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Social Sciences

Recent Research
Economics and Administrative Sciences- 2024

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PREFACE

The book, titled " Recent Research Economics and Administrative Sciences" includes research carried out by valued academics from several regions of Turkey. The topic includes interdisciplinary research in areas that include Business, Economics, Law, Applied Sciences, Public Administration, Political Science and International Trade and Logistics.

The book covers many current issues and methodologies, include Digitalization, Globalization, Innovation, supply chain management, financial analysis, bibliometric analysis, Monte Carlo analysis, causality analysis... Authors retrieved their datasets from the World Bank, TURKSTAT and the WoS database.

The book comprises fifteen chapters. The initial nine chapters relate to Business, covering subjects such as Quantitative Methods, Management and Organization, Production Management, Finance and Marketing. The next six chapters deal with different fields of Social Sciences, including Economic Policy, Economic Development, International Economics, Public Administration, Public Law, and International Trade and Logistics.

The book is expected to help academic members and graduate students working on social science research. Additionally, we expect that it will also be beneficial to a broader spectrum of readers.

I would like to express my appreciation to all authors who spend their time to contribute to this book and to all the publishing company staff who carefully and professionally participated in numerous responsibilities, including formatting and printing.

Prof. Dr. Gülsen KIRAL
Dr. M. Selçuk ÖZKAN

CONTENTS

CHAPTER I

A BIBLIOMETRIC ANALYSIS OF BEHAVIORAL FINANCE AND RISK

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1. Introduction

Behavioral finance has emerged as a sub-branch of finance that goes beyond the definition of classical finance and tries to integrate human psychology into all disciplines that include economics. Psychological factors form the basis of all economic activities, from production to consumption, from investment to saving behavior, and they closely affect these activities. It is possible to express the psychological elements expressed here as behavioral biases that affect individuals' financial decisions. These behavioral bias elements can cause individuals to make irrational decisions. These types of decisions reveal the risk potential that may occur in financial activities. Psychological variables closely affect current theories such as investor behavior, return expectation, corporate investment and financial management (Garg and Thakur, 2023).

Behavioral finance is a field of science whose research has increased significantly in recent years, especially because financial resources affect economic balances and the financial value of these resources increases day by day. Therefore, many scientists have revealed the effects of rational or irrational aspects of human decision-making (Hirshleifer, 2015Irrational and prejudiced behaviors of investors significantly affect the investment decision-making process. For nearly 30 years, researchers have been working hard on this topic, trying to prove that behavioral finance is worth studying to understand efficient financial markets.

The understanding of behavioral finance reveals the factors responsible for irrational decisions and provides investors with insights into the framework for effective investment strategies (Bhatia et al., 2020). In this study, it is aimed to expand the literature review methods in this field by making a bibliometric analysis of the literature on how risk perception is taken into account in the field of behavioral finance. The research results were used to examine the studies in the Web of Science database with R Studio software program, bibliometric and biblioshiny analysis, to identify trending topics in this field and to help future researchers synchronize their studies.

2. Methodology

The study is a bibliometric analysis conducted using articles taken from Web of Science, which is also classified as descriptive (Costa et al., 2019) and has a quantitative approach. The reason behind this choice is the Web of Science database's coverage of a wider range of journals and its established credibility as a source of information among researchers. Bibliometric analysis should be systematic, that is, based on primary studies, include clearly stated aims and methods, and be conducted using a clear and reproducible methodology (Greenhalgh, 1997). Bibliometric analysis uses three basic knowledge structures: conceptual, social, and intellectual (Aria & Cuccurullo, 2017). Bibliometric analysis covers the field of social sciences (Carlson and Ji 2011) and provides a strong and valid infrastructure for evaluating the literature (Liu et al. 2014).

In the search criteria, the words "behavioral finance" and "risk" occurring in the article title, abstract or one of the keywords were applied. The research period covers the period 1998-2024. The Web of Science database produced 1,067 matches as a result of this search. Therefore, according to Table 1, it is possible to explain the five steps that need to be followed in order to perform bibliometric analysis by adapting the bibliometric constraints developed by Prado et al. (2016).

Table 1: Steps to frame the research and the bibliometric analysis

Steps	Description
1- Choosing the object of analysis and scientific basis	a) Explain the scientific and theoretical framework of the study
	b) Determine the objectives of the research
	c) Determine the scientific infrastructure that will support the search for articles
2-Search procedures	a) Define the networks
	b) Describe operators for an advanced search
	c) Describe search filters
3-Data collection and organization	a) Describe software for managing resources
	b) Explanation of software suitable for bibliometric analysis
	c) Implementation of downloading of resources according to the resource manager, bibliometric analysis software and spreadsheet formats
	d) Transfer of articles to resource management and bibliometric analysis software
4-Context analysis of the scientific production related to the samples	a) Time analysis of identified publications
	b) Time analysis of publications through search networks
	c) Analysis of citations of identified articles
	d) Analysis of journals publishing identified articles
	e) Analysis of countries of origin of identified articles
	f) Analysis of keywords in identified articles
	g) Analysis of scientific fields of identified articles
5-Analysis of the citation networks in the samples	a) Analysis of the citations and co-citations in the total sample;
	b) Individual analysis of the citations and co-citations through the bias;
	c) Analysis of the most often cited authors;
	e) Analysis of the main journals;

Source Adapted from Prado et al. (2016)

2.1. Selection of Bibliometric Tool

A bibliometric technique was adopted in the study for comprehensive science mapping. Various software such as BibExcel, Publish or Perish, VOSviewer have been used in bibliometric studies conducted in the past. In this research, the Bibliometrix R-package, a tool developed by Ariaa and Cuccurullo (2017) in the R language, was used. This software facilitates studies with detailed bibliometric analyses, including data analysis and data visualization (Ingale and Paluri, 2022). In the study, data were analyzed using Biblioshiny, a web-based application included in the Bibliometrix package.

3. Data Analysis and Discussion

During the analysis period (1998-2024), a total of 1,067 publications, including 957 articles, 2 book chapters, 46 early access, 25 articles, 36 reviews and 1 early access, were obtained in scientific journals selected according to the specified keywords. The total number of citations was 34,439 and an average of 19.14 citations were made per article. The annual growth rate of the studies conducted is 12.82% and the average age of the documents is 6.61 years. There are 2,277 authors in the studies reached and 179 of the studies are single-authored studies. The number of co-authors per document is 2.63 and the international co-authorship rate is 25.96%.

Table 2: General Information

Description	Results
Maın Informatıon About Data	
Timeframe	1998:2024
Sources (Journals, Books, etc.)	298
Documents	1067
Annual Growth Rate %	12.82
Average Age of Document	6.61
Average citations per document	19.14
References	34439
DOCUMENT SCOPE	
Keywords Plus (ID)	1640
Author Keywords (ID)	2925
AUTHORS	
Authors	2277
Authors of single-authored documents	179
AUTHOR COLLABORATIONS	
Single-authored documents	199
Co-authors per document	2.63
International co-authorships %	25.96
DOCUMENT TYPES	
article	957
article; book chapter	2
article; early access	46
article; abstract	25
review	36
review; early access	1

Considering the annual production numbers of publications in Figure 1, the highest number of publications within the framework of the selected keywords was 125 in 2023, 107 in 2022, and 103 in 2021, respectively. The minimum number of publications was 1 in 2000-2001, 2 in 1998-1999, and 4 in 2002, respectively. When we look at the publication years, it is observed that risk has been addressed significantly within behavioral finance, especially since 2020.

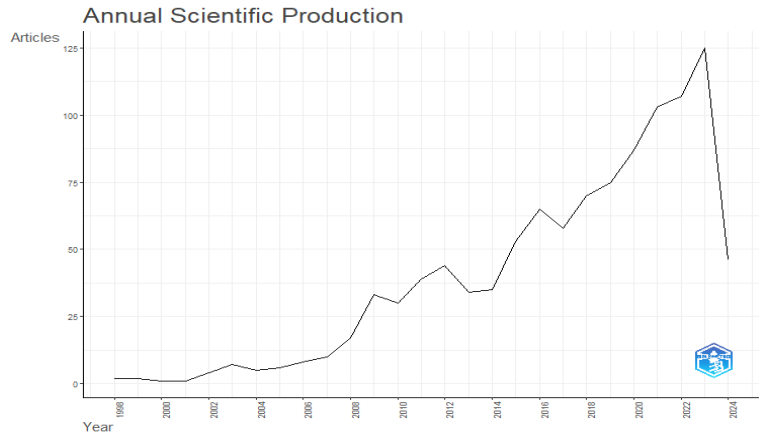

Figure 1: Annual Scientific Production Numbers

The three-field plot in Figure 2 gives the relationship between the three fields using Sankey Plots, where the quotient is proportional to the value of the size node (Riehmann et al., 2005). On the left side of the Sankey plot are the authors, in the middle row are the countries and on the right side are the sources selected for analysis. Each of the twenty articles depicts important countries such as the USA, China, England, Germany, Australia with their sources and productive authors. All twenty influential sources appear to originate from the USA, and the majority of the sources focus on behavioral finance and financial economics.

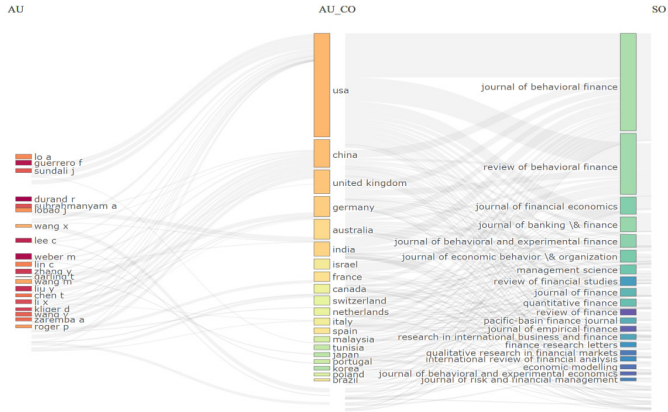

Figure 2: Three-Field Plot

Figure 3 shows the most relevant sources of publications on behavioral finance and risk. When looking at the sources, it is seen that behavioral finance journals have the highest number of publications (198) and reviews (144), and finance (12) and pacific-press finance journals (12) have the least number of publications.

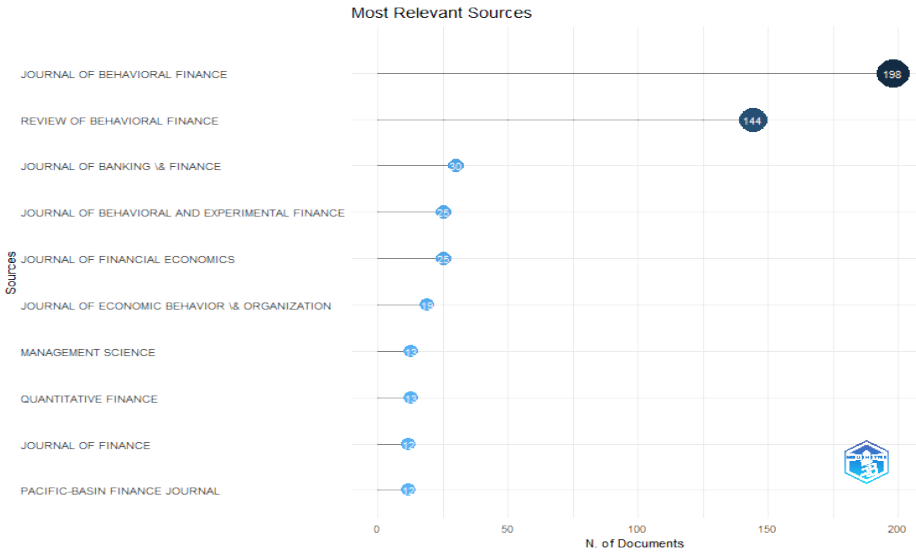

Figure 3: Most Relevant Resources

Countries working in the field of behavioral finance and risk are shown in blue on the world map in Figure 4. The increase in the number of publications is directly proportional to the intensity of the blue color. Dark blue countries produce more publications, while gray countries produce fewer publications. The countries where the most work is done in this field are America, China, Germany and England. In addition, it can be said that Türkiye, Portugal, Japan and Italy contribute to the studies in the field compared to other countries.

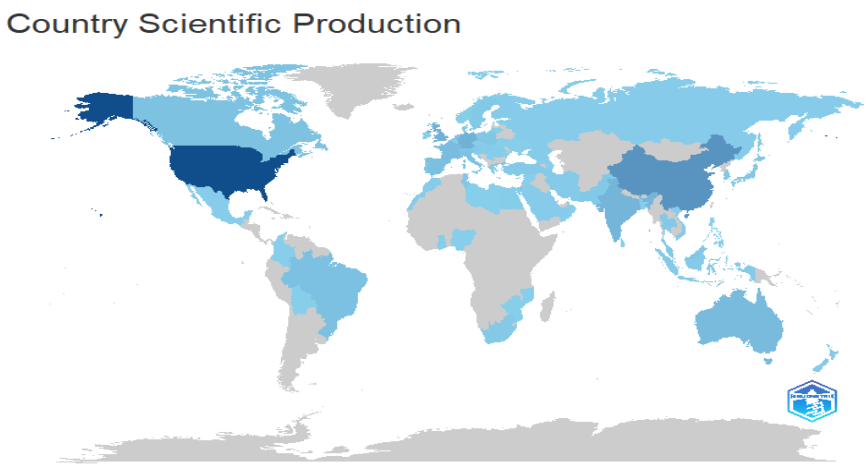

Figure 4: Country Scientific Production

Figure 5 displays the country cooperation map. Authors in America have co-authored 74 of a total of 154 publications, including 32 Chinese, 19 British, 12 Canadian and 11 Australian. The remaining 80 publications were made jointly with 33 other countries. America is followed by China with 10 collaborations and the UK with 7 collaborations.

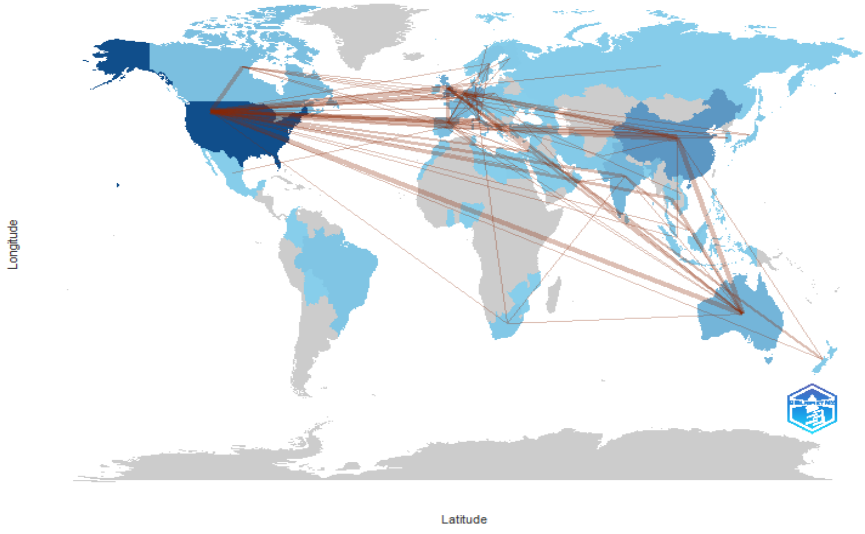

Figure 5: Country Collaboration Map

As seen in Figure 6, America, China and Germany are the countries with more than 1000 citations. Countries with less than 1000 citations are Malaysia, Brazil, Slovenia and Switzerland.

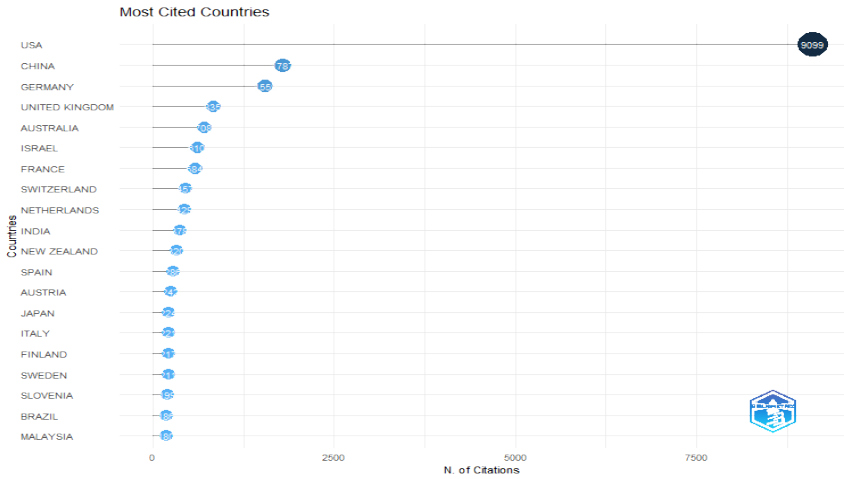

Figure 6: Most Cited Countries

Durand R, Weber M, Guerrero F, Lee C, Liu Y, and Zhang Y are the most prolific authors with the most publications in the field. Durand and Weber, among the top ten authors, have 8 publications each in this field, and Sundali and Subrahmanyam have 6 publications.

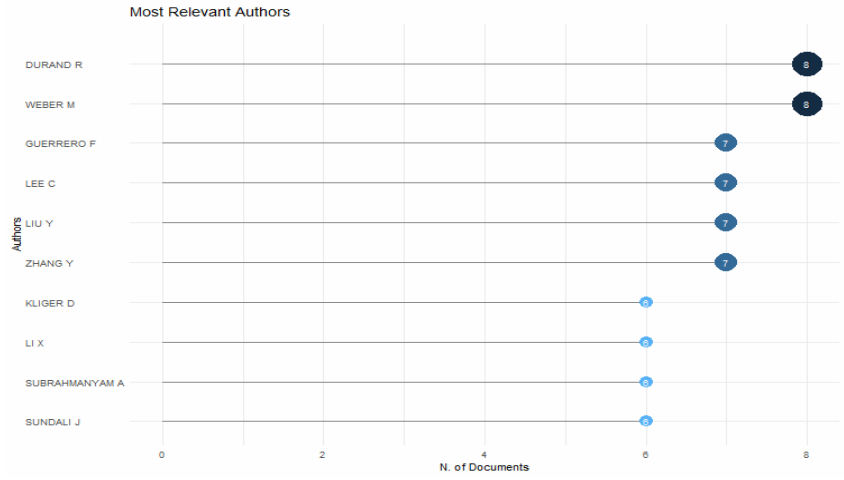

Figure 7: Most Relevant Authors

Table 3 provides comprehensive information about the most prolific authors. The top 20 authors with the most publications are listed. Among the 2,277 authors contributing to studies in behavioral finance and risk, the top contributor is Weber M, with the second top authors being Durand R, Kliger D, Lee C, Li X, and Wong W.

Table 3: Most Prolific Authors

Element	h_index	g_index	m_index	TC	NP	PY_start
Weber M	6	8	0,3	595	8	2005
Durand R	5	8	0,29411765	245	8	2008
Klıger D	5	6	0,33333333	98	6	2010
Lee C	5	7	0,20833333	463	7	2001
Lı X	5	6	0,38461538	56	6	2012
Wong W	5	5	0,29411765	100	5	2008
Aabo T	4	4	0,4	43	4	2015
Aspara J	4	4	0,23529412	94	4	2008
Hoffmann A	4	4	0,30769231	140	4	2012
Lın C	4	5	0,25	105	5	2009
Lıu Y	4	7	0,26666667	161	7	2010
Roger P	4	5	0,25	31	5	2009
Seıler M	4	4	0,26666667	50	4	2010
Subrahmanyam A	4	6	0,21052632	249	6	2006
Vasıleıou E	4	4	0,57142857	56	4	2018
Wang M	4	5	0,26666667	147	5	2010
Wang Y	4	6	0,30769231	55	6	2012
Yang C	4	5	0,33333333	43	5	2013
Zeısberger S	4	5	0,26666667	105	5	2010

Table 4 shows the most frequently mentioned keywords on behavioral finance and risk. Keywords commonly used in the literature are behavioral finance, investor sentiment, finance and prospect theory. In the table, risk, recycling, market and expectation theory are among the most discussed trending topics.

Table 4: 20 Most Commonly Used Author Keywords Related To Behavioral Finance And Risk

Most Frequent Words		Trend Topic	
Words	**Occurences**	**Item**	**Frequency**
behavioral finance	418	risk	388
investor sentiment	60	returns	165
finance	56	market	137
prospect theory	46	cross-section	128
behavioral	42	prospect-theory	123
asset pricing	41	performance	106
risk	41	information	101
risk aversion	38	model	77
market efficiency	30	investor sentiment	71
g11	27	prices	68
investment	27	decision	67
stock market	27	impact	67
overconfidence	26	decision-making	57

Figure 8 is a visual representation of the top keywords used over time. The most used keywords are risk (388), returns (165), market (137) and cross-section (128).

Figure 8: Word Cloud Analysis Showing Most Commonly Used Keywords

Figure 9 shows high-frequency keywords that have a tight association between behavioral finance and risk. According to Figure 9, three main clusters were created; “market”, “stock market”, “investor”, “evidence” cluster 1, “risk”, “behavioral”, “financial”, “investment” cluster 2, “behavior”, “impact”, “approach” ”, “social” and “analysis” indicate cluster 3.

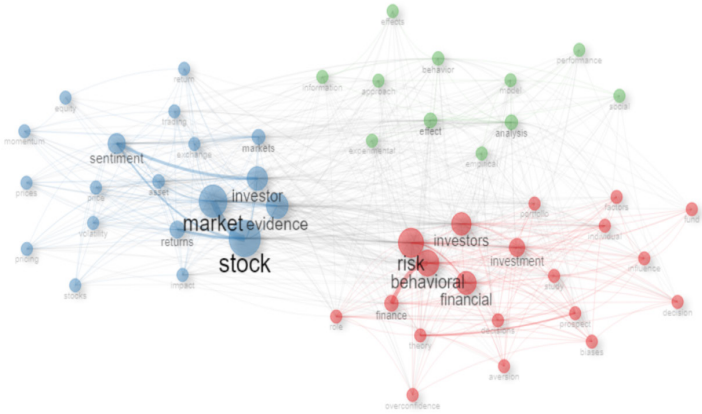

Figure 9: Co-Occurrence Network

Bradford's rule predicts that the number of journals in the second and third regions will be n2 times larger than in the first region; therefore, if the core and middle region numbers are known, the total number of journals carrying articles on a topic can be predicted (Cobo et al., 2011). Figure 10 shows the three most relevant sources for the topic of behavioral finance and risk. The journal of behavioral finance (198 articles) is the most important publication in this discipline, followed by behavioral finance reviews (144 articles).

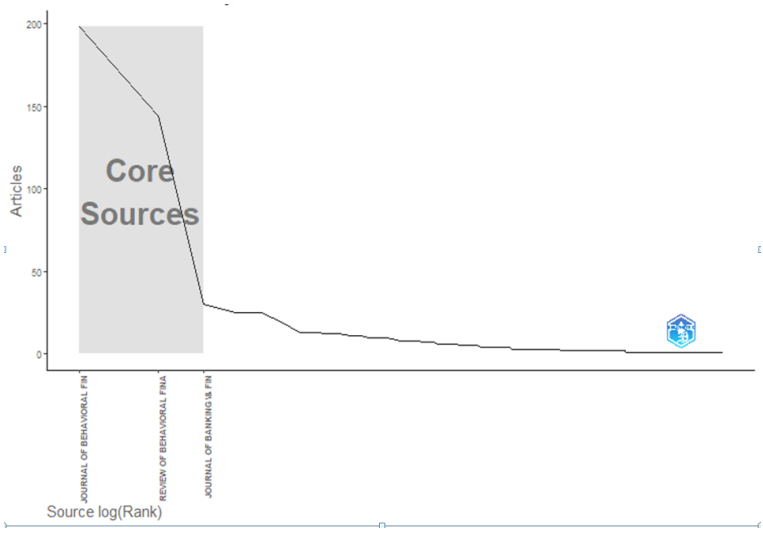

Figure 10: Bradford's Law

Science mapping, also known as bibliometric mapping that analyzes evolution along thematic lines, is a graphical depiction of the network of relationships between scientific fields, articles, and authors (Handoko, 2020). In Figure 11, the study also divided the density and centrality of the thematic maps into four quadrants. The upper left quadrant shows a high growth theme, indicated by high density but low centrality. Topics of this quarter include "stock market", "market" and "evidence". In the lower right quadrant there is a simple motif with strong centrality but low density. It is vital that these themes are included in the study, as there are frequently used refreshing themes such as "risk", "behavioral" and "financial" themes.

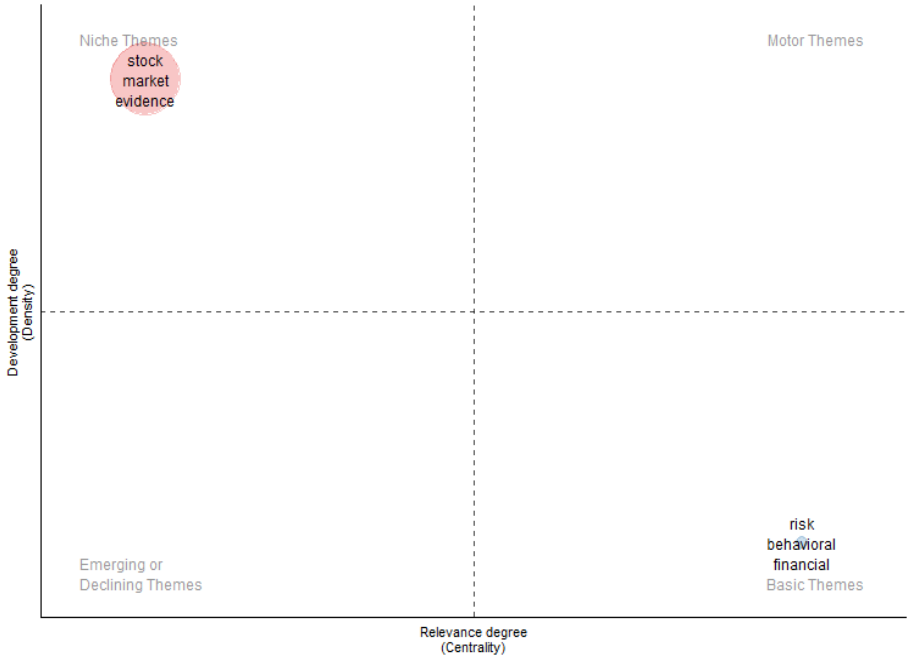

Figure 11: The Thematic Evolution

4. Conclusion

In this study, it was aimed to determine the bibliometric analysis of the relationship between behavioral finance and risk management. Therefore, it underlines the development of behavioral finance and risk fields in the period 1998-2024. It also provides a comprehensive evaluation of the conceptual, intellectual and social structure of the research topic. Bibliometrix and Biblioshiny R-package, a useful tool for biblometric analysis, were used. The data set of

the study was created from the WoS database, taking into account its official structure, quality of research resources and suitability for the software. The data show that there has been a gradual increase in publications, especially after 2008. The global crisis experienced as a result of non-repayment of subprime mortgage loans in the USA in 2008 shows that behavioral finance is addressed more and the risk factor is taken into consideration more in this context. Considering the density of publications around the world, the fact that most publications are made in America stands as a result of this phenomenon. Looking at the results of the social structure analysis, it is seen that American, Chinese and British writers have a strong cooperation. The majority of publications have been in journals such as behavioral finance, financial economics, banking and finance, and experiential finance. For this reason, this study reveals the claim that researchers can go beyond classical finance theory and create a potential risk area on the basis of financial activities due to the effects of non-rational behavior, and creates a road map for academics to understand the current knowledge.

The authors with the highest number of publications regarding the concept of risk resulting from rational and non-rational financial behavior are Durand, Weber, Guerrero, Lee and Liu. The work of these authors has proven to be extremely important for the field of behavioral finance. Our study identified behavioral finance sources in which the concept of risk is taken into account in the literature as publications, citations, and authorship between 1998-2024. In this respect, it can be crucial in discerning the overall research portrait of such research trends. Comprehensive bibliometric analysis can make various contributions to science. Performance mapping analysis of studies related to the research topic can help authors who are inclined to publish in this field to make new intellectual discoveries. On the other hand, the increasing trend in the publication of research articles on the subject over the years also provides information about the future scope of the field of behavioral finance. At the same time, this review delineates the entire structure of behavioral finance, including its bibliometric qualities, intellectual structure, and future research directions. Future researchers can conduct different types of systematic literature reviews using multiple databases. However, researchers can evaluate behavioral finance factors in terms of risk and conduct separate studies on factors that are considered risky.

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CHAPTER II

DIGITAL BURNOUT AMONG EMPLOYEES: THE HIDDEN DANGER OF THE DIGITAL AGE

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1. Introduction

Technology has revolutionized the business world, with increasing reliance on digital platforms and tools in workplace environments. While this digital transformation enhances productivity, accelerates business processes, and fosters more effective communication, it also brings significant challenges. Among the most pressing issues is digital burnout, which has become more prevalent with the rise of remote work models. Research highlights that digital burnout stems from blurred work-life boundaries, constant connectivity demands, and difficulties in time management (Sonnentag, 2023; Mazmanian et al., 2023). This phenomenon causes both physical and psychological exhaustion among employees and leads to organizational productivity losses.

Digital burnout is described as a state where continuous interaction with technological tools threatens employees' mental and emotional well-being (Houghton, 2024). Employees are expected to remain accessible at all times via digital devices, causing further narrowing of the boundaries between work and private life, which intensifies the feeling of burnout (Consiglio et al., 2023). Stress related to the workplace is no longer confined to traditional office environments; the persistent need to stay online and use digital tools exacerbates psychological pressure (Ayyagari, Grover, & Purvis, 2011). This trend has led to the growing prominence of digital burnout as a workplace issue.

Recent studies have revealed the increasing prevalence of digital burnout, particularly in remote and hybrid working environments. The proliferation of

digital tools and virtual workspaces has amplified the risk of digital burnout. Factors such as constant connectivity and the diminishing separation between professional and personal life are major contributors.

For instance, research conducted by WorkWellRemote (2024) indicates that remote workers often experience mental and emotional strain due to the expectation of being always accessible via digital devices. This situation not only impacts their work hours but also intrudes on their personal time, such as evenings and holidays, reinforcing feelings of burnout (WorkWellRemote, 2024).

Another study highlights the heightened workload associated with remote work and the need to remain perpetually online, which increases stress and digital burnout among employees. Constant exposure to emails and messages leaves employees both physically and mentally drained, thereby adversely affecting organizational productivity (Mazmanian et al., 2023). On the other hand, interventions like mindfulness practices are identified as effective tools for combating digital burnout. Research indicates that mindfulness techniques help reduce stress and burnout, proving to be an effective preventive measure against digital exhaustion (ScienceDaily, 2024).

These findings underscore the importance of organizations developing comprehensive strategies to prevent digital burnout. Establishing boundaries for employees' interactions with digital tools and maintaining a balance between work and personal life are essential. Moreover, mindfulness and similar awareness-based practices can be employed to mitigate the effects of digital burnout. Digital burnout poses a significant threat to employee productivity and mental health, emphasizing the need for further research and innovative solutions.

This study examines the causes, impacts, and potential solutions to digital burnout comprehensively. It discusses preventive measures at both individual and organizational levels while analyzing how digital burnout affects the workforce and its implications for organizational efficiency.

2. Literature Summary

2.1. Causes of Digital Burnout

2.1.1.Constant Connectivity

Technological advancements have enabled employees to access their workplaces at all times. However, this convenience has created pressure and turned constant connectivity into one of the primary causes of digital burnout.

Employees often find themselves required to stay connected not only during work hours but also on weekends and evenings, blurring the boundaries between work and personal life, thereby intensifying feelings of burnout (Mazmanian, Yates, & Orlikowski, 2013).

Constant connectivity negatively affects employees' mental and emotional health while simultaneously increasing their workload. The expectation of responding to emails or messages at any moment leaves employees perpetually alert, heightening work stress and contributing to burnout (Ayyagari et al., 2011).

Recent studies reveal that digital burnout has become more prominent in remote and hybrid work environments. A report by *Think Remote* (2024) emphasizes that while remote work offers flexibility, it also blurs the boundaries between work and personal life, exacerbating burnout. Post-pandemic, 61% of employees reported working beyond standard hours more frequently after transitioning to remote work, further fueling digital burnout (ThinkRemote, 2024).

Moreover, excessive use of digital communication tools has emerged as a significant contributor to mental fatigue and anxiety. A separate study (Reed, 2024) highlights that constant online interactions through digital devices negatively impact employees' mental well-being. The lack of face-to-face communication in remote work increases digital fatigue, which in turn leads to both physical and psychological exhaustion.

Research conducted by the University of Nottingham shows that mindfulness techniques effectively reduce stress and burnout among employees. Despite the challenges posed by digital overload, such techniques can mitigate its adverse effects, demonstrating the importance of awareness-based interventions (University of Nottingham, 2024).

These findings underscore the importance of limiting interactions with digital tools and maintaining a balance between work and personal life. Furthermore, organizations should adopt strategies like mindfulness programs to protect employees' mental health.

2.1.2. Overuse of Digital Tools

Digital tools play a crucial role in enhancing productivity in today's business world. They enable employees to complete tasks efficiently, manage responsibilities effectively, and stay connected through various platforms (Desklog, 2024; Tech.co, 2024). However, the excessive use of these tools often undermines productivity, imposing significant cognitive and emotional strain on employees.

Using multiple digital platforms simultaneously leads to cognitive overload and distraction. Notifications, emails, and social media alerts impede employees' focus, reducing efficiency (Tarafdar, Cooper, & Stich, 2019). Research has shown that excessive use of digital tools not only diminishes concentration but also impairs decision-making and information processing, resulting in errors and inefficiencies (Nikkelen et al., 2014; Loh & Kanai, 2014).

Additionally, the constant demand for online engagement heightens levels of emotional exhaustion and anxiety. Prolonged interaction with digital devices blurs the boundaries between work and personal life, compelling employees to handle work-related responsibilities during off-hours (Hertlein, 2023). Persistent activity on digital platforms fosters overcommitment, further intensifying stress and feelings of burnout (Chen, 2024).

Research suggests that transitioning between digital platforms increases cognitive strain and affects memory and focus. This phenomenon can be mitigated through strategies like digital detoxes, which alleviate mental fatigue and improve productivity (Nikkelen et al., 2014; Loh & Kanai, 2014).

Furthermore, the overuse of digital tools exacerbates not only cognitive fatigue but also emotional burnout. Employees constantly engaging with digital devices experience continuous disruptions in work-life boundaries, leading to emotional exhaustion. This pattern highlights the need for organizations to adopt measures such as flexible work arrangements and clearer work-life boundaries to combat digital burnout (Chen, 2024).

The excessive use of digital tools and the resulting cognitive and emotional exhaustion pose significant challenges for organizations. As employees are increasingly affected by this issue, their performance declines, and workplace engagement diminishes. This results in productivity losses and higher employee turnover rates, creating a major concern for organizations. In this context, strategies such as digital detox programs, flexible working hours, and clear work-life boundaries can help mitigate the effects of digital burnout (Chen, 2024).

2.1.3. Screen Time and Physical Effects

Spending prolonged periods in front of screens is a key factor negatively impacting employees' physical health. Extended screen use can lead to physical problems such as eye strain, headaches, sleep disorders, and neck pain. These health issues can exacerbate the experience of digital burnout. Employees who spend their entire workday in front of screens face physical health challenges

that amplify their sense of exhaustion and adversely affect their overall well-being (Lund et al., 2021; WHO, 2020).

Additionally, prolonged hours spent in front of screens impact not only physical health but also mental health. Continuous interaction with digital tools leads to mental fatigue, which further intensifies digital burnout (Jiang et al., 2020).

Table 1: Key Factors Associated with Digital Burnout

Factor	Causes	Effects
Constant Digital Connectivity	Employees staying online continuously, interacting with digital devices even outside work hours, constant accessibility through emails and messaging tools.	Disruption of work-life balance, increased stress (Ayyagari et al., 2011).
Blurring of Work-Life Boundaries	Continuous use of digital tools causing unclear boundaries between professional and personal life.	Burnout, feeling of perpetual work (Lee & Lee, 2021).
Excessive Use of Digital Tools	Concurrent use of multiple platforms, cognitive load increase.	Distraction, issues with focus (Brooks & Califf, 2017).
Screen Time and Physical Effects	Prolonged screen time; exposure to blue light.	Eye strain, sleep disturbances, physical discomfort (WHO, 2020).

2.2. The Effects of Digital Burnout on Employees

Digital burnout has various negative impacts on employees. These effects influence not only their personal health but also organizational productivity.

Table 2: Impacts of Digital Burnout on Employees and Proposed Solutions

Impact	Proposed Solution
Stress and Anxiety	Limiting constant digital connectivity and reducing expectations of accessibility outside work hours.
Constant accessibility increases mental workload and leads to feelings of burnout.	Introducing stress management programs and employee support services.
Distraction and Mental Fatigue	Limiting notifications and adopting work models that encourage focus on a single task..
Continuous notifications and messages from digital tools increase cognitive load.	Providing training on the effective use of digital tools and encouraging attention-focused work practices.
Physical and Mental Health Issues	Improving workplace ergonomics and limiting screen time.
Prolonged screen use causes physical issues such as eye strain, neck pain, and back pain.	Implementing regular breaks, physical exercise programs, and awareness campaigns to promote sleep hygiene.
Work-Life Imbalance	Clearly defining work-life boundaries and eliminating expectations for communication outside working hours.
Constant digital connectivity reduces personal time and increases feelings of burnout.	Promoting flexible working models and digital detox programs among employees.

2.2.1. Stress and Anxiety

Constant digital connectivity creates high levels of stress and anxiety among employees. Continuous communication through digital tools increases employees' mental load, leading them to feel psychologically burned out. Research shows that the expectation of constant availability not only leads to emotional exhaustion but also increases physical and cognitive fatigue, resulting in a loss of productivity (Mazmanian, Yates, & Orlikowski, 2013; Sonnentag et al., 2021).

Studies on the impact of stress in the workplace highlight that constant connectivity causes employees to experience distractions and deplete their cognitive resources while transitioning between tasks. This negatively affects job performance (Barber & Santuzzi, 2015; Van Zoonen et al., 2021).

2.2.2. Distraction and Mental Fatigue

The excessive use of digital tools significantly hampers employees' ability to concentrate, leading to distraction. Notifications, messages, and the constant expectation of accessibility from multiple digital platforms deplete employees' mental resources and reduce their productivity. This not only has negative effects on an individual level but also on an organizational level (Brooks & Califf, 2017; Mark et al., 2018).

Research has shown that employees' constant divided attention increases cognitive load, leading to errors in work processes and raising the risk of failing to complete tasks on time. Overexposure to technology also increases feelings of burnout and psychological fatigue (Sonnentag et al., 2021; Van Zoonen et al., 2021).

2.2.3. Physical and Mental Health Issues

Spending long periods in front of screens leads to various physical health problems in employees. Issues such as eye strain, headaches, neck and back pain are directly associated with prolonged screen use. Postural problems caused by working in the same position can lead to chronic musculoskeletal issues. Additionally, sitting for extended periods in front of screens reinforces a sedentary lifestyle, increasing the risk of obesity, cardiovascular diseases, and other metabolic disorders (WHO, 2020; Nakata, 2022; Thomee et al., 2018).

The duration of screen time not only affects physical health but also has negative consequences on mental health. Employees may experience disruptions in their sleep patterns and increased stress due to excessive screen use. Particularly, exposure to blue light affects sleep quality, reducing employees' rest and impairing their performance the next day. This situation increases the risk of digital burnout among employees and leads to a loss of productivity at the workplace (Carter et al., 2021; Korpinen & Pääkkönen, 2020).

2.2.4. Work-Life Imbalance

Remote work and constant digital connectivity are causing the boundaries between work and personal life to become increasingly blurred. Employees, even outside working hours, can access their work via digital tools, disrupting the balance between work and personal life and intensifying feelings of burnout. The reduction in personal time negatively affects employees' psychological well-being, leading to increased stress and anxiety levels (Lee & Lee, 2021; Derks & Bakker, 2014).

This issue has become more pronounced with the widespread adoption of remote work models after the pandemic. Employees are trying to cope with the pressure of staying constantly online while working from home. The overlap between household responsibilities and work demands rapidly depletes employees' energy reserves and increases the risk of digital burnout. Additionally, the expectation of being constantly accessible through digital devices makes it difficult for employees to mentally disconnect from work (Vaziri et al., 2020; Santuzzi & Barber, 2018).

In this context, clearly defining work-life boundaries and implementing digital detox strategies can play a significant role in reducing employees' feelings of burnout. Moreover, organizations adopting flexible work policies and offering a supportive digital work environment can contribute to maintaining this balance (Rudolph et al., 2021).

2.3. Proposed Solutions for Digital Burnout

Digital burnout is a manageable issue, and various solution strategies can be developed to prevent it. These strategies can be implemented both at the individual and organizational levels.

2.3.1. Individual Solution Strategies

2.3.1.1. Time Management and Digital Detox

While the intensive use of digital tools can enhance employees' work productivity, the mental load associated with constant connectivity increases the risk of burnout. Employees are advised to adopt time management techniques and take regular digital detox breaks to protect themselves from this risk. Research has shown that such approaches reduce screen time, improving focus and work performance (Mark et al., 2018). Furthermore, individual measures to reduce digital stress, particularly digital detox practices, have been emphasized as helping to alleviate burnout symptoms (Stich, Tarafdar, & Cooper, 2019). Limiting interaction with technology and using it more consciously contributes to achieving more positive outcomes in work processes (Ayyagari, Grover, & Purvis, 2011).

2.3.1.2. Physical Activity

Regular physical activity has emerged as an effective method for reducing stress levels and alleviating mental fatigue. Physical activities lower stress

hormone levels (such as cortisol) while increasing the release of endorphins, the "happiness hormone," which can improve employees' mood (Salmon, 2001). Regular exercise not only supports employees' mental health but also contributes to preventing physical health issues such as postural problems, musculoskeletal disorders, and obesity (WHO, 2020).

Helping employees develop stress management skills through physical activities plays a crucial role in enhancing their job performance and overall quality of life. Research has shown that moderate physical activity, particularly for desk job employees, reduces burnout symptoms and increases job satisfaction (Niemann et al., 2021). Additionally, regular physical exercise improves employees' sleep quality, supports cognitive functions, and positively impacts their workplace productivity (Toker & Biron, 2012).

Thus, developing a habit of physical activity is suggested as an individual solution strategy for alleviating digital burnout and its associated negative effects. Organized group exercises or sports encouragement programs can be part of organizational initiatives that help employees adopt this habit.

2.3.2. Organizational Solution Strategies

2.3.2.1. Flexible Work Arrangements

Flexible working hours and locations are an effective solution strategy for reducing digital burnout. Employees can balance their work and personal lives by working at their preferred times and reducing interactions with digital tools. This flexibility can help employees alleviate the pressure created by notifications from digital platforms and constant online connectivity. Studies have shown that flexible work arrangements reduce employees' stress levels, increase their productivity, and improve overall job satisfaction (Gajendran & Harrison, 2007; Allen et al., 2013). Additionally, the adoption of hybrid work models post-pandemic has increased employees' ability to work from home, thus reducing the risk of digital burnout (Choudhury et al., 2020).

2.3.2.2. Clarification of Work-Life Boundaries

Clarifying work-life boundaries is critical for preventing digital burnout. By limiting access to digital tools outside of working hours, employees can protect their personal time and maintain their mental health. Organizations may adopt policies that prevent or limit employees from using digital devices outside of work hours. Maintaining work-life balance not only reduces feelings of burnout

but also makes the work-life balance more sustainable (Derks & Bakker, 2014; Mazmanian et al., 2013). Studies have shown that in environments where work-life boundaries are clearly defined, employees experience lower stress levels and higher job satisfaction (Hickox et al., 2021).

3. Conclusion

Digital burnout has become an increasingly prevalent issue in the digitalized workplace. While technology provides opportunities to enhance productivity and streamline work processes, the excessive use of these tools threatens employees' physical, mental, and emotional health. Employees face constant online connectivity through digital devices, and they feel that the boundaries between work and personal life are becoming increasingly blurred. This situation leads to negative effects such as stress, anxiety, burnout, and health problems (Mazmanian, Yates, & Orlikowski, 2013; Ayyagari, Grover, & Purvis, 2011).

The increase in remote work models and the widespread use of digital tools post-pandemic have further deepened the issue of digital burnout. Employees have reported that, within this new working setup, they are not only faced with increased workloads but also with the blurring of boundaries between their work and personal lives. Digital burnout affects not only employees but also organizations. Organizations with employees experiencing digital burnout face issues such as reduced productivity, higher turnover rates, and low employee engagement (Bennett, 2023; Shibata, 2024). This creates a long-term situation that threatens job performance and organizational success.

To overcome this issue, various solution strategies have been developed at both individual and organizational levels. Measures such as flexible working hours, digital detox, clarifying work-life boundaries, and stress management play a significant role in reducing the effects of digital burnout (Mazmanian et al., 2023; Ayyagari et al., 2011). Furthermore, it is important for organizations to raise awareness among their employees about digital burnout and take proactive steps in this regard. Digital burnout has become a critical issue not only for employees but also for organizations' sustainable success. Therefore, combating digital burnout is possible through the creation of strategies that ensure a healthy, motivated, and productive workforce.

Policies and strategies developed to address digital burnout are essential for the long-term success of both employees and organizations in the business world. In this context, combating digital burnout should not only be an individual responsibility but also an organizational one (Mazmanian et al., 2023; Bennett, 2023).

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CHAPTER III

THE TAXATION PHENOMENON AND ANALYTICS OF TAX INCIDENCE IN THE MARKET COMPETITION ALTERATIONS

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1. Introduction

The effects of taxation policies under competitive and non-competitive market conditions manifest differently depending on the level and nature of competition. Competitive or non-competitive market conditions significantly affect firms' capacity to carry tax burdens and the general balance of conditions in the markets. In this context, taxation policies emerge in line with the state's aim of generating revenue and as a tool that determines market conditions. Taxation is one of the main intervention tools through which the state plays an active role in economic processes. Therefore, beyond the state's revenue-generating function, it is also considered an element that shapes market competition. Especially in non-competitive monopolistic markets, as tax burdens are directly reflected in prices, costs on the consumer increase, and market imbalance deepens. In such market structures, tax policies significantly shape firms' cost advantage or disadvantage, thus affecting the nature of competition (Talpoş & Crâşneac, 2010: 48).

Competitive markets are one of the economic areas directly affected by tax policies. Firms in such markets try to achieve cost advantage by minimizing their tax burdens. When there are high tax burdens, firms lose their cost advantage, making it difficult to compete in the market. In such a case, firms are forced to adapt to tax policies by trying to optimize their tax burdens. However, outside

of competitive markets, tax policies have a different effect in markets where competition is limited, called monopolistic markets. In such markets, firms increase consumer costs by directly reflecting the tax burden on prices (Wilson & Wildasin, 2004: 1076). Thus, the negative effects of a non-competitive market structure are reflected in consumers, and the economic imbalance of such markets deepens. The impact of tax policies on competitiveness varies according to the market structure. Taxation policies in competitive markets allow firms to achieve cost advantage by optimizing their tax burdens.

However, in monopolistic or oligopolistic markets, consumers face higher prices due to the reflection of the tax burden on prices. In this context, tax policies shape the nature of competition and produce different results according to the market structure. In non-competitive markets, the tax burden reflected on the consumer is more significant due to firms increasing prices above costs. In such market structures, the effect of tax policies causes the competitive conditions in the market to be more negatively affected, and an unbalanced structure emerges. In addition, the increase in prices by firms due to the tax incidence effect causes competition between sectors to decrease (Sinn, 1997: 268). This situation leads to the similarity of the cost structures of firms operating in different sectors and to the decrease of sectoral advantages. Therefore, tax policies have a competition-reducing effect in non-competitive markets. On the other hand, it is possible to determine sectoral differences by analyzing the impact of tax policies on sectoral cost structures.

Such analyses reflect the tax effect on sectoral cost structures and are vital for understanding the differentiation of tax burdens between sectors. Price increases due to the tax burden affect the market balance by increasing the costs reflected on the consumer. Especially in non-competitive markets, an increase in consumer costs occurs due to the tax burden being reflected on consumers. This situation causes a disadvantageous process to emerge in the market as sectoral differences decrease. The competitive and non-competitive structures of the markets are the main elements that shape the direct effects of tax policies on market conditions. While tax policies can be designed to provide advantages on the cost structures of firms in competitive markets, in markets where competition is limited, these policies are reflected as additional costs to consumers (Baldwin & Krugman, 2004: 13-14). The effect of tax policies on the economic structure varies according to the nature of market conditions. It is evaluated as a strategic tool to protect the market's competitive structure. Businesses' preferences for competitive approaches are directly related to taxation policies in the market competition process and the general welfare level of society (OECD, 2023: 36).

While high tax rates increase production costs in potential monopolistic markets and reflect them on final product prices, they also make a structure where markets without competition cause a decrease in consumer welfare inevitable. In this context, tax impact analytics refers to the entirety of analytical tools and methods used to analyze the reflections of this effect on businesses and consumers in detail and the process of mutual interaction. Tax elasticity, marginal tax rates, and sectoral tax burden comparisons are frequently used in the analysis process to determine the direct impact of taxes on business costs and understand how the competitive environment is affected. While tax elasticity measures the event impact of changes in tax rates on prices and demand, marginal tax rates analyze the tax paid on additional unit income. Such analyses also guide determining priority intervention focuses, especially in non-competitive markets, by revealing sectoral competition differences and the effects of taxation on the market more clearly (Cengiz, 2021: 75-76 and 86).

2. The Impact of Tax Incidence on Competitiveness and the Role of Taxation Policies

The effects of tax incidence in competitive and non-competitive markets create visible differences in the cost structures of businesses and consumer prices. This impact of taxation policies on the decision-making processes of economic units varies according to the level of competition. While tax rates have a decisive effect on cost advantage and competitiveness in competitive markets, in non-competitive markets, these effects are primarily reflected in the consumer through price increases and indirect tax burdens. In both market structures, tax policies are used as an essential tool in determining the strategies of market actors and shaping market dynamics. Therefore, tax incidence-impact analytics is based on the analytics of tax practices that directly affect the competition levels of economic actors in production and consumption markets. This phenomenon is based on various tax tools and methods that effectively shape the competition levels of tax decision-making processes (OECD, 2021: 72).

2.1. The incidence Dynamics of Tax Analytics in the Markets and Market Competition Levels Relationship

The analytics of tax practices that directly affect the competition levels in production and consumption markets is a comprehensive analysis approach used to understand and measure the effects of taxes on the competition processes in the markets. This analysis examines the direct impact of tax policies on

businesses' cost and price determination structures and, therefore, evaluates the market competition conditions. On the other hand, businesses operating in competitive markets aim to provide a cost advantage over other companies and increase their market share. In this context, the existence and level of tax elasticity in competitive markets channels the preferences and expectations of the competition level of taxes based on market sectors with analysis methods such as marginal tax rates and inter-sectoral tax incidence comparisons and shapes the market competition levels between sectors (European Commission, 2023-a: 82).

Tax elasticity stands out as a frequently used method in analyzing tax effects. In this context, within the framework of tax analytics, such a tax elasticity is essential in terms of understanding the extent to which the demand or supply for a good or service can increase its prices in the face of changes in tax rates and tax increases, or the extent to which consumers are sensitive to price increases. This analysis is particularly important for markets with intense competition because businesses operating under intense competition may have difficulty reflecting cost increases on prices; therefore, tax burdens may reduce companies' profit margins. On the other hand, the marginal tax rate refers to the amount of tax paid on additional unit earnings, and this rate is an influential factor in businesses' decisions to make further production or growth strategies. In other words, analyzing marginal tax rates can directly affect investment decisions and competitive balances in the market, especially in capital-intensive sectors. As the tax burden on the cost structures of businesses increases, large-scale companies, especially, turn to cost-cutting strategies to maintain their competitive advantage.

In contrast, smaller-scale companies may have difficulty developing strategies to adapt to the levels of competition in the markets. While this situation provides a justification that may cause competition intensification in the markets and the strengthening of oligopoly structures, the effect of taxes in the process also shapes the competitive process by systematically carrying the distributive incidence of taxes on businesses (Marzio et al., 2024: 5). Therefore, the analysis of the tax effect on the competition levels in the market creates profound effects not only on the financial statements but also on the market dynamics and the structure of competition. In this framework we have addressed, taxation incidence analytics refers to a process that brings to the agenda the re-evaluation of profitability rates and competitive positions of businesses, especially the impact of indirect and direct taxes on market structures, indirect taxes such

as Value Added Tax (VAT) affecting the purchasing power of consumers, as well as the impact dynamics that can directly affect the production, pricing and investment decisions of market players (European Commission, 2023-b: 172).

How tax policies affect market competition levels, the level of competition that gains concreteness and clarity with the intersection points of microeconomics and public finance theories prioritizes a meaningful process with the existence of an impact domain that depends on factors such as the number of market participants, product differentiation, entry-exit barriers and price flexibility. In this context, while tax incidence changes consumption habits, it can also bring extremely opposite differences in competition levels to a more optimal level by reshaping cost structures and pricing strategies with their effect on producers. Tax incidence policies can create unique advantages for small and medium-sized enterprises, contributing to maintaining competitive markets. Undoubtedly, on the other hand, transparent and data-driven analytical tax incidence approaches in the fight against tax evasion reveal a direct structural relationship process with different levels of competition in the markets as a tax incidence effect that can also minimize tax losses and positively affect the distribution of production factors in the markets. The potential of tax domain analytics to optimize market competition levels also offers essential opportunities for policymakers. In this context, a tax incidence analytics framework can be expressed as Figure 1 below within the framework of a structural relationship to achieve policy objectives.

Source: Faster Capital (2024). *Tax Incidence Analysis.* https://fastercapital.com/keyword/tax-incidence-analysis.html (Accessed November, 11.2024).

Figure 1. Analytical Dynamics of Tax Incidence Analysis in The Market Competition

As shown in Figure 1 above, the structure of tax incidence is central to economic analyses and provides a framework for determining which actors carry the tax burden and how it is shared. The sharing of the tax burden between producers and consumers refers to the dynamics that directly affect market balances, determine the direction of economic processes, and enable both the carrying and increasing of tax burdens in different directions. While the impact of the area of influence, as tax incidence, on consumers changes purchasing power and consumption habits, the incidence on producers refers to a taxation process in which cost structures and pricing strategies are reshaped. The interaction of these structural elements and market actors in Figure 1 creates an area of influence on harmonization in the optimal distribution of the tax burden.

Therefore, the structural analysis of tax incidence is measured by the target effects of tax policies and structural changes in tax areas of influence in competitive or non-competitive markets, which are the subject of target effects in practices. Especially in markets with different and even opposite levels of competition, the application preferences of the tax incidence emphasize supporting fair competition, which is also a critical application tool of the scope of the tax incidence area (Bachas et al., 2024: 57-58). In this context, it is also seen that supporting and encouraging the market innovation process, which directly affects market competition levels, scoping targets an essential module of objectives that can be shaped with tax incidence analytics to provide a healthy competition environment with tax incentives for technology investments. Another expression is that advantageous tax policies, such as tax reductions, allow small-scale enterprises to produce at lower costs and adapt to competitive conditions (Marshalok et al., 2021: 60). When these effects are analyzed correctly regarding the levels of competition, they make significant contributions to the development of the sectors related to the general health of the economy and the increase in the level of financial control of the markets. Tax elasticity is essential in understanding to what extent businesses in competitive markets can increase their prices in the face of tax increases or to what extent consumers are sensitive to price increases.

In this context, businesses operating under intense competition have difficulty reflecting cost increases in prices. At the same time, the variations in tax burdens affect businesses' profit margins on a larger scale, making the competition structure even more sensitive, especially in sectors operating with low-profit margins. For this purpose, low tax rates increase the competitiveness of businesses and allow them to reduce their production costs. For example,

companies that minimize their costs thanks to low tax rates can increase their prices more competitively than their competitors (OECD, 2022: 12). This situation provides a significant advantage in sustainability and growing market share, especially for small and medium-sized businesses. However, high tax rates increase the operational costs of companies, and this increase causes companies to have difficulty in competitive markets. High taxes cause companies to increase their prices, thus reducing their competitive advantage and negatively affecting their long-term ability to hold on to the market.

2.2. Tax Incidence Position of Marginal Tax Rates in the Market Competition and Flexible Impact Levels

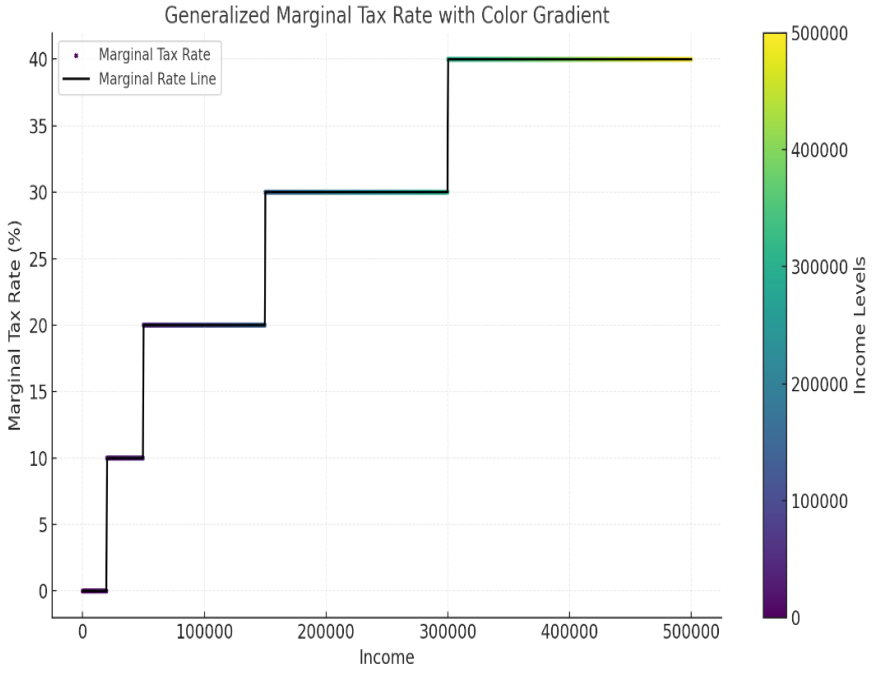
Differences in the levels of competition in the markets necessitate a sector-based examination of the critical elements that determine which economic actors carry the tax incidence. In particular, the dynamics of monopoly markets reveal the need to analyze the effects of marginal tax rates more deeply within the framework of such market structures. Marginal tax rates emerge as an essential policy tool that affects both the distribution of resources among market players and economic efficiency. In this context, the reflections of marginal tax rates in the markets as tax incidence stand out as an essential variable to consider in forming economic policies. The effects of high marginal tax rates, especially on more fragile enterprises such as SMEs, can potentially create a negative domino effect on economic growth, employment creation and the entrepreneurial ecosystem by reducing the competitiveness of such firms.

The concentration of tax incidence on these segments increases market imbalances and slows down economic activities. Tax impact and tax impact analyses require considering the direct effects of such policies and their indirect consequences (IMF, 2023: 22-23). Marginal tax rates refer to the tax incidence rate applied to additional income obtained in the tax system, and the impact of these rates on businesses and individuals is directly related to the dynamics in competitive markets. In competitive markets, in particular, the change in marginal tax rates significantly affects businesses' cost structures, profit margins, and investment decisions. These effects are shaped in line with businesses' competitive strategies because the tax burden plays a decisive role in a business's resource allocation and strategic decisions. While high marginal tax rates, such as tax incidence, cause businesses to pay more taxes on their additional income, this situation usually causes firms to be more careful in their cost management and review their strategies to increase their profitability.

Especially in sectors with intense competition, high marginal tax rates may force businesses to reduce costs rather than increase prices. This strategy includes developing more efficient production processes, focusing on innovation, and reducing costs to gain a competitive advantage. At the same time, businesses can earn more income in sectors with low marginal tax incidence rates and evaluate this income as an investment. This allows companies to accelerate their growth strategies and gain a stronger position in competitive markets (Arezki et al., 2019: 230). The impact of marginal tax rates is not only a tax incidence but also a dynamic that affects businesses' strategic decisions and market structure. Especially when the tax incidence burden and competition dynamics are considered, high marginal tax rates can cause businesses to pay more taxes in proportion to their increased earnings.

This creates a restraining effect on competition and can lead to small and medium-sized enterprises being more positively affected by the competitive environment. In markets with high competition, while businesses try to reduce their costs, high marginal tax rates can lead to a structure that leads to lower profitability rates rather than increasing prices (Kindermann & Krueger, 2014: 30). Such a structure can be a critical regulatory factor in markets with variable competition or environments without competition to prevent the transition to monopolistic markets. Tax incidence policies are critical elements that shape the economic structure and market dynamics. Mainly, marginal tax rates create a tax impact area directly affecting businesses' activities. This tax incidence affects businesses' competitive capacity and long-term sustainability in market conditions. The effects that high marginal tax rate incidences can create, especially in monopolistic markets, can have various negative consequences for businesses and consumers. In monopolistic markets, the cost advantages of large businesses provide a serious competitive advantage over small and medium-sized enterprises (SMEs) (Cagetti & Nardi, 2006: 837-838).

Considering all these evaluations, Figure 1 provides the opportunity to examine in detail the effects of marginal tax rates on competition in the market. In this context, the concepts of tax sphere of influence and tax incidence gain an essential dimension of analysis, especially in the context of increasing marginal tax rates and the variability in income levels. Figure 2 concretizes the effects of increases in marginal tax rates on economic actors in terms of different income groups and competition dynamics and more clearly reveals the tax incidence policies on market conditions. In this context, it becomes understandable how changes in marginal tax rate incidences, both at the individual and societal level, shape market competition and economic efficiency:



Source: Thomas F. Dernburg (1985). *Macroeconomics: Concepts, Theories and Policies*. 7th Ed., New York: McGraw-Hill Co. p. 108.

Figure 2. Marginal Tax Rates in the Market Competition Alterations and Impact Levels

The analysis of the effects of changes in marginal tax rate incidences on market competition in Figure 2 above clearly shows the negative consequences of high marginal tax rates on small and medium-sized enterprises (SMEs). High marginal tax rates, as a phenomenon with a high probability of limiting the economic activities of enterprises by weakening their competitiveness, can also be considered an essential justification for the transformation into monopoly markets where there is no competition. This situation, as related to tax incidence, is a critical justification for the formation of monopoly markets, which becomes more apparent with the increase in the pressure of high tax rates on cost structures, especially for SMEs, through tax incidence (distribution of tax reflection burden). In this context, SMEs may have difficulty reflecting these cost increases on prices due to low capital reserves, which may negatively impact market competition. This situation leads to the withdrawal of these businesses from the market and the market becoming more trapped in monopolistic structures. Thus, as market competition is distanced, the tax effect is felt more and more intensely (Conesa & Krueger, 2006: 1426).

Marginal tax rates refer to the tax rate a company pays on the additional income it earns, and this rate can have different effects depending on the size of the business, its sector structure, and its competitiveness. Large companies generally have lower unit costs and more financial resources, so they can tolerate the effects of high marginal tax rates more easily than small businesses. Therefore, regulating marginal tax rates fairly becomes critical for SMEs to survive in the market. One of the areas where the tax incidence is most clearly felt in monopolistic markets is pricing (Yang et al., 2011: 110). Businesses generally perceive high tax rates as an increase in costs, and these cost increases are reflected in prices. Increasing prices negatively affect consumer welfare in a market where competition is limited. Low-income consumer groups are disproportionately affected by these price increases. As a result, not only the effects of tax incidence on businesses but also their indirect effects on consumers should be considered. Another significant effect of high marginal tax rates is that they cause businesses to lose the balance between tax burden and competitiveness (Saez, 2001: 209-210).

In monopolistic markets, high tax incidence results in small companies withdrawing from the market while the monopoly power of large businesses increases. This situation reduces market efficiency and deepens economic inequalities. When designing tax policies, the impact of marginal tax rates on market dynamics and ensuring tax justice should be a priority. The state should aim to both protect competitive market structures and increase consumer welfare by adopting tax policies that support market regulations (Vogelgesang, 2000: 418). In this direction, tax incidence and regulatory mechanisms should be developed for SMEs to mitigate the negative effects of high marginal tax rates in monopolistic markets. In non-competitive, monopolistic or oligopolistic markets, the effect of tax rates manifests on a different level. Since companies operating in such markets have a significant market share, they may tend to pass on the high tax burden to consumers. In this case, with the increase in tax rates, product and service prices also increase, and the tax burden falls directly on the shoulders of the consumer. In non-competitive markets, tax increases generally do not create a significant difference in cost structures since companies can pass these costs on to consumers.

This situation makes price levels more stable depending on the nature of the market structure. In non-competitive markets, businesses tend to manipulate the markets with unilateral deterministic approaches to regulating prices. A monopolistic market is a structure in which a single firm, producer or distributor

can set its price for a specific product in a market without fear of lower prices from rival firms (Ahmed & Ali, 2020). Therefore, the possibility of monopolistic firms being managed with total efficiency is generally less than that of a firm in a free competition environment. This is a negative feature in terms of the monopolist firm developing itself and thus contributing to society, and it is also able to primarily use the opportunity to obtain more financial advantages through the price mechanism in the market to avoid the effects of tax dynamics. However, the fact that a firm in a monopolistic position sets a higher price does not mean the monopoly will always make a high positive profit. The fact that costs continue to exceed the income obtained from time to time can also turn into a structure in which the monopolist firm in question and its consumers mutually shoulder the financial costs due to the interventionist effect of tax incidence (Yang et al., 2016: 53).

2.3. Analytical Tax Incidence in Non-Competition or in Excellent Competition Markets Where Market Processes

Marginal formations in market competition are a critical variable for understanding the effects of tax incidence policies. Small changes in the level of competition can significantly affect how the tax burden is distributed among consumers and producers. In designing tax policies, careful analysis of the dynamic nature of market competition and examination of firms' behavioral responses are essential to balancing economic efficiency and income distribution objectives and successfully implementing tax policies. In the design of tax policies, it is crucial to consider the dynamics of the market structure.

Marginal variations in market competition can directly affect the efficiency and distributional effects of the tax. Therefore, governments should take market structure into account when determining tax policies. For example, in a policy framework aimed at protecting low-income groups, careful planning should be made in taxes applied to basic consumer goods. If there is a monopolistic structure in the market, the burden on consumers may be heavier. Similarly, in markets with high levels of competition, the tax burden may remain on firms, which may increase production costs and affect the labour market in the long run. In the context of marginal market formations and volatility, the fact that an increase in competition in market structures such as oligopoly or monopolistic competition can change firms' marginal costs or pricing strategies is shaped by the fundamental impact values that can affect how tax incidence impact values are shared between firms and consumers.

For example, in a monopoly market, producers can usually easily pass on tax incidence impact values to consumers by using their advantage of unilaterally manipulating market prices, while in perfectly competitive markets, this transfer may be more limited. In markets where perfect competition is the case, the tax incidence phenomenon is a concept that measures the effect of a change in a tax rate on consumer and producer prices. In understanding this effect, considering two different tax types as specific (determined) tax and ad-valorem (proportional) tax applications, while both tax types provide the same tax revenue, it presents a meaningful analysis topic in terms of understanding how they can be reflected in consumer and producer prices in different ways.

Explaining how tax rates and incidence are related to market equilibrium, demand, and supply functions also provides a meaningful basis for revealing the differences in tax impact areas between both types. When we put the subject in terms of specific taxes, let "q" be the consumer price, "p" the producer price, and "t" the specific tax rate. The consumer price in practice as the "t" unit tax rate for each product sold is expressed by adding the tax rate to the producer price (Hindriks & Serse, 2020: 7):

$$q = p + t$$

In Tax Practices, an ad-valorem tax is a tax levied proportionally on the product's price. That is, the tax rate is determined as a fixed percentage (τ), and this rate is multiplied by the cost of the product to calculate the tax burden. In the case of an ad-valorem tax, the consumer price can be written as:

$$q = (1+\tau)\, p$$

In the equation above, "τ" represents the ad-valorem tax rate, "p" represents the producer price, and "q" represents the consumer price, indicating that the consumer price increases proportionally depending on the proportional increases in the producer price of the product. On the other hand, as "τ" is the ad valorem tax rate, "p" is the producer price, and "x" is the market equilibrium quantity.it is possible to express the issue by relating it to the variability of tax revenues (R) (Hindriks & Serse, 2020: 7):

$$R = \boldsymbol{\tau} \cdot p \cdot x$$

As can be understood from the equation above, ad-valorem tax has a structural impact value that increases tax revenue as the product price increases. In terms of tax incidence, when the ad-valorem tax rate "$\tau\boldsymbol{\tau}$" is written concerning the specific tax rate t within the framework of the equivalence of both tax types in terms of Market Equilibrium and market competition balance, it will be seen that the same tax revenue will be obtained because of both tax applications. It

is possible to write the proportional effect values as ad-valorem tax rate "τ" and specific tax rate "t" by relating both taxes mutually as follows:

$$\tau = p / t$$

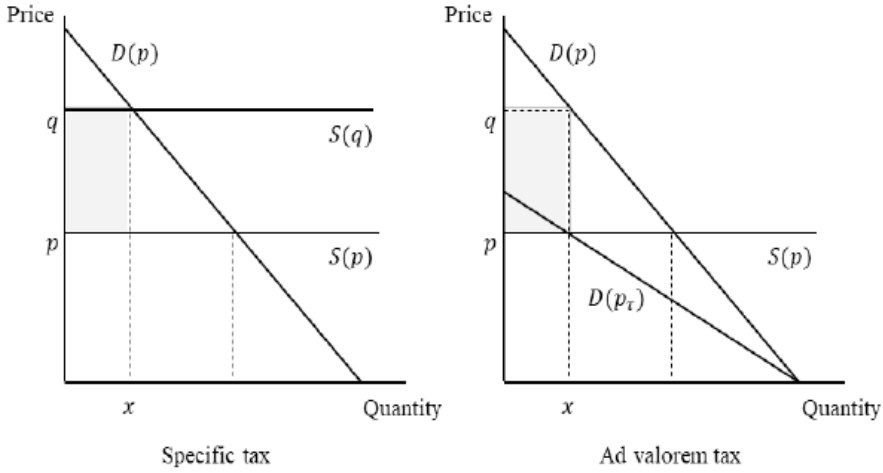
It is possible to express the market equilibrium, which is based on the principle that the demand function $D(p)$ and the supply function $S(q)$ are equal to each other on quantity and provide market price equilibrium in the equilibrium process, as follows (Hindriks & Serse, 2020: 7-8):

$$D(p) = S(q) = x$$

This equation means that when a tax is applied in a process that expresses the equilibrium quantity as "x", where demand and supply are equal, the equilibrium prices and quantities will change. At this stage, it is also important to emphasize that

$$q = p + t = (1 + \tau)$$

creates (Hindriks & Serse, 2020: 8) the same consumer price q and therefore the same consumption x. The same equilibrium quantity can be achieved because of both specific tax and ad-valorem tax applications. Therefore, both types of taxes provide the same tax revenue and create a scale effect that affects consumer prices with the same tax effect. It can be to express the tax incidence effect area for ad-valorem and specific tax practices in a perfectly competitive market as in Figure 3 below:



Source: Jean Hindriks & Valerio Serse (2020). "The Incidence of VAT Reforms In Electricity Markets: Evidence From Belgium", *CORE Discussion Papers* 2020/12 (2020)35, p. 8. http://hdl.handle.net/2078.1/229565.

Figure 3. Tax Incidence Under Perfect Competition Process

As can be observed in the framework of the above equation, the income obtained in the ad-valorem tax application process is "$R = \tau px$" and the income is equivalent to the income received under the specific tax scope "$R = tx$", which is framed using the equation "$\tau = t/p$". This situation reveals the scale effect value that reflects the tax incidence emphasis on producer and consumer prices by equating demand and supply to "$(p) = S(q) = x$" in a perfectly competitive market equilibrium process.

However, it can be said that in markets where there is imperfect competition, ad-valorem tax applications bring a higher tax incidence effect to the forefront in terms of obtaining higher income. This process in ad-valorem tax applications is also an expression of a process in which competitive balances are disrupted based on increasing prices and the process towards monopoly markets also limits the market power. Because each unit fixed cost is "c". To see this, a monopolist market formation with a fixed unit cost of c and a demand of "$x(q)$", monopoly profit under a tax rate "t" is (Hindriks & Serse, 2020: 7):

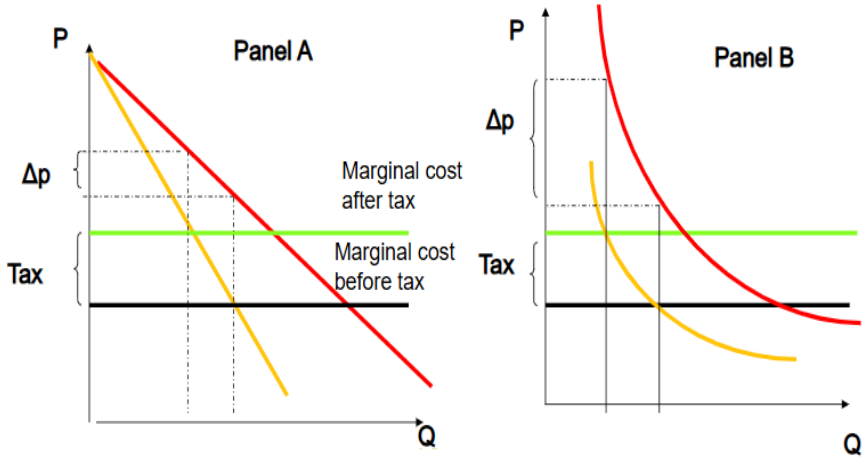
$$\Pi = (q - t) - cx = qx - (c + t)x$$

At this point, in a monopolistic market where there is no competition, the tax cost arising based on tax incidence increases from "c to $c + t$", thus reducing the ad valorem tax revenue from "qx to $qx/1+\tau$" and causing the income level to decrease from "qx to $qx/1 + \tau$" with the location of increasing prices. For example, while ad-valorem tax creates a greater incidence effect on products in a process where prices are more flexible, specific tax brings the feature of tax incidence to the fore as it can be effective on products with more fixed prices.

Such analyses are of great significance in understanding the effectiveness of tax policy and its effects on consumers and producers. On the other hand, this approach can also be interpreted as an expression of the transformation into a monopolistic market process without competition. In other words, because of producers limiting supply, the price is above the competitive price equilibrium of the market equilibrium formation. The most important reason for this is that, in contrast to specific tax applications with the market restriction effect of an approach where the price is directly taxed, ad-valorem taxes produce higher tax revenue due to a higher tax incidence effect.

However, possible tax incidence differences depend on the way the tax is applied and market conditions in the process. On the other hand, the possibility that the post-tax price increase and decreases in production volume related to changes in price and production levels may affect the monopoly's profits and

total efficiency in the market should not be ignored.It is possible to observe the possible expression of this analytical process, which occurs with the tax incidence effect and in the absence of market competition, with the help of a figure in Figure 4 below:



Source: Joseph E. Stiglitz (2000). Economics of The Public Sector. 3rd Ed., New York/London: W.W. Norton & Co., p. 499.

Figure 4. Tax Incidence in The Non-Competition Process in Markets and Impact Reflections

As can be observed in Figure 4 above, in terms of the area of influence where the tax incidence effect process takes place in the process, despite the equivalent effect of both taxes in applications in a perfectly competitive market equilibrium, in this case, which is not valid in markets without competition -or in an imperfect competition process-, ad-valorem taxation and monopoly profit *is*

$$\Pi = qx/1 + \tau - cx = [1/1 + \tau]\,[qx - (c + \tau c)]$$

The ad-valorem tax expressed in the equation above is equivalent to a profit tax at the rate of "$\tau/1 + \tau$" and a specific tax at the rate of "τc", if we determine an ad-valorem tax rate as "$\tau c = t$", the ad-valorem tax creates the same consumer price "q" as the specific tax "t". However, the ad-valorem tax is a situation where this increased tax revenue directly affects price increases (Hindriks & Serse, 2020: 7-8):

$$R = \tau cx + (\tau/1 + \tau)\,\Pi = tx + (t/c + t)\,\Pi > tx$$

With this analytical analysis of "$R = \tau cx + (\tau/1 + \tau)\,\Pi = tx + (t/c + t)\,\Pi > tx$", and the tax is reflected in monopolistic price increases through its

effect on price in a market non-competition process. On the other hand, to understand the distribution of the tax burden in a monopolistic market where there is no competition, the variability of the structural fact level regarding demand elasticity is important and should be emphasized based on tax incidence and competition variability. When Demand Elasticity is Low, if consumers' demand is insensitive to price (i.e., elasticity is low), the monopolist firm can largely transfer the tax burden to consumers as the tax incidence area of influence increases and passes to the consumer. If consumers continue to buy the product despite the price increase, the tax incidence area of influence increases and passes to the consumer. When Demand Elasticity is High, that is, when consumers' demands are quite sensitive to price, the monopolist firm may have to cover most of the tax itself. Thus, there is a monopolist market structure that causes profits to decrease as a result of the decrease in consumer demand, and it is not very possible to increase prices in the tax incidence area of influence (Bachas & Soto, 2021: 38).

A monopolist firm bases its pricing on the principles of marginal cost and marginal revenue. When a tax is applied, the direct relationship between tax incidence on these two variables is that the tax increases the firm's costs per unit within the framework of marginal cost increases, and these cost increases may cause the dominant firm in a monopolist market to rise or deviate from optimal prices. On the other hand, this phenomenon directly affects prices with a quantity combination that will maximize the monopolist firm's total revenue within the framework of marginal revenue and profit maximization, and a new monopolist market equilibrium is reached by affecting both the consumer and the producer tax burden of the tax incidence area.

Undoubtedly, in a monopoly market where there is no competition, the effects of the tax incidence tax area are not limited to the tax incidence distribution. Social welfare losses (Deadweight Loss) can disrupt market competition balances with tax incidence and cause significant deviations in social welfare losses. In monopoly markets where there is no competition, these deviations and losses can become even more pronounced and cause significant deviations and decreases in consumer and producer surpluses. However, in terms of the effect that the tax will restrict supply, it is also observed that the possible approaches of monopolist firms to restrict the amount of supply in practice to reduce the effects of the tax constitute an important reason and justification for monopolistic profits that may result in higher prices (Tarasov & Zubrickas, 2011: 16).

3. Conclusion

The relationships between market competition and tax policies are critical to efforts to optimize economic efficiency and income distribution goals. In this context, marginal formations in market competition stand out as a fundamental variable in analyzing the effects of tax policies. The success of tax incidence designs is not only based on the general assumptions of economic theories but also makes it inevitable to consider the behavioral responses of market actors and market dynamics. When these effects are evaluated within the framework of the concept of tax incentives impact, they reveal how the distribution of taxes among sectors shapes the area of tax incidence impact on businesses and, thus, the conditions of competition in the market. In industries with high marginal tax rates, it is understood that the increase in the tax incidence impact on businesses will negatively affect their capacity to maintain their market shares and competitive advantages. This situation can limit investment decisions and long-term growth potential, especially in capital-intensive sectors. In this context, states' tax incentives and discount policies for specific sectors can be used as critical tools to increase economic diversity and balance the conditions of competition. For example, tax advantages applied to industries that encourage new enterprises or technological innovations can improve the competitiveness of these sectors and create a fairer competitive environment in the market.

In addition, correctly analyzing the impact of tax incidence is crucial in understanding who ultimately bears the tax incidence in a particular sector. This analysis will also enable policymakers to make fairer and more effective decisions by determining whether businesses or consumers are more affected. The effects of taxation methods on markets vary depending on the type of tax chosen and the market structure. For example, direct taxation on price (ad-valorem taxes) can potentially increase tax revenues but can create different levels of restrictive effects on the market. While the higher pass-through effect of ad-valorem taxes increases the contribution of these taxes to total tax revenues, it can also bring with it the risk of disrupting the market's competitive structure. Especially in monopolistic markets, such taxes are likely to shift economic outcomes towards a market structure without competition. Due to monopolistic markets, a portion of the tax incidence on producers is passed on to consumers, increasing the prices of final goods and services.

This situation may increase income distribution injustices and negatively affect consumer welfare in perfectly competitive markets; the effects of taxes

exhibit a more complex structure. Tax incidence, i.e. how the tax burden is shared between producers and consumers, is directly related to the price elasticities of the market supply and demand curves. While changes in market equilibrium affect the sharing of the tax incidence cost of the tax depending on the producer and consumer behavior, they may also produce different results depending on the flexibility of the market structure and the degree of competition. Considering that marginal changes in market dynamics shape both the effectiveness of tax policies and their effects on income distribution, decision-makers in-depth understanding and analysis of these processes will not only contribute to the creation of a more equitable tax system but also be essential to achieving economic growth and sustainable development goals. Tax incidence impact analyses evaluate the effects of these policies and contribute to the development of sustainable solutions aimed at more straightforward targets. Considering that tax policies may affect sectors differently, designing a tax effect that encourages market competition and innovation is a fundamental requirement to support economic sustainability.

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CHAPTER IV

PLANNING, CONTROLLING AND EVALUATION TOGETHER AS MANAGEMENT FUNCTIONS

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1. Introduction

Management or administration is used in meanings such as the effective and efficient use of available resources to achieve the goals of an institution (organization); dispatch and administration; the implementation of management functions. Management is first divided into two: private administration (business) and public administration. Public administration means state administration. Public Administration basically consists of politics and bureaucracy (Öztürk, 2023: 128). The term bureaucracy was first used in 1745 by the French Minister of Commerce, Vincent De Gourney, to mean the dominance of offices over the administration (Öztürk, 2018a: 12; Türköne, 2011: 434; Aydın, 2015: 98). According to Michel Crosier, bureaucracy is defined as the management of offices, the organization of social activities, and the flow of services and is also used as a management method (Öztürk, 2018c: 11, 13; Eryılmaz, 1997: 3). According to Weber, the characteristics of bureaucracy (Polatoğlu, 2001: 38); division of labor, authority based on hierarchy, rationality (Öztürk, 2017b: 66-82; Öztürk, 2017a: 145-164; Öztürk, 2018b: 29-49; Öztürk, 2022: 39-57), merit, continuity, lack of ownership by the manager, broad scale, an organization with a way of functioning based on rules, personnel with fixed wages and working hours (Aydın, 2015: 101; Aydin, 2011: 95).

As stated in our Constitution, it is generally possible to see the administrative structure in two parts: central government and local administrations. While local governments are appropriate for some reasons, central governments are

preferred for some other reasons (Şinik & Görgün, 2014: 802-803), mainly the preservation of the sovereignty of the state is emphasized (Görgün, 2019: 115).

In this context, politics includes determining and implementing top policies (Alkan, 1993: 105-106); These are activities carried out with the aim of seizing power or getting a share of it (Akyüz, 2009: 95; Türk, 2011: 8).

According to Henri Fayol, management functions were divided into five as Planning, Organizing, Directing, Coordination and Supervision, but later, budgeting and personnel procedures were added to these by Gulick and Urwick and increased to seven. and has taken its place in the literature as POSDCORB (Planning, Organizing, Staffing, Directing, Co-ordinating, Reporting, Budgeting) (Duyar, 2018: 75; Öztürk, 2023: 20).

2. Planning as a Management Function

2.1. General

Planning is extremely important in any company or public institution because it helps focus on the future and determines what actions will be taken in the future. It is among the five functions of management; The other four are Organizing, Directing, Coordinating and Controlling. Planning is an ongoing process and since there will always be inevitable factors that will affect a company's performance positively or negatively, adjustments to the planned action are required, this is called strategic planning. Planning provides a systematic way and a perspective on determining when and how a certain activity or task of an organization will be carried out and who will be responsible for its execution.

Planning is a basic function of management and ensures adequate use of available resources to achieve the goal. It helps in achieving goals through the use of facts rather than through the use of guesses. Since goals and objectives are determined in planning, different alternatives are also used in the same process to maximize success in an institution or organization in the long term. Planning, as a basic function of management, is vital to the success of any organization because it determines the current situation and position and provides a way to achieve future goals. It makes it easy and simple to achieve the goals set in an institution or organization. Strategic planning is vital as it allows identifying the strengths and weaknesses of a company.

In organizations with proper management, managers should check when, how and who is responsible for a particular action and whether there is

appropriate coordination between various parts. Without such responsibility, it may lead to the collapse of an organization that initially performed well. Correct communication is necessary to ensure the satisfaction of the relevant parties while performing the functions of the organization or institution. For developing an organization, it must be flexible and adaptable to the changes that occur.

Planning, by its nature, is about the future and gives the chance to see what can be done in the future (Aydın, 2015: 34; Aydın, 2011: 35). Thus, a connection can be established between the current place and the destination in the future (Eroğlu, 2011: 130). The plan should be made to make maximum use of resources (Aydın, 2015: 35; Aydın, 2011: 35).

Policies that shape state functioning and public administration also affect the functions of management, this influence is most visible in the planning function and these functions become policy instruments (Duyar, 2018: 75).

According to Fayol, making plans means making inferences about the future from the precise knowledge of the past (Fayol, 1937: 111). Gulick, on the other hand, sees planning generally as determining what needs to be done and the methods to be applied (Gulick, 1937: 14). Planning consists of many dimensions such as certain processes, types, and application methods (Tortop et al., 2016: 40 ff; Parlak, 2011: 146 ff). Over time, planning manifested itself in state structures with planning organizations and institutions (Sezen, 1999: 44-52). Planning appears as a central planning phenomenon in bureaucratic models through the connection with economic development (Tuncer and Köseoğlu, 2015: 85-87).

Planning includes activities related to creating a plan (Koparal, 2012: 93; Genç, 2007, 144). Planning reveals which job will be done, by whom, where, when and how (Koçel, 2010: 157). When planning is done, the long-term goals of the institution should be clearly determined (Şimşek, 2009: 130).

2.2. Benefits and Principles

Benefits: Its benefits are generally as follows: Ensuring unity in work; To facilitate the administrator's work; making it possible to be rational and efficient; helping the manager direct events towards organizational goals; to give the manager the habit of looking forward; To ensure that all activities are carried out in accordance with the common goal; Helping the manager delegate authority and focus on core tasks; giving meaning to control; to guide administrators when they make decisions (Öztürk, 2023: 21; Tortop et al., 2007: 52; Şahin, 2017: 163-164).

Principles: Its main principles are: to be as long as possible (Keleş, 1990: 105); be open to change and flexible; equal application to all; be binding; Being clear-transparent and having a wide coverage; and having internal integrity (Şahin, 2017: 166-169; Öztürk, 2023: 21). Şerif states these principles as follows (Şimşek, 2009, 133): Having a clear, definite and valid purpose; be prepared in unity and stick to a master plan; ensuring continuity; be adaptable to changes; be written clearly; Complies with the organization's standards and policies.

Public plans should not protect certain people, and even regional development plans should be prepared in the name of social justice (Harvey, 2003: 97 ff.). Due to the increase in education and income, public plans are expected to be more transparent (Bilgiç, 2003: 28 ff.)

2.3. Varieties and Stages

Varieties: For planning: Long, medium, short according to their duration; coercive and democratic in the way it is prepared and implemented; written and unwritten in terms of form; Disposable and continuous use in terms of usage periods; managerial and development in terms of the organization-economy distinction; and strategically as strategic and tactical, classifications are made (Öztürk, 2023: 22; Ergun and Polatoğlu, 1988: 231-235). The governance (Coşkun, 2003: 39 ff.) and accountability (Balcı, 2003: 115) approach in the public sector and the social responsibility and stakeholder approach in businesses hinder coercive plans.

Stages (Tortop vd, 2007: 56-57; Şahin, 2015: 154-160):

Determining the purpose, (at the first stage of planning Gatewood, 1995, 248)

Collection of data,

Preparation and implementation of the plan,

Controlling,

It's coordination.

3. Controlling as a Management Function

3.1. General

Controlling/Reporting: The activity of determining whether the planned work has been done or not, if it has not been done or has been done incompletely, the reason, and if it has been done, how correctly and effectively it has been done (Özer et al., 2015: 7); the process of measuring the performance of the

institution in achieving the goal (Özalp et al., 2004: 159; Şahin, 2017: 256); It is the determination of negative differences by comparing what should be with what is (Eroğlu, 2011: 137). While Fayol sees supervision as monitoring the results (Fayol, 1937: 112), Gulick sees controlling as the manager informing himself and his subordinates about what happened after recordings and research (Gulick, 1937: 13). The controlling must be carried out with expertise and impartiality (Fayol, 2008: 131 ff.). When carried out by the closest superiors, it also becomes evident as legal and hierarchical control centered on punishment (Al, 2002: 46 ff.; Eken, 2010: 41; Eren, 2006: 260). New public management presents a model for the development of personnel through the concepts of accountability, effectiveness and efficiency, and performance controlling (Demirel, 2006: 118; Akyel and Köse, 2010: 13; Bilgiç, 2003: 27-46).

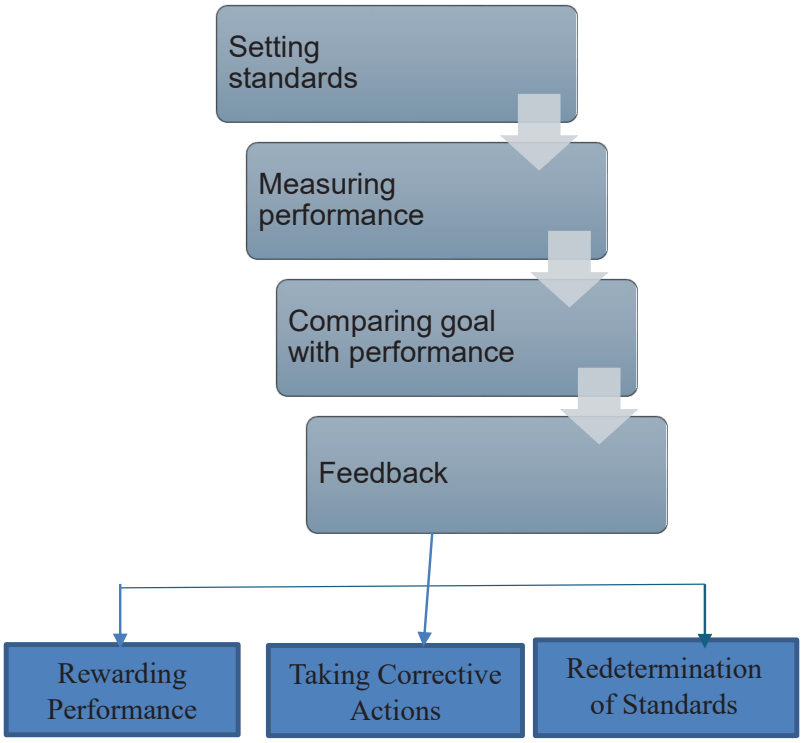
Controlling is the hierarchical and sanctioned monitoring of whether the goals and duties of the organization are carried out efficiently and completely (Fişek, 2011, 281). Controlling is an effort to use resources effectively and efficiently by checking whether and to what extent the previously determined standards have been achieved (Certo and Certo, 2006, 480).

Table 1: Controlling Approaches and Some Basic Components

Controlling Approaches	Some Basic Components
Bureaucratic Control	Rules, standards, hierarchy, authority
Market Control	Price, competition, exchange relationship
Clan Control	Traditions, common values and beliefs, trust

(**Source:** Daft, Murphy ve Willmott, 2010: 370; Koparal, 2012: 151).

The conditions for an effective or quality control are: It is related to the purpose, it is objective, it is holistic, timing is taken into consideration and the use of an acceptable-functional audit system (Öztürk, 2023: 41; Şahin, 2017: 265-266). There are also those who state the conditions for an effective control system as follows: Correctly setting the standards of success; there is sufficient flow of information; convincing employees of the necessity of controlling; impartiality and having a multidimensional approach (Koparal, 2012: 176-177).



Source: (Öztürk, 2023: 42; Özalp vd, 2004: 160; Şahin, 2015: 257)

Figure 1: Control Process

3.2. Resources and Types

Resources: Sources of controlling are employee control, group control, organizational control and stakeholder control (Şahin, 2017: 262-264).

Types: Controlling is divided into two as internal control and external control (Aydın, 2015: 93; Aydın, 2011: 77), and can also be divided into pre-control, immediate control and post-control in terms of the time it is carried out (Ergun & Polatoğlu, 1988: 345 ff.; Aydın, 2006). :33). It is also possible to differentiate Controlling as preventive and corrective Controlling (Özalp et al., 2004: 163; Şahin, 2015: 261-262).

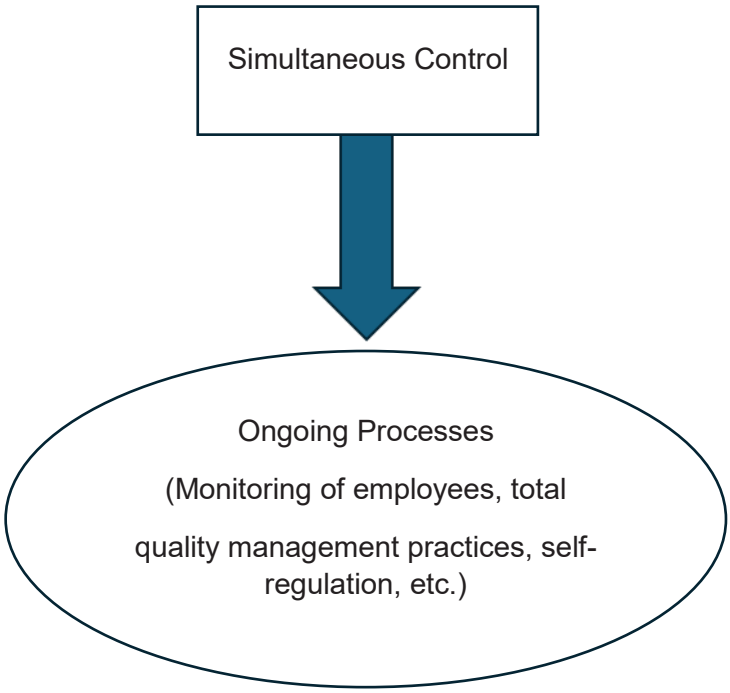
For success in internal controlling, it is important that the necessary regulations are made in the legislation of institutions (Çoban & Aydın, 2009: 8). Internal control is hierarchical control, administrative inspection and administrative tutelage control (Şahin, 2017: 260). Internal control is the control carried out by the administration on its own to ensure that its activities comply

with laws and standards (Aydın, 2006: 33; Ergun & Polatoğlu, 1988: 352; Özer, 1998: 151). Hierarchical control is a control exercised by hierarchical superiors due to their positions. Administrative inspection is the inspection carried out by the board or inspectors on behalf of the authority and is also seen as the inspection of the executive body (Eryılmaz, 1997: 302; Öztürk, 2023: 45).

The state generally keeps absolute powers and does not give them to local governments (Tortop et al., 2007: 100), therefore it keeps local governments under its control through tutelage control (Gözübüyük, 2001: 222). Tutelage control is one of the conditions for the existence of local government (Gözler, 2019: 27-29) and is a pre-functional control over transactions (Aydın, 2006: 34; Örnek, 1994: 123). External controlling (Öztürk, 2023: 43 ff.) controls carried out by the State Control Institution and the Court of Accounts; political control by elected officials; Ombudsman controlling, which helps those who claim that their rights have been violated by the administration to get their rights and reduces bureaucratic procedures (Tortop et al., 2007: 177-188); control of public and pressure groups; judicial review by judicial authorities; and the inspection carried out by international criminal justice authorities (Özer, 1998: 156; Sur, 2011: 286).

Political control is the control of the legislature over the executive and administration. It is especially done through the budget; the budget is a kind of bargaining tool between the executive and the legislature (Page, 1992: 89; Öztürk, 2023: 45). Judicial control: People use this method to ensure that the administration carries out its activities in accordance with the law and even to force it in this direction (Örnek, 1994: 259). The actions and transactions of the administration must be in accordance with the law, which is also a principle of the rule of law (Simon et al., 1973: 25). The Public Controller/ Ombudsman Controlling: The purpose of this body, which appears to be a cross between a public arbitrator and a public observer, is to protect the rights of those harmed by the actions of the administration (Versan, 1978: 72). Public Opinion and Pressure Groups Control: Public Opinion tries to influence the administration through non-governmental organizations such as political parties, unions, press and associations. (Aydın, 2006: 36; Versan, 1978: 205).

In order to be effective in this control, the society must have the ability to act together, there must be independent mass media and press tools, there must be organizational autonomy and freedom (Öztürk, 2023: 47; Ergun & Polatoğlu, 1988: 338; Aydın, 2006: 37). With these tools, they make political suggestions and make efforts to implement them (Page, 1992: 107).



Source: Daft, 2008: 455; Koparal, 2012: 157

Figure 2: Control Process

3.3. Techniques and Stages

Techniques:

Different techniques can be used, some of which include:

Positive and negative evaluation of employees,

Separation of employees according to their qualifications and jobs

Determination of job plans and job analysis,

Organizing meetings where subordinates and superiors are together,

Preparation of manuals for guidance (Özalp vd, 2004: 160; Şahin, 2015: 257; Öztürk, 2023: 42).

Stages:

* Setting standards,
* Measuring performance
* Comparing goal with performance,
* Feedback (Ergun & Polatoğlu, 1988: 342 vd; Aydın, 2011: 76; Aydın, 2006: 32).

4. Evaluations Together and Conclusions

It is necessary to plan all, a period or part of the activities that need to be carried out to achieve the goals of the organization. At the end of our planning, it is necessary to perform an audit to see whether the goals have been achieved or not and to what extent they have been achieved. Otherwise, it becomes impossible to see neither the course nor the outcome.

Inspection during the operations after planning will show us in time if there are any setbacks or negativities. If there are adverse situations and situations that will lead to failure, it is possible to intervene in time and get the chance to change the plans with a flexible approach. In this case, controlling will allow you to change plans and revise them without waiting for the eventual failure. With a prior control, it will be possible to abandon the implementation of plans, avoid wasting time and resources, and review them. What is mentioned here is a preliminary audit, but by taking other types of audits into consideration, it will always be possible to foresee such negativities, prevent negativities from the beginning or cancel plans.

By applying different types of inspections during the planning and implementation stages, it will be possible to see many different points, thus giving direction to the planning will be on the agenda. Planning points that are insensitive to the sensitivities of the people that will emerge through referendum control or unlawful points that will emerge through judicial controls will be corrected. Thus, deficiencies and unsuitable aspects can be eliminated.

On the other hand, planning is also an important function for the performance or effectiveness of the controlling. Controlling is ultimately a matter of sharing authority and responsibility, organizing, directing and coordinating, as well as a matter of planning. Controlling is ultimately a matter of sharing authority and responsibility, organizing, directing and coordinating, as well as a matter of planning.

One should be flexible when planning; when flexible, it will be possible to make changes such as the place, form and time of the inspection when necessary. Sometimes it may be necessary to make changes or give up the inspection, such as in the case of a disaster that occurs within the distance to be traveled while the inspection is to be carried out.

Before conducting a controlling, it must be planned to be effective and efficient. Inspection is not done just for the sake of inspection. It is essential that the inspection to be carried out is appropriate and serves the purpose. Therefore, planning to meet these criteria is extremely essential.

It may also be necessary to change the type and form of control to be implemented by making different plans. The first control that comes to mind may not always be as simple or accurate as it seems, these situations will also arise in the plans and it may be possible to make adjustments or corrections.

If planning and controlling can be done effectively, one positively develops the other. In other words, there is a mutual bilateral relationship between them. While planning creates a framework for the future, it also provides an effective road map for controlling. Controlling functions also contribute to planning by directing the efficient and effective use of available resources. When making decisions regarding controlling, the organization's plans should be taken into consideration and efforts should be made to make rational decisions. (Koparal, 2012: 150).

In conclusion; The controlling function will provide extremely useful and necessary data to the manager in order to be able to see the results and progress of planning, to take precautions in advance if there are negativities and setbacks, to abandon planning if necessary, to see different situations and make corrections, to ensure that planning serves its purpose and similar situations. On the other hand, the planning function provides extremely useful and necessary data to the manager in order to perform the controlling function, the effectiveness and efficiency of the control, to make changes or give up if necessary, to ensure that the controlling serves the purpose, to make changes-corrections-arrangements and similar situations.

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CHAPTER V

MANAGING COSTS FROM A SUPPLY CHAIN COST MANAGEMENT PERSPECTIVE

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1. Introduction

The supply chain includes all processes an organization must perform to produce a product or service, from raw material suppliers to the final consumer. These processes are a complex network that includes many components, ranging from raw material supply to production, storage, transportation, distribution, and delivery of products to the end user (Chopra & Meindl, 2016; Christopher, 2016). Each stage of the supply chain significantly contributes to product value creation, and each of these processes is managed in accordance with organizational strategies. Supply chain management (SCM) is a discipline that effectively coordinates supply chain management (SCM) processes. For an organization to achieve a sustainable competitive advantage, it is critical to carefully monitor and manage costs at each stage to minimize costs by increasing efficiency throughout the SCM, to respond quickly to customer demands, and to increase the overall performance of organizations (Porter, 1985; Simchi-Levi et al., 2014; Heizer et al., 2017).

Christopher (2016) defined supply chain management as the management of processes from product design, production, distribution, and delivery to the final consumer. This definition emphasizes that each stage of the supply chain significantly impacts product value. Each component in the supply chain plays a critical role in an organization's ability to gain competitive advantage.

For example, effective supply chain management not only increases customer satisfaction and helps organizations reduce costs (Simchi-Levi et al., 2014).

Cost management involves controlling, optimizing, and minimizing the costs incurred in all production and operation processes of an organization. Proper management of supply chain processes directly affects cost structure. Therefore, the relationship between supply chain management and cost management is of central importance for increasing enterprises' competitiveness. In developing global markets, optimizing supply chain costs can enable companies to increase their profitability and expand their market share (Chen & Lee, 2009; Kraljic, 1983).

In this study, to understand the relationship between supply chain management and cost management, the theoretical foundations of these two concepts are discussed. Then, the application areas of these concepts, the challenges encountered, and the best practice strategies used to deal with these challenges are discussed. Finally, the findings obtained from the literature on how to monitor and optimize costs from the perspective of supply chain cost management by integrating supply chain management and cost management are included.

2. Supply Chain Cost Management (SCCM)

2.1. Supply Chain Structure and Components

The supply chain comprises a series of interconnected stages, each of which determines the efficiency of the chain. The basic components of the supply chain are as follows:

Suppliers: Providers of raw materials, semi-finished products or services. Suppliers are the starting point of the chain. Management of supplier relationships is a factor that directly affects the efficiency of the supply chain. Starting from supplier selection to contracts with suppliers, each stage determines costs and service levels throughout the chain (Kraljic, 1983). Collaboration in supplier relationships can reduce costs and secure on-time deliveries, as well as increase quality.

Producers: Companies that process raw materials and produce final products. The role of manufacturers is critical to ensuring efficiency in the supply chain. Effective management of production processes ensures that not only the quality and quantity of products are controlled, but also costs. Modern production techniques, such as Just-in-Time (JIT) and total quality management (TQM), are important strategies for reducing waste and costs while increasing efficiency in production processes (Liker, 2004). These processes can be used as an effective tool to reduce costs throughout the supply chain.

Distributors and Warehouses: Companies that stock products and distribute them to end consumers or retailers. Storage and distribution processes are an important component of the supply chain. This stage plays an important role in reaching the final consumer. Distributors increase the effectiveness of inventory management in the supply chain by delivering the right quantities to customers at the right time. Optimizing storage costs and transportation times is an important factor in reducing the total cost of the supply chain (Bowersox et al., 2013). Storage strategies are critical to ensuring correct inventory management in a dynamic environment where demands can change rapidly.

Retailers: Businesses that deliver final products to consumers. Retailers are the final link in the supply chain and reach consumers directly. Retailers determine how products will be offered to the market, priced, and distributed. This stage is directly related to customer demands and is extremely important for customer satisfaction. In addition, the relationships of retailers with other actors in the supply chain are a determining factor in delivering products to consumers on time and at an affordable cost (Kotler & Keller, 2016).

2.1.1. The Strategic Role of Supply Chain Management

Supply chain management is vital for organizations to gain the competitive advantage. Correct decisions at each stage of the supply chain allow companies to optimize their costs and gain a stronger position in the market. Therefore, supply chain management is not only an operational activity but also a strategic process (Porter, 1985). Effective supply chain management provides organizations with the following advantages:

Cost Reduction: Every stage of the supply chain offers opportunities for cost reduction. This can be achieved by implementing more efficient methods in both raw material supply and distribution processes.

On-Time Delivery: Effective supply chain management ensures that production and distribution processes are completed on time. This increases customer satisfaction and improves inventory management.

Flexibility and Adaptability: This characteristic allows the supply chain to continue to operate healthily without being affected by external factors.

2.2. Cost Management: Basic Concepts and Methods

Cost management is a set of methods used to determine, monitor, and control costs in all production processes. Cost management is of critical importance for businesses to increase profitability, use resources efficiently, and gain competitive advantage. A well-structured cost management system helps organizations achieve

their strategic goals while playing an important role in controlling costs and ensuring sustainable growth (Horngren et al., 2013). The aim of Cost Management is to effectively manage and optimize costs in all organizational processes. This includes monitoring and analyzing all cost items related to production, logistics, supply chain management, and other operational activities. In this context, the cost management process not only ensures that costs are kept under control but also minimizes costs through efficient strategies. The success of cost management enables organizations to use resources more efficiently, improve their profit margins, and ensure long-term sustainability (Kaplan & Anderson, 2004).

2.2.1. Cost Management Process

The cost management process consists of a series of stages to ensure that organizations can achieve their cost targets. These processes consist of basic steps, such as planning, monitoring, controlling, and optimization, and each serves a different purpose.

Cost planning: This stage determines the estimated costs of all activities at the beginning of the production process. This process reveals organizations' cost expectations regarding production and operational activities, and these estimates form the basis for future budget and strategy determination processes. Cost planning generally includes the stages of cost estimates, budgeting, and the creation of cost structures that are compatible with strategic goals (Kaplan & Norton, 1996).

Cost monitoring: This refers to the monitoring of costs throughout the production process and analyzing deviations. As the production process progresses, costs should be compared with the planned budget. The efficiency of the supply chain and production processes is evaluated, and the causes of deviations are investigated. Cost monitoring allows managers to identify potential inefficiencies in the supply chain and take action to eliminate them (Bromiley & Marcus, 1989).

Cost control: Control mechanisms are implemented to ensure that costs match budgeted targets. The supply chain and production processes are managed correctly in this process. For cost control to be successful, production and operational processes must be continuously monitored, deviations must be analyzed and interventions must be made when necessary. Cost control also involves measuring performance in line with organizational targets (Antle & Demski, 1998).

Cost Optimization: Cost optimization aims to reduce costs by increasing process efficiency. This process is related to improving each stage of production and supply chain management. For example, changing the supply chain can

reduce overall costs by optimizing transportation or inventory levels. Cost optimization aims to eliminate waste and inefficiencies at each stage of the supply chain, and these processes are usually supported by continuous improvement methods (Womack & Jones, 1996).

2.3. Supply Chain Cost Management (SCCM)

Optimizing supply chain costs directly affects businesses' overall cost structure. Supply chain management covers not only logistics and inventory management, supplier relationships, production processes, and distribution networks. Costs can be controlled using appropriate strategies that can be applied at every stage of these processes. Supply chain cost management requires optimizing both fixed and variable costs and adopting efficiency-enhancing approaches in all processes (Simchi-Levi et al., 2014).

Simchi-Levi et al. (2014) stated that optimizing supply change costs can directly increase organizations' profitability. This can be achieved through factors such as lower supplier prices, efficient production processes, reduced transportation costs, and better inventory management. For example, by using the just(Just-In-Time) strategy in a supply chain, stock levels can be reduced, which reduces inventory costs. In addition, optimizing contracts with suppliers can provide significant advantages in terms of both cost and supply continuity (Chen & Lee, 2009).

Supply chain cost management ensures that all components of the supply chain are directed toward common goals. In this process, the cooperation of all stakeholders to achieve cost savings significantly impacts minimizing total costs. In addition, the use of technology, especially ERP (Enterprise Resource Planning) and SCM (Supply Chain Management) software, can make supply chain cost management more effective and increase efficiency in the supply chain (Liker, 2004).

2.3.1. Strategic Approaches to Supply Chain Cost Management

The effectiveness of supply chain cost management strategies is not limited to monitoring and controlling processes; they should also be supported by strategic planning, continuous improvement, and innovation processes. In this context, some strategic approaches can be summarized as follows:

Valuee engineering: In product design, functionality and costs can be balanced. Value engineering helps reduce costs while also improving product quality (Miles, 2001).

Supplier relationship management: By establishing long-term supplier relationships, permanent costs can be reduced. Collaboration with suppliers can lead to discounts in bulk purchases and increased logistics process efficiency (Kraljic, 1983).

Total Quality Management (TQM): Improvements in quality management can reduce costs by reducing error rates. Quality improvements in production processes result in savings at every stage of the supply chain (Deming, 1986).

2.3.2. Supply Chain Cost Elements

Supply chain cost elements originate from different components at each stage, and these components significantly affect organizations' total cost structure. Since the supply chain includes a series of activities from raw material procurement to the delivery of the final product to the consumer, each activity leads to certain cost elements. Understanding and managing these cost elements effectively allows organizations to optimize their cost structures. The main cost elements of supply chain cost management are discussed in detail below.

Inventory costs: Inventory costs are among the most important elements of supply chain cost management. Inventory costs include costs incurred in both storage and transportation processes and generally consist of four main components:

- *Storage costs:* These are the costs incurred in storing products in warehouses. These costs include all expenses related to warehouse space rental, energy costs, and inventory preservation and management (Bowersox et al., 2013). Storage costs increase as stock levels increase. Efficient warehouse management is important for minimizing these costs.
- *Stock carriage costs:* The costs incurred when transporting products to the warehouse, their relocation, and shipment to another location. This includes processes such as transportation, handling, and packaging. High carrying costs mean that inventory levels are kept unnecessarily high.
- *Inventory holding costs:* These costs result from holding excess inventory and are related to the risks that the inventory carries. Excess stock products carry risks, such as loss of value, spoiling, or becoming obsolete (Chopra & Meindl, 2016).

Inventory levels can be minimized using strategies such as "Just-in-Time" (JIT) to optimize inventory costs. These strategies ensure timely and efficient

production and distribution processes but require strong coordination at each stage of the supply chain.

Transportation costs: Transportation costs are the expenses incurred when moving products from one location to another in the supply chain. These costs vary depending on the mode of transportation, distance, quantity transported, and timing. The transportation cost has several basic components:

- *Transportation vehicles:* This category covers all expenses related to the vehicles used to transport the products (trucks, trains, ships, airplanes, etc.). These costs vary depending on the type of transportation vehicle, its size, fuel costs, and maintenance expenses (Ballou, 2007).
- *Transportation time and speed:* The time taken to transport products directly affects transportation costs. Faster transportation is generally associated with higher costs (Koch, 2009). Therefore, it is important to strike a balance between transportation time and cost.
- *Transportation distance:* Transportation distance is a major determinant of transportation cost. Longer distances typically require more energy and time to travel, thereby increasing transportation costs. Longer distances can also increase environmental costs.

Efficient transportation and logistics strategies can help reduce transportation costs and prevent loss of time. In addition, integrating transportation methods and using multimodal transportation options plays a critical role in optimizing costs (Muller et al., 2011).

Production costs: Production costs include all expenses incurred during product production. These costs include direct labor, materials, and manufacturing overhead:

- *Material Costs:* These are the costs of raw materials and components used in product production. Material costs are usually the largest item cost per product. Supplier relationships and fluctuations in raw material prices can directly affect these costs (Stevenson, 2014).
- *Labor Costs:* Includes expenses such as salaries and fringe benefits, of employees during the production process. Labor costs are directly related to production process efficiency, and automation of production processes plays an important role in reducing these costs (Harrison & Van Hoek, 2011).
- *General production costs*: These include costs such as energy used during the production process, machine maintenance, equipment rental, and

factory costs. The optimization of these costs can be achieved by improving production processes more efficient (Heizer & Render, 2014).

Effective production planning, strategic supplier selection, and technology use are important for reducing production costs. For example, robotic automation and digitalization in production processes can improve production costs by reducing labor and failur rates.

Supplier costs: Supplier costs are the costs arising from contracts and supplier relationships with suppliers. These costs include the following:

- *Price agreements:* Price agreements with suppliers directly affect the price of the supplied material. Long-term agreements with suppliers usually provide discounts and price lock-ins, but the supplier selection and bargaining process affect the height of these costs (Kraljic, 1983).
- *Payment terms:* Supplier payments vary according to the terms of the contract with the supplier. Payment terms and cash flow management are important factors that affect supplier costs (Van Weele, 2018).

Reducing supplier costs can be achieved by carefully selecting the supplier selection process and establishing long-term strategic partnerships. In addition, strong communication and information sharing among all stakeholders in the supply chain can reduce costs.

Quality costs: Quality costs are the costs incurred to correct defective or poor quality products. Quality costs generally fall into four categories:

- *Preventive costs:* The expenses incurred to prevent quality problems in products. This includes investments in design improvements, training, and quality control processes.
- *Evaluation costs:* The expenses incurred to evaluate and control the quality. These costs include product testing, quality audits, and inspections.
- *Internal failure costs:* These are costs related to failure detected during production. These costs include the reprocessing or disposal of defective products.
- *External failure costs:* These are the costs related to failures detected after reaching the consumer. Corrective activities for warranties, returns, and customer complaints are included in these costs.

Controlling quality costs is possible by implementing quality management systems at every stage of the supply chain. Continuous improvement (Kaizen)

and effective use of quality management systems (such as ISO 9001) are necessary to minimize quality costs (Juran & Godfrey, 1999).

2.3.3. Cost Reduction Strategies in Supply Chain Cost Management

Reducing supply chain costs is critical for organizations seeking to gain competitive advantages and increase sustainability. There are multiple strategies to reduce supply chain costs, and these strategies can help organizations achieve both short-term and long-term savings by increasing their efficiency. The following are detailed strategies for reducing supply chain costs.

Collaboration and Integrated Supply Chains: Working closely with suppliers and integrating the supply chain is an effective way to reduce costs. Collaboration can increase efficiency at every stage of the supply chain, thus reducing total costs. This strategy generates effective results not only in supplier selection and supplier relationship management. In particular, establishing long-term strategic partnerships with suppliers can ensure that materials and services are procured at lower costs (Kraljic, 1983).

Supply chain integration involves sharing data and coordinating processes among all stakeholders in the supply chain. Thus, inventory levels, production planning, ordering processes, and logistics operations become more efficient. Integrated supply chain structures, especially with the use of models such as Vendor Managed Inventory (VMI), enable the reduction of both stocks and carrying costs (Christopher, 2016).

Such integration also increases the accuracy of demand forecasts and reduces unnecessary stock holding and carrying costs. In particular, the Lean Supply Chain philosophy encourages continuous improvement and data sharing with suppliers, leading to continuous cost reduction (Liker, 2004).

Just-in-Time (JIT): The Just-in-Time (JIT) strategy reduces costs by ensuring that inventories in the supply chain are kept to a minimum and supplied only when needed. JIT is an approach that optimizes manufacturing processes, inventory management, and supplier relationships. JIT philosophy accepts that holding excess inventory is costly and creates a financial burden on the business (Ohno, 1988).

JIT applications help reduce both transportation and storage costs. Storage costs increase with excess inventory; therefore, inventory in the supply chain is supplied only when needed. JIT also makes production processes more flexible and prevents unnecessary steps. However, for JITs to be successfully implemented, highly reliable supplier relationships and a strong logistics infrastructure are needed in the supply chain (Simchi-Levi et al., 2014).

JIT can significantly reduce transportation and storage costs while ensuring that products are supplied at the right quantity and at the right time. However, any disruption in the supply chain can affect production processes; thus, supply chain security and flexibility are also important factors (Coyle et al., 2016).

Supply Chain Optimization: The overall supply chain optimization reduces costs by efficiently planning and managing all processes. Optimizing production, transportation, and storage processes directly affects total supply chain costs.

Supply chain optimization is generally focused on the following areas: *Production Optimization:* Performing production processes on time and correctly reducing costs by reducing waste and excess stock. Lean manufacturing principles can be applied to use production capacity efficiently (Womack & Jones, 1996).

Logistics optimization: Optimizing transportation routes and transportation in transportation processes can reduce transportation costs. Route planning software can reduce time and fuel costs by ensuring the most efficient planning of transportation routes (Ballou, 2007).

Inventory optimization: Determining inventory levels accurately reduces storage and transportation costs by preventing excess stock. An appropriate amount of inventory can be maintained using inventory management software and demand forecasting systems. The supply chain optimization can be improved using software and algorithms. In addition, all stakeholders in the supply chain must coordinate processes and work toward common goals. This not only reduces costs but also increases on-time delivery and customer satisfaction (Lee et al., 2007).

Use of Technology: Technology plays a major role in reducing costs by digitizing and automating processes in the supply chain. Today, supply chain management software provides significant developments in areas such as supplier management, inventory control, logistics, and transportation planning. These technological solutions reduce costs and increase efficiency.

Artificial intelligence and machine learning: Artificial intelligence and machine learning can improve demand forecasts and accurately determine stock levels. They can also be used as decision support systems in inventory management and supplier selection processes (Choi et al., 2020).

Blockchain technology: Blockchain can help improve supply chain processes in terms of transparency and security. Each transaction in the supply chain can be tracked on the blockchain, facilitating inventory tracking and

ensuring fewer errors in processes such as supplier payments and quality control processes (Saberi et al., 2019).

IoT (Internet of things): IoT devices allow monitoring of every stage in the supply chain. Products and inventories can be tracked using IoT sensors, and disruptions in transportation and storage processes can be detected quickly. This is an effective strategy to reduce transportation and storage costs (Baryannis et al., 2019).

As a result, the use of technology offers a significant opportunity to reduce supply chain costs while increasing efficiency. Digitalization can help organizations make faster decisions, improve processes, and respond more quickly to customer demands.

2.3.4. The Challenges Encountered in Supply Chain Cost Management

The challenges encountered in supply chain cost management arise from both internal and external factors. Globalizing markets, changing economic conditions, technological developments, and various risks have made the process of controlling and managing costs in the supply chain more complex. In this section, the main challenges encountered in supply chain cost management are discussed, and the sources and effects of these challenges are discussed.

Globalization and Market Uncertainties: Globalization has expanded the scope of the supply chain and forced businesses to collaborate with suppliers and customers operating in different geographies. However, globalization also leads to increased uncertainty and risk in supply chain management. In global supply chains, factors such as exchange rate fluctuations, international trade regulations, customs duties, and political risks complicate supply chain cost management (Chen & Lee, 2009; Christopher, 2016).

Exchange rates: In global supply chains, the impact of exchange rate changes constitutes a major cost element, especially for multinational companies. Exchange rate fluctuations make it difficult to estimate and control product costs. In supply chains in which different currencies are used, sudden changes in exchange rates can significantly affect suppliers' and importers' costs (Sodhi & Tang, 2012).

Customs duties and trade regulations: Complex regulations on international trade, customs duties, and trade barriers are another factor that complicates cost estimates. Actors in the supply chain may face unexpected cost increases due to customs duties and trade barriers when exporting and importing products to

other countries. This creates more unpredictability, especially in supply chains that operate under variable policies and regulations (Gereffi, 2018).

Political risks: Global markets may experience serious difficulties because of political risks. Factors such as war, civil unrest, changes in government, trade wars, and protectionist policies implemented by the state can increase supply chain costs and complicate supplier selection processes (Harrison & Van Hoek, 2011). These uncertainties pose greater risks, especially for businesses in developing countries.

The Numerous Actors and Complexity in the Supply Chain: The supply chain has a complex structure that involves different actors involved in product production and distribution. These actors include suppliers, manufacturers, distributors, logistics providers, retailers, and end consumers. As each actor is involved in different stages of the supply chain, cost calculations and management becomes more complex.

Coordination challenges: The efficient coordination of different actors at each stage of the supply chain can make supply chain cost management difficult. In particular, incomplete or faulty information flow between suppliers and manufacturers can lead to faulty production processes, excess or deficient inventories, and ultimately higher costs (Simchi-Levi et al., 2014).

Inventory management: Inventory management can be challenging in a supply chain in which multiple actors participate. Failure to accurately track inventory levels can result in oversupply or undersupply of products, which increases both transportation and storage costs (Coyle et al., 2016). In addition, managing different inventory levels requires that the responsibilities of each actor be clearly defined; otherwise, unnecessary costs may arise. • Hidden Costs: The complexity of the supply chain can sometimes cause hidden costs to be overlooked. These hidden costs can arise from a lack of cooperation between different actors or inadequate management of processes. For example, supplier changes or unexpected production errors can cause unexpected increases in supply chain cost management (Koh et al., 2014).

Technological and Information Flow Challenges: Although integrating technology into the supply chain can increase process efficiency, it also introduces many challenges. In particular, properly managing the flow of information throughout the supply chain plays a critical role in controlling costs.

Digitalization and automation: The digitalization of processes in the supply chain is necessary for accurate data collection and analysis. However, since not every supplier or manufacturer uses the same digital infrastructure,

data incompatibility and incorrect information flow issues can occur. This can affect the accuracy of cost estimates and make it difficult to optimize the supply chain (Choi et al., 2020).

Investment in technology: Supply chain technologies often incur high initial costs. High technology investments can be barriers, especially for SMEs. In addition, the constant updating and maintenance of technology can incur additional costs (Baryannis et al., 2019).

Emotional and Behavioral Challenges: Emotional and behavioral challenges also play an important role in supply chain cost management. In particular, the goals, cultural differences, and business practices of organizations and suppliers can affect cost management strategies.

Lack of trust and communication: Trust problems with suppliers can prevent collaboration and information sharing. Inadequate communication can lead to misunderstandings and increased costs (Van Weele, 2018). In addition, cultural differences and different business practices can make it difficult for all actors in the supply chain to achieve common goals.

Lack of motivation: Supply chain actors must establish appropriate motivation systems. If the supplier or manufacturer is not sufficiently motivated to reduce costs or increase efficiency, costs can become uncontrollable.

2.3.5. Modern Supply Chain Cost Management Approaches

Supply chain cost management is becoming increasingly sophisticated. Technological advances, particularly data analytics, artificial intelligence (AI), and blockchain technologies, play a significant role in optimizing costs in supply chain processes. These technologies enable effective and efficient management of various elements in the supply chain, more accurate cost forecasting, and improved resource utilization. A more detailed review of modern supply chain cost management approaches is provided below.

Data Analytics and Big Data: Data analytics is the process of collecting, analyzing, and deriving meaningful results from data for supply chain cost management. With the development of big data technologies, companies can now analyze millions of data points and obtain important insights from such data, which will increase their operational efficiency. The use of big data in supply chain cost management offers many opportunities to control and improve costs, from supplier selection to inventory management (George et al., 2014).

Inventory optimization: Data analytics can prevent excess stock and inventory insufficiency by forecasting accurate demand forecasts. Accurate

analyses of stocks can minimize unnecessary storage and transportation costs while increasing product lead time and customer satisfaction (Chae, 2015).

Demand forecasting: Demand forecasts are one of the most critical components of the supply chain. Data analytics can learn from past data and predict future demand fluctuations more accurately. This allows for production processes and stock levels, thus avoiding unnecessary transportation and storage costs (Waller et al., 2015).

Artificial Intelligence and Machine Learning: Artificial intelligence (AI) and machine learning (ML) technologies are increasingly being used to manage costs in the supply chain. AI-based systems can automate processes, accelerate decision making, and make more accurate predictions. The integration of these technologies into the supply chain offers great opportunities to reduce costs while increasing efficiency.

Demand forecasting and dynamic planning: AI-based systems improve inventory management by accurately predicting product demand. In particular, using dynamic planning algorithms, fluctuating demand can be responded to quickly, and unnecessary production or transportation costs can be prevented (Agrawal et al., 2018).

Decision support systems: AI can create decision support systems that provide suggestions to improve the efficiency of the supply chain. These systems can inform managers about supply chain areas that can optimize costs. AI algorithms can perform faster and more accurate analyses than the human brain by processing large datasets (Choi et al., 2020).

Blockchain Technology: Blockchain technology has great potential for supply chain cost management. Blockchain increases transparency and security by storing data in a decentralized network. These features play an important role, particularly in monitoring and making transparent costs in the supply chain.

Transparency and traceability: Blockchain technology records the movements of each transaction and material in the supply chain. This allows materials and products to be tracked throughout the entire supply chain, thus minimizing costs related to false information or counterfeit products (Ivanov & Sokolov, 2019). Blockchain technology can be used to verify when and where products are manufactured, how they are transported, and what processes they go through by keeping a record of each step in the supply chain. This transparency prevents supplier errors and quality issues, thus reducing costs.

Smart contracts: Smart contracts implemented over the Blockchain enable the automatic implementation of agreements with suppliers. In this way, it

is possible to quickly check whether contracts have been fulfilled and avoid possible payment delays or penalty costs (Tapscott & Tapscott, 2017).

Robotic Process Automation (RPA): Robotic Process Automation (RPA) uses software robots to automate business processes. RPA eliminates human error, especially in repetitive and time-consuming tasks, thereby allowing processes to be executed more quickly and accurately. The use of RPA in the supply chain can significantly reduce costs.

Increased productivity: RPA can reduce labor costs by automating tasks such as inventory tracking, order processing, and invoice management in the supply chain. It can also keep costs under control by reducing error rates in processes (Deloitte, 2017).

Supplier relationship management: RPA can also help manage supplier relationships. Routine tasks, such as orders, invoice transactions, and payment processes, can be automated, enabling faster and more efficient communication with suppliers.

Cloud Computing: Cloud computing technology allows data from every stage of the supply chain to be collected on a central platform. This provides faster data access and analysis. Cloud computing increases data security in supply chain cost management and helps to control costs.

Real-time cost tracking: Cloud technology allows real-time tracking of supply chain data. This helps managers monitor costs and performance instantly. Real-time data enable decisions to be made quickly and accurately, thereby preventing unnecessary costs (Teece, 2010).

Digital Twins: Digital twin technology creates digital copies of physical assets. In supply chain processes, digital twins simulate each stage of the supply chain using real-time data. This technology helps reduce costs by increasing the efficiency of each stage of the supply chain.

Performance improvement and cost reduction: Digital twins test how these processes can be improved by creating a digital model of each step in the supply chain. Therefore, unnecessary costs and bottlenecks can be eliminated (Grieves, 2014).

3. Conclusion

Supply chain cost management plays a critical role in modern businesses' achievement of competitive advantage and increase profitability. These two areas have become even more important because of the complex and rapidly changing economic conditions faced by businesses operating in globalized

markets. Effectively managing costs in the supply chain not only optimizes the cost structure of organizations but also helps them use resources more efficiently by increasing operational efficiency (Simchi-Levi et al., 2014).

For supply chain cost management to be successful, organizations must establish effective collaborations with all chain actors, such as suppliers, manufacturers, distributors, and retailers. This collaboration creates opportunities to monitor and improve costs at every stage of the supply chain. Collaboration in areas such as supplier relations and inventory management offers significant advantages in achieving common goals and operational efficiency (Koh et al., 2014; Christopher, 2016). In addition, emerging technologies can significantly transform supply chain cost management. New-generation technologies such as data analytics, artificial intelligence (AI), blockchain, robotic process automation (RPA), and digital twins enable more efficient and flexible management of supply chain processes. These technologies allow for more accurate estimation, monitoring, and optimization of costs at every stage of the supply chain (Agrawal et al., 2018; Tapscott & Tapscott, 2017). For example, AI-powered demand forecasting systems allow unnecessary stock to be avoided in the TZ, while data analytics and blockchain technologies provide transparency and traceability in the supply chain, making it possible to accurately control costs (Ivanov & Sokolov, 2019; Chae, 2015).

However, difficulties in supply chain cost management should not be ignored. Factors such as uncertainties in global trade, exchange rates, customs regulations, and political risks make it difficult to predict costs (Chen & Lee, 2009). In addition, the large number of actors and complex relationship structures at each step in the supply chain can make managing costs even more difficult. Therefore, the accurate monitoring and optimization of costs in the supply chain should support not only by technological solutions and organizational strategies.

As a result, supply chain cost management has emerged as a new perspective that is critical to the sustainable success of modern businesses. In addition to technological developments, effective collaboration among supply chain actors constitutes the basic element for cost-management success. In an environment where the dynamics of global trade are rapidly changing, the need for continuous innovation and adaptation in supply chain cost management and control arises. Despite these challenges, businesses must develop strategic flexibility and innovative solutions to overcome them.

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CHAPTER VI

VALUE CHAIN COST MANAGEMENT FROM A COMPETITIVE STRATEGY PERSPECTIVE

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1. Introduction

The concept of the value chain was defined by Michael Porter in his book Competitive Advantage: Creating and Sustaining Superior Performance, published in 1985, and it has emerged as a critical concept in the processes of businesses achieving competitive advantage. According to Porter, the value chain can be defined as a structure in which all activities of a business are interconnected, and the sum of these activities shapes the value creation processes that provide the business with competitive advantage (Porter, 1985). The primary purpose of the value chain approach is to analyze the contribution of each activity step toward the value created and to optimize these contributions. This process includes a holistic approach that includes not only product or service production but also supply chain management, logistics, marketing, and after-sales services and more (Porter, 1985).

The management of the value chain plays an important role, particularly in the context of cost management. Cost management involves monitoring, analyzing, and minimizing costs at each stage of enterprises' activities. By carefully managing the costs of each activity in the value chain, a company can optimize its overall cost structure. Thus, it can increase its profitability. However, the relationship between value chain analysis and cost management aims not only to reduce costs but also to increase the potential for efficient use of resources and value creation (Kaplan & Norton, 2001).

In Porter's value chain model, the distinction between the firm's core activities and support activities helps determine where cost management should focus. Core activities are directly related to product and service production and affect costs. These activities include incoming logistics, manufacturing operations, outgoing logistics, marketing and sales, and after-service support services. Support activities are functions that support the firm's core activities and include HR management, technology development, and supplier relations (Porter, 1985). A detailed analysis of the cost structure and efficiency of each segment of the value chain can help a firm both control costs and gain a competitive advantage.

In the modern business world, globalization, digitalization, and increasing competition force businesses to manage costs more effectively. In particular, businesses operating in globalized markets must become more competitive and ensure sustainability by optimizing costs. Cost management strategies should be adopted as a tool to increase efficiency and use resources efficiently at each step in the value chain, rather than focusing solely on reducing costs (Stabell & Fjeldstad, 1998). Value chain analysis serves as a map in this process and determines in which areas businesses need to invest more to create value or in which areas they need to cut costs.

Strategic management tools, such as the Balanced Scorecard developed by Kaplan and Norton (2001), are powerful tools for integrating value chain and cost management strategies. Rather than focusing solely on monitoring costs, such tools also evaluate the performance of all value chain activities in line with the strategic goals of the company. In this way, the company takes more solid steps toward achieving its strategic goals while increasing its cost efficiency.

This strong relationship between value chain and cost management becomes a decisive factor in achieving a competitive advantage for businesses. By carefully monitoring and optimizing each area of activity in the value chain, a business can reduce costs and increase customer value. This process is critical for creating a sustainable competitive advantage. In this context, value chain analysis and cost management are important factors that shape not only the short-term profitability of businesses and their long-term strategic success.

2. Fundamentals of the Value Chain

The value chain model developed by Michael Porter in 1985 classifies all activities of a business aimed at creating a competitive advantage into two main

groups: basic activities and support activities. According to Porter (1985), these two groups shape the value creation process of a business, and each activity directly affects the cost structure and competitive position of the business. Value chain analysis helps businesses better understand activities in each area and optimizes these activities to provide a competitive advantage.

2.1. Core Activities

Core activities are activities directly related to product and service production and customer value. Porter (1985) defined core activities as follows:

Inbound logistics: Processing of raw materials, material supply, supplier relations, warehouse management. Input logistics ensure that the resources required for production are efficiently provided and delivered on time.

Production: Finalizing products and services. This activity directly affects the production capacity, production costs, and efficiency of the enterprise.

Outbound logistics: Distribution and delivery of products according to customer demands. This process includes activities related to logistics networks and distribution channel management.

Marketing and Sales: Introducing products to customers and conducting sales. Marketing activities include creating brand value, conducting market research, and analyzing customer demands.

Service: Services provided after product delivery, such as warranties, maintenance, and support. Services increase customer satisfaction and strengthen customer loyalty.

These activities directly create customer value and determine the competitive position of the enterprise in the market. Efficient management of core activities reduces costs and increases product or service quality to be increased (Porter, 1985; Gallo, 2014).

2.2. Support Activities

Support activities are services provided by various business functions to increase and optimize the efficiency of core activities. Although support activities do not create direct value, they significantly impact the overall efficiency and competitiveness of the business (Porter, 1985). Porter defined these activities as follows:

Human Resources Management: Recruiting, training, motivating, and managing employees. Human resource management supports other activities in the value chain by increasing business and workforce productivity.

Technology Development: This includes product development, automation of production processes, and R&D activities. Technology development plays a critical role in providing a business with a competitive advantage because producing innovative solutions and improving processes are among the main ways to reduce costs and create value.

Supply Management: Sourcing raw materials and components, managing supplier relationships, and optimizing the supply chain. Supply management is critical for ensuring that key value chain activities continue to operate efficiently. Supply chain strategies require a strategic approach to reduce costs and shorten lead times (Christopher, 2016).

Infrastructure: The general management structure of a business; financial management; planning; legal services and other administrative functions. Infrastructure provides the administrative and operational support required for a business to achieve its strategic goals.

Porter (1985) stated that support activities are of great importance to increasing the efficiency of core activities and contributing to the value creation process in accordance with the general strategy of the company. Effective management of these activities directly affects the competitive power of the company and enables it to achieve its strategic goals.

2.3. Value Chain Analysis and Competitive Advantage

The value chain analysis allows businesses to evaluate costs and value creation potential in each area of activity. This analysis helps businesses understand which activities they reduce efficiency by keeping costs high or which activities they gain competitive advantage by focusing more on creating value (Kaplan & Norton, 2001). Improvements, especially in activities with high costs or inefficiencies, can strengthen the competitive position of businesses.

Optimizing activities at each stage of the value chain not only controls costs but also increases customer value by improving the quality of the company's products or services. Porter (1985) emphasized how companies adopting this strategy can create a competitive advantage when implementing cost leadership and differentiation strategies. For example, a company that improves its production processes can obtain a price advantage in the market by producing the same product at lower cost. Similarly, a company that improves its customer service processes can create higher customer satisfaction and loyalty.

2.4. Relationship Between the Value Chain and Cost Management

The value chain analysis is directly related to cost management. Analyzing the costs of each activity will show businesses in which efficiency can be improved and in which activities they can reduce costs. Porter (1985) stated that using this type of analysis, businesses can better manage their cost structure and thus gain a competitive advantage in the market. Similarly, Kaplan and Norton (2001) emphasize that value chain analysis allows businesses to control costs and create value to help them achieve their strategic goals.

3. The Importance of Cost Management

Cost management is a critical process to ensure a business' sustainable profitability. Basically, cost management is the process of effectively controlling and monitoring costs in every aspect of the business, from production processes to logistics activities, product development, and after-sales services (Kaplan & Anderson, 2004). Accurately calculating costs and understanding how these costs relate to each value chain activity is a fundamental requirement for a business to achieve a competitive advantage. Cost management is not only a means of controlling current costs but also a strategic tool for increasing the operational efficiency of the business, improving profit margins, and using resources more efficiently (Cooper & Kaplan, 1992).

3.1. Cost Management in Competitive Markets

In competitive markets, low-cost production is necessary for businesses to survive. Globalization, technological developments, and consumer demands have led businesses to reduce costs and increase efficiency (Porter, 1985). In this context, effective cost management is essential for businesses to remain competitive in the market. In particular, low-cost production can increase a business' market share and provide a competitive advantage by making product prices more attractive than competitors' prices.

The importance of cost management in competitive markets goes beyond simply reducing costs. By effectively managing their costs, businesses can create more efficient production processes and provide greater flexibility. Thus, they can respond quickly to changing demands in the market (Kaplan & Norton, 2001). Kaplan and Anderson (2004) stated that cost management gives businesses the ability to offer quality products at competitive prices, thus increasing customer loyalty and brand value.

3.2. Profit Margins and Cost Management

Effective management directly affects profit margins. Profit margins are calculated as the ratio of a business' revenue to its costs. This ratio is a basic financial indicator of business profitability. To improve profit margins, businesses must carefully examine their cost structures and provide cost control for each activity in the value chain. At this point, a detailed calculation of costs helps determine which activities cause costs to be high and which activities contribute more to value creation (Cooper & Kaplan, 1992).

A business can reduce costs by eliminating inefficiencies in the production process to increase value. In addition, more efficient logistics and supply chain management strategies play a significant role in reducing costs. Such improvements increase business profit margins because it is possible to charge higher prices by offering high-quality products at lower costs (Christopher, 2016).

3.3. Increased Profitability and Efficient Use of Resources

Cost management not only controls costs but also ensures efficient use of resources. Effective resource management prevents waste, reduces labor and material costs, and increases overall efficiency. Businesses can increase their profitability by using their resources more efficiently and contributing to environmental sustainability goals in the process (Brealey, Myers, & Allen, 2012).

Porter (1985) and Kaplan and Norton (2001) emphasized that for businesses to achieve their strategic goals, they need to not only monitor costs but also understand how these costs relate to each activity in the value chain. The value chain analysis shows businesses which activities can reduce costs and which activities they can invest more in to create value. This approach helps businesses use resources more efficiently and improves their operational efficiency. With the increasing use of technology, it has become easier for businesses to increase efficiency in their production processes and supply chains. Digital technologies such as automation, artificial intelligence, and big data analysis offer significant opportunities to reduce costs. These technologies can significantly reduce costs, especially in complex production and logistics processes, by minimizing human error and speeding up processes (Brynjolfsson & McAfee, 2014).

3.4. The Strategic Importance of Cost Management

As a strategic tool, it helps businesses gain a competitive advantage. Any business should not only optimize the costs of products and services but

also take steps to increase the value created for the customer. Businesses that can establish this balance between cost management and value creation have a greater chance of achieving long-term success in the market (Porter, 1985; Stabell & Fjeldstad, 1998).

By strategically addressing cost management, businesses can not only reduce costs but also provide high-value products and services that meet customer expectations. This strategic approach allows businesses to become more sustainable and profitable.

4. Value Chain Cost Management Strategies

The value chain cost management approach analyzes the costs of each activity step in a company's value chain, minimizes these costs, and increases efficiency. This process allows companies to optimize costs and gain competitive advantage. Effective cost management strategies directly affect a company's operational efficiency and capacity to achieve strategic goals. The basic components of value chain cost management strategies can be listed as follows: resource optimization, process improvement, supply chain management, and technology use (Kaplan & Norton, 2001; Porter, 1985).

4.1. Resource Optimization

Resource optimization minimizes costs by enabling businesses to use their resources (labor, energy, materials, etc.) more efficiently. This strategy focuses on preventing unnecessary resource use and managing existing resources effectively. Effective use of resources eliminates waste and increases overall efficiency. Resource optimization can also help businesses achieve their environmental sustainability goals. Preventing waste of resources means using natural resources more efficiently, which helps reduce long-term costs (Porter, 1985).

Porter (1985) and Christopher (2016) emphasized that businesses should carefully monitor their production processes and energy consumption to optimize resources. For example, workforce optimization involves developing employee skills and ensuring that employees are appropriately placed in work processes. In this way, both labor costs and productivity can be reduced. Energy optimization indicates that businesses should monitor their energy consumption and develop strategies to increase energy efficiency. These strategies allow businesses to turn to environmentally friendly practices and reduce costs.

4.2. Process Improvement

Process improvement is a continuous improvement intended to improve the business processes of a company. This strategy aims at minimizing time and labor losses. Making processes efficient makes it possible to produce more output using the same amount of resources, thus significantly reducing costs (Womack & Jones, 1996). An approach to process improvement can be supported by methods such as Lean manufacturing philosophy and Six Sigma. These methods allow continuous improvements at every stage of the production process by minimizing waste and failure.

Lean production eliminates all unnecessary costs while creating value. In this approach, only activities that create value for the customer are performed, and waste (time, material, labor) is minimized. For example, optimizing each step in the production line can reduce the waiting and transportation times of the production process, thus reducing costs (Womack & Jones, 1996).

Six Sigma is a method for improving the quality and minimizing error rates. In this process, error analyses are performed at each stage to increase the quality of products and services, and continuous improvements are made to make processes more efficient (Harry & Schroeder, 2000). Both strategies focus on improving quality while reducing costs, providing long-term sustainable cost advantages.

4.3. Supply Chain Management

Supply chain management is an important component of value chain cost management and plays a major role in effective cost control. The supply chain covers all processes from a business' raw material supply to final product delivery, and each of these processes directly affects costs (Christopher, 2016). Supply chain strategies require cost effectiveness and quality control to gain importance in supplier selection. Choosing the right suppliers and ensuring timely and reasonable material supplies can significantly reduce business costs.

Supply chain optimization includes factors such as strengthening supplier relationships, improving logistics processes, and enabling inventory management. Christopher (2016) stated that supply chain management not only reduces costs but also increases the ability to respond more quickly to customer demands. In this way, businesses not only reduce their costs but also strengthen their competitive position in the market by increasing customer satisfaction and loyalty.

4.4. Use of Technology

Technology can reduce costs and increase efficiency through digitalization and automation. Digital technologies can make production processes faster, more cost effective, and more efficient. In particular, advanced technologies such as industrial automation and artificial intelligence provide high production process efficiency and reduce labor costs (Brynjolfsson & McAfee, 2014). In addition, big data analysis and machine learning can be used to optimize supply chain processes, improve inventory management, and improve the accuracy of demand forecasts.

Automation offers businesses the opportunity to produce at low cost because it reduces the dependence on labor and speeds production processes. Such technologies provide significant advantages, especially for businesses that produce high volumes. For example, automated assembly lines can increase the production speed while also improving the quality. With digitalization, businesses can collect more data at every stage, from production to logistics, track costs, and optimize quickly (Brynjolfsson & McAfee, 2014).

5. Value Chain Cost Management and Competitive Advantage

A competitive advantage refers to a company achieving sustainable profitability by being more effective and more efficient than its competitors in the sector (Porter, 1985). To achieve a competitive advantage, businesses can not only increase the quality of their products or services but also optimize their costs and compete in the market with more attractive prices. In this context, value chain cost management is a critical tool for businesses to reinforce their competitive advantages. Monitoring and optimizing the costs of each activity in the value chain not only provides businesses with a cost advantage but also increases their capacity to better meet customer expectations (Kaplan & Norton, 2001). This section discusses the role of value chain cost management in creating competitive advantage through low-cost production and value-enhancing strategies.

5.1. Low-Cost Production and Competitive Advantage

Low-cost production allows businesses to minimize costs by using strategies that increase production efficiency. Reducing costs allows businesses to offer quality products at lower prices. Porter (1985) considered low-cost production to be one of the basic elements of competitive advantage and stated that this strategy offers businesses a significant advantage, especially in price-

sensitive consumer segments. Low-cost production includes strategies that minimize waste and use resources more effectively. These strategies include supply chain optimization, automation, increased labor productivity, and more effective material use (Christopher, 2016).

The success of a low-cost production strategy can be achieved by controlling costs at each step in the value chain. This can be achieved by implementing practices such as increasing labor productivity in production processes, efficiently operating machines, or reducing material consumption (Porter, 1985). For example, Toyota's Lean production philosophy is one of the best examples of such a strategy. Toyota has significantly reduced costs by eliminating waste in each process in its production line, thus producing high-quality vehicles at lower prices (Womack & Jones, 1996).

A low-cost production strategy allows businesses to gain market advantages through price competition. However, this strategy should not only reduce costs but also maintain quality. Businesses that reduce costs while maintaining quality can gain a stronger competitive advantage in the market (Brealey, Myers, & Allen, 2012).

5.2. Value Enhancement and Competitive Advantage

Value enhancement is a strategy that allows businesses to not only offer low-cost products to their customers and offer them more value. The value enhancement strategy usually aims to offer a product or service that exceeds customer expectations and that they will be willing to pay more for (Kotler & Keller, 2016). This can be achieved through elements such as higher-quality products, innovative designs, superior customer service, and brand value. Value enhancement is achieved not only by controlling costs but also by incorporating elements that create demand in the market.

Porter (1985) defined value enhancement as a strategy in which businesses aim not only to compete at a low cost but also to create meaningful value for customers. Customer focus and quality product delivery are the key components of this strategy. Each activity in the value chain should increase the value offered to the customer. In this context, Arçelik's high-quality products and superior customer service in the consumer electronics and white goods sector are a successful example of a value enhancement strategy. Arçelik has gained a competitive advantage in the market by providing value to its customers through product innovation and after-sales services (Brealey et al., 2012).

The value enhancement strategy can be successful in consumer segments that are not price sensitive. This strategy is often associated with marketing premium products that can be sold at a higher price. For example, Apple has managed to offer value to its customers at premium prices through innovative designs, user-friendly interfaces, and strong brand perceptions (Kotler & Keller, 2016). Apple has not only sold technology products, but has also consistently improved the user experience and the value of its brand, offering consumers a value that they are willing to pay more for.

5.3. Value Chain Cost Management and Sustainable Competitive Advantage

Value chain cost management plays an important role in creating sustainable competitive advantages for businesses. Both low-cost production and value-enhancing strategies not only provide short-term successes and create long-term sustainable competitive advantages. Value chain cost management ensures that effective strategies for creating value are developed at each activity step and that these strategies are implemented systematically. In this way, businesses can respond to the ever-changing demands of the market and achieve long-term success (Kaplan & Norton, 2001).

Businesses that can establish a balance between cost management and value creation can not only minimize costs but also respond better to customer demands. This type of strategic control provides businesses with a strong competitive advantage in the market and allows them to exist in the market for longer periods. In addition, value chain cost management can help businesses accelerate innovation, increase product quality, and strengthen customer loyalty (Christopher, 2016).

6. Value Chain and Financial Performance

Optimizing value chain activities with cost management is a fundamental factor that directly affects businesses' financial performance. Effective cost control is not limited to reducing costs; it also has critical strategic importance for increasing revenue and profitability. Value chain analysis is a tool for understanding how each activity step can be improved in terms of value creation and cost control, allowing businesses to increase their financial performance (Porter, 1985). In this section, the effects of optimizing the value chain on financial performance will be examined in detail, and analyses will be

conducted on how this relationship is embodied through application examples in different sectors.

6.1. Relationship Between Value Chain Analysis and Financial Performance

The value chain analysis strategy optimizes the costs of each activity step by examining all operational processes of businesses (Kaplan & Norton, 2001). This analysis not only helps businesses control costs and increases revenues by increasing the effectiveness of activities. Effective cost management provides businesses with lower production costs and faster operational processes, and these improvements are directly reflected in financial performance. However, successful implementation of value chain analysis contributes to increasing operational efficiency, revenue, and profit margins (Porter, 1985; Christopher, 2016).

Identifying inefficiencies at each step of the value chain activities allows the costs of these activities to be optimized. For example, improving supply chain processes can reduce logistics costs, which directly affects the financial results of the company. Efficiency in supply chain management can reduce inventory costs and provide time and cost savings for procurement of raw materials (Kaplan & Norton, 2001). In addition, increased production process efficiency reduces product costs and improves profit margins.

6.2. Reduce Costs and Increase Income

Reducing costs at each value chain activity step increases business profitability. Typically, cost reduction is achieved using more efficient production techniques, optimization strategies, and technology. This allows quality products to be produced at a lower cost and therefore sold at lower prices. Porter (1985) stated that a low-cost production strategy allows businesses to increase their market share by providing a price advantage, thus increasing their income.

In addition, reducing costs has significant effects not only in the production area but also in other activities, such as supply chain, distribution, and sales activities. Efficient supply chain management can increase customer satisfaction by eliminating unnecessary inventory, reducing transportation costs, and accelerating delivery times. These processes directly affect business profit margins and contribute to increasing revenues (Christopher, 2016).

Strategies such as low-cost production and efficient supply chain management help companies achieve a price advantage in the market while reducing the costs of the company sustainably in the long term. For example, the

success story of Zara in the fashion retail sector is an example of the effects of value chain optimization on financial performance. By managing the production and distribution processes quickly and efficiently, Zara was able to produce its products at low cost and sell them with high profitability (Ferdows, Lewis, & Machuca, 2004).

6.3. Sectoral Application Examples and Financial Performance

The impact of value chain optimization on financial performance can manifest in different ways in different sectors. In this context, the specific needs and strategic goals of each sector affect the way value chain management is implemented.

Manufacturing Sector: In the manufacturing sector, value chain analysis generally focuses on reducing costs and increasing efficiency in production processes. In the automotive sector, Toyota's lean manufacturing approach is a well-known example of this strategy. By optimizing the supply chain, Toyota significantly reduced production costs and thus increased profit margins (Womack & Jones, 1996). Lean manufacturing reduces costs and improves product quality by minimizing waste.

Retail Industry: In the retail industry, value chain management is associated with logistics and supply chain optimization. For example, Walmart has been continuously improving its financial performance through its low-cost supply chain management and strong distribution network. By efficiently managing each step in the value chain, Walmart has kept product prices low and thus has a large market share (Christopher, 2016).

Technology Sector: In the technology sector, value chain analysis usually focuses on innovation, product development, and customer service. Apple has optimized its value chain through R&D investments and high-quality customer service, increasing its revenues and achieving high profit margins (Kotler & Keller, 2016). Apple's product development efficiency allows it to achieve high profits despite products being sold at high prices.

6.4. Monitoring and Measuring Financial Performance

Although there is a strong relationship between optimizing value chain activities and financial performance, it is important to measure this relationship clearly. Value chain analysis can be performed together with traditional financial indicators used to measure financial performance (e.g., profit margin, net profit, ROI). In addition, strategic management tools, such as balanced scorecards, can

be used to evaluate business performance from a broader perspective (Kaplan & Norton, 2001). Such tools consider other important factors, such as customer satisfaction, internal process efficiency, and innovation capacity, in addition to financial performance.

7. Modern Technologies and Value Chain Cost Management

Today, digitalization, automation, artificial intelligence (AI), big data analytics and other modern technologies play an important role in transforming the value chain cost management of enterprises. Technological developments allow enterprises to make faster decisions, calculate costs more precisely and optimize operational processes. In addition to providing more efficient cost management at every stage of the value chain, these technologies also strengthen strategic decision-making processes. In this section, the effects and application areas of modern technologies on value chain cost management will be discussed, and concrete examples from various industries will be discussed to see how these technologies are implemented.

7.1. Digitalization and Value Chain Cost Management

Digitalization offers businesses better cost-management capacity by optimizing data collection, analysis, and management processes at every stage of the value chain. In particular, ERP (Enterprise Resource Planning) systems and cloud-based software provide businesses with uninterrupted information flow at every stage of the supply chain (Davenport, 2018). The transparency created by digitalization allows businesses to identify potential inefficiencies more precisely and quickly.

The integration of digital technologies into the value chain provides important data for better decision-making processes and strategic directions. For example, thanks to digitalization, instant monitoring of supply chain processes can be accomplished, and inventory management can be made more efficient. Walmart's supply chain management is a successful example of such digital transformation. Walmart uses digital tools to monitor all stages of the supply chain and minimize costs by intervening when necessary (Christopher, 2016).

7.2. Automation and Increased Productivity

Automation can significantly reduce costs and increase productivity by allowing repetitive and low-value jobs in the value chain to be performed by

machines or software. Automation increases productivity, especially in areas such as production and logistics. Automation reduces labor and production failure rates. This allows businesses to offer higher quality products at lower costs.

The impact of automation on cost management in the value chain is particularly evident in production processes. Toyota's lean manufacturing philosophy is an important example of the impact of automation on value chain cost management. Toyota has managed to produce high-quality products at low cost through automation in its production lines (Womack & Jones, 1996). In addition, process standardization achieved through automation optimizes inventory management and material flow, thereby providing cost savings.

7.3. Cost Estimation Using Artificial Intelligence and Big Data Analytics

Artificial intelligence (AI) and big data analytics revolutionize value chain cost management. Artificial intelligence offers businesses great opportunities to analyze historical data, make predictions, and offer optimization suggestions. AI-based algorithms can estimate costs at every stage from supply chain processes to production lines, allowing businesses to plan more efficient operations (Choi, Wallace, & Wang, 2018). Big data analytics also provides in-depth insights into customers, allowing companies to optimize product development, sales strategies, and customer service.

Big data analytics and artificial intelligence allow businesses to make more accurate and predictable predictions at every step in the value chain. For example, Amazon uses big data and artificial intelligence to manage inventory levels and demand forecasts in its supply chain. This significantly reduces its operational costs and ensures that products are in the right place at the right time (Dastin, 2017). AI also enables the automation of data-intensive processes, such as financial transactions, using robotic process automation (RPA). These applications provide significant benefits in terms of reducing operational costs and accelerating business processes (Brynjolfsson & McAfee, 2014).

7.4. Blockchain technology and Supply Chain Transparency

Blockchain technology is an important tool in value chain cost management. This technology prevents fraud and incorrect data entry by keeping a transparent record of every stage of the supply chain process in a digital environment. Blockchain technology allows the verification of every transaction record, and every material flow can be tracked in real time (Tapscott & Tapscott, 2016).

This transparency allows costs to be calculated and managed more accurately because every transaction made at every step in the supply chain can be verified and analyzed.

Walmart uses Blockchain technology in its supply chain to track the sources of food products and increase efficiency. This technology helps reduce potential costs in the supply chain, increase product quality, and provide safe products to customers (Crosby et al., 2016).

7.5. Integration of Technologies in the Value Chain

The integration of technologies into the value chain requires a strategic approach for businesses to optimize cost management. Technologies such as digitalization, automation, and artificial intelligence not only provide operational efficiency and contribute to strategic decision-making processes. The success of these technologies depends on their proper integration and use in accordance with strategic goals. Effective application of technologies at every stage of the value chain provides businesses with a competitive advantage and contributes to their long-term sustainability (Porter, 1985).

8. Challenges in Value Chain Cost Management

Although value chain cost management offers significant opportunities for businesses to increase their operational efficiency and optimize costs, it also faces various challenges. These challenges arise from factors such as supply chain complexity, increased labor costs, technological barriers, and market uncertainties. Businesses must develop strategic approaches to address these challenges and ensure sustainable cost management in the value chain. In this section, the main challenges encountered in value chain cost management are discussed in detail, and strategic solutions are discussed to overcome these challenges.

8.1. Supply Chain Complexity

Supply chains have become increasingly complex as globalization trade and global connections increase. Since the management of supply chain processes involves several suppliers, logistics networks, and inventory management, it is becoming very difficult for businesses to control costs throughout the supply chain. This complexity creates uncertainty at every stage of the supply chain, making it difficult to predict costs (Christopher, 2016).

In particular, businesses with long supply chains may face increased costs because of delays and disruptions in production and distribution processes. Such disruptions increase business costs and negatively affect service quality. To overcome the complexity of the supply chain, businesses must establish more flexible and compatible supply chain structures. For this purpose, methods such as supplier diversity, strengthening supplier relationships, developing risk management strategies, and digitalizing the supply chain are recommended (Choi et al., 2018). Digitalization and big data analytics can help manage supply chain complexity better. Additionally, the use of flexible production systems, such as just-in-Time (JIT) systems, in supply chain management can help reduce costs (Kraljic, 1983).

8.2. Increased Labor Costs

Labor costs are a significant problem in globalized economies. In developed countries, increased labor costs significantly increase businesses' production costs. The increase in labor costs poses a significant challenge, especially for businesses operating in labor-intensive sectors. High labor costs can negatively affect the efficiency of production processes and complicate the cost structure (Brynjolfsson & McAfee, 2014). To overcome this problem, businesses can implement innovative solutions, such as automation, artificial intelligence, and robotic technologies. Automation and robotic systems can increase production efficiency by reducing labor costs. In addition, labor costs can be optimized through strategies such as remote working and digitalization (Davenport, 2018). For example, Amazon has managed to reduce labor costs by using robot technology in its warehouse and logistics processes (Dastin, 2017).

8.3. Technological Barriers

The integration of modern technologies into the value chain poses significant challenges for most businesses. Technological barriers can affect businesses' digital transformation processes and lead to loss of efficiency in value chain cost management. Small- and medium-sized enterprises (SMEs) may experience difficulty investing in new technologies. In addition, the training and infrastructure investments required for the implementation of such technologies constitute a significant cost element. To overcome technological barriers, businesses must strengthen their digital infrastructure and accelerate their technological adaptation processes. In addition, cloud-based solutions

and SaaS (Software as a Service) model applications for small businesses can facilitate access to technology and reduce costs. Technologies such as big data analytics, artificial intelligence, and the internet of things (IoT) offer effective tools for automating processes, reducing error rates, and using resources more efficiently (Porter, 1985).

8.4. Uncertainties in Market Conditions and Economic Fluctuations

Uncertainties in market conditions and economic fluctuations make it difficult to predict costs in the value chain. For example, external factors such as exchange rates, raw material prices, changes in the supply-demand balance, and political factors can affect supply chain costs and require businesses to be more careful when making strategic decisions. Such uncertainties can complicate the cost management of businesses (Christopher, 2016).

Businesses must develop flexible and adaptive strategies to deal with such uncertainties. Risk management strategies can minimize uncertainty by increasing supply chain flexibility. In addition, supply chain diversity can provide protection against global fluctuations. Another solution is "source diversification"; businesses can reduce their risks during crises by diversifying their supply sources geographically and sectorially (Deloitte, 2019).

8.5. Strategic Solutions to Overcoming Challenges

These challenges in value chain cost management can only be overcome with appropriate strategies. Here are some strategic solutions that businesses can develop to address these challenges:

Digital Transformation and Automation: By investing in digital technologies, businesses can automate their processes and increase their efficiency. This will reduce costs and provide a competitive advantage.

Supply Chain Risk Management: A proactive approach should be adopted for supply chain risks, and flexible supply chain structures should be created. In addition, supplier diversification can be employed as a precaution against possible risks. Restructuring

Workforce Strategies: despite high labor costs, a transition to automation and digitalization processes can be achieved. In addition, labor productivity can be increased, and personnel training and skills can be developed.

Continuous Improvement and Innovation: Businesses must continuously improve their processes and adopt innovative methods. Methods such as Lean production and Six Sigma can provide effective cost-management solutions.

9. Application Examples

Value chain cost management is not merely a theoretical framework but a strategy that can be applied effectively in real-world businesses. This section focuses on how value chain cost management (VCM) has been successfully implemented and the advantages it provides to businesses, with examples from different sectors. This section will explain how each stage in the value chain is optimized and how costs are managed, with examples from the manufacturing sector to the service and technology sectors.

9.1. Cost Optimization in the Manufacturing Sector

Toyota's "Just-in-Time" SystemToyota is an example of successfully implementing value chain cost management in its manufacturing processes and thus achieving a competitive advantage worldwide. Toyota's famous Just-in-Time (JIT) manufacturing system stands out as a strategy aimed at optimizing the costs of each stage in the value chain. JIT was developed to minimize inventory in manufacturing processes, supply materials and components just in time, and thus reduce unnecessary stock costs and storage expenses (Ohno, 1988).

This strategy by Toyota enables continuous monitoring and management of material flow in the production line. Thus, any waste and time losses that may occur during the manufacturing process are eliminated. In addition, the use of labor and machinery can be improved. The JIT system significantly reduced Toyota's costs while also increasing its ability to respond quickly to customer demands, and thus the company managed to increase its market share (Liker, 2004).In other words, Toyota's value chain analysis and cost management strategies are spread over a wide perspective, covering not only the production process but also supplier relationships and logistics operations. This strategy has given Toyota a strong competitive advantage by ensuring both cost effectiveness and on-time delivery.

9.2. Value Chain Improvement in The Service Sector: McDonald's and Process Improvement

In the service sector, value chain cost management can also be successfully applied to optimize processes and increase customer satisfaction. McDonald's is an example of a perfect application of value chain cost management in quick service restaurants. McDonald's has analyzed each service step to ensure operational efficiency and has used methodologies such as Lean management and Six Sigma to optimize service processes.

McDonald's process improvement approach focuses particularly on employee training and labor efficiency. Each operational stage of the restaurants has been optimized in terms of time and labor. For example, order preparation time and division of labor among employees are structured to respond quickly and efficiently to customer demands. The digitalization of these processes has also helped McDonald's reduce costs and increase efficiency. In addition, McDonalds has minimized raw material costs by optimizing its supply chain and has increased its capacity to provide quality service by strengthening supplier relationships. These strategies have provided McDonald's with significant gains in both service quality and cost management (Hitt et al., 2007).

9.3. Digital Transformation in The Technology Sector: Amazon and Cost Management

An effective example of value chain cost management in the technology sector is Amazon. Amazon offers high-quality products at competitive prices by significantly reducing its operational costs through digitalization and automation. Amazon's digital transformation process covers not only sales and marketing but also logistics and supply chain management. The foundation of Amazon's cost management strategies is its use of cloud computing and artificial intelligence. Amazon Web Services (AWS) enable the company to realize data storage, processing capacity, and analysis processes at lower cost with its cloud-based services. Thus, data processing and analysis processes are becoming faster and more cost efficient. In addition, Amazon's logistics processes are optimized using robotics and artificial intelligence. Robots in warehouses perform rapid placement and shipping of products, reducing labor costs and ensuring that products reach customers more quickly (Dastin, 2017).

Amazon's value chain analysis monitors every stage of the supply chain with digital tools and thus makes decisions to minimize costs at each stage. In addition, by offering dynamic and personalized pricing, the company can respond to customer demands at the most affordable prices. These strategies have enabled Amazon to achieve significant cost management success and have consolidated its leadership position worldwide.

9.4. Apple's Supply Chain and Cost Management

Apple is another successful example of effectively implementing value chain cost management in the technology field. Apple is known for its strategic partnerships and supplier relationships in supply chain management. The

company continues to provide high-quality products while keeping costs under control in the supply chain. Apple's supply chain is designed to optimize costs at every stage, from the procurement of components used in the production of the company's products to the distribution of the products.

Apple's cost management is not limited to product development and production processes but also covers the logistics and distribution stages. Apple manages to keep raw material costs low by working closely with suppliers. In addition, Apple's minimal inventory strategy allows it to offer products at a low cost, even during periods of high demand. Apple effectively manages costs by controlling every stage of its value chain and integrating digital technologies (Keller et al., 2018).

10. Conclusion

The relationship between value chain analysis and cost management plays a vital role in modern business strategies. For a business to gain the competitive advantage and ensure sustainable profitability, costs must be effectively managed at each stage of the value chain. Porter's (1985) value chain model assumes that all activities of a business are interconnected and that each activity step contributes to the value creation process. In this context, optimizing costs in each activity area not only increases efficiency, but also directly affects a business' competitiveness in the market.

Cost management is not limited to monitoring and reducing costs; it includes implementing efficiency-enhancing strategies at each stage of the value creation process. An approach based on Porter's (1985) distinction between core and support activities offers business optimization opportunities in both areas. While reducing costs in core activities, more effective resource use and process improvements can be achieved in support activities. Establishing this balance allows businesses to not only reduce costs but also create higher value.

One of the most important benefits of value chain cost management for businesses is that it allows for more efficient use of resources. By using resources more effectively, businesses can optimize production and operational costs, reduce total costs, and increase customer satisfaction (Kaplan & Cooper, 1998). This not only increases profitability but also helps firms to gain a stronger position in market competition. In recent years, digitalization and technological innovations have transformed value chain cost management. Modern technologies such as artificial intelligence, big data analytics, the internet of things (IoT), and automation allow businesses to monitor and manage

costs more precisely (Brynjolfsson & McAfee, 2014). Technology-focused companies, in particular, use digital tools to speed up their operational processes and reduce costs. For example, the use of robotics in Amazon's logistics processes has optimized costs by reducing labor and time losses. Likewise, in the manufacturing sector, systems such as Just-in-Time (JIT) manage to keep costs under control by improving the efficiency of supply chain processes more efficient (Ohno, 1988).

Value chain cost management not only provides businesses with short-term cost savings and contributes to creating long-term competitive advantage. Porter (1985) stated that value chain analysis offers businesses a strategic tool not only for controlling costs but also for market leadership. When businesses focus on providing customer value and cost efficiency, they can achieve a competitive advantage in terms of both price and quality. This approach provides long-term sustainable growth and profitability.

In particular, low-cost production and value-enhancing strategies help businesses achieve a unique position in the market. Elements such as rapid response to customer demands, flexible production processes, and quality customer service not only optimize costs but also increase the value of the brand (Kotler & Keller, 2016).

The success of value chain cost management strategies does not only depend on choosing the right tools and methods; it is also necessary to effectively implement these strategies within an organization. Successful examples demonstrate how value chain cost management provides a competitive advantage when combined with appropriate strategies. However, the difficulties encountered during the implementation process, especially supply chain complexity, increased labor costs, and technological barriers, should be carefully addressed. These difficulties can be overcome with flexible strategies and digital solutions (Porter, 1985). Therefore, value chain cost management is a critical strategy that increases business cost efficiency while strengthening value creation processes. Correctly analyzing the value chain, optimizing costs in each area of activity, and effectively using technological innovations enable businesses to gain competitive advantage. Effective implementation of value chain cost management not only improves businesses' financial performance and helps them consolidate their leading positions in the sector. In this context, it is of great importance for businesses to constantly review and update their value chain strategies to maintain their competitive advantage.

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CHAPTER VII

FINANCIAL ANALYSIS OF BASIC METAL INDUSTRY ENTERPRISES FOR THE PERIOD 2019-2023: ENTROPY-BASED TOPSIS APPLICATION

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1. Introduction

The changes, developments and transformations in the economic, social and cultural fields experienced in the global competitive environment have created a world market in which political borders have lost their importance and economic regions have gained importance. One of the main objectives of businesses, namely their survival and growth, is becoming more and more important in an increasingly competitive environment. With the developing technology, the simultaneous rapid spread of information and the integration of national economies with each other make it necessary for businesses to compete not only with local businesses but also with international businesses. It is a fact that in this competitive environment, there will be businesses that are highly productive and perform well in their own fields of activity. The performance of businesses is of great importance not only for themselves but also for the investors of the business and the country's economy.

Performance analysis, which is performed to analyze the managerial effectiveness, operational efficiency, liabilities, profitability and future earnings potential of the business, is an important tool both in evaluating the past and in predicting and planning future performance. Different parties are interested in financial statements and the results of financial analysis to be obtained from these statements for different purposes. While partners are interested in profitability

per share, managers are interested in all the results of the activities, creditors are interested in the ability of the business to pay its debts on time, employees are interested in wages and social rights, investors are interested in the sustainable profitability of the business, its compliance with the state accounting system and the amount of tax to be paid by the business, customers are interested in the continuity of goods and services and quality assurance, and academics are interested in reliable information in the fields they are interested in. In addition to these interest groups, non-governmental organizations, or in other words, the public, are also interested in the environmental sensitivity of businesses within the framework of their understanding of social responsibility. In this context, a performance analysis conducted with the right methods and criteria, as well as in comparison with competitors and industry averages, can help management in planning and deciding on future policies of businesses.

In order for the Main Metal Industry, which is within the manufacturing industry, to maintain its current situation and grow, it depends on the resistance of the iron and steel companies within the Main Metal Industry to compete with rival companies. In order to compete, the financial situation of the business must first be good. It is of great importance to analyze the financial situations of the businesses and measure and interpret their financial performance. The study was written based on the importance of the sector. In this study, firstly the literature review and then the financial performances of 18 enterprises belonging to the iron and steel sector were analyzed using the Entropy based TOPSIS Multiple Decision Making Technique.

The study consists of six sections in line with the determined objectives. In the first part, the general framework of the study and research was summarized, and in the second part, the relevant literature was scanned and previous studies were reviewed. In the third section, the scope of the research and the data set are explained. In the fourth part, the methods and model used are introduced, and in the fifth section, the financial performance of the main metal enterprises is analyzed only according to 2023 data using the proposed model. In the sixth and last section, the results obtained are discussed and a general evaluation is made.

2. Summary of Literature

The TOPSIS method is used in many sectors in both national and international studies to measure the performance of enterprises. In this context, some of the studies conducted domestically where business performances were evaluated using the TOPSIS method are summarized below:

In the study conducted by Dumanoğlu (2010), the fiscal performance of fifteen cement firms traded in Borsa Istanbul was examined using the TOPSIS method. The ratios acquired from the fiscal statements of the relevant firms among 2004 and 2009 were converted into scores using the TOPSIS method, and the obtained performance conclusions were evaluated and compared.

Dumanoğlu and Ergül (2010) used the TOPSIS method to measure the fiscal performance of eleven technology firms traded on Borsa Istanbul. As a consequence the analysis using the fiscal ratios of the relevant firms between 2006 and 2009, the findings obtained are consistent with the fundamental analysis results.

According to the study of Çonkar et al. (2011), the relationship between the fiscal performances of firms traded in the Borsa Istanbul corporate governance index and their corporate governance ratings was investigated. The fiscal ratios of the firms for the years 2007 and 2008 were converted into success scores with the help of the TOPSIS method and the correlation among these scores and the corporate governance scores of the relevant companies was investigated. As a consequence the evaluations, no important correlation was found between corporate governance scores and financial performance scores.

In the study conducted by Türkmen and Çağıl (2012), the fiscal performance of twelve firms listed in the Borsa Istanbul IT index was analyzed using the TOPSIS method. Financial performance ratings of the firms were made by converting the fiscal ratios computed for the period 2007-2010 into scores using the TOPSIS method.

Ergül (2014) measured the fiscal performance of tourism partnerships listed on Borsa Istanbul using the ELECTRE and TOPSIS methods and analyzed the findings comparatively. In the study where financial ratios for the years 2005-2012 were used, it was determined that ELECTRE and TOPSIS methods were successful methods for decision making.

Bayramoğlu and Başarır (2016) evaluated the fiscal performance of six insurance companies listed on Borsa Istanbul using the TOPSIS method. In the study using fiscal ratios for the years 2011 to 2014, they found that four partnerships were financially successful, though at dissimilar levels, while two insurance companies were unsuccessful.

In their study, Metin et al. (2017) analyzed the fiscal performance of eleven energy firms listed on Borsa Istanbul using TOPSIS and MOORA methods. In the study using financial ratios between 2010 and 2015, it was determined that the consequences of the TOPSIS and MOORA methods varied and only

three companies had the same financial performance ranking. However, they found that there was no single company that had the best and worst financial performance in all years.

Aliakbarzadeh and Tabriz (2014) aimed to measure the performance of the interest-free loan fund in the market in their study. In the study, the market performance of the interest-free loan fund named ToseAsrShomal was analyzed using the TOPSIS method between 2013 and 2014. Following the TOPSIS analysis, a survey was also conducted to measure the fund's performance. Both financial and non-financial data were used together in the survey. Then, the performance measurement was carried out using the survey results together with Fuzzy AHP and TOPSIS methods. As a consequence the study, they determined that financial criteria have more importance than non-financial criteria.

In their study, Mandic et al. (2014) analyzed the banks operating in the Serbian banking sector between 2005 and 2010. In the study, after using Fuzzy AHP for weighting the criteria, TOPSIS method was used for measuring and ranking the performance of the banks. In the performance measurement, capital, portfolio values, resources, liquid assets, cash assets, net interest income, main operating net income, pre-tax profit variables were used as performance criteria. As a consequence of the study, it was determined that the bank named Banca Intesa had the best performance value.

In their study, Behbamzadeh et al. (2015) analyzed the service quality of banks operating in Iran using fuzzy AHP and TOPSIS methods. In the study, bank customers' opinions about service quality were obtained by survey application method. As a consequence of the study, banks were ranked with respect to their service quality.

In their study, Şit, Ekşi and Hacıevliyagil (2017) analyzed the fiscal performances of 16 firms in the BIST Base Metal Index (XMANA) for the period 2011-2015. In the analysis, they used the Entropy method for the criteria weights and then compared them with the TOPSIS method. As a consequence of the study, it was determined that the financial performances of the firms operating in the sector diversed over the years, but CUSAN, EREGL, ERBOS, KRDMA and MAKTK companies had higher performance than others.

In their study, Eş and Çobanoğlu (2017) made the performance ranking of iron and steel companies traded on Borsa Istanbul using the TOPSIS method for the periods of 2013-2015. In the study where the 16 criteria used and the cost-benefit characteristics of these criteria were discussed in detail, three several weighting methods were used, namely commensurate weights, entropy weights

and non-linear programming weights, and the success of these weights relative to each other was examined. In the research, which took the yearly change in market value as the benchmark, they concluded that it is possible to achieve very successful rankings with TOPSIS for companies in the steel and iron sector.

Eyüboğlu and Bayraktar (2019) evaluated the fiscal performances of the sub-sectors in the main metal industry for the period 2014-2016 by using the Analytical Hierarchy Process (AHP) and TOPSIS ways. In their study, the weights of the criteria were decided by the AHP method, taking into account the liquidity, fiscal condition, activity and profitability ratios, and then the fiscal performance scores of the sectors were counted and categorized by the TOPSIS method. As a consequence of the examination, it was determined that the most expanding sector for each year was the manufacturing of other products obtained from the first working of steel. The manufacturing sector of basic iron and steel products and ferroalloys was identified as the least successful sector.

In their study, Yıldırım, Karakaya and Altan (2019) tested the achievement of cost and profitability ratios in the performance investigation of a manufacturing enterprise listed in the Borsa Istanbul Main Metal Industry Index between 2008 and 2017 using the TOPSIS method. As a result of the research, they determined that the company's most achievement year was 2008 and its least successful year was 2015.

Avinash (2019) used ARAS, SAW and TOPSIS methods in her study to analyze the fiscal performance of 24 steel manufacturing enterprises in India between 2014-2018. As a consequence of the study in which the SVD (Singular Value Decomposition) method was used to weight the 17 selected criteria, Tata Metalik company ranked first in the performance ranking in all three methods.

3. Assessment of Fiscal Performance of Basic Metal Industry Firms

3.1. Dataset and Method of the Study

Many of the studies conducted on the basic metal firms whose shares are exchange on Borsa Istanbul are related to performance ranking, and it has been noticed that the TOPSIS method is used as the ranking method. In this study, both methods were applied to rank the fiscal performances of enterprises in both the basic metal industry and the BIST manufacturing sector. Within the scope of the study, the names of 18 enterprises included in the Main Metal Index were taken from the official website of the Kamuyu Aydınlatma Platformu (KAP). The firms within the extent of the area are presented in Table 1.

Table 1. Businesses Operating in BIST Metal Main Industry Sector

	STOCK EXCHANGE CODE	BUSINESS NAME
1	AYES	AYES ÇELİK HASIR VE ÇİT SANAYİ A.Ş.
2	BRSAN	BORUSAN MANNESMANN BORU SANAYİ VE TİCARET A.Ş.
3	BURCE	BURÇELİK BURSA ÇELİK DÖKÜM SANAYİİ A.Ş.
4	BURVA	BURÇELİK VANA SANAYİ VE TİCARET A.Ş.
5	CELHA	ÇELİK HALAT VE TEL SANAYİİ A.Ş.
6	CEMAS	ÇEMAŞ DÖKÜM SANAYİ A.Ş.
7	CEMTS	ÇEMTAŞ ÇELİK MAKİNA SANAYİ VE TİCARET A.Ş.
8	CUSAN	ÇUHADAROĞLU METAL SANAYİ VE PAZARLAMA A.Ş.
9	DMSAS	DEMİSAŞ DÖKÜM EMAYE MAMÜLLERİ SANAYİ A.Ş.
10	DOKTA	DÖKTAŞ DÖKÜMCÜLÜK TİCARET VE SANAYİ A.Ş.
11	ERBOS	ERBOSAN ERCİYAS BORU SANAYİİ VE TİCARET A.Ş.
12	EREGL	EREĞLİ DEMİR VE ÇELİK FABRİKALARI T.A.Ş.
13	ISDMR	İSKENDERUN DEMİR VE ÇELİK A.Ş.
14	IZMDC	İZMİR DEMİR ÇELİK SANAYİ A.Ş.
15	KRDMD	KARDEMİR KARABÜK DEMİR ÇELİK SANAYİ VE TİCARET A.Ş.
16	SARKY	SARKUYSAN ELEKTROLİTİK BAKIR SANAYİ VE TİCARET A.Ş.
17	TUCLK	TUĞÇELİK ALÜMİNYUM VE METAL MAMÜLLERİ SANAYİ VE TİCARET A.Ş
18	YKSLN	YÜKSELEN ÇELİK A.Ş.

The data used for modeling in the study were selected from ratios that can provide information about the liquidity, fiscal profitability, activity and structure status of 18 enterprises for the period 2019-2023, available on the official website of the Kamuyu Aydınlatma Platformu (KAP).

Table 2. Fiscal Rates Utilized in the exploratory

Code	Financial Performance Indicators
F1	Current Assets / Short-Term Liabilities
F2	Total Debt / Total Assets
F3	Total Debt / Equity
F4	Equity / Total Assets
F5	Long Term Foreign Resources / Total Assets
F6	Net Sales / Total Assets
F7	Net Sales / Equity
F8	EBIT / Total Assets
F9	EBIT / Equity
F10	Operating Profit / Equity
F11	Operating Profit / Total Assets

As seen in Table 2, 11 different indicators were utilized to measure the fiscal performance of the companies within the scope of the research. İnside the scope of the study, firstly the fiscal rates of the firms used in the study were computed. The fiscal tables utilized in calculating the financial ratios were downloaded from the formal website of the Kamu Aydınlatma Platformu (www.kap.gov.tr). In determining the indicators in question, studies in the written works were utilized and polite letters study was utilized in determining the fiscal rates utilized inside the scope of the study. Primarily, the fiscal rates mostly utilized in the literature were determined and the fiscal rates utilized inside the scope of the study are presented in Table 2.

4. Materials and Methods

In this research, Entropy and TOPSIS methods were created as a multi-criteria decision-making model to examine the performance of enterprises in the BIST Base Metal Index and applied to the decision-making problem. In MCDM methods, the weighting process that shows the importance level of the criteria is usually done in two techniques: objective and subjective weighting. While subjective weighting involves the decision maker's evaluations, objective weighting takes into account the quantitative characteristics of the options (Bakır and Atalık, 2018: 621). The results provided by the entropy-based model have been analyzed.

The reason why the Entropy method, which is used to take the measurements of the quantity of useful information on the assumption that by the available data, was chosen in practice is that it is a method that permissions the weight values of the selection criteria to be calculated objectively with the real data obtained without the need for subjective judgments and personal evaluations of the decision makers. When previous studies are reviewed, they can yield extremely successful results in terms of consistency of the results obtained. The entropy method was preferred as a tool to have a numerical scale for the data obtained from the main metal industry and to calculate the weights accurately and consistently using these values in the performance analysis.

4.1. Improved Entropy Method

Entropy is an goal weighting method utilizied to define criteria weights. Entropy, which first be seen in the thermodynamics literature, was introduced to information theory by Shannon (1948) in the following years (Zou et al., 2006: 1020). Unlike subjective weighting techniques where the subjective judgments of decision makers are taken into account, Entropy works with quantitative data and is therefore widely used in the literature (Zhu et al., 2020: 1).

Since the entropy values are calculated using the natural logarithm function, that is, the logarithm of the number in base e, and therefore the presence of zero and/or negative values in the data set will cause problems in the calculations to be performed, these data must be converted to positive values. For this purpose, the Enhanced Entropy method developed by Zhang et al. (2014) and based on z-score normalization was used in this study. The steps applied in the Improved Entropy method for the decision matrix $X = [x_{ij}]_{m\times n}$, where m is the number of alternatives (i = 1,2, … , m), n is the number of criteria (j = 1,2, …, n) and x_{ij} is the value of the i. alternative according to the j. criterion, are as traces (Zhang et al., 2014: 3):

Step 1: The z-score standardization process is applied to the xij worths in the decision matrix with the equations given in (1) and (2), respectively. z'_{ij} represents the standard value after the conversion process and $z_{ij}' > 0$. The closer the A value is chosen to $|\min z_{ij}|$, the more significant the result is.

$$z_{ij} = \frac{x_{ij} - \bar{X}_j}{\sigma_j}, \qquad \forall\, i,j \tag{1}$$

$$z'_{ij} = z_{ij} + A, \qquad A > \left|\min z_{ij}\right|, \qquad \forall\, i,j \tag{2}$$

Step 2: z'_{ij} values are normalized using equation (3).

$$p_{ij} = \frac{z'_{ij}}{\sum_{i=1}^{m} z'_{ij}}, \qquad \forall\, i,j \qquad (3)$$

Step 3: Entropy worths for every criterion are calculated with the aid of equation (4).

$$e_j = -k \sum_{i=1}^{m} p_{ij} \ln(p_{ij}), \qquad k = \frac{1}{\ln(m)}, \qquad \forall\, j \qquad (4)$$

Step 4: The degree of differentiation of the criteria is reached by using equation (5).

$$d_j = 1 - e_j, \qquad \forall\, j \qquad (5)$$

Step 5: The weights of the criteria are calculated by equation (6).

$$w_j = \frac{d_j}{\sum_{j=1}^{n} d_j}, \qquad \forall\, j \qquad (6)$$

The sum of the wj values representing the criteria weights is always equal to 1 $(\sum_{j=1}^{n} wj = 1)$. In this study, the w_j values obtained with the Enhanced Entropy method are used as the weights of the TOPSIS method explained in the next title.

4.2. TOPSIS Method

According to Yayar and Baykara, the TOPSIS principle is defined as choosing the one that is close to good solutions and far from bad solutions. Here, the good or best solutions are the accessible and possible ones, while the bad and worst solutions are the sum of the results of the unattainable and impossible ones. TOPSIS is a method applied by measuring the distance of deviations of the compared choices from the ideal solution. Each solution criterion requires the efficiency functions to increase and decrease (Liaudanskiene, Ustinovicius, Bogdanovicius 2009: 34).

TOPSIS, one of the techniques that can assist in selection in the decision-making process, is a model that is preferred according to its similarity to the ideal solution and requires limited consideration of the decision maker's own thoughts. The only inputs that require the decision maker's judgment are the

weights. One of the best advantages of TOPSIS is that it quickly identifies the appropriate alternative (Olson 2004:721-722).

TOPSIS is a very simple method to use in practice. The positive ideal solution maximizes the benefit criterion and keeps the expense at the lowest level. In order to apply this method, the characteristics of the problem must have a numerical value and be measurable (Behzadian et al. 2012: 13052).

The main reasons why Entropy-TOPSIS methods are deemed necessary in the study are; ease of application, ability to reach ideal and negative ideal solutions obtained as a result of weighting and normalization, and correct and simple interpretation of their values. Another requirement is that the TOPSIS method is anticipated to be more appropriate due to the large number of companies determined in the research universe and the large number of ratio analyses to be applied.

In the TOPSIS method, after the steps explained above are applied in order, the values get in the 6th step are arranged from largest to smallest and the order of significance of the verdict points (alternatives) is determined.

The TOPSIS method developed by Hwang and Yoon in 1980 is based on the idea that the selected alternative should be at the shortest distance to the positive ideal solution and the farthest distance from the negative ideal solution (Hwang and Yoon, 1981:128). For a problem with m alternatives (A_1, A_2, A_3,… ,A_m) and n criteria (C_1, C_2, C_3,…,C_n), the stages of the TOPSIS method can be briefly listed as follows (Salabun, 2013:181):

1. The decision matrix $D[x_{ij}]_{mxn}$ with m alternatives and n criteria is created. x_{ij}; is the evaluation of the A_i alternative according to the C_j criterion.

2. Various normalization methods are used to normalize the decision matrix. In this study, the vector normalization formulas given below were used to normalize the decision matrix (Jahan and Edwards, 2015:337; Vafaei, Ribeiro and Camarinha-Matos, 2015:3; Vafaei, Ribeiro and Camarinha-Matos, 2016: 265; Liao, Wu and Herrera, 2018: 66). In the study of Vafaei, Ribeiro and Camarinha-Matos (2015), it was determined that the vector normalization method used in normalizing the data in the TOPSIS method was among the most successful methods.

i. For benefit criteria : $r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}^2}}$

ii. For cost criteria : $r_{ij} = 1 - \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}^2}}$

3. The weighted normalized decision matrix is created by calculating $v_{ij} = w_j \,.\, r_{ij}$ for each element of the matrix.

4. Positive ideal *(A*)* and negative ideal (A^-) solutions are determined**.**

$$A^* = \left\{ \left(\max_i v_{ij} \middle| j \in J\right), \left(\min_i v_{ij} \middle| j \in J'\right) \right\}_{(i=1,2,\ldots,m)}$$

$$A^* = \left\{v_1^*, v_2^*, \ldots, v_n^*\right\}$$

$$A^- = \left\{ \left(\min_i v_{ij} \middle| j \in J\right), \left(\max_i v_{ij} \middle| j \in J'\right) \right\}_{(i=1,2,\ldots,m)}$$

$$A^- = \left\{v_1^-, v_2^-, \ldots, v_n^-\right\}$$

5. Euclidean distances are calculated:

a. distance between alternative and best alternative:

$$S_i^* = \sqrt{\sum_{j=1}^{n} (v_{ij} - v_j^*)^2}$$

b. The distance between the alternative and the worst alternative:

$$S_i^- = \sqrt{\sum_{j=1}^{n} (v_{ij} - v_j^-)^2}$$

6. The relative closeness to the ideal solution is calculated.

$$C_i^* = \frac{S_i^-}{S_i^- + S_i^*}, \quad 0 \leq C_i^* \leq 1$$

$C_i^* = 1$ shows the absolute closeness of the relevant decision point to the ideal solution, $C_i^* = 0$ shows the absolute closeness of the relevant decision point to the negative ideal solution.

5. Analysis of Research Data and Findings

Entropy criterion weights used for each year in the study are shown in Table 3. Accordingly, the variables of the performance indicator for 2023 will be included. Financial performance indicators for other years will not be disclosed individually and can be followed in the table (table 3).

The TOPSIS application of the study was carried out separately for each year, but in order to save space, only the 2023 analyses will be included in detail. Similar calculations were made for the years 2019 and 2023; However, these calculations were not included in the research.

Table 3: Entropy Criteria Weights for the Analysis Period (2019-2023)

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
w-2019	0,1768	0,0656	0,1845	0,0901	0,2243	0,1265	0,0013	0,1081	0,0019	0,0192	0,0017
w-2020	0,1584	0,0839	0,1587	0,1175	0,1599	0,1550	0,0011	0,1545	0,0017	0,0077	0,0017
w-2021	0,1607	0,0518	0,2315	0,0769	0,1475	0,0770	0,1100	0,1230	0,0088	0,0042	0,0086
w-2022	0,1360	0,0653	0,1814	0,1022	0,2256	0,1075	0,0019	0,1474	0,0053	0,0224	0,0052
w-2023	0,0932	0,0286	0,1115	0,0251	0,1190	0,0991	0,1005	0,0670	0,1364	0,0888	0,1308

Step 1: Creating the Decision Matrix

The first step of the TOPSIS method is the decision matrix. In the first step, the verdict matrix is created. The rows contain the verdict points whose advantages are to be understood, and the columns contain the factors to be used in the verdict-making phase. Because the Main Metal Industry companies, it is created as in Table 4.

Table 4. Decision Matrix - 2023

Company Code	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
AYES	1,125	0,715	0,958	0,285	0,003	28,933	0,055	3,010	0,015	0,159	0,015
BRSAN	1,240	0,554	0,626	0,446	0,094	3,182	0,134	0,754	0,097	0,164	0,097
BURCE	1,252	0,418	0,900	0,582	0,123	5,826	0,069	0,579	0,083	0,080	0,080
BURVA	1,329	0,659	0,955	0,341	0,081	6,603	0,058	1,264	0,019	0,069	0,019
CELHA	0,593	0,775	0,371	0,225	0,023	6,152	0,008	1,140	0,022	0,110	0,022
CEMAS	2,303	0,162	1,857	0,838	0,007	7,337	0,050	0,471	0,181	0,103	0,183
CEMTS	7,057	0,132	4,667	0,868	0,040	4,780	0,186	1,184	0,017	0,023	0,017
CUSAN	1,194	0,668	0,809	0,332	0,047	2,863	0,064	0,767	0,189	0,307	0,133
DMSAS	0,838	0,658	0,662	0,342	0,057	11,627	0,041	1,249	0,042	0,154	0,042
DOKTA	0,944	0,615	0,420	0,385	0,288	4,794	0,079	0,831	0,049	0,106	0,049
ERBOS	2,218	0,373	1,292	0,627	0,056	4,275	0,205	1,185	0,039	0,074	0,039
EREGL	1,507	0,382	0,753	0,618	0,094	2,577	0,090	0,477	0,029	0,021	0,027
ISDMR	1,525	0,366	0,685	0,634	0,088	4,373	0,084	0,654	0,052	0,054	0,052
IZMDC	0,773	0,457	0,265	0,543	0,104	7,340	0,024	1,062	0,040	0,042	0,031
KRDMD	1,311	0,386	0,673	0,614	0,065	4,888	0,059	0,861	0,031	0,026	0,031
SARKY	1,445	0,601	0,867	0,399	0,090	7,211	0,062	2,758	0,032	0,088	0,032
TUCLK	1,078	0,556	0,880	0,444	0,238	7,557	0,303	0,422	0,217	0,091	0,217
YKSLN	1,534	0,597	0,841	0,403	0,064	2,239	0,116	0,877	0,104	0,227	0,104

Step 2: Weighting the Decision Matrices

The square root operation of the decision matrices is shown in Table 5.

Table 5. Squares of Numbers in the Verdict Matrix - Year 2023

Company Code	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
AYES	0,124	0,245	0,106	0,200	0,198	0,084	0,269	0,138	0,245	0,302	0,261
BRSAN	0,137	0,245	0,106	0,200	0,198	0,084	0,269	0,138	0,245	0,302	0,261
BURCE	0,138	0,185	0,152	0,261	0,259	0,153	0,138	0,106	0,210	0,147	0,215
BURVA	0,147	0,291	0,161	0,153	0,171	0,174	0,116	0,232	0,048	0,127	0,051
CELHA	0,065	0,342	0,063	0,101	0,049	0,162	0,016	0,209	0,056	0,203	0,059
CEMAS	0,254	0,072	0,313	0,375	0,015	0,193	0,100	0,086	0,457	0,190	0,492
CEMTS	0,779	0,058	0,787	0,389	0,084	0,126	0,373	0,217	0,043	0,042	0,046
CUSAN	0,132	0,295	0,136	0,149	0,099	0,075	0,128	0,140	0,477	0,566	0,358
DMSAS	0,093	0,290	0,112	0,153	0,120	0,306	0,082	0,229	0,106	0,284	0,113
DOKTA	0,104	0,271	0,071	0,172	0,608	0,126	0,158	0,152	0,124	0,195	0,132
ERBOS	0,245	0,165	0,218	0,281	0,118	0,113	0,411	0,217	0,098	0,136	0,105
EREGL	0,166	0,169	0,127	0,277	0,198	0,068	0,180	0,087	0,073	0,039	0,073
ISDMR	0,168	0,162	0,116	0,284	0,186	0,115	0,168	0,120	0,131	0,099	0,140
IZMDC	0,085	0,202	0,045	0,243	0,219	0,193	0,048	0,195	0,101	0,077	0,083
KRDMD	0,145	0,170	0,114	0,275	0,137	0,129	0,118	0,158	0,078	0,048	0,083
SARKY	0,160	0,265	0,146	0,179	0,190	0,190	0,124	0,505	0,081	0,162	0,086
TUCLK	0,119	0,245	0,148	0,199	0,502	0,199	0,608	0,077	0,548	0,168	0,583
YKSLN	0,169	0,264	0,142	0,181	0,135	0,059	0,233	0,161	0,263	0,418	0,280
TOPLAM	**3,231**	**3,934**	**3,062**	**4,070**	**3,487**	**2,550**	**3,542**	**3,167**	**3,383**	**3,506**	**3,420**

Step 3: Normalizing the decision matrices

The normalization of the square root operation calculated in the previous step will take place in this step and the financial ratios are converted to a single denominator within a certain range. It is shown in Table 6.

Table 6. Normalized Decision Matrix – Year 2023

Company Code	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
AYES	0,348	0,221	0,297	0,088	0,001	8,955	0,017	0,932	0,005	0,049	0,005
BRSAN	0,384	0,171	0,194	0,138	0,029	0,985	0,041	0,233	0,030	0,051	0,030
BURCE	0,388	0,129	0,279	0,180	0,038	1,803	0,021	0,179	0,026	0,025	0,025
BURVA	0,411	0,204	0,296	0,106	0,025	2,044	0,018	0,391	0,006	0,021	0,006
CELHA	0,184	0,240	0,115	0,070	0,007	1,904	0,002	0,353	0,007	0,034	0,007
CEMAS	0,713	0,050	0,575	0,259	0,002	2,271	0,015	0,146	0,056	0,032	0,057
CEMTS	2,184	0,041	1,444	0,269	0,012	1,479	0,058	0,366	0,005	0,007	0,005
CUSAN	0,370	0,207	0,250	0,103	0,015	0,886	0,020	0,237	0,058	0,095	0,041
DMSAS	0,259	0,204	0,205	0,106	0,018	3,599	0,013	0,387	0,013	0,048	0,013
DOKTA	0,292	0,190	0,130	0,119	0,089	1,484	0,024	0,257	0,015	0,033	0,015
ERBOS	0,686	0,115	0,400	0,194	0,017	1,323	0,063	0,367	0,012	0,023	0,012
EREGL	0,466	0,118	0,233	0,191	0,029	0,798	0,028	0,148	0,009	0,006	0,008
ISDMR	0,472	0,113	0,212	0,196	0,027	1,353	0,026	0,202	0,016	0,017	0,016
IZMDC	0,239	0,141	0,082	0,168	0,032	2,272	0,007	0,329	0,012	0,013	0,010
KRDMD	0,406	0,119	0,208	0,190	0,020	1,513	0,018	0,266	0,010	0,008	0,010
SARKY	0,447	0,186	0,268	0,123	0,028	2,232	0,019	0,854	0,010	0,027	0,010
TUCLK	0,334	0,172	0,272	0,137	0,074	2,339	0,094	0,131	0,067	0,028	0,067
YKSLN	0,475	0,185	0,260	0,125	0,020	0,693	0,036	0,271	0,032	0,070	0,032

Step 4: Weighted normalized decision matrix

The *w* weight value determined in the entropy analysis will be used in this step. The weights will be normalized by multiplying the normalized values with the *w* weight value. As a result of the process, positive ideal distance and negative distances will be determined. It is shown in *Table 8.* It can be defined as A^+: Positive ideal distance A^-: Negative ideal distance.

Table 7. Weighted Normalized Decision Matrix - Year 2023

Company Code	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
AYES	0,032	0,006	0,033	0,002	0,000	0,888	0,002	0,062	0,001	0,004	0,001
BRSAN	0,036	0,005	0,022	0,003	0,003	0,098	0,004	0,016	0,004	0,005	0,004
BURCE	0,036	0,004	0,031	0,005	0,005	0,179	0,002	0,012	0,004	0,002	0,003
BURVA	0,038	0,006	0,033	0,003	0,003	0,203	0,002	0,026	0,001	0,002	0,001
CELHA	0,017	0,007	0,013	0,002	0,001	0,189	0,000	0,024	0,001	0,003	0,001
CEMAS	0,066	0,001	0,064	0,007	0,000	0,225	0,002	0,010	0,008	0,003	0,007
CEMTS	0,204	0,001	0,161	0,007	0,001	0,147	0,006	0,025	0,001	0,001	0,001
CUSAN	0,034	0,006	0,028	0,003	0,002	0,088	0,002	0,016	0,008	0,008	0,005
DMSAS	0,024	0,006	0,023	0,003	0,002	0,357	0,001	0,026	0,002	0,004	0,002
DOKTA	0,027	0,005	0,014	0,003	0,011	0,147	0,002	0,017	0,002	0,003	0,002
ERBOS	0,064	0,003	0,045	0,005	0,002	0,131	0,006	0,025	0,002	0,002	0,002
EREGL	0,043	0,003	0,026	0,005	0,003	0,079	0,003	0,010	0,001	0,001	0,001
ISDMR	0,044	0,003	0,024	0,005	0,003	0,134	0,003	0,014	0,002	0,001	0,002
IZMDC	0,022	0,004	0,009	0,004	0,004	0,225	0,001	0,022	0,002	0,001	0,001
KRDMD	0,038	0,003	0,023	0,005	0,002	0,150	0,002	0,018	0,001	0,001	0,001
SARKY	0,042	0,005	0,030	0,003	0,003	0,221	0,002	0,057	0,001	0,002	0,001
TUCLK	0,031	0,005	0,030	0,003	0,009	0,232	0,009	0,009	0,009	0,003	0,009
YKSLN	0,044	0,005	0,029	0,003	0,002	0,069	0,004	0,018	0,004	0,006	0,004

Table 8. Positive and Negative Ideal Solution Values – 2023

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
Positive Ideal Solution (*A*+)	0,204	0,007	0,161	0,007	0,011	0,888	0,009	0,062	0,009	0,008	0,009
Negative Ideal Solution (*A*−)	0,017	0,001	0,009	0,002	0,000	0,069	0,000	0,009	0,001	0,001	0,001

Step 5: Calculating distance measures and proximity to the solution

In this step, the positive ideal solution S+ and negative ideal solution S- distances are calculated. In addition, the closeness value to the ideal solution was calculated and displayed in the same table at C+ value. It is shown between Table 9 and Table 13. Finally, in Table 14, companies are ranked according to their C+ values. C+ rankings are listed for each year from the firm with the most successful fiscal performance to the company with the least successful fiscal performance.

Table 9. Relative Closeness Values to the Ideal Solution – 2019

No	Company Code	S +	S -	C*
1	AYES	0,441	0,574	0,565
2	BRSAN	0,670	0,091	0,120
3	BURCE	0,693	0,070	0,091
4	BURVA	0,701	0,089	0,112
5	CELHA	0,648	0,127	0,164
6	CEMAS	0,598	0,181	0,233
7	CEMTS	0,476	0,505	0,515
8	CUSAN	0,634	0,125	0,164
9	DMSAS	0,552	0,215	0,280
10	DOKTA	0,634	0,142	0,183
11	ERBOS	0,628	0,134	0,176
12	EREGL	0,643	0,145	0,184
13	ISDMR	0,588	0,201	0,255
14	IZMDC	0,661	0,135	0,169
15	KRDMD	0,682	0,078	0,103
16	SARKY	0,485	0,363	0,428
17	TUCLK	0,492	0,410	0,454
18	YKSLN	0,632	0,194	0,235

Table 10. Relative Closeness Values to the Ideal Solution – 2020

No	Company Code	S +	S -	C*
1	AYES	0,196	0,722	0,786
2	BRSAN	0,743	0,039	0,050
3	BURCE	0,659	0,110	0,143
4	BURVA	0,558	0,211	0,274
5	CELHA	0,651	0,122	0,158
6	CEMAS	0,570	0,226	0,284
7	CEMTS	0,623	0,286	0,314
8	CUSAN	0,688	0,092	0,118
9	DMSAS	0,561	0,208	0,271
10	DOKTA	0,661	0,112	0,145
11	ERBOS	0,664	0,167	0,201
12	EREGL	0,727	0,145	0,166
13	ISDMR	0,701	0,230	0,247
14	IZMDC	0,599	0,184	0,235
15	KRDMD	0,670	0,098	0,128
16	SARKY	0,607	0,173	0,221
17	TUCLK	0,512	0,270	0,345
18	YKSLN	0,712	0,151	0,175

Table 11. Relative Closeness Values to the Ideal Solution – 2021

No	Company Code	S +	S -	C*
1	AYES	0,692	0,356	0,340
2	BRSAN	0,765	0,052	0,063
3	BURCE	0,761	0,074	0,088
4	BURVA	0,759	0,051	0,063
5	CELHA	0,763	0,071	0,085
6	CEMAS	0,269	0,730	0,731
7	CEMTS	0,577	0,263	0,313
8	CUSAN	0,731	0,094	0,114
9	DMSAS	0,696	0,166	0,192
10	DOKTA	0,770	0,065	0,078
11	ERBOS	0,679	0,132	0,163
12	EREGL	0,686	0,141	0,170
13	ISDMR	0,681	0,145	0,176
14	IZMDC	0,755	0,144	0,160
15	KRDMD	0,733	0,082	0,101
16	SARKY	0,709	0,132	0,157
17	TUCLK	0,711	0,132	0,157
18	YKSLN	0,665	0,145	0,179

Table 12. Relative Closeness Values to the Ideal Solution – 2022

No	Company Code	S +	S -	C*
1	AYES	0,250	0,587	0,701
2	BRSAN	0,585	0,068	0,104
3	BURCE	0,543	0,114	0,174
4	BURVA	0,638	0,028	0,042
5	CELHA	0,541	0,126	0,189
6	CEMAS	0,495	0,296	0,374
7	CEMTS	0,540	0,206	0,276
8	CUSAN	0,593	0,062	0,095
9	DMSAS	0,459	0,220	0,324
10	DOKTA	0,559	0,103	0,156
11	ERBOS	0,548	0,118	0,177
12	EREGL	0,604	0,074	0,109
13	ISDMR	0,560	0,100	0,152
14	IZMDC	0,476	0,201	0,297
15	KRDMD	0,578	0,074	0,113
16	SARKY	0,494	0,182	0,269
17	TUCLK	0,528	0,132	0,200
18	YKSLN	0,557	0,093	0,144

Table 13. Relative Closeness Values to the Ideal Solution – Year 2023

No	Company Code	S +	S -	C*
1	AYES	0,214	0,821	0,793
2	BRSAN	0,821	0,038	0,045
3	BURCE	0,742	0,114	0,133
4	BURVA	0,717	0,139	0,162
5	CELHA	0,740	0,121	0,141
6	CEMAS	0,686	0,173	0,202
7	CEMTS	0,742	0,253	0,255
8	CUSAN	0,830	0,035	0,041
9	DMSAS	0,579	0,289	0,333
10	DOKTA	0,777	0,081	0,094
11	ERBOS	0,779	0,088	0,101
12	EREGL	0,837	0,033	0,038
13	ISDMR	0,784	0,073	0,085
14	IZMDC	0,705	0,157	0,182
15	KRDMD	0,770	0,086	0,100
16	SARKY	0,698	0,163	0,190
17	TUCLK	0,693	0,166	0,193
18	YKSLN	0,846	0,036	0,041

Table 14. 2019-2023 Success Ranking of Companies According to C+ Values

	2019	2020	2021	2022	2023
1	BURCE	BRSAN	BURVA	BURVA	EREGL
2	KRDMD	CUSAN	BRSAN	CUSAN	CUSAN
3	BURVA	KRDMD	DOKTA	BRSAN	YKSLN
4	BRSAN	BURCE	CELHA	EREGL	BRSAN
5	CELHA	DOKTA	BURCE	KRDMD	ISDMR
6	CUSAN	CELHA	KRDMD	YKSLN	DOKTA
7	IZMDC	EREGL	CUSAN	DOKTA	KRDMD
8	ERBOS	YKSLN	TUCLK	ISDMR	ERBOS
9	DOKTA	ERBOS	SARKY	BURCE	BURCE
10	EREGL	SARKY	IZMDC	ERBOS	CELHA
11	CEMAS	IZMDC	ERBOS	CELHA	BURVA
12	YKSLN	ISDMR	EREGL	TUCLK	IZMDC
13	ISDMR	DMSAS	ISDMR	SARKY	SARKY
14	DMSAS	BURVA	YKSLN	CEMTS	TUCLK
15	SARKY	CEMAS	DMSAS	IZMDC	CEMAS
16	TUCLK	CEMTS	CEMTS	DMSAS	CEMTS
17	CEMTS	TUCLK	AYES	CEMAS	DMSAS
18	AYES	AYES	CEMAS	AYES	AYES

Table 14 shows the success ranking of companies that went public 5 years ago and are currently traded on Borsa Istanbul in the basic metal industry sector. Although all of the companies in the table are in the main metal industry sector, 18 companies operate in different areas. These are; iron and steel, aluminum, copper, industrial sub-industry equipment, etc. When the success rankings are evaluated according to sub-sectors; although iron and steel companies are larger than other main metal industry sector companies, their financial performances are more limited. Foundry industry companies have more successful results than other sub-sectors. Different separations have been observed in the success ranking of companies that focus on the production of industrial product groups such as valves, steel mesh, steel fences, ropes, etc.

In addition, among the companies subject to the study, BURVA was identified as the company that was in the top three in 2019 in terms of 5-year performance, experienced the fastest decline in 2020, and rose the fastest in 2021-2022, then fell and experienced fluctuations. It has been determined that BRSAN is the company that remained in the top five for 5 years. It has been determined that CUSAN is the company that has advanced its success most

steadily recently, except for 2021. Although EREGL was the company with the highest market value among the companies subject to the study, its performance fluctuated with ups and downs in the first four years.

6. Conclusion

The basic metal industry is a sector that makes significant contributions to national economies. Market values, liquidity ratios, activity ratios, fiscal structure ratios and profitability ratios of companies in the sector are the criteria that should be taken into consideration for the continuity of the sector. The economies of countries that continue their activities strongly in the basic metal industry sector are likely to be in a competitive position.

When the fiscal performance successes of the firms are considered together with their market values, it is observed that the financial successes of the companies with higher market values are more limited, but the stability of these companies in the success ranking should be taken into consideration. Although the performance of companies with lower market values is more successful, fluctuations in the ranking are observed.

The basic metal industry sector is gaining importance day by day due to the changing dynamics inside the sector, financial gains as a result of value - added product manufacturing, direct contribution to the defense industry sector developing as a result of geopolitical risks, infrastructure support for the green energy transformation of countries and contribution to innovations in the automotive sector. For this reason, it is anticipated that the work done and the work to be done will contribute primarily to the main metal industry sector and then to the country's economy.

The findings obtained as a consequence of the analysis confirm the success of the TOPSIS method and the ratios used, and national and international developments in the sector support the consequences of the analysis.

As a consequence, the profitability and cost ratios used in the study revealed accurate results with the Entropy-based TOPSIS method. The use of profitability and cost ratios used in the study, especially in performance measurements of manufacturing enterprises, will also contribute to other studies to be conducted in this field.

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CHAPTER VIII

RECENT TRENDS IN E-COMMERCE IN THE WORLD AND IN TÜRKİYE

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1. Introduction

Digital transformation is transforming almost everything rapidly in the global world. In recent decades, the rapid development of information communication technology and the increase in internet usage have significantly changed the way trade is conducted. Nowadays, the share of e-commerce in global trade is increasing fastly. Countries that can adapt to the digital transformation process and develop their technical infrastructure in this field are also countries that can get a larger share from e-commerce. The aim of this study is to examine recent developments on e-commerce in the world and in Türkiye. In this context, the study introduction takes places first, the second chapter touched upon the concepts of digital transformation and e-commerce and explained the types of e-commerce. In the third part of the study, the benefits and risks of e-commerce are explained and the factors affecting e-commerce are emphasized. The fourth part tries to unearth the recent trends of e-commerce in the world. In the fifth part of the study, the development and current trends of e-commerce in Türkiye is discussed. The study ends with the conclusion section where the findings are briefly summarized and policy recommendations for Türkiye are tried to be developed.

2. Digital Transformation and E-Commerce

Throughout the history of the world, the way of production has deeply affected the socio-economic structures of societies. It is observed that technology has become a prominent factor of production especially in the process following the Industrial Revolution, and the role of technology in economic functioning has increased especially with the Fourth Industrial Revolution. With the integration of technological innovations into the production processes and marketing forms of products, the way organisations function today has changed significantly, and while organisations that can adapt to digital transformation can gain a place in the market, those that cannot adapt are excluded. Although digital transformation is a concept with multiple definitions, it can be briefly defined as "the process of creating a new opportunity and value by using digital technologies and the process of strengthening the existing structure with digital technologies". The first of the prominent elements in this process is human and the second is adaptation to technology, and what is meant by transformation is not to completely abandon the old system, but to adapt the old system to the needs of the day and to upgrade the system (Bozkurt et al, 2021, p.40). Today, digital transformation is used in various fields from education to health, defense to tourism, agriculture to industry, banking to trade, and countries who can adapt more to the relevant process can be more economically competitive. Artificial intelligence, internet of things, big data, cloud computing, blockchain, e-commerce and digital payment systems are some of important components of digital transformation (Yılmaz & Özen, 2021, p.184).

With the digitalisation of the economy, trade models have also changed and e-commerce has become an important element of the digital economy. E- commerce is simply the sales of goods and services with the help of digital networks (WB, 2019). When the literature is examined, it is noticeable that there are different types of e-commerce. These are B2B e-commerce, B2C e-commerce, C2C e-commerce, cross-border e-commerce and trade of the future; trade of things. This classification in the literature is generally made according to whether the buyer and seller are organisations or individuals. B2B is a type of e-commerce in which both the buyer and the seller are organisations (business-to-business). The volume of B2B commerce in the world is many times higher than B2C commerce. This type of trade has been going on since the 1970s and has increased with the spread of internet technologies and accessibility. B2C is a type of e-commerce where the buyer is an individual and the seller is an organisation (business-to-consumer). B2C applications

emerged in the mid-1990s and related applications have developed rapidly since then. In 1995, Amazon.com, which started to sell books over the Internet, is one of the prominent success stories in this field. C2C refers to consumer-to-consumer electronic commerce. This practice emerged with the birth of auction sites. With e-auction applications, users were able to offer price offers for products and purchase products. The site that popularised this application was E-bay. In this application, both first-hand and second-hand products are sold. Cross-border trade is a type of trade that enables the delivery of products purchased from abroad to buyers (customers) within the country within the framework of micro export rules. The last type is trade of the future; trade of things. Although the trade of things is a type of trade that has not become widespread today, it is a type of trade where the purchase of products and services can be made without the need for an interface or a human. In this type of trade, smart devices can make purchases on behalf of people or on a direct command. For example, Amazon incorporates a tool such as a printer designed with a 'Dash Replenishment' connection into its commerce network, and Amazon can automatically create an order when the printer cartridge is about to run out (ISO, 2021).

3. Risks and Benefits of E-Commerce, Factors Impacting on E-Commerce

The risks and benefits of e-commerce, which has become widespread with digital transformation, are very diverse. If we discuss the benefits or advantages first, it is possible to divide the advantages into three groups. These can be listed as benefits to customers, benefits to companies and benefits to society. The first benefit to customers is that e-commerce can be carried out without time constraints. E-commerce stores are open 24/7 and the customer can shop without any time restrictions. Secondly, customers have access to products without any physical restrictions. Thirdly, e-commerce saves time. Buying any product through e-commerce does not take more than 15 minutes on average. This is a very important advantage in today's conditions where time is equivalent to money. E-commerce enables customers to choose from a wide range of options and thus compares prices. In traditional trading, visiting many shops and comparing prices is costly, tiring and time-consuming. Thanks to e-commerce, it is possible to access detailed information about a product in a short time, which is something that cannot be easily realised in traditional trade (Taher, 2021). From the perspective of companies, e-commerce has

many benefits. In this framework, e-commerce increases the export of goods and services and paves the way for diversification. It makes it possible to open up to new markets, expands the export basket, increases the number of exporters, thus strengthening ties with global value chains (WB, 2019). Apart from these, cost reduction, faster response to buyer and market demands and affordable advertising and marketin opportunities are other benefits (Amazon, 2024). This type of trade also eliminates the location problem. The only necessary element is an electronic device and internet connection. Thus, business procedures are significantly eliminated and it becomes easier to operate (Taher, 2021). The benefits to society are preventing environmental pollution, increasing entrepreneurship, providing the opportunity to obtain products at more affordable prices, providing more interconnectedness (this type of trade removes borders, enabling sales to people outside the country). (FAC, 2024). The risks and/or disadvantages include technical difficulties such as the need for an internet connection and a certain level of knowledge and experience in setting up an online business, security risks (the need for a website with a robust security infrastructure to ensure the security of customer information and credit card details), and in some cases high shipping costs (Shopify, 2024).

Various factors affects e-commerce. The level of economic development and macroeconomic structure are among the most important factors. It is not surprising that China and the USA, which are the largest economies of the world economy, are also leaders in e-commerce. It should be emphasised that global developments also have a significant impact on e-commerce volume. The e-commerce volume, which has grown significantly with the Covid-19 pandemic, is a proof of this. The demographic structure, which includes factors such as age and gender, also has a significant impact on e-commerce. Strong internet infrastructure and ease of access to the internet, prevalence of mobile device usage, prevalence of social media usage, prevalence of digital payment systems can be listed as other factors that significantly affect e-commerce (ISO, 2021).

4. Recent Developments in E-Commerce in the World

When the countries with the highest e-commerce revenues in the world in 2023 are analysed, it is noticeable that China and United States are leaders in this field. Japan, United Kingdom and Germany are the countries following China, respectively (Figure 1).

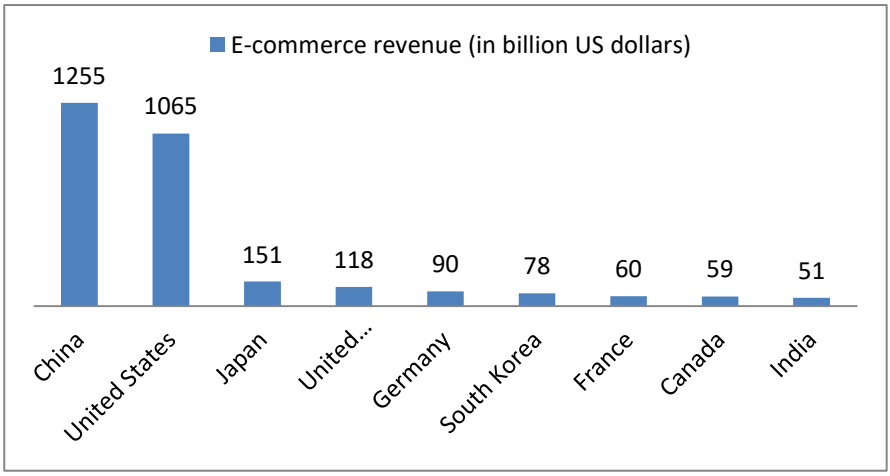

Figure 1. E-commerce Revenue By Countries as of 2023 (Statista, 2024)

The reasons for China's leading position in the global e-commerce market are various. Significant support from the government, high internet speed, high number of internet users, existence of special economic zones related to the subject, logistic efficiency are the reasons that make China a leader in this field. Elaborating on the element of government support, it should be emphasised that advances in this area in China emerged in the 1990s. The Chinese government prepared 'Golden Projects' in this field in the relevant years and the e-commerce industry started to develop in the country in 1994. China Electronics Chamber of Commerce was constituted in 2000, thus, the first Chinese e-commerce companies started to emerge (Vlasenko& Goloventchik, 2022, p.44). Apart from the factors mentioned above, the increase in the middle class in the country, rising smartphone and internet penetration, and the popularity of online shopping platforms in the country pave the way for China to become the market leader (AHK, 2023). There are many reasons why the USA, one of the leading economies in the world economy, is one of the pioneers in e-commerce. Firstly, the country has a large economy and a dense population. It is one of the global focal points of trade and finance. Per capita income and wealth in the country is quite high. The country has made major investments in IT technological infrastructure in the last decades. Internet access in the country is quite high, there are many websites operating commercially, B2B trade and B2C trade are highly developed in the country. The internet is integrated into the life of American society to a significant extent, playing an important role in every activity such as shopping, communication, banking activities and business to

business commerce (McGann et.al, 2002). The country is home to many of the world's most visited e-commerce websites such as Amazon, E-Bay and Walmart as of September 2024 (Similarweb, 2024). Japan, which ranks third in the world in terms of e-commerce revenues, is also a country with advanced network infrastructure and mobile infrastructure. Logistics systems and delivery systems are also highly developed in the country. A significant portion of e-commerce revenues in the country comes from retail stores such as Rakuten and Amazon Japan, which operate entirely online and host many brands. In Japan, which has a demographic structure with a high average age (elderly), people live in small houses and spend hours travelling to and from work. For this reason, Japanese people use their phones disproportionately more than their Western peers and fulfil all their needs from entertainment to expensive shopping by using their phones (Komoju, 2024). E-commerce in the country has experienced a great expansion due to the Covid-19 outbreak, and 24% of the trade in the country was realised online in 2020. Internet penetration in the country has reached 92% of the population, which means significant market opportunities for e-commerce companies (Viraize&Tabata, 2022, p.6). When the product categories with the highest sales in B2C e-commerce are analysed globally, it is found that the highest demand is for fashion products. Electronics, toys and hobby products and furniture are the other most popular categories (Table 1).

Table 1. Estimated Annual Spend (in US Dollars) in Consumer Goods Categories Globally, B2C Only, Full Year 2022) (Digital, 2023, p.366)

Consumer Goods Categories	Estimated Annual Spend (in US Dollars)
Fashion	871,2 billion
Electronics	765,7 billion
Toys, hobby products	601,7 billion
Furniture	387,7 billion
Personal, household care	368,2 billion
Food	244 billion
Beverages	207,9 billion
Physical Media	143,8 billion

In the global context, when weekly mobile commerce is analysed in terms of gender, it is determined that in most age group, women internet users make more weekly online purchases than men internet users, however, the 55-64 age group is an exception in this respect (Table 2).

Table 2. Weekly mobile commerce percentage by sex and age groups (Digital, 2023, p.358)

Sex /Age Group	16-24	25-34	35-44	45-54	55-64
Female	27,50%	33,70%	35,60%	30,40%	23,80%
Male	24,10%	28,90%	31,10%	28,10%	25,90%

While addressing global developments in e-commerce, it is necessary to examine the effects of the Covid 19 pandemic on e-commerce in the context of countries. The Covid 19 pandemic, which emerged in Wuhan, China in 2019 and then spread rapidly all over the world, affected the global economy sharply. With the limitation of mobility and the closure of country borders, economic activity and global trade has significantly reduced. In 2020, global GDP decreased by 4.3 per cent, global trade in goods decreased by 9 per cent, while global trade in services fell by 15 per cent. The pandemic accelerated the digital transformation in the world. Consumers have turned to online shopping in domestic markets as they have worried about social interaction. The volume of e-commerce has increased significantly with the pandemic, the global retail share of e-commerce increased from 14% in 2019 to 18% in 2020 (UN, 2021). Therefore, countries with strong e-commerce infrastructure and countries that made significant investments in this field before the pandemic have benefited from this situation. According to UNCTAD data, while the rate of internet users who shopped online before the pandemic was 53% in 2019 in 66 countries, this rate reached 60% in 2020-2021 after the pandemic. On the other hand, the boom in online shopping has shown significant differences between countries. While the rate increased more in developed countries, developing countries had a smaller share in this rise. Striking increases have also been observed in some developing countries. In the United Arab Emirates, the proportion of internet users shopping online increased from 27% in 2019 to 63% in 2020. In Bahrain, the relevant rate tripled in the year after the pandemic and reached 45%. In developed countries, the highest increase was observed in Greece, Ireland, Hungary and Romania. Among 66 countries, the countries with the lowest increase in online shopping are El Salvador, Azerbaijan, Uzbekistan and Colombia. The main reason for these diversity is the differences in their extent of digitalisation. While countries that cannot rapidly adapt to digital technologies face significant economic difficulties, retail sales have exploded in countries that can adapt to the digitalisation process more rapidly and have

already made significant investments in this field. While online retail sales were 2 trillion dollars in 2019 before the pandemic, it increased to 2.5 trillion dollars in 2020 and increased to 2.9 trillion dollars in 2021. About half of these sales belong to China, while about 30 per cent belong to the US. Canada, Australia and Singapore are among the countries that showed significant increases in the relevant period. During this period, the largest online sales platforms made huge profits. Alibaba, Amazon, JD.com and Pinduoduo's revenues increased by 70% between 2019 and 2021 (UNCTAD, 2022).

5. Development of E-Commerce in Türkiye and Current Trends

The emergence of the Internet in Türkiye took place in the early 1990s. In 1991, METU and TUBITAK initiated a project on a new network using internet technologies. The first internet connection was realised in 1993 by means of routers in the hall of METU Information Processing Department (METU, 2024). In terms of internet usage, METU was followed by Bilkent, Boğaziçi, Istanbul and Ege Universities, and websites such as Mynet and Ekşi Sözlük were also launched in the 1990s. In 1997, the High Council of Science and Technology paved the way for the establishment of e-commerce in the country, and the Electronic Commerce Coordination Board was established in 1998. In 2001, the General Coordination Office for Electronic Commerce within the Undersecretariat of Foreign Trade continued its activities as 'E-Commerce Working Group'. In 2010, the 'Draft Law on the Regulation of Electronic Commerce' was submitted to the Türkiye National Assembly, but the law was adopted in 2014 and entered into force in 2015 (Demirdöğmez et. al., 2018, p.2222-2223).

When the statistics on the subject in Türkiye are analysed, it is determined that the volume of e-commerce has increased significantly in recent years. In 2023, the volume of e-commerce in the country increased by 115.15% compared to the previous year and reached USD 77.89 billion (TL 1.85 trillion). On the other hand, when the growth rate between 2019 and 2023 is analysed, it is determined that the relevant rate is 92.17% (TCTB, 2024, p.18). It can be observed in Figure 2 that the general and retail e-commerce volume has increased dramatically since 2019, when the Covid-19 pandemic emerged in Türkiye.

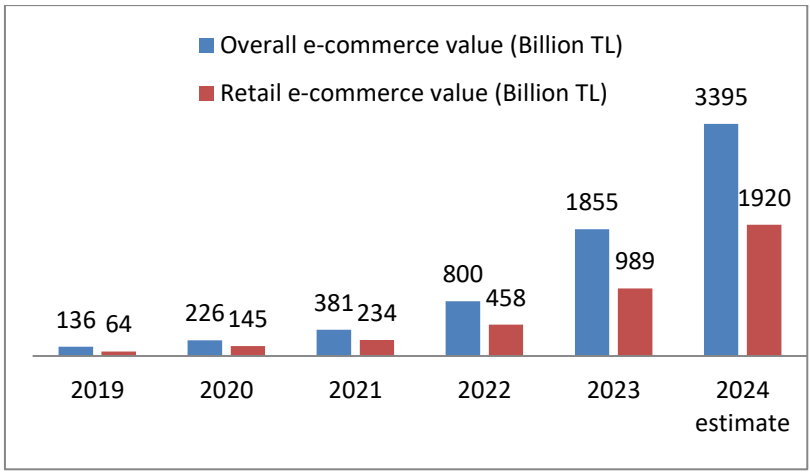

Figure 2. Changes in general(overall) and retail e-commerce volume in Türkiye between 2019 and 2024 (TCTB, 2024, p.19)

In line with the trends in the world, it can be stated that the Covid 19 pandemic in Türkiye has changed consumer habits in favour of e-commerce. With the pandemic in Türkiye, digitalisation gained importance in all sectors, and shopping in many sectors, especially in the food sector, was carried out through e-commerce. The increase in e-commerce has also increased the volume of digital payments in the country, and payments such as card payments and remittance/EFT have increased much more. The rapid increase in e-commerce volume with the pandemic has also increased cargo and transport transactions, and the country's leading e-commerce companies such as Trendyol and Hepsiburada have established their own logistics networks. In the relevant period, the highest demand was in the food and supermarket sectors, followed by the demand for products in the chemical sector. With the rapid increase in e-commerce activities in Türkiye, competitiveness in the relevant market has also increased, and the quality of the service offered has become more important from the perspective of consumers. The rapid increase in the volume of e-commerce in the country has also increased the number of new-small companies wishing to operate in this field (Kılınç&Akın, 2021, p.95).

With the rapid expansion of the internet and mobile device usage in Türkiye in recent years, shopping habits have also changed significantly and e-commerce sites have started to be visited intensively and become the new address for shopping. E-commerce sites in the country offer a wide range of

products to consumers with a wide range of products, causing many national and international brands to strengthen their presence in the country. Figure 3 shows the most visited e-commerce websites in Türkiye and their estimated traffic as of 2024.

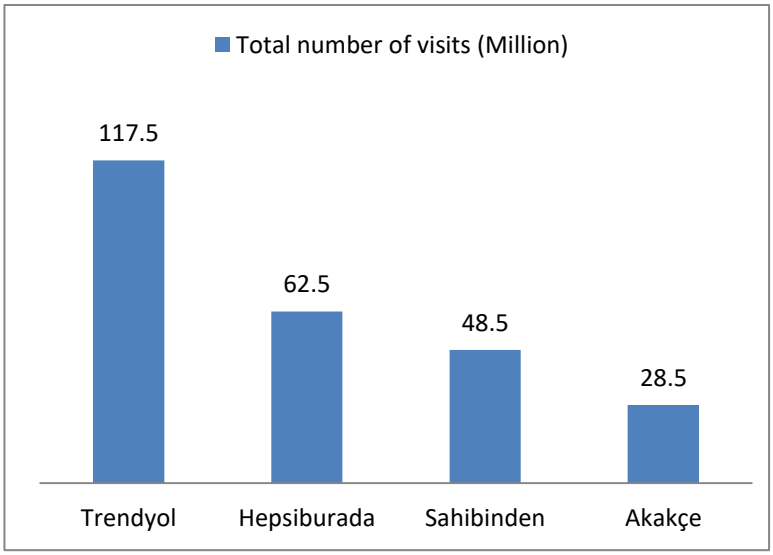

Figure 3. Most visited e-commerce sites in Türkiye as of October 2024 (Magna, 2024)

As can be seen from Figure 3, Türkiye's largest e-commerce site is by far Trendyol, while Hepsiburada is in a secondary position. Operating since 2010, Trendyol is Türkiye's largest e-commerce website and has 30 million customers. Going beyond fashion products in Türkiye, the organisation also provides catering and grocery services and is also the owner of Dolap, one of the largest second-hand platforms. The platform, which has its own logistics network under the name Trendyol Express, works with over 250,000 business partners, markets more than 80 million products and delivers to more than 100 countries (Trendyol, 2024). The other biggest e-commerce website Hepsiburada, brings together thousands of businesses, offering more than 200 million product types in more than 30 categories to its customers. The platform, which has its own logistics network, also operates in different areas such as travel and market and continues its investments (Hepsiburada, 2024). The sectors with the highest share in e-commerce volume in Türkiye in 2023 are white goods and small household appliances, electronics, clothing, footwear and accessories, airlines, food and

supermarket, home-garden furniture decoration, travel-transportation, food and software sectors, respectively. More than half of the e-commerce volume in Türkiye in 2023 was realised by consumers in the 25-36 age range. When the distribution of e-commerce volume according to the time interval is analysed, it is understood that the relevant activity takes place mostly in the evening hours. As of 2023, the most transactions took place between 18.00-24.00 hours (TCTB, 2024, pp:26-39). The weekly shopping frequency of internet users in Türkiye is above the world average. While the percentage of internet users between the ages of 16-64 who shop once a week is 57.6 per cent in the world average, this rate is 64.6 per cent in Türkiye and Türkiye ranks third in the world with this rate. The first country is Thailand and the second country is South Korea (Digital, 2023, p. 355). When the ratio of online consumer goods trade to the GDP of the countries during the year is analysed, China (with 6.31%) ranks first and South Korea (with 6.24%) ranks second. The world average in this area is 3.53% and Türkiye is well below the average with 2.45% (Digital, 2023, p. 363).

As relevant data on the subject shows, special days are the days when the volume of e-commerce changes in Türkiye. In 2023, the highest transaction volume in the country took place on 24 November Teachers' Day. November Campaigns are also the days when the volume increases. On the other hand, 28 June 2023, the first day of the Feast of Sacrifice, was the day with the lowest e-commerce volume in the country. After Eid al-Adha, the lowest e-commerce volume in the country was on 6 February 2023, when the twin earthquakes occurred and a significant part of the country suffered great destruction. The online expenditures of the buyers in Adana, Adıyaman, Diyarbakır, Elazığ, Gaziantep, Hatay, Kahramanmaraş, Kilis, Malatya, Osmaniye and Şanlıurfa approached zero on the dates of the earthquake, and could approach the annual average towards 21 March (TCTB, 2023, pp:33-36).

6. Conclusion

Digital transformation has significantly transformed economic functioning and trade all over the world, and while organisations that can adapt to the relevant transformation can remain in the market, those that cannot adapt are excluded. Since the 1970s, the development of internet technology and increased accessibility have significantly transformed trade. There are many types of e-commerce, which comes to the fore as a type of trade realised through digital networks. It should be underlined that the existence of an important technological infrastructure is essential for the proper functioning of

e-commerce, which has many benefits as well as risks. In other words, countries with a strong technological infrastructure encounter more benefits of e-commerce and can eliminate risks more easily. Although there are many factors affecting e-commerce, the level of economic development and macroeconomic structure are important factors. In this context, when the global situation is analysed, it is not surprising that China and the USA are the world leaders in this field. The mentioned countries are countries that understood the importance of e-commerce in the 1990s, have tried to stand out in the field with strong state investments since the relevant date, and have developed a solid technological infrastructure. Today, the world's highest e-commerce revenues expressed in billions of dollars belong to China and the USA. The online shopping platforms of the relevant countries are the world's leading platforms and earn huge profits. In other words, success is not a coincidence. The Covid 19 pandemic, which occurred in 2019 and lasted for several years, also accelerated digital transformation, and e-commerce volume increased globally in the post-pandemic period. Therefore, countries that developed their technological infrastructure in the pre-Covid period achieved higher e-commerce revenues during and after the pandemic. Türkiye, a developing country, is an important market for e-commerce with its dense and relatively young population. Studies on developing e-commerce in the country started in the 2000s legally, however e-commerce in the country has developed rapidly. The pandemic has significantly changed consumer preferences in Türkiye, as in the world, and further accelerated digitalization in the financial field. On the other hand, e-commerce in Türkiye is not yet developed enough. In order to stand out in international markets in this field, it is necessary to strengthen the digital infrastructure, support and regulate e-commerce platforms. Considering that the companies doing business in the country are mostly SMEs, it is important to support these companies in expanding abroad (ISO, 2021). Moreover, the development of new professions related to this field and the provision of the necessary education by universities are also important for the development of the sector.

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CHAPTER IX

HIGH TECHNOLOGY EXPORTS, R&D EXPENDITURES AND ECONOMIC GROWTH NEXUS IN TÜRKİYE

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1. Introduction

Today, Competitive advantage in international commerce relies not just on a nation's natural resources but also on its creative products and services. Recently, technology and innovation have become a driving force in positioning long-term competition in global markets (Alagöz et al., 2016). Technology trade not only fosters innovation and competitiveness but also significantly influences the economic strength and geopolitical standing of states globally (Cetulean & Tănase, 2024). Unquestionably, the technical infrastructure of developed and developing nations is one of the fundamental causes of the disparities in economic development and wealth levels between them. Numerous factors, including the workforce, natural resources, economic and political stability, educational attainment, intensity of R&D activities, and innovation, contribute to disparities in development and growth among nations; however, the paramount factor is the technology underpinning production (Kabaklarli et al., 2017). Because most researchers agree that one of the main factors affecting economic production is technical growth (Yoo, 2008).

The phrase "high technology" is widely used to refer to organizations and industries whose goods or services integrate new and sophisticated technologies (Seyoum, 2004). High technology relies on sophisticated scientific and technological knowledge that necessitates increased investment in research and development (Yurdagul, 2019). Therefore, high-technology production requires a

skilled workforce, investment, and expenditure in R&D (Bayraktutan & Bıdırdı, 2018). In this context, it is impossible for companies and countries that do not give the necessary importance to R&D activities to achieve a sustainable growth trend. Since R&D operations are an essential source of economic growth, it is unavoidable that there is a significant link between R&D spending and growth in today's world. In this context, R&D expenditures are one of the main purposes of gaining knowledge and experience, which are of significant importance in the process of gaining technological talent (Alagöz et al., 2016). Additionally R&D activities play a locomotive role in the production and development of new Technologies (Taşiyan & Çadırcı, 2024). Because the necessity of research and development (R&D) is now well known by development economists and policy makers worldwide (Gaur et al., 2020).

One of the most important components of a country's development and economic expansion is exports. With the exports they make, countries increase their factor endowments, earn foreign exchange income, and can more easily import intermediate goods and investment goods. In addition, countries can increase their employment rates with the contribution of exports. With the exports made, a resource distribution suitable for the international specialization areas of the countries can be provided, and an increase can be achieved both in the welfare of the countries themselves and in global welfare (Şimdi & Şeker, 2018). In recent years, a number of emerging nations have seen tremendous economic development. One of the major reasons behind this was the improvement in export performance. Exports are considered important determinants of economic output, especially in the long run (Satrovic, 2018). Exports are a crucial economic activity that stimulates economic growth and national development by facilitating foreign cash influx (Konak, 2018).

The importance of specialization in technological advancement and the export of high-technology products for economic growth is now well established in the international trade literature (Gaur et al., 2020). High technology productivity is viewed as the driving engine of economic development, especially for nations following export-led growth strategies (Sahin, 2019). High-technology production also entails the production of high-value products, so producing and exporting goods that contain high-technology products is crucial for nations pursuing export-oriented growth in order to increase export earnings and finance their expansion and development (Yıldız, 2017). Therefore, policies and strategies for export promotion are generally focused on high-technology exports, which are the most dynamic component (Sandu &

Ciocanel, 2014). The potential of emerging nations to advance to the level of industrialized countries depends on the extent of the high-technology exports that these countries can produce. It is crucial for emerging countries to focus swiftly on quality education and R&D activities and to create and export high-technology items (Kabaklarli et al., 2017).

Basic pharmaceutical products and manufacturing; computer, communication, electronic, and optical products manufacturing; aircraft, etc.; spacecraft; railway locomotives; rail systems; motorized and non-motorized land vehicles; trailers or semi-trailers manufacturing; military combat vehicles, etc. Manufacturing of transportation vehicles, fabricated metal products, and medical and dental-related tools and equipment constitutes the sectors within the scope of high-technology exports (Öztemiz, 2024).

Türkiye's overall R&D expenditure was 16.1 billion dollars in 2023. The percentage of R&D spending in gross domestic product was 1.42%. In 2023, the private sector continued to be the dominant driving factor with a share of 65.1% in R&D spending. The percentage of the private sector in R&D spending was followed by higher education with 30.0%. The percentage of public R&D spending in total was 4.9%. The biggest R&D spending in the private sector was made by firms in R&D centers and high-technology operations. (Tubitak, 2023).

Table 1: The Top 10 High Technology Exporting Countries and Türkiye

Rank	Country	High Technology Exports (Million $)
1	China	825,045
2	Hong Kong	369,163
3	Germany	255,687
4	Korea, Rep.	209,651
5	United States	208,514
6	Singapore	197,387
7	Vietnam	135,907
8	Malaysia	127,032
9	France	115,256
10	Netherlands	110,952
34	Türkiye	8,461

Source: Worldbank (2023)

According to the statistics for 2023, the top 10 high-tech exporting countries worldwide and data for Türkiye are shown in Table 1. The large number of

Asian countries in high-tech exports is striking. Türkiye ranks 34th in the world with $8,461 million.

Studies in this field generally take into account the impact of high-tech exports on economic growth. In this study, it was examined whether economic growth has an impact on increasing high-tech exports, in other words, whether there is a reciprocal cyclical relationship between the two variables. In addition, R&D expenditures, which have a direct impact on determining high-tech capacity, were also included in the model. In the first part of the study, a comprehensive literature review was conducted on the subject. In the next part, the data set and econometric methods were introduced. In the last part, empirical findings were discussed and suggestions were made.

2. Literature Review

High-tech exports have become one of the fundamental determinants of economic growth and competitive strength in countries today. Therefore, the importance of academic studies on this subject is quite significant. The contributions to the economic growth of countries result in many positive outcomes, such as the production of higher-valued products, increased employment, and improved living standards. Researchers focus on this topic to better understand this relationship and to assist countries in developing their economic development strategies. Particularly, the relations between high-tech exports and subjects such as economic growth, innovation and R&D expenditures, foreign direct investments, globalization, human capital, production capacity, financial resources, and government policies have become the focal points of researchers both at the country and country group levels. Consequently, a rich literature on high-tech exports has emerged. In studies conducted for Türkiye, Yurdagül (2019) and Sahin (2019) examined the relationship between economic growth and high-tech exports. Dereli (2019) also considered the number of patents in addition to economic growth. Ustabaş & Ersin (2020) conducted a comparative analysis of the relationship between economic growth and high-tech exports for Türkiye and South Korea. In studies conducted for European countries, Sandu and Ciocanel (2014), Meo & Usmani (2014) examined R&D expenditures and high-technology exports; Gokmen & Turen (2013) and Koç et al. (2016) examined the determinants of high-technology exports; and Cetulean & Tanase (2024) examined economic growth and high-tech exports. In studies conducted for OECD countries, Falk (2009) examined the link between economic growth and high-tech exports. Zapata et al. (2024) and Kabaklarli et

al. (2017) investigated the determinants of high technology exports. In studies conducted for developed and developing countries, Bayraktutan and Bıdırdı (2018) examined the number of patents and high-technology exports; Seyoum (2005) and Gaur et al. (2020) examined the determinants of high-technology exports Satrovic (2018) examined economic output and high-tech exports. Sajoodi & Baghbanpour (2024) examined economic growth and high-tech exports and Costantini & Liberati (2014) examined the impact of high-tech exports on development. In studies conducted for selected countries, Seyoum (2004), and Tebaldi (2011) examined the determinants of high-technology exports; Şahin and Şahin (2021), Ekananda and Parlinggoman (2017), and Cetulean & Tanase (2024) examined economic growth and high-tech exports and Hoo Yoo (2008) examined economic output and high-tech exports. Alagöz et al. (2016) examined R&D expenditures and high-tech exports for E7 countries. Usman (2017) studied economic growth and high-tech exports in Pakistan. Beser & Soyyiğit (2019) analyzed the relationship between high-tech exports, income, and carbon emissions in G20 countries; Fonkam (2023) investigated the determinants of high-tech exports in African countries. Göçer (2013) examined economic growth and high-tech exports in Asian countries, and Yıldız (2017) analyzed economic growth and high-tech exports in BRICS countries.

3. Data and Methodology

In the analysis, Türkiye's yearly high-technology exports (LTECH), R&D expenditures (LDR), and gross domestic product per capita (LGDP) statistics for the period 1996-2021 were employed. The statistics were taken from the World Bank and Worlddata electronic database. All variables are represented in logarithmic form.

The Fourier ADF (FADF) unit root test developed by Christopoulos & Ledesma (2010) is expressed by the following equation based on the Fourier model of Becker et al. (2006).

$$y_t = \delta_0 + \delta_1 \sin\left(\frac{2\pi kt}{T}\right) + \delta_2 \cos\left(\frac{2\pi kt}{T}\right) + v_t \tag{1}$$

In equation (1), T is the sample size, t is the trend, $\pi = 3.14$, and k is the frequency integer value with the minimum residual squared and taking values between 1 and 5. The null hypothesis is expressed as follows.

$$H_0 : v_t = \mu_t \ , \qquad \mu_t = \mu_{t-1} + h_t \tag{2}$$

In hypothesis (2), h_t represents a stationary process with zero mean. The test statistic is calculated in three stages. In the first stage, the optimum k value (k^*) that minimizes the residual sum of squares from equation (3) is found.

$$\hat{v}_t = y_t - \left[\hat{\delta}_0 + \hat{\delta}_1 \sin\left(\frac{2\pi k^* t}{T} \right) + \hat{\delta}_2 \cos\left(\frac{2\pi k^* t}{T} \right) \right] \tag{3}$$

In the second stage, the unit root test is applied to the residuals obtained from equation (3). The FADF unit root test is performed with model (4).

$$\Delta v_t = \alpha_1 v_{t-1} + \sum_{j=1}^{p} \beta_j \Delta v_{t-j} + u_t \tag{4}$$

Hypotheses for the FADF unit root test are established as follows.

$$H_0 : \alpha_1 = 0$$

$$H_1 : \delta_1 = \delta_2 \neq 0$$

The null hypothesis argues that the trigonometric terms are not significant. When the null hypothesis cannot be rejected, applying the ADF unit root test instead of the FADF unit root test gives more reliable results.

Banerjee et al. (2017) developed the Fourier ADL (FADL) cointegration test by adding trigonometric terms to the Autoregressive Distributive Lag (ADL) cointegration approach. The model to be used for the test is given below.

$$\Delta y_{1t} = d(t) + \delta_1 y_{1,t-1} + \gamma' y_{2,t-1} + \varphi' \Delta y_{2t} + e_t \tag{5}$$

In equation (5), the dependent variable and the explanatory variables, the lags in and allow for the control of possible correlations in the error term. The right side of the equation is supplemented with the variables' lagged values. AIC and BIC information criteria are used for the appropriate lag length.

Using the Fourier approximation, the deterministic component d(t) is defined as follows.

$$d(\mathrm{t}) = \gamma_0 + \sum_{k=1}^{q} \gamma_{1,k} \sin\left(\frac{2\pi kt}{T} \right) + \sum_{k=1}^{q} \gamma_{2,k} \cos\left(\frac{2\pi kt}{T} \right) \tag{6}$$

The hypotheses for the FADL cointegration test are established as follows.

$$H_0 : \delta_1 = 0 \qquad H_1 : \delta_1 < 0$$

The null hypothesis indicates that there is no cointegration relationship between the variables, whereas the alternative hypothesis states that there is a cointegration between the variables. Critical values are listed by Banerjee et

al. (2017). T-statistics are used to test the basic hypothesis. The F statistic is also used under the $H_0 : \delta_1 = \gamma = 0$ constraint. The test statistic for FADL is calculated as follows.

$$t_{ADL}^{F} = \frac{\hat{\delta}_1}{\text{se}(\hat{\delta}_1)} \tag{7}$$

In equation (7), $\hat{\delta}_1$ is the least squares estimator of δ_1. $se(\hat{\delta}_1)$ is the standard error of $\hat{\delta}_1$ obtained from the least squares estimator.

Toda & Yamamoto (1995) developed a causality test based on the extended VAR model with lags. They used the modified WALD (MWALD) test statistic with a chi-square distribution to test the significance of the parameters. Hacker & Hatemi (2006) followed the same procedure and used the bootstrap approach for critical values. They suggested that the bootstrap distribution is more robust for different sample sizes. The VAR(p+d) model proposed by Toda & Yamamoto (1995) is shown below.

$$y_t = \hat{v} + \hat{A}_1 y_{t-1} + ... + \hat{A}_p y_{t-p} + ... + \hat{A}_{p+d} y_{t-p-d} + \hat{\varepsilon}_t \tag{8}$$

In model (8), $\hat{A}$ represents the parameter estimate, *d* represents the maximum degree of integration, and *p* represents the number of lags. The null hypothesis for Granger causality is established as follows.

$$\text{H}_0 = C\beta = 0$$

Critical values are obtained with the boostrap distribution. The test also takes into account the autoregressive conditional heteroscedasticity (ARCH).

4. Empirical Findings

In the study, the findings obtained from the econometric methods used to examine the relationship between economic growth, R&D expenditures, and high-tech exports are given in tables.

Table 2: Unit Root Test

Variables	Min. SSR	k	FADF	F(k)
LTECH	1.495	1	-2.61	19.568***
LRD	0.472	1	-1.17	10.229***
LGDP	0.550	1	-0.06	25.020***

*, ** and *** indicate 10%, 5% and 1% significance levels. Critical values for FADF are 1%: -4.39, 5%: -3.82 and 10%: -3.54 for k = 1 frequency value. Critical values for the F test are 1%: 6.730, 5%: 4.929 and 10%: 4.133.

The F(k) statistics values for trigonometric terms are significant, based on the data shown in Table 2. FADF unit root test results were found to have unit roots for LTECH, LRD and LGDP variables. The appropriate frequency number for the variables is 1.

Table 3: Cointegration Test

Dependent Variable	Independent Variables	k	FADL Test Statistics
LTECH	LRD, LGDP	1	7.322***

*, ** and *** indicate 10%, 5% and 1% significance levels. (k) is the frequency value with the minimum squared residual. Critical values are included in the study of Banerjee et al. (2017). %1: -4.96, %5: -4.32 ve % 10: -3.98.

Table 3 shows that there is a cointegration relationship between high-tech exports, economic growth, and R&D expenditures. There is a long-term relationship between the variables. This means the variables have an equilibrium relationship and move in the same direction over time.

Table 4: Causality Test

Direction of Causality	MWALD	Critical Values		
		%1	%5	%10
LRD→LTECH	13.534***	8.076	4.382	2.970
LTECH→ LRD	2.382	8.364	4.314	2.972
LGDP→ LTECH	1.163	7.691	4.345	2.947
LTECH→ LGDP	11.311***	7.823	4.415	3.051

*, ** and *** indicate 10%, 5% and 1% significance levels.

The findings in Table 4 indicate that there is a one-way causal relationship between R&D spending and high-tech exports as well as between high-tech exports and economic growth. The causality relationship from R&D expenditures to high-tech exports shows that high-technology exports are a result of R&D investments. The causation link from high-tech exports to economic growth illustrates that high-tech exports have a important impact in the development of the economy.

5. Conclusion

This study reveals that there is a long-term relationship between high-technology exports, economic growth, and R&D expenditures in Türkiye. The findings show that high-technology exports and R&D investments support

economic growth, while economic growth also encourages investments in high-technology and R&D areas. This reciprocal relationship points to a feedback mechanism that is critical for the sustainability of economic growth and technological progress. The results reveal that policies that specifically focus on increasing R&D investments and supporting high-technology sectors are indispensable for Türkiye's economic growth strategies. Effective use of R&D expenditures and increasing the production and export capacities of high-technology products can significantly contribute to economic growth by increasing Türkiye's global competitiveness.

We should develop policies that promote high-technology exports, such as offering state-supported credits, tax reductions, and subsidies to firms operating in high-technology sectors. These policies should specifically encourage the production and export of high-value-added products, increase the promotion and accessibility of high-technology products in international markets, and strengthen international cooperation projects.

In order to increase the effectiveness of R&D expenditures, industry cooperation programs should be developed for the commercialization of R&D studies conducted at universities, and technology development zones and innovation centers should be established at local and national levels. In addition, partnerships with developed countries should be encouraged for Türkiye to gain knowledge and experience through technology transfer, and result-oriented transformation programs should be implemented for R&D and technology projects that will create tangible effects on economic growth.

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CHAPTER X

THE IMPACTS OF TRANSATLANTIC TRADE AND INVESTMENT PARTNERSHIP (TTIP) ON TURKIYE'S INTERNATIONAL TRADE

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1. Introduction

Historically, advancements in institutions and technology have dismantled barriers to the flow of goods, capital, and labor, steering the world toward greater unity. Globalization has rendered an interconnected world unavoidable. Throughout this process, key mechanisms—social, institutional, political, individual, and economic—have experienced profound transformations. Although these elements are intertwined, economic collaboration plays a pivotal role in shaping global dynamics. The fundamental aim of economic integration is to minimize trade-related costs for both consumers and producers, under the premise that doing so will boost the overall welfare of participating nations.

The historical evolution of global economic integration reveals several consistent trends. Firstly, technological progress has lowered transaction costs in key areas like communication and transportation, facilitating the growth of international trade and market expansion. Secondly, the liberalization of global trade may prompt the rise of nationalist protectionist movements within individual countries. However, 19th-century Britain challenges this trend, as it actively supported free trade and unrestricted capital flow, even during a period

of protectionism among Western nations, thus fostering international economic integration (Baldwin et al., 2009). In the present day, the world is increasingly interconnected across various spheres—social, diplomatic, and commercial. Furthermore, there has been a significant increase in regional trade agreements, especially in recent years.

Economic integration, which seeks to eliminate trade barriers between nations, has advanced rapidly over time. The expansion of international free trade is a key driver of economic growth across various countries. Factors such as reduced trade restrictions, lower transportation and communication costs, and the growth of global production networks are often highlighted as major contributors to increased trade flows, which in turn fuel economic development. As a result, "mega-regional" trade agreements have gained prominence in recent years. Notable examples of such agreements include the Transatlantic Trade and Investment Partnership (TTIP), the Trans-Pacific Partnership (TPP), and the Regional Comprehensive Economic Partnership (RCEP), all of which represent significant regulatory reforms (Turanlı, 2019).

In line with the rise of mega-regional trade agreements, the U.S. and the EU initiated talks for a bilateral trade agreement, the Transatlantic Trade and Investment Partnership (TTIP). While TTIP aimed to establish a free trade area between the U.S. and the EU, it is considered a major economic pact. Like other large-scale regional agreements, TTIP's primary focus was on addressing non-tariff barriers, with the goal of improving market access for goods, services, and public investments by removing such obstacles and enhancing regulatory cooperation. Unfortunately, the negotiations for TTIP were discontinued during the Trump administration. However, as Beesley and Donnan (2017) pointed out, countries are hesitant to completely abandon existing agreements, recognizing the costs associated with disengaging from frameworks that create new trade norms and regulations.

The origins of TTIP can be traced to the 1990s, when the European Community (EC) and the United States signed the Transatlantic Declaration, which aimed to promote a trade-oriented partnership between the two. This initiative was followed by the formation of the Transatlantic Business Dialogue (TABD), a group of business leaders from both regions advocating for a more extensive partnership. Over time, discussions between the U.S. and the EU progressed, ultimately paving the way for a transcontinental trade alliance and, later, an intercontinental economic union. These continuous dialogues led to the initiation of in-depth free trade agreement (FTA) negotiations between the U.S. and the EU in 2013 (Gutu, 2016).

TTIP is a broad trade and investment partnership framework designed between the EU and the U.S. The first round of negotiations focused on establishing the rules for the transatlantic agreement, marking the initial effort to enhance trade and investment ties. The main goal of TTIP is to remove trade barriers between the U.S. and the EU, thereby fostering investment and stimulating economic growth for both partners. As a mega-economic agreement, it encompasses a wide-reaching agenda aimed at significantly liberalizing trade between two major economies (Lopez, 2015). Moreover, due to its global scope and potential, TTIP is expected to establish new international standards once implemented. The negotiations seek to resolve challenges within the current trade system, focusing on reducing tariffs, eliminating trade barriers, harmonizing standards and regulations, and advancing broader global economic goals.

The main advantage of TTIP is seen in its potential to eliminate technical trade barriers in domestic markets. However, comprehensive negotiations to remove these obstacles were hindered by the strong positions of opposing groups and independent regulatory authorities on both sides. For example, trade in food products was stalled due to differences in health and labeling regulations. Despite this, TTIP's goals extend beyond the removal of trade barriers; it also aims to establish regulatory frameworks for issues such as intellectual property rights, ecosystems, labor standards, e-commerce, and harmonization (Akhtar and Jones, 2013).

Since Türkiye formed a Customs Union (CU) with the EU in 1996, TTIP has a direct effect on Türkiye's foreign trade, irrespective of Türkiye's participation in the agreement. The EU is Türkiye's largest trading partner, comprising 29% of its imports and 40,7% of its exports in 2023. Similarly, the U.S. also holds a crucial position in Türkiye's trade, ranking as its second-largest export market and sixth-largest source of imports in 2023.

This research analyzes the potential impacts of the Transatlantic Trade and Investment Partnership (TTIP) on Türkiye and investigates the potential outcomes of these effects. Considering Türkiye's direct trade connections with these two major economic powers, it is essential to explore how TTIP could influence the country, both positively and negatively.

2. The Possible Effects of TTIP on Türkiye

It is crucial to analyze its ongoing relationships with the EU and the U.S. The history of U.S.-Türkiye relations dates back to 1831 to better understand Türkiye's potential involvement in the TTIP agreement. The U.S. and Türkiye

formalized their collaboration with the Economic and Technical Cooperation Agreement on July 12, 1947. Türkiye became a NATO member in 1952, and as economic cooperation deepened, the bilateral relationship between the two nations continued to develop.

Bilateral political relations between the U.S. and Türkiye have not kept pace with their trade potential. As a result, both nations are striving to strengthen this partnership. Given the size of the U.S. market, it remains an attractive destination for Turkish exporters. Should the revival of TTIP become a key issue, negotiating a Free Trade Agreement between the U.S. and Türkiye will be critical (Özgöker and İnamoğlu, 2017). Thanks to the Customs Union, TTIP will enable U.S. goods to enter Türkiye duty-free. Although Türkiye is not an EU member, it has established a trade agreement (Customs Union) with the EU.

If TTIP is concluded, U.S. products will enter Türkiye duty-free through the U.S. However, Türkiye remains subject to the customs tariffs imposed by the U.S. This economic relationship may negatively affect Türkiye, particularly in sectors where high tariffs are in place, creating competitive disadvantages. Turkish producers face challenges as U.S. goods will enter Türkiye tariff-free, while Turkish exports will struggle in the U.S. market due to tariff barriers. Despite duty-free entry for U.S. products into Türkiye, Turkish goods will still encounter tariff barriers in the U.S. market. Once TTIP is implemented, Turkish companies will face increased competition from U.S. products, and other third-party firms benefiting from preferential EU access will hold an advantage over those without such benefits (Akman, 2014).

Since 1950, the European Union has played a pivotal role in shaping Türkiye's economic relations. Although Türkiye is not a full member of the EU, the EU remains Türkiye's primary trading partner. In 2001, nearly 52% of Türkiye's exports were directed to Europe, while imports from Europe accounted for about 45% in the same year. The trade relationship between Türkiye and the EU has continued to expand. To attract more foreign direct investment (FDI), the Turkish government has implemented significant reforms. Türkiye's alignment with the EU has encouraged the flow of European investment into the country. EU member states constitute the largest group of foreign investors in Türkiye, accounting for 65% of FDI in 2002. Germany and the UK are key players in transferring technology via FDI, which has led many Turkish workers to seek employment in the EU. Moreover, European tourists contribute significantly to Türkiye's economy (Yılmaz, 2003).

The strengthening of Türkiye's relations with Europe has fostered Bilateral Preferential Trade. Türkiye entered into the Ankara Agreement with the EU

in 1963, followed by the Customs Union Agreement in 1996. The creation of the Customs Union led to a significant increase in bilateral economic activity. However, the 2001 banking crisis had a negative impact on Türkiye's trade balance, particularly concerning imports. In 2008, bilateral trade growth slowed down (European Commission, 2016). Türkiye's strategic geopolitical position makes it a key player in global trade. Despite being part of the Customs Union, Türkiye maintains strong economic ties with both the U.S. and the EU. However, it continues to face trade barriers when engaging with these partners (Vesterbye and Akman, 2017).

Türkiye is a significant economic partner to consider in the context of a potential TTIP agreement due to its participation in the Customs Union (CU) with the EU since 1996. As a CU member, Türkiye is obligated to open its market to third parties automatically. However, as Türkiye is not an EU member, it does not have the same market access rights to countries with which the EU has negotiated free trade agreements. If a free trade agreement were established between the EU and the U.S., Türkiye, as a third party, would experience a shift in its exports from the U.S. market (Akman, 2013). Since no such agreement exists between Türkiye and the U.S., while tariffs on EU-origin products would be removed, Turkish exports would still face protectionist measures in the U.S. market, placing Turkish goods at a competitive disadvantage against EU products.

Similarly, as Türkiye and the EU have established a Customs Union, the U.S. imports goods that can enter Türkiye duty-free from any EU member state. This asymmetry is likely to result in trade diversion (Akman, 2014), and Türkiye may lose control over its imports from the U.S. This situation could lead to negative consequences, such as Türkiye unilaterally eliminating tariffs on U.S. goods.

Furthermore, Yeşilyurt and Paul (2013) have outlined five potential strategies for Türkiye to mitigate the negative consequences of being excluded from TTIP. The first, though unlikely, is for Türkiye to join the EU. The second option involves Türkiye and the EU striving to negotiate an agreement, though this might weaken EU-Türkiye relations and prove detrimental to both parties. The third possibility is for Türkiye to modify its bilateral economic partnership with the U.S. to secure a new Free Trade Agreement. The fourth option suggests that Türkiye could convince the EU to pursue agreements with these countries and initiate parallel negotiations with third parties. Finally, they propose that Türkiye could be granted observer status in TTIP negotiations during council meetings. However, some scholars argue that TTIP would benefit not only

the EU and the U.S., but also Türkiye (Kirişçi, 2013; Kirişçi and Ekim, 2015; Mavus et al., 2013). These researchers emphasize that Türkiye is a member of numerous international cooperations and occupies a strategically important position in the region.

3. Literature Review

This section will review the literature that evaluates the potential effects of the Transatlantic Trade and Investment Partnership on Türkiye's international trade. Significant studies in both national and international literature address the Transatlantic Trade and Investment Partnership, which is expected to have substantial impacts on Türkiye's international trade.

Erixon and Bauer (2010) analyzed the potential impact of GDP on welfare and estimated the benefits for both parties over a sustainable period, observing positive outcomes for each. Based on the anticipated advantages for both sides, the authors concluded that TTIP offers substantial benefits for both parties.

Aran (2013) explores how the need to maintain and enhance the existing trade system has driven the creation of new agreements like the Trans-Pacific Partnership (TPP) and the Transatlantic Trade and Investment Partnership (TTIP). He underscores that these initiatives are complementary and should be viewed as crucial components of a unified international strategy spearheaded by the U.S. Additionally, he emphasizes the significance of Türkiye's positioning as an emerging economy in this evolving global landscape.

Güneş et al. (2013) forecast that if TTIP solely removes tariffs, Türkiye's GDP will shrink by 0.1% and its exports will drop by 0.2%. If tariff removal is fully implemented, the loss in benefits is expected to grow. As a result, Türkiye's GDP could fall by 0.5%, and its exports may decrease by 0.4%. However, if direct spillover effects occur within this agreement, the negative impacts on Türkiye could be reduced. The projections suggest that the outcomes will be favorable if Türkiye becomes part of the agreement. In conclusion, the agreement has minimal effects on the EU and the U.S. (%0.009, %0.004), with benefits primarily arising from tariff reductions.

Mavus et al. (2013) argue that Türkiye's participation in the agreement is linked to higher GDP growth for both the U.S. and the EU. As the partnership between the EU, the U.S., and Türkiye deepens, the economic benefits for all three parties will increase. While some scholars consider TTIP a valuable opportunity for Türkiye, others highlight the potential adverse effects of being excluded from the agreement.

Yeşilyurt and Paul (2013) present five strategies for Türkiye to alleviate the negative impacts of being excluded from TTIP. While they acknowledge that the first option—Türkiye becoming an EU member—is unlikely in the short term, they propose a second option: Türkiye and the EU working towards a mutual agreement. Third, they suggest that Türkiye could renegotiate its bilateral economic relationship with the U.S. to secure a new Free Trade Agreement. The authors also propose that, if Türkiye can persuade the EU to form agreements with these nations, it could negotiate alongside third-party countries. Lastly, they recommend that Türkiye be granted observer status in TTIP discussions at council meetings, providing Türkiye an opportunity to present its viewpoint.

Stroiman (2014) examines the potential impacts of the TTIP agreement on emerging economies and developing countries that are not part of the deal. The author concludes that the results will primarily depend on whether the agreement achieves its broad goals and desired outcomes. This will play a crucial role in determining whether the WTO continues to serve as the cornerstone of the global trade system and whether TTIP will offer provisions for third-party countries to join the agreement.

Alemno (2015) highlights that the Transatlantic Trade and Investment Partnership has the potential to transform the political and legal dynamics between the European Union and the U.S., creating a new model for global economic governance built on international regulatory collaboration. Additionally, Babarinde (2015) explored the potential impact of TTIP on EU-Africa and U.S.-Africa relations, focusing particularly on the EU's Economic Partnership Agreements (EPAs), the "Everything But Arms" (EBA) initiative, and the U.S. African Growth and Opportunity Act (AGOA). The study concludes with policy recommendations for African countries on how to engage with TTIP.

Boyraz (2015) forecasts that if Türkiye is excluded from TTIP, it will experience negative consequences, including a decline in trade balance, GDP, and employment, along with deteriorating bilateral relations with both the U.S. and the EU. Brakman et al. (2015) predict a 0.2% increase in overall trade flows for third countries. The authors argue that these changes in trade will not be driven by cost alterations but by the trade creation and trade diversion effects of TTIP. They further emphasize that income changes will play a central role in shaping trade shifts. Specifically, they anticipate that trade creation between the EU and the U.S. will lead to higher demand for African products. They suggest that Türkiye, along with Russia, will be among the next beneficiaries of TTIP, following African countries, due to its strong trade ties with the EU.

Additionally, the authors predict that countries with established trade relations with the U.S., such as Canada, Mexico, and Japan, will likely see a reduction in their total trade because of trade diversion, as U.S. trade shifts towards its domestic market.

Akman et al. (2015) contend that the impact of TTIP will be influenced by various factors. For example, the standards of preferential arrangements for both TTIP members and third-party countries are significant. The capacity of third countries to align with TTIP's harmonized standards is essential. To mitigate potential losses, third countries, including Türkiye, must adopt necessary reforms and adjustments in standards, legal frameworks, and other areas. To boost its economy, Türkiye must align itself with the new regulations. If TTIP is strategically implemented, Türkiye's participation would not only benefit the country economically but could also contribute to the strengthening of democratic governance within Türkiye.

Göral and Dartan (2016) stress the necessity of improving decision-making processes to address issues within the Customs Union that favor Türkiye. They point out that commercial visa restrictions are a significant barrier to the Customs Union and emphasize the need to resolve this issue in any future revisions. Furthermore, they argue that transportation barriers, which contradict the principles of a common market, should be addressed in potential updates. The study also highlights that Türkiye-EU relations involve not only economic and political aspects but also sociological factors, noting that prolonged negotiations have eroded trust in the EU among the Turkish population.

Raza et al. (2016) provide an alternative assessment of TTIP, proposing a new viewpoint that it is reasonable to expect benefits for both the U.S. and the EU from such an agreement. However, they stress the importance of examining whether employment and income distribution will be impacted across different countries and sectors. To explore this issue, they utilized a structural CGE model, diverging from the standard CGE models typically used. Their results suggest that the U.S. benefits more than the EU, with the distribution of gains among European nations being uneven. Additionally, the study finds that TTIP positively influences employment in both the U.S. and the EU, but has adverse effects on low-skilled workers.

De Ville and Gheyle (2019) highlight that TTIP has strengthened trade ties between the EU and third countries, while also sparking unprecedented demands for political involvement. They argue that the agreement has put the EU-Canada trade deal at risk, led to reforms in EU trade governance, and changed the EU's

stance on trade policy. The authors attribute these unintended outcomes to inflated expectations and a lack of understanding regarding the unique nature of TTIP, particularly its scope and the nature of its partnerships, when compared to other trade negotiations.

Öz et al. (2019) indicate that the prolonged economic losses following the global crisis led to the need for a broad trade agreement between the U.S. and the EU. The agreement planned under the Transatlantic Trade and Investment Partnership (TTIP) would be the largest bilateral trade agreement, covering a third of global trade, and it is expected to have significant effects not only on the participating countries but also on third countries. This study examines the impact of TTIP on Turkey's foreign trade in manufactured goods. Panel data analyses using structural gravity models indicate that TTIP would reduce Turkey's trade with third group countries, increase its trade with the EU, and boost intra-industry trade between the EU and the U.S.

Turanlı (2019) sought to assess the impact of the Transatlantic Trade and Investment Partnership (TTIP) on Türkiye's foreign trade, drawing from studies on the agreement between the U.S. and the EU. The study uses the World Bank's SMART model to evaluate the potential effects of TTIP on Türkiye's manufacturing sector imports and exports under various scenarios. The results suggest that Türkiye's participation or exclusion from the agreement would lead to distinct outcomes. Specifically, Türkiye would experience the greatest benefits if it were included in a Free Trade Agreement between the EU and the U.S., while being excluded would result in welfare losses due to trade diversion effects.

Hagemejer et al. (2021) analyzed the effects of trade liberalization through the Transatlantic Trade and Investment Partnership (TTIP) on the Polish economy. Employing a partial equilibrium model, they simulated the trade impacts of TTIP on Poland's trade with the U.S. at a granular product level. The results of these simulations reveal that although the trade diversion effects of TTIP are considerable, the overall welfare benefits of the agreement are relatively modest.

The study of Köse (2022) addresses Turkey's obligation to align with the EU's common trade policy under the Partnership Council Decision between Turkey and the EU. However, Turkey is unable to simultaneously negotiate free trade agreements (FTAs) with third countries that the EU has signed agreements with. This gap has led to delays in Turkey's alignment with the EU's FTAs and has negatively impacted Turkey's access to third-country markets. The study

examines the differences in FTA policies between Turkey and the EU and the challenges Turkey faces in achieving alignment.

In conclusion, based on the literature review, it is clear that the Transatlantic Trade and Investment Partnership will have significant effects on Türkiye's international trade. In this context, new policies should be developed to ensure the sustainability of Türkiye's international trade and prevent any harm to its existing trade relations. Furthermore, establishing new trade relationships and enhancing trade agreements is crucial for the expansion of international trade volume.

4. Conclusion and Discussion

Considering the significance of the EU and the U.S. as major trading partners, along with the binding commitments of the Türkiye-EU Customs Union, this study seeks to assess the potential impacts of TTIP on Türkiye's manufacturing sector exports and imports.

Unless Türkiye join the free trade agreement between the EU and the U.S., the current tariff rates on trade between these countries will remain unchanged. Any increase in Türkiye's exports to the U.S. would be driven solely by income growth resulting from TTIP. In this scenario, since no tariff reductions would apply to trade between Türkiye and the U.S., Türkiye would miss out on potential export growth due to the price effects of tariff cuts. This represents the worst-case scenario for Türkiye, as trade diversion would undermine its trade position. Since Türkiye is part of a Customs Union with the EU, U.S. goods entering any EU member state can be imported into Türkiye duty-free. While TTIP may boost exports from the U.S. and the EU due to income growth, the increased imports from the U.S. caused by trade diversion are likely to negate these positive effects for Türkiye.

This study shows that Türkiye's participation in TTIP or the signing of a Free Trade Agreement (FTA) with the U.S. would have a positive effect on Türkiye's trade. On the other hand, if Türkiye is excluded from the agreement, it would face a scenario similar to unilaterally removing tariffs against the U.S., which would negatively impact its trade. Consequently, Türkiye needs to formulate alternative policies to mitigate these adverse effects if TTIP is revived in the future. The most effective solution would be to amend the Customs Union agreement with the EU to include a provision that automatically incorporates Türkiye into future EU trade agreements. Therefore, a deeper understanding of the negotiating parties' priorities should inform Türkiye's trade strategies with the U.S. and the EU.

A limitation of this study is that it evaluates the impact of TTIP on Türkiye's foreign trade exclusively through the lens of tariff reductions, neglecting the potential effects of non-tariff barriers. It is anticipated that future studies will explore the implications of reducing non-tariff barriers under TTIP on the Turkish economy.

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CHAPTER XI

CIRCULAR ECONOMY APPROACHES AND PRACTICAL EXAMPLES IN THE REAL ESTATE SECTOR

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1. Introduction

Sustainability is a fundamental principle that integrates environmental protection, economic resilience, and social welfare to shape the economic and societal models of the future (WCED, 1987). Rapid industrialization, urbanization, and migration dynamics have heightened pressure on the environment, further emphasizing the importance of sustainable development. In this context, the circular economy model plays a critical role in achieving sustainability goals by abandoning the traditional "take-make-dispose" approach and prioritizing the efficient management and reuse of resources. Particularly in the post-Industrial Revolution era, factors such as urbanization, mass migration to cities, and economic growth objectives have led to the rapid depletion of natural resources and the degradation of ecosystems. Industrial activities and urbanization processes have increased greenhouse gas emissions, contributing to climate change and imposing significant pressure on environmental sustainability. Effectively implementing sustainability depends on the adoption of the circular economy approach (Ellen MacArthur Foundation, 2013).

The circular economy aims to optimize repair, recovery, and material cycles at micro, meso, and macro levels (Lyle, 1996), enabling more efficient and sustainable production and consumption systems. Rather than adhering to the traditional "take-make-dispose" model, the circular economy encourages the prolonged use of products and materials, preserving their value and facilitating their recovery (Ellen MacArthur Foundation, 2013). This model has been developed to ensure sustainable resource management, reduce waste, and enhance environmental sustainability (Geissdoerfer et al., 2017). In the circular economy, resources are reused, recycled, and reintegrated into biological cycles, thereby mitigating the negative environmental impacts of economic systems (Ghisellini et al., 2016). The circular economy model offers environmentally friendly solutions in key areas such as improving resource efficiency, optimizing waste management, and preserving ecosystems (Korhonen et al., 2018).

The real estate and construction sector exerts significant pressure on environmental sustainability due to its high energy consumption, extensive use of raw materials, and substantial waste production (Pomponi & Moncaster, 2017). Research indicates that the construction sector is responsible for 36% of the world's energy use and 39% of global carbon dioxide emissions (International Energy Agency, 2019). Additionally, the large volume of raw materials used for construction and the waste generated further amplify the sector's environmental impact (Giesekam et al., 2016).

The unique characteristics of the real estate market, such as the long-term utility of its products and their immovability, make the application of circular economy principles both a necessity and an opportunity. These factors emphasize the importance of circular design approaches that aim to extend the lifecycle of real estate products while preserving their value (Yalçiner, 2018). In the real estate and construction sectors, the removal or withdrawal of a product from the market is generally impractical or occurs over an extended period (Tursun, 2023). Evaluations of global material usage reveal that over 90% of materials consumed, particularly in the construction sector, are wasted. The increasing rate of material extraction has reduced global circularity from 9.1% in 2018 to 8.6% in 2020 and 7.2% in 2023 (Circle Economy, 2023). A substantial portion of materials produced worldwide follows a "take-make-dispose" pattern. Adopting circular economy principles in the construction sector offers numerous environmental and economic advantages, significantly contributing to the sustainable transformation of the industry. In rapidly urbanizing countries

such as Türkiye, embracing circular economy principles is crucial for achieving sustainable development goals.

In 2019, the European Commission introduced the European Green Deal to advance sustainable development goals and facilitate the transition to a global sustainable economy. Serving as a strategic framework, the Green Deal aims to align economic growth with environmental protection, establishing the EU as a frontrunner in combating climate change. Its primary objective is to achieve carbon neutrality in Europe by 2050, addressing the economic, social, and environmental aspects of green transformation. In 2020, the Circular Economy Action Plan was launched as part of the Green Deal to promote circular economy principles across all sectors, minimize waste during production and consumption, and ensure efficient resource use. The construction and building sectors were identified as key focus areas within this action plan.

Türkiye has also undertaken efforts in this direction. In 2021, the Ministry of Trade prepared the Green Deal Action Plan. Furthermore, the 2025-2027 Medium-Term Program, developed by the Presidential Strategy and Budget Directorate, includes the implementation of a National Circular Economy Action Plan. These initiatives reflect Türkiye's commitment to aligning with global sustainability and circular economy objectives.

The primary aim of this study is to explore the application areas of the circular economy concept within the real estate sector and to analyze its impacts on the industry. The main objectives include assessing the applicability of circular economy principles in the real estate sector, examining current projects that incorporate circular economy practices, and proposing recommendations for integrating these approaches into future projects. In this context, the study provides a theoretical framework on the role of the circular economy concept and its fundamental principles within the real estate sector. It highlights existing projects that align with circular economy principles in the industry and discusses the challenges encountered in transitioning to a circular economy. Furthermore, the study offers solutions to these challenges and examines global examples of circular economy practices relevant to Türkiye.

2. Principles of Circular Economy and Challenges in Transitioning to Circularity

The principles of the circular economy provide a vital roadmap for the efficient use of resources, waste reduction, and achieving environmental sustainability. Effective implementation of these principles not only supports

economic growth but also helps minimize environmental impacts. The core principles of the circular economy can be summarized as resource reuse, waste reduction and recycling, durability and flexible design, as well as resource efficiency and energy conservation.

Resource Reuse

The circular economy aims to minimize waste generation by maximizing the lifespan of products and materials. This approach primarily focuses on preserving natural resources and establishing a sustainable production-consumption cycle. Stahel (2016) emphasizes that the foundation of the circular economy lies in the processes of reuse, repair, and remanufacturing of materials and products. Reuse processes not only reduce dependence on new resources but also generate economic value.

Waste Reduction and Recycling

The circular economy model promotes the reutilization of waste within production processes as raw materials. This principle plays a critical role in reducing not only resource consumption but also carbon emissions associated with waste management. Moreover, effectively implementing recycling processes enables the closure of material loops, contributing significantly to environmental sustainability (Ghisellini et al., 2016).

Durability and Flexible Design

Design strategies that enhance the durability and flexibility of products hold a crucial position within the circular economy framework. These strategies aim to extend the lifespan of products, facilitating repair and reuse processes. Bocken et al. (2016) emphasize that durable design increases the value of products, providing both economic and environmental benefits to consumers. Additionally, flexible design enhances the adaptability of products to changing needs, enabling more efficient resource utilization.

Resource Efficiency and Energy Conservation

Efficient resource utilization and energy conservation are critical components of the circular economy's sustainability objectives. Geng & Doberstein (2008) state that circular economy policies reduce energy consumption while balancing economic growth with environmental sustainability. Through this approach, energy efficiency in production processes is improved, and dependency on fossil fuels is reduced. The circular economy is essential for the efficient use of resources, waste reduction, and the promotion of sustainable development. However, the transition process faces several challenges, which can be

categorized as financial and legal barriers, awareness and education deficits, technological limitations, and implementation difficulties.

Financial and legal regulations are among the most significant obstacles to adopting circular economy principles. Traditional economic models often prioritize short-term profitability, whereas the circular economy focuses on long-term sustainability. Achieving these goals requires a restructuring of financial systems. For instance, difficulties in securing funding for circular economy projects and inadequate legal frameworks hinder businesses from transitioning to this model (Geissdoerfer et al., 2017). Existing regulations often fail to sufficiently promote practices such as recycling, reuse, and resource efficiency, leading to inconsistencies (Kirchherr et al., 2018).

Another major challenge in transitioning to a circular economy is the lack of awareness among consumers, institutions, and policymakers. Insufficient understanding of circular economy concepts complicates the adoption of this model (Murray et al., 2017). Additionally, the existing workforce may lack the necessary knowledge and skills related to circular economy practices, further complicating the transition. The absence of comprehensive training and awareness programs limits the widespread adoption of circular economy models (Rizos et al., 2016).

The transition to a circular economy necessitates the development of new technologies and innovations. However, this transformation poses significant costs and challenges, particularly for small and medium-sized enterprises (SMEs). Insufficient technological infrastructure hampers the effective implementation of recycling processes and the adoption of sustainable production models (Bocken et al., 2016). Furthermore, the lack of technical solutions tailored to circular-specific business models complicates the practical application of these principles.

In conclusion, while the circular economy offers a transformative pathway toward sustainable development, overcoming these challenges is essential for ensuring its successful implementation across industries. Moreover, technical barriers to the realization of innovative business models specific to the circular economy also complicate this process (Lieder & Rashid, 2016).

3. The Relationship between Circular Economy and the Real Estate Sector

The circular economy plays a crucial role in enhancing the sustainability of the built environment and, consequently, the real estate sector by aiming to optimize

resource use and minimize waste generation. The built environment accounts for approximately one-third of global environmental impacts in terms of energy consumption, carbon emissions, and material usage (Pomponi & Moncaster, 2017). In this context, circular economy principles are applied across the design, construction, operation, and end-of-life stages of buildings and infrastructure to reduce environmental impacts. For instance, design strategies that promote the reuse of materials in buildings reduce the consumption of natural resources while significantly lowering the carbon footprint (Adams et al., 2017). Additionally, the circular economy supports innovative solutions such as adopting energy-efficient technologies and utilizing waste for energy production, contributing to the sustainable transformation of the built environment (Ghisellini et al., 2016). However, successfully implementing these transformations requires the adoption of circular economy approaches in design and construction processes, alongside active support from policymakers and industry stakeholders.

The circular economy offers significant economic gains and cost-saving advantages for the real estate sector. Practices focusing on reuse, recycling, and resource efficiency can substantially reduce construction and operational costs. For example, recovering and reusing materials during building demolition reduces the demand for raw materials, creating economic value (Pomponi & Moncaster, 2017). Moreover, the adoption of energy-efficient technologies lowers operational costs while providing long-term savings (Ghisellini et al., 2016).

The real estate sector is directly associated with significant waste generation and carbon emissions. Circular economy principles are essential as they aim to mitigate these impacts. The reuse and recycling of construction materials significantly reduce waste production. Additionally, the construction of energy-efficient buildings and the utilization of renewable energy sources contribute to environmental benefits by lowering carbon emissions (Adams et al., 2017). Moreover, adopting circular economy practices promotes the conservation of natural resources, thereby supporting ecological sustainability (Kibert, 2016).

The circular economy makes a substantial contribution to achieving Sustainable Development Goals (SDGs) in the real estate sector. In particular, SDG 11 (Sustainable Cities and Communities) and SDG 12 (Responsible Consumption and Production) are directly aligned with circular economy applications. Energy-efficient buildings and the use of sustainable materials help realize these goals (Ellen MacArthur Foundation, 2013). At the same time, circular economy practices enhance social sustainability by providing more livable and economically accessible housing for communities (UNEP, 2018). While offering significant potential to support the sustainability goals of the real

estate sector, circular economy practices such as reuse and recycling, sustainable material selection, waste management, modular building design, and energy-water efficiency are gaining prominence. One of the most effective methods of applying circular economy principles in the real estate sector is the reuse and recycling of materials following demolition. Specifically, the recovery of construction materials such as concrete, steel, and wood for reuse as building materials significantly reduces the consumption of natural resources (Pomponi & Moncaster, 2017). Such practices not only generate cost savings but also minimize the need for waste disposal (Adams et al., 2017).

The selection of sustainable building materials is of great importance in the application of circular economy principles. The use of recycled materials or biodegradable construction materials can reduce environmental impacts while extending the lifespan of buildings (Ghisellini et al., 2016). Materials such as wood, bamboo, and recycled metals stand out for their low carbon footprint and high durability (Kibert, 2016).

Effective management of waste generated during construction processes is a key component of circular economy principles. Waste management strategies involve the segregation and reuse of recyclable waste, which not only reduces environmental pollution but also enhances resource efficiency (Cheshire, 2016). Furthermore, technologies that enable the use of construction waste for energy production can contribute to the circular economy.

Modular building design represents an innovative approach that facilitates the flexible use of buildings throughout their lifecycle. These designs allow structures to be easily disassembled and reassembled, thereby reducing material waste and increasing reuse potential (Lacey et al., 2020). Modular systems also have the added advantage of shortening construction times and lowering costs.

In the context of the circular economy, energy and water efficiency are crucial elements that enhance environmental sustainability in the real estate sector. Energy-efficient building systems, the integration of renewable energy sources, and water reclamation techniques reduce energy and water consumption (Zhang et al., 2019). These practices not only lower operational costs but also minimize environmental impacts.

4. Practical Examples in the Real Estate Sector

4.1. De Ceuvel Project (Amsterdam, Netherlands)

The De Ceuvel project in Amsterdam is one of the most recognized examples of the application of circular economy principles worldwide. Located

on the Johan van Hasselt Canal along the IJ River in northern Amsterdam, De Ceuvel is an award-winning sustainable office space designed for creative and social initiatives on a former shipyard site (De Ceuvel, 2024). Once a polluted shipyard, the site was transformed into a sustainable campus that hosts offices, creative workspaces, and social events through an innovative approach. The structures within the project were constructed using second-hand boats and other recycled materials, promoting resource reuse and contributing to a reduction in the carbon footprint. Additionally, biological filtration systems were employed to treat wastewater. To ensure energy efficiency, renewable energy sources were integrated into the project, with solar panels providing the majority of the site's energy needs. The buildings were also designed to minimize energy consumption. Another innovative aspect of the project involved the use of plants for the remediation of contaminated soil (Figure 1).

Figure 1. De Ceuvel transformation project (Deceuvel 2024)

4.2. Park 20|20 (Haarlemmermeer, Netherlands)

Park 20|20, located in the Netherlands, represents the first urban development project based on the cradle-to-cradle concept. This innovative approach prioritizes reducing resource usage and enhancing human well-being. The project exemplifies the cradle-to-cradle principles through circular design, the use of non-toxic materials, and the incorporation of design for disassembly. Spanning an area of 11 hectares, the development includes an office tower, various high-density office buildings, a hotel, sports and childcare facilities, greenhouses, and 9 hectares of public open space. The project began in 2000 and was completed in 2013. The design aims to create a closed-loop system modeled on natural ecosystems for managing waste, energy, and water (Healthy Urbanism,

2024). Fully adhering to circular economy principles, the project incorporates innovative green technologies to utilize waste, solar, wind, geothermal, and gravitational energy for its energy supply while promoting biodiversity. Priority was given to the use of reusable or biodegradable materials wherever possible. Waste management practices included the collection, treatment, and reuse of greywater, while waste segregation efforts aimed to minimize the ecological footprint. The entire site is heated and cooled by a single sustainable energy plant, and solar panels installed on rooftops ensure access to renewable energy. The project also includes vegetable gardens for growing produce, with the goal of attracting butterflies and bees to the park to maintain biological balance. All buildings in Park 20|20 were designed for disassembly, ensuring that materials retain their value and can be reused. Design for disassembly is highlighted as a key element in realizing the circular economy. Materials used in the design were selected based on their ecological footprint, including reusable organic materials and technical materials suitable for upcycling (Park 20|20, 2024) (Figure 2).

Figure 2. Circular approaches in Park 20|20 (Park2020, 2024)

4.3. Hammarby Sjöstad (Stockholm, Sweden)

Hammarby Sjöstad is a district located within the municipal boundaries of Stockholm, Sweden. Designed by the Urban Planning and Environmental

Coordination Committee, the area spans approximately 150 hectares. Developed since the 1990s, the district serves as a successful example of alignment with circular economy principles. Once a run-down and unsafe industrial and residential area in the early 1990s, it has been transformed through a successful urban renewal project into a sustainable neighborhood (Urbangreenbluegrids, 2024).

In Hammarby Sjöstad, district heating relies on locally sourced energy. Approximately 34% of the heat is generated from treated wastewater, 47% comes from burning household waste, and 16% is supplied by biofuels. The residual cold water, after heat extraction from the treated wastewater, is repurposed for district cooling. This water is utilized in energy-consuming cooling systems, such as cold storage in supermarkets or air conditioning in offices. Various solutions have been developed to ensure energy supply within the project. Solar cells installed on buildings provide a portion of the electricity and hot water needs for shared building spaces. Additionally, fuel cells have been implemented to generate both electricity and heat. Biogas produced from the wastewater of local residents reduces electricity consumption in buildings by 20% (Urbangreenbluegrids, 2024) (Figure 3).

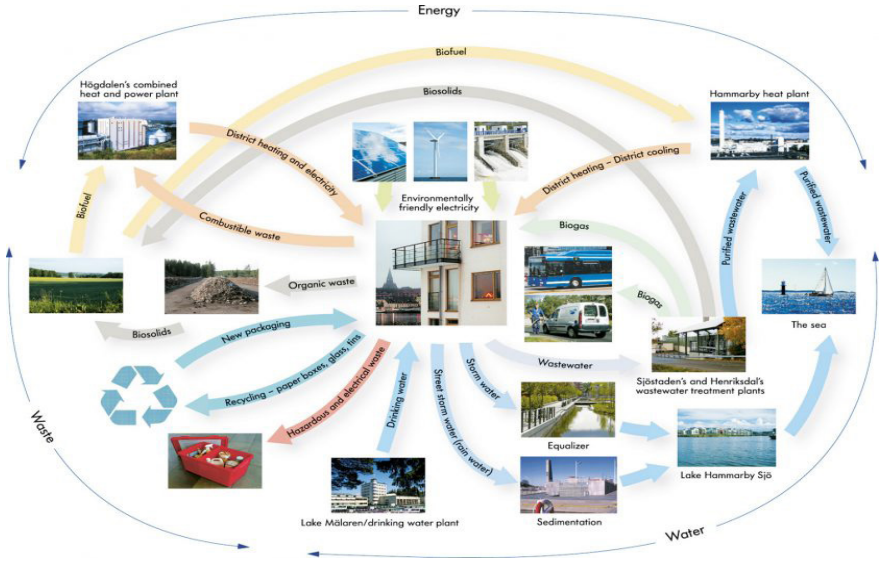

Figure 3. Hammarby Sjöstad transformation scheme

Systems have also been established in the area to utilize rainwater effectively, with certain buildings designed as green roofs that absorb and retain most of the rainwater. Additionally, undrained rainwater is directed to

treatment ponds for further use. Through these measures, the district has become a successful example of sustainable urban planning.

4.4. Urban Mining and Recycling Unit (UMAR) (NEST, Switzerland)

The Urban Mining and Recycling Unit (UMAR) is a module within the NEST research building, situated on the campus of the Swiss Federal Laboratories for Materials Science and Technology (Empa) in Dübendorf, Switzerland. This project follows the principle that all materials used in constructing a building should be entirely reusable, recyclable, or compostable. Emphasizing circular economy principles, the building prioritizes material reuse and repurposing alongside recycling.

Constructed using a modular building concept, the load-bearing structures and facades are largely made of untreated wood, which can be reused or composted after the building is dismantled. The facade also incorporates two types of metals—aluminum and copper—that can be cleanly separated and recycled by melting. Inside the unit, a wide range of mass-produced building products are used, which can be separated into their components and returned to their respective material cycles without generating waste or residue.

The technologies employed include mycorrhizal panels, innovative recycled bricks, repurposed insulation materials, rentable flooring systems, and multifunctional solar thermal systems (UMAR, 2024) (Figure 4).

Figure 4. View of the UMAR building (UMAR 2024)

4.5. Circle House (Aarhus, Denmark)

The Circle House project is the first social housing initiative built according to circular principles. Located in the Lisbjerg Bakke area of Aarhus,

Denmark, the project comprises 60 social housing units, planned for completion by 2020. In addition to providing housing, the project aims to contribute to the construction sector by enhancing knowledge and expertise in architectural and construction circularity. The buildings are designed to be disassembled and nearly all building components can be recycled with minimal loss of value (Circle House, 2018) (Figure 5).

Figure 5. Circle House Housing Example (Circle House, 2018)

5. Conclusion and Recommendations

Adopting circular economy approaches in the real estate sector plays a critical role in achieving environmental sustainability and economic efficiency goals. The examples discussed in this study illustrate how circular economy principles can be integrated into the construction industry and highlight the environmental, economic, and social benefits of this process. Practices such as reuse, recycling, and energy and water efficiency not only reduce the consumption of natural resources but also minimize environmental impacts, including carbon emissions and waste generation. Projects like Park 20|20, De Ceuvel, and Hammarby Sjöstad clearly demonstrate the transformative potential of the circular economy in the real estate sector.

However, challenges such as insufficient financial and legal frameworks, lack of awareness, and technological barriers remain significant obstacles to this transition. Addressing these barriers is essential to enable the implementation of circular economy principles. One critical step is the establishment of incentive

mechanisms and legal regulations that support circular economy practices. Tax reductions and grants that encourage recycling and reuse can serve as significant drivers in this field. Comprehensive training programs should be organized to raise awareness of circular economy principles among consumers, professionals, and policymakers. Sector-specific guidelines and manuals should be prepared to support businesses in their transformation processes.

Investment in technology for recycling, reuse, and innovative material design is necessary, along with supporting research to enhance the applicability of these technologies. Initiating pilot projects in Türkiye that align with circular economy principles and disseminating the lessons learned from these projects throughout the industry is vital. In rapidly urbanizing contexts, adopting circular economy approaches is strategically significant for achieving sustainable development. Furthermore, collaboration with international organizations and increasing knowledge sharing will contribute to the wider adoption of these principles.

Certain conclusions can be drawn from examples of circular economy applications in the built environment in Türkiye. For instance, as demonstrated in the De Ceuvel project, repurposing idle spaces, utilizing second-hand materials, and implementing biological treatment systems contribute significantly to circularity. Based on this example, urban regeneration projects could aim to transform abandoned industrial zones or contaminated lands, as well as older residential areas, into low-cost and sustainable social and business spaces.

The cradle-to-cradle design approach applied in Park 20|20 can be employed at the building scale or in macro-scale areas. Thus, constructing buildings in newly developed satellite towns using dismantlable and reusable materials is particularly important in optimizing waste management and supporting biodiversity. Inspired by the example of Hammarby Sjöstad, municipalities could establish regional energy supply systems to convert waste heat into energy. Additionally, rainwater collection and treatment systems could offer solutions for managing wastewater. To enhance housing accessibility, social housing projects constructed by TOKİ could also incorporate dismantlable and recyclable materials, contributing to environmental sustainability.

As part of this research, the circular economy system in the built environment has been examined, and relevant application examples have been evaluated. Future studies could focus on analyzing the economic and environmental impacts of circularity and transformation in greater detail, thereby contributing to the development of more effective strategies for the sector.

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CHAPTER XII

TURKEY'S INNOVATION COMPETITIVENESS: AN EVALUATION WITHIN THE FRAMEWORK OF THE EUROPEAN INNOVATION SCOREBOARD

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1. Introduction

Innovation is now considered one of the determining factors of global competition. Innovation, which underlies the sustainable success of an organization or a country, is important in terms of the continuous development and implementation of new ideas, products, processes and technologies. Innovation is also critical for economic growth, social development and human well-being. For developing countries like Turkey, the adoption and promotion of innovation plays a critical role in achieving national development goals. When Turkey's current status in the field of innovation is evaluated, it can be said that the country has taken important steps in recent years but still faces some challenges. Turkey is making efforts to strengthen its innovation ecosystem by increasing investments in science and technology, encouraging R&D activities and supporting innovative entrepreneurship. However, more efforts are needed in areas such as allocating more resources to increase the country's innovation capacity, strengthening the R&D infrastructure and restructuring the education system with an innovation focus. When evaluating Turkey's current status in the field of innovation, it is important to focus on a few key points. In this context, important factors to be taken into account when evaluating Turkey's

innovation performance include the ratio of R&D expenditures to national income, university-industry collaboration, and the effectiveness of policies supporting innovative entrepreneurship. These factors have strategic importance for strengthening Turkey's innovation ecosystem and achieving national development goals.

In this study, Turkey's current status in the field of innovation will be discussed in relation to Turkey's overall performance in the European Innovation Scoreboard. As is known, the European Innovation Scoreboard (EIS) is a tool used to assess the innovation capabilities and performances of European Union countries. This scoreboard evaluates the innovation capacities of countries using various indicators such as R&D expenditures, policies supporting innovative entrepreneurship, education level and scientific publications. When Turkey's overall status in the European Innovation Scoreboard is evaluated, it is seen that the country has made progress in some areas but still has more development potential. For example, a certain increase has been observed in Turkey's R&D expenditure rate and policies supporting innovative entrepreneurship. However, further improvements are needed in areas such as university-industry cooperation and scientific publications. In relation to the main starting point of this study, the assessment of Turkey's overall status in the European Innovation Scoreboard provides an important tool to determine the country's strengths and weaknesses in the field of innovation. This assessment can provide strategic guidance to strengthen Turkey's innovation ecosystem and achieve national development goals.

The European Innovation Scoreboard has been published annually since 2001 to monitor and benchmark the relative innovation performance of the EU27 Member States. Drawing on the general view that policies that encourage innovation are a key determinant of economic growth, the Lisbon Council in March 2000 called on the Member States of the European Union to increase innovation in response to globalisation and the challenges of the knowledge-driven economy. In this context, the EIS has become a starting point for the overall strategy to increase the competitiveness of the Union by providing a common measure of each country's performance. The EIS has become an important part of the overall strategy for the European Union to transform "the Union into the most competitive and dynamic knowledge-based economy in the world", particularly since the second half of the 1990s, when productivity growth between the US and the EU began to widen. In this context, the Council has called for a series of similar exercises in the areas of employment, enterprise and research, aiming to provide a modular set of scoreboards.

In 2001, EIS examined 17 indicators in 4 dimensions: human resources for innovation (5 indicators), creation of new knowledge (3 indicators), transfer and application of knowledge (3 indicators) and financing of innovation, outputs and markets (6 indicators). In the new methodology, the number of dimensions was increased to 7, namely human resources, finance and support, firm investments, connections and entrepreneurship, yields, innovators, economic activities, and these dimensions were grouped into 3 main blocks: facilitators, firm activities and outputs.

The indicators included in the European Innovation Scoreboard and the methodological changes to these indicators provide an important basis for assessing the innovation performance of countries and reshaping their strategies. When Turkey's current innovation situation is considered within the framework of these indicators, it requires a comprehensive analysis to assess the effectiveness and shortcomings of the policies adopted at the national level. In this context, the policy decisions that shape Turkey's innovation ecosystem and the historical development of these decisions can provide a better understanding of the country's strategic efforts to increase its innovation capacity. The following section will discuss the historical development of Turkey's innovation policies and important milestones in this area.

2. Turkey's Innovation Policies and Innovation Ecosystem Historical Perspective

Turkish innovation policy can be examined based on Turkey's science and technology policy documents and the institutional infrastructure developed in this field. One of the most important steps taken within this framework was the establishment of the Scientific and Technological Research Council of Turkey (TUBITAK) in 1963. While its initial mission was to support scientific research and young scientists, today it has a mission covering different areas from directing agricultural policies to supporting R&D projects with the dozens of units it hosts. The institution aims to develop, encourage, organize and coordinate research and development activities in positive sciences in Turkey according to the priorities of the country's development; to access and ensure access to existing scientific and technical information (TUBITAK, 2023).

It is seen that the second and third of the five-year plans, which Ergun Türkcan (2009) stated as the first tools that provided the emergence of science policy, also addressed the issues of technological development and technology transfer. In the Fourth Five-Year Development Plan, the concept of technology policy was used, and the integration of technology policy with industry,

employment and investment policies, and the development of new industrial sectors that can produce their own technology were brought to the fore.

The first policy document named "Turkish Science Policy 1983-2003" was published by the state in 1983. This document was prepared with the participation of approximately three hundred scientists from TÜBİTAK, Turkish Atomic Energy Agency, State Planning Organization, Higher Education Council, Universities, relevant Ministries and affiliated research organizations. The main goals in the document are to enrich Turkey's culture and increase the level of science, to increase the effectiveness of science and technology in the country's economic and social development, to mobilize science and research to increase defense power, to contribute science and research to the development of infrastructure and service sectors, to increase the health and welfare level of Turkish society and to protect the environment (Elmacı, 2015). The Turkish Science Policy 1983-2003, which was prepared with a study lasting more than two years and a twenty-year accumulation, unfortunately, was not put into practice. On the other hand, the document was used as a source on scientific issues, and even the World Bank benefited from the document (Özdaş, 1990: 33-34).

Another important milestone in Turkey's innovation journey was the establishment of the Supreme Board of Science and Technology (BTYK) in 1983. BTYK, which has undertaken tasks such as assisting the government in determining Turkey's long-term science and technology policy and determining research and development targets in science and technology-related fields, aims to reflect the continuous developments in science and technology in every area of life (BTYK, 1983). On the other hand, in the analysis study conducted by Apaydın (2015) on BTYK decisions; it was determined that decisions in the field of education and technology were more, decisions regarding research and science were partly less, and decisions regarding health were insufficient; according to the results of the conformity analysis, it was determined that decisions taken in the fields of education, technology, science and research were not within a systematic planning and were scattered over the years.

BTYK held its first meeting on October 9, 1989, 6 years after its establishment. In this meeting, decisions were made to increase the number of researchers by 30 people per 10,000 workforce, to increase the share of R&D expenditures in GDP to 2%, to establish Research-Planning Coordination (APK) offices in ministries, to establish technoparks, new research centers and a national metrology institute, to develop new organizational models to develop international relations, to establish an effective technical information

system, to update the industrial rights law and to put into effect the "Science and Technology Fund Establishment Law" prepared by TÜBİTAK (Yaşar, 1999).

In the second meeting of BTYK on February 3, 1993, Turkey's second policy document, the "Turkish Science and Technology Policy: 1993-2003", was accepted. This policy document is actually considered the fundamental document of Turkey's current science and technology policy. When we look at the purpose of the policy document in question, it is seen that it is set forth as establishing a national innovation system, ensuring that all institutions and other mechanisms of this system develop scientific and technological research and development activities in systematic harmony and transforming the results of all activities into providing economic and social benefits. According to Özdaş (2000), although this document is a repetition of the goals in the 1983-2003 Turkish Science Policy after ten years, it is of great importance in terms of reactivating a stalled process. The policy expressed in this document was developed and placed on a concrete basis with the "Science and Technology Breakthrough Project" within the scope of the basic structural change projects envisaged to be addressed primarily in the 7th Five-Year Development Period by the High Planning Council. This project, in turn, is a project of the 7th It constituted one of the main headings of the Five-Year Development Plan (TUBITAK, 1997).

The Turkish Science and Technology Policy documents of 1983-2003 and 1993-2003 provided a general perspective for the period until the mid-90s and formed the basis for many of the decisions of the BTYK. These studies are essentially of a character that adapts the goals of some major countries to Turkey; they are not based on a special "Technological Foresight" study (BTYK, 2000: 13).

The Science and Technology Breakthrough Project (1995) is a strategy document that aims to indicate on which concrete foundations Turkey's science and technology capabilities can be increased and shows the ways to make Turkey a country that is competent in science and technology production; has acquired the ability to rapidly transform the produced science and technology into economic and social benefit (innovation); and has established the necessary innovation system for this purpose. The main objective of this project prepared by TÜBİTAK was determined as the establishment of the "National Innovation System" (Çolak, 2014).

In 1997, the BTYK held its third meeting and published the report titled "Science and Technology Policy Agenda for 1996-1997". The report defines the

preparations needed to establish a national innovation system, which is one of the main themes of the national science and technology policy. This decision of the BTYK was shaped around the concept of innovation and touched upon the areas of research on regional innovation systems, creating awareness on the concept of innovation, disseminating technology management, innovation and quality management techniques, accelerating innovation development activities and finally supporting the innovation development activities of SMEs.

The decisions taken by BTYK in its meetings held in 1998 and 1999 were shaped in a way that would preserve the innovation policies and strategies that had been in place until then. While some of the decisions taken in these meetings were aimed at establishing the science and technology infrastructure, some were studies on the manpower and technology infrastructure and legislation aimed at establishing the national innovation system (BTYK, 2000: 71).

At the meeting of BTYK on December 13, 2000, it was decided to prepare the "National Science and Technology Policies: 2003-2023 Strategy Document" (BTYK, 2001). Based on the fact that the last science and technology policy study was conducted in 1993, TÜBİTAK was assigned to determine new science and technology policies for a 20-year period extending to 2023, the year when the 100th anniversary of the Republic of Turkey will be celebrated. It was envisaged that the study named "Vision 2023: Science and Technology Strategies", which was revealed as a result of the preparatory studies, would be supported by four sub-projects: the Technology Foresight Project, the National Technology Inventory Project, the Turkish Researchers Inventory Project and the National R&D Infrastructure Project (BTYK, 2001: 10). In the Vision 2023 Project, the importance of training the human resources that will be needed to have a say in the field of science and technology in the future was emphasized. For this purpose, it was emphasized that the determined education and employment policies should be implemented urgently and that Turkey should take its place in the strategic technology fields of the future. It is aimed to be among the top ten countries of the European Union in science, technology and innovation indicators in 2023 (TUBITAK, 2004).

The 8th Five-Year Development Plan (2001-2005) focuses on the needs for producing technological innovation. During the preparation of the plan, the Science and Technology Special Commission prepared a proposal document in the field of sustaining innovation policies. Special commissions established for information technologies, biotechnology, electronics industry and other fields also prepared reports within the same framework. It is possible to say

that all these reports constitute a building block on the innovation-related issues mentioned in the development plans. However, despite the 2000s, it is seen that the necessary structure for the National Innovation System in Turkey has not yet been formed and that this system has not yet been established with all its elements (BTYK, 2003:19).

At the 11th meeting of the BTYK held on March 10, 2005, the Science and Technology Policy Implementation Plan 2005-2010, which was prepared within the framework of the basic goals, principles and targets in the field of science and technology determined at the previous meeting, was accepted and TUBITAK was assigned to monitor and coordinate the implementation of the said plan (BTYK, 2005: 137). Despite all these developments, the view that Turkey still lacks a national innovation strategy and that this situation constitutes a negative factor for economic growth performance led to the acceptance of the International Science, Technology and Innovation Strategy Implementation Plan 2007-2010 at the 15th BTYK meeting held in March 2007. This plan is an important development in terms of Turkey closely following the developments in the rapidly changing world and putting innovation policies in writing in order not to fall behind the change (BTYK, 2007).

Following the decision taken by the OECD and TUBITAK authorities to review Turkey's National Innovation Policies at the end of 2007, the National Innovation Strategy 2008-2010 policy document was approved with an additional decision taken at the 15th BTYK meeting on March 7, 2007 (BTYK, 2007). The approved strategy document included the innovation concepts and processes in the "Oslo Guide" in line with the OECD criteria (BTYK, 2008). A certain momentum of success was achieved within this scope with the National Science and Technology Policy Implementation Plan 2005-2010 prepared regarding Turkey's 2023 goals in the field of science, technology and innovation. In order to ensure the sustainability of these policies, the National Science, Technology and Innovation Strategy 2011-2016 strategy document was accepted at the BTYK meeting in 2010.

In the 22nd BTYK meeting held in December 2010, it was decided to change the name of the Science, Technology and Innovation Policies Implementation Plan 2011-2016 to the National Science, Technology and Innovation Strategy (UBTYS) 2011-2016. The main feature that distinguishes the UBTYS 2011-2016 document from other strategy documents at the national level is that the document in question is the basic national science, technology and innovation (STY) strategy document that addresses issues specific to R&D and innovation

within a single strategic framework. In addition, with the UBTYS 2011-2016, Turkey's national science, technology and innovation vision is presented; the R&D and innovation system is addressed holistically. The establishment of the relationship between the UBTYS 2011-2016 document and other current strategy documents, primarily the 9th Development Plan, and its holistic understanding with national goals provide a more effective and holistic focus on national goals (BTYK, 2010).

In 2018, the decree law numbered 77, which was the establishment law of the Supreme Council of Science and Technology, was repealed and with a new regulation, the Science, Technology and Innovation Policies Board (BTYPK) was established instead of BTYK. Following its establishment, BTYPK was given the task of "Preparing the National Science, Technology and Innovation Strategy and Action Plan" and within the scope of this task, BTYPK initiated the Technology Area Prioritization Study. Since there was no science, technology and innovation strategy document covering the period after 2016 and in order to fill this gap, Turkey's Science, Technology and Innovation Policies and Strategies framework was started to be prepared. The difference of this new document from the previous term strategy document is that instead of sector priority, technologies are focused on. Within the body of BTYPK, in cooperation with the Ministry of Industry and Technology and with the technical support of TÜBİTAK, Technology Roadmaps were prepared in the fields of Artificial Intelligence, Advanced Materials, Big Data and Cloud Computing, Engine Technologies, Cyber Security, and Biotechnological Medicine. Technology areas were selected from the common technology areas with the highest impact potential included in the BTYPK Technology Prioritization Study, 2023 Industrial and Technology Strategy and 11th Development Plan. In addition to prioritizing the prepared technology roadmaps in R&D and innovation supports, it is aimed to guide universities, research organizations, private sector, entrepreneurs, investors and researchers who continue their work in the relevant field (TÜBİTAK, 2023).

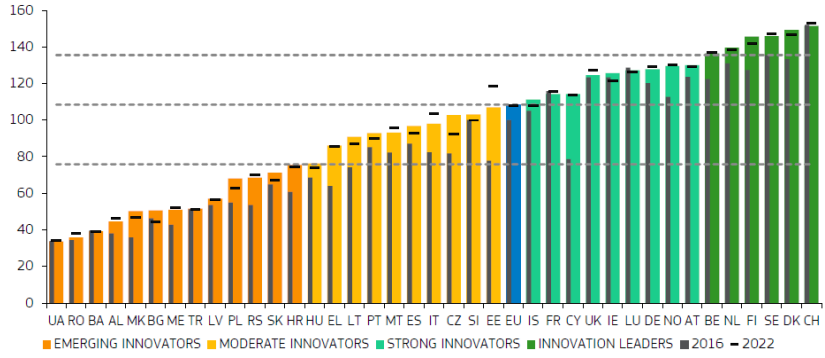
Since 2013, TÜBİTAK has been preparing a "TÜBİTAK Priority R&D and Innovation Topics" study every 2 years. The TÜBİTAK 2024-2025 Priority R&D and Innovation Topics study, which includes current priority topics, includes a total of 482 priority topics targeting 252 critical products/technologies in 4 main sections with a focus on "green" and "digital" dual transformation, for an ecosystem that is "Environmentally Sensitive, Disaster Resistant, and Generates High Added Value Based on Advanced Technology" in line with the national vision of the 12th Development Plan (TÜBİTAK, 2024).

In light of all these developments, Turkey's innovation performance can be directly associated with the country's economic situation and investments. R&D expenditures and investments in technology-intensive sectors in particular play a critical role in determining innovation potential. The increase in R&D expenditures and technology investments in Turkey in recent years has positively affected innovation performance. Turkey's innovation policies and strategies play an important role in determining the country's innovation potential and planning its future steps. Analyses that will be conducted by bringing these factors together are of critical importance in understanding Turkey's innovation performance and determining strategies for development. In the following section of the study, Turkey's innovation performance will be evaluated comparatively with European countries using the European Innovation Scoreboard data.

3. An Assessment of Turkey's Innovation Performance

As is known, the Annual European Innovation Scoreboard (EIS) is a document that provides a comparative assessment of the research and innovation performances of EU Member States and selected third countries, and the relative strengths and weaknesses of their research and innovation systems; and helps countries assess the areas where they need to focus their efforts to increase their innovation performance.

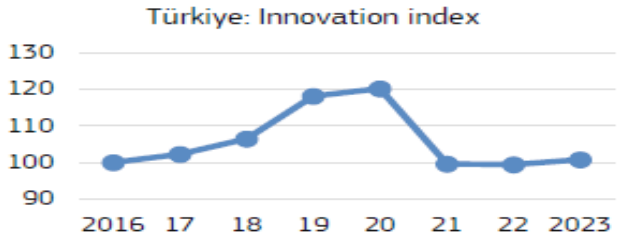
According to EIS 2023 Report with performance at 47.6% of the EU average, Türkiye is classified as an Emerging Innovator. The level of performance falls short of the Emerging Innovators' average. The rate of performance growth is less than that of the EU (8.5%-points). The nation's performance is falling short of that of the EU (EIS, 2023).



Source: EIS,2023

Figure 1. Performance groups: innovation performance per dimension

In figure 1, all the performance scores are compared to the EU in 2016. The performance of the countries in 2023 is displayed in colored columns, which use the most recent data for 32 indicators. With the most recent statistics available, the performance in 2022 is shown by the horizontal hyphens. 2016 performance of countries is displayed in grey columns. The graph displays performance scores in relation to the EU in 2016, and the dashed lines indicate the threshold values between the performance groups. Using the most recent 2023 data, the threshold values of 70%, 100%, and 125% have been adjusted upward by multiplying by 1.085 to reflect the performance increase of the EU between 2016 and 2023.



Kaynak: EIS, 2023

Figure2. Türkiye's Innovation Performance (2016-2023)

Figure 2 above compares Türkiye's performance in 2016 with the evolution of innovation performance throughout time. Between 2016 and 2020, innovation performance improved; in 2019, it accelerated; in 2021, it sharply fell; and in 2022 and 2023, it remained essentially unchanged. Overall performance changed in a slightly good way from 2016 and 2023. Reduced performance on the indicators utilizing data from the innovation survey, businesses offering ICT training, HRST job-to-job mobility, PCT patent and design applications, and environment-related technologies are the main causes of the significant fall in innovation performance in 2021 (EIS, 2021).

Türkiye's economy is developing more quickly despite having a lower per capita income. The manufacturing sector accounts for a larger portion of the economy, and SMEs and large firms generate a larger portion of turnover. While top R&D spenders and buyer sophistication contribute negatively to the innovation climate, enterprise births, entrepreneurial activity, and net FDI inflows all contribute positively. Türkiye has greater proportions of non-innovators who are actively engaged in innovation, non-innovators who have the

capacity to innovate, and non-innovators who lack the motivation to innovate. In terms of stimulating research and innovation, government procurement and entrepreneurial training fall short of the EU average. Türkiye's reduction in greenhouse gas emissions is below average, according to indicators connected to climate change (EIS, 2023).

4. Turkey's Future Innovation Directions

Turkey's future goals to increase its innovation capacity require a comprehensive strategic approach that is in line with global trends. In this context, policies, sector-focused strategies and international collaborations should be prioritized in order to develop the country's innovative capacity and increase its international competitiveness.

Firstly, prioritizing R&D investments plays a critical role in strengthening the innovation ecosystem and ensuring sustainable development. Turkey should encourage public and private sector cooperation and strengthen the knowledge production and technology transfer capacities of universities in order to increase the effectiveness of the national innovation system. In this context, investments should be increased, especially in strategic areas such as digital transformation, green energy technologies and biotechnological innovation.

In addition, supporting innovative entrepreneurship and spreading entrepreneurial culture is another important step. Turkey's innovation policies need to create incentive mechanisms that will increase the participation of SMEs in innovation activities, diversify venture capital funds, and expand infrastructures such as incubation centers that support technology-based initiatives. Such policies will prepare the necessary ground for new ideas to become commercial and compete in international markets.

International collaborations also play an important role in Turkey's future innovation orientations. In order to sustain the performance improvements observed in the European Innovation Scoreboard, Turkey needs to establish stronger collaborations with the European Union. In addition, increasing scientific and technological partnerships with Asia, America and other regions will facilitate integration into global innovation networks. International collaborations will directly contribute to the country's innovative capacity by accelerating knowledge and technology transfer.

Finally, Turkey's future innovation policies should be shaped by an approach that focuses on environmental sustainability and targets social

development. As part of green transformation policies, investing in energy efficiency, environmentally friendly production processes and climate-friendly technologies has strategic importance in terms of both economic growth and environmental protection. In order for Turkey's strategic goals to be successfully implemented, active participation of all stakeholders in the national innovation ecosystem, efficient use of resources and a long-term vision are required. In this context, every step Turkey takes to increase its innovation capacity will positively affect the country's competitiveness in the international arena and its social welfare.

5. Conclusion

This study aimed to evaluate Turkey's innovation performance within the framework of the European Innovation Scoreboard and reveal the country's strengths and weaknesses. Although Turkey has taken important steps in recent years to increase its innovation capacity, it still faces fundamental challenges such as insufficient R&D expenditures, limited university-industry collaboration, and lack of desired levels of innovative entrepreneurship. In this context, a comprehensive strategic approach needs to be adopted to develop innovation capacity, increase international competitiveness, and achieve sustainable development goals.

Strengthening Turkey's innovation ecosystem will be possible through more efficient use of resources and increased investments in strategic sectors. The study emphasized that focus should be placed on areas such as digital transformation, green energy technologies and biotechnology. Investments in these areas will contribute not only to Turkey's economic growth but also to environmental sustainability and social development.

In addition, Turkey's expansion of international collaborations and integration into global innovation networks will accelerate knowledge and technology transfer and positively affect innovation performance. Strengthening relations with the European Union and increasing other regional partnerships will add strategic depth to Turkey's innovation policies.

As a result, the steps Turkey will take to increase its innovation capacity will not only achieve national development goals, but will also provide the country with a strategic advantage by increasing its global competitiveness. In this context, it is critical for policymakers to adopt a long-term, holistic and sustainable innovation strategy for Turkey's future success.

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CHAPTER XIII

GLOBALIZATION AND FOOD IMPORTS TO TÜRKİYE: A CAUSALITY ANALYSIS (1996-2020)

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1. Introduction

The increase in mobility of ideas, people, capital and goods and services is defined by the concept of globalization. Although the concept is multidimensional since it also includes further integration into a web of global political and social relations and a common culture, its economic reflections are generally defined in an increased mobility of goods, services and capital. Globalization has been seen as a reason of the increasing volume of world trade since the late 1970s. While improvements in the production technology increased the amount of goods produced through gains in productivity, innovations in communication, such as utilization of electronic means of trade, facilitated rapid distribution of market and product knowledge, and advances in transportation technologies decreased the delivery time for the traded goods. Policies for further liberalization of international trade also contributed to the increase of types and amount of goods and services traded between borders.

Increasing international trade also caused an increase in the global wealth in general. People now have access to a diversified range of goods, including food products from different parts of the world. Food is essential for healthy physical development of human beings as well as economic development, in the sense that nutrition contributes to increasing productivity of the human capital. In general, food consumption has been increasing globally, thanks to a general increase in the global wealth. Diffusion of a global consumption culture through the Internet also changed tastes and lifestyles around the world and contributed

to the increasing volume of trade in food products. This situation seems to be a continuing trend in the future as it was reported that the most of the growth in the global GDP will be generated by developing countries which will host most of the major urban areas in the world, with an increase in the demand for processed goods and developed country diets (Ataseven et al., 2020).

Trade in food products not only includes trade in primary products but also intra-industry trade in processed intermediaries. Food industry, including farms, is producers of the food products as well as users of raw and intermediary food products as consumers (Josling, 2002). Although the liberalization of world trade in food and agricultural products is still an active policy topic, globalization opens up local markets to a harsh competition from elsewhere around the world, creating survival problems for small- and middle-sized producers. Providing enough food for the populations through national production systems is also important, both economically and politically, since self-sufficiency in food production is also a symbol of sovereignty and political efficiency. It has also been argued that liberalization of trade in agricultural and food products unilaterally favors the developed and causes food crises in especially developing countries through increasing prices (Biber, 2011; 2012). Thus whether globalization caused more dependence on food imports and increased competitive pressures faced by local producers especially in developing countries remains an active discussion. In addition, global warming is also pressurizing the food production systems. With the onset of Covid-19 pandemic and disruptions in global supply chains food security and dependence on food imports have become more important than ever (Kerr, 2020).

Food security and self-sufficiency is an important political issue in Türkiye. The ongoing debate in the last a few decades is that the country has been losing its traditional comparative advantage in agriculture and becoming more dependent on imported food products. It has been argued that global dynamics and unfavorable (erroneous) policies have resulted in an agricultural sector which is incapacitated in meeting with the national needs (Tokatlıoğlu et al., 2018). In addition to protectionist policies observed by the developed nations, more liberalization in primary and food trade pushes the state out of the agricultural sector and a global reorganization of the agricultural sector resulted in new production models that pushes traditional products out of the food industry (Çelik, 2019). It has also been argued that this new food regime, which disrupted traditional rural production systems and established a market controlled by multinational enterprises through new production models, has

made Türkiye dependent on food imports since the 1990s (Çaşkurlu, 2012, Aydın and Aydın, 2018). Not only the dependence on direct imports but also the dependence on imported inputs has also been increasing. Alkın (2020) reports that while dependence on imported inputs in the Turkish agricultural sector increased slightly in the period 2005-2014, the dependence on imported inputs in the food sector was much higher during the same period.

Türkiye is one of the major food importers in the world, both in terms of monetary value and total calories (MacDonald et al., 2015). The country has an increasing population, thus an increasing food demand. Türkiye is also a major exporter of food to Middle Eastern markets and needs intermediate goods to produce processed agrifood products; as empirically shown by Şimşek (2017) food exports is a Granger cause of food imports in Türkiye in the period 1980-2015, during when globalization was accelerating. Türkiye has always been identified herself as a self-sufficient agricultural country; however, the dependence of the country on food imports has been increasing in the past decade (Table 1) and this situation brings about the danger of crowding-out of the rural producers from agricultural production and a food security crisis due to decreasing domestic supply (Ataseven et al., 2020).

Table 1. Türkiye's Total Agrifood Trade Values
(Chapters1-24 of Harmonized System, thousand US Dollars)

	2010	2019	Change (2010-2019)	Annual Change (%)
Total Exports	12040472	17946464	5905992	4.5
Total Imports	7682821	12652049	4969228	5.7
Net Trade Balance	4352657	5294415	936764	2.2
Coverage Ratio (%)	157	142		

Source: General Directorate of Development Agencies, 2021

Increasing food imports has been a hot topic in the Turkish media in recent years. It has been discussed that agricultural policies implemented in parallel with liberalization of trade in agricultural and food products and entry of multinationals to the national market, as a result of globalization, have been the major causes of decline in Turkish agricultural sector and loss of food self-sufficiency. Upon this background, it is important to analyze whether globalization, with its different dimensions, is effective in food imports to Türkiye. Yet, to the best of the author's knowledge, there are a few studies focusing directly on the relationship

between globalization and food imports to Türkiye. Thus, this study aims to investigate the relationship between globalization and food imports to Türkiye for the period 1996-2020. In particular, the following prepositions are tested in this study:

Preposition 1: Policy-led globalization is a Granger cause of food imports to Türkiye.

Preposition 2: Political globalization is a Granger cause of food imports to Türkiye.

Preposition 3: Financial globalization is a Granger cause of food imports to Türkiye.

Preposition 4: Cultural globalization is a Granger cause of food imports to Türkiye.

Preposition 5: Globalization is a Granger cause of food imports to Türkiye.

The study is organized as follows: A review of the relevant literature is provided in the next chapter. The data and the model are given in the third section. Empirical analysis is presented in the fourth section. Results of the study and some policy recommendations are given in the last and the concluding section.

2. Literature Review

The related literature includes various studies on the effects of various aspects of globalization on food trade, food security, domestic production systems, and public health and so on.

There are different dimensions of globalization of food and agricultural sector. Von Braun and Diaz-Bonilla (2008) argues that an agrifood system can be called as "globalized" when there is an increase in internationally traded foods, either in the form of raw materials or processed goods, the production knowledge becomes an international good, the trade is institutionalized with supranational bodies, there are similarities in demand (tastes) and supply (production for these tastes) and when the externalities resulting from agrifood systems have global consequences. In this respect, globalization creates direct benefits for the food and agriculture sector in the form of trade gains from increased exports in products of comparative advantage and indirect gains as the beneficial trade in other sectors creates an indirect demand for food due to increased incomes (Pingali, 2007). Food trade has also been increasing with the search for new markets by multinational enterprises. In addition to increasing incomes in the developing countries, food imports have also been increasing as

a result of increasing demand for non-traditional diets due to such reasons as increasing urbanization, changing consumption culture and changing patterns of work (Pingali, 2007, von Braun and Diaz-Bonilla, 2008).

Food security has become an important issue because of increasing pressures on food production systems due to growing populations and global warming. Increasing imports may increase food security in countries where factors such as arable land is scarce, however, opening to global competition may also drive small local producers out of the domestic markets. Feeding populations has become an important policy issue especially in developing countries where there are increasing young population with an increasing requirement for calories. In this context, countries that do not have enough domestic supply import food and agricultural products.

All the pressures put forward by global warming and global population growth are reflected by a food crisis in the second half of 2000s, which showed itself with globally-increasing food prices. Not only may the products of direct imports but also imports of intermediate products drive food price inflation up. Başkaya et al. (2008) shows that, in addition to changes in temperatures, the effects of international terms of trade can increase prices of processed food products through the prices of intermediate processed food products, which is an important finding for food security in trade-dependent countries. Consequences of the global economic crises may also increase food insecurity as unemployment, inflation and depreciation of national currencies may increase risk of food insecurity (Eştürk et al., 2010). Gürlük and Turan (2008) lists a trending, strong growth in the developing countries, slow increase in agricultural supply, low competitiveness of the traditional small enterprises, increasing energy prices, an increasing demand for biofuels which decrease production for nutritional purposes and highly-protectionist policies and subsidies by the developed policies as some of the reasons behind the food crisis in the 2000s. Citing unilateral liberalization that favors the more structured markets of the developed countries, Biber (2012) emphasizes increase in input prices, especially in oil prices, as an important driver of agricultural prices although the production area and productivity are increasing, and reports that the import dependency of the developing nations in the global agricultural trade have been increasing from the 1990s onwards. Although increasing international trade in food may be beneficial in terms of food security in the sense that it connects countries with food surpluses to those with shortages, the need for regulation of global agricultural trade and more equitable liberalization still exists to be important unsolved problems (Moon et al.,2011).

Global trade in food is increasing as shown by the increasing volume of traded calories and intensifying trade linkages between more and more nations (D'Odorico et al., 2014). In a global market with increasing prices, being a net food importer may increase hunger while exporters may not be affected (Mary, 2019). Increasing international trade in food and agricultural products may also increase food insecurity. Excess supply and decreasing international terms of trade resulting from the subsidized production in the developed countries increase the imports of the developing countries, leaving the low-productivity producers in these countries in a difficult situation and endangering their food security (Yılmaz, 2008). Small producers in globalizing markets can hardly compete with larger producers and multinationals who directly invest in food production in their countries. Although globalization gives small-scale producers an opportunity to tap into a larger export market, their access to export markets is problematic due to problems in accessing credits and a lack of technical know-how and other necessary inputs (Harrison and McMillan, 2007). An important comparative advantage arises with the increasing demand from the developed markets for the niche products such as organic products, however, entry into such markets may be hard for small-scale producers due to high entry costs and this situation may result in further "corporatization" of the food market (Raynolds, 2004). This situation not only increase domestic prices by adding different layers of agents to the food and agricultural markets but also jeopardizes domestic food security by channelling resources to more profitable niche markets and decreasing the production of traditional livelihood products. On the contrast, Uğur and Özocaklı (2019) report that the increase of the ratio of food imports to merchandise imports increase food security in especially food insecure countries over the period 2000-2015, using quintile regression in a panel of 50 countries. Fusco et al. (2020) also report a positive effect of trade openness on food security within the European Union. Austin et al. (2012) also argue that agricultural exports to high-income countries can increase the risk of food insecurity in the developing nations and that globalized trade may not be a solution to the global food security problem. Yet, comparative advantages in food and agricultural trade may be lost even in economic integrations as the most effective producers become dominant in time in the markets of less competitive or smaller members (Bojnec and Fertö, 2009). In contrast, when trading to developed neighbors becomes less costly within geographically-close integration such as NAFTA, agricultural and food sector jobs in the more developed members may be lost due to increased imports from low-cost

neighbours (Kennedy and Rosson, 2002). In parallel, Gozgor (2019) reports that volatilities of agricultural and food commodities prices have a negative influence on the integration levels of a panel of 133 countries, particularly in middle- and high-income countries, over the period 1970-2012. Moreover, asymmetrical linkages to the integration movements and relying only on the competitiveness of the low agricultural wages may be detrimental as more effective developed members may increase food insecurity in the relatively less-developed members (Otero, 2011).

While globalization increases food security increased accessibility to an increased variety of food products may have adverse health effects. Popkin (2006) argues that decrease in the physical energy required in the work due to technological changes and to changing structure of the economic activity, increase in the consumption of cheaper edible vegetable oils, increasing ratio of supermarkets in the food distribution systems and increasing effects of the mass media are some reasons behind the changing diets in the developing nations. Reductions in barriers to trade and investment may as well be effective in increased food availability through increasing imports and due to increasing domestic production as a result of expansion of domestic processed food markets (Thow and Hawkes, 2009). Not only the transformation to this "neoliberal diet" increases the risk of obesity and non-communicable diseases as incomes rise, but it also increases dependency to food imports as tastes change towards imported products and processed products by multinationals (Otero et al., 2015). Nutrition-based health problems caused by globalization in the form of liberalized capital flows, trade liberalization and increased socio-cultural interaction may also differ for different sub-groups in the population (Cuevas Garcia-Dorado et al., 2019). Internet may have played an important, but yet-to-be discovered role here, by accelerating global socio-cultural integration, as well as by facilitating faster and more effective trade in agrifood products (Wheatley and Roe, 2008).

Globalization may also affect food prices through exchange rates. Erdem et al. (2010) reports a reduction in agricultural imports to Türkiye associated with exchange rate uncertainty and an increase in imports associated with an increase in incomes. Erdal et al. (2012) report a negative unilateral causality running from real exchange rates to agricultural imports in Türkiye. Tay Bayramoğlu and Koç Yurtkur (2016) report that while exchange rates significantly affect food prices in the short run, oil and input prices, and terms of trade, as well as exchange rates, are important determinants in the long run. Barbaros et al. (2019) report bilateral causality between food prices and food exports; they argue that

food exports rather than imports are the reason for increasing inflation, as food exports increase domestic food prices. Hasan and Masih (2018) also argue that reducing imports may be an important measure in preventing food price inflation caused by pass-through effect.

3. Methodology and Data

3.1 Data

There are different globalization indexes using different indicators of economic activity as variables have been developed to measure globalization (Huh and Park, 2019). We use the KOF (Swiss Economic Institution-Konjunkturforschungsstelle) globalization index developed by Dreher (2006), which is the most popular globalization index, in this study as a measure of globalization. KOF Globalization Index is a flexible tool since it provides information on all dimensions of globalization (economic, trade, financial, cultural, informational, political and interpersonal) and aggregates all these to a general globalization index value for each country. We use the version of KOF index revised by Gygli et al. (2019) which distinguishes between de facto and de jure globalization. While de facto globalization refers to the actual flows and changes in these flows, de jure globalization refers to the institutional set up that enables these flows; and these two types of globalization may have different economic outcomes (Gygli et al., 2019). At least three variables are used to construct the index values for each sub-dimension of globalization. Variables included in the index and how they are calculated can be seen in the website of KOF.

We use the share of agricultural and food imports within all imports to Türkiye (AGI) as the variable representing agrifood imports to Türkiye. The data is taken from the database of TÜİK (Turkish Statistical Institution) and were classified according to Broad Economic Categories (BEC) organized as to special trade system. First the totals of import values of "unprocessed food and beverages", "processed food and beverages", "unprocessed materials of food and beverages", and "processed materials of food and beverages", calculated in US Dollars, were taken for each year for the period 1996-2020. Then, ratios of the total agrifood import values to the corresponding year's current import value were taken to calculate AGI.

Trade liberalization is one of the channels through which the effects of globalization are reflected on the domestic agrifood systems, as it is indicated

in the literature. It is the policy side, rather than the flows, is of interest here, because of two reasons: First, the discussion in Türkiye revolves around inefficiency of the agricultural policies in sustaining food self-sufficiency. Thus, it is important to investigate whether trade globalization facilitated by trade policy effects Turkish agricultural imports. Second, since the de facto index is constructed by the ratios of exports and imports to GDP, the use of de facto index may result in autocorrelation problem since we use AGI as the dependent variable. Thus, we use KOF Trade Globalization de jure (KOFTr) index to capture the effects of policy-led globalization. Financial globalization index (KOFFi) and political globalization index (KOFPo) are used in aggregate form, as well as cultural globalization index (KOFCu). KOFFi includes information on flows of capital and may provide clues on whether capital flows, debt, and freedom of investing or international earnings have effects on agrifood imports. All variables are normalized by taking natural logarithms.

3.2. Methodology

We use bootstrap symmetrical and asymmetrical causality tests developed by Hacker and Hatemi-J (2006) and Hatemi-J (2012) to analyze causality relations between globalization indexes and agricultural imports to Türkiye. An important property of this test is that VAR models can be constructed by using level values of the series involved even if the series are not stationary or are not stationary of the same level (Erdas, 2019: 383). Hacker-Hatemi-J test is based on Toda-Yamamoto (1995) procedure. Critical values of the test are calculated by bootstrap testing based on Monte Carlo simulation in order to avoid getting errors that are not distributed normally and, thus, having more reliable results. In this approach, causality between two variables is tested by using the following lagged vector autoregressive (VAR) model (Hacker and Hatemi-J, 2012):

$$y_t = \alpha + A_1 y_{t-1} + \cdots + A_p y_{p-1} + u_t \qquad 1$$

Where y_t, is the 2x1 dimensional variable vector while A is the parameter vector. VAR model specified in Equation (1) can be rewritten as below in order to calculate the Wald statistic to be used in testing the null hypothesis of no Granger causality between the series:

$$Y = DZ + \delta \quad (2)$$

where;

$$Y = (y_1^+, y_2^+, y_3^+, \dots, y_t^+) \quad (3)$$

$$D = (\alpha, A_1, A_2, A_3, \dots, A_p) \quad (4)$$

$$Z = (Z_0, Z_1, Z_2, \dots, Z_{T-1}) \quad (5)$$

$$Z_t = \begin{bmatrix} 1 \\ y_t^+ \\ y_{t-1}^+ \\ . \\ . \\ y_{t-p+1}^+ \end{bmatrix} \quad (6)$$

$$\delta = (u_1^t, u_2^t, u_3^t, \dots, u_T^t) \quad (7)$$

Null hypothesis of no Granger causality between the variables can be tested using the Wald statistics obtained by Equation (8) below:

$$W = (C\beta)'[C((Z'Z)^{-1} \otimes S_u)C']^{-1}(C\beta) \quad (8)$$

where " $\otimes$ " represents Kronecker product of the two matrices and "C" represents indicator function. "β" is defined as $\beta = vec(D)$ where "vec" is the column aggregation operator. "S_u" is the variance-covariance matrix calculated for the unrestricted VAR model (Hacker and Hatemi-J, 2012).

In classical causality tests, it is tested whether a variable provides useful information in the future prediction of another variable. However, when examining the existence of a causality relationship between the variables, the causality effects of the positive shocks are considered to be the same as those of the negative shocks. However, this assumption may not hold since the responses of economic agents to positive and negative shocks may vary. Causality analyzes that take these different responses to different types of shocks into account are asymmetric causality analyzes.

It was argued by Granger and Yoon (2002) for the first time that the relationship between positive and negative shocks of some series may be different from the relationship between the original states of the same series. Granger and Yoon (2002) stated that the economic series are cointegrated when they react to shocks together, and that they cannot be cointegrated when they

react separately. Arguing that the series can respond to a certain type of shock together, they decomposed the cumulative positive and negative changes in the data and examined the long-run relationship between these negative and positive components (Yılancı and Bozoklu, 2014). Thus, Hatemi-J (2012) took Hacker and Hatemi-J (2006) causality test one step further and investigated the relationship between the positive and negative components of the variables. As in the cointegration analysis, Hatemi-J (2012) aimed to find the hidden relationship that would allow developing predictions for the future (Yılancı and Bozoklu, 2014).

Assuming that we test the causality between two series as y_{1t} and y_{2t} for the Hatemi-J (2012) test, then (Yılancı and Bozoklu, 2014);

$$y_{1t} = y_{1t-1} + \varepsilon_{1t} = y_{1,0} + \sum_{i=1}^{t} \varepsilon_{1i} \quad 9$$

$$y_{2t} = y_{2t-1} + \varepsilon_{2t} = y_{2,0} + \sum_{i=1}^{t} \varepsilon_{2i} \quad 10$$

where $y_{1,0}$ and $y_{2,0}$ in Equations 9 and 10 represent the initial values. Positive and negative shocks in the series then can be defined as in Equations 11 and 12:

$$\varepsilon_{1i} = \varepsilon_{1i}^{+} + \varepsilon_{1i}^{-} \quad 11$$

$$\varepsilon_{2i} = \varepsilon_{2i}^{+} + \varepsilon_{2i}^{-} \quad 12$$

where;

$$\varepsilon_{1i}^{+} = \max(\varepsilon_{1i}, 0) \quad \varepsilon_{1i}^{-} = \min(\varepsilon_{1i}, 0) \quad \varepsilon_{2i}^{+} = \max(\varepsilon_{2i}, 0) \quad \varepsilon_{2i}^{-} = \min(\varepsilon_{2i}, 0)$$

Using these equations to rearrange Equations 9 and 10, we obtain Equations 13 and 14 below:

$$y_{1t} = y_{1t-1} + \varepsilon_{1t} = y_{1,0} + \sum_{i=1}^{t} \varepsilon_{1i}^{+} + \sum_{i=1}^{t} \varepsilon_{1i}^{-} \quad 13$$

$$y_{2t} = y_{2t-1} + \varepsilon_{2t} = y_{2,0} + \sum_{i=1}^{t} \varepsilon_{2i}^{+} + \sum_{i=1}^{t} \varepsilon_{2i}^{-} \quad 14$$

Positive and negative components (shocks) contained in each variable are defined in cumulative form in the following equations:

$$y_{1i}^{+} = \sum_{i=1}^{t} \varepsilon_{1i}^{+}, \quad y_{1i}^{-} = \sum_{i=1}^{t} \varepsilon_{1i}^{-}, \quad y_{2i}^{+} = \sum_{i=1}^{t} \varepsilon_{2i}^{+}, \quad y_{2i}^{-} = \sum_{i=1}^{t} \varepsilon_{2i}^{-} \quad 15$$

At the final step of Hatemi-J (2012) test, Hacker and Hatemi-J (2006) test is applied to positive and negative components of the series. For example, model specified in Equation 16 is used to test the causality between negative shocks:

$$y_t^+ = \alpha + A_1 y_{t-1}^+ + \cdots + A_p y_{p-1}^+ + u_t^+ \qquad 16$$

lnAGI, lnKOF, lnKOFTrDj, lnKOFFi, lnKOFPo and lnKOFCu series are decomposed to their positive and negative components first and all series were subjected to unit-root tests to continue with the Hatemi-J (2012) procedure. The main research question is that whether agricultural imports to Türkiye increase as globalization and different types of globalization intensify.

3.3. Unit Root Tests

Three different unit-root tests were applied to all components (positive and negative) of the series, as well as the series themselves, to decide whether series are stationary or not. First, Augmented Dickey Fuller (ADF), developed by Dickey and Fuller (1979, 1981) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS-1992) tests were used in tandem to decide on the stationarity of the series. Following Nusair (2003), if the result of the ADF test rejects null hypothesis (no unit root) and result of the KPSS test cannot reject null hypothesis (stationarity) then series are stationary, and if vice versa, the series are non-stationary. If the ADF test concludes no unit root and KPSS non-stationarity, then the first differences of the series are tested to decide on stationarity, and if the ADF test concludes unit root and the KPSS tests concludes stationarity, then a de-trended test is used to decide on stationarity. Thus, Dickey Fuller- Generalized Least Squares (DF-GLS- 1996) proposed by Elliot, Rothenberg and Stock (1996) is applied to check whether de-trended series are stationary or not. The results for the series are presented in Table 2 and the results for positive and negative components of the series are presented in Table 3.

Table 2. Stationarity Tests of the Series

	ADF		KPSS		DF-GLS	
	C	C+T	C	C+T	C	C+T
lnAGI	0.40(0) [0.97]	-1.32(0) [0.85]	0.510(3)	0.179(2)	-0.078(0)	-1.59(0)
lnKOF	-1.92(0) [0.31]	-1.34(0) [0.85]	0.670(3)	0.140(3)	-0.91(0)	-1.57(0)
lnKOFTr	-1.98(0) [0.24]	-4.14(5)[b] [0.02]	0.214(3)[a]	0.101(3)[a]	-1.81(0)[c]	-2.26(0)
lnKOFFi	-2.23(0) [0.19]	-2.19(0) [0.47]	0.216(2)[a]	0.085(2)[a]	-2.24(0)[b]	-2.33(0)
lnKOFPo	-1.86(1) [0.34]	-3.13(0) [0.12]	0.702(3)	0.151(2)	-0.46(1)	-3.13(0)[c]
lnKOFCu	-1.68(1) [0.42]	-1.10(1) [0.90]	0.528(3)	0.165(3)	-1.14(1)	-1.42(1)
FIRST DIFFERENCES						
	ADF		KPSS		DF-GLS	
	C	C+T	C	C+T	C	C+T
ΔlnAGI	-4.28(0)[a] [0.003]	-5.32(0)[a] [0.001]	0.493(0)	0.084(3)[a]	-4.25(0)[a]	-5.54(0)[a]
ΔlnKOF	-4.60(0)[a] [0.001]	-4.68(0)[a] [0.006]	0.275(2)[a]	0.097(5)[a]	-4.11(0)[a]	-4.74(0)[a]
ΔlnKOFTr	-4.36(0)[a] [0.003]	-4.45(0)[a] [0.009]	0.170(0)[a]	0.087(0)[a]	-4.46(0)[a]	-4.67(0)[a]
ΔlnKOFFi	-4.72(0)[a] [0.001]	-4.60(0)[a] [0.007]	0.068(1)[a]	0.061(2)[a]	-4.71(0)[a]	-4.82(0)[a]
ΔlnKOFPo	-7.22(0)[a] [0.00]	-7.44(0)[a] [0.00]	0.249(3)[a]	0.195(7)	-7.09(0)[a]	-7.76(0)[a]
ΔlnKOFCu	-3.03(0)[b] [0.046]	-3.31(0)[c] [0.089]	0.286(2)[a]	0.112(1)[a]	-3.10(0)[a]	-3.42(0)[b]

ADF: Augmented Dickey Fuller, KPSS: Kwiatkowski-Phillips-Schmidt-Shin (1992), DF-GLS: Dickey-Fuller Generalized Least Squares (1996). C: Represents model with constant. C+T: Represents model with constant and trend. Numbers in parentheses are lag lengths for the ADF and the DF-GLS tests while they denote Newey-West bandwidths for the KPSS test. Numbers in brackets are probability values for the ADF test. a, b, and c denotes significance 1%, 5% and 10% significance levels, respectively.

Table 3. Stationarity Tests of Positive and Negative Components

	ADF		KPSS		DF-GLS	
	C	C+T	C	C+T	C	C+T
lnAGI(+)	1.12(0) [0.99]	-1.22(0) [0.88]	0.707(3)	0.161(2)	0.94(0)	-1.68(0)
lnAGI(-)	-4.01(0)[c] [0.053]	-3.58(0)[c] [0.053]	0.708(3)	0.171(2)	-1.15(0)	-2.48(0)
lnKOF(+)	-2.83(0)[c] [0.07]	-0.82(0) [0.94]	0.705(3)	0.181(3)	-0.07(1)	-1.05(1)
lnKOF(-)	-1.10(0) [0.69]	-2.23(0) [0.49]	0.662(3)	0.109(3)[a]	-0.44(0)	-2.28(0)
lnKOFTr(+)	-2.21(0) [0.21]	-2.07(0) [0.53]	0.661(3)	0.152(3)	-0.83(0)	-1.94(0)
lnKOFTr(-)	-0.41(0) [0.89]	-1.91(0) [0.69]	0.693(3)	0.117(3)[a]	0.68(0)	-1.94(0)
lnKOFFi(+)	-1.45(0) [0.53]	-1.10(0) [0.90]	0.713(3)	0.162(3)	-0.09(1)	-1.34(0)
lnKOFFi(-)	-0.84(0) [0.78]	-2.55(1) [0.30]	0.694(3)	0.113(2)[a]	-0.18(0)	-2.32(0)
lnKOFPo(+)	-1.71(0) [0.41]	-1.51(0) [0.79]	0.707(3)	0.147(3)	-0.46(0)	-1.74(0)
lnKOFPo(-)	-0.84(0) [0.78]	-2.04(0) [0.55]	0.673(3)	0.105(3)[a]	-0.50(0)	-2.13(0)
lnKOFCu(+)	-1.46(0) [0.53]	-0.54(0) [0.97]	0.650(3)	0.159(3)	-0.77(1)	-1.50(1)
lnKOFCu(-)	-1.68(1) [0.42]	-1.10(1) [0.91]	0.528(3)	0.159(3)	-1.14(1)	-1.42(1)
FIRST DIFFERENCES						
	ADF		KPSS		DF-GLS	
	C	C+T	C	C+T	C	C+T
ΔlnAGI(+)	-4.79(0)[a] [0.0009]	-5.45(0)[a] [0.001]	0.331(1)[a]	0.104(4)[a]	-4.79(0)[a]	-5.67(0)[a]
ΔlnAGI(-)	-6.22(1)[a] [0.00]	-6.00(1)[a] [0.0004]	0.460(1)	0.097(1)[a]	-3.57(0)[a]	-4.53(0)[a]
ΔlnKOF(+)	-4.15(0)[a] [0.004]	-4.71(0)[c] [0.053]	0.622(0)	0.176(9)	-3.44(0)[a]	-4.69(0)[a]
ΔlnKOF(-)	-5.35(0)[a] [0.0003]	-5.26(0)[a] [0.002]	0.105(3)[a]	0.090(3)[a]	-5.40(0)[a]	-5.47(0)[a]

ΔlnKOFTr(+)	-4.66(0)[a] [0.001]	-5.15(0)[a] [0.002]	0.283(2)[a]	0.101(5)[a]	-4.69(0)[a]	-5.29(0)[a]
ΔlnKOFTr(-)	-4.50(0)[a] [0.002]	-4.38(0)[b] [0.011]	0.090(0)[a]	0.093(0)[a]	-4.60(0)[a]	-4.52(0)[a]
ΔnKOFFi(+)	-4.52(0)[a] [0.002]	-4.73(0)[a] [0.005]	0.236(1)[a]	0.064(0)[a]	-4.61(0)[a]	-4.95(0)[a]
ΔlnKOFFi(-)	-4.59(0)[a] [0.002]	-4.50(0)[a] [0.008]	0.093(4)[a]	0.084(4)[a]	-4.56(0)[a]	-4.69(0)[a]
ΔlnKOFPo(+)	-5.10(0)[a] [0.0004]	-5.36(0)[a] [0.001]	0.226(0)[a]	0.056(1)[a]	-5.11(0)[a]	-5.61(0)[a]
ΔlnKOFPo(-)	-5.15(0)[a] [0.0004]	-5.04(0)[a] [0.003]	0.118(3)[a]	0.111(3)[a]	-5.19(0)[a]	-5.27(0)[a]
ΔlnKOFCu(+)	-3.19(0)[b] [0.034]	-3.40(0)[c] [0.08]	0.229(2)[a]	0.097(2)[a]	-3.24(0)[a]	-3.50(0)[b]
ΔlnKOFCu(-)	-3.04(0)[b] [0.046]	-3.31(0)[c] [0.09]	0.286(2)[a]	0.112(1)[a]	-3.10(0)[a]	-3.42(0)[b]

ADF: Augmented Dickey Fuller, KPSS: Kwiatkowski-Phillips-Schmidt-Shin (1992), DF-GLS: Dickey-Fuller Generalized Least Squares (1996). C: Represents model with constant. C+T: Represents model with constant and trend. Numbers in parentheses are lag lengths for the ADF and the DF-GLS tests while they denote Newey-West bandwidths for the KPSS test. Numbers in brackets are probability values for the ADF test. a, b, and c denotes significance 1%, 5% and 10% significance levels, respectively.

The decisions on the stationarity of all series are presented in Table 4. All series are integrated of order 1. Thus, bootstrap symmetrical and asymmetrical causality test developed by Hatemi-J (2012) can be used to analyze causality relations between different dimensions of globalization and food imports to Türkiye, since this approach allows for analysis even if the series are not cointegrated of the same order.

Table 4. Decisions on the Stationarity of Series

Series	Stationary at	dmax
lnAGI	I(1)	1
lnKOF	I(1)	1
lnKOFTr	I(1)	1
lnKOFFi	I(1)	1
lnKOFPo	I(1)	1
lnKOFCu	I(1)	1
lnAGI(+)	I(1)	1
lnAGI(-)	I(1)	1
lnKOF(+)	I(1)	1
lnKOF(-)	I(1)	1
lnKOFTr(+)	I(1)	1
lnKOFTr(-)	I(1)	1
lnKOFFi(+)	I(1)	1
lnKOFFi(-)	I(1)	1
lnKOFPo(+)	I(1)	1
lnKOFPo(-)	I(1)	1
lnKOFCu(+)	I(1)	1
lnKOFCu(-)	I(1)	1

3.4. Asymmetrical Causality Test

It is important to determine the optimal lag length of the VAR model in the first stage in Hatemi-J asymmetric causality analysis followed by determining the additional lag length to be added to the model in the second stage, and to determine the critical values for the Wald test statistic in the last stage (Yılancı and Bozoklu, 2014: 215). As for the additional lag length; Toda and Yamamoto (1995) suggest adding additional lags to the VAR model as much as the maximum degree of integration of the variables while Dolado and Lütkepohl (1996) recommend adding only one additional lag (Hatemi-J, 2014: 450). We follow Toda-Yamamoto (1996) approach and add as much lags as the maximum degree of integration (dmax) to the VAR model. The results of Hatemi-J (2012) asymmetric causality test are given in Table 5.

4. Results

Elaboration of the Hatemi-J (2012) test results according to our prepositions is given below.

Preposition 1: Policy-led globalization is a Granger cause of food imports to Türkiye.

According to the results of Hatemi-J (2012) test, there is no Granger causality running from trade policy globalization (lnKOFTrDj) to food imports (lnAGI) or vice versa. However, the test revealed a strong one-way Granger causality from positive shocks to lnKOFTrDj to negative shocks to AGI at 1% significance level, while the results also point to a weaker Granger causality between positive shocks to lnKOFTrDj and positive shocks to lnAGI, as expected. The latter result can be easily explained. Since this measure of globalization is constructed by data on trade barriers and bilateral agreements, it may be said that as globalization by trade liberalization intensifies, food imports increases. The former result contradicts with our expectations and suggests that an intensification of policy-led globalization results in a negative shock in agrifood imports. This result needs some explanation. There may be a couple of reasons for this result. First, as countries pursue liberal trade policies, domestic producers face competition both in home and at abroad. This may result in the exit of low productivity producers, leaving the market to those efficient producers who can supply for both domestic and foreign markets. Wang (2012) reports that imports significantly affect total factor productivity growth in developing countries. Anderson and Strutt (2012) also reported that trade liberalization may increase productivity in the agricultural sector. As for the industrial sector, trade liberalization may also result in productivity increases by externalities brought about by cheaper utilization of imported capital and intermediary goods (Amiti and Konings, 2007). Increasing demand for imported goods may also result in increased demand for local substitutes or tougher competition by local producers (Wong, 2006) and thus, while trade policy globalizes the country food imports may decline. Another reason may be the inflationary effects of imported goods. It is reported that there may be a significant long-run relationship between inflation and trade openness, in particular import openness, as it was argued for Pakistan by Zakaria (2010) and Munir and Kiani (2011). In this respect, when imported raw or intermediate goods or food products become more expensive, consumers may substitute these for cheaper domestic products or inputs.

Preposition 2: Political globalization is a Granger cause of food imports to Türkiye.

The results of our analysis show that there is no Granger causality between political globalization and food imports or vice versa. However, there is one-

way Granger causality running from negative shocks to lnAGI to negative shocks to lnKOFPo at 1% significance level and a rather weaker Granger causality running from positive shocks to lnAGI to positive shocks to lnKOFPo, at 10% significance. It has long been argued that food exports are used as tools of international policy (Rothschild, 1976, Afesorgbor and Beaulieu, 2021). It has been reported that as food imports get more expensive, possibility of socio-political instability increases (Meyimdjui, 2020). Thus, as imported food gets more scarce or expensive, the countries may feel pressures from within to de-align from ongoing political and trade partnerships, or increase commitment to the ongoing political ties or to new political or trade partnerships. Our analysis also revealed a one-way Granger causality running from negative shocks to lnKOFPo to positive shocks to lnAGI at 5% significance level. This may be a result of increasing trade with other partners in case of slowing political globalization. Boycotts of goods and services of certain origin over political issues, as more recently seen in March 2017 in the boycott against Dutch products, are also seen in Türkiye.

Preposition 3: Financial globalization is a Granger cause of food imports to Türkiye.

There is no Granger causality between financial globalization and food imports in any direction. However, the Hatemi-J (2012) test revealed unidirectional Granger causality from negative shocks to lnAGI to negative shocks to lnKOFFi at 5% significance level and from positive shocks to lnAGI to positive shocks to lnKOFFi at 10% significance level. There may also be several factors for this result. For example, Correa et al. (2017) argue that due to financialization of the markets, foods had become speculative commodities and their relationship with the financial sector rather strengthened. As discussed by Coulibaly et al. (2021), Rastoin (2012) also argues that due to financialization of the agricultural sector, most producers resort to financial sector to finance their activities. Production may be problematic in case when international sources are becoming scarce due to negative shocks to financial globalization, resulting in an increase in food imports. It is also argued that since trade is getting more open and cheap imports move intensively among borders, farmers produce for export markets (Watkins, 2002), therefore they seek financing for production of exports rather than producing for domestic markets. As far as our findings concerned, it is more possible that producers import intermediary agrifood products for supplying to domestic or export markets, and these exports are most possibly financed by global financial markets.

Preposition 4: Cultural globalization is a Granger cause of food imports to Türkiye.

There is no Granger causality between cultural globalization (lnKOFCu) and food imports (lnAGI) in any direction. However, the Hatemi-J (2012) test revealed one-way Granger causality from positive shocks to lnKOFCu to positive shocks to lnAGI at 10% significance level, as expected. It is no surprise that globalization is creating a common consumption culture embodied in consumption of global brands, and in terms of food consumption this means penetration of global food brands into local markets, and standardization of dining preferences and products (Peng, 2023). Even when there is no market penetration from global brands, globalization may still influence the dining culture, especially in younger generations (Zaman, Selim and Joarder, 2013), or through development of tastes towards internationally-recognized cuisines and products (Lorenzana, 2023). In this respect, development of a common global food culture may be effective in increasing food exports.

However, test results also revealed unidirectional Granger causality running from positive shocks to lnKOFCu to negative shocks to lnAGI at 10% significance. Cultural globalization may also result in an increased awareness for protection of traditional cuisine or foods and the price differences between imported and local products may also decrease the tastes for imported agrifood products (Güldemir, 2020). In addition to such local preferences, concerns or beliefs about the safety of imported foods may also play a role in decreasing imports under cultural globalization (Nygård and Storstad, 1998).

The test also suggested a one-way Granger causality from negative shocks to lnAGI to positive shocks to lnKOFCu at 5% significance. This is an interesting result since it is hypothesized that increasing food imports leads to more cultural globalization. In tandem with an increased concern to consume traditional, local products may be recreated or redesigned for global consumption (Crane, 2002), such as in the case of improvisation of Turkish döner (Tuncer, 2023), which may in turn increase cultural globalization through exports, rather than imports.

Preposition 5: Globalization is a Granger cause of food imports to Türkiye.

Symmetric causality test results revealed no Granger causality from globalization (lnKOF) to food imports (lnAGI) or vice versa. However, opposite to our expectations, negative shocks to globalization Granger causes positive shocks to food imports as we reject the null hypothesis of "No causality" at 10% significance level. Although not included in this study, other sub-indices (social, interpersonal, or informational) of globalization may be

a reason for this result. As negative shocks to such sub-indices occur, people may increase food imports as a way of interacting with other cultures or continue globally-recognized diets. This might also be a result of a "curiosity effect", as a negative shock to globalization may increase the demand for food imports due to a slow- down in globalization that results in a decreased agrifood trade. However, the test results also revealed Granger causality from positive shocks to ln KOF to negative shocks to lnAGI at 10% significance level, another finding opposite to our expectations. This might be explained with the dependence of the Turkish food industry on imports of agricultural inputs for food manufacturing. As connections with the rest of the world, especially through bilateral agreements, get weaker, domestic producers in Türkiye may be looking for other sources for imported intermediate materials to carry on food production. On the contrary, in order to cut down on costs of imported food and intermediate materials, the producers cut down on imports and choose to invest in producing domestic inputs or in R&D for producing imported inputs in Türkiye. Görkem and Mutlu Öztürk (2018) report that some food producers may cut down on using imported inputs since it might negatively affect the taste of local products, which may be a way of preserving the profitable traditional tastes in case of increasing globalization. However, this result must be approached with caution, since, in theory, a positive shock to globalization increases any type of trade. In addition, Türkiye's dependence on imported inputs may also important in this outcome. When negative shocks occur in imported inputs, this may reduce the trade in exported food products. The Hatemi-J (2012) test also revealed a rather weaker Granger causality from negative shocks to lnAGI to negative shocks to lnKOF at 10% significance. Decline in agricultural imports may affect globalization negatively through trade and other channels such as culture and interpersonal relations.

5. Conclusion

This study aimed at testing whether globalization is effective in Türkiye's import of agrifood products. There is a general tendency to view globalization, trade globalization in particular, as an important cause of increasing food imports to Türkiye. To the best of our knowledge, there are a limited number of studies on agricultural imports to Türkiye, focusing especially on food prices and exchange rates. This study takes a different approach and uses KOF Globalization Index and its sub-indices as explanatory variables, and analyzes their relationship with the ratio of agricultural and food imports to total imports of Türkiye.

Granger cause of agrifood imports to Türkiye. There is a unilateral Granger causality running from positive shocks to policy-led globalization to positive shocks to agrifood imports to Türkiye. There is also bilateral Granger causality between positive shocks to policy-led globalization and negative shocks to food imports. Thus, policies that will lead to more trade in agrifood products should be carefully formulated. Formulation of more open trade policies that can affect agrifood imports should be carefully considered in parallel to domestic agricultural subsidies if an increase in domestic production and a decrease in dependence on agrifood imports are to be targeted. The policy mix may include easy-to-access financing for producers targeting export markets, especially in the short-run and during times of macro crises. The emphasis here should be on financing those young producers who can understand the importance of value-added products in agriculture and act as agricultural entrepreneurs in the export sector.

In fact, globalization may not be the only factor in increasing food imports; the subject must be investigated from a wider vantage point including climate change, input costs, seasonal factors, local factors and cultural factors. Thus, new studies, including different countries and variables must be carried out to have a better understanding of the nexus between globalization and food trade.

Table 5. Results of Symmetrical and Asymmetical Causality Tests

X	Y	X→Y	Y→X	$X^+ \rightarrow Y^+$	$X^- \rightarrow Y^-$	$X^- \rightarrow Y^+$	$X^+ \rightarrow Y^-$	$Y^+ \rightarrow X^+$	$Y^- \rightarrow X^-$	$Y^- \rightarrow X^+$	$Y^+ \rightarrow X^-$
lnKOF	lnAGI	0.128 8.712 4.681 3.152	3.090 10.058 6.085 4.612	0.387 13.263 6.227 4.054	0.539 18.708 6.510 4.027	4.153*** 12.933 6.002 3.881	4.026*** 13.058 6.021 3.891	6.361 29.938 12.072 8.239	4.564*** 12.513 5.675 3.791	1.539 22.847 9.902 6.587	0.008 14.588 5.912 3.533
lnKOFTr	lnAGI	1.944 11.929 6.700 4.711	0.051 9.700 4.732 3.210	6.533*** 15.555 6.906 4.296	1.532 12.564 6.427 4.159	0.005 11.456 4.819 3.121	46.984* 14.378 6.464 4.167	0.107 15.201 6.564 3.982	1.971 13.594 5.888 3.766	4.040 29.195 8.490 5.182	1.885 26.852 11.016 6.774
lnKOFPo	lnAGI	0.125 9.025 4.732 3.257	4.010 11.390 6.598 4.781	0.198 12.294 5.693 3.665	0.156 12.508 5.568 3.467	9.976** 12.613 6.657 4.210	2.696 13.342 5.977 3.761	10.182*** 22.928 11.801 8.444	12.984* 12.684 5.702 3.640	0.353 42.630 11.821 6.616	0.034 15.787 7.482 5.012
lnKOFFi	lnAGI	0.012 10.592 6.261 4.358	0.000 8.590 4.685 3.218	0.198 13.895 6.383 4.141	0.313 13.315 6.059 4.108	3.276 12.642 5.958 3.916	3.003 14.185 6.147 3.933	12.571*** 30.034 13.021 8.485	10.320** 13.673 5.878 3.822	1.282 31.357 16.118 10.633	0.420 10.433 4.639 2.904
lnKOFCu	lnAGI	0.782 9.710 4.855 3.244	1.457 13.041 6.493 4.495	9.220*** 27.388 10.124 6.320	2.047 20.581 8.133 4.866	0.601 13.963 6.454 4.244	5.471*** 14.768 5.837 3.803	0.424 27.696 7.978 4.961	1.433 13.362 5.604 3.685	16.561** 22.703 8.751 5.727	0.000 16.695 7.269 4.205

The results are obtained with 10000 iterations. The numbers on the lower right-hand of each column are bootstrap critical values at 1%, 5% and 10% significance levels, respectively. *, ** and *** represent significance at 1%, 5% and 10% siginificance levels, respectively.

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CHAPTER XIV

GENDER DISCRIMINATION IN TURKISH ECONOMY AND ITS REFLECTION ON AGRICULTURAL SECTOR

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1. Introduction

Different attitudes towards men and women have emerged throughout history. Many factors such as the structure, values and beliefs of a society can be effective on this. Especially in societies where the male figure is dominant, women remain in the background. Even if they make the same contribution to the development of an economy and society, they are kept away from these areas. This discrimination, which started even before they were born, has become a tradition that deeply affects the society over time. Türkiye is seen as a country where women have less say in economic affairs. Especially in the field of employment, men outnumber women. Therefore, there is a need for initiatives to prevent this problem and to raise social awareness on the issue.

In the Turkish economy, gender discrimination is observed in different sectors. It can be said that even in sectors where women should have a say, their employment rates are low compared to men. Agriculture is a sector that is important for the entire world economy and in which rural areas are generally intensively engaged. However, it is seen that women's labour is less in the agricultural sector in terms of employment. In addition, it can be said that restrictions are imposed not only on women's participation in agricultural

activities, but also on their enjoyment of various rights and their ability to be decision-makers. In the historical process, the importance given to women in Türkiye has changed. During the Ottoman Empire, women had a voice but were subjected to discrimination over time.

After the establishment of the Republic of Türkiye, women were granted various privileges. With the beginning of the globalisation process, the influence of Western societies has been taken into consideration. With the 20th century, although women's employment has increased over time, it has not yet reached the desired level. Therefore, the aim of this study is to determine the place of women's employment in the agricultural sector in today's conditions in terms of Türkiye. With the 21st century, it is thought that determining the position of women in employment in agriculture and other sectors is important for the development of the economy of the society and the agricultural sector.

In this study, it is aimed to reveal the gender discrimination encountered in the employment of women in the Turkish economy and the reflections of this discrimination on the agricultural sector. Analysing gender discrimination from a sectoral perspective is important both for the development of the agricultural sector and for determining the importance of women in the economy. In this context, firstly, the concept of gender discrimination in the economy and women's employment in the Turkish economy are given as sub-headings in this study. In the next Iranian section, the importance of agriculture and women's employment are given. Then, the reflection of gender discrimination on the agricultural sector in the Turkish economy is mentioned. The study is completed with a conclusion and evaluation section.

2.Gender Discrimination and Women's Employment in Turkish Economy

In this section of the study, the conceptual framework, gender discrimination in the economy and women's employment in the Turkish economy are presented under subheadings.

2.1. Conceptual Framework and Gender Discrimination in Economics

Some roles have been attributed to women since the existence of mankind until today. The different treatment of women in a society compared to men may arise due to various reasons.

Gender can be expressed as a concept that explains the duties of individuals in society. This concept, which is used to define individuals and is gradually

changing, also shows that individuals are biologically separated from each other. The tasks attributed to men and women are the same all over the world and in all cultures (OSCE, 2006:1). The concept of gender, which is often used only for discrimination against women, is used in situations such as deprivation of rights, inequality and oppression depending on societies (Sivakumar, 2008). Conceptually, discrimination can be defined as undesirable behaviour towards individuals in many areas such as race and gender. This situation negatively affects the achievement of peace, equality and development, and is seen as a situation that women are particularly exposed to. Although women have similar proportions to men in the population, they face discrimination in different ways in many countries in terms of social, religious and cultural aspects (Pokharel, 2008:80).

Lack of education, class structures, religious and cultural habits, family structure and traditionalism, economic difficulties, and the attitudes of the family and society are effective in the emergence of discrimination against women. Although women contribute as much or more than men in the development of a nation, this contribution is ignored where patriarchal understanding is dominant (Sivakumar, 2008). Gender discrimination causes women to be unable to benefit from issues such as health and economy, and this situation becomes more worrying especially in the poorer segments. Women who are subjected to discrimination also face situations such as not being harboured in the society, being badly remembered and violence when they do not follow the rules determined by the society (Hosang & Bhui, 2018:682).

It is not certain to which period the traditionally transmitted discriminatory view of the sexes dates back. However, it can be traced back to the period when Adam and Eve were warned about the forbidden fruit. This situation may arise as a result of the instinct to ensure that the woman is not harmed by the belief that she is created from the rib of the man. In the Stone Age period, men used their physical strength for hunting, while women stayed where they lived and undertook the task of caring. In ancient times, the position of women and the value attributed to them were not the same everywhere (Das & Modak, 2014:24). For many years, gender discrimination against women has had an important place and their access to many of their rights has been restricted. This discrimination, which is an ongoing problem in many countries, has caused women to be deprived of economic and various civil rights, and even the right to drive a car is subject to certain conditions. Although there have been many developments to prevent this discrimination, this problem persists in modern societies (Oswald, 2023:1-2).

In male-dominated societies, girls are despised by their families and gender discrimination is practised before they are born (Kohli, 2017:178). Gender discrimination emerges with the birth of babies. If the baby is a boy, celebrations are held. However, with the birth of female babies, they are seen as a burden and this process continues until marriage (Shastri, 2014:27). The behaviours that children should show in the society in which they live vary and different behaviours are attributed according to their gender. Socio-culturally, each society has its own norms, and even babies are raised accordingly without even realising it. (Kohli, 2017:181).

In short, it is seen that women, who are exposed to different attitudes even before they are born due to their gender being a girl, are deprived of many rights over time, put in the second plan and assigned duties in this direction.

2.2. An Overview of Women's Employment in Türkiye

In the historical process in Türkiye, it is seen that women started to have a voice especially from the Ottoman Empire period and their position started to change over time. With the proclamation of the Republic, important developments have taken place regarding the place of women in society. However, it can be said that there were no significant developments regarding the position of women in employment in the 20th century.

In non-modern societies, women are generally assigned the duties of being busy with their families and homes, while men are assigned the duties related to the economy. This situation, which restricts women's employment, has also made women's employment in male-dominated societies dependent on the approval of men. Movements towards cities as a result of economic growth and industrialisation have positively affected agricultural productivity. The habits of individuals started to differ. Especially for Türkiye's economic growth and development, there is a need to ensure more participation of women in employment (Taşdemir & Uçak, 2021:50).

The history of the position of women in Türkiye can be associated with the 16th and 17th centuries. Because in these periods, the power of women in the harem in the Ottoman Empire could reach political dimensions. Again in these periods, the young age of the sultans ensured that their mothers and sisters had a say. This situation was reversed in the 19th century, and the educated women living in Istanbul were seen as feminists (İnce-Yenilmez, 2017:173). In the 19th century, the Ottoman Empire underwent a major structural transformation in many areas, which brought about a differentiation in the position of women (Karagöz, 2016:35).

It can be said that the history of women's revolutions in Türkiye is essentially linked to the women's movement in the Ottoman Empire (Tekeli, 2010:120). In Türkiye, where the view that male domination was dominant was widespread, there were various developments regarding women before the Republic was proclaimed. Westernisation, which took effect in societies with the Tanzimat period, also affected women. Especially with the Industrial Revolution, women were employed, the issue of education came to the agenda and equality started to be mentioned. In addition, with the American and French Revolutions, women became aware of their rights. This situation also had an impact on the Ottoman Empire in the 19th century (Karagöz, 2016:36). In the Republican period, women were granted various rights with the law enacted in 1926. In 1934, political rights were granted. In 1935, women started to take part in the parliament and Mustafa Kemal Atatürk had an influence on women's gaining these rights (Tekeli, 2010:120).

At the end of the 20th century, with the globalisation that occurred at the end of the 20th century, there has been a liberalisation in economic and humanitarian issues. This situation is seen by some economies as a development that will be effective in changing the role of women (Dhar, 2021:137). The globalisation process, which is seen as an opportunity for many educated women, has created the opposite environment for some women (Vijaya, 2014:21). During the globalisation period in Türkiye, women were employed as cheap labour force and their number increased. The need to produce more ensured that women were also employed more. Towards the end of the 20th century, as a result of commercial liberalisation, practices similar to other countries were tried to be implemented in women's employment. However, the expected increase in employment in sectors other than agriculture did not materialise (İnce, 2010:63). Globalisation in the economy has been effective in the development of the agricultural sector and women have started to be employed more (Hosseini,2006:36). Women, who have experienced differences in their economic and social positions, have had the opportunity to gain more job opportunities, education and income (İnce, 2010:60).

In short, the economic and social position of women in Türkiye dates back to the Ottoman Empire. It can be said that there have been changes in women's employment especially after the globalisation towards the end of the 20th century, but this is not enough.

2.2.1. Place of Women in the Turkish Economy

Türkiye is a country where women and men are not at the same economic level. Especially the differentiation in human development and gender can be seen more clearly through the United Nations Development Programme (UNDP).

The human development index, which is used to understand the position of individuals and their access to opportunities, determines the level of development of countries just like economic growth (Tobaigy et al., 2023:231). According to the United Nations Development Programme (UNDP), Figure 1, which shows some of the leading countries in the human development index in 2022 and Türkiye, shows that Türkiye is far behind when compared with other countries.

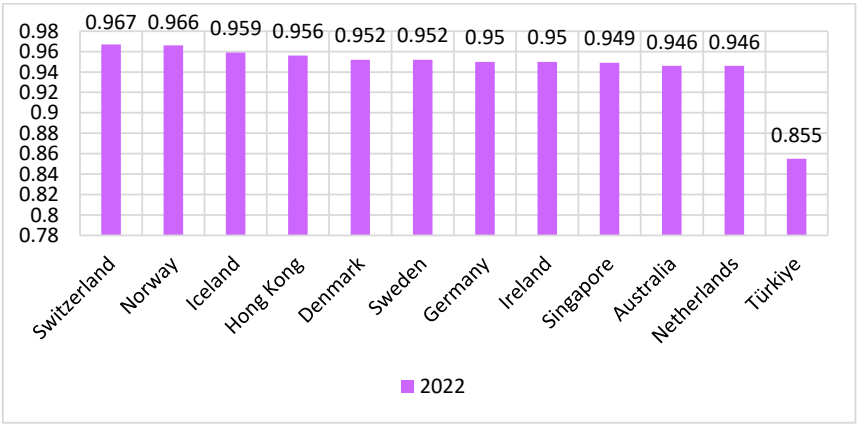

Figure 1: Leading Countries in the Human Development Index in 2022 and Türkiye
Source: UNDP https://hdr.undp.org/data-center/human-development-index#/indicies/HDI Access Date: 07.09.2024

Figure 2 of the United Nations Development Programme (UNDP), which shows the gender inequality index by country in 2022, shows that this index is quite high in Türkiye compared to other countries.

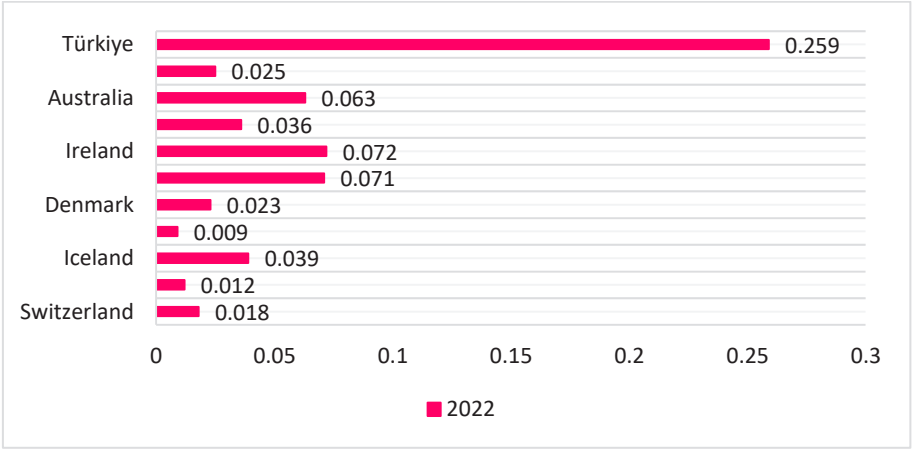

Figure 2: Gender Inequality Index by Country in 2022
Source: UNDP https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index#/indicies/GII, Access Date: 08.09.2024

Figure 3, which shows the population by gender in Türkiye in 2022, shows that the total population is 85,279,553 and the number of women in this population is 42,575,441 while the number of men is 42,704,112.

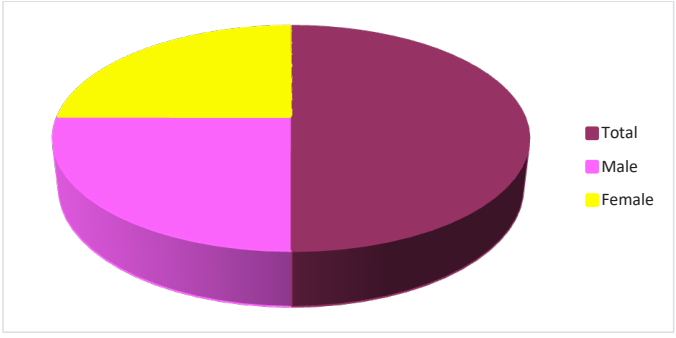

Figure 3: Population Number by Gender in Türkiye in 2022
Source: TURKSTAT, 2024a

Figure 4, which shows the employment rates by gender in Türkiye in 2022, shows that while the male employment rate is 65 per cent, the female employment rate is 30.4 per cent. Accordingly, it can be said that female employment is quite low compared to male employment.

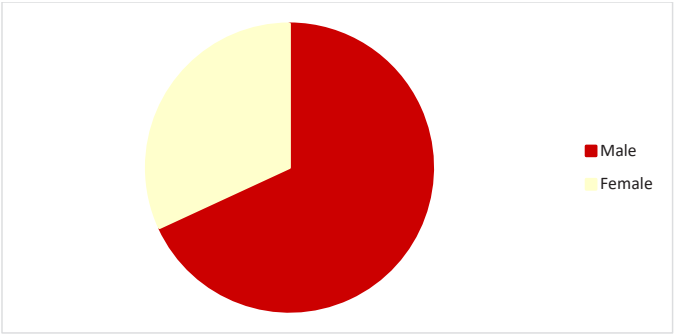

Figure 4: Employment Rate by Gender in Türkiye in 2022 (%)
Source: TURKSTAT

Table 1, which shows the employment and unemployment rates of women and men in Türkiye by gender and education level in 2022, shows that the illiterate group has the lowest employment rate. At this education level, the employment rate of men is 27.1 per cent, while it is 13.4 per cent for women. The highest employment rate is at higher education level. At this level of education, the employment rate of men is 78.0 per cent while that of women is 58.3 per cent. When the unemployment rate is analysed, the highest unemployment rate is in the illiterate group for males. The highest unemployment rate in women is in high school and vocational or technical high school. The lowest unemployment rate is observed in higher education for males and illiterate for females.

Table 1: Employment and Unemployment Rates in Türkiye by Gender and Education in 2022

	Employment Rate			Unemployment Rate		
	Total	**Male**	**Female**	**Total**	**Male**	**Female**
Total	47,5	65,0	30,4	10,4	8,9	13,4
Illiterate	15,7	27,1	13,4	6,2	11,6	3,8
Below High School	42,3	60,0	24,4	9,2	8,9	10,0
High School	48,4	64,9	29,2	12,7	10,0	19,1
Vocational or Technical High School	59,1	74,4	34,8	11,3	8,7	19,1
Higher Education	68,6	78,0	58,3	11,3	8,3	15,2

Source: TURKSTAT,2024b

In Türkiye in 2022, wage and earnings differences by gender according to educational attainment are shown in Table 2. Accordingly, the highest wage-salary gap is observed in higher education. The earnings gap is highest at the high school education level.

Table 2: Wage and Earnings Differences by Education Level in Türkiye in 2022 (%)

	Wage-Salary	Profit
Total	5,7	6,2
Primary school and below	12,4	14,5
Primary and secondary school	12,8	15,0
High School	16,0	19,6
Higher Education	17,1	17,2

Source: TURKSTAT,2024b

Figure 5 shows the number of ambassadors by gender in Türkiye. Although the number of female ambassadors increased in 1990, 2000, 2010 and 2022, it is observed that the number of female ambassadors is still far behind the number of male ambassadors.

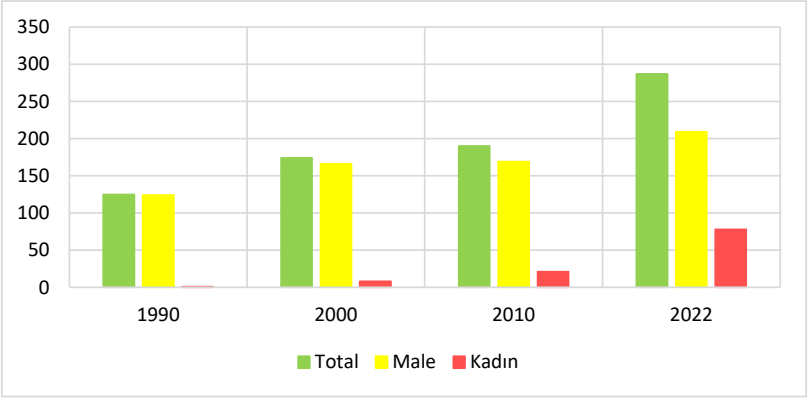

Figure 5: Number of Ambassadors in Türkiye by Gender
Source: TURKSTAT,2024b

Figure 6, which shows the number of deputies by gender in Türkiye, shows that the number of female deputies increased in 1991, 2002, 2011 and 2022. However, this increase is lower than that of men.

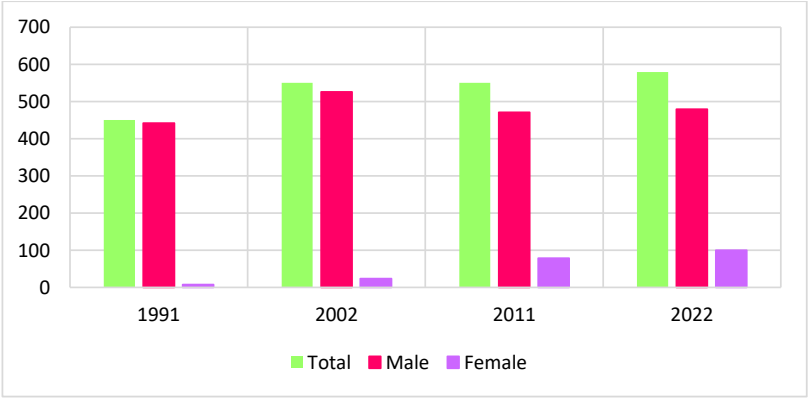

Figure 6: Number of Deputies by Gender in Türkiye
Source: TURKSTAT,2024b

Table 3 shows the academic staff in Türkiye by gender and academic titles. The number of male and female academics has increased in the specified periods. However, it is seen that the number of male academics is higher than the number of female academics. On the other hand, it can be said that there are more women than men as lecturers and research assistants in 2021-2022.

Table 3: Academic Staff by Gender and Academic Titles in Türkiye

	Male				Female			
	1995-1996	**2000-2001**	**2010-2011**	**2021-2022**	**1995-1996**	**2000-2001**	**2010-2011**	**2021-2022**
Total	33,779	43,519	65,896	100,147	16,480	24,361	45,599	84,555
Professor	5,331	6,623	11,241	21,490	1,388	2,181	4,288	10,695
Associate Professor	2,555	3,644	5,751	12,047	1,119	1,605	2,735	8,097
Doctor Faculty Member	-	-	-	22,545	-	-	-	18,939
Assistant Professor	4,642	7,376	14,012	-	1,713	3,031	7,705	-
Lecturer	4,918	6,648	10,676	18,893	1,998	3,492	6,844	19,499
Lecturer	1,867	2,347	3,273	-	2,237	3,043	4,917	-
Expertise	1,100	1,293	1,791	-	764	978	1,466	-
Research Assistant	13,334	15,563	19,066	25,172	7,238	10,017	17,603	27,325
Translator	8	9	8	-	13	10	15	-
Education and Training Planner	24	16	78	-	10	4	26	-

Source: TURKSTAT,2024b

Figure 7 shows the ratio of middle and senior level managers by gender in Türkiye in 2022. In these positions, the ratio of men and women is 80.4 per cent

and 19.6 per cent, respectively. Therefore, it can be said that there are more men than women in middle and senior level positions.

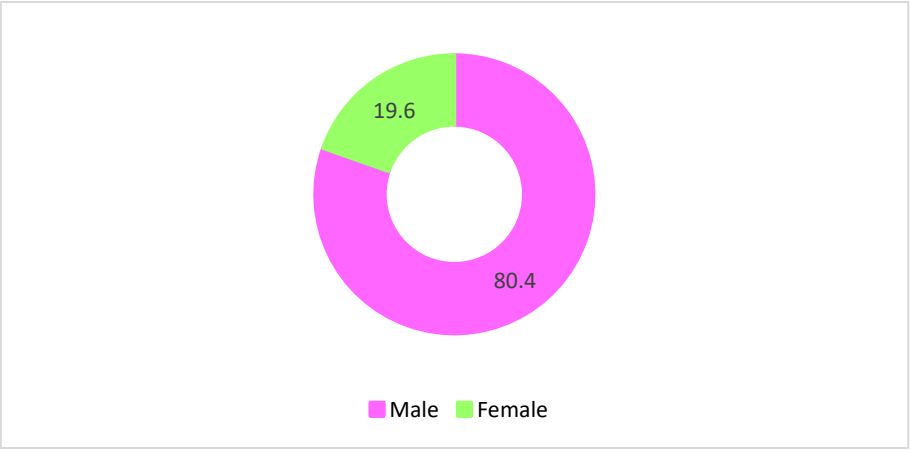

Figure 7: Ratio of Middle and Senior Level Managers by Gender in Türkiye in 2022 (%)
Source: TURKSTAT,2024b

To put it briefly, the female population in Türkiye has an important place in the total population. However, it is observed that they are subjected to economic discrimination. As a matter of fact, this situation can be seen more clearly when we look at employment rates, wage and earning differences, the number of women in ambassadors, deputies, academicians, middle and senior positions.

3.The Importance of Agriculture and the Place of Women in the Agricultural Sector

Agriculture can be seen as a sector that has an important role in the development of national economies. It can be said that women, who are generally subjected to discrimination in society, are less involved even in a sector where they can show the most productivity.

Even though women have an important place in the global economy, women's labour is put in the second plan. Although they make a great contribution especially in the agricultural sector, they are still not valued as they should be. Women who had to work for a longer period of time received low wages, and those who owned land were subjected to many pressures (Pathak, 2022:127). Agriculture is an important sector that is effective in increasing growth,

employment, access to food and combating poverty for developing countries. Discrimination against women, who make a great contribution to the agricultural sector, leads to a disadvantageous situation both economically and socially. Especially in this More women in the sector is effective in terms of production and income and reduces discrimination (Giroud & Huaman, 2019:89).

People living in rural areas are generally engaged in the agricultural sector. Inadequate education is encountered in these areas. Although they attach importance to education, they are engaged in agricultural activities with their children. The segment dealing with the agricultural sector generally consists of those with low or no income (Abdelali-Martini,2011:10). Although women contribute to the agricultural sector by engaging in various activities, they are exposed to various problems. They face different treatment in terms of both legal rights and economic freedom. Even the development strategies for the agricultural sector are generally not carried out by women (Lal & Khurana,2011:30).

Women who do not have the necessary equipment and products to engage in agricultural activities do not have the right to express their opinions. No support is provided to ease their burden. In addition, women do not have adequate education, so they are not aware of their rights before the law and earn lower incomes (Munj et al., 2017:51). Especially in countries with developing economies, the development of agricultural activities is not high. Women's access to resources and time cannot be used effectively. Although women are producers in many fields, they are excluded from some things due to their gender. Preventing this discrimination will positively affect both the agricultural sector and the economy of a country, reduce poverty and facilitate access to food resources (Patil & Babus, 2018:109).

To summarise, it is seen that women remain in the background in society, especially women living in rural areas are deprived of the rights they should have even though they are engaged in agricultural activities.

4. Reflection of Gender Discrimination on Agriculture Sector in Turkish Economy

In line with the data obtained from TURKSTAT in Türkiye, it is thought that in order to see the dimensions of women's employment in the agricultural sector in the 2000s, it is necessary to show the number of employment by gender, Level 1 and Level 2 regions.

Accordingly, total employment in agriculture and other sectors in Türkiye is shown in Figure 8. While 5 million 713 thousand people were employed in

agriculture in 2004, 4 million 866 thousand people were employed in 2021. In non-agricultural sectors, 13 million 919 thousand people were employed in 2004 and 25 million 887 thousand people will be employed in 2022.

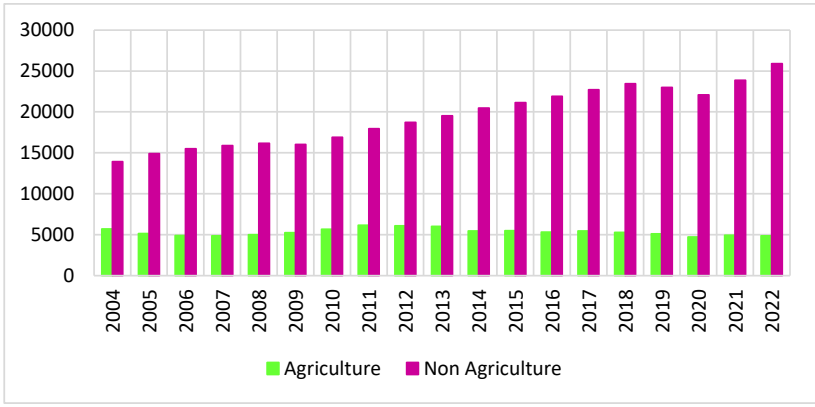

Figure 8: Employment in Agriculture and Non-Agriculture Sectors in Türkiye (Thousands)
Source: TURKSTAT

Figure 9 shows employment by gender in agriculture and non-agriculture sectors in Türkiye. Accordingly, it is observed that women's employment in the agricultural sector is lower than that of men. Although female employment in sectors other than agriculture has tended to increase, it has lagged behind male employment.

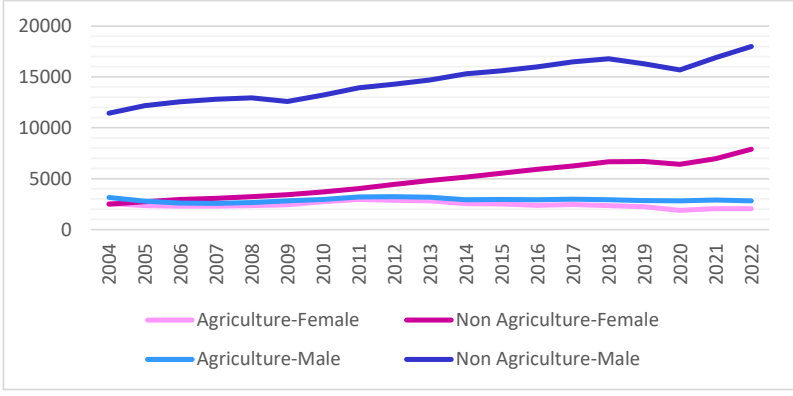

Figure 9: Employment by Gender in Agriculture and Non-agriculture in Türkiye (Thousands)
Source: TURKSTAT

Figure 10, which shows women's employment in the agricultural sector by Level 1 classification in Türkiye, shows that the lowest level of agricultural employment is in Istanbul. Although they are employed more in the Aegean Region, especially after 2012, their employment tends to decrease.

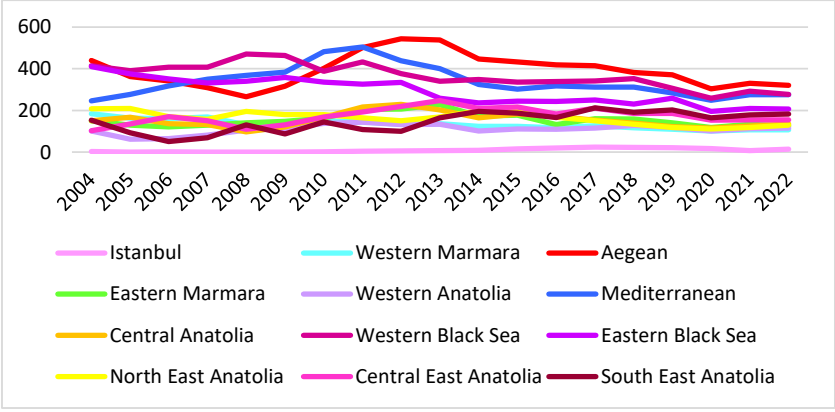

Figure 10: Employment of Women in Agriculture in Türkiye by Level 1 (Thousands)
Source: TURKSTAT

Table 4, which shows women's employment in the agricultural sector by Level 2 in Türkiye, shows the number of employment according to TR10, TR21, TR22, TR31, TR32, TR33, TR41 and TR42 regions.

Table 4: Female Employment in Agriculture Sector in Türkiye by Level 2

	TR10 (İstanbul)	TR21 (Tekirdağ, Edirne, Kırklareli)	TR22 (Balıkesir, Çanakkale)	TR31 (İzmir)	TR32 (Aydın, Denizli, Muğla)	TR33 (Manisa, Afyon, Kütahya, Uşak)	TR41 (Bursa, Eskişehir, Bilecik)	TR42 (Kocaeli, Sakarya, Düzce, Bolu, Yalova)
2004	3	76	108	46	184	209	105	45
2005	1	55	109	44	158	160	77	53
2006	2	47	114	47	133	161	71	51
2007	1	48	121	46	115	148	75	53
2008	1	40	91	34	106	126	64	77
2009	1	41	100	41	122	153	56	92
2010	2	48	103	69	157	176	58	105
2011	4	46	99	81	193	228	67	139
2012	6	41	93	64	227	254	65	142
2013	8	42	93	87	216	235	87	141
2014	9	46	78	70	157	219	59	114
2015	16	48	77	65	155	211	63	114
2016	20	43	74	76	152	191	53	79
2017	25	46	81	72	156	187	66	95
2018	23	42	76	60	155	167	68	91
2019	22	39	72	62	156	153	66	76
2020	17	40	62	47	112	144	52	66
2021	7	41	66	55	120	156	54	79
2022	15	43	64	49	109	163	44	81

Source: TURKSTAT, https://data.tüik.gov.tr/Kategori/GetKategori?p=istihdam-issizlik-ve-ucret-10&&dil=1 22.07.2024

Table 5, which shows women's employment in the agricultural sector by Level 2 in Türkiye, shows the number of employment in TR51, TR52, TR61, TR62, TR63, TR71, TR72, TR81 and TR82 regions.

Table 5: Female Employment in the Agricultural Sector in Türkiye by Level 2

	TR 51 (Ankara)	TR52 (Konya, Karaman)	TR61 (Antalya, Isparta, Burdur)	TR62 (Adana, Mersin)	TR63 (Hatay, Kahramanmaraş, Osmaniye)	TR71 (Kırıkkale, Aksaray Niğde, Nevşehir)	TR72 (Kayseri-Sivas, Yozgat)	TR81 (Zonguldak, Karabük, Bartın)	TR82 (Kastamonu, Çankırı, Sinop)
2004	16	86	122	57	67	88	63	72	21
2005	15	47	96	55	126	92	76	85	21
2006	13	52	132	72	114	93	44	88	78
2007	12	71	147	100	103	74	58	96	69
2008	6	98	158	101	110	37	60	120	73
2009	7	107	149	129	105	59	63	122	60
2010	20	119	161	163	158	84	84	93	77
2011	29	114	174	167	162	74	143	110	94
2012	31	102	162	123	153	73	156	107	78
2013	25	109	171	114	116	87	116	93	54
2014	20	82	150	108	67	77	88	86	72
2015	24	88	133	110	58	77	106	75	71
2016	25	85	126	115	78	72	100	65	79
2017	20	94	116	105	91	68	85	67	78
2018	26	102	106	109	97	68	71	60	71
2019	24	94	98	109	76	58	66	59	58
2020	18	83	100	90	58	53	63	45	56
2021	26	87	111	93	73	64	62	44	61
2022	25	91	108	90	77	65	70	41	59

Source: TURKSTAT, https://data.tüik.gov.tr/Kategori/GetKategori?p=istihdam-issizlik-ve-ucret-10&&dil=1 22.07.2024

Table 6, which shows women's employment in the agricultural sector according to Level 2 in Türkiye, includes employment numbers in TR 83, TR90, TRA1, TRB1, TRB2, TRC1, TRC2, TRC3 regions.

Table 6: Level 2 Women's Employment in the Agricultural Sector in Türkiye

	TR83 (Samsun, Tokat, Çorum, Amasya)	TR90 (Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane)	TRA1 (Erzurum, Erzincan, Bayburt)	TRA2 (Ağrı, Kars, Iğdır, Ardahan)	TRB1 (Malatya, Elazığ, Bingöl, Tunceli)	TRB2 (Van, Muş, Bitlis, Hakkâri)	TRC1 (Gaziantep, Adıyaman, Kilis)	TRC2 (Şanlıurfa, Diyarbakır)	TRC3 (Mardin, Batman, Şırnak, Siirt)
2004	321	410	137	71	58	45	16	70	67
2005	285	375	124	85	66	69	13	51	28
2006	242	351	84	85	80	90	22	24	5
2007	243	331	60	96	83	69	38	27	4
2008	277	340	91	104	62	48	71	50	10
2009	282	358	98	83	79	52	42	39	7
2010	216	336	99	81	103	66	59	56	30
2011	228	326	73	92	93	100	46	46	16
2012	191	335	59	91	117	103	51	40	8
2013	193	259	65	104	157	89	68	80	16
2014	190	236	86	113	82	128	48	116	32
2015	190	244	93	105	80	138	47	121	19
2016	194	243	78	91	75	108	29	127	9
2017	195	250	64	87	96	115	37	159	17
2018	222	230	53	81	104	91	42	132	17
2019	189	258	46	82	97	88	49	136	18
2020	158	196	49	62	70	84	52	92	21
2021	187	210	47	71	76	78	70	91	18
2022	176	207	63	66	67	87	55	91	38

Source: TURKSTAT, https://data.tüik.gov.tr/Kategori/GetKategori?p=istihdam-issizlik-ve-ucret-10&&dil=1 22.07.2024

When a comparison is made with the data shown in Table 4, Table 5 and Table 6, it is seen that the highest female employment occurs in the TR90 region, which includes the provinces of Trabzon, Ordu, Giresun, Rize, Artvin and Gümüşhane. It can be said that the lowest female employment in the agricultural sector belongs to the TR10 region.

5. Conclusion and Evaluation

It is seen that gender discrimination has existed throughout history and that babies are subject to discrimination even when they are not yet born. It can be said that this discrimination deeply affects the structure of a society and its reflections on the economy are in this direction. It is seen that this discrimination against women manifests itself in almost every field. In Türkiye, women are far behind men in terms of employment, unemployment, positions such as parliamentarians, ambassadors, academicians, senior and middle-level managers in economic terms.

It can be said that they are left behind. In addition, there are wage and earning differences between women and men. The fact that women, who make up almost half of the population, are less involved in the economy compared to men may indicate that there is discrimination against women in the Turkish economy.

It is seen that the status of women in the economy and society is lagging behind that of men. Even in the agricultural sector, which is a sector where they can make the most contribution in terms of production, women's employment has not been given enough space. For this reason, women who are employed may encounter many problems. There have been changes in the status of women in politics and the economy in Türkiye. It can be said that women were affected positively and negatively depending on the developments in the world in the 1980s and afterwards. When we look at employment in agricultural and non-agricultural sectors in Türkiye in the 21st century, it is seen that employment in non-agricultural sectors is quite high compared to the agricultural sector. It can be said that the employment of women and men in the agricultural sector is low compared to the non-agricultural sectors, but that women's employment is also lower in itself. When looking at Level 1 and Level 2 regions, it is seen that the lowest employment in Level 1 is in Istanbul, and the highest employment for women is in the Aegean Region in 2012 and after.

However, despite this, agricultural employment is still on the decline in this region. When looking at Level 2 regions, it is seen that the highest employment belongs to the TR90 region. In short, it is seen that women in Türkiye are exposed to low employment opportunities in other sectors, especially in the agricultural sector. It is thought that this situation has a negative impact on the development of the agricultural sector and the economy. Especially when its potential is considered from a regional perspective, it is expected that more women's labor will have positive effects on the economy. Therefore, government policies

and practices should ensure that women are more involved in employment. In addition, it is thought that employment opportunities should be opened for women in non-agricultural sectors, especially in the agricultural sector, and that support should be provided in this direction.

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CHAPTER XV

LIMITATION AND OVERSIGHT OF POLITICAL POWER THROUGHOUT HISTORY: AN EXAMINATION OF THE OMBUDSMAN INSTITUTION AS AN ALTERNATIVE MECHANISM

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1. Introduction

The concept of the liberal state, which emerged in the aftermath of the Industrial Revolution, proved inadequate in safeguarding fundamental human rights and freedoms. This shortcoming led to the evolution of the welfare state model, predicated on the necessity of active state intervention in various aspects of human life to ensure the protection of these rights and freedoms. Over time, the administrative activities and institutional interventions of states have expanded significantly, rendering the effective oversight of administrative bodies increasingly challenging. In response to the limitations of classical oversight mechanisms, the ombudsman institution—a novel, practical, efficient, and cost-effective oversight tool—has gained prominence and widespread adoption globally. This study explores the historical evolution of the mechanisms for limiting political authority and supervising administrative actions. Furthermore, it evaluates the ombudsman system as an alternative oversight mechanism within the broader framework of limiting and monitoring political power.

The study employs qualitative research methods to examine the role of the ombudsman institution in administrative oversight throughout history. The findings underscore that oversight mechanisms constitute a critical component of the administrative process, particularly in the context of limiting political power. Moreover, the ombudsman institution emerges as a vital element of this process due to its dual capacity to evaluate both legality and appropriateness in administrative actions. As part of this study, the emergence of the ombudsman institution as a non-judicial mechanism for reviewing administrative actions is analyzed within a historical framework, emphasizing its contribution to the development of alternative oversight approaches.

2. Limitation of Political Authorities

Throughout history, the concept of natural law has emphasized the inalienable rights inherent to human beings, in contrast to the unlimited authority exercised by governments over humanity. The gradual development of this understanding over time has contributed to the limitation of governmental powers. Examining the evolution of the concept of human rights is crucial for understanding the position of individuals in relation to the state in the modern era.

2.1. Historical Developments in the Limitation of Power

Within the framework of natural law, the intellectual foundations of the inalienable rights inherently possessed by individuals from birth have been developed throughout history. These ideas have inspired revolutions and led to significant successes in challenging political power. This section examines the historical evolution of the concept of natural rights up to the modern state period, with a particular focus on its role in limiting political authority.

2.1.1. Limitation of Power in Ancient Greece

The roots of natural law, which seeks to protect individuals against political power, can be traced back to the philosophers of Ancient Greece. Ideas concerning the limitation of power evolved and diversified over time. These concepts are regarded as a foundational starting point in the historical progression toward the recognition of modern fundamental human rights and freedoms.

2.1.1.1. The Emergence of the Concept of Natural Law

The acknowledgment of the existence of inalienable rights and freedoms inherent in human beings dates back to Ancient Greece. One of the earliest

written sources referring to the idea of natural law, superior to human-made laws, is Sophocles' (495–406 BC) tragedy Antigone (Uygun, 2019: 486), dated 411 BC. This tragedy encapsulates the concepts of natural rights and the limitation of power. In the story, two brothers kill each other while fighting for the throne. Upon learning that one of her brothers will not be buried, Antigone defies Kreon's order and buries her brother. Kreon confronts the captured Antigone, questioning her for violating the law. Antigone asserts that neither Zeus nor the Goddess of Justice recognizes such a law. She declares that the command of a mortal holds no authority over the eternal and unwritten laws of the Gods, emphasizing that she would rather face divine punishment than obey a mortal, given the brevity of life. According to her, the laws of the Gods have always existed, even if they have not been written down (Sophocles, 2005: 69-87). She argues that everyone has the right to a proper burial, a right that cannot be overridden by any positive law (Uygun, 2019: 486). This tragedy illustrates the notion that the authority of rulers is not unlimited, as the laws of the Gods surpass the laws of earthly power.

Another philosopher who advocated for the existence of natural law is Plato. Plato's general philosophy is grounded in his theory of ideas (Plato, 2022: 222-223). According to Plato, the sensory world is subject to constant change and therefore varies depending on circumstances and individuals. This sensory world is merely a reflection of the universe of ideas (Uygun, 2019: 113). Unlike the sensory world, the universe of ideas remains unaffected by change and possesses an independent existence. Plato explains the distinction between these two worlds through the allegory of the cave.

The world perceived through the senses and the world comprehended through reason are distinct from one another. However, the connection between them arises because the Demiurge—a divine being outside the material world—shapes and gives form to formless matter. Through the Demiurge's intervention, the shadows of the beings from the world of ideas manifest in the material world. Within the universe of ideas, there exists a perfect order and hierarchy. All ideas derive their characteristics from the idea of the good, which is the highest of all ideas. Plato describes the idea of the good as the ultimate cause of everything in the universe (Plato, 2022: 219). According to him, being is inherently good, beautiful, and just. Humans, too, are essentially good by nature. The only reason for the existence of evil is ignorance of the good. People commit evil acts because they lack knowledge of what is good and what is evil (Özkan, 2018: 4). Plato argues that the state's duty is to ensure the realization of the absolute good by educating its citizens (Plato, 2022: 120-121). The state must maintain order

and provide the best possible education to help society distinguish between good and evil, thereby enabling the achievement of perfection (Özkan, 2018: 4).

Plato believes that excesses, such as wealth and poverty, which cause human beings to become dysfunctional and ineffective, should not be allowed to emerge. He argues that the use of power must be subjected to truth and justice to prevent it from going to extremes (Uygun, 2019: 120). In this way, it becomes possible for people to achieve happiness by living together in harmony and peace. With these ideas, Plato stated that the purpose of the state is to ensure the happiness of its people, and he saw states that failed to achieve this as doomed to collapse. Humans, like all matter, will strive to reach their best form by turning towards the idea of the good, which is permanent and unchanging. States will play an intermediary role in this process.

According to Aristotle's view of natural law, a natural being is composed of both matter and form. Since humans are natural beings, everything that exists or comes into existence naturally carries within itself the natural principle of becoming and being. However, Aristotle asserts that unless a being has a form, it does not yet have a nature (Akkağıt, 2022: 125-126). In Aristotle's understanding, matter and form, namely the human body and soul, interact. Beyond the necessity of needing each other to survive, humans also appear to have a natural sympathy for one another and a natural desire to be together. The common good is the most important factor that unites them (Arslan, 2019: 286). According to Aristotle, the desire of all living beings to realize their essence and reach the highest good manifests itself in the effort to achieve happiness, which results from a life established in accordance with reason. Humans achieve this by using reason—the only essence in humans— to the maximum level. Consequently, the ultimate goal is the attainment of happiness (Kantarcı, 2014: 24).

Unlike Plato, Aristotle does not equate the natural with the unchanging; he considers the changes that occur as a result of a being's inner efforts to be natural. While pursuing happiness, human beings cannot achieve this goal alone. Instead, they can only reach the highest level of their development as members of society, within political and social rules and unity (Türkeri, 2005: 142). Aristotle defines happiness as the 'best' among the 'good,' and views happiness as the ultimate goal toward which other goals are directed (Aktaş, 1996: 38). According to Aristotle, individuals do not belong to themselves but to the state, and the purpose of the state is goodness and justice. Its duty is to educate the people (Fendoğlu, 1993: 135).

Although the views of Plato and Aristotle are considered within the framework of natural law, these views do not prioritize fundamental human

rights and freedoms. It is evident that they only regarded free Greek men as citizens and accepted slavery as a normal condition. According to them, the establishment of the state is based on people coming together to fulfill their needs. However, not all individuals enjoy rights and freedoms equally.

For the first time in the Ancient Age, the Stoics emphasized that reason and law were above the state, asserting that both the state and individuals must abide by them, and that all people are brothers and sisters (Gözler, 2022: 126).

Within the scope of the views of Plato and Aristotle, it is apparent that people come together as a result of their needs and form the state. It has been determined that the rulers of this state are wise individuals, the concept of 'justice' is prioritized, and the purpose of the state is to ensure the happiness of the people. In states governed in this manner, it cannot be said that the rulers possess absolute power. This is because these philosophers mentioned that arbitrariness in governance leads to the deterioration and transformation of governance forms. In the ideal state models presented by these philosophers, the powers do not have unlimited authority. According to the Stoics, there are laws of reason and God that transcend positive laws. For this reason, governments cannot have unlimited authority. Additionally, the concept of fraternity emphasized by the Stoics aligns with the principle of equality as understood in today's context.

2.1.1.2. Democratic Practices in Ancient Greece and Associated Critiques

Democracy, which emerged around 2,500 years ago in the city-states known as polis in Ancient Greece, contributed to the establishment of modern states (Aydoğdu, 2019: 4739). In Ancient Greece, democracy was understood as the sovereignty of the people or the majority, with power held by the people; however, the concept of citizenship did not encompass all inhabitants of the city (Dinçkol, 2017: 753). Accordingly, only free men could participate in governance, while slaves, women (even if they belonged to an aristocratic class), guests, and soldiers were excluded from this right (Aydoğdu, 2019: 4744). This form of government, which can be described as a form of minority democracy, allowed political participation through popular assemblies. The assembly had the power to decide on matters of war and peace, enact laws, question rulers and public officials, and even dismiss them as a result of such questioning (Yalçınkaya, 2019: 41). In this example of direct democracy in Athens, although certain means of control were adopted to limit power, the fact that only free, male Greek citizens had a say in governance highlights that the aim of protecting the rights of all people within the polis was not realized.

Plato criticized the direct democracy of Athens at the time, describing it as "the rule of an ignorant people." In his ideal state, only wise individuals would be fit to rule. In his work The Republic, he argued that aristocracy would eventually degenerate into thymocracy, thymocracy into oligarchy, and oligarchy into democracy (Plato, 2022: 270-295). In such a state, there would be no sense of duty, as democracy, by its very nature, is based on freedom. People who are liberated in all matters would avoid taking responsibility. It is neither possible nor controllable for everyone to have infinite freedom. The people's hunger for freedom would interfere with the rights of others (Plato, 2022: 292-293). While some individuals would grow wealthier, others would become poorer. Democracy would ultimately give way to tyranny. In other words, the pursuit of extreme freedom would lead to harsh slavery (Plato, 2022: 294). Although the philosopher defined a utopian ideal state in The Republic, he felt the need to adjust his ideas for practical application in his later work The Laws. In The Laws, the ruling stratum to whom power was originally entrusted in The Republic was replaced by the power of laws.

In Politeia, which Aristotle defines as the best form of government, rulers consist of virtuous individuals. These rulers are the most qualified, well-educated people, selected from among the free citizens. Additionally, there are public assemblies designed to protect the interests of the people. These assemblies, composed of free citizens, have increased participation in governance. In contrast, Aristotle viewed democracy, as a deviant form of government, as primarily concerned with freedom, yet it was often dominated by a poor majority making decisions. The philosopher categorized democracy into four types, ranging from moderate to deviant democracy. In the deviant form of democracy, the will of the people becomes paramount, and this form of popular participation in governance is criticized by Aristotle (Topakkaya & Özyürek Şahin, 2015: 201).

2.1.2. Limitation of Power in Medieval Europe

In the Middle Ages, the feudal system and Christian faith contributed to the limitation of governmental power, and the adoption of the Magna Carta, a document that restricted the powers of the king, occurred during this period.

2.1.2.1. Key Actors Limiting Political Power

In medieval Europe, two powerful forces emerged that could limit authority: the feudal lords, who wielded wealth and power, and the Christian faith, which in its early stages valued individuals for their inherent humanity.

2.1.2.1.1. The Role of Feudalism

In the 3rd century, the weakening of the Roman Empire and the increasing barbarian invasions led local authorities, namely the feudal lords, to assume the responsibilities of tax collection, justice, and security in place of the central government (Uygun, 2019: 145). Feudalism refers to the system in which landowners, known as overlords, held nearly absolute control over all goods and persons within their land in Western and Central Europe until the French Revolution. Accordingly, the feudal lord was responsible for all administration within his domain, ensuring its protection from external threats, and controlling all profits derived from the land. Due to this structure, the central state began to disintegrate, and the absolute and unlimited power of the state became constrained (Gözler, 2022: 129). Additionally, the goods donated to the Church by individuals seeking to cleanse their sins and attain salvation further elevated the Church's power, thereby diminishing the political authority's power even more (Uygun, 2019: 148-149).

2.1.2.1.2. The Influence of Christianity

Initially banned within the Roman Empire, Christianity was officially recognized in 313. While its spiritual aspect predominated in the early period, as the authority of the state weakened, the Church began to assume a more active role in worldly affairs, establishing itself as another significant authority (Büyük, 2004: 138).

2.1.2.2. Thinkers Advocating for the Limitation of Power

Medieval intellectuals, influenced by Christian doctrine, conceptualized ideal states based on the idea of 'God.' They argued that bad rulers would answer to God rather than claiming their authority from God.

2.1.2.2.1. St. Augustine

Augustine attempted to explain Christianity from a philosophical perspective. He divided the state into two categories: the 'City of God' and the 'Earthly City.' According to Augustine, all humans are born sinners due to the original sin of Adam and Eve. Those who are free from sin belong to the City of God, while sinners remain in the Earthly City. Augustine's concept of limiting power is based on the idea that rulers are accountable to God. The notion of a ruler deriving absolute and unlimited power from God evolved into the belief that rulers who govern unjustly will ultimately answer to God.

2.1.2.2.2. Thomas Aquinas

Aquinas modified the saying "All power comes from God" to "All power comes from God through the people." By distinguishing between the source and the exercise of power, he recognized a role for the people in governance, thereby contributing to the development of democratic ideas.

2.1.2.3. Contractual Development Supporting the Limitation of Power: Magna Carta

The Magna Carta Libertatum, signed during this period, stands as an important document in limiting the powers of the government. Issued on June 15, 1215, by King John of England, the Magna Carta set a precedent for subsequent declarations by grounding human rights and freedoms in legal and political terms, rather than leaving them as abstract concepts (İlal, 1968: 210). Notably, this document, which has significantly influenced today's legal systems, was the result of pressure from feudal lords, not the people (Karaimamoğlu, 2022: 119).

The Magna Carta is significant in history for two key reasons. First, it protects the rights and freedoms of all individuals without discrimination. Second, it contributed to the development of the idea of the rule of law by asserting that the king could not be superior to the law, thus providing the first example of the concept of the rule of law (İlal, 1968: 210-211).

2.1.3. The Emergence of the Modern State

The Ottoman Empire's control over the Mediterranean, which restricted trade, pushed Europe into a closed agricultural economy, thereby reinforcing the feudal structure that operated on a small scale in the Middle Ages. However, the end of this blockade revitalized commercial life and brought the bourgeoisie, enriched by trade, into prominence, replacing the aristocracy that derived its power from land ownership.

The borders of feudal principalities were too small, and those of empires were too large to accommodate the secure markets required by the commercial bourgeoisie. As a result, the desire for increased wealth and the pursuit of power grew proportionally. The strengthening bourgeoisie supported the kings in this context, allowing the kings to establish political unions by incorporating local units. The concept of 'sovereignty' explained the concentration of all powers in the hands of the monarchs.

2.1.3.1. Philosophers Advocating for the Limitation of Power

During this period, the ideas of Locke, Montesquieu, and Rousseau laid the intellectual foundations of the French Revolution, which ended the absolute and unlimited power of the king and influenced changes in the forms of government worldwide.

2.1.3.1.1. John Locke

Locke advocated for a constitutional monarchy that would protect the interests of the bourgeoisie and respect natural rights. According to Locke, before the establishment of the state, humans lived in a state of nature governed by the law of nature, which considers everyone equal and independent and includes rules that no one may harm another's life, health, liberty, or property (Akkurt, 2021: 113-114). In the state of nature, people have inalienable natural rights to their lives, property, and freedom (Uygun, 2019: 215). Locke defines the state of nature as a state of peace. However, anyone who exercises unauthorized power, regardless of their identity, creates a state of war (Akkurt, 2021: 118). Thus, while everyone is equal and free, this brings with it certain issues. Although the laws of nature are clear, some individuals may act contrary to them. In the face of injustices that arise from this situation, individuals may act as their own judges and seek revenge, while those who should be punished may attempt to evade justice (Odabaş, 2018: 75). To resolve these issues, people end the state of nature and form the state through a social contract; thus, the state may only exercise its authority to protect individuals' security, life, property, and freedoms (Uygun, 2019: 214). Since individuals have inalienable natural rights even in the state of nature and cannot intervene in this domain, the state is not granted absolute power and is instead responsible solely for ensuring security and justice (Uygun, 2019: 214-215). If the state exceeds its powers or fails to fulfill its duties, it constitutes a breach of contract (Kapani, 1993: 304). In response to such a breach, individuals have the right to resist. Locke's views formed one of the intellectual foundations of both the French and American Revolutions (Uygun, 2019: 216). He is regarded as the founder of liberalism due to his understanding of the limited state.

2.1.3.1.2. Charles Louis Montesquieu

Montesquieu emphasized the variable nature of human beings, stating that they are influenced by their natural and social environments, and that different

societies and social institutions are formed under these conditions (Gürkan, 1988: 12). According to him, laws do not emerge based on the whims of rulers, but are shaped by the geography, climate, traditions, and beliefs of different countries (Uygun, 2019: 226). Montesquieu, inspired by Locke's classification of legislative, executive, and federative powers, argued that power should be separated into three branches: legislative, executive, and judicial. Montesquieu's assertion of judicial power as a separate and independent branch complements the idea of a liberal state (Öztürk, 1987: 209). He stressed the necessity of the separation of powers to protect freedoms and argued that adopting this system would benefit the French people (Değirmenci, 2023: 23). This principle was strongly embraced by the French revolutionaries (Uygun, 2019: 230).

2.1.3.1.3. Jean-Jacques Rousseau

Rousseau believed that people are born equal, that their only society is their own family, and that the only valid law is the "law of nature" (Geçit, 2022: 290). He argued that no one has superiority over another, and that brute force does not create rights; thus, contracts are the foundation of all legitimate claims (Rousseau, 2012: 7). According to Rousseau, surrendering freedom leads to the loss of one's humanity, and contracts that do not benefit both parties are invalid. Therefore, the right to slavery is not only wrong but also meaningless and absurd (Rousseau, 2012: 9-12).

Rousseau argued that people, who are equal and free, may only give up their freedoms for their own interests and to establish a state. While people lived freely, equally, and happily in the pre-state period, the emergence of private property disrupted this order, and the wealthy class established the state to protect themselves from the poor. However, a state and social order should be established in which all people can be equal and free. For this purpose, the social contract should be based on unanimity, and laws should be determined by majority vote (Uygun, 2019: 230-233). It is unthinkable for the sovereign entity created by the social contract to act against the interests of the people who created it; thus, all interests compel the parties to mutually support each other (Rousseau, 2012: 17). Rousseau has had the most significant influence on the contemporary concept of democracy, particularly with his model of direct democracy as seen in the social contract (Uygun, 2019: 230).

2.1.3.2. Revolutionary Developments in Limiting Power

The 18th century is often referred to as the Age of Enlightenment, a period marked by the influence of the English, American, and French Revolutions.

Although all these revolutions were driven by different reasons and resulted in divergent outcomes, they left a lasting impact on the period. For instance, while the French Revolution was based on the rational principles of the French Enlightenment, the American Revolution was rooted in the idea of freedom (Koç, 2018: 55).

2.1.3.2.1. The American Revolution

In contrast to the aristocratic control of the state in Britain, the American colonies were composed of middle-level nobility, and the geographical distance from the metropolis provided the colonists with a broad area of freedom, free from oppression. For these reasons, Protestantism became dominant in the American colonies, which, in turn, allowed the colonies to approach the point of self-governance. Following the Seven Years' War between Britain and France (1756-1763), which ended in Britain's favor, the tax burden on North America was increased to alleviate the financial strain resulting from the war (Bonwick, 2003: 94-95). In response, the revolutionary movement known as the American War of Independence took place from April 19, 1775, to September 3, 1783. The American Declaration of Independence, dated July 4, 1776, marked America's separation from Great Britain and holds significant importance in American political and intellectual history (Köktaş, 2014: 116).

The Declaration highlighted the repeated injustices of the British King, emphasizing his arbitrary actions in administration and his attempt to establish absolute tyranny over the colonial states. This situation ultimately forced the colonies to decide to alter their system of governance. The declaration concluded by stating that a monarch who governed tyrannically could not rule over a free people, thereby terminating political relations with Great Britain and recognizing all colonies as free and independent states. The Declaration emphasized natural rights and the necessity of limiting the absolute power of governments, asserting that governments were established to protect the inalienable rights of individuals.

2.1.3.2.2. The French Revolution

By 1788, stagnation in industry and trade, poor harvests, and a harsh winter led to uprisings by peasants and looting by city dwellers. Although the idea of collecting taxes from the churches and nobles, who had previously been exempt, was raised as a solution to the financial crisis, the notion of "equality in taxation" was rejected (Arslan, 2018: 21). In response to this conflict, King Louis XVI called for the convening of the Estates General on May 5, 1789. However, the segment that had been silenced defied the King, declaring itself

the National Assembly. This defiance culminated in a popular uprising on July 14, 1789, during which the Bastille Prison was stormed and seized (Giritli, 1989: 539). The revolution was driven by the wealthy bourgeoisie's desire for political identity, alongside the positive influence of the philosophical ideas of Locke, Montesquieu, and Rousseau on the people.

On August 26, 1789, the National Assembly adopted the Declaration of the Rights of Man and the Citizen, consisting of seventeen articles. The Declaration identified the disregard and neglect of human rights as the primary causes of disorder in governance and the suffering of the people. This document also served as the preface to the French Constitution of 1791. The French Revolution, along with the subsequent declaration, would later promote the adoption of nationalism and liberalism—principles that minimized the state's interference in individuals' lives—across the world.

2.2. Oversight of Administrative Authorities

Individual and political rights, referred to as first-generation rights, developed around the natural rights doctrine in the 17th and 18th centuries and were recognized by documents such as the Declaration of the Rights of Man and the Citizen and the American Declaration of Independence. In this context, the state should not interfere with the rights that people are considered to have inherently, as well as political rights such as voting, being elected, and engaging in political activity (Gözler, 2022: 157). These rights impose an obligation on the state not to interfere and require the state to adopt a passive attitude.

However, in Europe, where poverty emerged due to the influence of the working class that arose with the Industrial Revolution, people were unable to fully benefit from their innate rights. In the 19th century, in addition to creating a field of freedom for human rights, the aspect that gave individuals the authority to request services from the state was highlighted, leading to the regulation of second-generation rights (Uygun, 2019: 498-500).

While the recognition of second-generation rights in positive law is reflected in constitutions made after the First World War, their implementation coincided with the period after the Second World War (Gözler, 2022: 157). With the development of these rights, the social state emerged in the 19th century in opposition to the concept of the gendarmerie state, which was inspired by liberal philosophy (Atar, 2017: 118). In human rights law, the obligation to refrain from interfering with or violating rights without a valid reason is defined as the negative obligation of the state. In contrast, the necessity for the state to take

certain measures and take active action for human rights to be effectively used and become functional emerges as the positive obligation of the state (Sunay, 2013: 51-54).

In light of these obligations, the power of human rights to limit state power should be recognized, and a guarantee mechanism should be established by incorporating principles such as respect for human rights, the rule of law, the social state, separation of powers, human dignity, justice, and equality into the constitutions (Sunay, 2013: 108). The greatest threat to human rights comes from the state, and particularly from the administration, which is a part of the executive branch. This is because administrative activities affect everyone daily (Gözler, 2022: 50). For this reason, it is necessary to establish a security mechanism.

States possess the privilege called 'public power' in the lives of individuals, derived from the authority granted by society. Public power is exercised by the administration. When the term administration is used in a functional/material sense, it refers to all activities carried out by the administration to achieve the state's specific goals. When used in an organic sense, it refers to the administrative organization encompassing the department, institution, or place where any administrative work or official duties are carried out (Akyılmaz, Sezginer, and Kaya, 2018: 8). The authority possessed by states allows the administration to unilaterally establish transactions without the consent of the relevant individual. Even with the presence of legal rules that the administration is obligated to follow, the administration must be audited to ensure compliance with these rules. In cases of non-compliance, the administration must be held accountable for its mistakes (Ulusoy, 2023: 701).

The rule of law is defined as a state regime governed by legal rules rather than arbitrary ones, and the fact that the administration, as an organ of the state, is also subject to the law is a natural consequence of this principle (Akyılmaz, Sezginer, and Kaya, 2018: 68). One of the distinguishing features of the rule of law is the existence of effective legal protection mechanisms that individuals can use continuously and regularly against the unlawful activities of the administration. The principle of the rule of law is only realized when control and sanction mechanisms exist together (Ulusoy, 2023: 94). This principle requires that all actions and transactions of the state be carried out within the framework of legal rules and ensures legal security for citizens (Özbudun, 1998: 89).

To be a democratic state governed by the rule of law, it is not only necessary for the people to elect their leaders, but also for the principle of the separation

of powers to be upheld within the state. Additionally, fundamental human rights and freedoms, as well as the principles of the rule of law, must be respected (Ulusoy, 2023: 701-702).

2.3. Oversight of the Administration Through the Ombudsman Mechanism

The state, through its administration, makes concrete interventions in human life under the name of public administration. Administrative law emerged to ensure that the administration, with its public authority, complies with the rule of law. Under the influence of the French Revolution, the idea of supervising the administration developed, leading to the establishment of the French Council of State to oversee the relationship between individuals and the state. Initially, the Council of State served as an administrative unit that allowed the administration to supervise itself. However, over time, it began to encompass both administrative supervision powers and judicial powers (Ulusoy, 2023: 33). These developments led to the creation of a distinct judicial order known as the administrative judiciary. However, the inability to conduct an appropriateness check in Continental Europe created a significant limitation in judicial control over the administration (Düğer, 2019: 73). In general, the fact that judicial control is a lengthy process and does not perform an appropriateness check appears as a negative feature.

Although individuals have the option to appeal to the legislative body regarding the injustices committed by the administration through petitions or human rights commissions, the reports prepared by these commissions do not have executive power over the executive branch in accordance with the principle of separation of powers. In such cases, the legislative branch may enact laws based on the reports, but the likelihood of such laws being enacted is low, making legislative control over the administration often ineffective (Gözler, 2022: 443-444). Additionally, if a large majority in the legislative branch supports the executive, it seems practically impossible for the legislature to control the executive branch (Ulusoy, 2023: 702-703).

While administrative control methods can be employed against the actions of the administration, the administration's self-control often serves the purpose of covering up injustices and is insufficient in terms of protecting human rights and freedoms, as well as regulating the functioning of the administration.

As the scope of public services expands, it becomes apparent that traditional control mechanisms are inadequate to ensure the effectiveness and legality of

the actions and transactions of the administration, particularly in addressing violations, neglect, or mismanagement of individual rights and freedoms by the administration (Mutta, 2001: 5).

In response to this situation, the ombudsman control system, which provides a simpler, more affordable, and practical means of resolving individuals' issues with the administration, has developed as one of the non-judicial control methods for overseeing the administration (Ulusoy, 2023: 707). Initially introduced in Sweden, this control system has been adopted in many countries in various forms due to the need for effective administration oversight.

When examining the different practices across countries, it is evident that ombudsmen are experts, experienced, impartial, and independent of both the legislature and the executive. They are appointed for a specific term and, in principle, cannot be removed from office before the end of their term. They listen to individuals' complaints about misadministration, injustices, and unfairness. Additionally, ombudsman institutions are typically established by constitutions or laws and may consist of one or more ombudsmen. Individuals can access ombudsman services free of charge (Mutta, 2001: 8).

The state, through its administration, makes concrete interventions in human life under the guise of public administration. Administrative law emerged to ensure that the administration, holding public authority, complies with the rule of law. Under the influence of the French Revolution, the idea of supervising the administration developed, leading to the establishment of the French Council of State to oversee relations between individuals and the state. While the Council of State initially served as an administrative unit that allowed the administration to supervise itself, over time, it evolved to include both administrative supervisory powers and judicial functions (Ulusoy, 2023: 33). These developments led to the emergence of a separate judicial order known as administrative judiciary. However, the inability to conduct an appropriateness check in Continental Europe created a significant limitation in judicial control over the administration (Düğer, 2019: 73). Generally, the lengthy nature of judicial control and the lack of an appropriateness check are seen as negative aspects. Although individuals can appeal to the legislative body regarding injustices committed by the administration through petitions or human rights commissions, the reports produced by these commissions do not possess executive power over the executive branch, in accordance with the principle of separation of powers. The function that the legislative branch can fulfill in this context is the enactment of laws based on these reports. However, as the

enactment of such laws is unlikely, legislative control over the administration is often ineffective (Gözler, 2022: 443-444). Moreover, if there is a large majority in the legislative branch that supports the executive, it becomes practically impossible for the legislature to control the executive branch (Ulusoy, 2023: 702-703).

While administrative control methods can be used against actions by the administration, the administration's self-control often serves to conceal injustices and is insufficient in safeguarding human rights and freedoms or in regulating the functioning of the administration. As the scope of public services expands, it becomes clear that traditional control mechanisms are inadequate in ensuring the effectiveness and legality of the administration's actions, especially in cases of violations, neglect, or the misoperation of individual rights and freedoms (Mutta, 2001: 5).

In response to this situation, the ombudsman control system—recognized as a simpler, more cost-effective, and practical method for resolving individuals' issues with the administration—has emerged as one of the non-judicial control mechanisms of the administration (Ulusoy, 2023: 707). First implemented in Sweden, this control system has been adopted in various countries in different forms due to the need for effective administration oversight.

When considering the diverse practices of countries, it is evident that ombudsmen are experts, experienced, impartial, and independent of both the legislature and the executive. They are appointed for a fixed term and, in principle, cannot be removed from their duties before the end of this term. They address individuals' complaints regarding misadministration, injustices, and unfairness. It is also apparent that ombudsman institutions are typically established by constitutions or laws and can consist of one or more ombudsmen, with services being freely accessible to individuals (Mutta, 2001: 8).

3. The Historical Development of the Ombudsman Concept

3.1. Pre-Ombudsman Practices with Similar Functions

3.1.1. Yuan Control Institution

During the Qin Dynasty (221-206 BC) and the Han Dynasty (206 BC-220 AD), officials with the title of Yii Shih were appointed by the emperors to supervise and control members of the central government. During the Wei Dynasty (220-264 AD) and Jin Dynasty (265-420 AD), these officials were separated from the executive branch and gained independent control power.

In the Tang Dynasty (618-907 AD), the task was divided into two parts: one part was responsible for ensuring control of the central government, while the other was tasked with advising the emperor directly (Ma, 1963: 403-404). Based on this practice, the 1947 Chinese Constitution (Taiwan) integrated Western systems with ancient Chinese practices, acting on Sun Yat-Sen's principle of the "five branches of constitutional government," resulting in the establishment of five organs of the state. One of these organs, the Control Yuan, has its roots in the aforementioned practice in ancient China, which dates back more than 2,000 years (Annual Report of the Control Yuan, 2022).

These officials exhibit characteristics similar to those of the ombudsman, as they play a role in supervising the administration, are independent, and their statements are not coercive for the administration. They serve as a bridge between the administrators and the administered, and they can make suggestions to the administration to eliminate errors and deficiencies.

3.1.2. The Institution of Muhtasib (Hisba Organization)

The Islamic concept of "emr-i bi'l-maruf nehy-i ani'l-münker" (enjoining good, forbidding evil) required that rulers treat their people with justice. The assignment of muhtasib in Islamic states is rooted in the idea of justice. The practice of the muhtasib, which began during the time of Prophet Muhammad, encompasses religious, social, and commercial aspects (Eşrefoğlu, 1971: 100). Prophet Muhammad appointed Said bin Said el-As as muhtasib after the conquest of Mecca, and he himself assumed this role in Medina. During this period, muhtesips conducted various inspections in markets and bazaars to ensure that the rules of Sharia were being followed. This practice continued throughout the Abbasid, Andalusian Umayyad, Fatimid, Ayyubid, Mamluk, Seljuk, and Ottoman periods. The role of muhtasib was primarily effective in regulating commercial life, functioning as a control mechanism that listened to and decided on consumer complaints, and imposed administrative responsibility when necessary (Habergetiren & Yalnız, 2021: 184-186). Muhtasibs were responsible for overseeing the orderly functioning of commercial activities, monitoring civil servants' duties, and enforcing prohibitions (Hizmetli, 2017: 434-435). They also listened to public grievances regarding the judiciary and followed up on cases where no one could take the problem to a judge, or when individuals were unable to protect their own rights (İbn Aşur, 1988: 178). The judicial control exercised by muhtasibs, with its unique characteristics, had an administrative rather than a judicial nature (Fendoğlu, 2019: 182).

3.1.3. Court of Mazalim (Diwan al-Mazalim)

There are differing opinions regarding the origins of cruel practices. It is suggested that these practices date back to the Hilfü'l-fudûl organization, which included Prophet Muhammad, and that their formalization as an institution coincided with the period of Imam Ali. The Umayyad Caliph Abdülmelik b. Mervan was the first to designate a specific day for the cruelty meetings. This practice persisted and gained influence in other Islamic states (Yeniçeri, 2004: 516-518). During the Abbasid period, it became an integral part of the administrative structure and was referred to as Diwan al-Mazalim. Additionally, during the Zengid period, a building named Daru'l-Adl was constructed for the practice (Coşkun & Günaydın, 2015: 29). It is also noted that the responsibilities of this institution were directly assumed by the Imperial Council in the Ottoman Empire.

The Diwan al-Mazalim is the competent authority in matters of trial, administrative oversight, judicial control, and financial supervision. Although the functions of the Diwan al-Mazalim encompass duties similar to those of contemporary ombudsman institutions, the Diwan differs significantly in terms of its breadth of authority, scope of duties, and jurisdiction.

3.2. The Emergence and Spread of Ombudsman Practices

The ombudsman system, which has rapidly gained international acceptance, was first established in Sweden within a cause-and-effect cycle. It was subsequently transformed in response to the political conditions of the country and began to spread as a necessary practice in many nations following events that led to increased governmental intervention in citizens' lives worldwide.

3.2.1. Origins of the Ombudsman Institution

The Ottoman Empire signed the Treaty of Karlowitz on January 26, 1699, marking the beginning of its decline. This treaty, signed with Austria, Venice, and Poland (the so-called Holy Alliance states), prompted Russia, which had benefited from the Ottoman Empire's state of war, to focus on the Baltic Sea. Russia believed it would no longer be able to maintain its success in the peaceful environment fostered by the Treaty of Karlowitz (Kurat, 2014: 275). In line with its objectives, Russia signed the Treaty of Istanbul (July 13, 1700) with the Ottoman Empire, which was valid for 30 years. This treaty allowed Russia to neutralize a potential Ottoman threat and directed its attention toward Sweden, as it established the Triple Alliance with Denmark and Poland (Kurat, 1940: 37).

During this period, King Charles XII of Sweden, who had ascended to the throne, initially gained the upper hand over the Triple Alliance in the early stages of the Great Northern War. However, he was decisively defeated by the Russian army, led by Tsar Peter I, at the Battle of Poltava on July 8, 1709. Following the defeat, King Charles XII sought refuge on the Ottoman border, where he and his soldiers were granted asylum. The king resided in Bender for more than five years, earning the nickname "Iron Head Charles" in the Ottoman Empire due to the length of his stay. It is suggested that during his extended visit, King Charles XII had the opportunity to observe Ottoman state practices closely, which influenced the development of the concept of the ombudsman.

In the Ottoman Empire of that period, influenced by the Divanı Hümayun institution, the Kadi'l-kudat authority, and the practices of the Ahi organization, individuals were able to submit their complaints and requests, thereby ensuring the respect of individual rights vis-à-vis the administration. This situation positively affected the functioning of the administrative order. Considering that the technological advancements available today were not present during that time, it seems unlikely that the King of Sweden could achieve the desired administrative efficiency during the periods he spent away from his country.

In 1713, the King established an office headed by Högste Ombudsmanen, a representative of himself, to ensure order and control within his country. Upon his return, the King discovered that the ombudsman had played an intermediary role in the administration by listening to citizens' complaints and offering logical suggestions to ensure the efficiency and fairness of public services. As a result, he decided to continue the institution (Mutta, 2005: 52-54). The concept of Högste Ombudsmanen became permanent in 1719, and with the change in name, it began to be referred to as Justitiekansler (Chancellor of Justice). As of 1739, the institution began to report to the Riksdag (parliament), and as a result of the conflicts between the executive and legislature in the 1809 Constitution, the ombudsman became subordinate to the parliament, while the Chancellor of Justice was subordinated to the king (Coşkun & Günaydın, 2018: 54-55).

The appeal of controlling the administration through the ombudsman lies in the fact that, unlike other administrative control mechanisms, it is an independent, efficient method that can perform both legality and appropriateness control. Given this, since the ombudsman functioned as an institution affiliated with the administration in its original form in 1713, the activities of the ombudsman essentially meant that the administration was controlling itself. The 1809 amendment enhanced the effectiveness of the ombudsman as an

institution independent of the administration, aligning its function with today's understanding of the parliamentary ombudsman.

3.2.2. Global Diffusion of the Ombudsman Model

Ombudsmanship gained constitutional recognition in Sweden in 1809 and was not adopted by any other country for more than a century. After World War II, as states began to play an increasingly active role in human affairs and their interventions became more pronounced, new methods of supervision were needed to protect fundamental rights and freedoms from potential administrative overreach. At this point, the simple, fast, and effective nature of ombudsman supervision garnered increased interest. The widespread application of this system first developed in the Scandinavian region, being adopted in Finland in 1919, Denmark in 1955, and Norway in 1962. The ombudsman model, which did not have the authority to investigate the judiciary, was later adopted by other countries through Denmark and Norway, with New Zealand following suit in 1962. This wave of adoption was subsequently embraced by other members of the British Commonwealth of Nations (Reif, 2000: 7-8).

The initial skepticism about the ombudsman practice being exclusive to northern countries due to their similar social structures and legal systems was dispelled with the acceptance of such practices in Commonwealth countries (Mutta, 2005: 55). In 1967, the UK implemented its version of the ombudsman, wherein the appointment was made by the government (Ataman, 1993: 218-222). Accordingly, the parliamentary commissioner, appointed by the Crown on the Prime Minister's recommendation, is also required to receive approval from the House of Commons (Zeren, Tekin & Özdek, 2000: 41). Despite the belief that an ombudsman was unnecessary in a country where administrative control was most effectively exercised, France introduced this practice in 1973 (Ataman, 1993: 218).

The term "ombudsman," a combination of the Swedish words 'ombuds' (representative, intermediary, agent) and 'man' (person), takes on different meanings in various countries. In some nations, terms such as 'public defender' in France, 'people's lawyer' in Austria, 'justice defender' in Portugal, 'civil defender' in Italy, and 'public inspector' in Turkey have been adopted instead (Tortop, 1998: 4-5). In its Recommendation No. 757 (1975), the Parliamentary Assembly of the Council of Europe emphasized that public authorities were playing an increasingly significant role in human life. While fundamental rights and freedoms had been safeguarded, there was a growing concern that these

protections might be compromised due to increasing interventions by public authorities. The Assembly also noted that other judicial control mechanisms might not be sufficiently fast or effective in terms of administrative oversight and thus called for a faster, simpler, cheaper, and more flexible method—believing that the ombudsman could fulfill this role. The recommendation urged member states that had not yet adopted this practice to do so, in light of the positive effects of increased parliamentary control over the executive.

The International Ombudsman Institute was established in 1978 as the only global organization where over 200 independent ombudsman institutions from more than 100 countries across six different regions cooperate. The Institute's internal regulations outline two primary objectives. The first is to embrace inclusivity in light of the diversity of countries, administrations, and ombudsman practices, reflecting this diversity across all members. The second is to uphold the fundamental values of independence, objectivity, and justice by advancing the role of the ombudsman.

In its Recommendation No. 13 (23 September 1985), the Committee of Ministers of the Council of Europe, referencing Recommendation No. 757 (1975) of the Parliamentary Assembly and Resolution No. 2 of the European Conference of Ministers on Human Rights (Vienna, 19-20 March 1985), stated that it was desirable to increase control mechanisms in the face of the complex structure of modern administration. The Committee further noted that parliamentary control could be strengthened by establishing the ombudsman institution, while considering the administrative functioning unique to each country. Accordingly, the Committee recommended that member states evaluate the possibility of appointing ombudsmen at national, regional, or local levels or within specific areas of public administration, strengthen the ombudsman institution, initiate actions to enhance the focus on human rights even in the absence of an ombudsman, and expand the powers of the ombudsman institution to protect fundamental rights and freedoms in the context of administrative functioning.

Successful ombudsman practices at the regional and national levels in the member states of the European Union have been instrumental in the institution's evolution into a supranational entity within the EU (Sucu, 2021: 165). The Maastricht Treaty of 7 February 1992, the founding treaty of the European Union, led to the establishment of the concept of the European Ombudsman under Articles 8/d and 138/e. The Amsterdam Treaty of 2 October 1997, which amended the Maastricht Treaty, introduced regulations regarding the European

Ombudsman in Article 195. According to the first paragraph of this article, the European Parliament appoints an ombudsman, and citizens of the Member States, as well as residents and legal entities based in these States, are permitted to submit complaints concerning maladministration by Community institutions or bodies (excluding the Court of Justice and the Court of First Instance) to the European Ombudsman. The Ombudsman is required to submit an annual report detailing the findings of these investigations to the European Parliament. The Treaty on the Functioning of the European Union, the EU Treaty, the EU Charter of Fundamental Rights, the EP's Decision on the Status of the European Ombudsman, and the Implementation Provisions of the European Ombudsman all contain provisions relating to the European Ombudsman (Sucu, 2021: 166).

On 2 May 2019, the Principles for the Protection and Development of the Ombudsman Institution (Venice Principles), adopted by the European Commission for Democracy through Law (Venice Commission), were approved by the Committee of Ministers. These principles emphasize the significant role of ombudsman institutions in strengthening democracy, the rule of law, and good administration, as well as in protecting and advancing human rights and fundamental freedoms. The existence of various ombudsman practices across the member states of the Council of Europe was acknowledged, and it was confirmed that support would be extended to protect and reinforce ombudsman institutions across all member states, regardless of these differences, with a guarantee of their independence.

The principles recommend that ombudsman institutions derive their legal basis from constitutions, be of a high rank, and ensure that ombudsmen receive salaries and retirement benefits commensurate with their status. Furthermore, it is advised that the election process for ombudsmen should strengthen the institution's impartiality and independence, with ombudsmen preferably elected by parliament through an appropriate qualified majority. It was stated that the criteria for appointing an ombudsman should include high moral character, honesty, and professional expertise. The term of office for ombudsmen should exceed the term of the appointing body, and the protection and development of fundamental rights and freedoms, as well as the prevention and correction of administrative errors, should fall within their mandate.

The principles further stipulate that any natural or legal person may apply to the ombudsman free of charge, that the ombudsman can request meetings or written explanations from relevant authorities, and that the ombudsman can make recommendations to institutions within their jurisdiction. It was also decided that the ombudsman should report to parliament at least once per year.

4. Conclusion

The issue of limiting power has been a subject of discussion for centuries, both in power struggles and human rights debates. Since power is ultimately embodied through individuals and those in power can always abuse it, limiting power has been an ongoing endeavor. Philosophers since Ancient Times have proposed ideas regarding the formulation, restriction, or recognition of certain criteria for the use of power. These struggles, both within individual countries and in the broader context of human history, have shaped political history. This study has addressed this political struggle through the perspectives of political actors and philosophers, starting with Ancient Greece, and has examined the concept of limiting power while maintaining the integrity of the topic and considering historical differences.

In Ancient Greece, the teaching of natural law and a natural-based explanation model that was seen as above and limiting power was adopted. During the Middle Ages, this notion was shaped more through the influence of feudal lords and Christian belief. With the rise of the modern state, the concept that limited power became the social contract. During this period, thinkers such as John Locke, Montesquieu, and Jean-Jacques Rousseau attempted to explain the source of power and define the boundaries of obedience and authority. The French Revolution, which both resulted from and contributed to the differentiation of ruling classes or the groups, individuals, or institutions holding power, as well as the construction of the nation-state and the replacement of religious teachings with ideologies, complicated the relationship between society and the state. The most recent development in political history, particularly after World War II, was the adoption of neoliberalism. This brought about new definitions of the state and required new additions to the classical mechanisms of control.

The administration has expanded its interventions into the lives of individuals due to the growing demands for public services. As a result, existing control methods have proven insufficient. In order to realize the rule of law, the actions and decisions of the administration must be effectively controlled. The ombudsman system has been developed in recent times to achieve this goal of effective oversight.

Ombudsman control appears to be the system most capable of establishing communication between the administration and the public. It is far easier to communicate with an ombudsman than to apply to a legislative body. While using ordinary judicial channels requires more financial burden and effort for citizens, ombudsman control is, in principle, free of charge and completed in a short

time. These features make this relatively new control system quite attractive. Despite the numerous advantages mentioned, it must also be acknowledged that ombudsman control has some limitations. Since ombudsman decisions are, by nature, advisory, administrations are not obliged to comply with them. Although efforts were made to ensure the effectiveness of ombudsman institutions by making them independent of the executive, no effective sanction mechanism exists within this oversight system. Although this may reduce individuals' trust in the system in practice, it positions the ombudsman institution—independent from the executive, and functioning as a mechanism of the legislature's control over the administration—in a significant role. The historical process reveals that the powers of control must be limited, the arbitrary use of power prevented, and the importance of law in the relationship between the individual and the state emphasized. This once again underscores the critical importance of the mission (appropriateness and legality) undertaken by the ombudsman institution.

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