic accounting in the real world may not be universally applicable to the conditions of the virtual world. Attempting to apply them in such a context is likely to give rise to conceptual and legal challenges. Thirdly, the use of virtual worlds can have certain effects on users' real lives. These effects can be exemplified by the economic activities in the virtual world, leading to various cybercrimes, and exerting negative influences on the real society. The metaverse environment should not be perceived as outside the realm of legal order, and particularly, legal rules should be applicable when considering the impacts and consequences on the real world.

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In cases of crimes committed within the metaverse, the issue of which country has jurisdiction emerges as a significant problem. Determining which country's laws are applicable to activities conducted in the metaverse and which country has the authority to punish criminals becomes a fundamental legal debate. Some of the challenges faced include identifying the perpetrator and determining the extent of financial loss due to the use of various cryptocurrency units. In this regard, it is known that according to network identity management principles, telecommunications companies, internet service providers, or network operators are required to verify users' network identities and real identities.

Metaverse concept being a relatively new phenomenon, there are few studies in the literature that specifically examine the risks in the metaverse domain and its connection to forensic accounting. In a study titled "Identity, Crimes, and Legal Sanctions in the Metaverse" by Qin, Wang, and Hui (2022), it is emphasized that the establishment of an international legal framework is necessary to promote international cooperation, facilitate crime investigations, and support democratic governance. It is emphasized that all active entities in the virtual realm are composed of humans and that human behaviors should adhere to rules such as law and ethics. In another study titled "Metaverse: Welcome to the New Fraud Market" by Smaili and Rancourt-Raymond (2022), the fraud triangle was adapted to the metaverse domain based on 21 articles published between 2021 and 2022. In the study titled "Rules of the Metaverse" by Zhang (2022), emphasis is placed on the need for criminal law in the metaverse. The study discusses the importance of predefining legal sanctions and penalties to be applied when criminal behavior occurs. Another study, "Digital Forensic Investigation Framework for the Metaverse" by Seo, Seok, and Lee (2023), proposes a forensic framework specifically tailored for digital investigations in the metaverse for the first time. In the study titled "Financial Crimes in the Web3-Empowered Metaverse: Taxonomy, Countermeasures, and Opportunities" by Wu, Lin, Lin, Zheng, Huang, and Zheng (2023), the focus is on definitions, relevant case analyses, and existing academic research related to such crimes.

CONCEPTUAL FRAMEWORK

In the conceptual framework of the study, concepts such as metaverse, avatar, cryptocurrency, non-fungible token, digital twin, and metaverse wallet have been attempted to be explained.

Concept of Metaverse

With the acceleration of global digital transformation, activities such as remote work, virtual conferences, online education, and internet banking have increased the recognition of the Metaverse. However, despite the increased recognition of the Metaverse concept, there is no agreed-upon or universally accepted definition. Metaverse is considered as the name given to the virtual world where users create its content in a three-dimensional form (Tekin, 2022). The concept of the Metaverse is expected to elevate the interfaces (experience) for users to interact with the internet from two-dimensional to three-dimensional.

Metaverse is defined as a digital realm that combines features of mobile devices, social media, virtual and augmented reality, online gaming, blockchain, and cryptocurrency, creating a vast and interactive online virtual experience (Kaya, 2022). At this point, the Metaverse is the result of technological innovation reaching a certain stage of development. It is described as a scalable immersive 3D virtual world or network of worlds where users can interact with each other and with applications and environments, enabling individual presence and simultaneous collaborative actions through interoperable services (Beşinci, 2023).

Metaverse is a next-generation internet approach that is based on principles such as virtual reality, augmented reality, decentralization, autonomy, and real-time activity. At this point, it is seen as a brand new format or stage that integrates next-generation information technologies and guides the development of the internet towards Web 3.0. Since the structure of the Metaverse is still in its early stage, it is not possible to talk about a final structure (Koç, 2023).

One of the most significant differences that distinguishes the concept of the Metaverse and Metaverse worlds from other virtual platforms and 3D computer games is the idea that all content within the platform is created by the users themselves (Gönülal, 2022). The creation of 3D content, giving the user a sense of being there, and creating an environment that resembles the perception of the real world through the five senses are among the innovative aspects of the Metaverse concept. In the Metaverse universe, individuals are envisioned to use virtual reality goggles and interact through their avatars (virtual bodies) to attend concerts, watch movies, visit museums, go shopping, and even purchase virtual real estate (Başoğlu, 2023).

Due to the emergence of the Metaverse as a social phenomenon, it is also possible for this new technology to be used for criminal purposes. However, since the crimes committed in this environment are very new, there are currently no sufficient standards in place for preventing, detecting, or investigating these crimes.

Concept of Avatar

An avatar is considered as an individual's virtual extension, reflecting specific images, behavioral characteristics, personalities, values, preferences, and digital rituals within the Metaverse environment. Through their avatars, both individuals and organizations are able to easily navigate and interact with various spaces and engage with one another (Atak, 2022).

An avatar is considered as a model of transferring human consciousness into a digital object. In this model, individuals are able to navigate digital environments using their avatars as if they were their own physical bodies. By utilizing a digital body, an attempt is made to create a perception of the five senses within the virtual world. However, in the context of Metaverse crimes, the issue of determining the responsible party for the crimes committed by avatars becomes problematic.

The Concept of Cryptocurrency

Cryptocurrency is defined as a digital form of currency created and operated in a decentralized manner, based on blockchain technology. It is a software-based currency that people attribute value to, without being subject to a central authority. Cryptocurrencies are encrypted using cryptographic systems, providing security and protection for digital or virtual money (Bil, 2023). While the intangible nature of cryptocurrencies raises questions for individuals, their impact on the financial sector and their role as pioneers in technological advancements have gradually gained trust over time (Gürbüz, 2023). Therefore, it is predicted that in the future, both similar and more complex new types of virtual currencies will continue to emerge (Isfarin, 2022).

In the Metaverse environment, the occurrence of relatively new generation crimes such as theft of cryptocurrencies, their fraudulent use, and their exploitation for money laundering purposes is possible. It is believed that forensic accountants will play an important role in efforts to investigate and shed light on financial crimes in this context.

The Concept of Immutable Tokens

Non-fungible tokens (NFTs) are recognized as digital assets that represent tangible objects in the world, such as artworks, in-game items, collections, and videos. They are known as qualified intellectual property titles, emphasizing their immutable nature and compliance with punctuation and grammar rules (Güngör, 2022). Qualified intellectual property titles developed with blockchain technology are unique identities integrated into the virtual world (Baltacıoğlu, 2023). At this point, they serve as indisputable indicators of who created the digital asset and who owns it. NFTs provide provable uniqueness to digital products, thus assisting in determining ownership of the digital item.

NFTs provide standardized features to digital assets, making them suitable for trading. This feature enables fast and secure transactions of digital assets, granting them liquidity. The ability to exclude duplication, along with easy identification of the original digital asset, strengthens the liquidity feature. A system has been established to allow digital artworks to be digitally signed by the artist, thereby protecting the artist's copyright (Arıcı Turhangil, 2023).

Currently, the storage of NFT metadata is primarily achieved through online and offline methods. NFTs, with their verification capabilities, can quickly confirm information such as ownership, transaction history, and creation timestamps of digital assets. This consensus feature gives digital assets a certainty that can have various legal implications. The concept of ownership in the Metaverse operates differently and more complexly than in the physical world (Güven, 2022).

The approval of digital assets is essential for the economic sustainability and value-added development of Metaverse worlds. In future Metaverse applications, NFTs can contribute to generating meaning, economic activity, and various benefits (User, 2022). With the advancement of digital product industries, it is believed that NFTs have potential uses in financial markets, social ecology, and other fields. The use of NFT features in electronic invoices, enabling the creation of e-invoices that are impossible to counterfeit, immutable, and verifiable, can serve as an example in this regard.

However, within the scope of Metaverse crimes, the theft, copying, or imitation of NFTs, as well as the sale of these products as if they were genuine, may give rise to various new offenses.

The Concept of Digital Twins

In the Metaverse, the exact replicas of real-world objects can be created as digital twins. Through the use of sensors and artificial intelligence tools, digital counterparts of physical objects can be accurately generated. In this context, a digital twin is considered a virtual model designed to accurately reflect a physical object (Akturan, 2023).

Regarding Metaverse crimes, the question of whether certain actions involving a digital twin, such as the theft of a digital twin object or causing harm to it through an avatar, constitute offenses within the Metaverse, is currently being debated.

The Concept of Metaverse Wallet

A crypto asset wallet is defined as an address identified by a public key that can send and receive the relevant crypto assets (Çağlar, 2022). Crypto asset wallets are divided into hot (online) and cold (hardware) wallets. A cold wallet is known as the safest way for investors who do not frequently engage in cryptocurrency trading, such as long-term investors, to securely store their assets offline (Özkul, 2022). In this context, Metamask is considered a wallet used in the Metaverse environment for storing cryptocurrencies and conducting payments and transactions. Concerns such as the compromise of digital wallet passwords and the exploitation of cybersecurity vulnerabilities to obtain the values stored in these wallets are among the discussed topics in the realm of Metaverse crimes.

FIELDS OF FORENSIC ACCOUNTING

Forensic accounting is an interdisciplinary field that intersects accounting and law, while also drawing significant benefits from other areas such as forensic science and auditing. It focuses on the financial dimension and accounting aspects of events that constitute a crime, involving the examination of evidence and documentation to form opinions and generate reports. In other words, the concept of forensic accounting can be defined as the collection of financial-related information and the application of analytical thinking with the aim of obtaining evidence in legal matters (Özer, 2022).

Due to its relatively new nature, the forensic accounting profession has become a subject of interest for both accounting practitioners and academics, as it has not been able to prevent fraud and corruption despite all international regulations (Çekmen, 2022). Forensic accounting encompasses various fields that can be described as litigation support services, expert witness testimony, fraud, corruption, and abuse auditing. Forensic accountants are likely to encounter metaverse and cryptocurrency crimes within each of these subfields.

Litigation Support

Litigation support refers to the assistance provided by forensic accountants to all parties involved in a legal case concerning matters related to the court proceedings (Aytekin, 2022). Within the scope of litigation support, forensic accountants present evidence-based accounting-focused technical information to attorneys in order to help them construct their defenses and legal pleadings. Attorneys are expected to share information about their clients with forensic accounting experts under written consent and confidentiality agreements.

Forensic accountants can indeed provide litigation support services in cases involving metaverse and cryptocurrency crimes. Naturally, whether metaverse and cryptocurrency crimes are brought before judicial authorities or not becomes significant. In this study, text mining analyses conducted on court decisions have not yet revealed any instances of the term “metaverse.” However, when text mining studies were conducted on court decisions concerning cryptocurrency, 37 cases were identified. It is worth noting that not all incidents are brought before judicial authorities, and considering stages such as mediation and settlement, the number of cases is expected to be higher.

Indeed, due to the relatively new nature of metaverse and cryptocurrency crimes, there is a clear need for forensic accounting analysis in the process of developing defense strategies and preparing legal petitions. Furthermore, the importance of forensic accountants’ work in uncovering the accounting aspects of metaverse and cryptocurrency crimes is critical.

Expert Witness Testimony

Within the scope of expert witness testimony, forensic accountants provide their knowledge and expertise to the courts, both in written and oral form, particularly regarding financial crimes. As an expert witness, a forensic accountant analyzes the accounting aspects of the case and presents their findings in a report. Unlike a court-appointed expert, the forensic accountant supports their report with visual elements such as tables, graphs, and videos, and delivers an oral presentation in court. During this oral presentation, they answer questions from legal professionals present in the courtroom, including judges, prosecutors, and lawyers. It is through

this comprehensive examination of the case that legal professionals can make informed decisions.

In a court proceeding, a forensic accountant, as an expert witness, presents their own thoughts on accounting issues arising in the case, devoid of subjectivity and emotion, in a calm and composed manner (Yüksel, 2022). Acting impartially, the forensic accountant utilizes their technical knowledge and presents it to legal professionals in court, based on evidence and documentation, thereby assisting in the administration of justice.

The lack of established terminology and even a consensus on definitions regarding metaverse and crypto crime creates various communication problems in understanding the contents of written reports. It is believed that the inclusion of expert witness testimony specifically addressing metaverse and crypto crimes will further enhance the value of forensic accounting work.

Fraud, Corruption, and Abuse Examination

Forensic accounting, also known as investigative accounting, is a service that involves the examination of illegal issues that typically require legal sanctions (Altaylı, 2022). Investigating, probing, and monitoring negative financial events such as fraud, corruption, and embezzlement within companies to identify the perpetrators with evidence and documents constitute the most recognized field of forensic accounting. Forensic accountants go beyond traditional audit and accounting practices by employing techniques such as criminology, graphology, psychology, and forensic computing to shed light on incidents.

Forensic accounting in itself comprises subfields such as fraud prevention and fraud risk reduction, detecting financial losses caused by fraud, and uncovering perpetrated fraud. In relation to Metaverse and cryptocurrency-related financial crimes, forensic accounting services are highly needed for both crime prevention and risk reduction, identification of the perpetrator's avatar, and calculating the incurred financial losses. Until effective forensic investigations are conducted in the Metaverse and law enforcement agencies increase their efforts in this field, every forensic accounting task holds significant importance.

The characteristics of Metaverse, cryptocurrency, and blockchain technologies, such as providing privacy, lack of central authority, and unclear legal regulations, present various opportunities for criminals in this field. Forensic accountants can provide critical services to victims by assisting them in presenting digital and physical evidence and documents to legal authorities. They can support individuals in escalating incidents to the appropriate judicial bodies.

DIGITAL FINANCIAL CRIMES

Metaverse Financial Crimes

Due to the lack of precedents or existing applications with identification gaps, Metaverse gives rise to various new legal implications. The absence of effective regulation on blockchain or Web3 allows Metaverse to become a breeding ground for criminal activities, encouraging financial crimes such as fraud, code exploitation, money laundering, and illicit services (Wu, Lin, Lin, Zheng, Huang & Zheng, 2023). In the Metaverse, the use of unreal avatars and digital masks on social networks allows crimes to be committed in this manner. Some users who perceive the Metaverse as an unprecedented realm of freedom may seek to exploit this environment for their own nefarious purposes.

With the development and widespread adoption of public Metaverse applications, forensic accountants are facing new challenges. These include:

- The Metaverse can currently facilitate the commission of known financial crimes.
- New financial crimes can be committed in the Metaverse environment. The use of novel methods and applications for criminal activities can create vulnerabilities in combating crime.
- Regulatory gaps and the freedom-oriented environment in the Metaverse can provide opportunities for virtual criminals.

Regulatory bodies, financial authorities, governing boards, and fraud investigators should consider these risks before investing in a metadata repository (Smaili & Rancourt-Raymond, 2022). The absence of an established legal framework or criminal sanctions increases the potential for criminal activities to occur.

When users interact through their avatars, situations may arise in which disputes occur that are akin to transgressions beyond legal boundaries in the real world (Cheong, 2022). The identification of the subject matter of a transaction and the determination of the identities of those involved in the transaction are crucial in the investigation of Metaverse or digital currency crimes. However, the seamless completion of the investigation and evidence collection relies on clarifying the real identities of the perpetrators involved in digital currency

crimes. The administrators of the Metaverse service platform or the managers of the cryptocurrency exchange where transactions are conducted must comply with requests to officially transmit recorded information to the appropriate legal authorities without face-to-face identification or verification of individuals involved in the requested transactions.

Although users have the possibility to register multiple anonymous addresses, it is imperative for the central servers of the Metaverse service platform to encrypt transaction information thoroughly and store traces of criminal activities solely in the blockchain ledger. Transactions made from blockchain ledgers can be easily detected. However, there can be challenges in determining the real identities of the individuals involved in these transactions. Various crimes such as theft, fraud, and money laundering can occur in stores opened within the Metaverse. Measures such as restricting the proximity between avatars to prevent crimes like avatars causing harm to each other have been considered. In February 2022, Meta announced the activation of a feature called "Personal Boundary" to provide avatars with secure distance protection. However, there is currently no effective measure in place specifically targeting financial crimes in the Metaverse environment. In 2012, the Dutch Supreme Court issued a conviction against two young individuals who stole a virtual amulet from another player in the online game Runescape, citing that the time and effort spent in obtaining these amulets had a value. With this decision, virtual treasures or virtual currencies used in online games became recognized as goods with real value in the Netherlands. It has been determined through text mining during this conversation that there are no court decisions in Turkey that explicitly mention the term "metaverse." However, it is expected that a settled precedent will emerge in the future as a result of cases brought before the judicial authorities. In Turkey, there are currently no specific regulations stating that "account, character, currency, and treasure information of online games must be stored as electromagnetic records on the game server. The user of the game has clear ownership rights over the account, character, currency, and treasure, and has the right to control their account, desire the protection of these digital assets, and seek compensation for them."

Cryptocurrency Crimes

Within the scope of the Metaverse, financial cybercrimes have been observed to occur on a significant scale in recent years, including large-scale theft of cryptocurrencies from exchanges and the sale of fake or suspicious cryptocurrencies (Katterbauer, 2022). The proliferation and recognition of cryptocurrencies also increase the potential for their misuse. Concerns in this regard encompass the illicit use of cryptocurrencies for activities such as illegal drug trading, theft, ransomware, financing terrorism, money laundering, circumvention of capital controls, and any other unlawful purposes (Atıcı, 2023).

Indeed, cryptocurrency crimes are more commonly observed compared to Metaverse crimes. In this regard, it can be stated that forensic accountants have a certain level of familiarity with cryptocurrency crimes (Al-Dulaimi, 2021). However, due to legal and technological delays, the analysis and investigation of crimes related to digital currencies present numerous challenges in forensic accounting. The lack of clarity in legislation concerning digital currencies necessitates an improvement in the legal perception of digital currency-related crimes. Establishing an effective investigation and evidence-gathering mechanism within judicial authorities, along with interaction with forensic accountants during the process, is believed to yield various positive outcomes. Additionally, the development of court precedents related to cryptocurrency crimes will enable forensic accountants to enhance their analyses.

Since the emergence of Bitcoin in 2009, numerous digital currencies have been created one after another. The proliferation of digital currencies and their widespread use has not only changed the rules of market transactions but has also had profound implications for traditional crimes. Private digital currencies have become a significant tool or object of crime. Changes in the form and circulation structure of digital currency have necessitated the introduction of criminal sanctions for offenses involving digital currency by also bringing about changes in the legal attributes of the currency.

It is necessary to determine that, according to the legislation in force in Turkey, Bitcoin is not recognized as legal tender, and therefore, it cannot be considered as currency under Turkish Law (Yılmaz, 2021). Bitcoin is not an economic currency; although it possesses some functions of a currency, it is essentially still a commodity due to limitations in its market size and public acceptance. Criminals often employ various methods to conceal the transactional pathway of digital currency when using it for illegal and criminal activities. While traditional crimes assist in the concealment of illicit proceeds by blending stolen money with legal currency, more complex mechanisms can be employed in cryptocurrency transactions.

Virtual currency possesses characteristics such as anonymity, decentralization, and globalization, which can assist criminals in money laundering. The anonymous nature of Bitcoin and the lack of oversight by a third party have made it a convenient system for criminals to conduct payment transactions (Demir, 2023). During a transaction, while the virtual currency account, transaction address, and amount can be identified, a random "public key" and "private key" pair are generated for each virtual currency transaction. As a result, it becomes difficult to determine the real IP address of the actual user and the user of the account. From virtual currency wallet addresses to network scanning records, electronic evidence becomes a kind of crime scene. The identification and reporting of electronic evidence are key to resolving virtual currency cases. Forensic accountants play a significant role in ensuring the integrity of electronic evidence, but they also need to collaborate with relevant technology companies to enhance the effectiveness of evidence collection.

The Function of Forensic Accounting in Next-Generation Financial Crimes

To investigate crimes such as money laundering and virtual theft that occur in the Metaverse, digital forensic investigations are necessary (Israfin, Imamy, & Wirawan, 2023). Due to the unique technical features of the Metaverse and the cryptocurrencies used within it, new generation financial crimes possess characteristics of privacy, complexity, and prevalence. In addition to forensic accountants being mindful of the technical risks brought about by new technologies, they also need to develop investigation technologies in line with the features of the Metaverse and cryptocurrencies. Forensic accountants should update their investigation models based on the characteristics of crimes involving the Metaverse and cryptocurrencies and collaborate with third parties, such as forensic computing experts, to strengthen their investigations.

The Metaverse represents a virtual world, while cryptocurrencies are digital forms of virtual currency. However, it can be expressed that ultimately the Metaverse and cryptocurrencies are financed with real-world currencies. The values such as Turkish Lira, US Dollars, Euros, etc., held in a regular bank account, are converted into the cryptocurrency accepted by the Metaverse platform for various purposes such as buying virtual properties, purchasing NFTs, or conducting e-commerce transactions. When this converted value is subjected to theft, fraud, or financial crimes in any way, it creates a real-world impact and victimization. During the use of the Metaverse and cryptocurrencies, people are more vulnerable to financial crimes. Using a technology does not necessarily equate to understanding or comprehending it fully. Moreover, the requirements for cybersecurity further increase the complexities of Metaverse and cryptocurrency usage. There are numerous risks involved, such as attacks on accounts, wallets, or avatars, irreversible financial transactions, fraudulent or duplicate transactions, and the exploitation of cybersecurity vulnerabilities for fraudulent activities.

Metaverse is envisioned as the living space of post-humans, giving rise to the concept of digital life, including digital humans, electronic humans, virtual humans, information humans, and more. NFTs, cryptocurrencies, and metaverse technologies are closely related to real-world rights. Forensic accountants find their field of work in addressing the grievances and ensuring justice when these rights are violated by financial crimes. Investigations into Metaverse and cryptocurrency cases are typically conducted by forensic accountants upon the request of the victim or their legal representative. Once the evidence and documents of the incident are compiled into a report, they are submitted to the judicial authorities, leading to further legal investigations and proceedings. It is crucial to take preventive measures at national, social, and individual levels before the dimensions of Metaverse and cryptocurrency crimes expand further.

TEXT MINING APPLICATION IN COURT DECISIONS

Statistical information regarding metaverse and cryptocurrency crimes in Turkey is not regularly shared with the public. However, it has been observed that the total number of crimes queried with the keyword "Bitcoin" in search engines is significantly higher than the total number of crimes queried with the keyword "digital currency." By applying text mining analysis techniques to Turkish judicial decisions, results similar to those attempted to be expressed in Table 1 have been obtained. The data in Table 1 was obtained from http://www.lexpera.com.tr and the table was created by the authors.

When examining Table 1, it is observed that out of 176 decisions from the courts of first instance, the term "bitcoin" or "cryptocurrency" appears in the text. One decision is from 2019, one from 2020, 13 from 2021, and finally, three decisions are from 2022. By analyzing the keywords in the text using text mining techniques, it is concluded that four cases are related to Bitcoin-related

Table 1: In First Instance Court Decisions Regarding Bitcoin

Decision Authority	Decision Number	Subject
Bakırköy 2nd Commercial Court of First Instance	E. 2020/27 K. 2021/585, T. 10.6.2021	Claiming Compensation for Losses in Bitcoin Buying and Selling (Negative Determination of Exchange Instrument)
Bakırköy 7th Commercial Court of First Instance	E. 2019/153 K. 2019/716, T. 12.7.2019	No cryptocurrency debt belonging to the company
Ankara 3rd Intellectual and Industrial Property Rights Court	E. 2021/143 K. 2021/401, T. 9.12.2021	Regarding the inability to use the term "Bitcoin" as a trademark
Ankara 3rd Intellectual and Industrial Property Rights Court	E. 2021/142 K. 2021/397, T. 9.12.2021	Regarding the inability to use the term "Bitcoin" as a logo
Ankara 10th Commercial Court of First Instance	E. 2020/321 K. 2021/122, T. 8.3.2021	Demanding a Loss Certificate as a result of the system being hacked and Bitcoin being requested
Ankara 11th Commercial Court of First Instance	E. 2020/333 K. 2021/928, T. 7.12.2021	Demanding a Loss Certificate as a result of a Bitcoin-related cyber attack
İstanbul 21st Commercial Court of First Instance	E. 2019/1326 K. 2021/688, T. 12.10.2021	The plaintiff, who operates a hotel, engaged in Bitcoin transactions based on the guidance of an individual named "...," deposited a total of 115,000.00 TL, but after some time, couldn't access their account, and their account was emptied by a person named "..."
Bursa 3rd Commercial Court of First Instance	E. 2021/411 K. 2021/545, T. 22.6.2021	Thodex platform (… Technologies Inc.) investment company involved in Bitcoin and derivatives exchange fraud
Ankara 3rd Commercial Court of First Instance	E. 2020/562 K. 2021/239, T. 29.3.2021	Demanding a Loss Certificate as a result of a Bitcoin-related cyber attack
Ankara 14th Commercial Court of First Instance	E. 2020/582 K. 2021/39, T. 25.1.2021	Establishment of a cryptocurrency trading system
İstanbul 5th Commercial Court of First Instance	E. 2021/269 K. 2022/339, T. 12.5.2022	Gradual sale of Bitcoins in the account and conversion into Turkish Lira (TL), money laundering
İstanbul 11th Commercial Court of First Instance	E. 2021/602 K. 2022/131, T. 11.2.2022	Repetitive transactions in cryptocurrency buying and selling
İstanbul 18th Commercial Court of First Instance	E. 2021/424 K. 2021/737, T. 28.10.2021	Regarding refund fees in cryptocurrency exchanges
İstanbul 21st Commercial Court of First Instance	E. 2019/915 K. 2020/278, T. 2.7.2020	Regarding the process of refund in cryptocurrency buying and selling
İstanbul 7th Commercial Court of First Instance	E. 2021/469 K. 2021/704, T. 6.9.2021	Inaccessibility to the account for cryptocurrency transactions
İstanbul 12th Commercial Court of First Instance	E. 2020/108 K. 2021/219, T. 23.3.2021	Demanding a Loss Certificate as a result of a Bitcoin-related cyber attack
İstanbul 9th Commercial Court of First Instance	E. 2021/672 K. 2022/190, T. 22.3.2022	Unauthorized transactions in cryptocurrency trading platforms
İzmir 7th Commercial Court of First Instance	E. 2021/321 K. 2021/731, T. 30.9.2021	Bitcoin mining with illegal electricity.

Source: http.//www.lexpera.com.tr (Access Date: 01.04.2023), Created by the Authors.

Table 2: Bitcoin in Appeals and Supreme Court Decisions

Decision Authority	Decision Number	Subject
Samsun Regional Court of Justice, 1st Civil Chamber	E. 2020/1488 K. 2020/1799 T. 19.11.2020	...gave 105,000 TL to the close friend, who has been a friend for 15 years, to be invested in Bitcoin, along with a certain amount of gold and a small sum of cash.
Bursa Regional Court of Justice, 5th Civil Chamber	E. 2021/2349 K. 2022/781 T. 6.6.2022	Bitcoin mining was conducted using company resources, but the profits generated were not transferred to the company accounts.
Istanbul Regional Court of Justice, 14th Civil Chamber	E. 2020/1588 K. 2020/1107 T. 22.10.2020	The total profit and principal amount from Bitcoin trading amounted to 165,025.76 USD. The debtor defaulted on the payment, and the password used was changed.
Court of Cassation, 6th Criminal Chamber	E. 2020/1158 K. 2020/2598 T. 7.7.2020	The forcible acquisition of computer password and its use in Bitcoin transactions.
Istanbul Regional Court of Justice, 27th Civil Chamber	E. 2019/501 K. 2020/1218 T. 10.6.2020	Termination of employment contract due to placing the devices used for Virtual Currency Mining (Bitcoin) in the information processing server room.
Ankara Regional Court of Justice, 22nd Civil Chamber	E. 2023/94 K. 2023/153 T. 17.2.2023	Seizure of Bitcoin accounts.
Istanbul Regional Court of Justice, 3rd Civil Chamber	E. 2023/308 K. 2023/869 T. 21.3.2023	Bitcoin and cryptocurrency trading platform fraud..
Izmir Regional Court of Justice, 17th Civil Chamber	E. 2022/727 K. 2022/864 T. 12.5.2022	Loss incurred due to the disappearance of bitcoins purchased through the company's website in the digital realm and inability to sell them.
Istanbul Regional Court of Justice, 17th Civil Chamber	E. 2023/148 K. 2023/191 T. 16.2.2023	The right to reject advertising requests from a country where advertising for cryptocurrencies is not permitted.
Ankara Regional Court of Justice, 20th Civil Chamber	E. 2020/1093 K. 2022/379 T. 25.3.2022	The prohibition of using the term "cryptocurrency" as a registered trademark.
Ankara Regional Court of Justice, 20th Civil Chamber	E. 2020/70 K. 2021/1164 T. 30.9.2021	The prohibition of using the term "cryptocurrency" as a registered trademark.
Ankara Regional Court of Justice, 21st Civil Chamber	E. 2023/141 K. 2023/220 T. 22.2.2023	Imposing interim measures on accounts related to cryptocurrencies, electronic money, etc.
Istanbul Regional Court of Justice, 19th Civil Chamber	E. 2021/1963 K. 2021/1628 T. 17.9.2021	Freezing the funds in the company's account due to cryptocurrency trading transactions.
Izmir Regional Court of Justice, 11th Civil Chamber	E. 2022/625 K. 2022/602 T. 12.4.2022	Engaging in unfair competition by featuring other cryptocurrency advertisements.
Istanbul Regional Court of Justice, 12th Civil Chamber	E. 2022/1073 K. 2022/915 T. 16.6.2022	Engaging in repeated transactions in cryptocurrency buying and selling.
Istanbul Regional Court of Justice, 19th Civil Chamber	E. 2021/3166 K. 2021/2411 T. 21.12.2021	Inability to access the account in cryptocurrency buying and selling.
Istanbul Regional Court of Justice, 13th Civil Chamber	E. 2023/522 K. 2023/491 T. 23.3.2023	Making cryptocurrency buying and selling transactions worth 700,000 USD with commission payment.
Istanbul Regional Court of Justice, 37th Civil Chamber	E. 2022/2128 K. 2023/826 T. 22.3.2023	Failure to reimburse the amount paid for cryptocurrency asset purchases and sales.
Istanbul Regional Court of Justice, 44th Civil Chamber	E. 2021/1354 K. 2021/1325 T. 4.11.2021	Making various commitments regarding cryptocurrencies, collecting substantial amounts of money from customers, but failing to fulfill the commitments.

Source: http.//www.lexpera.com.tr (Access Date: 01.04.2023), Created by the Authors.

cyber attacks, one case is related to Bitcoin mining with illegal electricity, five cases are related to Bitcoin trading fraud, and one case is related to money laundering. The search was conducted using the common keywords "Bitcoin," "cryptocurrency," and "digital currency." The data in Table 2, obtained from http://www.lexpera.com.tr, is created by the authors of the table.

According to the analysis of Table 2, it is concluded that there are 19 decisions, with 4 decisions made in 2020, 4 decisions in 2021, 5 decisions in 2022, and 6 decisions in 2023. When the words in the decisions were examined using text mining techniques, it was observed that 1 decision involved robbery, 1 decision involved unfair competition, and 1 decision involved trademark usage, while the remaining decisions were related to buying and selling transactions.

CONCLUSION

In today's world, communication, transportation, software, the internet, artificial intelligence, and computer technologies are rapidly advancing. While these advancing technologies bring beneficial outcomes for humanity, they also create opportunities for criminals. The Metaverse or virtual world is a relatively new technological ecosystem compared to cryptocurrencies. Measures to prevent financial crimes that can be committed in the Metaverse world, fighting against criminals, and conducting crime investigations do not yet have a well-defined methodology. In contrast, there is a relatively more established structure regarding financial crimes related to cryptocurrencies since they are more commonly observed. The currency that is valid in the Metaverse world is cryptocurrency.

Forensic accounting is an effective forensic discipline in the investigation of financial crimes. It can be observed that various fields such as law, auditing, criminology, psychology, and graphology have a perspective closely related to the science of accounting. Forensic accounting comes into play when accounting analysis is required in legal cases. In the resolution of metaverse and cryptocurrency financial crimes, significant responsibilities lie with forensic accountants. In the virtual world of the metaverse, forensic accountants can be consulted in cases involving the theft, fraud, manipulation, corruption, and misuse of digital assets known as NFTs. Furthermore, in the perpetration of new generation digital financial crimes such as fraud and money laundering using cryptocurrencies, forensic accountants can be sought for assistance in analyzing the incidents.

Whether the rules designed by the Metaverse are consistent with legal norms in the real world is yet to be determined, as there are currently no detailed legislative regulations specifically addressing Metaverse and crypto-related crimes. It is expected that regulations will be established regarding information security, identity verification, the valuation of crypto assets, and determining which behaviors constitute crimes. The digital identity represented by avatars in the metadata repository serves not only as an online account holder for users in the Metaverse but also grants ownership rights due to its facilitation of transactions such as crypto and NFT trading. It is crucial to establish clear guidelines for determining the value of digital assets and defining the crimes and penalties associated with offenses related to digital assets.

REFERENCES

Akturan, K.E. (2023). Metaverse'ün Yapım Sektöründeki Etkilerinin İncelenmesi, İstanbul Kültür Üniversitesi, Lisansüstü Eğitim Enstitüsü, Yüksek Lisans Tezi, İstanbul, 5-6.

Al-Dulaimi, A.F.T.A. (2021) Kripto Para: Muhasebeleştirilmesi Ve Kripto Para Dolandırıcılığının Tespitinde Adli Muhasebenin Rolü, Erciyes Üniversitesi, Sosyal Bilimler Enstıtüsü, Yüksek Lisans Tezi, Kayseri. 103-104

Altaylı, E. (2022), Adli Muhasebe-Adli Müşavirlik Kapsamında Hile Araştırmacılığı, Regresyon (Bağlanım) Modeli İle Analizi Ve Raporlanması, Hacı Bayram Veli Üniversitesi, Lisansüstü Eğitim Enstitüsü, Yüksek Lisans Tezi, Ankara, 31-32.

Arıcı, S.T. (2023), Çağımıza Global Köy Olarak Bakmak, Metaverse Yaşamlar, Başkent Üniversitesi, Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, Ankara, 87-88.

Atak, M.C. (2022), Metaverse'ün Çalışma Hayatı Üzerine Etkisi: Bir Delphi Çalışması, Başkent Üniversitesi, Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, Ankara, 40-41.

Atıcı, G. (2023), Dijital Ekonomi Blokzinciri ve Finansal Sistem, Nobel Yayınevi, Ankara, 58.

Aytekin, M.İ., (2022), Adli Muhasebe Kapsamında Uzman Tanıklık (Bilirkişi Tanıklığı), Dava Destekleri, Hile, Yolsuzluk Ve Suistimal Denetçiliği: Karaman İlinde Bir Araştırma, Karamanoğlu Mehmetbey Üniversitesi, Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, Karaman, 30-31.

Baltacıoğlu Ş. (2023), Metaversede Mülkiyet Sahibi Olan Ve Olmayan Kişilerin Psikolojik Ölçeklerle Değerlendirilmesi Ve Karşılaştırılması, Cumhuriyet Üniversitesi, Aile Hekimliği Anabilim Dalı, Yüksek Lisans Tezi, Sivas, 7-8.

Başoğlu, R. (2023), Siyasal İletişimde Metaverse'ün Kullanılma Potansiyeli: Fırsatlar ve Tehditler, Hasan Kalyoncu Üniversitesi, Lisansüstü Eğitim Enstitüsü, Yüksek Lisans Tezi, Gaziantep, 43-44.

Beşinci, E. (2023), Metaverse'te Pazarlama Ve Vrchat'te Bir Pazarlama Deneyimi Tasarımı, Işık Üniversitesi, Lisansüstü Eğitim Enstitüsü, Yüksek Lisans Tezi, İstanbul, 39-40.

Bil, H. (2023), Ekonomide Kripto Para Kullanım Tercihi: Siirt Üniversitesi Örneği , Siirt Üniversitesi, Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, Siirt, 14-15.

Cheong, B.C. (2022), Avatars in the Metaverse: Potential Legal Issues and Remedies, Int. Cybersecurity Law Rew. 3, 467-494.

Çağlar, O.B. (2022), Dijital Varlık Ekonomisi Atıl Kaynakların Blokzincir İle Finansal Varlığa Dönüşümü, Pusula Yayıncılık, İstanbul, 144.

Çekmen, Y. (2022), Muhasebede Yapılan Hatalar, Hileler Ve Adli Muhasebe, İksad Yayınevi, Ankara, 65.

Demir, N. (2023), Kripto Para Ve Kara Para Aklama İlişkisi, Fırat Üniversitesi Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, Elazığ, 42-43.

Güngör, İ. (2022), Metaverse'de Influencer Pazarlamaya Yönelik Bir İnceleme, TOBB Ekonomi Ve Teknoloji Üniversitesi, Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, Ankara, 58-59.

Gürbüz, R. (2023), Yenilikçi Finansal Yatırım Aracı Olarak Kripto Para Ve Kripto Para Yatırımcılarının Ekonomi Okuryazarlıkları Üzerine Bir Araştırma, Muğla Sıtkı Koçman Üniversitesi, Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, Muğla, 17-18.

Güven, İ. (2022), Metaverse'te Arsa Değerini Belirleyen Faktörler, Yıldız Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Yüksek Lisans Tezi, İstanbul, 34-35.

Gönülal, M. (2022), Marka İletişimi Açısından Yeni Bir Kanal Olarak Metaverse, Bolu Abant İzzet Baysal Üniversitesi, Lisansüstü Eğitim Enstitüsü, Yüksek Lisans Tezi, Bolu, 31-32.

Israfin, N. N.,Imamy, S.N. & Wirawan A.R.,(2022), Potential of Money Laundering in the Metaverse Era, The 4 th Open Society Conference OSC 2022 Faculty of Law, Social and Political Sciences, 112-121.

Katterbauer, K., Syed, H. & Cleenewerck, L. (2022), Financial Cybercrime in the Islamic Finance Metaverse, Journal of Metaverse, V.2(2), 56-61.

Kaya, E. (2022), Metaverse Meta İnsana Hazır Mısın?, Nemesis Kitap, İstanbul, 28.

Koç, F. N. (2023), Dijital Pazarlamanın Metaverse Fenomenine Sunduğu Fırsatlar Ve Sınırlılıklar: Tekstil Sektörü İncelemesi, İstanbul Gelişim Üniversitesi Lisansüstü Eğitim Enstitüsü, Yüksek Lisans Tezi, İstanbul, 17-18.

Özkul, F. (2022), Kripto Varlıklar Muhasebesi Blokzincir Teknolojisi İle Muhasebe Dünyasında Paradigma Değişimine Doğru, Hümanist Yayınevi, İstanbul, 70.

Özer, İ. (2022), Adli Muhasebe Boyutunda Bilirkişilik Mesleği Ve Meslek Mensuplarının Algı Düzeylerinin Demografik Özelliklere Göre Tespiti, Batman Üniversitesi, Lisansüstü Eğitim Enstitüsü,Yüksek Lisans Tezi, Batman, 3-5.

Qin, H. X.,Wang, Y. & Hui,P. (2022), Identity, Crimes, and Law Enforcement in the Metaverse, arXiv:2210.06134v2, 1-13.

Seo, S., Seok, B. & Lee, C. (2023), Digital Forensic Investigation Framework For The Metaverse, J Supercomput 79, January 2023, 9467–9485.

Smaili, N. & Raymond, A.R. (2022), Metaverse: welcome to the new fraud marketplace, Journal of Financial Crime, 21 July 2022, https://doi.org/10.1108/JFC-06-2022-0124, 1-15.

Tekin, Z. (2022), Metaverse 101, Scala Yayıncılık, İstanbul, 1-3.

User, E. (2022), Metaverse, Cinius Yayınları, İstanbul, 66-67.

Yılmaz, A.(2021), Kripto Para Birimi Bitcoin ve Bitcoin'in Türk Sermaye Piyasası Hukuku Açısından Değerlendirilmesi, On İki Levha Yayıncılık, İstanbul. 43-44.

Yüksel, H. (2022), Hile, Etik Davranış Ve Kalite Kavramına, Adli Muhasebe Ve Adli Müşavirlik Çerçevesinde Genel Bir Bakış: Giresun İlindeki Banka Çalışanları Üzerinde Bir Alan Araştırması, Giresun Üniversitesi, Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, Giresun, 104-105.

Zhang, Q. (2022), Rule of the Metaverse, Metaverse, V.3 (1), 1-6.

Wu, J., Lin, K., Lin, D., Zheng, Z., Huang, H., & Zheng, Z., (2023), Financial Crimes in Web3-Empowered Metaverse: Taxonomy, Countermeasures, and Opportunities, IEEE Open Journal of the Computer Society, 2023, V: 4, 37-49.

http.//www.lexpera.com.tr (Access Date: 01.04.2023).

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The Effects of Early Republican Period Political System on Democracy in Türkiye in the Context of Elite Power and Political Culture in Contemporary Political Sociology

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ABSTRACT

The issue of elitist power, which is one of the important issues of political sociology, is based on a dual form of power, in which a minority that considers itself privileged manages, decides and manipulates large masses on the grounds that they are "not mature enough politically". This distinction also emerges in the context of the differentiation of the norms that make up the political culture between the elites and the masses. The elitist tendencies that have left their mark on the political life of Türkiye since the Ottoman modernization experienced its historical peak in the single-party period. According to T. H Marshall's category of citizenship processes, in the early republican period, rights were formed mostly at the economic level, and there was an ongoing historical struggle to reverse the tutelage of the elitist center over political power for the development of civil and political rights that constitute the mature mechanisms of citizenship. Since the 1980s, concepts such as demilitarization, identity, belonging and citizenship rights have historically increased at the global and national level. As a matter of fact, the period between 1980-2000 has created a fertile climate even though it progressed with breaks and returns in terms of civil society and citizenship concepts. However, a process emerged where economic models and economic development did not progress in coordination with this breakthrough, the function of the state to protect social welfare was eroded, and thus democracy was blocked. However, after the 2000s, a political climate was created in which economic stability was established, welfare policies were strengthened, identity policies made a breakthrough besides social rights, and an inclusive citizenship was established in which elitist politics were eliminated and demilitarization increased..

Keywords: Political sociology, elites, modernization, democracy, demilitarization.

JEL Classification Codes: P16, Z13

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INTRODUCTION

Political sociology differs from political science in that it is a discipline that deals with political phenomena in a social context. It combines concepts that both political science and sociology have left out, sheds light on them and fills an important gap. Political sociology has dealt with the issue of power in its social context with its different aspects and examined the relationship between the elitist form of power, which is one of them, and the social base of politics with an increasing interest in some periods and a decreasing interest in others. In fact, this situation has arisen out of necessity: Considering the long journey of the social sciences, it has become inevitable to evaluate the idea of elitism, which has a long history and which was put forward to criticize the rational human phenomenon created by the Enlightenment, with the new tools and perspectives acquired by the discipline.

The idea of elitism is founded on a dualism based on the idea of a supposedly immature population that needs to be mobilized by a group of elites who have amassed economic, cultural and political privileges. At this point, the questioning of where elites derive the legitimacy of their power has dominated the discussions within the discipline. Indeed, the theory of elitism in political sociology in the twentieth century, based on the theses of Weber and Durkheim, has put forward important theses on the development and implications of elitism from a critical perspective.

In the context of early Republican Türkiye, the idea of elitism determined the founding framework of Turkish modernization and shaped the political power's view of the masses on the axis of a legacy passed on from the Ottoman Empire to the Republic. In this respect, the main purpose of this study is to examine the evolution of the elitist approach, which constitutes the main axis of Turkish modernization and the history of democracy, in the light of certain concepts of contemporary political sociology and within its historical context. In addition, this analysis will also examine the damage that elitist political thought has done to the development of democracy in Türkiye.

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From a historical perspective, Ottoman modernization was carried out by a new generation of enlightened and progressive bureaucrats and the military, who had embraced Western ideas that emerged in the 19th century, and who were different from the traditional state-affiliated bureaucracy. This generation, which was in conflict with the traditional elements of the state, imagined itself as the savior and society as an ignorant, uncivilized, passive mass waiting to be saved, and their efforts to "civilize" society by force through a reform program imposed from the top down and its Jacobin tendencies were inherited by Republican Türkiye and shaped the elitist tendencies of the founding cadre.

The Republic's total modernization project was carried out by a narrow cadre of people who devoted themselves to the secular aims of the state, identified their existence with the state, adopted a monolithic nation model and a monolithic identity imaginary, and tried to shape society from top to bottom, with all its cells, in line with the ideas of this core cadre of state bureaucracy and intellectuals. After 1925, this tendency became even more ascendant and reached its historical peak during the one-party period that lasted until the end of World War II.

Following the transition to the multi-party era in 1950, Türkiye was governed for the first time by a government that derived its legitimacy from the people. The multi-party period was marked by the struggle of the bureaucratically based, coercive, centralized elite power not to hand over the flag to the civilian political power that derived its legitimacy from the people, and the resistance of this civilian power to open space for itself. Both the diversifying social structure and the conjuncture that shifted due to political and economic changes on a global scale did not change the ideology of the founding elites; on the contrary, social dynamism was forcibly pruned and condemned to the narrow ideological framework of the bureaucratic elitist center. In this context, May 27th marked the beginning of a process of coups carried out by bureaucratic elites backed by military elites in order to return society to its center settings every time society "goes off the rails" with its pluralism and demandingness.

With the strengthening of civil society debates in the global conjuncture after the 1960s, new social stratifications, different identities and visibilities gradually rose in Türkiye and sought to represent themselves in the public and political sphere. This diversification in the structure of society seeped through the cracks in the walls of the bureaucratic elitist ideology, shaking its monolithic ideological integrity. Nevertheless, the military, which was the most inflexible and still intensely preserved its internal integrity, intervened every decade to re-establish the elitist socio-political order of the pre-1950s, preventing the representation of social demands in the political center and keeping democratic demands under restraint.

Türkiye took a different turn in the 1980s, when the concepts of civil society and citizenship came to the fore with the impact of global liberalization. During this period, on the one hand, civil and political rights gained strength at the social level, but on the other hand, individuals' social rights and social welfare suffered due to the economic instability of the state. Indeed, this situation constituted one of the obstacles to the full development of democracy in Türkiye for a long time. In addition, another phenomenon that hindered the development of civil society in this period was the February 28th coup, which went down in history as an experience different from other coups. In the previous coups, the military, in its capacity as a monolithic military elite, has carried out a total intimidation movement against the society by displaying an image above all social layers. However, the February 28 process targeted the Islamist identity, which had been gaining strength by rallying behind it not only the Anatolian capital and the newly formed devout middle class but also individuals seeking belonging thrown by modernization, and which had confronted the bureaucratic elitist center as a serious political power with the support it received from society. Being entirely a society-based movement, with its localism, orientalism, "backwardness", "vulgarity", and anti-elitist stance, this social movement, which struck all centers that had adopted elitism as an ideology right at their core, was intervened by the "vigorous forces" and the "danger" was swiftly attempted to be eliminated.

The 2000s is a period in Türkiye's democratic adventure that exhibits different dynamics from previous periods. The diversifying social structure has increasingly insisted that the elitist coercive framework be overthrown and that politics be transformed to include society, and a systematic struggle has been carried out to this end. Although every move to expand the dominant political and public framework based on bureaucratic elitist tutelage in favor of freedoms has met with fierce resistance from the elitist center, it has enabled a different political system to come to life in order to build a new system in which politics is socialized and the influence of the state and its bureaucratic elites on politics is regressed. Besides, democratic development, which was set back by the state's backsliding in creating social welfare due to economic instability, especially after 1990, will only be able to resume its course after the 2000s.

Development of the Conceptual and Theoretical Framework of Political Sociology

The discipline of political sociology has a unique place in contemporary social sciences. This discipline, which is often compared to political science and sociology and even considered synonymous by some, actually examines important political and social phenomena that political science and sociology ignore. As Raymond Aron points out, political science examines political phenomena by detaching them from their social context - largely on the formal level - while sociology focuses primarily on abstractions such as social structure and class, ignoring concrete institutions (Uslu, 2019: 13). In this context, political sociology fills an important gap in terms of contemporary social sciences by focusing on the research area left out of the perspectives of these two disciplines. The fact that political sociology occupies an interdisciplinary position between political science and sociology gives political sociology strength in terms of theoretical and conceptual framework (Uslu, 2019: 15).

From this perspective, the main issue that political sociology examines is politics in its social context. More specifically, it is, in Bottomore's terms, "power in its social context" (Bottomore, 2020: 7). It can be said that while political science examines the institutionalized dimension of power, political sociology deals with the underlying structures of power. In this context, it is generally accepted that traditional political science primarily asks the question of how the state, power and authority function, while political sociology deals with the issue of relationality, that is, from a historical sociological perspective, how politics, culture and society are related and how they affect each other (Alptekin, 2020: 4). In particular, Seymour Martin Lipset's groundbreaking work in the field of political sociology, Political Man (1960), which introduced the "social bases of politics" thesis marked the classical period of this discipline. However, since the 1980s, especially as a result of the post-modern and post-structuralist theories that emerged with the increasing dominance of Michel Foucault's concepts and ideas in social sciences, the "social bases of politics" approach began to lose its weight in political sociology (Taylor, 2010: 2). On the other hand, as a result of the impact of post-modern and post-structuralist approaches on political sociology, there are also those who argue that the discipline needs to be better framed and that it is essential to establish a coherent conceptual foundation (Hicks, Janoski and Schwartz, 2005: 12-17). In this respect, the necessity of redefining the concepts of "power in its social context" and "the social bases of politics" within the theoretical framework of political sociology is increasingly being articulated (Uslu, 2019: 17). In addition, it has also been argued that research areas such as elitism and pluralism, which were dominant in the classical period of political sociology but were pushed to the background in the period when post-structuralism was dominant, should be addressed with a new perspective. As a matter of fact, in the field of political sociology today, the major issues of the discipline such as political elitism, pluralism, political culture and political socialization have begun to be addressed again with a new perspective.

The Evolution of Elitism Theory in Contemporary Political Sociology

In political sociology, classical elitist theory is mostly associated with three thinkers, Gaetano Mosca, Vilfredo Pareto and Robert Michels. These three thinkers - albeit through different conceptual frameworks - constructed their theories in reaction to Enlightenment thought, that is, to the view that human beings would move towards absolute progress under the guidance of rational reason. These elitist theorists, who are considered by some to be within the Weberian tradition, have taken up Weber's arguments on bureaucratic rationalization in modern societies and have addressed the function of elitism in modern societies that are increasingly dominated by rules and formal procedures. In this context, they questioned the foundations of democratic development in increasingly bureaucratic and rationalized societies in Europe and put forward a theory of elitism that also sought to refute the arguments of Marxism (Blondel and Müller-Rommel, 2009: 820).

The main theoretical framework of classical elitist thinkers is based on the existence of a dual power structure in societies. On one side of this dual structure is the "elite" as an organized minority that holds political power and controls many resources, while on the other side is the "mass" as an unorganized passive crowd that is considered politically immature (Acar and Uslu, 2019: 27). In terms of both political science and political sociology, the most important issue at this point is the legitimacy of the minority in power. According to Weber, every government needs to create a justification for its legitimacy and to gain the consent of the governed (Weber, 2006: 272). Lipset, on the other hand, defined legitimacy as the ability to create a belief that the existing political system and political institutions are the most appropriate systems and institutions for society (Sokullu, 2013: 103). According to the classical elitist theory, the elite can resort to various means to legitimize its power. It

can resort to certain "myths" such as "the right of the elite to rule", as well as methods such as "recruitment" or "co-optation" of the rest of society to ensure the maintenance of the elitist power structure (Acar and Uslu, 2019: 27).

Although there are some important differences between them in terms of their arguments on elite power, the main significance of these classic thinkers of political sociology is that they provided a theoretical framework - especially for the analyses of Joseph Schumpeter and C. W. Mills - for the function of power elites in post-World War II liberal democratic societies. Schumpeter and Mills critically analyzed how elite power functions in industrialized democratic regimes in the changing political and economic climate of the post-war period. According to Schumpeter, who argues that there is competition within the elite minority, there is no internal cohesion among the elite. Therefore, one cannot speak of a monolithic elite, there are multiple elite groups and this corresponds to elitist pluralism. Another important point in Schumpeter's elitist theory is that he conceptualizes democracy as a means rather than an end (Acar and Uslu, 2019: 38). He argues that the characterization of democracy as "the manifestation of the will of the people" is a "myth" and that the outcome of the democratic process is not a government "brought about by the will of the people" but rather a government "accepted by the people"[1]. This, as we will see below, offers insights into why democracy in Türkiye has failed for so long.

Mills, who analyzes elite power within a more intricate theoretical framework than Schumpeter, presents a theory of the development of elite power based on the social structure in America in his famous *The Power Elite*. According to Mills' analysis, which he calls "the theory of balance", government in America has lost its characteristic of being an apparatus that balances competing interests in society, and as a result, a system of power elites has emerged in the form of a tripartite structure of political, economic and military institutions (Mills, 1959: 242-250). Mills defines these power elites as those who are in positions to control the basic organizations in society and make decisions that have important consequences, and argues that all decisions that permeate society are made by political, economic and military institutions (Mills, 1959: 268). Consequently, in Mills' theory, power elites have the power to govern not because of their skills or psychological qualities, but because of the positions they occupy (Glasberg and Shannon, 2011: 25). Although Mills points out that his analysis is limited to America and that the power structure may be different in other societies (Rush, 1992: 60), as we will see below, Mills' theory of power elites also functions to explain Türkiye's elitist experience of power in the early republican period.

Power of Elites and Democracy in the Concept of Political Culture

Another important concept in contemporary political sociology is the concept of political culture, which is also related to the concept of culture in its broadest sense. The concept of culture, which has been studied in depth by various disciplines, especially in the twentieth century, from an anthropological and sociological perspective, refers to the way of life of societies that is transmitted from generation to generation through learning (Nesbitt-Larking, 1992: 81). Therefore, culture can be defined as a set of values agreed upon by the society from which it originates and transmitted between generations through inheritance. Political culture, which can be considered one of the manifestations of culture at the social level, can be defined as the set of dominant behaviors, beliefs and values in society that are essential for the functioning of a political system (Sokullu, 2013: 103). More specifically, political culture is formed through the transmission of norms and values between society and the individual. Each individual in a society has a set of ideals and values about how the political system should function, what he or she expects from the system and the obligations of the system, and this set of values, symbols and beliefs constitutes the political culture of that society (Roskin, 1994: 122). In the end, the values of a society are ultimately decisive for its political system.

If we look at the theoretical background of the concept of political culture in political sociology, we can see that the first formulation of the concept is found in Weber and Durkheim. Unlike Marx, who advocated economic determinism in the formation of social and political structure, Weber and Durkheim argued that political institutions and political actions are shaped under the influence of religious beliefs and cultural values in that society (Ayata and Klujs Gölgelioğlu, 2019: 300). This idea was later further developed by the American sociologist Talcott Parsons, whose theses such as social action have become important in the study of political culture[2].

[1] See. Bachrach, *The Theory of Democratic Elitism: A Critique*, p. 20. In this work, Bachrach critically interprets Schumpeter's views on democracy and argues that he reduces democracy to a state apparatus with a technical functioning.

[2] According to Parsons' theory of social action, the ends, means, motivations and limitations of individual actions are largely determined by cultural components and the cultural system. As a matter of fact,

The importance of the concept of political culture in the context of elitism theory emerges in the determination of the relations between elites and the masses. Political culture, which can also be described as ingrained behaviors that emerge in a certain period of time, exhibits a difference between elites and the public (Roskin, 1994: 129). As mentioned above, the political culture of individuals outside the elite consists of values and norms that have been formed over a long period of time. The elite, on the other hand, are endowed with economic, social and cultural capital and belong to a different political culture. As a result, elites, as Benedict Anderson puts it, play a special role in changing political culture in the process of nation and identity building (Anderson, 1983: 123). However, at this point, in the process of elites changing the political culture for nation and identity building, an antagonism between elites and the public may emerge. Indeed, in contemporary political sociology, when talking about the existence of a consensual political culture or a conflictual political culture in a society, what is referred to is whether this antagonism exists in that society or not[3]. As we will discuss below, it can be argued that the influence of elites on Turkish political culture in the early republican period ultimately led to the emergence of a conflicted political culture.

The Development of Elitist Thought in Ottoman Modernization

In order to examine the influence of elites on political culture in Türkiye and the dynamics of the political and cultural context that produces and sustains the elitist approach, it is imperative to examine Ottoman modernization. Constituting a pattern diametrically opposed to the existing structures and traditions of the Ottoman Empire, "modernization" was a painful process imposed from the top down. Of course, at this point, it is necessary to consider the concept of "modernization" from the perspective of political sociology. As pointed out above, according to this perspective, "modernization" is based on a conception of social evolution that emerged especially in the 19th century and is both associated with the idea of progress and emulates the notion of evolution in the natural sciences (Bottomore, 2020: 73).

When considered in the specific context of the Ottoman Empire, the centralist structure of the state produced a bureaucratic and administrative tradition that was raised to be fully loyal to the state (Özbudun, 1995: 4). As a matter of fact, this traditional tendency also determined the relationship of the bureaucratic elite, which positioned itself as the bearer of modernization, with the public. As Niyazi Berkes points out, there was a disconnect between the Ottoman bureaucracy and the social layers (Pustu, 2007: 200). In the 19th century, as the centralized tradition of the empire lost its former power, the ideology of the bureaucratic and military elite, which was reproduced on the axis of "loyalty to the state", was destroyed, at least for a certain wing.

The army and bureaucracy have undoubtedly always been one of the most important pillars of the Ottoman administrative system. However, unlike the ulema, the army and the bureaucracy underwent a major change depending on the conjuncture in which they found themselves. As a matter of fact, the biggest investment in the Ottoman modernization process was spent on military and administrative reforms. Within this new system, a new generation of bureaucrats, fused with Western ideas, embraced constitutionalist ideas and identified with the enlightenment approach, was formed and the dominance of this new elite over the bureaucracy increased (Lewis, 1993: 456). Foreign-language speaking, secular educated civilian bureaucrats who saw Westernization as the only way to salvation, or as Feroz Ahmad called them, "convinced Westerners" (Ahmad, 1984: 6), began to play an increasing role in the political and cultural life of the capital (Lewis, 1993: 62). The ideological attitude, approach and tendencies of this elite wing, which came into conflict with the more traditionalist elements of the state and gradually gained power, also determined the fabric of Ottoman modernization. As a result, modernization remained the main axis of intellectual efforts towards social change in the late Ottoman Empire and permeated the political sociology of contemporary Türkiye (Bouquet, 2016: 51).

The 19th century can be seen as the history of the struggle between these elitist bureaucrats and the traditional wing of the empire (Özbudun, 1995: 5). The theses of the elitist bureaucrats, first organized under the name of the Neo-Ottomans and later as the Union and Progress or Young Turks, shaped the Turkish modernization approach. This tradition, which supported a Westernist approach and a development

human action is ultimately a cultural action. In this context, Parsons opposes theories that seek the origin of human action in biological or materialist explanations and traces how the cultural factor is encoded in human actions. For Parsons' theory of social action, see Parsons, Talcott (1967), The Structure of Social Action, Free Press, New York.

[3] For a detailed discussion of this issue and an explanation of how political culture change is shaped by consensus or conflict in Germany, see Dalton, R. J. (1993), Politics in Germany, Harper Collins, New York.

in the Western manner, produced a kind of intellectual despotism (Mardin, 1997: 83-84). As Aslan and Alkış state, the bureaucratic elite in question became one of the important actors of the modernization process in Türkiye's later periods as the "motor force of modernization" in Weberian terms. This pattern, which was also transmitted to the Republican ideology, shaped the elitist tendencies in Turkish political culture. In fact, it can be said that this conception of modernization based on Westernization has become a *doxa* - in the Bourdieuian sense - that "there can be no modernization without Westernization" in Türkiye's political culture (Bouquet, 2016: 52).

The Historical Peak of Elitist Thought in Türkiye: The Single Party Regime as a Political Culture Phenomenon

The cadres who founded the Republic inherited their intellectual infrastructure from the Committee of Union and Progress, and although a rupture between these two movements is defined in the literature as a general tendency, in fact these structures are interconnected in terms of continuity and determination (Özbudun, 1995: 7). The principles shaping the ideology of the Republic are the inherited ideas of a narrow cadre of Ottoman bureaucrats. This narrow cadre, described by Hourani as the "reformist group" (Hourani, 1983: 67) or by Findley as the "modernist faction" (Findley, 1980: 153), was largely "devoted exclusively to the secular interests of the state" (İnalcık, 1964: 55). The continuity between the two periods is so evident that, as Rustow states, 93% of the Ottoman Empire's staff officers and 85% of its civil servants continued to serve in the Turkish Republic (Rustow, 1964: 388). These figures testify to the continuity of bureaucrat-based elites in power. On the other hand, the presence of clergy and local representatives in the first parliament convened in the run-up to the founding of the Republic has gone down in history as an exception. In a short time, this exceptional diversity and pluralistic structure was eliminated and a total modernization project was implemented by a narrow cadre of elites (Kara, 2008: 14). As a matter of fact, in the first parliament, a coalition called the second group, representing a variety of colors and traditions, constituted 21% of the parliament. In the second parliament, the military bureaucratic elite dominated the entire structure and other elements were reduced to less than 1 percent (Frey, 1975: 58). As Frey argues, the legislative Kemalist elite that carried out the major reforms in the 1920s and early 30s was predominantly composed of former civil servants, who also formed the institutional core of modernizing coalitions throughout Turkish history (Frey, 1975: 58).

The main ideology that the founding elite of the Republic sought to establish by shaping society and political culture in Türkiye was the ideal society of Kemalism, the "secularized and Westernized homogeneous nation-state". The insistence on this ideal society prevents an open and public debate on the formation of a social contract (Yavuz, 2005: 70). A specific example in this context can be found in the attitudes of the Kemalist elites in the early Republican period towards the then newly established academic structure. In 1924, after the closure of the madrasas, the government decided to open a Faculty of Theology in Istanbul, which was soon closed down in 1933, revealing the hegemonic view of Kemalist elitist cadres towards the public sphere. The main factor in the almost hasty closure of the Faculty of Theology, where only three of the faculty members were from the ulema and which taught mainly in areas such as the sociology of religion, was that a significant part of the Kemalist elite thought that the academic structure should be completely subordinated to serve the Revolution (Clayer, 2016: 106). According to Clayer, the closure of the faculty in question was the result of a desire to conduct a thorough purge of the fledgling academic structure. Moreover, "it cannot be ruled out that some Kemalists may have wanted to put an end to any kind of higher education related to religion, citing the danger that new religious cadres might be trained who could form alternative cadres" (Clayer, 2016: 107). This specific example also reveals that in the early republican period, the state power set out to establish a symbolic power, as Bourdieu conceptualized it, by engaging in the cultural reproduction of its own ideology on the axis of Westernism.

The core cadre formed by the state bureaucracy and intellectuals also included the military elite and thus gained the monopoly on the use of physical force (Kalaycıoğlu, 2007: 475) and thus the ability to shape society by force in a top-down manner. Looking at this issue from the perspective of political sociology, "even if the masses of people are mobilized in revolutions from above, it is the elites who actually carry out the revolution" (Gürsoy, 2013: 81). Moreover, the most important point here, as pointed out above, is that such revolutions often require a military force behind them. As a matter of fact, when considered from the perspective of comparative politics, the elites that carry out top-down revolutions are often a military elite group that emerged from the old regime, as witnessed in Türkiye in 1923 or Japan in 1868 (Trimberger, 1978).

As a result, the practice of modernization, which was implemented on the axis of a strict secularization principle and a homogeneous nationalism approach, was based on the principle of "the total realization of modernity in such a way that it would be the sole color of all mental and social layers" (Özçelik, 2019: 320). This macro project, which was implemented with a solidarist-corporatist philosophy in which the state, the nation and the party were identified with the slogan of "united mass without privilege or class", intervened in all social processes, including the smallest areas. From language to identity and history, from the design of the public sphere to dress code, academic and social life, from generation upbringing policies to the cultural traditions and beliefs of the people, not a single area was left untouched by this ideological pattern.

The Foundations/Emergence of Social Movements against the Elites and the First Struggles in the Construction of Democracy: Transition to the Multi-Party Era

Until 1950, Türkiye was unable to obtain a political power that derived its legitimacy from the people. In this process, any focus outside the power clustered around the bureaucratic elite was not tolerated, and if there was such a focus, it was thought to be essential for the continuation of the order and the survival of the state (Kaynar, 2019: 36).

From the perspective of political sociology, it is useful to analyze the early republican period in Türkiye, which lasted until the multi-party era, in terms of the concept of "distribution of power" put forward by elitist theories. In this context, when addressing the nature of the "subject of power", which is the research object of this concept, it is necessary to consider whether "power is in the hands of a minority" or "power is in the hands of different minorities competing with each other" (Acar and Uslu, 2019: 22). In this respect, it is important whether the minority in power constitutes a unity, whether it has internal cohesion, or whether it exhibits a fragmented character (Therborn, 1976: 224). In this framework, the gradual disintegration among elite groups in the early republican period found its reflection in the social base and it became clear that the one-party regime was no longer a sustainable political regime.

Moreover, in a structure where society was conceived as a homogeneous mass, where civil society was not allowed to develop and groups that derived their power from the market economy were not allowed to separate from the bureaucracy, a bureaucratically based, centralized power based on coercion could only be sustained for a while. On the other hand, in a social structure where the bourgeoisie became stronger between 1930 and 1950 and modernizing influences began to penetrate the peasant masses and landowners for the first time, it would not be as easy as before to establish the unity of the elite (Frey, 1965: 391). Stratification based on the status order was gradually replaced by stratification based on the balance of economic forces (Kazancıgil, 2007: 186).

At this point, the economic dimension is important from the perspective of political sociology. The democratization that necessarily comes with the transition from a single-party regime to a multi-party period should actually be considered in the context of the modernization theory that has become increasingly dominant in political sociology starting from the 1950s. This theory of modernization, which considers democratization as part of a process of change that is considered natural and whose theoretical framework is laid out in Lipset's *Political Man: The Social Bases of Politics*, which is now considered a classic in political sociology, assumes that there is a correlation between economic growth and progress in other fields (Gürsoy, 2013: 87). According to Lipset, economic progress leads to political and social development, which in turn leads to democratization[4]. From this perspective, it can be argued that the end of the one-party regime in the early republican period and the beginning of the multi-party era were to a certain extent influenced by changes in the socio-economic structure rather than a change or development in the ideology of the founding political elites. On the other hand, the transition to a multi-party system in Türkiye should also be analyzed in terms of the broader global conjuncture of the period. This examination is also important for understanding the different phases of the long-term transformation of Turkish politics that began after the 1950s.

At the beginning of the 20th century, the regime based on a single political party that emerged with the establishment of the Republic of Türkiye was based on an understanding of political parties inherited from France. The political parties that first emerged in France after the French Revolution were primarily parties of the elite and were organizations composed of individuals belonging to the elite class who had prestige and wealth in their constituencies[5]. In this respect, it is not surprising that the

[4] Lipset, Political Man: The Social Bases of Politics, especially in the second chapter entitled "Economic Development and Democracy".

[5] For an analysis of the historical development of political parties, see Duverger, 1959.

early republican political structure, inspired by the French political system, implemented an elitist understanding of politics. However, in the second half of the 20th century, which corresponded to the transition to a multi-party regime in Türkiye, changes in social and political thought worldwide, particularly in the Western world, had significant effects on the nature of political action. In this period, political action began to change its nature with the emergence of new issues and new movements based on identity politics (Bottomore, 2020: 43). Political action can be defined as the activities of a social group in the struggle for power. In terms of political sociology, these groups are generally classified under two general categories: "social movements" and "organized political formations" (Bottomore, 2020: 51). In general, a social movement is characterized as a collective struggle to bring about change or to resist change in the society in which it exists. The main significance of these movements is that they played a key role in the process of what is called the "self-production" of modern society. Accordingly, societies have come to see themselves as "[...] the result of social action, decision and functioning, domination or conflicts" (İncioğlu, 1977: 1). In this process of society creating itself, social movements have historically been forces that have resisted an established system of political power and tried to steer the development of society in a different direction. However, it is important to note that the long-term success of social movements depends on certain conditions. First of all, such movements need to create a doctrine that will encourage individuals to participate in political activities. This doctrine must have qualities such as explaining the problems in the society in question and developing solutions, and formulating a political understanding that responds to the issues of belonging and identity of different segments of society. From a historical perspective, social movements that have failed to fulfill these requirements have failed to form a political unity[6].

This points to the importance of the fundamental difference between a social movement and a political party. Social movements create the preconditions for changes in the established political climate by creating a different climate of opinion in the society in which they exist. However, in order for a social movement to directly participate in the struggle for power and to bring about a lasting transformation in society once in power, it needs to form a political organization. Historically, the 1950s have been an important turning point for social movements in Türkiye. Although the DP government had a relatively short political life due to the military coup, the resistance of popular groups to the elitist political elite by forming the nucleus of a social movement and then manifesting in the political arena became a decisive factor in the political developments that would take place from the 1960s onwards after the multi-party transition period.

As mentioned above, social movements and their ideals gaining a political identity and becoming embodied in a party began to shake the elitist political structure from the 1950s onwards. Moreover, this was achieved despite the resistance of elitist cadres and their moves that amounted to political manipulation. Indeed, according to İnönü and his circle, the transition to a multi-party system was designed to be a controlled and step-by-step process. Thus, the legitimacy of the old system would not be questioned and democracy would be established, at least in appearance. According to İncioğlu, "The multi-party system that İnönü and his circle tried to create was not really a competitive and pluralist party system, but a 'hegemonic party' regime in which opposition parties existed only in appearance." (İncioğlu, 2007: 256). However, the efforts of the bureaucratic elite to expand the system in a controlled manner and to mend fences with various segments of society (Varel, 2019: 209) did not turn out as expected and interest in the Democratic Party turned into mass support. At this point, the social movement as an unorganized force paved the way for a political transformation through its involvement in the formation of a political party.

With the impulse of this transformation, there were significant changes in the nature of political representation and state organization. In the period between 1950-60, the dominant position of bureaucratic elites in parliament, their influence, status and income decreased significantly (Özbudun, 1995: 17). Likewise, the structure of the parliament started to present a more fragmented appearance, the proportion of deputies with public origin decreased, while the proportion of deputies with self-employment or economic occupation origin increased in parallel. Likewise, the degree of regionalism, which had declined significantly during the single-party years, increased again with the transition to a multi-party system (Özbudun, 1995: 8).

In the new period, the share of bureaucrats in national income dropped by nearly half (Şaylan, 1984: 303). Instead of the traditional bureaucracy, the Democrat Party enabled a professional bureaucratic class that performed technical economic services to emerge and gain power and prestige, and as a result, the position

[6] The most specific example of social movements that failed to form a political unity is the student movements of the 1960s; see Bottomore, Political Sociology, pp. 63-66.

of the bureaucratic elite, which positioned itself as the owner of the system, was gradually eroded (Şaylan, 1984: 305). Practices such as "placing under ministerial orders", "referring them to ex officio retirement", and "closing the way to the Council of State against government actions", which were implemented during the Democrat Party period, were in fact attempts to break the power of the bureaucratic elite that had been integrated with the power during the single party period (Şaylan, 1984: 305). This struggle culminated in the 1960 coup in which the bureaucratic elite, backed by the military (in fact, there is a symbiotic relationship between these two groups), forcibly removed from power a political party that had gained legitimacy by representing different social layers and identities.

Period Between 1960-80: Painful Democratization

After the 1960 coup, Türkiye entered a new era in terms of the relations between the political elite and the agents who resisted it at the social level. In fact, even when there seemed to be a period of gradual reconciliation, underlying conflict and tension continued. The 1960s and 70s were a period in which capitalism was becoming well established in Türkiye and an economic transformation was taking place, rural-urban migration emerged as an important phenomenon, different identities and layers became more visible in the cities, and different social segments strengthened their search for political representation. Therefore, in such a period when new stratifications, different social groups, identities and their rising demands started to become evident within the country, and as mentioned above, the dynamics of political action on a global scale were transformed, the bureaucratic elites no longer had the objective conditions to establish a solid power as before. Likewise, from the perspective of Lipset's theory that correlates modernization and democratization on the basis of economic change, the loss of this objective ground of power is understandable. It was necessary to address this multi-layered social structure and economic transformation with a constitution that corresponded, at least in appearance, to the political and economic developments in the world. However, while the 1961 constitution expanded the scope of citizens' rights and freedoms, which were extremely limited in previous constitutions, it also differed from other constitutions in terms of the construction of tutelage institutions that would ensure control over the political elite and brake and control mechanisms over the will of the people (Aydın and Taşkın, 2014: 89). Through practices such as the establishment of the National Security Council and the Constitutional Court, the Council of State's legal control over the legislature and the executive, and the elevation of the Chief of General Staff to a position above the governments, the tutelage system that frames the control of elites over the people was institutionalized.

This was a period in which an adventure of democracy was envisioned under the shadow of institutions that sought to re-establish the elitist socio-political order of the pre-1950 period (Karpat, 2004: 22). Indeed, the two coup attempts in 1962 and 1963 prove how sharply the military's designing and aligning role in the system continued. Even though it is a different period from the one where the monolithic ideological unity among the bureaucratic elite was broken and even the CHP, which had existed as the party of the bureaucratic elite and the center, shifted to the left of the center, the Justice Party (AP), which is considered the heir of the DP, cannot feel comfortable under these conditions, as it won the absolute majority in the 1965 and 69 elections and came to power. Inevitably, the AP became a party that tried to appease the actors of the May 27 coup and the military front. As a matter of fact, even if the integrity among the bureaucratic elites was disrupted, the ideological unity in the army still persisted. As Özbudun states, "among the sub-groups of the state elites, only the army seems to have been able to maintain its internal integrity throughout this period" (Özbudun, 1995: 26).

The atmosphere of political fragmentation and ideological polarization in Türkiye in the 1960s and 70s began to erode the influence of Kemalism which was the glue that held the bureaucratic elite together. The bureaucratic interpretation of Kemalist thought began to lose political power with the diversification of society, but the bureaucratic elite did not have the means to produce a new or updated paradigm to replace it (Heper, 1985: 115). During this period, for example, the economic power of entrepreneurial groups was on the rise, while bureaucratic elites began to lose their economic advantage. However, the bureaucratic elite, despite its diminishing professional prestige and income, maintains its claim on politics and retains its power in terms of other aspects of social stratification (Heper, 1976: 492).

Beginning in 1973, with the coalition governments, civil servants were replaced by the political power, and with this new trend, the erosion of power of the bureaucracy accelerated further. Therefore, the coups of 1970 and 1980 can be evaluated as an attempt to prune the diversifying social structure and confine it to the socio-political framework of the pre-1950 period by the military, the only bastion that maintained its

ideological integrity. The bureaucratic elites, incapable of renewing and revising their own ideology and attitudes, in order to re-establish their power and regain their lost power, forcibly trapped the political system, which now produces a thousand and one kinds of diversity, and tried to confine it to an extremely narrow, archaic framework.

The period between 1960 and 1980, the main stages of which are described above, presents a specific outlook when analyzed in terms of political sociology concepts. This was a complex period in which social movements as a form of political action gained ground and debates on citizenship and civil society came to the fore in public opinion due to the 1961 constitution.

In a political climate that has long been dominated by military-based political elites, the concept of civil society has inevitably been vague and distorted. Likewise, the notion of the existence of a non-state social sphere that corresponds to the concept of civil society could not be realized during the single party period. At this point, it is useful to look at the historical course of the concept in order to examine why the concept of civil society remained dormant in the early republican period. The concept of civil society was first introduced during the Enlightenment. The meaning of the concept at that time pointed to the ability of society to organize itself and thus referred to the modern state. As a matter of fact, a society that could organize itself and establish a state meant civil society. Subsequently, this concept, which was also attributed importance in Hegel's philosophy in the 19th century, reached its current widely accepted comprehensive form with Gramsci's arguments. According to Gramsci, civil society corresponded to the non-state sphere, where power struggles were taking place (Gülalp, 2018: 134).

However, the real introduction of the concept of civil society into liberal political theory in the West occurred during the Cold War. During this period, the social opposition against the Communist regime in the Eastern European countries living under the authoritarian system of the Soviet Union put the concept of civil society at the center of discussions. In particular, the opposition of various segments of society in Hungary, Poland and Czechoslovakia to the authoritarian regime embodied in the Soviets constituted a specific example of civil society's ability to mobilize as an entity separate from the state (Judt, 2005: 425). Thus, civil society became the dominant medium for opposing authoritarian political regimes and gradually gained weight in the Western democracy-based political thought (Judt, 2005: 436). As a matter of fact, when viewed from this perspective, it is necessary to see the gradual strengthening of the discussions focusing on civil society and democracy in the 1960s, which started with Türkiye's transition to a multi-party system, in the light of the social and political developments of the world, especially the West, at that time.

The 1980s and Beyond: Strengthening Civil Society and the Emergence of New Social Movements

The 1980 coup marks a break for the bureaucratic elite. Therefore, there is a different picture from the "bureaucratic transcendentalist" (Heper, 1985: 93) view of the single-party period when the entire bureaucracy acted in unity with the military. The military also tried to control the civilian bureaucrats who, in Kenan Evren's words, were "obsessed with reactionary ideas and deviant ideologies" (Heper, 1985: 173). In order to restore the ideological integrity of the single party era, many bureaucrats who did not fit this framework were purged. As Heper puts it, "The aim was to bring the civil bureaucracy, which could no longer be an institution in which the transcendentalist state could be structured, under strict control" (Heper, 1985: 175). The socio-political model, whose ideal form was experienced during the single-party period and in which all the founding codes of Turkish modernization were observed in the purest form, was stretched by external influences and its monolithic integrity was disrupted. Nevertheless, the transcendentalist state approach of the single-party period was attempted to be reconstructed through the military, which remained more ideologically stable.

For a certain period of time, the army took over the government by appearing to be above all these groups, social and political debates, and above all parties. In this process in which political parties were shut down, their properties confiscated, leaders arrested, parliament and the cabinet disbanded, and all mayors and municipal councils were dismissed, the generals, as Zürcher says, saw their task as saving democracy from politicians and cleaning up the political system (Zürcher, 2009: 402). Unlike in previous times, the cooperation of existing political leaders was not seen as a fundamental element in reshaping the political and economic structure of the country. The military targeted all ideologies and political views except its own (Karabelias, 1999: 133). All power was concentrated in the hands of the National Security Council, and any movement deemed to be "anarchy-related" was violently suppressed, in a sense destroying the social base of politics. Thus, for three years, the military was legally the sole ruler of Türkiye (Karabelias, 1999: 133).

The new civilian era that began with the November 6, 1983 general elections constitutes a unique process in which different motifs were incorporated into Turkish political culture. According to Göle, "the 1980 coup, despite the use of 1920s themes, unintentionally played a catalytic role in replacing the Westernist positivist and Jacobin tradition that began with the Tanzimat with a new process" (Göle, 2007: 521). In Özbudun›s words, this was a period in which "the unity of mentality on the part of the bureaucratic elite, the reformist, secular, tutelary worldview of the old bureaucratic center was shattered" (Özbudun, 1995: 31). A context in which different groups such as Islamists/conservatives could be included in the bureaucratic center has emerged (Kalaycıoğlu, 2007: 491). It is observed that ANAP (Anavatan-Motherland Party), which was in power during this period, tried to establish a bureaucracy that was not traditionally attached to the regime and its ideology and thus indirectly reduced the role of bureaucratic elites in the political system (Özbudun, 1995: 30). As a matter of fact, these developments were in line with the liberal economic policies of the period and the principles of downsizing the state and simplifying the bureaucracy. In this respect, a strong public opinion began to form and the "single actor pathology" that characterized the pre-1980 period began to move away (Göle, 2007: 520). The policy-making process carried out by the ruling elites in a top-down and anti-civil society manner shifted from the state and elites to the society (Göle, 2007: 521) and a political climate that focuses on more stakeholders began to emerge.

One of the biggest changes that took place in the 1980s was a kind of dimension jump in Islamist identity with urbanization, developments in the economic and social climate, the strengthening of Anatolian capital, and the increase in the educational opportunities of Islamist groups at universities in big cities. Göle considers this process as the birth of contemporary Islamism in Türkiye (Göle, 2002: 107). This newly formed religious middle class largely supported center-right parties until the 90s (Ete, 2009). However, the fact that political Islam transformed and updated itself with new paradigms that could produce solutions to current problems, and that it put forward a real alternative to power by taking the disadvantaged segments in the cities that were swept away by urbanization, voters from various ideologies who were tired of failed governments and corruption, conservative middle classes and the rising elements of Anatolia, whose moves towards the center were cut off by a stable blockage, hit the bureaucratic-elitist center in the heart, so to speak. The new Islamist political cadres' one-to-one contacts with the society, unlike the patronizing and unapproachable state elites, and their emphasis on national values have enabled them to find an increasing response among the society (Kurtbaş, 2017: 197-198). On the other hand, the bureaucratic-elitist center and the military, which now stands at the heart of the system as its anchor, have no tolerance for the possibility that "their ideology, which they embroider like lace, loses its social relevance" (Arpacı, 2020: 199). In this respect, the February 28th process was an attempt by the elite forces to "get back on track" the political environment that had "gone out of hand" and to raise the flag of their bureaucratic elitist worldview. In this way, the positions lost by the state elites in areas such as the military, education, economy and media were taken back by force. Unlike other coups, the February 28 process targeted a single group. As Arpacı states, "February 28th was the most obvious ontological struggle of the elites of the Republic. Qualitatively, February 28th differs from other coups and memorandums in that for the first time it was directed against a single group, a single ideology and only its institutions, instead of being directed against the whole society, either theoretically or rhetorically" (Arpacı, 2020: 199).

At this point, it is useful to look at the elitist intervention crystallized in the February 28th process in the light of C. W. Mills' theory in order to better understand certain issues. The concept of "power elite", which Mills examines in his work *The Power Elite* and which has an important place in contemporary political sociology literature, finds its counterpart in a society like Türkiye, which has experienced some setbacks on the road to democratization[7]. Mills conceptualized the "power elite" as a tripartite system consisting of administrators or bureaucrats, capitalists and the military, united around a particular ideology. Therefore, Mills argued that all decisions affecting society are made by political, economic and military institutions (Acar and Uslu, 2019: 39). Mills' conceptualization is in line with the political, economic and military structure of early republican Türkiye. When analyzing the development of elitism in the Turkish context, it is necessary to consider the economic manifestation of elitism in addition to the

[7] In his work The Power Elite, C. W. Mills analyzed state-society relations and political structure, especially in the American context, and introduced the concept of "power elite" within this cultural and political background. In the introduction to his work, Mills defines the concept of "power elites" in American society as those in positions that "command the basic hierarchies and organizations/initiatives in modern societies"; see Mills, 1959, p. 3. However, the concept of power elites developed by Mills has also been applied theoretically to societies outside the United States by many researchers and thinkers; for a good example, see Skocpol, Theda, States and Social Revolutions: A Comparative Analysis of France, Russia and China, Cambridge University Press, 1979.

political and military groups that are usually emphasized. In this respect, one of the components of Mills' tripartite power structure, which he characterizes as capitalists, corresponds to Istanbul capital in the context of early republican Türkiye. Istanbul capital, which received the support of the state under the guidance of the republican elite from the foundation of the republic until the early 1970s and embodied its ideological and class nature through the TUSİAD organization they established, is also a dominant element of this elitist faction (Arpacı, 2020: 195).

In this tripartite structure formed by the ruling elite, while the power of the bureaucracy increased, civil society could not find a place for itself, the power of centralization gradually increased in contradiction to the local administration approach, and the political sphere came under the dominance of the positivist Westernist understanding (Yücekök, 1976: 83). In this context, this tripartite power structure, from the very beginning, envisioned Islam as an opposing ideology and resorted to many means incompatible with democracy, including military coups, to keep it out of power. As a matter of fact, the February 28th process is one of them. The February 28th process, which was carried out with the initiative of the capitalists who embraced a certain ideology, the political class that inherited the elitist legacy of the republic, and ultimately the military as the main actor, was in this sense a confirmation of Mills' assertion that the ruling elite turned democracy into a game. In conclusion, the February 28 process is a very important breaking point in the period between 1980 and 2002, which began with a military coup and ended with the bankruptcy of the political and economic thought that represented the elitist thought of the republic. This incident is a clear demonstration of the instrumental view of elitist groups that reduces democracy to a means of play, as both Mills and Schumpeter point out[8].

Political formations centered on Islam, which were regarded as enemies by this triumvirate of power elites - and which Arpacı characterizes as 'challenger groups' (Arpacı, 2020: 196) - began to gain the character of a minimum common ground where the reactions of different social segments to this triumvirate of power gathered, especially after 1980. In this sense, it can be said that, thanks to these political formations, the reactions against the cultural and social revolution of the Republic, which was centered on the West, also acquired the character of an identity politics.

When the period between 1980 and 2000 in Türkiye is viewed from a more general perspective that also takes into account global developments, the panorama of social and political developments takes on a more meaningful framework. Indeed, the civil society debates that started in the 1960s in Turkish political life gained momentum in the 1980s and dominated the entire political climate.

Civil society debates in Türkiye became more holistic in the late 1980s and early 1990s and made its impact felt in all areas from politics to social life and even popular culture (Gürbilek, 2020: 110). On the other hand, when we look at the course of civil society debates in Turkish public opinion, we come across an interesting point. Various arguments have been put forward that civil society in Türkiye is almost non-existent, that it has difficulties in developing, that this situation is inherited from the Ottoman Empire and that it hinders the development of democracy, and these views have been widely accepted in many circles, from Kemalists to leftists. However, this view contains a general misconception. If civil society means organizations that exist outside the state and operate on a voluntary basis, these already existed in the Ottoman Empire in the form of foundations, guilds and religious communities. If civil society means a sphere separate from the state and based on private property and the free market, i.e. a capitalist political economy, it is inherently impossible for such a concept to exist in the Ottoman Empire since the Ottoman Empire did not have a capitalist system (Gülalp, 2018: 145). Therefore, attributing the Ottoman social structure as the culprit for the prolonged inhibition of the development of civil society in Türkiye is a completely wrong reasoning. Leaving such distorted reasoning aside and looking through the lens of political sociology, it is seen that both the internal dynamics of Turkish society and the global conjuncture at the time were behind the strengthening of the concept of civil society in Türkiye since the 1980s.

In the last quarter of the twentieth century, globalization provided a favorable environment for the emergence of alternative communities based on different identity claims, thus creating social movements that transcend social stratification and are based on issues of cultural identity. The axis of the concepts of civil society and democracy began to shift towards issues such as the legitimate recognition of these

[8] Like Mills, Schumpeter, especially in chapter 22 of his famous Capitalism, Socialism and Democracy, drawing on the behavioralist movement in contemporary political sociology, argues that elitist governments use democracy not as an end within the framework of an ideal, but as a means within the framework of a method to maintain power; see Schumpeter, Joseph (2003), Capitalism, Socialism and Democracy, Taylor & Francis, Londra, p. 269.

identities and the acceptance of cultural and religious diversity (Harvey, 1989: 286). The 1980s, when civil society debates gained strength at the global level, was a period when social movements gained a solid ground not only to oppose the authoritarianism of the state but also to oppressive modernity (Hobsbawm, 1994: 346). What these movements have in common is their opposition to the unquestionable assertions of modernism based on Enlightenment rationality, such as bureaucratic progressivism. A social movement - such as a religious movement - that challenges the political and cultural system of the modern national state based on a homogeneous ideology of exemplary citizenship can characterize itself as a civil society movement. As a result, in the last period of the 20th century, all movements that argued that the main dilemma in a society was not class conflict - contrary to what Marxist thought argued - and aimed to fight against the oppressive aspects of modernity began to appropriate the concept of civil society (Gülalp, 2018: 137).

In this respect, an examination of Türkiye's context between 1980 and 2000 reveals how the concept of civil society constitutes an important crossroads in political and cultural life. Indeed, as an example of this phenomenon, it is significant that the Refah (Welfare) Party, which was the representative of Islamic social movements at the political level at the time, considered itself a civil society movement. However, such a characterization was considered strange by both secular republicans and leftists, who said that the Islamic movement embodied in the Welfare Party could not be a civilian movement. Nevertheless, given the specific nature of this movement in terms of opposing the uniformizing and homogenizing ideologies and practices of the national state and gathering the power of various religious communities as non-state institutions, it is clear that the social movement embodied in the Refah (Welfare) Party is a civil society movement (Gülalp, 2018: 145).

Of course, at this point, one should not overlook the obvious difference between a social movement and a political party. While a political party directly participates in the struggle for power by forming an organized structure, social movements, which exhibit a more dispersed structure, create the preconditions for policy and regime change by creating a different climate of opinion within society and proposing alternatives. However, there is an important requirement for the success of a social movement. At some stage in its development, a social movement must create more organized political entities that can directly participate in a power struggle, that can be used to rebuild society once they are in power, or that can change the existing political climate (Bottomore, 2020: 71). When we look at this phenomenon in the light of the historical development of social movements in Türkiye, we see that Islamic social movements began to gain power in the social structure starting in the 1960s. However, after the military coup of 1980, social movements, which remained dormant for a short period of time due to the political and social conjuncture, started to gain power again from the end of the 1980s, and in this process, Islamic social movements became prominent thanks to their successful organizational capabilities. In this sense, the Refah (Welfare) Party is an important turning point in the political and socio-cultural life of Türkiye in terms of bringing the Islamic social movement that gained strength in the 1980s into an organized structure.

The fact that the Islamic-democratic movement in Türkiye gained power at the level of political representation with a social acceleration in the late 20th century also testifies to the deep sense of unrest that society experienced during this period. While elites were questioning where the fault lay, sections of the population were experiencing a loss of direction in the face of growing social unrest, institutional corruption and the erosion of the rule of law (Keyder, 1998: 39). On the other hand, this was a period in which a deep political struggle was becoming increasingly evident. As Keyder points out, especially during the 1990s, the main political struggle in Türkiye was between the authoritarian modernizing state of the past, whose legitimacy was slowly eroding, and political liberalism and the concept of citizenship (Keyder, 1998: 52).

The Elimination of the Elitist Political Understanding and the 2000s: The Construction of Democracy in Türkiye on the Axis of Civil Society and Citizenship

In the 20th century, one of the two main components of the concept of civil society, which is recognized as the source of democracy, has been social movements, as mentioned above. However, given the definition of democracy as the sharing of power through deliberation among the members of a community without disregarding the diversity within that community (Benhabib, 2002: 89), the other element necessary for civil society, and ultimately democracy, to truly take root in a society is the concept of citizenship. As a matter of fact, as will be analyzed below, the reasons for the failure of the development of democracy in Türkiye until the 2000s lie in the destruction of the ground for the construction of the concept of citizenship at the social level.

The concept of citizenship, which played a major role in the evolution of the conception of civil society, was based on the "citizen with rights as an individual" model in the West. As a result of the transformation that took place in Eastern Europe at the end of the Cold War, the idea of citizenship began to gain strength in the West starting from the late 1980s (Mann, 1987: 343). According to this view, the state, and politics more generally, is an institution at the service of the individual, not a focus from which the individual directs his or her life as a duty. Participation in politics is recognized as a right, but this right does not imply a duty. This raises the issue of the individual's "civil", "political" and "social" rights.

According to T. H. Marshall, the author of the most important studies on civil rights in political sociology, civil rights in the West developed in three phases: first, "civil rights" such as freedom of thought and belief and the right to a fair trial, which are necessary for individual freedom; then "political rights", which are the right to participate in the exercise of political power; and then "social rights", which are related to welfare and social well-being (Marshall, 1964: 71). Although it has been argued that Marshall's framework does not fit many countries and societies around the world[9], this distinction between civil, political and social rights has continued to exist as a paradigmatic distinction in discussions on citizenship and democracy in political science and sociology literature (Gülalp, 2018: 147). Although these rights take different forms in different social contexts, the following is a general characterization: In the twentieth century, states mostly recognized social rights, but by the end of the century, the criterion of democracy was shaped by the recognition of cultural diversity and identities rather than the provision of welfare rights (Taylor, 1994: 145). Indeed, identity politics started to rise in this period.

From Marshall's conceptual framework, the welfare state based on the social rights of individuals in the 20th century was widely accepted as a model across the world, but it did not emerge in a liberal democratic form everywhere. Examples include fascist regimes such as Nazism or Communism, or populist regimes in the Third World (Berger, 1994). In societies where welfare-enhancing practices were articulated with authoritarian or totalitarian administrations, the state aimed to create an artificial sense of community. As a matter of fact, in examples of non-liberal political regimes, the masses of the people did not have political and civil rights, even though they had social rights to increase their welfare (Gülalp, 2018: 150). In this context, it can be said that in the early republican period, the founding elites pursued a developmentalist economic policy within the framework of the Kemalist ideology and as a result, certain steps were taken to increase the level of welfare. However, Kemalism's elitist dogmatic political and cultural ideology did not allow for the development of civil and political rights at the social level, and thus hindered the establishment of an identity-based political understanding and democracy.

The roots of this situation lie in the French-style conception of citizenship, which was largely appropriated during the early republican period. This conception is based on the suppression of different cultures and identities and the effort to impose a single cultural framework on all segments of society (Vaner, 2005: 155). As a result, it has meant the exclusion from the public sphere of individuals and communities that do not conform to the normative ideal set by elites with political and cultural sovereignty. As a matter of fact, it can be said that the set of rights and duties determining the early republican conception of citizenship, which was guided by the French-style conception of citizenship, was illiberal[10]. The emphasis on the sovereignty of the general will and homogeneity in such an understanding of citizenship paved the way for a political culture that ignored diversity and difference. The Kemalist emphasis on unity and *solidarity* in the sense of homogeneity is actually guided by modernity, which sees uniformization and homogeneity as a normative feature (Groc, 2005: 196). Consequently, it is obvious that such a conception of citizenship constructed by elites cannot establish a democratic regime[11].

[9] See for instance Mann, 1987.

[10] In the French conception of citizenship, which was shaped under the influence of Rousseau's views, it was assumed that there was a distinction between the sum of individual wills and the general will and that the state represented the general will, and as a result, the concept of citizenship was determined by duties rather than rights. For the distinction between the individual will and the general will in Rousseau, see Rousseau, The Social Contract, Book 1, Chapter 7. The main dilemma in Rousseau's argument lies in the conception of the general will, according to which the general will is superior to the individual will in all cases and is the main determining factor. As a matter of fact, according to Rousseau's theory of society, the freedom of the individual passes through submission to the general will. This understanding of citizenship is still evident in contemporary French society. For example, the ease with which a ban on the turban can be imposed in France and individual freedoms restricted indicates that such an understanding prevails.

[11] One of the implications of such an understanding based on the distinction between the general will and the individual will is that it creates a state/government distinction unique to Türkiye. According to this understanding, the state represents a supra-political structure and occupies an unquestionable position, while politics is always directed towards the government. An example from the recent past is the words of former DTP deputy Aysel Tuğluk in her speech at the Turkish Grand National Assembly during the constitutional

The social dilemmas caused by such a conception, which does not coincide with Türkiye's social reality and political culture, and which systematically discriminates between individuals in terms of religious and cultural aspects, has influenced Türkiye's political and socio-cultural life for most of the 20th century. On the other hand, shortly after the establishment of the republican regime, the world economic conjuncture and the ideological environment of the period had changed in a way that favored anti-liberalism and a state-led economy. In this phase of national developmentalism, conditions on a world scale allowed the state to regulate the economy in a relatively closed manner. Indeed, as in most peripheral economies around the world until the 1980s, Türkiye also experienced development, urbanization and increased prosperity. However, material progress did not lead to the development of individual autonomy or civil rights. In the early republican period, as mentioned above, a citizenship that would be based on a system in which the rights implied by a Marshallian understanding of citizenship would gain strength never developed, and the welfare policies in question could not be complemented by a social reform (Keyder, 1998: 42).

In this sense, both on a global scale and in Türkiye, the 1980s marked a turning point. Along with globalization, the rise of identity politics and civil society debates on a global scale had repercussions in Türkiye, and demands for identity and belonging, voluntary identities such as religion and sect, which had been suppressed by elitist politics for so long, began to be given more importance at the social level, and as a result, such identity demands naturally manifested themselves at the political level. In this sense, the period between 1980 and 2000 was a fertile climate for the concepts of civil society and citizenship. However, it can be said that as a result of globalization, political economy models regulated by the state have been pushed to the background and there has been a decline in the social rights of individuals, that is, in the level of welfare (Akagül, 2005: 443). The state's function of safeguarding social welfare has been eroded and thus the establishment of democracy has been blocked. For, as Marshall argued, in addition to civil and political rights, social welfare rights provided by the state to society are also essential for democracy to have a solid foundation (Burchill, 2000: 286). As a matter of fact, due to the economic crises Türkiye experienced especially in the 1990s, which reached its peak with the 2001 economic crisis, and the difficulties faced by the state in fulfilling its obligations to increase social welfare, social rights could not be articulated with the civil and political gains experienced at the social level in this period, and thus the development of democracy was hindered.

Consequently, although the period between 1980 and 2000 witnessed identity movements at the social level due to the impact of globalization, social rights of segments of the population were weakened due to the instability of the economic environment in Türkiye. Both the strengthening of welfare policies through the establishment of economic stability and thus the development of social rights and the strengthening of the democratic ground through identity politics and the creation of a more inclusive citizenship environment were only possible after the 2000s, after the elitist politics was completely eliminated.

CONCLUSION

The theoretical and conceptual framework developed by contemporary political sociology as a discipline at the intersection of political science and sociology has provided important intellectual insights into the analysis of the forms of government and administration that emerged in the twentieth century. In this context, elitism theory, one of the main branches of political sociology, has articulated and developed various theories that emerged at the beginning of the twentieth century, offering analyses of the power of elites that prevailed on a global scale for most of the twentieth century. This analytical framework provided an intellectual ground to shed light on the elitist regime of power that Türkiye experienced in the early Republican period and which dominated Türkiye's political climate for a long time afterwards.

One of the most obvious examples of elitist governments' imagination of transforming society through the creation of political culture is the Western-based modernization and single-party era that Türkiye experienced in the early Republican period. The efforts of the ruling elite, within a tripartite structure consisting of the political, economic and military sectors, to forcibly change the long-established political culture of the people have been the biggest obstacle to the development of a democratic civil society in Türkiye. The democratization process, which was interrupted by successive military coups and the tutelary political understanding that persisted and reproduced itself in the multi-party period, eventually led to a social resistance

amendment negotiations on the turban issue: "Today, political Islam has finally taken over not only the government but also the state"; see. https://m.bianet.org/bianet/print/104725-cicek-in-incileri-radyoaktif-korku-laiklik-noteri-endise-giderme-komisyonu; (28.06.2021).

and, as a result, prepared the necessary social context for the strengthening of political Islamic formations as a social movement representing the pluralist structure and political culture of society.

On the other hand, the concept of citizenship, which is necessary for democracy to take full root in a society, and the civil, political and social rights that will ensure it, have been disrupted in various ways from the early republican period to the early 2000s in Türkiye, and this tripartite structure that forms the basis of democracy could not be established simultaneously in the said period. The development of social rights that would ensure social welfare on one hand, and the establishment of civil and political rights on the other, thereby representing individuals' issues of identity and belonging in a constructed public sphere and creating an inclusive citizenship environment, has only been possible after the 2000s, following the elimination of elitist politics and its extensions.

REFERENCES

Acar, F. ve Uslu, H. F. (2019). Seçkincilik ve Seçkinci Kuramcılar. (Ed. F. Acar, H. F.Uslu). *Siyaset Sosyolojisi Temel Yaklaşımlar-Yeni Tartışmalar*, Ankara: Dipnot Yayınları.

Ahmad, F. (1984). The Late Ottoman Empire. (Ed. M. Kent and F. Cass). The *Great Powers and the End of the Ottoman Empire*, Londra.

Akagül, D. (2005). "L'économie turque depuis l'avenement de la République: performance ou contre-performance", *La Turquie,* Paris: Fayard-CERI.

Alptekin, M. Y. (2020). Önsöz. (Ed. Doç. Dr. M. Yavuz Alptekin). *Siyaset Sosyolojisi*, Ankara: Nobel Yayın.

Arpacı, I. (2020). "Seçkinci Siyaset Bağlamında Bir 28 Şubat Analizi", *Liberal Düşünce Dergisi*, 97, 187-203.

Ayata, A. ve Klujs Gölgelioğlu, Ö. (2019). Siyasi Kültür, (Ed. F. Acar, H. F. Uslu). *Siyaset Sosyolojisi: Temel Yaklaşımlar-Yeni Tartışmalar*, Ankara: Dipnot Yayınları.

Aydın, S. ve Taşkın, Y. (2014). *1960'dan Günümüze Türkiye Tarihi*, İstanbul: İletişim Yayınları.

Bachrach, P. (2002). *The Theory of Democratic Elitism: A Critique*, Maryland: University Press of America.

Anderson, B. (1983). *Imagined Communities.* London: Verso.

Benhabib, S. (2002). *The Claims of Culture: Equality and Diversity in the Global Era*, Princeton: Princeton University Press.

Berger, M. (1994). "The End of the Third World?", *Third World Quarterly*, 15(2), 257-275.

Blondel, J. and Müller-Rommel, F. (2009). Political Elites, (Ed. R. Dalton, H. D. Klingemann). UK: The Oxford Handbook of Political Behaviour.

Bottomore, T. (2020). *Siyaset Sosyolojisi*. (Çev. Erol Mutlu). İstanbul: İletişim Yayınları.

Bouquet, O. (2016). Hâlâ Osmanlı Modernleşmesinden Söz Etmeye Gerek Var mı?. (Ed. M. Aymes, B. Gourisse, E. Massicard). *Devlet Olma Zanaatı*, İstanbul: İletişim Yayınları.

Burchill, S. (2000). Democracy and World Order, *Citizenship and Democracy in a Global Era*, New York: St. Martin's Press.

Clayer, N. (2016). Dayatma ve Uzlaşma Arasında Bir Laiklik? Tek Parti Türkiye'sinde Din Eğitiminin İdaresi. (Ed. M. Aymes, B. Gourisse, E. Massicard). *Devlet Olma Zanaati*, İstanbul: İletişim Yayınları.

Dalton, R. J. (1993). *Politics in Germany,* New York: Harper Collins.

Daver, B. (1965). "Az Gelişmiş Ülkelerde Siyasi Elit (Şeçkinler)", *Ankara Üniversitesi Siyasal Bilgiler Fakültesi Dergisi*, 20 (2), 517-535.

Durkheim, E. (1997). *The Division of Labor in Society*, New York: The Free Press.

Duverger, M. (1959). *Political Parties: Their Organization and Activity in the Modern State*. Wiley.

Ete, H. (2009). "28 Şubat Süreci Devlet Aklında Bir Kırılmadır", https://www.setav.org/28-subat-sureci-devlet-aklinda-bir-kirilmadir/, (10.05.2021).

Findley, C. V. (1980). *Bureaucratic Reform in the Ottoman Empire, The Sublime Porte: 1789-1922*, Princeton: Princeton University Press.

Frey, F. W. (1965). *The Turkish Political Elite*, Cambridge, Massachusetts: MIT Press.

Frey, F. W. (1975). Patterns of Elite Politics in Turkey. (Ed. G. Lenczowski). *Political Elites in the Middle East,* Washington DC: American Enterprise Institute, 41-83.

Glasberg, D. S. and Shannon, D. (2011). *Political Sociology: Oppression, Resistance and the State*, California: Pine Forge Press.

Göle, N. (2002). *Melez Desenler*, İstanbul: Metis Yayınları.

Göle, N. (2007). 80 Sonrası Politik Kültür, (Ed. E. Kalaycıoğlu, A. Y. Sarıbay). *Türkiye'de Politik Değişim ve Modernleşme*, İstanbul: Alfa Yayınları, 515-526.

Groc, G. (2005). "Démocratie et société çivile", *La Turquie,* Paris: Fayard-CERI.

Gülalp, H. (2018). *Laiklik, Vatandaşlık, Demokrasi: Türkiye'nin Siyasal Kültürü Üzerine Çalışmalar,* İstanbul: Metis Yayıncılık.

Gürbilek, N. (2020). *Vitrinde Yaşamak: 1980'lerin Kültürel İklimi*, İstanbul: Metis Yayıncılık.

Gürsoy, Y. (2013). Rejim Değişiklikleri: Otoriterleşme ve Demokratikleşme. (Ed. S. Sayan, H. D. Bilgin). *Karşılaştırmalı Siyaset Temel Konular ve Yaklaşımlar*, İstanbul: İstanbul Bilgi Üniversitesi Yayınları.

Harvey, D. (1989). *The Condition of Postmodernity: An Enquirty into the Origins of Cultural Change*, Oxford: Blackwell.

Heper, M. (1985). *Türkiye'de Devlet Geleneği,* Ankara: Doğu Batı Yayınları.

Heper, M. (1976). "The Recalcitrance of the Turkish Public Bureaucracy to "Bourgeois Politics": A Multi Factor Political Stratification Analysis", *Middle East Journal*, 30 (4), 485-500.

Hicks, A. M., Janoski, T. and Schwartz, M. A. (2005). Political Sociology in the New Millenium. (Ed. T. Janoski, R. Alford, A. Hicks, M. A. Schwartz). *The Handbook of Political Sociology*, UK: Cambridge University Press.

Hobsbawm, E. (1994). *The Age of Extremes: The Short Twentieth Century 1914-1991*, New York: Vintage Books.

Hourani, A. (1983). *Arabic Thought in the Liberal Age*, Oxford: Oxford University Press.

İnalcık, H. (1964). The Nature of Traditional Society, Turkey. (Ed. R. Ward, D. Rustow). *Political Modernisation in Japan and Turkey,* Princeton: Princeton University Press.

İncioğlu Kara, N. (2007). Türkiye'de Çok Partili Sisteme Geçiş ve Demokrasi Sorunları, (Ed. E. Kalaycıoğlu, A. Y. Sarıbay). *Türkiye'de Politik Değişim ve Modernleşme*, İstanbul: Alfa Yayınları, 253-266.

Judt, T. (2005). *Postwar: A History od Europe since 1945*, Londra: The Penguin Press.

Kalaycıoğlu, E. (2007). 1960 Sonrası Türk Politik Hayatına Bir Bakış: Demokrasi Neo-Patrimonyalizm ve İstikrar, (Ed. E. Kalaycıoğlu, A. Y. Sarıbay). *Türkiye'de Politik Değişim ve Modernleşme*, İstanbul: Alfa Yayınları, 471-500.

Kara, İ. (2008). C*umhuriyet Türkiyesi'nde Bir Mesele Olarak İslam*, İstanbul: Dergah Yayınları.

Karabelias, G. (1999). "The Evolution of Civil-Military Relations in Post-War Turkey, 1980-95", *Middle Eastern Studies*, Seventy-Five Years of the Turkish Republic, 35(4), 130-151.

Karpat, K. (2004). *Studies on Turkish Politics and Society: Selected Articles and Essays*, Leiden: Boston.

Kaynar, M. K. (2019). Türkiye'nin Ellili Yılları Üzerine Bazı Notlar. (Ed. M. K. Kaynar). *Türkiye'nin 1950'li Yılları,* İstanbul: İletişim Yayınları, 15-38.

Kazancıgil, A. (2007). Türkiye'de Modern Devletin Oluşumu ve Kemalizm, (Ed. E. Kalaycıoğlu, A. Y. Sarıbay). *Türkiye'de Politik Değişim ve Modernleşme*, İstanbul: Alfa Yayınları, 171-192.

Keyder, Ç. (1998). 1990'larda Türkiye'de Modernleşmenin Doğrultusu, *Türkiye'de Modernleşme ve Ulusal Kimlik*, İstanbul: Tarih Vakfı Yurt Yayınları.

Kurtbaş, İ. (2017). "Türkiye'de Politik Değişim ve Siyasi Elitler: Merkez-Çevre Kuramının Gözden Geçirilmesi ve Türkiye'de Bir 'Elit Koalisyonu Olarak Yeni Elitler'", *The Journal of Academic Social Science Studies*, 54, 179-204.

Lewis, B. (1993). *Modern Türkiye'nin Doğuşu*, Ankara: TTK Yayınları.

Lipset, S. M. (1981). *Political Man: The Social Bases of Politics*. The Johns Hopkins University Press.

Lukes, S. (2010). İktidar ve Otorite. (Ed. T. Bottomore, R. Nisbet). *Sosyolojik Çözümlemenin Tarihi*, İstanbul: Kırmızı Yayınları.

Mann, M. (1987). "Ruling Class Strategies and Citizenship", *Sociology*, 21(3), 339-354.

Mardin, Ş. (1997). 19. Yüzyılda Düşünce Akımları ve Osmanlı Devlet, *Türk Modernleşmesi*, İstanbul: İletişim Yayınları.

Marshall, T. H. (1967). Citizenship and Social Class, *Class, Citizenship and Social Development*, New York: Doubleday and Company.

Mills, C. W. (1959). *The Power Elite*, New York: Galaxy Book.

Nash, K. (2010). *Contemporary Political Sociology*, Oxford: Wiley-Blackwell.

Nebati, N. (2020). *Hâkim Parti Sistemi ve Türkiye'nin İlk Hakim Partisi Olarak AK Parti*, İstanbul: İşaret Yayınları.

Nesbitt-Larking, P. (1992). "Methodological Notes on the Study of Political Culture", *Political Psychology,* 13(1), 79-90.

Özbudun, E. (1995). Türkiye'de Devlet Seçkinleri ve Demokratik Siyasi Kültür, Türkiye'de Demokratik Siyasi Kültür, Ankara: Türk Demokrasi Vakfı, 1-42.

Parsons, T. (1967). The Structure of Social Action, Free Press, New York.

Pustu, Y. (2007). "Osmanlı Türk Devlet Geleneğinde Modernleştirici Unsur Olarak Bürokratik Elitler", Gazi Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 9(2), 197 – 214.

Roskin, M. vd. (1994). Political Culture, (Ed. M. Roskin). Political Science: An Introduction, New Jersey: Prentice Hall,

Rousseau, J. J. (2006). Toplum Sözleşmesi. (Çev. Vedat Günyol). İstanbul: İş Bankası Kültür Yayınları

Rush, M. (1992). Politics and Society: An Introduction to Political Sociology, New York: Prentice Hall.

Rustow, D. A. (1964). The Military: Turkey, (Ed. R. E. Ward, D.t A. Rustow). Political Modernization in Japan and Turkey, Princeton: Princeton University Press.

Schumpeter, J. (2003). Capitalism, Socialism and Democracy, Londra: Taylor & Francis.

Sokullu, E. C. Ş. (2013). Siyasal Kültür, Karşılaştırmalı Siyaset: Temel Konular ve Yaklaşımlar, İstanbul: İstanbul Bilgi Üniversitesi Yayınları.

Skocpol, T. (1979). States and Social Revolutions: A Comparative Analysis of France, Russia and China, Cambridge University Press.

Şaylan, G. (1984). Cumhuriyet Bürokrasisi, Cumhuriyet Dönemi Türkiye Ansiklopedisi, Cilt 2, İstanbul: İletim Yayınları, 298-308.

Özçelik, T. G. (2019). "Batı-Dışı Modernleşme Kavramı Temelinde Türkiye'de Cumhuriyetin İlk Yıllarında Modernleşme Çabaları", İstanbul Gelişim Üniversitesi Sosyal Bilimler Dergisi, 6 (2), 308-326.

Taylor, G. (2010). The New Political Sociology, Power, Ideology and Identity in an Age of Complexity, UK: Palgrave.

Taylor, C. (1994). The Politics of Recognition, Multiculturalism: Examining the Politics of Recognition, Princeton: Princeton University Press.

Therborn, G. (1976). "What Does The Ruling Do When It Rules? Some Reflections on Different Approaches to The Study of Power in Society", Critical Sociology, 25 (2/3).

Touraine, A. (1977). *The Self-Reproduction of Society*, Chicago: University of Chicago Press.

Trimberger E. K. (1978). *Revolution From Above, Mİlitary Bureaucrats and Development in Japan, Turkey, Egypt and Peru*, New Brunswick: Transaction Publishers.

Uslu, H. F. (2019). Giriş. (Ed. F. Acar, H. F. Uslu). Siyaset Sosyolojisi Temel Yaklaşımlar-Yeni Tartışmalar, Ankara: Dipnot Yayınları.

Vaner, S. (2005). "La démocratie et l'autoritanisme vont de pair", *La Turquie,* Paris: Fayard-CERI.

Varel, A. (2019). 50'li Yıllarda Muhalefet: Hükümete Yönelik Temel Eleştiriler ve DP Karşısında CHP'nin İdeolojik Konumlanışı. (Ed. M. K. Kaynar). *Türkiye'nin 1950'li Yılları,* İstanbul: İletişim Yayınları, 203-234.

Weber, M. (2006). *Sosyoloji Yazıları*, çev. Taha Parla, İstanbul: İletişim Yayınları

Yavuz, H. (2005). *Modernleşen Müslümanlar: Nurcular, Nakşiler, Milli Görüş ve AK Parti*, İstanbul: Kitap Yayınevi.

Yılmaz, N. (2011). 2000'li Yıllarda Elitlerin Dönüşümü: Devlet, Siyaset ve Batı. (Ed. A. Demirhan), *2000'li Yıllar: Türkiye'de Toplum*, İstanbul: Meydan Yayıncılık, 51-74.

Yücekök, A. (1976). *Türkiye'de Din ve Siyaset*, İstanbul: Gerçek Yayınevi.

Zürcher, E. J. (2009). *Modernleşen Türkiye'nin Tarihi*, İstanbul: İletişim Yayınları.

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Tourism Activities in the Context of Ecological Footprint: Panel Data Analysis for Mediterranean Countries

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ABSTRACT

Tourism is seen as one of the important sources of economic growth in developing countries. It makes positive contributions to the country's economy, with national income, foreign currency inflow and employment created. While the basis of investments in the tourism sector is primarily to achieve economic gains, today is the sustainable tourism concept emerged and the effects of tourism on the environment have come to the fore. Sustainability in tourism emerges as a new tourism approach that takes environmental damage into consideration. The aim of this study is to examine the relationship between tourism activities and ecological footprint in countries bordering the Mediterranean, using annual data for the period 2001-2021. In the analysis; Generalized Moment Method (GMM), system GMM, constant effects model and random effects models were used. The results of the analysis showed that tourism activities have a significant and positive impact on the ecological footprint of countries bordering the Mediterranean. The findings obtained from the study confirm the expectations that tourism activities increase the ecological footprint by causing environmental degradation.

Keywords: Ecological Footprint, Tourism Economy, Ecological Economics, Panel Data Analysis.

JEL Classification Codes: Q57, F43, C52, C23, P28

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INTRODUCTION

Tourism, which has been one of the fastest growing sectors in the world since the second half of the 20th century, has added a new dimension to the international trade economy. Today, reasons such as technological advances, improvement in living standards and freedom of travel brought about by globalization have made tourism one of the fastest growing sectors in the world. The tourism sector contributes to the development of country economies by providing opportunities such as employment and investment (Selvanathan et al., 2020: 1). It contributes to the economic, political, social and cultural development of many developing countries.Foreign exchange inflows obtained through invisible exports as a result of tourist activities have become an important source for countries. The foreign exchange input obtained makes a significant contribution to the balance of payments of the countries. Its positive contributions to national income, increase in employment volume and regional development are an undeniable fact (Belisle and Hoy, 1980, Holzner, 2011). As a matter of fact, insufficient capital and technology gap in developing countries have made tourism, which is a labor-intensive sector, more attractive (Öztürk and Yazıcıoğlu, 2002:185). Countries that do not have sufficient resources and development potential in agriculture and industry, but have tourism supply potential; The tourism sector will support the development of the country, to the extent that it can implement planned and effective tourism policies. Depending on the development of the tourism sector, physical infrastructure problems such as roads, water, electricity, sewage and communication will disappear in these regions. Thus, tourism will also contribute to increasing the regional standard of living (Çeken, 2008: 302).

People's consumption activities also increase during tourism activities. The increase in the amount of waste along with the large amounts of increased energy and water consumption causes environmental damage (Jebli et al., 2019; Paiano et al., 2020). In addition, since the tourism industry is a sector that requires high energy, it negatively affects nature by increasing carbon dioxide emissions. The factor that increases carbon dioxide emissions the most during tourism activities is; it arises from transportation, cooking, heating and cooling processes in which solid fuels are used extensively during these activities (Gössling, 2000: 410). The increase in greenhouse gas emissions that cause

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global warming, climate change and water pollution are caused by increasing tourism activities (Sun and Liu, 2020). Transportation activities, especially tourism-related, threaten all living things by increasing the world temperature (Scott et al., 2016; Rico et al., 2019).

While the aim of investments in the tourism sector is primarily to obtain economic gains, today the concept of sustainable tourism has come to the fore by drawing attention to the effects of tourism activities on environmental quality. Aiming only at the economic benefits of tourism; Not using renewable resources in a controlled manner causes natural resources to face the danger of extinction over time (Selvanathan et al., 2020; Godfrey, 1996). These negative effects of tourism activities on nature destruction increase the ecological footprint. The value resulting from the production of resources that people will consume and the elimination of waste generated during this production process is called ecological footprint (Wackernagel et al., 1999; GFN-Turkey, 2012). The way to reduce the ecological footprint will be possible by switching to a tourism approach that raises sustainable environmental awareness and takes social and environmental factors into consideration.

The purpose of this study is to question the effects of tourism on the ecological footprint in countries bordering the Mediterranean, where tourism activities are intense. For this purpose, the relationship between tourism and ecological footprint in countries bordering the Mediterranean was examined with the Dynamic Generalized Moment Method (GMM) using annual data covering the period 2001-2021. The findings to be obtained from the research are limited by the variables used in the analysis, the period covered by the analysis and the econometric method used. The study aims to contribute to the limited empirical literature on this subject and to provide a resource for future studies in this field by raising awareness about the environmental damage of tourism activities in countries bordering the Mediterranean in terms of using the ecological footprint variable, which is more comprehensive. In the section following the introduction, a summary of the literature on the subject is included. Then, the environmental damage of tourism activities and the theoretical framework regarding sustainable tourism are discussed. After the data set, econometric method and empirical findings were presented, the findings were evaluated and suggestions were made.

EMPIRICAL EVIDENCE

Studies examining the effects of tourism activities on nature destruction; They are summarized in two groups: the relationship of tourism activities with CO2 emissions and the relationship of tourism activities with the ecological footprint.

Tourism and Carbon Emission Nexus

In the studies conducted, CO2 emission was considered as the most important factor showing the destruction of nature. Many researchers have examined the environmental impacts of tourism activities using CO2 emissions. For example, Lee et al. (2013) used panel data analysis for the years covering the period 1988-2009 in EU countries, examining the effects of tourism activities on GDP and carbon dioxide emissions. While the findings confirm the positive effect of GDP on carbon dioxide emissions; Contrary to other studies, it has been found that tourism activities have a negative impact on carbon dioxide emissions. Banday et al. (2014) found a strong intercourse between tourism income and economic growth in their study to examine the effects of tourism income on economic growth and on pollution. It has been concluded that tourism income is one of the most important sources affecting economic growth in Kashmir. It has also revealed the negative effects of pollution and tourism revenue that affect environmental sustainability, such as degradation of natural resources. Vita et al. (2015) tested the environmental effects of developments in tourism with the Environmental Kuznets Curve model. Accordingly, there is a cointegrated relationship between the number of international tourists coming to Turkey, tourism income, energy consumption and carbon dioxide emissions. The empirical results showed that CO2 emissions decreased in the long, supporting the Environmental Kuznets Curve hypothesis. It also draws attention that despite the environmental degradation resulting from the development of tourism, sufficient importance is not given to policies to protect the environment. Likewise, in the study conducted by Isik et al. (2017) analyzed the impact of GDP, economic development, international trade and tourism expenditures on CO2 emissions in Greece with the help of data for 1970-2014. According to the results of Zivot-Andrews unit root tests, ARDL models and Vector Error Correction Model (VECM), it has been determined that economic growth, financial development, international trade and tourism expenditures increase CO2 emissions. Jebli et al. (2018) investigated the relationship between international tourism and energy consumption in the

top ten international tourism destinations that attract the most tourists for the period 1995–2013, using the Vector error correction model and Granger causality test. There is unidirectional causality from economic growth to CO2 emissions. On the other hand, it was concluded that there is a bidirectional causality between international tourism activities, economic growth and energy use. Balli et al. (2019) examined the relationship between tourism, economic growth and CO2 emissions using panel data analysis for Mediterranean countries, showed the existence of a positive relationship between tourism and CO2 emissions in the long run. Arı (2021), who researched also the relationship between GDP, tourism, renewable energy and carbon dioxide data for Turkey, used the FMOLS method in his study. According to the results obtained, renewable energy reduced carbon dioxide emissions. On the other hand, it has been concluded that developments in the tourism industry do not have a significant effect on carbon dioxide emissions and that policies that encourage tourism will not negatively affect nature. Meşter et al. (2023), who examined the intercourse between developments in the international tourism sector, GDP and CO2 emissions for 27 EU countries in the period covering 1995–2019, used the ARDL approach in their study. The results of the research supported the positive relationship of tourism on per capita GDP and CO2 emissions in EU countries.

Tourism and Ecological Footprint Nexus

Today, increasing production and consumption activities lead to more energy use and increase CO2 emissions. However, CO2 emissions constitute a very small part of nature destruction. With this reality, in order to measure the magnitude of nature destruction caused by tourism activities, it is necessary to use the concept of ecological footprint, which is a more comprehensive indicator that considers more factors. Uncontrolled use of natural resources due to the increasing consumption activities of societies as well as developing tourism activities has brought the concept of ecological footprint to the agenda.

In this context, the relationship between tourism and environmental damage; They were examined in three categories: studies that increase the ecological footprint of tourism activities, studies that have a healing effect on the ecological footprint of tourism activities in the long term, and studies that do not have a significant relationship between tourism activities and ecological footprint.

Bagliani et al. (2004) examined the impact of tourism on the ecological footprint for Venice. According to the results obtained, tourism activities increase the ecological footprint by 8.5%. Leon et al. (2014) studied the intercourse between tourism and ecological footprint for underdeveloped and developed countries for the period 1998-2006 using the STIRPAT approach. According to the analysis, it has been determined that tourism has a significant impact on the carbon footprint in both underdeveloped and developed countries. Godil et al. (2020) investigated the impact of financial development, tourism, and globalization on the ecological footprint in Turkey in the period covering the years 1986-2018 using the QARDL method. Kongbuamai et al. (2020a) investigated the relationship between tourism activities and ecological footprint in ASEAN countries using the Driscoll-Kraay estimation method using data between 1995 and 2016, revealed that tourism activities are negatively related to the ecological footprint. The empirical results obtained showed that the number of tourists, globalization and financial development had a eloquent and positive relationship on the ecological footprint. In their study, Younes et al. (2020) examined the impact of tourism activities on the ecological footprint. Statistical analysis was conducted by distributing 611 surveys to randomly selected tourists from different nationalities. The study found that there is a positive relationship between tourism activities and ecological footprint. Ansari et al. (2021) examined the intercourse between tourism activities and ecological footprint in the top 5 countries that attract the most tourists (USA, Spain, France, Italy and China), in their study using panel NARDL analysis. The result of the research shows that the number of incoming tourists increases the ecological footprint. Alola et al. (2021) examined the relationship between the number of tourists and ecological footprint in 10 tourism centers (France, USA, Spain, China, Italy, England, Germany, Mexico, Thailand and Turkey) in the period of 1995-2016, used the Pooled Mean Group (PMG) method in the study. According to the results obtained, it was determined that there was a positive relationship between the number of tourists and the ecological footprint. Anser et al. (2021) in the research conducted using the Generalized Method of Moments (GMM) using annual data between 1995 and 2018 for 130 countries; The relationship between population density, number of tourists, economic growth and ecological footprint was investigated. In another study conducted for Turkey, Kutlu et al. (2022) examined the intercourse between tourism and ecological footprint for the

period 1970-2017 according to the ARDL boundary test approach. GDP, energy consumption, tourism revenues, tourism expenditures and natural resource cost data were used in the study. According to the findings of the research; Energy use and tourism expenditures increase the ecological footprint. Adedoyin et al. (2022) investigated the causality relationship between the number of incoming tourists and ecological footprint in a study using the Dumitrescu and Hurlin panel causality test. According to the results obtained, the number of incoming tourists increases the ecological footprint, causing a decrease in environmental quality. Guan et al. (2022), who evaluated the effects of international tourism on the ecological footprints of G-10 countries in the period 1995–2019 with the CS-ARDL method, show that tourism significantly increases the ecological footprint. The study conducted by Liu et al. (2022) using the ARDL bound test and Bayer and Hanck tests covers the years between 1980-2017. The effect of tourism, GNP, energy use, commercial openness and FDI on the ecological footprint in Pakistan is examined with Environmental Kuznets Curve (EKC). The obtained results confirm the EKC hypothesis. In addition, the fact that foreign direct investments increase the ecological footprint shows that the Pollution Haven Hypothesis is supported. When we look at the studies that conclude that tourism activities have a positive impact on the ecological footprint; Katırcıoğlu et al. (2018), the relationship between tourism activities and environmental damage was examined for the 10 most visited countries in the period between 1995 and 2014 using the panel data method. According to the results obtained, the relationship between tourism activities and ecological footprint confirms the environmental Kuznets curve. The development of tourism activities in selected countries creates corrective effects on ecological footprint levels. Kongbuamai et al. (2020) examined the relationship between GDP, energy use, tourism, openness, population density and ecological footprint between 1974 and 2016 in their study for Thailand using the ARDL bounds test technique. The results of the research have shown that variables such as energy use, economic development and openness to trade increase the ecological footprint. Otherwise, it was found that the relationship between tourism activities and population density on the ecological footprint was negative. Using data from 38 countries between 1995 and 2018, Khan et al. (2020) researched the impact of energy consumption, economic growth and tourism activities on the ecological footprint in their study where they applied second generation unit root and cross-section dependence analysis. It states that energy consumption causes economic environmental damage in the long term, while tourism improves environmental quality and promotes economic growth. Khoi et al (2021), examined the intercourse between tourism activities and ecological footprint in Singapore between 1978-2016 with the asymmetric NARDL method, state that developments in tourism have a corrective effect on the ecological footprint. Additionally, while there is a positive relationship between GNP and ecological footprint, it has been shown that there is no meaningful intercourse between energy use and ecological footprint. In the research conducted by Nathaniel et al. (2021) for the top 10 countries that attracted the most tourists in 2019, it was observed that there was a negativ intercourse of the tourist arrivals and tourism revenues on ecological footprint. In addition to these results, the relationship between urbanization, natural resource expenses and energy use and ecological footprint was also found to be negative.

On the other hand, when we examine the studies that argue that there is no relationship between the development of tourism activities and environmental damage; Öztürk et al. (2016), examining the environmental hurt of tourism activities using ecological footprint, tested the effective of the Environmental Kuznets Curve (EKC) hypothesis for 144 countries between 1988 and 2008. In the study carried out using the Generalized Method of Moments (GMM), ecological footprint as an indicator of environmental damage and income data from tourism as an economic indicator was used. According to the results of the study, it appears that there is no significant relationship between tourism income and ecological footprint. Han et al. (2022), who analyzed the impact of tourism development on the ecological footprint in Turkey between 1995 and 2017 by establishing two different models, FMOLS and DOLS methods, found no significant relationship between the ecological footprint and tourism.

When the studies reviewed in the literature are evaluated in general, the impact of tourism activities on the ecological footprint may show different results in terms of country groups, the period examined and the estimation methods used. However, the general findings are that tourism activities cause an increase in the ecological footprint. In this regard, the study has a critical role in determining the mutual relations between tourism and the environment and sustainable tourism policies.

THEORETICAL FRAMEWORK

The negative effects of increased economic activities on the environment for a higher level of welfare and higher growth are an inevitable reality. Because in order to produce more, needs more inputs must be used. Therefore, it will cause more natural resource consumption during the production phase. More production means more natural resource consumption, more waste and emissions. By switching from the industrial sector, where energy use is intense, to the production system, where technology use is intense, the share of economic activities that pollute the environment less is increased (Tsurumi et al.; Sarkodie et al., 2019: 130).

It is an undeniable fact that the rapid growth in the tourism sector, which represents an important source of growth due to its contributions to the country's economies, may cause major problems in terms of environmental sustainability (Tsai et al., 2014:14). Because the tourism sector requires large infrastructure investments. Different tourism services such as roads, holiday villages, hotels, marinas, airports and golf courses are investments that require infrastructure. When we look at the negative effects of tourism on the environment, cutting down forests to build resorts and hotels, uncontrolled use of natural resources causes loss of natural habitats and soil erosion. In countries where water resources are limited, the environmental destruction of golf courses and the economic damage they cause must be taken into account. Golf courses pose a great danger in terms of water consumption due to excessive water use. So much so that many chemical fertilizers and pesticides used for lawn care leak underground and cause pollution of water resources and other natural resources. In this sense, the concept of sustainability has gained importance as the awareness that natural resources consumed uncontrollably are scarce has become widespread in societies (Garcia-Falcon ve Medina-Munoz, 1999).

Although the concept of sustainability has basic dimensions consisting of economic, environmental and social components, sustainability is essentially a situation related to the environment. Aranson (1994) emphasized the purpose of sustainable tourism as using limited natural resources correctly and in a planned manner, preserving ecological and economic balance, preserving natural resources and cultural heritage and transferring them to the generations that will come after us. Clarke (1997), Bahaire and White (1999), Cottrell et al. (2004) stated that in order for the sustainable strategy in tourism activities to be successful, not only airline companies, hotels and restaurants, but all actors within the system must fulfill their responsibilities. This awareness has encouraged many researchers to investigate the impact of tourism on environmental pollution. The existence of a positive or negative relationship between tourism activities and environmental degradation is very important for policy makers.

In studies, CO2 emissions have generally been used as an indicator of environmental pollution, representing the carbon footprint. However, this indicator covers a small part of the environmental damage caused by tourism. When evaluated from this point of view, it would be appropriateto use a more comprehensive indicator. Carbon footprint, which expresses the CO2 emissions resulting from our activities, is only one of the components of the ecological footprint. For this reason, it would be more appropriate to analyze the environmental damage of tourism activities using the more comprehensive ecological footprint indicator instead of CO2 emissions. The ecological footprint calculates the rate at which a country consumes its natural resources and how much of its waste (including CO2 emissions) is capable of being regenerated or cleaned by nature.

The ecological footprint is a parameter that measures the impacts of an individual or community on the environment. Although there are many factors affecting the ecological footprint, the most important factors are listed in Figure 1.

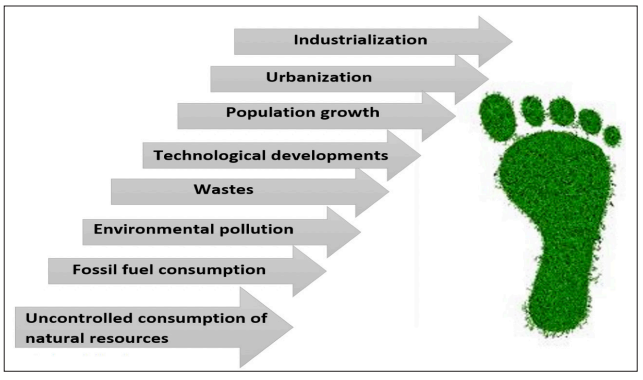

Figure 1: Factors Affecting the Ecological Footprint Area

The increased consumption of natural resources as a result of rapid population growth and increased consumption activities reveals that nature has a resource capacity. The amount of ability to produce renewable natural resources gives us the biological capacity of that region. Today, it is seen that the ecological footprint of many countries exceeds their biological capacity. The value resulting from the production of resources that people will consume and the elimination of waste generated during this

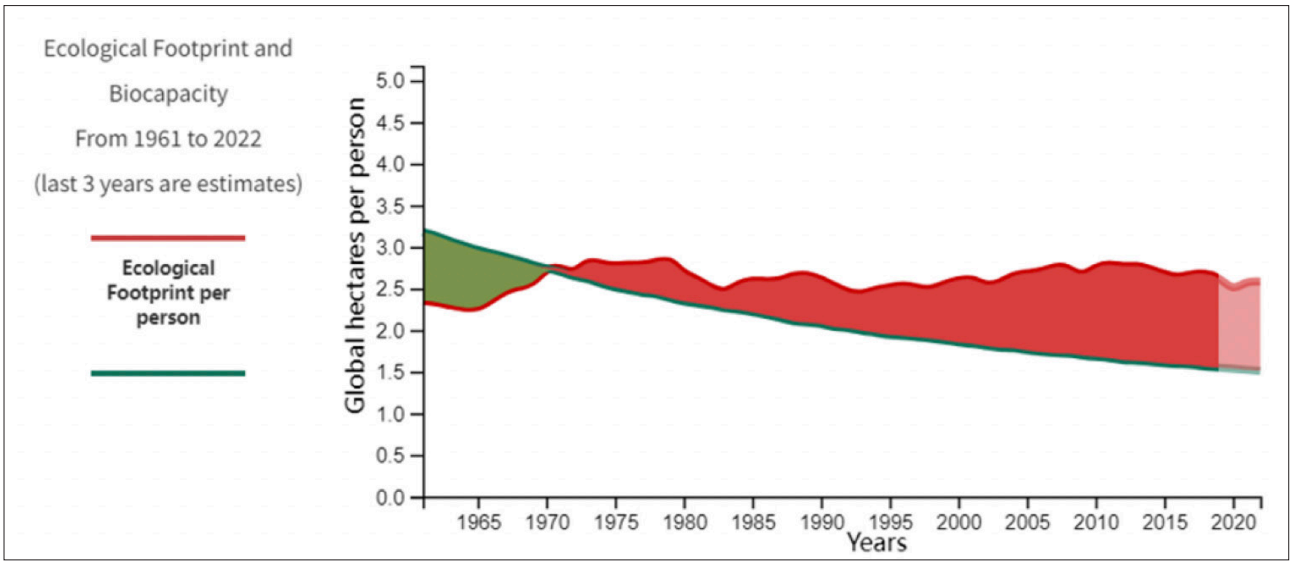

Figure 2: World Ecological Footprint and Biocapacity Trends

Source: National Footprint and Biocapacity Calculations 2023 Edition (Data Year 2019)

production process is called ecological footprint. Ecological footprint measures the amount of natural resources consumed and the rate at which waste is produced. The amount of renewable natural resources we can produce in the same period of time is expressed as biological capacity. If the ecological footprint value is greater than the biological capacity, an ecological deficit will occur (Wackernagel et al., 1999). In order not to create an ecological deficit, the ecological footprint value must be less than the biological capacity. It is clearly seen in Figure 2 that the ecological footprint worldwide has exceeded its biological capacity (GFN-Turkey, 2012: 6).

Countries bordering the Mediterranean are among the world's leading tourism regions with their unique natural beauties, favorable climatic conditions and rich history. According to United Nations data, coastal countries in the Mediterranean region are seen as the most popular tourism destinations (Table 1).

In these countries, which have a coastline on the Mediterranean and are preferred as tourism centers, the tourism revenues are considered as an important resource that contributes to the economic growth of the countries. However, these developments in the tourism industry are among the causes of environmental degradation.

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Table 1: Mediterranean Coastal Countries

MEDITERRANEAN COASTAL COUNTRIES		
Continent of Europe	**Asian Continent**	**African Continent**
France	Türkiye	Egypt
Spain	Israel	Libya
Italy	Palestine	Tunisia
Greece	Lebanon	Algeria
Croatia	Cyprus	Morocco
Monaco	Syria	
Bosnia and Herzegovina		
Montenegro		
Albania		
Malta		
Slovenia		

Although climatic conditions are generally similar in countries bordering the Mediterranean, they have different structures in terms of fertile soils. On one side, there are Western European countries with rich and fertile lands, while on the other side, there are North African

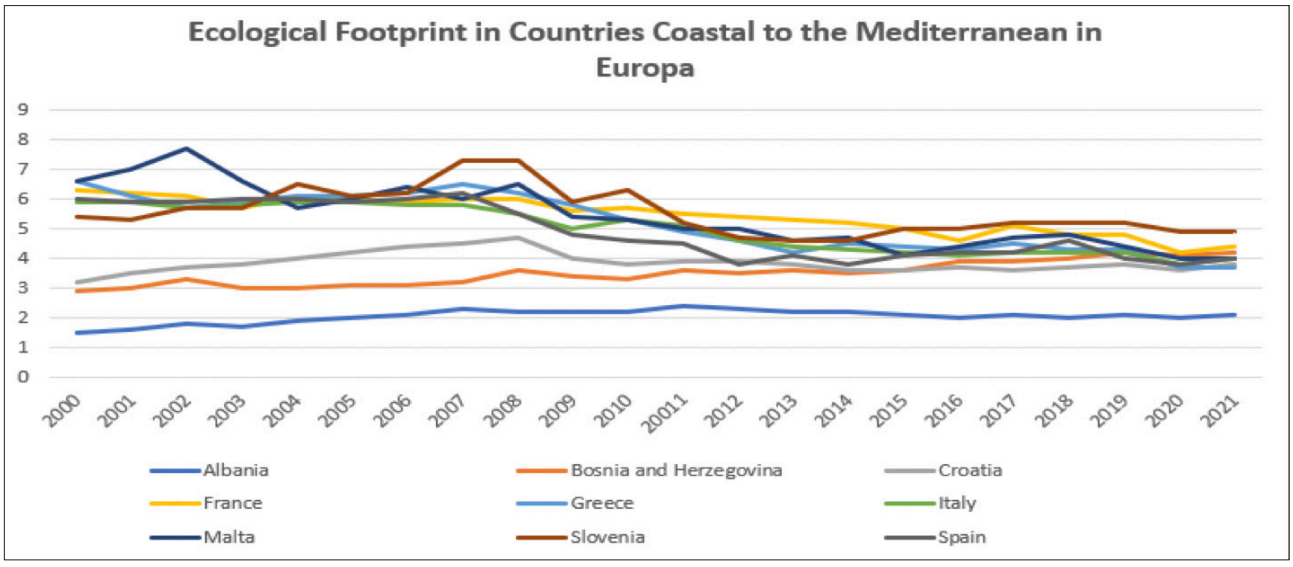

Figure 3: Ecological Footprint Graph of Countries Coastal to the Mediterranean in Asia (Compiled from GFN)

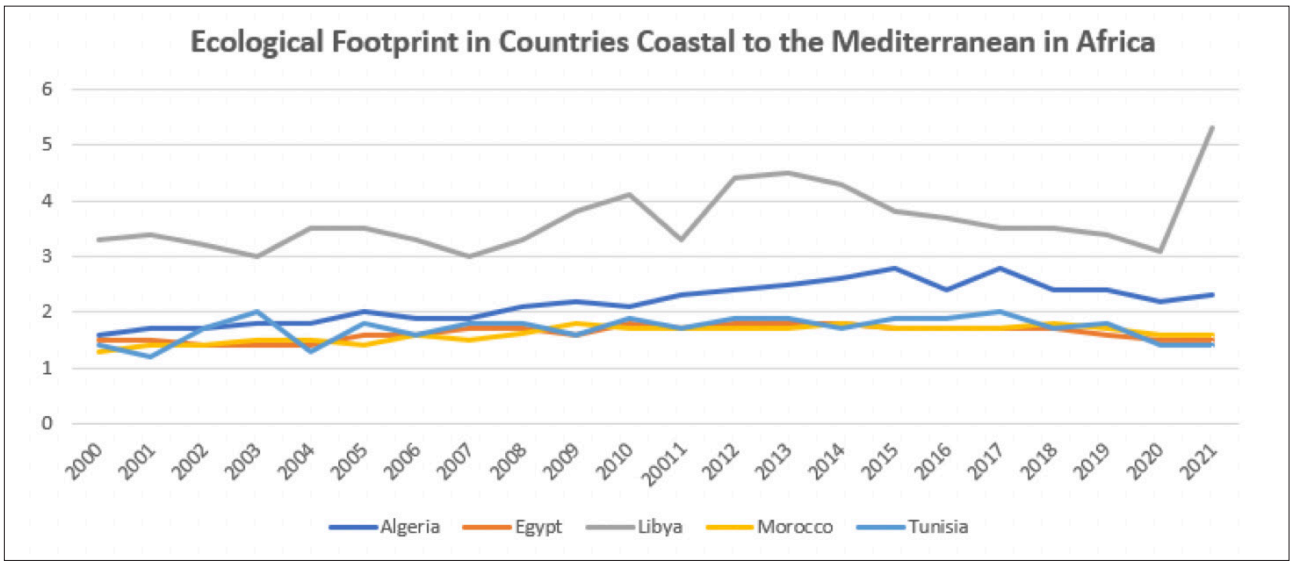

Figure 4: Ecological Footprint Graph of Countries Coastal to the Mediterranean in Africa (Compiled from GFN)

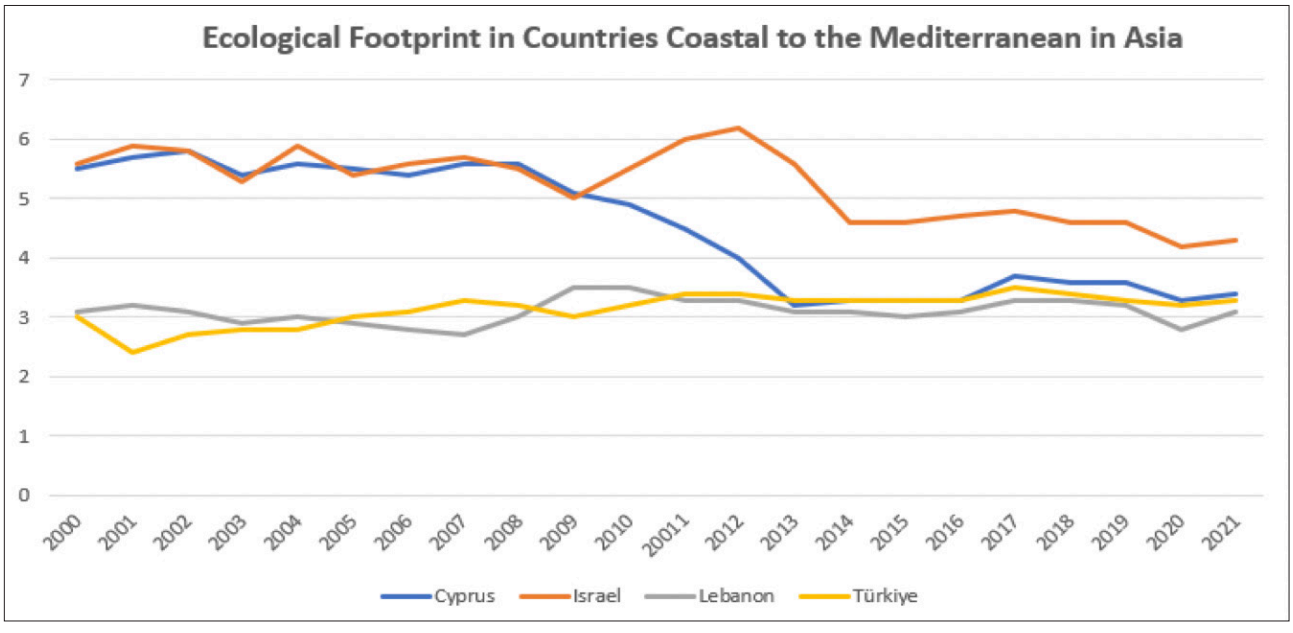

Figure 5: Ecological Footprint Graph of Countries Coastal to the Mediterranean in Asia (Compiled from GFN)

countries with arid lands and relative poverty. On the other hand, these countries bordering the Mediterranean have different structures in terms of income level and consumption amount. While the rapidly increasing consumption amount is important in the countries in the north of the Mediterranean, population growth is also noteworthy in the countries in the south. These rapid increases in both factors cause negative effects on the ecological footprint. Figure 3, Figure 4 and Figure 5 shows the ecological footprint graphs of countries bordering the Mediterranean.

RESEARCH METHODOLOGY

The method that allows testing complex models from time series and cross-sectional data is called panel data analysis (Greene, 2003: 612). Panel data allows the creation of more complex hypotheses and broader modeling compared to one-dimensional data such as cross-sections or time series. For this reason, the number of econometric applications based on panel data has been increasing in recent years.

Econometric Method

Among the analysis methods based on panel data, dynamic panel data analysis is one of the most preferred methods. This study will use panel data analysis and accordingly fixed effects and random effects models. Widely used in dynamic panel data analysis is the Generalized Method of Moments (GMM) developed by Arellano and Bond (1991). Economic behavior in a period is under the influence of behavior in previous periods. Therefore, in the analysis of economic relations, the lagged values of the variables should also be included in the model as explanatory variables. The difference between dynamic panel data models and static panel data models is due to the fact that the lagged variable is also included in the model (Tatoğlu, 2013: 65).

The effectiveness and consistency of predictions made with the Generalized Method of Moments (GMM) is based on two basic assumptions. The first of these is that there is no autocorrelation between error terms. Whether there is an autocorrelation problem in a model is determined by looking at the results of AR(1) and AR(2) tests developed by Arellano-Bond (1991). The second assumption is that the instrumental variables included in the model must be appropriate. The Sargan test is performed to test whether the instrument variables are appropriate (Arellano and Bond, 1991: 282; Yıldız, 2020: 108).

Dynamic Generalized Method of Moments (GMM) is a dynamic model created by including the lagged values of the dependent variable into the model as independent variables. According to the method, the fact that the dependent variable is dynamic means that it is affected by its own history. Dynamic models are generally expressed as follows (Çeştepe et al., 2020: 183). In the model, i denotes the cross-sections dimension and t denotes the time dimension (Tatoğlu, 2012: 130).

$$y_{it} = \alpha + \delta y_{i,t-1} + \beta x_{i,t} + u_{i,t} + \varepsilon_{i,t} \quad (1)$$

In the model numbered (1), for i= 1, 2, ..., N and t=1, 2, …, T; which refers y_{it} the dependent variable, a the constant value, $y_{i,t-1}$ the lagged value of the dependent variable, $x_{i,t}$ the independent variables, β the coefficients, $u_{i,t}$ the errors between the cross-sections and $\varepsilon_{i,t}$ the errors within the cross-sections.

Fixed effects model; It is a linear regression model in which the constant term varies from unit to unit. The constant term takes varying values for each cross-section unit. In other words, differences between units are expressed by differences in the constant term. Additionally, in these models, it is assumed that the independent variables have no connection with the error term. However, there is a relationship between unit effect and independent variables. The fixed effects model can be generally represented as follows:

$$y_{it} = \alpha_i + \beta x_{i,t} + u_{i,t} \quad (2)$$

In model (2), for i= 1, 2, ..., N and t=1, 2, …, T; which shows y_{it} the dependent variable, a_i the i. constant value, $x_{i,t}$ the independent variables, β the coefficients and $u_{i,t}$ the error term of the model (Torres-Reyna, 2007:10).

The random effects model differs from the fixed effects model. In the random effects model, changes that occur cross-section sections or both cross-section and time are included in the model as a component of the error term (Bontempi et al., 2012).

$$y_{it} = \alpha + \beta x_{i,t} + u_{i,t} + \varepsilon_{i,t} \quad (3)$$

In model (3), for i=1, 2, ..., N and t=1, 2, …, T; which represents y_{it} the dependent variable, a the constant value, $x_{i,t}$ the independent variables, β the coefficients, $u_{i,t}$ the errors between the cross-sections and $\varepsilon_{i,t}$ the errors within the cross-sections. The most important difference of model (1) compared to models (2) and (3) is that the lagged values of the dependent variable are included in the model and therefore the dynamic effects of time are taken into account (Tunay, 2014:9-10).

Dataset and Model

Countries bordering the Mediterranean are among the regions in high demand in terms of both touristic investments and international tourism. The Mediterranean Basin accounts for 32% of world tourism. For this reason, the region in which we will investigate the environmental damage of tourism activities consists of countries bordering the Mediterranean. In this context, the relationship between tourism activities and ecological footprint for 17 countries bordering the Mediterranean was examined using the panel data method by considering annual data covering the period 2001-2021.

The availability of data is important in the selection of countries; some countries with missing data were not included in the study. In analysis; generalized method of moments (GMM), system GMM, fixed effects model and random effects models were used. In the study where ecological footprint was considered as the dependent variable, the tourism variable was considered as the main control variable. Energy consumption, industrialization, urbanization, economic growth and foreign direct investments, which are factors that determine environmental degradation, were also included in the model as control variables (Figure 6).

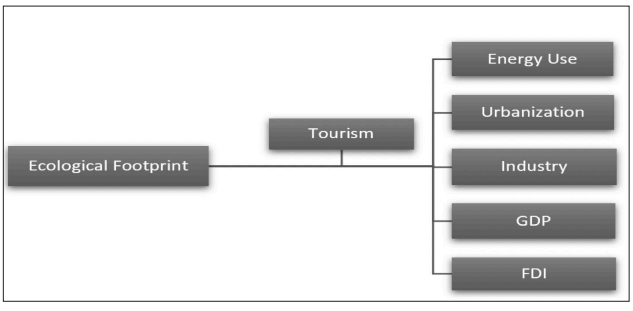

Figure 6: Drivers of Ecological Footprint

The data used in the study were obtained from the World Bank (WDI) and Global Footprint Network (GNF) indicators. The variables used to analyze the impact of tourism activities on the ecological footprint are given in Table 2.

The logarithms of the TA, EC, IND and FDI variables were taken to distribute them within normal limits and to provide more consistent and reliable results. For the variables whose logarithm was not taken, normalization was not required because they were calculated proportionally.

Table 2: Data Set and Variables

Symbol	Variable	Source	Period
EF	Ecological Footprint per Person (kha)	GFN	2001-2021
TA	Number of Tourists Arrivals	WDI	2001-2021
EC	Total Energy Consumption	WDI	2001-2021
IND	Industrialization	WDI	2001-2021
URB	Urban Population	WDI	2001-2021
GDP	Economic Growth Rate	WDI	2001-2021
FDI	Foreign Direct Investments	WDI	2001-2021

Source: 1. WDI (World Development Indicators)
2. GFN (Global Footprint Network)

Based on the theoretical and empirical literature examined in accordance with the purpose of the study, the econometric model based on the GMM method can be expressed empirically as follows:

$$EF_{i,t} = \beta_0 + \beta_1 EF_{i,t-1} + \beta_2 LOGTA_{i,t} + \beta_3 LOGEC_{i,t} + \beta_4 LOGIND_{i,t} + \beta_5 URB_{i,t} + \beta_6 GDP_{i,t} + \beta_7 LOGFDI_{i,t} + \varepsilon_{i,t} \quad (4)$$

In the model (4), each β parameter shows the coefficients of the relevant estimated variables. The parameter β_0 refers to the constant value, and the parameter ε_{it} refers to the error term that shows the difference between the actual value and the predicted value for the model.

$EF_{i,t}$: It represents the ecological footprint. Reasons such as rapid population growth, developing technology, increased urbanization rate, increased production and consumption activities cause environmental problems such as unconscious consumption of natural resources, increase in waste, destruction of agricultural lands, forests and living species.

$TA_{i,t}$: It shows tourism activities. The tourism sector has some externalities such as air pollution, water pollution, noise pollution, visual pollution and soil pollution. Especially the air conditioning and cooling systems of tourist facilities and fuel emissions resulting from tourism activity pollute the air. Most importantly, the fact that hotels do not have a proper sewage system and wastewater treatment system causes sea pollution. Considering these effects of tourism activities, it is expected that the number of incoming tourists will positively affect the ecological footprint.

$EC_{i,t}$: It gives the total energy consumption. The increase in energy consumption brings with it important environmental problems such as air, water and soil pollution. In theory, energy consumption is expected to positively affect the ecological footprint.

$IND_{i,t}$: It represents the data of industrialization. Industrialization without adequate infrastructure causes the destruction of forests, vegetation and many natural resources through the waste left by factories during the goods processing and production process. It is expected that industrial waste is one of the dominant factors that positively affects the ecological footprint.

$URB_{i,t}$: Urban population was taken as an indicator of urbanization. As the urbanization rate increases, housing demand, energy demand and consumption rate will also increase. In addition, the conversion of fertile lands into residential areas, consumption of natural resources and generation of waste will cause environmental problems. Theoretically, urbanization is expected to increase the ecological footprint.

$FDI_{i,t}$: When we examine the literature on the relationship between foreign direct investments and the environment, a long-term relationship was observed in underdeveloped and developing countries, while no significant relationship was found in developed countries.

Empirical Findings

Table 3 provides the descriptive statistics of the variables we used in the empirical study. All mean values of variables are found to be positive.

According to the descriptive statistical values, it is seen that the difference between the minimum and maximum values is low and the standard errors of the variables are also low. There are 374 observations in total for all variables. For this reason, the data set was evaluated as a balanced panel data set.

In order to apply parametric tests, normality distribution must be ensured. In this context, kurtosis and skewness coefficients were examined in order to determine the suitability of the variables for normal distribution. Hair et al. (2010) and Byrne (2010) stated that data is considered to be normal if skewness is between -2 to +2 and kurtosis is between -7 to +7. Since the skewness and kurtosis values in Table 4 remain between these critical values, it can be said that the variables are normally distributed. For this reason, it was decided to apply parametric tests in the study.

High correlation between independent variables causes some calculation errors, inconsistent results and incorrect coefficient values. For this reason, a correlation test was applied to see the relationship of the variables with each other. Table 4 shows the correlation test results.

The results of the correlation table show that there is a high correlation between some variables. The fact that the correlation coefficient between two variables is close to 1 suggests that there may be multicollinearity. While the correlation coefficient between the LOGIND variable and the LOGTA variable was found to be 0.853, the correlation of the LOGFDI variable with the LOGTA and LOGIND variables was determined as 0.559 and 0.601, respectively. Since the correlation between the LOGIND variable and the LOGTA variable was high, it was evaluated that there was a risk of multicollinearity problem in our model.

The problem of multicollinearity occurs when the correlation between variables is high. This will cause coefficient estimates to be biased and inconsistent. For this reason, whether there was a multicollinearity problem between the variables in the model used in this study was tested with Variance Increase Factor analysis.

In general, when the VIF value is above 10 (VIF values ≥ 10), the existence of multicollinearity between variables is accepted (Topal et al., 2010: 56). In the multicollinearity

Table 3: Descriptive statistics -means, standard deviation, skewness and kurtosis

	EF	LOGTA	LOGEC	LOGIND	URB	GDP	LOGFDI
Mean	3.76	15.54	9.977	23.694	67.133	2.194	21.87
Median	3.7	15.483	10.06	23.347	67.498	2.44	21.704
Maximum	7.7	18.325	12.847	27.066	94.81	18.912	25.286
Minimum	1.2	11.842	7.368	20.274	41.741	-19.748	14.509
Std. dev.	1.58	1.561	0.691	1.906	15.617	4.069	1.724
Skewness	0.12	0.008	-0.206	0.285	0.112	-0.715	-0.327
Kurtosis	1.87	2.23	3.225	1.862	1.958	6.889	3.839
Obs.	374	374	374	374	374	374	374

Source: Calculated by the author using Stata 18 program

Table 4: Correlation Matrix

Variables	ECOPC	LOGTA	LOGIND	LOGFDI	GDP	LOGEC	URB
ECOPC	1,000						
LOGTA	0.204	1,000					
LOGIND	0.273	0.853	1,000				
LOGFDI	0.281	0.559	0.601	1,000			
GDP	-0.113	-0.167	-0.212	-0.133	1,000		
LOGEC	0.853	0.198	0.228	0.322	-0.129	1,000	
URB	0.502	0.207	0.203	0.420	-0.216	0.499	1,000

Source: Calculated by the author using Stata 18 program

test results shown in Table 5, the fact that VIF values are lower than 5 shows that there is no multicollinearity problem among the variables that would affect the model.

After it is determined that there is no multicollinearity problem in the model, parametric tests can be started. Table 6 includes the results of the OneStep System GMM, OneStep Difference GMM, Fixed Effects and Random Effects analyzes determined for this study.

In dynamic panel data models, the AR(1) value is statistically significant, that is, first-order autocorrelation; It is important that the second-order autocorrelation AR(2) value is not meaningless, in other words, it is not a first-order autocorrelation (Baum and Schaffer, 2013). It is seen that there is no autocorrelation in the Arellano-Bond One Step Difference GMM and System GMM test analyzes performed for the model (Table 6). AR(1) values are statistically significant and negative at the 5 percent level for both analyses. AR(2) values give insignificant results as expected. These results show that there is no autocorrelation in the models, GMM estimates are consistent and therefore the coefficients are interpretable.

The Wald test gives the result that all explanatory variables together explain the dependent variable significantly. According to the GMM estimation results, the lagged value of the ecological footprint is significant at the 1% level. The Sargan test, which was performed to determine the overvaluation problem in the model, was also found to be at the desired values. It was determined that there was no overvaluation in the instrumental variables used in the GMM analysis and that the selected instrumental variables were appropriate to use in the model. The lagged value of the dependent variable added to the model in the GMM analysis was found to be significant and positive, as expected, as a result of both the System GMM and Difference GMM analyses. This shows that the determined model is consistent.

Table 5: Results of Variance Inflation Factor (VIF) Test

	VIF	1/VIF
LOGIND	4,116	0.243
LOGTA	3,724	0.269
LOGFDI	1,864	0.537
URB	1,543	0.648
LOGEC	1,371	0.73
GDP	1,089	0.919
Mean VIF	2,284	.

Source: Calculated by the author using Stata 18 program

A one percent increase in the number of tourist arrivals (LOGTA) rising the ecological footprint (EF) by 0.133 units according to the System GMM analysis result, and by 0.226 units according to the Fixed Effects estimator results. It was concluded that the number of tourist arrivals affects the ecological footprint significantly and positively. On the other hand, Difference GMM and Random Effects estimator show that the number of incoming tourists (LOGTA) has a negative impact on the ecological footprint (EF).

It is seen that the largest share of energy costs in the tourism sector is in heating, lighting and hot water usage in hotels and restaurants. It has a positive and statistically significant effect on energy use (LOGEC) and ecological footprint (EF) in all estimators . According to the results obtained, a one percent increase in energy use will cause an increase of 0.369, 0.286, 0.458 and 1.003 units on the ecological footprint (EF) for the System GMM, Difference GMM, Fixed Effects and Random Effects estimators, respectively.

The industrialization variable (LOGIND) gave significant results only as a result of Fixed Effects and Random Effects estimators. Accordingly, a one percent increase in the industrialization (LOGIND) variable will cause an increase of 0.361 and 0.211 units on the ecological footprint (EF) for the Fixed Effects and Random Effects estimators, respectively.

Table 6: Determinants of Ecological Footprint (2001-2021)

EF (Dependent Variable)	(1)	(2)	(3)	(4)
	System GMM	Difference GMM	Fixed Effects	Random Effects
EF(L1)	0.884*** (0.038)	0.809*** (0.061)	-	-
LOGTA	0.133** (0.051)	-0.007 (0.095)	0.226*** (0.09)	-0.058 (0.074)
LOGIND	-0.078 (0.053)	0.219 (0.143)	0.361*** (0.105)	0.211*** (0.073)
LOGFDI	0.053*** (0.026)	0.055** (0.027)	-0.107*** (0.031)	-0.086*** (0.033)
GDP	0.03*** (0.007)	0.02*** (0.007)	0.013 (0.009)	0.024*** (0.009)
LOGEC	0.369*** (0.101)	0.286** (0.135)	0.458*** (0.12)	1.003*** (0.11)
URB	-0.006*** (0.002)	0.015 (0.014)	-0.053*** (0.016)	0.020*** (0.007)
_cons _	-4.258*** (1,183)	-	-7.035*** (2,218)	-9.833*** (1,461)
Observations	357	340	374	374
year dummy	YES	YES	NO	NO
AR(1)	-8.37 (p =0.000)	-7.79 (p =0.000)		
AR(2)	1.25 (p =0.210)	1.04 (p =0.300)		
Sargan Test	0.058	0.08		
F Test / Wald Test Possible .	0.000	0.000	0.000	0.000
Number of Vehicle Variables	107	102	-	-

*** Significant at 1%
** Significant at 5%
* Significant at 10%
Parentheses indicate standard errors. System GMM and Difference GMM include time dummies.
AR1 (AR2) Arellano–Bond test for 1st (2nd) order autocorrelation

Tourism activities cause population concentration at certain times of the year, usually during the tourism season and in certain tourist destinations. The urbanization (URB) variable was resulted with different coefficients by the estimators. According to the Random Effects estimator, there is a positive intercourse between urbanization (URB) and ecological footprint (EF). A one percent increase in the urbanization (URB) variable will increase the ecological footprint (EF) by 0.020 units. The Fixed Effects estimator did not obtain a significant result, although there was a positive relationship between urbanization (URB) and ecological footprint (EF).

The effect of the economic growth (GDP) on the ecological footprint (EF) was found to be positive and statistically significant in all estimators, except the Fixed Effects estimator. When the analysis results are examined, if the economic growth (GDP) variable increases by one percent, the ecological footprint (EF) variable will cause an increase of 0.030, 0.020 and 0.024 units for the System GMM, Difference GMM and Random Effects estimators, respectively.

A statistically significant effect was found in GMM analyzes between foreign direct investments (LOGFDI) and ecological footprint (EF). This result is compatible with economic theory and expectations. Accordingly, a one percent increase in foreign direct investments (LOGFDI); According to the results of system GMM analysis increasing the ecological footprint (EF) by 0.053 units; According to the Random Effects estimator, it reduces by 0.086 units.

CONCLUSIONS

Today, reasons such as technological advances, improvement in living standards and freedom of travel brought about by globalization have made tourism one of the fastest growing sectors in the world. These developments in the tourism sector have added a new dimension to the international trade economy. Especially in developing countries, tourism constitutes an important source of economic development. Foreign exchange inflows obtained through invisible exports as a result of

tourist activities have become an important source for countries. Thus, the foreign exchange inflow obtained from tourism revenues makes a significant contribution to meeting the balance of payments deficit of the countries. It also supports the economic growth of countries by increasing the employment volume. The contribution of the tourism sector to the national economy is an undeniable fact. When the literature on the impact of tourism activities on economic growth is examined, it is seen that tourism increases economic activities and, accordingly, supports economic growth in the long term. (Belisle and Hoy, 1980; Holzner, 2011). While the aim of investments in the tourism sector was primarily to obtain economic gains, today the concept of sustainable tourism has emerged and the effects of tourism activities on environmental quality have come to the fore. It is a fact that the environmental consequences of the rapidly growing tourism sector cannot be ignored any longer (Gössling et al., 2002:199-200).

The main purpose of this study is to examine the relationship between tourism activities and ecological footprint in countries bordering the Mediterranean, where the tourism sector is intense. In the study where Dynamic Generalized Method of Moments (GMM), system GMM, fixed effects model and random effects models were used, the data range was determined as 2001-2021. In this context, the ecological footprint indicator was used to represent environmental degradation. In the study, where the number of incoming tourists was considered as the main control variable, an ecological footprint model was created by including control variables such as industrialization, urbanization, foreign direct investments, economic growth and energy consumption, which are among the factors that are related to tourism activities and trigger the ecological footprint, into the model. When evaluated from this perspective, the study aims to contribute to the few empirical literature on this subject and to provide a source for studies in this field by investigating the environmental damage of tourism in countries bordering the Mediterranean, where tourism activities are intense, with the ecological footprint indicator, which includes many factors such as carbon footprint. aims. The findings obtained are limited by the econometric method used, the data set used in the analysis and the period covered by the analysis.

According to the System GMM estimator, it was concluded that the number of incoming tourists, energy consumption, foreign direct investments, economic growth and urbanization positively affected the ecological footprint. According to another estimator Fark GMM, it has been observed that energy consumption, foreign direct investments and economic growth increase the ecological footprint. According to the Fixed Effects estimator, the effect of all variables except economic growth on the ecological footprint was found to be positive. In addition, according to the Random Effects estimator, energy consumption, foreign direct investments, economic growth and urbanization positively affect the ecological footprint. The results obtained from the study confirm the views that tourism activities cause environmental degradation.

The results obtained from the study are similar to Bagliani studies in the literature. et al. (2004), Leon et al. (2014), Godil et al. (2020), Younes et al. (2020), Kongbuamai et al. (2020a), Ansari et al. (2021), Alola et al. (2021), Kutlu et al. (2022), Adedoyin et al. (2022) and Guan et al. (2022), that tourism activities cause environmental degradation.

When the studies reviewed in the literature are evaluated in general, although the effect of tourism activities on the ecological footprint may show different results in terms of country groups, the period examined and the estimation methods used, the findings obtained in general lead to an increase in the ecological footprint of tourism activities. In this context, strategies to reduce environmental damage caused by the tourism sector are an inevitable necessity. Countries should develop and evaluate their natural resources within the framework of sustainability. Environmentally friendly tourism projects aiming at sustainable tourism should be prepared. In order for the plans and programs prepared in this direction to be successful, all actors within the system, the public and private sectors, must act together. Everyone, not just airline companies, hotels and restaurants, has to be a part of the solution. Both local governments and non-governmental organizations, as well as the public and other relevant institutions and organizations, must fulfill their duties and responsibilities (Grössling, 2023). On the other hand, individuals who make up the society should be made aware of reducing their ecological footprint and their awareness levels should be increased. In order to increase public awareness, it would be useful to hold meetings and speeches on reducing the ecological footprint in both schools and public institutions. School, factory, fairgrounds etc. Information about environmental pollution should be presented at mass events; People should be made aware of the ecological footprint through various communication tools such as radio, television, internet and magazines. For a sustainable future, more rational choices should be made regarding the resources used and the energy consumed, and ways to live without harming the environment and without exceeding the self-renewal limit of natural resources should be found. Targeting policies to minimize the negative impact of tourism activities on the ecological footprint can only be achieved within the scope of properly planned and sustainable tourism.

REFERENCES

Adedoyin, F.F., Alola, U.V. and Bekun, F.V. (2022). On the nexus between globalization, tourism, economic growth and biocapacity: evidence from top tourism destination. *Environmental Science and Pollution Research* (2022) 29:24995–25005.

Alola, AA, Eluwole, KK, Lasisi, TT and Alola, UV (2021). Perspectives of Globalization oath Tourism As Drivers of Ecology Footprint in Top 10 Destinations Economies. *Environmental Science oath Pollution Research*, 28, 31607-31617.

Ansari, MA and Villanthenkodath, MA (2021). Does Tourism Development Promo ecological Footprint? A Nonlinear ARDL Approach. *Anatolia*.

Anser, M.K., Yousaf , Z., Awan, U., Nassani , AA, Qazi Abro , MM and Zaman, K. (2020). Identifying the Carbon emissions Damage to International Tourism : Turn a Blind Eye. *Sustainability*, 12(5), 1-20.

Aranson, L. (1994). Sustainable Tourism Systems: The Example of Sustainable Rural Tourism in Sweeden. *Journal of Sustainable Tourism*, Vol:2, Issue: 1+2, London.

Arellano, M. and Bond S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *The Review of Economics Studies* , 58 (2), 277-297.

Arı A. (2021). Analysis of Renewable Energy, Tourism, CO2 and GDP Relationship for Turkey. *Journal of Academic Approaches* , C: 12 P: 2 YEAR: 2021, 192-205.

Bagliani, M., et al. (2004). The ecological footprint analysis for the Province of Venice and the relevance of tourism. Transactions on Ecology and the Environment, WIT Press.

Bahaire, T, White, M. E. (1999). The Application of Geographical Information Systems (GIS) in Sustainable Tourism Planning: A Review. *Journal of Sustainable Tourism*, Vol. 7, No. 2, p. 159-174.

Balli, E., Sigeze, C., Manga, M., Birdir, S. and Birdir K. (2019). The relationship between Tourism , CO2 Emissions and Economic Growth : A Case of Mediterranean Countries. *Asia Pacific Journal of Tourism Research*, 24 (3): 219-232.

Banday, U.J., Assawa A. and Kaushik G. (2014). Tourism oath Its Impact on Economics Growth and Environment. *The Asian Economic Review*, September 2014, Volume 56, No.3, 147-162.

Baum, F. C. and Schaffer E. M. (2013). A general approach to testing for autocorrelation. Boston: Boston College.

Belisle, F.J. and D.R. Hoy, (1980). The perceived impact of tourism by residents a case study in Santa Marta, Colombia. *Annals of Tourism Research*, Volume 7, Issue 1, pp:83-101.

Bimonte, S. (2002). Information access, income distribution , and the Environmental Kuznets Curve. *Ecological Economics* , Elsevier , vol. 41(1), pages 145-156, April.

Bontempi, M.E and Golinelli, R., (2012). The effect of neglect the slope parameters' heterogeneity on dynamic models of corporate capital structure. *Quantitative Finance*, Taylor & Francis Journals, vol . 12(11), pages 1733-1751, November

Byrne, B.M. (2010). Structural equation modeling with AMOS: Basic concepts, applications, and programming. New York: Routledge.

Clarke, J. (1997). A Framework of Approaches to Sustainable Tourism. *Journal of Sustainable Tourism*, Vol. 5, No. 3, p. 224-233.

Cottrell, S. Von Der Duim R., Ankersmid P., Kelder L. (2004). Meausuring The Sustainability of Tourism in Manue Antonio and Texel: A Tourist Perspective. *Journal of Sustainable Tourism*, Vol. 12, No. 5, p. 409-431.

Çeken, H. (2008). A Theoretical Examination on the Effect of Tourism on Regional Development. *Afyon Kocatepe University, Faculty of Economics and Administrative Sciences Journal* (CX, S II, 2008)

Çeştepe, H., Yıldırım, E. and Yıldız, H. (2020). The Impact of Health on Economic Growth in Turkey: Panel GMM Evidence from 81 Provincial Levels. *International Journal of Economic and Administrative Studies*, (28), 175-192.

Garcia-Falcon, J. and Medina-Munoz, D. (1999). Sustainable tourism development in island: A case study of Gran Canaria, Business *Strategy and the Environment*, 8, 336-357.

GFN (2023), Global Footprint Network, Access address: https://www.footprintnetwork.org/, (Accessed date: 18 September 2023)

Godfrey, K. B. (1996). Towards Sustainability?, Cited in: Lynn C. Harrison and Winston Husbands, Practicing Responsible Tourism: International Case Studies in Tourism Planning, Policy, and Development, John Wiley & Sons Inc., New York, pp. 58-79.

Godil, DI, Sharif, A., Rafique, S. and Jermsittiparsert , K. (2020). The Asymmetric Effect of Tourism, Financial Development and Globalization on Ecology Footprint in Turkey. *Environmental Science an Pollution Research*, 27, 40109-40120.

Gössling, S. (2000). Sustainable tourism developing in development countries: some aspects of energy-use. *Journal of Sustainable Tourism*, 8 (5), 410-425.

Gössling, S., Hansson, C.B., Horstmeier, O.and Saggel, S. (2002). Ecological Footprint Analysis As A Tool To Assess Tourism Sustainabilty. *Ecological Economics*, pp:199-211.

Greene , W. (2012), Econometric analysis (7th ed.). USA: Pearson education Publication.

Grossman, GM, and Krueger, AB (1993). Environmental impacts of a north American free trade agreement-In : Garber. The US Mexico Free Trade Treaty, 165-177.

Guan, C., Rani, T., Yueqiang, Z., Ajaz, T., & Haseki, M. I. (2022). Impact of tourism industry, globalization, and technology innovation on ecological footprints in G-10 countries. *Economic Research-Ekonomska Istraživanja*, 35(1), 6688-6704.

Hair, J.F., Hult, G.T.M., Ringle, C.M. and Sarstedt, M. (2022). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), Sage, Thousand Oaks, CA.

Han, V., Polat, G. and Coşkun, S. (2022). Türkiye'de Turizm Gelişiminin Çevresel Bozulma Üzerine Etkisinin Değerlendirilmesi. *Fiscaoeconomia*, 6 (2), 345-361.

Holzner M. (2011). Tourism and economic development: The beach disease? *Tourism Management*, Volume 32, Issue 4, Pages 922-933.

Isik, C., Kasimati, E. and Ongan, S. (2017). Analyzing the Causalities between Economic Growth, Financial Development, International Trade, Tourism Expenditure and /on the CO2 Emissions in Greece. Energy Sources, Part B: *Economics, Planning and Politics* , 12 (7): 665-673.

Jebli MB and Hadhri W. (2018). The dynamic causal links between CO2 emissions from transport, real GDP, energy use oath international tourism. *International Journal of Sustainable Development & World Ecology*, 25:6, 568-577,

Jebli, MB, Youssef, SB and Apergis, N. (2019). The dynamic linkage between renewable energy, tourism, CO2 emissions, economic growth, foreign directly investment and trade. *Latin American Economic Review*, 28 (2), 1-19.

Katırcıoğlu, S., Gökmenoğlu, KK and Eren, BM (2018). Testing the Role of Tourism Development in Ecological footprint Quality: Evidence from Top 10 Tourists Destinations. *Environmental Science oath Pollution Research* , 25, 33611-33619.

Khan, I. and Hou, F. (2021). The dynamic links among energy consumption, tourism growth, and the ecological footprint: the role of environmental quality in 38 IEA countries. *Environmental Science and Pollution Research*, 28(5), 5049-5062.

Khoi, NH, Le, NH and Ngoc, BH (2021). The Effect of Tourism Development on the ecological Footprint in Singapore: Evidence from Asymmetric ARDL Method. *Current Issues in Tourism*.

Kongbuamai, N., Bui, Q., Yousaf, H.M.A.U. and Liu, Y. (2020a). The Impact of Tourism and Natural Resources on the Ecological Footprint: A Case Study of ASEAN Countries. *Environmental Science and Pollution Research*, 27(16), 19251-19264.

Kongbuamai, N., Zafar, MW., Zaidi, SAH and Liu, Y. (2020b). Determinants of the ecological Footprint in Thailand : The Influences of Tourism, Trade Openness, and population Density. *Environmental Science oath Pollution Research*, 27(32), 40171-40186.

Kutlu, Ş. Ş. and Kutlu M. (2022). Turizm Faaliyetlerinin Ekolojik Ayak İzi Üzerine Etkisi: Türkiye Örneği. *Maliye Dergisi*, Ocak-Haziran 2022; 182:233-249.

Lee, J. W. and Brahmasrene, T. (2013). Investigating the Influence of Tourism on Economics Growth and Carbon Emissions: Evidence from Panel Analysis of the European Union. *Tourism Management* , 38: 69-76.

Liu, Y., Sadiq, F., Ali, W. and Kumail, T. (2022). Does tourism development, energy consumption, trade openness oath economic growth matters for ecological footprint: Testing the Environmental Kuznets curve oath pollution haven hypothesis for Pakistan. *Energy* 2022, 245, 123208.

Meşter, I., Simut, R., Meşter, L. and Bâc, D. (2023). An Investigation of Tourism, Economic Growth, CO2 Emissions, Trade openness oath Energy Intensity Index Nexus: Evidence for the european Union. *Energies*, 2023, 16, 4308.

Nathaniel, S.P., Barua, S. and Ahmed, Z. (2021). What drives ecological Footprint in Top Ten Tourists Destinations? Evidence from Advanced Panel Techniques. *Environmental Science oath Pollution Research*, 28, 38322-38331.

Paiano, A., Crovella, T. and Lagioia, G. (2020). Managing Sustainable Practices in Cruise Tourism: The Assessment of Carbon Footprint and Waste of Water and Beverage Packaging. *Tourism Management*, 77, 1-12.

Öztürk, İ., Al- Mulali U. and Saboori B. (2016). Investigating the environmental Kuznets curve hypothesis: the role of tourism oath ecological footprint. *Environ science Pollut Res* (2016) 23:1916–1928.

Öztürk, Y. and Yazıcıoğlu, İ. (2002). A Theoretical Study on Alternative Tourism Activities for Developing Countries. *Gazi University Journal of Commerce and Tourism Education Faculty*, Issue: 2, pp.183-195.

Rico, A., Martínez-Blanco, J., Montlleó, M., Rodríguez, G., Tavares, N., Arias, A. and Oliver-Solà, J. (2019). Carbon Footprint of Tourism in Barcelona. *Tourism Management*, 70, 491-504.

Sarkodie, S., A., and Strezov, V. (2019). A review on Environmental Kuznets curve hypothesis using bibliometric and meta- analysis. *Science of the Total Environment*, 128-145.

Scott, D., Hall, C.M. and Gössling, S. (2016). A Review of the IPCC Fifth Assessment and Implications for Tourism Sector Climate Resilience and Decarbonization. *Journal of Sustainable Tourism*, 24(1), 8-30.

Selvanathan, E.A., Jayasinghe, M. and Selvanathan, S. (2020). Dynamic modeling of inter-relationship between tourism, energy consumption, CO2 emissions oath economic growth in South Asia. *International Journal of Tourism Research* 2020, 1-14.

Sun, Q. and Liu, Z. (2020). Impact of Tourism Activities on Water Pollution in the West Lake Basin (Hangzhou, China). *Open Geosciences*, 12(1), 1302-1308.

Tatoğlu, F.Y. (2012). Advanced panel data analysis. Istanbul: Beta Publishing.

Topal, M, Eyduran, E., Yağanoğlu, A. M., Sönmez,A. Y. and Keskin S. (2010). Use of Ridge and Principal Components Regression Analysis Methods in Multiple Linear Connection Case. *Atatürk University Faculty of Agriculture Journal*, 41 (1), 53-57, 2010.

Torres-Reyna, O. (2007). Panel Data Analysis Fixed and Random Effects Using Stata, Data and Statistical Services Lecture Notes, Princeton University.

Tsai KT, Lin TB, Hwang RL and Huang YJ (2014). Carbon dioxide emissions generated by energy consumption of hotels oath homestay facilities in Taiwan. *Tour Manag* 42:13–21.

Tunay, K.B. (2014). Türkiye'de Banka Karlılığının Belirleyicileri: Ölçek Büyüklükleri, Mülkiyet ve Finansal Krizler Temelinde Yeni Bir Analiz. *Bankacılar Dergisi*, Sayı 91, 3-35.

Vita GD, Katircioglu S, Altinay L, Fethi S and Mercan M. (2015). Revisiting the environmental Kuznets curve hypothesis in tourism development context. *Environ science* Pollut Pic. DOI: 10.1007/s11356-015-4861-4.

Wackernagel, M., Lewan, L., and Hansson, C.B. (1999). Evaluing the use of natural capital with the ecological footprint, *Ambio* , 28, 604–612.

World Development Indicators DataBank (2020), Access date: 15 September 2023, Access address: https://databank.worldbank.org/reports.aspx?source=world-developmentindicators.

WWF-Turkey, 2012, Turkey's Ecological Footprint Report (2012), Turkey.

Younes, M., Khalil, A. and Alazab, M. (2020). The impact of the Ecological Footprint on tourist attitudes in choosing the tourist destination. *Journal of the Faculty of Tourism and Hotels University of Sadat City*, Volume 4, Issue 1 - Serial Number 7, Part 1, Pages 48-64.

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The Relationship of Financial Behaviors with Personality Traits and Financial Literacy: An Empirical Research

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ABSTRACT

People's transactions in financial markets may vary according to their financial literacy levels and personality traits. The main goal of this paper is to evaluate the connection between the characters and financial literacy levels of individuals and their financial behaviors. This study used a quantitative research method to reveal the relationship between variables. A simple random sampling technique determined the study's sample, and the survey technique was chosen to collect data. The questionnaire was created from the Type A and B Personality Scale and the Self-Determination Scale. In addition, a section to determine the level of finance literacy was added to the survey. In line with the findings got from the research data analysis, it was seen that the financial literacy level of people with type A personality traits is higher, and people with this personality type make more rational decisions in financial behaviors. These findings show that financial behaviors vary according to personality traits and actors can act irrationally in financial markets.

Keywords: Financial Literacy, Financial Behavior, Personality Traits, Type A and B Personality Characteristics, Self Determination.

JEL Classification Codes: G53, G10, G41, D14

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INTRODUCTION

Financial literacy is frequently on the agenda of policymakers and economists due to the increasing number of people making transactions in financial markets and the growing volume of transactions. In particular, the relative increase in the short-term return rates of capital market instruments in the recent period has triggered the use of instruments traded in these markets by abandoning traditional investment instruments, and the fact that a specific part of the households seeks investment in this field, regardless of profession and area of expertise. In addition, the increase in product diversity and the high rate of return in the capital markets have increased the incentives for investors to obtain returns. From this perspective, it is inevitable for individuals with low financial knowledge to make wrong decisions while developing an investment strategy (Bozkurt et al., 2019). It was carried out to reveal whether there is a connection between individuals' financial literacy levels and personality traits when making investment decisions. In this regard, after first discussing the concepts of financial literacy level and personality traits, individuals' financial behaviors were examined in more depth within the framework of these concepts.

Financial literacy is an important phenomenon that closely concerns the decision-making processes of individuals in financial markets. Financial literacy is an individual's ability to understand financial concepts and terms, make informed financial decisions, and effectively manage personal financial resources. These abilities enable individuals to make conscious financial decisions and can, therefore, affect their financial success (Kılıç et al., 2015). Moreover, personality traits are also one of the main factors affecting individuals' behavior. Personality types can shape individuals' risk tolerance, financial preferences, and investment decisions. Differences in personality traits are a subject that has been researched from the past to the present. The studies which the difference in personality traits require dealing with a structure difficult to observe at first glances, such as detecting behavioral differences (Chamorro & Premuzic, 2014). Considering the environment in which individuals

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live, personality types are the expressions of the attitudes in the life processes of human nature, such as people's worldview, their attitude towards the people around them, working principles, and the conduct of daily relationships. (Adler, 2011).

Research on personality traits generally concerns the similarities and differences between people. The fact that human behaviors are organized regularly and can be observed and that they can be classified with specific patterns allows us to measure how much behavior change can occur in people depending on these variables. The aim is to predict the differences between many stereotypes, such as health, happiness, and stress, by measuring them over time. It offers a universal framework to compare personality traits and individuals among themselves and explain their characteristics (Chamorro & Premuzic, 2014).

The main reason why we chose the self-determination scale and type A and B personality scales among the personality traits scales in our study is the main points that these scales focus on in person. The analysis of whether individuals are affected by environmental factors during self-determination-scale decision-making is closely related to our subject. On the other hand, the Type A and B personality scale makes it possible for individuals to distinguish between two essential personality traits and limit their character traits to two main factors, allowing us to examine investors under two types of characteristics. The strategy that individuals follow while investing within the framework of their own financial knowledge, decision-making skills, and personality type forms the basis of the study. In this sense, it is explained why self-determination scale and type A and B personality scales are chosen among personality traits theories, and the concepts are explained.

The experiences of individuals from childhood to developmental age and maturity age are effective in the formation of personality as a whole, and these personality traits play an active role in directing the individual. (Cemalcılar, 1999). Personality traits, among the determinants of household investment strategies, are generally used to monitor and analyze consumption habits. In terms of investment policies, the decision-making mechanisms of individuals can take shape according to their personality traits, just as in consumption. While individuals transfer some of their income to savings and investment instruments, they will be willing to choose vehicles with potentially high returns and high-profit expectations. While deciding on this choice, the level of risk-return factors for the individual becomes more important than financial information. (Ergün & Şahin, 2014). At this point, personality traits have an important role in individuals› Preference for high-risk, medium-risk, or low-risk investment instruments.

Along with the essential characteristics that make up personality, the choice of investment instruments is also related to the people›s financial information, and the determination of their options with these two primary factors makes the concepts of personality traits and financial literacy connected. Financial knowledge is an indicator of the way individuals will follow while investing. For this reason, individuals› financial skills, knowledge, and savings have a share in the share they allocate from their income to investors. Their personality traits have a decisive stake in their decisions while taking these financial actions (Hamza & Arif, 2019; Potrich & Vieira, 2018; Jain et. al., 2022; Bhargava et.al., 2022)

This study focuses on the variables that affect the investment decision-making criteria of individuals. The study emphasizes that personality traits, the variables that individuals are influenced by when making investment decisions, and the level of financial knowledge can be based on a significant relationship. Personality traits are based on many theories, such as dual process theory, social learning theory, bounded rationality theory, consumer socialization theory, psychological learning theory, self-determination theory, and the five-factor model of personality. Scales enable the descriptive analysis of the theories regarding many personality traits (Mcleod, 2021). The study examined the relationship between financial behaviors, personality traits and financial literacy. Environmental factors, social factors, and past experiences are influential in analyzing the criteria that make up the personality. Therefore, personality traits were analyzed within the framework of these factors. The study›s main question is how the personality traits and financial literacy levels that affect investors› financial decisions and sensitivity to risk affect financial behavior.

A questionnaire method was applied in our research. The survey was carried out with 400 participants selected according to the random sampling method, without dividing the households into groups based on occupation, age, and education level. The degree of financial literacy of the participants, as well as their personality traits and how these influenced their financial actions, were examined. The fact that individuals who want to trade in financial markets act according to their financial literacy level within the framework of their personality traits can contribute to making the right decisions during market

transactions and healthily making investment decisions. Similarly, the question of whether it is possible to stop investment ideas from leading to losses due to low financial literacy due to personality traits and people making poor decisions during their transactions in financial markets also arises.

Although the studies on the topic published in the literature mainly examined the relationship between financial literacy level and personality traits, no assessment of the participants› financial behaviors was done. Studies on the subject have investigated the impact of personality traits on financial literacy and identified significant relationships (Pinjisakikool, 2017; Goulart et al., 2022). There are also studies examining the relationship between investors› financial literacy levels and financial behaviors within the framework of investors› preferences against risk (Aren & Aydemir, 2015; Waheed et al., 2020; Khan, 2016; Adil et al., 2021; Sadiq & Azad, 2019). The five-factor personality trait scale (Jain et al., 2022; Hamza & Arif, 2019) was used in studies addressing the effect of personality traits on the relationship between financial literacy level and financial behavior. In addition, the same issue was taken with the personality colors scale of the participants› personality traits (Bhargava et al., 2022). The unique aspect of this study is that it used the Type A and B personality traits scale when comparing the participants› personality traits and financial literacy levels with their financial behaviors. While the A and B type personality traits scale mainly measures people›s behaviors, such as coping with stress, competitiveness, and haste, the five-factor personality traits deal with people›s behaviors in social relationships. With the idea that financial behaviors will be more affected by factors such as stress and competition rather than social relations, personality traits were tried to be measured within this framework and were included in the study. In addition, unlike the existing literature, whether investors are affected by environmental factors when making decisions was taken into account with the autonomous self scale. In this way, it contributes to the advancement of the literature scientifically by filling the gap identified in the literature.

In the first part of the study, the conceptual framework of the research will be discussed. Then, the method and data collection process will be explained, and the analysis of the obtained data will be presented. The results and discussion section will discuss the effects of financial literacy level and personality traits on financial behavior.

CONCEPTUAL FRAMEWORK

Financial literacy can be defined as the ability of individuals to understand financial concepts, interpret financial terms, and manage personal financial resources effectively. This concept is of fundamental importance for individuals to make conscious financial decisions (Kılıç et al., 2015). At the same time, personality traits are an important factor that shapes individuals' behavior. This study examines the personality traits of investors within the framework of type A and B personality traits and the autonomous self-trait, which expresses individuals' internal motivation and confidence in their decision-making abilities (Ryan & Deci, 2004). While type A personality describes competitive, ambitious, and sensitive individuals about time management, type B personality refers to more relaxed and patient individuals who cope better with stress (Friedman & Rosenman, 1974). Type A and B personality types were included in the study because their risk tolerance, potential to influence financial preferences and investment decisions, and autonomous self-scale will help us understand how individuals independently make their financial decisions. Under this heading, more detailed information about the financial autonomous self, Type A and B personality types, and financial literacy concepts will be given.

Self-Determination

Self-determination is a self-sufficient, independently thought self. Taking ownership of one's principles and deeds leads to a sense of competence in yourself, regardless of the cultural norms and social structures of the society in which one lives. The individual's view of life and the thought system based on this view, the philosophy of life, and self-determination are shown as the counterpart of the sense of self-sufficiency. While individuals continue their daily lives, they can offer different reactions to the same events with the influence of their past experiences (Akın et al., 2010).

At this point, the self-determination theory suggests a point of view that classifies the individual's motivation regarding the behavior within itself. The theory predicts that the individual's internal and external motivation differs according to his situation. For example, intrinsic motivation shows the result of obtaining the personal pleasure aimed by the action that the person will perform. On the other hand, extrinsic motivation is the desire to receive rewards rather than personal gratification, or it is the performance of an action based on obtaining a benefit from the action that will occur as a result of the action to be taken (Markus & Kitayama, 1991).

The self-determination theory defines people as beings who tend to develop since birth. This development process that people have shown only happens by chance. Along with the social environment, people build their personalities and character traits. While the social environment makes the activities of people easier at some times, it can make it difficult at other times. The effect of social norms on people directly affects their character traits. In this context, autonomous self-theory defines a human as a being prone to continuous development and bases the interaction with the social environment on the concepts of behavior, experience, and development. The concepts of self-contact and the choice fullness to illustrate two factors used in assessing these individual differences. The self-contact factor shows that the decision-making mechanisms of individuals are analyzed according to the level of being affected by external factors. The choice fullness is the factor of self-determination, which is analyzed whether individuals make decisions by being exposed to any motivation in their decision-making processes (Ryan & Deci, 2004).

The capacity to decide for oneself and take independent action free from outside influence or control is referred to as self-determination. It emerges as a scale that explains personality traits in which individual differences are considered in autonomous decision-making. It is an essential aspect of personal freedom and can be characterized as a source of satisfaction. The self-determination scale defines individuals as active creatures that show natural reflexes to develop. It is included in the autonomous self-explanation of the theory that this natural reflex does not develop spontaneously but occurs with the support of the social environment. For this reason, the fact that people's activities are affected positively or negatively by their social environment forms the basis of the emergence of the independent self-concept. The need for autonomy relates to the feeling that one can decide for himself in his actions rather than feeling that his actions are controlled or compelled to take them (Güldü & Kart, 2008).

Type A and B Personality Characteristics

They were categorizing the individuals that make up society in terms of their various distinctive features helps individuals to be better known. The theories of personality traits are studies on the analysis of the characteristics of individuals and on what reaction they give or can give to which effect. The analysis of personality traits helps to analyze what type of people can react to the event that is the subject of the research.

The Friedman and Rosenman (1974) Type A and B Personality Model tries to reveal the social and psychological makeup of the individual. Although not precisely, this approach allows for classifying people based on particular traits they possess (Durna, 2004). Type A and B personality is a concept that classifies individuals according to different personality traits and divides them into two other trait groups. The studies carried out, it was aimed to categorize the personality traits into two separate groups and to categorize the people with certain traits as A type and B type, and these two types were analyzed over their personalities. It has been determined that people with type A personality traits are generally faster and are in constant competition. The outcome of this contest and speed, they show stressful and hectic characteristics (Sakallı, 2019). Individuals with A-type personality traits make the necessary effort to reach the goal they have set for themselves. For this purpose, they are the personalities who can determine work time management correctly. People with A-type personality traits are generally described as impatient, weak bilateral relations, incapable of planning, aggressive, and generally work-oriented. In addition, it is determined as a personality trait that aims to have many talents as an individual talent and to do very successful work in a short time. People with A-type personality traits generally prefer to act quickly and keep busy (Ray & Bozek, 1980).

In the B-type personality trait, it has been stated that people have more positive, moderate, soft, and comfortable personalities. People with B-type personality traits prefer to reach the goal they want to achieve by planning, determining the right strategy, and generally acting more thoughtfully (Stroh et al., 2001). In B-type personality traits, people are expressed as the opposite of type A. People with B-type personality traits are less concerned with time. They prefer to have a more balanced life perspective. They make the choices that must be made about their lives and typically create a secure roadmap by carrying out this decision in a particular way. It would be incorrect to say whether type A or type B personality traits are more successful. The primary goal of a person with B-type personality traits is not necessarily success, though. The main factor is that people with type B personalities do not have exaggerated ambitions. Type B traits are more adaptable, less competitive, more relaxed, and less aggressive. They do not react very quickly to irritability and anger. Enjoying the activity they are doing is their primary goal. They have calm and orderly working principles. They prefer to be open to social circles and life (İbrahimoğlu & Karayılan, 2015).

The most fundamental criticism brought to the A, and B type personality scales is that the personality traits are sharply or oppositely separated from each other in this way, and it means that people have significant differences from each other. Individuals have unique personalities. The features that make up this personality are not only the features that can be counted among the A and B-type features. This personality trait, which provides a primary distinction between more than one factor that makes up the personality, has been used to classify people according to their general characteristics (Durna, 2010).

Financial Literacy

The notion of financial literacy has several definitions in the literature. Financial literacy is the capacity to logically assess an individual's income, expenses, and saves for investments, as well as the capacity to construct the proper budget balance in relation to the payments they have received (Schagen & Lines, 1996). Financial literacy is the skill of understanding and using financial terms and concepts. This skill is essential when trading in financial markets or making financial decisions. Financial literacy includes reading financial statements, understanding financial indicators, and communicating verbally and in writing on financial matters (Ergün & Şahin, 2014). Financial literacy demonstrates the ability of individuals to make an informed judgment about how they use and manage their income. The Program for International Student Assessment (PISA) defines financial literacy as understanding the concepts, risks, and skills necessary to make financial decisions to increase the economic development of individuals and society and having the motivation and self-confidence to use all these concepts and skills effectively (OECD, 2013).

Based on those definitions, the essential elements of financial literacy are comprehending the acquired financial information and implementing financial actions with self-confidence. The OECD has defined financial literacy as a critical concept that should be among individuals› achievements. Based on this, programs are being developed to increase the financial literacy competence of individuals. Along with the OECD, financial institutions see the concept of financial literacy as a tool to increase the financial participation of individuals. According to studies, the use of financial instruments and financial literacy are directly correlated. Financially literate individuals assess their savings more favorably than those with poor management, investing, and saving abilities. As a result of this assessment, people are seen putting more money or investment accounts into the financial markets (INFE, 2009).

Financial literacy level is an essential concept in terms of completing both individual and social development processes. The idea of financial literacy, which is shown as a concept that develops the skills of individuals, such as making investments and managing their savings, should also be mentioned from a social perspective. From a social point of view, individual savings can be seen as a usable fund for economic development (Yılmaz & Kaymakçı, 2021). Using some of society›s income in savings instruments makes the policies implemented by the government through savings funds more manageable. In other words, the increase in the financial literacy level of the individuals who make up the society contributes to the rise in the capital accumulation, production opportunities, and employment opportunities in the society. When viewed with a snowball effect, we can associate the awareness of financial literacy with the level of financial literacy that will benefit social development, manage economic crises, and mitigate the situation›s impact (Kılıç et. al., 2015).

The level of individual welfare must be sustainable at a certain level. Financial literacy has a significant impact on ensuring this sustainability. The importance of the level of financial literacy becomes clearer thanks to the different financial asset levels of individuals with the same income level in the long run. Financial risks are a factor that threatens the welfare level of individuals as well as increases their responsibilities in decision-making processes. The fact that these risks can be minimized and that individuals have a sufficient level of knowledge against financial risks are attributed to the importance of financial literacy (Karadeniz & Öztepe, 2013).

DATA AND METHODOLOGY

In this study, which was conducted to reveal the relationship of financial behaviors with type A-B personality traits, autonomous self-levels, and financial literacy, data obtained from 400 randomly determined people were used. The study's main question is, are financial literacy level and personality traits effective in financial behaviors or financial decisions? This study's fundamental supposition is that financial literacy levels and type A personality traits will be positively correlated. In addition, in this study, it is assumed that people with type A personality traits will engage in financial behaviors that will be considered more risky, and people with a high choice factor will make more rational decisions in their financial behavior. The survey approach was chosen as the primary way for gathering data because the study was designed as quantitative research. The SPSS Statistics program was used to examine the data collected from

400 individuals. Difference tests and correlation tests were run within the parameters of the investigation. In addition, cluster analysis and tree diagram were used to support the quantitative analysis findings.

The study's main limitation is that the data collection process is not collected at different times but continuously until a sufficient sample is reached. For this reason, the findings obtained from the study were interpreted on possible situations instead of revealing a definite cause-effect relationship.

In the questionnaire created to collect data within the scope of the study, four different sections were created: demographic characteristics of the participants, financial literacy levels, self-determination scale, and type A and B personality scale. While determining the questions to determine the level of financial literacy, Ozdemir et al. (2021) and developed by Sarıgül (2015). Financial literacy scales were used. In addition, in line with the opinions of academicians who are competent in their fields, questions about financial literacy were added, and a Likert -structured survey section consisting of 22 questions was created.

The self-determination scale, developed by (Ryan et al., 1996) and adapted into Turkish by Kart and Güldü in 2008, was used to measure the independent selves of the participants. (Ryan et al., 1996) The 10-item, 5-point Likert-type scale has a minimum scoring threshold of 10 points and a maximum scoring threshold of 50 points. The greater the participant's self-determination and understanding of personal requirements, the higher their score on the scale. The Güldü & Kart (2008) Cronbach's alpha value of the Self-Determination Scale was found to be 0.72 in the study.

Bortner Rating Scale is widely used to measure the participants' type A and B personnel characteristics. The scale in question consists of 14 questions prepared to be opposite each other. Aktas (2001) and Erdogan (2012) abbreviated the Bortner Rating Scale and published the Short Form of the Bortner Rating Scale. This study used the Likert -type short form of the scale, the Bortner Rating Scale. The participant's scores on the scale with seven opposing statements are multiplied by three to produce a score that ranges from 21 to 168. Participants are classified as having Type A personality traits if their scores are 100 or higher and Type B personality traits if they receive scores below 100 (Aktaş, 2001).

To measure the financial behavior of the participants, the transactions they carried out in the financial markets were taken into account. The markets in which people can invest are classified in different ways. Markets can be categorized according to their maturities, whether they are over-the-counter or centralized, whether they are primary or secondary, and as derivative markets developed to protect against financial risks with the increasing product diversity today (Anson et.al, 2010; Fabozzi et.al., 2019). Markets are divided into two, money and capital markets, according to their maturities (Sayim, 2021). Short-term, low-risk, and high-liquid instruments such as bonds, deposits, and repos are traded in money markets. Financial instruments such as stocks and bonds are used in capital markets, which have maturities longer than one year and have a relatively higher risk rate. Investors can also trade in precious metals, foreign exchange, and commodity markets besides money and capital markets. In addition, there are investment instruments such as futures, forwards, options, and swaps in derivative markets (Sayim, 2021; Kaya, 2023). The choices investors make among all these financial instruments are generally an important indicator that reflects their financial behavior and financial management abilities (Paksoy, 2021; Aydın & Büşra, 2016). Choices made in financial market instruments reflect individuals' financial goals, risk tolerance, and financial awareness (Ritter, 2003; Shleifer, 2000; Jain et.al., 2020). In this context, within the scope of the study, people were asked which financial investment instrument they turned to to measure their financial behavior, and inferences were made according to the features and differences of financial investment instruments. For example, it is accepted that a person investing in stocks has a higher risk tolerance. In contrast, a person investing in foreign currency or precious metals has a lower risk tolerance, and the behaviors of investors are grouped within this framework.

To assess the internal consistency of the scales over the correlations of the items targeted at survey study participants with one another, reliability analysis is carried out (Çevik & Akgül, 2005). According to Özdamar (2004), if the Cronbach alpha value of each scale is less than 0.4 as a result of the analysis, the scale is unreliable. 0.4 to 0.6 is low reliable; 0.6 to 0.8 is reasonably reliable; finally, it is highly reliable if it is more significant than 0.8. The reliability analysis results for each scale made with the SPSS package program are shown in the table below. In addition, the reliability value of the study is 0.822, which shows that the findings of the analyzes performed with the obtained data are reliable.

Table 1. Reliability Analysis

Name of Scale	Cronbach Alpha	Confidence Level
Self-Determination Scale	0.752	Reasonably Reliable
Bortner Rating Scale	0.777	Reasonably Reliable
Financial Literacy	0.900	Highly Reliable

Table 2. Analysis of Normality

Name Of Scale	Skewness	Kurtosis	Distribution
Self-Determination Scale	-,944	,255	Normally Distributed
Bortner Rating Scale	-1,218	-,518	Normally Distributed
Financial Literacy	-,110	-,681	Normally Distributed

To determine if the data were parametric or non-parametric and which analysis should be made to the variables in the SPSS statistics program, the normality analysis was conducted within the study›s parameters. First, a normality analysis was performed to determine whether the data were parametric. The sample size for a parametric test must be greater than 30, the data must be quantitative (likert scale), and the data must be regularly distributed (Abbott, 2011). Among the parametric test assumptions in this study, it is quantitative, and the sample is more than 30. According to Tabacknick and Fidell, the Skewness and Kurtosis values produced as a consequence of the normality study are adequate to accept that the data are usually distributed if they are between -1.5 and +1.5. (Tabachnick & Fidel, 2013). The table below displays the findings of the normalcy analysis of the study›s scales.

The Skewness and Kurtosis values of each scale used in the survey varied from -1.5 to +1.5, which according to the results of the normality analysis suggested that the data collected from the participants had a normal distribution. In addition, as the obtained data provided all of the parametric test assumptions, the decided was made to do parametric analyses on the data.

Table 3. Demographic Characteristics

VARIABLE		PIECE	PERCENTAGE %
Gender	Woman	188	47
	Male	212	53
Age	18-25	62	15.5
	26-35	186	46.5
	36-45	115	28.8
	46-55	30	7.5
	56 and above	7	1,2
Marital Status	Single	174	43.5
	Married	226	56.5
Income Level	5000 and below	59	14.8
	5001-10000	61	15.3
	10001-15000	122	30.5
	15001-20000	87	21.8
	20001-25000	28	7
	25001 and above	43	10.8
Education Level	Middle School	5	1.3
	High school	28	7
	Associate Degree	52	13
	Licence	176	44
	Masters's Degree	95	23.8
	Doctorate	44	11

The study group consists of 400 randomly determined people. The table below shows details on the study participants› demographic characteristics.

47 of the participants from whom we obtained data within the scope of the study were female, and 53 were male. Approximately 75% of the participants are between the ages of 26-45, 43.5% are single, and 56.5% are married. It can be seen that the distributions of the research participants› monthly income levels are reasonably similar to one another. Additionally, when the participants› level of education is looked at, it is discovered that almost 80% have at least a bachelor›s degree.

RESULTS

The table below displays the results of the analysis performed using the independent sample t-test for questions with two possible answers and the ANOVA test for questions with multiple possible answers to determine whether there is a statistically significant difference between the scales used in the study in light of the demographic information gathered from the participants.

It may be claimed that the analysis findings with a significant value less than 0.05 reveal a statistically significant difference when taking into consideration the significant values acquired as a consequence of the difference studies carried out. The analysis findings that reveal statistically significant differences are highlighted in italics in the table above. Only financial literacy levels differ by participant gender, according to the table. Based on the factors of marriage status, educational attainment, and income level, it can be demonstrated that there is a significant statistical difference among financial literacy and self-determination. Based on the age variable, only the self-determination scale exhibits a significant difference. For any demographic factor, there isn't a significant statistical difference between the Type A and B personality measures.

To ascertain the direction and magnitude of the linear relationship between two random variables, correlation analysis is used. Although different correlation coefficients have been developed for different situations, the best known of these coefficients and the most frequently used one in social sciences is the Pearson correlation coefficient. By dividing the covariances of two random variables by the sum of their standard deviations, the Pearson correlation coefficient is calculated. The range of values for this coefficient is (-1) to (+1). A positive coefficient represents a direct linear relationship between the variables, and a negative coefficient represents an inverse linear relationship (Özdamar, 2004). The closer the absolute value of the coefficient is to 1, the stronger the relationship between the two variables. (İslamoğlu & Alnıaçık, 2014)› according to; weak correlation if the correlation coefficient is less than 0.3; If it is in the range of 0.3-0.5, medium relationship; If it is between 0.5-0.8, there is a strong relationship, and if it is more significant than 0.8, there is a more strong relationship. The fact that this coefficient takes the value (0) indicates no linear relationship between the variables included in the research.

In order to ascertain whether there is a significant association between financial literacy level, Type A and B personality traits, and self-determination level, as well as the direction of that relationship, Pearson correlation analysis was performed.

The table was created using the results of a Pearson Correlation analysis, which examined the correlation between the variables using the 400 pieces of data collected for the study. The table shows a statistically significant relationship between financial literacy level, Type A and B personality, and Self-determination level. At a significance level of 0.05, there is a statistically significant correlation between Type A and B personality and financial literacy. Additionally, at a significance level of 0.01, there is a statistically significant correlation between financial literacy and self-determination levels. Additionally, it can be shown that both major

Table 4. Test Results for Difference Between Demographic Information and Scal**es**

SCALE	Sig . Value				
	Gender	**Marital Status**	**Age**	**Education Level**	**Income Level**
Financial Literacy	*0.00*	*0.005*	0.125	*0,000*	*0.001*
Self-Determination	0.078	*0.002*	*0.001*	*0.040*	*0.004*
Type A Type B Personality	0.366	0.858	0.142	0.698	0.449

Table 5. Relationship Between Scales

Correlations		
		Financial Literacy
Financial Literacy	Pearson correlation	1
	Sig . (2-tailed)	
Type A and B Personality	Pearson correlation	,055*
	Sig . (2-tailed)	,027
Self-Determination	Pearson correlation	,192 **
	Sig . (2-tailed)	,000

** 0.01 level (2-tailed).

* 0.05 level (2-tailed).

relationships are moving in a favorable way because both relationships have positive Pearson correlation coefficients.

The analysis results to examine the relationship between the level of financial literacy and demographic characteristics are given in the table below. According to the table, there is a statistically significant relationship at 0.01 significance level between gender, marital status, education level, income level, and financial literacy levels. In addition, when the Pearson Correlation coefficient of the significant relationships that emerged as a result of the analysis is examined, it is seen that there is a positive relationship.

Based on the data obtained from 400 randomly selected people, the analysis results to look at the relationship between all dependent and independent variables and demographic variables and the direction of the relationship are given in the table below.

Cluster Analysis

Cluster analysis is one of the many statistical methods that detect the closeness between the data included in the analysis. Statistical clustering methods are divided into two progressive and non-staged. Although advanced clustering methods depend on the difference or distance values between units, all events are grouped until they are members of a single group. Ward's method aims to achieve optimum groups, minimize the spread between groups, and variance within groups, which aims to minimize it, is the most widely used cluster analysis (He, 1996). Data can be grouped together using the multivariate statistical procedure known as cluster analysis. This analysis aims to group variables with different characteristics within the framework of their similarities. It is expected that each group formed by cluster analysis will have the same sensitivity, and all variables will be homogeneous groups (Sala & Bragulat, 2004; Dahl & Næs, 2004).

Table 6. The Relationship Between Demographic Characteristics and Financial Literacy

Correlations		
		Financial Literacy
Financial Literacy	Pearson Corr.	1
	Sig . (2-tailed)	
Age	Pearson correlation	,085
	Sig . (2-tailed)	,091
Gender	Pearson correlation	,253 **
	Sig . (2-tailed)	,000
Marital Status	Pearson correlation	,140 **
	Sig . (2-tailed)	,005
Education Level	Pearson correlation	,291 **
	Sig . (2-tailed)	,000
Income Level	Pearson correlation	,192 **
	Sig . (2-tailed)	,000

** 0.01 level (2-tailed).

* 0.05 level (2-tailed).

Table 7. Summary Table of Relationship Results

	Financial Literacy Self-Determination			Self-Determination			Type A and B Personality		
	Direction	Significancy	Value	Direction	Conclusion	Value	Direction	Conclusion	Value
Age	+	X	,085 C. / ,091 S.	+	✓	,192 C.** / ,000 S.	+	X	,069 C. / ,171 S.
Gender	+	✓	,253 C.** / ,000 S.	+	✓	,089 C. / ,075 S.	+	X	,046 C. / .364 S.
Marital status	+	✓	0.140 C.** / ,005 S.	+	✓	,153 C.** / ,002 S.	-	X	,009 C. / ,858 S.
Education level	+	✓	,291 C.** / ,000 S.	+	✓	,140 C.** / ,005 S.	+	X	,013 C. / ,796 S.
Income Level	+	✓	,192 C.** / ,000 S.	+	✓	,130 C.** / ,009 S.	+	X	,081 C. / ,106 S.
Self-Determination	+	✓	0.192 C.** / ,000 S.	1			+	✓	,118 C.* / ,018 S.
A-B Type Personality	+	✓	,055 C.* / ,027 S.	1	✓	,118 C.* / ,018 S.	1		
Financial Literacy	1			+	✓	,192 C.** / ,000 S.	+	✓	,055 C.* / ,027 S.

** 0.01 level (2-tailed).

* 0.05 level (2-tailed).

c. Peorson Correlation Coefficient
s. Significant Value

This study attempted to identify the attributes of the clusters produced by grouping the participants' financial literacy levels according to their personality traits. The distance between the variables used in the clustering analysis was specified as the squared euclidean distance. In cluster analysis, two steps were used as an algorithm. Five variables were included in the analysis: financial literacy, autonomous self, type A-B personality, those who trade in precious metals, and foreign currency, and those who trade in the stock market. As a result of the research performed with these variables, 3 clusters were formed. The quality range of the clusters created was reasonable (between 0.0 and 0.05). The sample size of the smallest group among the three clusters formed is 83 people (20.8%), and the largest cluster is 170 people (42.5%). The size of the third cluster is 147 people (36.8%). The largest group to lowest cluster ratio is 2.05. Cluster analysis findings performed in the SPSS Statistics program are shown below.

The importance of the linked variables in the clustering process and the homogeneity of the resulting cluster are considered when deciding the order of the columns in the table produced by the clustering analysis. In this direction, respectively, trading on stock market (1.00), trading with precious metals, or foreign currency, etc. (0.82), financial literacy (0.09), self-determination (0.04), and Type A and B personality characteristics (0.01) are the variables with the importance degrees. The clustering analysis produced information regarding the inputs of the groups. The 2nd group does not participate in stock market trading. Instead, these people deal with financial instruments such as precious metals, and foreign currency. They have low financial literacy, high self-contact, and type B personality characteristics. Persons in the 1st group trade on the stock market. It deals with financial instruments such as precious metals, and foreign exchange. They have low financial literacy levels, high self-contact, and type A personality characteristics. The

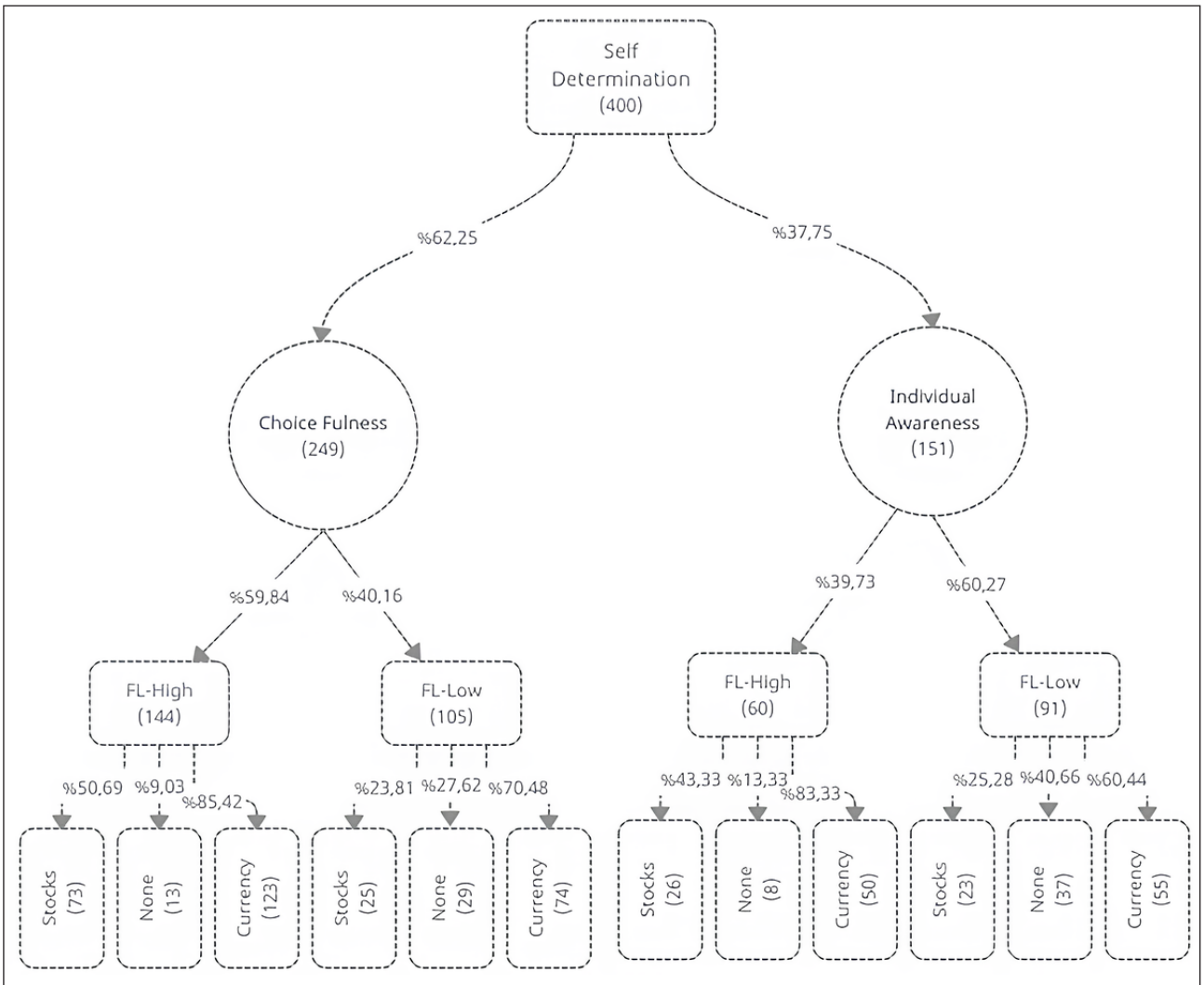
Table 8: Cluster Analysis Results

	Input (Predictor) Importance 1,0 0,8 0,6 0,4 0,2 0,0		
Cluster	2	1	3
Label			
Size	42,5% (170)	36,8% (147)	20,8%(83)
Inputs	Trading on stock market	Trading on stock market	Trading on stock market
	Trading with precious metals and foreign currency	Trading with precious metals and foreign currency	Trading with precious metals and foreign currency
	Financial literacy 4,81	Financial literacy 5,19	Financial literacy 4,53
	Self-determination 1,77	Self-determination 1,75	Self-determination 1,18
	A-B type 108,62	A-B type 149,71	A-B type 110,17

3rd group of people doesn't trade in the stock market or other financial products like precious metals, or foreign money. They have low financial literacy levels, high choice fullness, and type B personality characteristics.

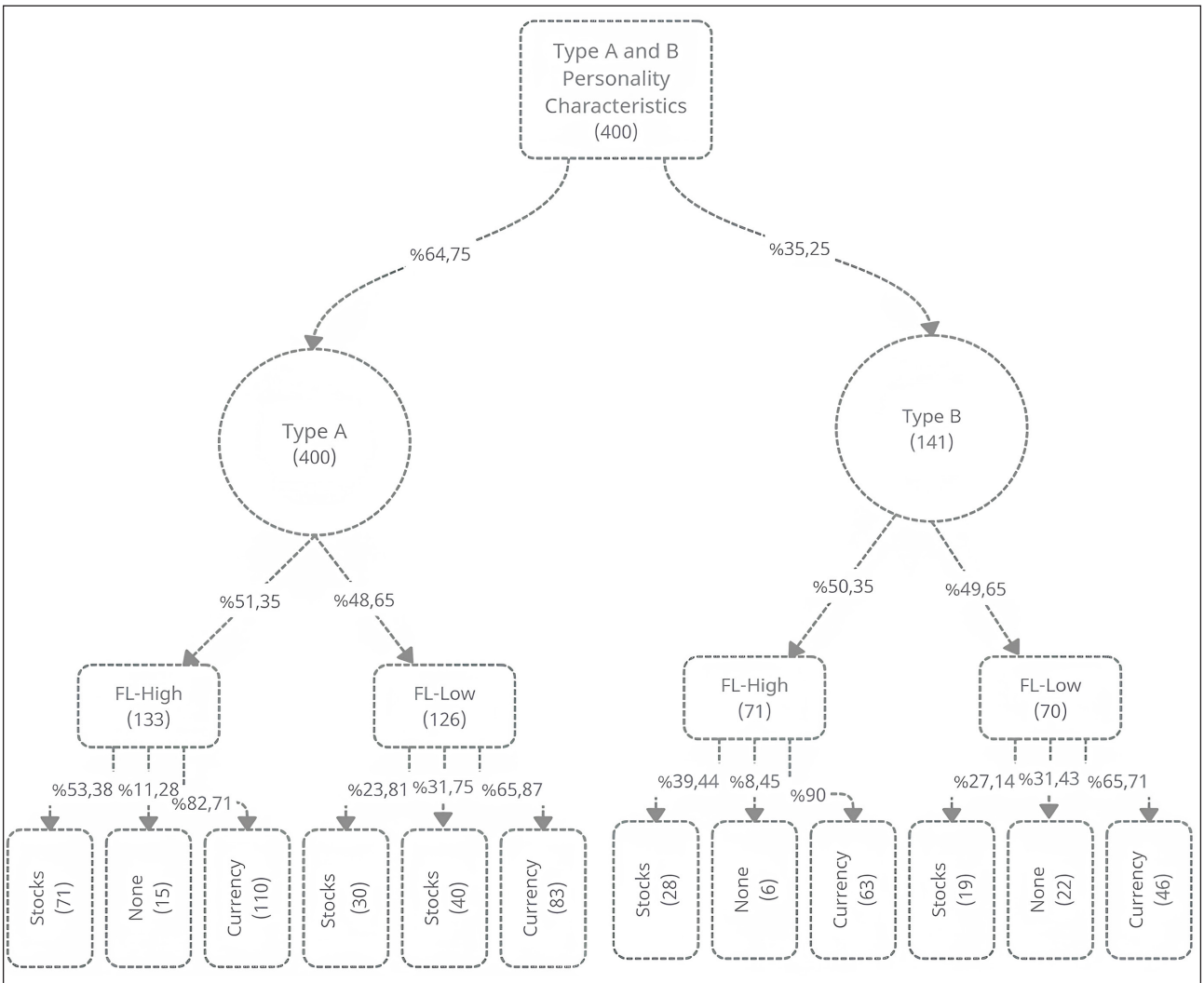
Tree Diagrams

Based on the information gathered for the study, a tree diagram of participants' financial activities and literacy levels, as determined by their scores on the self-



FL: Financial literacy level
Stocks: People who trade in stock market
Currency: People who trade with investment instruments such as precious metals, and foreign currency
None: People who don't participate in trading on the stock market and the foreign exchange market

Figure 1: Self Determination Tree Diagram



FL: Financial literacy level
Stocks: People who trade in stock market
Currency: People who trade with investment instruments such as precious metals, and foreign currency
None: People who don't participate in trading on the stock market and the foreign exchange market

Figure2: Type A and B Personality Characteristics Tree Diagram

determination scale and their Type A and B personality scores, is displayed in the figures below. Self-determination scale while creating tree diagram; It is divided into two sub-dimensions, the choice fullness, and self-contact. The sub-dimensions are divided into groups with high and low financial literacy (FL). Financial literacy levels are divided into 3 dimensions. Those who engage in stock market trading (stocks), Those who trade with precious metals, currency, etc. investment instruments (currency), and those who do not trade on the stock market or other traditional investment instruments (none). The numbers between the concepts show the number of people, and the numbers on the lines between the images show the percentages. The percentage ratios related to financial behavior are more than one hundred because participants trade both on the stock market and with traditional investment instruments.

According to the tree diagram prepared according to the self-determination scale, 62% of the 400 participants had a high level of choice fulness, while 38% had a high level of self-contact. The rate of people with high financial literacy is higher among people with high choice fullness. In both subgroups, more than 80% of the financially literate respondents trade in foreign exchange markets. It has been observed that persons with a high degree of choice fullness have a rate of stock market trading that is 7% lower than that of those who are financially knowledgeable. On the other side, those with a high level of self-contact have a higher percentage of financial literacy but do not trade stocks or use investment vehicles like precious metals, or foreign currency.

When the financial behaviors of the participants who are financially illiterate according to the When the self-determination scale is looked at, it can be seen that the ratio of stock market traders who are not financially literate

is near to one another in both sub-dimensions. Despite their lack of financial literacy, those who have a high level of choice are more likely to trade with investment assets like precious metals, and foreign currency. Conversely, people with higher levels of self-awareness tend to have a higher percentage of nonfinancial literate individuals who don't trade on the stock market or use investment vehicles like precious metals, or foreign currency.

According to the tree diagram prepared for the type A and B personality scale, 65% of 400 participants exhibit A-type personality characteristics and 35% B-type personality characteristics. Although the number of people with a high financial literacy level of type A personality characteristics is more elevated than people with type B personality characteristics, they are proportionally close to each other. Among the financially literate participants, 82.71% of type A people trade in foreign exchange markets, while 90% of type B people trade in foreign exchange markets. People with type A personality traits have a 13% higher rate of stock market traders among those who are financially literate. People with type A personality traits tend to have a higher percentage of people who are financially aware but do not trade on the stock market or with investment vehicles like precious metals, and foreign currency.

The percentage of participants who trade in the stock market despite being financially educated is 23.81% for type A people when the financial behaviors of the participants who are financially illiterate according to the Type A and B personality traits scale are evaluated. When compared to Type B individuals, it is 27.14%. Despite the lack of financial literacy, the proportion of people who trade with investing products like precious metals, and foreign currency is very close to each other (65%) in both personality types. The rate of people who are not financially literate and do not trade with investing products like precious metals, and foreign currency is similar in both personality types (31%).

CONCLUSION AND RECOMMENDATIONS

This study aims to address people's financial behaviors in terms of financial literacy level and personality traits. For this purpose, quantitative analysis methods were preferred, and the clustering analysis method and tree diagram were used to support the findings. This study differs from others that have looked at the connection between financial literacy and personality traits in that it interprets the topic in light of the participants' financial behavior. One of the study's limitations is that it does not reveal a definite cause-effect relationship as a result of the collected data not being collected at different times and being collected continuously until a sufficient number of samples is reached.

People's marital status, education level, and income level were shown to have a statistically significant and favorable link when the relationships between financial literacy level and demographic features were evaluated. The positive relationship between the marital status variable and financial literacy may be because married individuals tend to have financial issues with the responsibility of avoiding future economic uncertainties. It was believed that there would be a correlation between education level and financial literacy. The positive relationship between income level and financial literacy, the other hand, as people's income level increases, they may be because tend to evaluate the remaining income by investing after meeting their basic needs. For this reason, the higher the income, the higher the probability of trading in financial markets and the greater the need for financial information.

Our sample was separated into three groups as a consequence of the cluster analysis. Each cluster-derived category is made up of participants with inadequate financial literacy. The main points where they differ are financial behaviors, self-determination, and type A and B personality characteristics. Group no 1, obtained as a result of the analysis, consists of people with type A personality features, with high self-contact, and who trade both in the stock market and with traditional investing products like precious metals, and foreign currency. The people in group 2 have B-type personality traits, have high self-contact, and do not trade in the stock market but with traditional investing products like precious metals, and foreign currency. Group 3, unlike the other two groups, consists of people with a higher right to choose fullness. Persons in the 3rd group have B-type personality traits and do not trade on the stock market or with traditional investment instruments. While groups 1 and 2 are affected by their social environment while making decisions, group 3 makes decisions individually.

When Groups 1 and 2 are compared, both consist of people affected by their social environment while making decisions but differ according to A and B-type personality traits. As a result of this difference, those in the 2nd group tend to make rational decisions by being more cautious in their financial behaviors. On the other hand, those in the 1st group are more ambitious and result-oriented, so they tend to make riskier transactions despite their low level of financial literacy in their financial behavior. When group 2 and group 3 are compared, although both groups exhibit B-type personality traits, the main difference between the two groups is that the people in group 3 make their decisions individually. As a result, although they have B-type personality traits, individuals who make their decisions individually do not turn to any investment instrument, being aware of their low financial literacy level. However, people with B-type personalities, whose decisions are influenced by their social environment, trade with less risky traditional investing products like precious metals, and foreign currency, although their financial literacy levels are low.

The tree diagram method was used to assess the people with high financial literacy because the levels of financial literacy are low in each group that was created as a result of the cluster analysis. According to the figure, persons with greater choice fullness are more likely than those with greater self-contact to trade in the stock market and conventional investments like precious metals, and foreign currency. The fundamental cause of this discrepancy is that self-contact might choose to trade in riskier markets since they have a high level of financial understanding. According to the tree diagram created according to the type A and B personality characteristics, Among people with high financial literacy, type A personality traits are more likely to trade in the stock market compared to type B personality traits. However, among those who trade with traditional investment instruments such as precious metals, and foreign currency, the proportion of people with type B personality traits is higher. This is because the tendency to trade with stock market instruments that can be considered riskier is higher in more ambitious people.

As a result, it has been discovered that personality traits and levels of financial literacy have an impact on how individuals make judgments about their financial behaviors. This study is also consistent with previous research revealing the importance of financial literacy on financial behavior (Agnew & Szykman, 2005; Lusardi & Mitchell 2011; Aren & Aydemir, 2015; Sadiq & Khan, 2019; Waheed et.al, 2020). Financial literacy affects a person's income and ability to use financial instruments. The study's results show that personality traits also affect financial behavior, similar to studies on the subject (Diacon & Ennew, 2001; Warneryd, 2001; Hamza & Arif, 2019, Bhargava et.al., 2022). Financial habits are influenced by a variety of factors, including education and financial literacy. Every factor that affects a person's character, such as past experiences and environmental factors, can affect people's financial decisions and financial behaviors. The most crucial issue this study emphasizes is that, besides the impact of personality traits and financial literacy level parameters on financial behavior, many social issues such as individual experience, social environment, culture and religion, social norms, law, and legislation can affect financial behavior.

To deal with the subject in more detail in future studies, the risk aversion or risk-taking attitudes of the people in the sample can be included in the research and evaluated in terms of personality traits. In addition, the data gleaned from participants can be compared not continuously but by collecting them in different periods or before and after financial literacy training. Also, in the suitability test applied to individuals by banks that act as intermediaries in financial markets, it is possible to determine which risk group the person will be included in by asking questions about personality traits. In this way, it could contribute to more stable and reliable financial markets in the country.

REFERENCES

Abbott, M. L. (2011). Understanding Educational Statistics Using Microsoft Excel and SPSS. Wiley.

Adler, A. (2011). İnsan Tabiatını Tanıma, Çev: Ayda Yörükan, Türkiye İş Bankası Kültür Yayınları, İstanbul.

Adil, M., Singh, Y., & Ansari, M. S. (2021). How financial literacy moderate the association between behaviour biases and investment decision?. Asian Journal of Accounting Research, 7(1), 17-30.

Agnew, J. R., & Szykman, L. R. (2005). Asset allocation and information overload: The influence of information display, asset choice, and investor experience. The Journal of Behavioral Finance, 6(2), 57-70.

Akin, A., Eroğlu, Y., Kayiş, A. R., & Satici, S. A. (2010). The Validity And Reliability Of The Turkish Version Of The Relational-Interdependent Self-Construal Scale. Procedia - Social and Behavioral Sciences, 5, 579–584.

Aktaş, A. M. (2001). Bir Kamu Kuruluşunun Üst Düzey Yöneticilerinin İş Stresi ve Kişilik Özellikleri. Ankara Üniversitesi SBF Dergisi, 26–42.

Anson, M. J. P., Fabozzi, F. J., Jones, F. J. (2010). The Handbook of Traditional and Alternative Investment Vehicles: Investment Characteristics and Strategies. Ukrayna: Wiley.

Aren, S., & Aydemir, S. D. (2015). The moderation of financial literacy on the relationship between individual factors and risky investment intention. International Business Research, 8(6), 17.

Aydın, Ü., & Büşra, A. Ğ. A. N. (2016). Rasyonel olmayan kararların finansal yatırım tercihleri üzerindeki etkisi: Davranışsal finans çerçevesinde bir uygulama. Ekonomik ve Sosyal Araştırmalar Dergisi, 12(2), 95-112.

Bhargava, M., Sharma, A., Mohanty, B., & Lahiri, M. M. (2022). Moderating Role of Personality in Relationship to Financial Attitude, Financial Behaviour, Financial Knowledge and Financial Capability. International Journal of Sustainable Development & Planning, 17(6).

Bozkurt, E., Toktas, Y., & Altiner, A. (2019). Türkiye'de Tasarruf ve Finansal Okuryazarlık Üzerine Bir Araştırma. Elektronik Sosyal Bilimler Dergisi, 18(72), 1580–1605.

Chamorro-Premuzic, Tomas. (2014). Kişilik ve Bireysel Farklılıklar. İstanbul Ticaret Üniversitesi Yayınları.

Cemalcılar, İ. (1999). Pazarlama (Kavramlar- Kararlar). Beta Basım Yayım.

Çevik, O., & Akgül, A. (2005). İstatistiksel Veri Analizi: SPSS'te İşletme Yönetimi Uygulamaları. Kişisel Yayınlar.

Dahl, T., & Næs, T. (2004). Outlier and Group Detection In Sensory Panels Using Hierarchical Cluster Analysis With The Procrustes Distance. Food Quality and Preference, 15(3), 195–208.

De Bortoli, D., da Costa Jr, N., Goulart, M., & Campara, J. (2019). Personality traits and investor profile analysis: A behavioral finance study. PloS one, 14(3), e0214062.

Diacon, S., & Ennew, C. (2001). Consumer perceptions of financial risk.Geneva Papers on Risk and Insurance. Issues and Practice, 389-409.

Durna, U. (2004). Stres, a ve b tipi kişilik yapısı ve bunlar arasındaki ilişki üzerine bir araştırma. Yönetim ve Ekonomi, 11 (1), 191-206.

Durna, U. (2010). A Tipi ve B Tipi Kişilik Yapıları ve Bu Kişilik Yapılarını Etkileyen Faktörlerle İlgili Bir Araştırma. Journal of Economics and Administrative Sciences, 19(1), 275–290.

Erdoğan, Ç., & Zengin, B. (2012). Turizm Lisans Öğrencilerinin A ve B Tipi Kişilik Özelliklerine Göre Mesleki Yönelimlerinin Belirlenmesi: Sakarya Üniversitesi Örneği. 11. Geleneksel Turizm Sempozyumu.

Ergün, B., & Şahin, A. (2014). Finansal Okuryazarlık: İşletme Bölümü Öğrencileri Üzerine Bir Çalışma. Uluslararası Sosyal Araştırmalar Dergisi, 7(34), 847–864.

Fabozzi, F. J., Jones, F. J., Jones, F. J., Fabozzi, F. A., Mann, S. V. (2019). Foundations of Global Financial Markets and Institutions. Amerika Birleşik Devletleri: MIT Press.

Friedman, M., & Rosenman, R. H. (1974). Type A behavior and your heart. New York, NY: Knopf.

Goulart, M. A. D. O. V., da Costa Jr, N. C. A., Paraboni, A. L., & Luna, M. M. M. (2022). Can personality traits influence Brazilian university students' financial literacy?. Review of Behavioral Finance, 15(3), 410-426.

Güldü, Ö., & Kart E. M. (2008). Özerk Benlik Yönetimi Ölçeği: Uyarlama Çalışması. Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi, 41(2), 187–204.

Hamza, N., & Arif, I. (2019). Impact of financial literacy on investment decisions: The mediating effect of big-five personality traits model. Market Forces, 14(1).

He, Q. (1996). A Review of Clustering Algorithms as Applied in IR. Graduate School of Library and Information ScienceUniversity of Illinois at Urbana-Champaign.

İbrahimoğlu, N., & Karayılan, D. (2015). A ve B Tipi Kişilik Özellikleri İle Zaman Yönetimi Davranışları Arasındaki İlişkiler. Dumlupınar Üniversitesi Sosyal Bilimler Dergisi, 8(33), 155–168.

İslamoğlu, A. H., & Alnıaçık, Ü. (2014). Sosyal Bilimlerde Araştırma Yöntemleri - Beta Yayıncılık. Beta Yayıncılık.

INFE. (2009). Financial Education and The Crisis Policy Paper and Guidance.

Jain, J., Walia, N., & Gupta, S. (2020). Evaluation of behavioral biases affecting investment decision making of individual equity investors by fuzzy analytic hierarchy process. Review of Behavioral Finance, 12(3), 297-314.

Jain, R., Sharma, D., Behl, A., & Tiwari, A. K. (2022). Investor personality as a predictor of investment intention–mediating role of overconfidence bias and financial literacy. International Journal of Emerging Markets.

Karadeniz, O., & Durusoy Ö. N. (2013). Türkiye'de Yaşlı Yoksulluğu. Çalışma ve Toplum, 3(38), 77–102.

Kaya, F. (2023), Finansal Yatırım Araçları, Beta Basım Yayın, İstanbul.

Kılıç, C., Kılınç Savrul, B., & Bayar, Y. (2015). Türkiye Ekonomisinde 2000 Yılı ve Sonrasında Yaşanan Finansal Krizlerin Evlenme-Boşanma ve İntiharlar Üzerindeki Etkileri. Dumlupınar Üniversitesi Sosyal Bilimler Dergisi, 40.

Khan, S. (2016). Impact of financial literacy, financial knowledge, moderating role of risk perception on investment decision. Financial Knowledge, Moderating Role of Risk Perception on Investment Decision (February 4, 2016).

Lusardi, A., & Mitchell, O. S. (2011). Financial literacy around the world: an overview. Journal of Pension Economics and Finance, 10(04), 497-508.

Markus, H. R., & Kitayama, S. (1991). Culture and The Self: Implications for Cognition, Emotion, and Motivation. Psychological Review, 98(2), 224–253.

Mcleod, S. (2021). Type A and Type B Personality Theory - Simply Psychology.

OECD. (2013). Financial Literacy and İnclusion Results Of OECD/INFE Survey Across Countrles and By Gender.

Özdamar, K. (2004). Paket Programlar ile İstatistiksel Veri Analizi 1. Kan Kitabevi.

Özdemir, F. S., Bengü, H., Bulut, E., & Çelik, S. (2021). Bilim İnsanlarının Finansal Okuryazarlık Tutum ve Davranışları Üzerine Bir Araştırma: Niğde Ömer Halisdemir Üniversitesi Örneği. Anadolu Üniversitesi Sosyal Bilimler Dergisi, 21(2), 449–482.

Paksoy, S. (2021). Yatırımcı Davranışlarının Davranışsal Finans Açısından DeğerlendirilmESİ. Uluslararası Ticaret ve Ekonomi Araştırmaları Dergisi, 5(1), 50-56.

Pinjisakikool, T. (2017). The effect of personality traits on households' financial literacy. Citizenship, Social and Economics Education, 16(1), 39-51.

Potrich, A. C. G., & Vieira, K. M. (2018). Demystifying financial literacy: a behavioral perspective analysis. Management Research Review, 41(9), 1047-1068.

Ray, J. J., & Bozek, R. (1980). Dissecting The A-B Personality Type. British Journal of Medical Psychology, 53(2), 181–186.

Ritter, J. (2003). Behavioral Finance . Pacific-Basin Finance Journal, 429-437.

Ryan, R. M., & Deci, E. L. (2004). Autonomy Is No Illusion: Self-Determination Theory and The Empirical Study Of Authenticity, Awareness, and Will. The Guilford Press.

Ryan, R. M., Sheldon, K. M., Kasser, T., & Deci, E. L. (1996). All goals are not created equal: An organismic perspective on the nature of goals and their regulation. In P. M. Gollwitzer & J. A. Bargh (Eds.), The Psychology of Action: Linking Cognition and Motivation to Behavior, 7–26.

Sadiq, M. N., & Khan, R. A. A. (2019). Impact of personality traits on investment intention: the mediating role of risk behaviour and the moderating role of financial literacy. Journal of finance and Economics research, 4(1), 1-18.

Sakallı, A. E. (2019). A Tipi ve B Tİpi Kişilik Özelliğine Sahip Bireylerde İş Doyumu ve Kazalanma Arasındaki İlişkinin İncelenmesi. Ohs Academy, 2(1), 11–31.

Sala, C. H., & Bragulat, E. J. (2004). A Program To Perform Ward's Clustering Method On Several Regionalized Variables. CG, 30(8), 881–886.

Sarıgül, H. (2015). Finansal Okuryazarlık Tutum ve Davranış Ölçeği: Geliştirme, Geçerlik ve Güvenirlik. Journal of Management and Economics Research, 13(1), 200–218.

Sayım, F. (2021), Finansal Piyasalar Kurumlar ve Araçlar, Nobel Akademik Yayıncılık, Ankara.

Schagen, Sandie., & Lines, Anne. (1996). Financial Literacy In Adult Life : A Report To The NatWest Group Charitable Trust. NFER.

Shleifer, A. (2000). "Inefficient Markets: An Introduction to Behavioral Finance". Oxford University Press

Stroh, L. K., Northcraft, G. B., Greenberg, J., Neale, M. A., Kern, M., & Langlands, C. (2001). Organizational Behavior: A Management Challenge. Behavioral Sciences.

Tabachnick, B. G., & Fidel, L. (2013). Using Multivariate Statistics (Seventh Edition). Pearson Education.

Waheed, H., Ahmed, Z., Saleem, Q., Din, S. M. U., & Ahmed, B. (2020). The mediating role of risk perception in the relationship between financial literacy and investment decision. International Journal of Innovation, Creativity and Change, 14(4), 112-131.

Wärneryd, K. E. (2001). Stock-market psychology: How people value and trade stocks. Edward Elgar.

Yılmaz, H., & Kaymakçı, T. (2021). Finansal Davranışlar ve Finansal Okuryazarlık İlişkisi. Akademik Hassasiyetler, 8(15), 141–164.

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