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THE MEDIATING ROLE OF PERCEIVED PSYCHOLOGICAL SAFETY IN THE EFFECT OF HEALTH-ORIENTED LEADERSHIP ON ORGANIZATIONAL COMMITMENT: A HOSPITAL SAMPLE[1]

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ABSTRACT

The purpose of this study is to determine the effects of health-oriented leadership and psychological safety on employees' organizational commitment. For this purpose, the impact of health-oriented leadership on organizational commitment and the mediating effect of psychological safety perception in this impact were examined. The data of the study were collected face-to-face using a questionnaire consisting of scales for health-oriented leadership, organizational commitment, and psychological safety. The data collected from 130 participants consisting of employees of a private hospital in a province in Turkey, were analyzed using statistical software. The analyses revealed that health-oriented leadership positively affects organizational commitment, and psychological safety perception partially mediates this effect.

Keywords: *Health-oriented leadership, organizational commitment, psychological safety*
JEL Code: *M10, M12, M19*

Scope: *Business administration*
Type: *Research*

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

SAĞLIK ODAKLI LİDERLİĞİN ÖRGÜTSEL BAĞLILIĞA ETKİSİNDE ALGILANAN PSİKOLOJİK GÜVENLİĞİN ARACI ROLÜ: BİR HASTANE ÖRNEĞİ

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ÖZ | Bu çalışmanın amacı, sağlık odaklı liderliğin ve psikolojik güvenliğin çalışanların örgütsel bağlılıkları üzerindeki etkilerini tespit etmektir. Bu amaçla sağlık odaklı liderliğin örgütsel bağlılığa etkisi ve bu etkide psikolojik güvenlik algısının aracılık etkisi incelenmiştir. Çalışmanın verileri sağlık odaklı liderlik, örgütsel bağlılık ve psikolojik güvenlik ölçeklerinden oluşan bir anket yardımıyla yüz yüze toplanmıştır. Türkiye'de bir ilde bir özel hastane çalışanlarından oluşan 130 katılımcıdan toplanan veriler istatistiki programlar aracılığıyla analiz edilmiştir. Analizler sonucunda sağlık odaklı liderliğin örgütsel bağlılığı olumlu yönlü olarak etkilediği ve bu etkide psikolojik güvenlik algısının kısmi aracılık rolü üstlendiği tespit edilmiştir.

Anahtar Kelimeler: *Sağlık odaklı liderlik, örgütsel bağlılık, psikolojik güvenlik*
JEL Kodları: *M10, M12, M19*

Alan: *İşletme*
Türü: *Araştırma*

1. **INTRODUCTION**

Throughout history, leaders have been needed wherever there are people. Therefore, leadership has existed since the beginning of human history (Kırmaz, 2010). The concept of leadership, which was previously at the forefront in religious, military and political fields, has gained similar importance in the organizational field (Akbaba and Erenler, 2008), especially as a result of the developments in the Industrial Revolution and its aftermath, and has aftermath, and has become an important and widely-studied concept in the literature (Pawar & Eastman, 1997). Leaders play an important role in ensuring that employees act willingly and voluntarily, are motivated, and achieve organizational goals (Yeşil, 2016; Önen & Kanayran, 2016; Kıngır & Şahin, 2005).

The new scientific environment shows that even if all the information about nature were available, we would not be able to reach a conclusion that is definitive and applicable in all circumstances. This means that our definitions of leadership and the characteristics that leaders should possess are only possible to the extent of the possibilities we can perceive (observe) (Baloğlu, 2011). "*A leader is someone who leads, guides, directs, and inspires others. Leadership is the process through which an individual influences a group to achieve a common goal*" (Gündüz & Dedekorkut, 2014). Leaders have always been prominent individuals in their communities with their personalities, physical characteristics, behaviors and approaches to events.

In the early days of leadership, there was a view that leadership was based on extraordinary ability and strength, that it was innate and that personal characteristics were at the forefront. With the emergence of behavioral and situational leadership theories, focus has shifted to behaviors and circumstances instead of solely the traits of the leader. In particular, situational leadership theory argues that a single leadership style is not possible for all circumstances and emphasizes that innate characteristics alone are not sufficient for a person to be a leader. Accordingly, the success of the leader depends not on his/her innate characteristics but on leadership actions that are suitable for the circumstances they encounter (Özalp & Öcal, 2000). Today, it can be statedthat there is a new understanding that recognize the significance of followers as well. Leaders who are appreciated, relied upon, and esteemed by their followers have a greater chance of attaining successful outcomes. When followers sense that their leader genuinely cares, appreciates, and has confidence in them, they are more inclined to put in extra effort to help the leader achieve their goals

A Review of the literature reveals the recent Emergence of various modern leadership styles such as authentic leadership (George, 2003), ethical

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leadership (Gini, 1997), and humble leadership (Owens and Hekman, 2012). Among these, Health-Oriented Leadership (HoL-SOL) is a novel leadership style introduced to the literature by Franke and Felfe (2011). In the realm of business, due to numerous risks and challenges, achieving optimal performance levels and success depends on a variety of factors. One of the key factors in overcoming these risks and challenges is maintaining good health. The growing stress in the workplace and the related health risks that employees encounter have led to the emergence of the "Health- Oriented Leadership" paradigm (Kerse, Soyalın, & Özdemir, 2021).

This study aims to address two main issues: first, the extent to which workers' perceptions of health-oriented leadership affecttheir organizational commitment and psychological safety; and second, the role psychological safety in the impact of health-oriented leadership on organizational commitment. Notably, there are only a few studies in the literature relatedto health-oriented leadership. Particularly within the national context, there is only one study on health-oriented leadership (Kerse et al., 2021). The literature review revealed a notable gap, as there has been no research examining health-oriented leadership, organizational commitment, and psychological safety together. Consequently, our study, which investigates these variables together, is expected to provide a valuable contribution to the existing literature.

2. CONCEPTUAL FRAMEWORK AND HYPOTHESES
2.1. Health-Oriented Leadership

As mentioned above, today's leadership characteristics and behaviors are largely dependent on the circumstances and the perception of the need for leadership. The significant level of uncertainty has made it challenging to plan for the long term and make the right decisions, making it a necessity to constantly restructure and adapt to the changing environment (Özalp & Öcal, 2000). In addition, factors such as chaos, competition and the necessity to keep up with change make employees the most valuable resources of organizations. Employees are expected to exhibit innovative behaviors, success motivation and loyalty to their organizations in order to cope with these situations and to be equipped to ensure success (Karip, 1998). To achieve all this, leadership should be based not on status and authority, but on the quality of the interaction between the leader and followers (İnce, Bedük & Aydoğan, 2004). Health-oriented leadership is a new approach that emphasizes the quality of these interactions through a focus on health. The concept of health is one of the main concepts that human beings have cared about the most throughout history. Being healthy is the key to achieving the elements that are attributed to many values, such as money, power, reputation

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and authority, which people strive to achieve throughout their lives.

One of the most basic requirements for working efficiently, producing, improving oneself, achieving goals and living a happy life is to be healthy (Kerse et al., 2021). This is particularly important in today's business world where chaos and complexity, stress, performance pressure and uncertainty are increasing. In such an environment, worker health has the potential to be damaged at any time due to the multiplicity of negative situations to which it is exposed. However, for employees to perform better, it is essential to eliminate these negative factors and improve their health. Leaders significantly influence the development or detriment of health in the workplace (Klug, Felfe & Krick, 2019). One of the new leadership approaches that clearly illustrates the relationship between leader behavior and health is health-oriented leadership, developed by Franke and Felfe (2011).

Unlike other existing leadership styles, health-oriented leadership prioritizes employee well-being (Kaluza, Weber, Dick, & Junker, 2020). It explicitly focuses on employee health. Additionally, it aims to create beneficial working conditions and set an example for workplace health and safety behaviors (Franke, Felfe, & Pundt, 2014; Klebe, Felfe, & Klug, 2021). Health-oriented leaders promote health in communication and working conditions while focusing on values, awareness, and behaviors related to the well-being of followers (Franke et al., 2014). Indeed, the role of leadership in promoting and improving workplace health is undeniable (Klug, Felfe, & Krick, 2019).

Health-oriented leadership (HoL-SOL), which is based on Franke et al. (2014) and formed in line with the leader center and staff center, is a leadership approach that contributes to many positive outcomes such as effective delivery of products and services, Increasing employee motivation and organizational outputs. Leader-centric elements encompass the attitudes and mental frameworks of health-oriented leaders, which shape their health behaviors and experiences with stress. Whether or not leaders are in a state of stress can directly or indirectly reflect on and affect the behaviors or attitudes of employees because they are role models (Stuber et al., 2021). In terms of the role of leaders, this approach focuses on supporting the overall success of the organization, such as visioning, strategic planning and managing organizational performance. In staff-centered aspects, which involve the creation of working conditions that promote mental health (Nielsen et al., 2008), the leader prioritizes the welfare and growth of their employees. In addition, it helps to prioritize work tasks and reduce stress levels by taking a proactive approach, through engaging in direct and attentive communication while interacting with staff throughout the process (Elprana et al., 2016; Franke & Felfe, 2011).

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Leadership oriented towards health prioritizes both the organization's success and the well-being of its employees. In other words, the health-oriented leader adopts a balanced approach to increase employee motivation and job satisfaction along with organizational goals. In this scenario, the leader attends to their own physical and psychological well-being, serving as an effective role model for the health of the staff (Skakon et al., 2010). Indeed, health-oriented leadership can be associated with several health indicators, including employee stress, anxiety, risk of burnout, and even depression. Emphasizing the significance of health-oriented leadership, which prioritizes the physical and mental well-being of employees, entails supporting health-promoting behaviors to mitigate workplace demands. In this regard, leaders pay attention to employee signs of overload, foster a positive team environment by providing useful resources, respect breaks and working hours, and encourage staff to attend stress prevention courses, potentially giving them more opportunities to rest and recover from work fatigue (Lutz et al., 2023).

At the heart of health-oriented leadership lie three key dimensions: the values, awareness, and behavior of leaders. These dimensions are fundamental to health-oriented leadership, encompassing leaders' management of their health, also referred to as self-care (Franke et al., 2015). The dimensions of health-oriented leadership include (Dannheim et al., 2021):

Values: Reflecting the leader's beliefs and priorities concerning the promotion of health for themselves and others.

Awareness: Referring to the leader's capacity to comprehend, evaluate, and manage both their health status and that of their team.

Behavior: Entailing the leader's implementation of tangible actions aimed at fostering health and well-being.

Leaders and followers are increasingly expressing concerns about workplace stress, leading to a rising interest in health-oriented leadership aimed at mitigating associated risks and enhancing overall well-being (Klebe et al., 2021). Moreover, this approach is considered to be a resource that improves working conditions and reduces stress factors, which in turn increases followers' productivity and workplace performance (Klebe et al., 2021). Furthermore, it's imperative for leaders to acknowledge health concerns within the workplace, show that they value employees' well-being as a crucial asset, and adopt the mindset that prioritizing healing outweighs short-term business objectives (Boehm, Baumgärtner, & Kreissner, 2016; Franke et al., 2014).

2.2. The Relationship Between Health-Oriented Leadership and Organizational Commitment

Since organizational commitment, another concept examined in the study is of interest to numerous fields, including sociology and psychology and organizational behavior, it is very difficult to make a specific definition upon which everyone agrees (Özsoy, Ergül, & Bayık, 2001; Çöl & Gül, 2005). In general terms, organizational commitment can be defined as an employee's loyalty to their organization, their interest in its success, and the strength of the bond they feel towards it (Koç, 2009; Bayram, 2005). Organizational commitment may be characterized as individuals identifying with the organizations they work for, internalizing them, making sacrifices by adopting organizational goals, having a great desire to join their organization permanently and firmly believing in the organization's objectives and principles, and directly or indirectly participating in organizational processes by integrating with the organization (Koç, 2009; Doğan & Kılıç, 2007). Organizational commitment is accepted to be an important phenomenon for maintaining employees' desire to stay in the organization permanently and for exhibiting creative and innovative approaches for the benefit of the organization (Bayram, 2005). It is becoming difficult to keep employees within an organization due to factors such as changing environmental conditions, needs, costs for recruits in the adaptation process and increasing competition (Durna & Eren, 2005).

Meyer and Allen (1991) classify organizational commitment into three types: affective commitment, continuance commitment, and normative commitment. They explain that the common thread among these forms of commitment is that they represent a psychological state that binds employees to an organization and influences the continuity of their association with it. They are also proposed as an element, not a type because they can be encountered independently and at different levels at the same time. For instance, one worker might feel a powerful urge and need to remain in the association and an obligation to have a place in the gathering, while another representative might feel a powerful urge but a moderate need (Maydiantoro et al., 2021).

Affective commitment, characterized by an employee's sense of ownership towards the workplace, loyalty to colleagues, and alignment with organizational values, reflects the desire to remain in the organization driven by emotional connections. Conversely, continuance commitment, as described by Meyer and Allen (1991), involves employees considering the potential drawbacks of leaving the organization, striving to maintain continuity, and feeling a sense of loyalty. This type of commitment may stem from concerns such as unemployment, financial loss, or damage to professional reputation upon leaving

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the workplace, and it can play a significant role in diminishing an employee's intention to resign from their position. Normative commitment, which refers to feeling loyalty to the workplace due to social or moral responsibilities, may arise from employees feeling an ethical or social obligation towards the workplace. Meyer and Allen (1997) explained this situation as the feeling of loyalty of the personnel to the organization they are a part of by believing that they should not leave the organization in line with their sense of moral duty.

The dimensions of commitment related to the connection between the individual and the organization share a commonality in influencing the individual's decision-making process about whether to stay with or leave the organization. While the common thread among these commitment elements lies in the bond formed between the employee and the organization, reducing the likelihood of discord and departure, the characteristics of these bonds vary depending on the organizational commitment elements (Meyer & Allen, 1997). Individuals who are emotionally attached remain part of the organization out of desire, those exhibiting continuance commitment stay due to vested interests, and those demonstrating normative commitment remain because they believe their actions align with what is morally right. In general, it is stated that affective commitment is a motivation to stay in an organization that depends on desire, normative commitment is dependent on obligation and continuance commitment is dependent on need (Çöl & Gül, 2015; Obeng & Ugboro, 2003).

These factors underscore the significance of organizational commitment. Organizational commitment serves as a cornerstone that aids employees in various aspects, including clarifying expectations and goals, fostering positive emotional attitudes, and enhancing employee satisfaction. Moreover, organizational commitment transforms employees into individuals who exhibit loyalty towards their organizations and harbor a robust psychological connection with them. Therefore, organizational commitment can be considered an important concept that supports both employees and organizations (Soydaş, 2023). When examined in this context, it may show that leaders' behaviors may be related to organizational commitment. Indeed, Loke (2001) has shown that leader behaviors are an important factor that can increase or decrease organizational commitment. Similarly, Çakınberk and Demirel (2010), and Dick and Metcalfe (2001) found that leaders' supportive behaviors positively affect organizational commitment.

Numerous studies in the literature investigate the correlation between leadership styles (Ismail et al., 2011; Keskes, 2014; Yahaya & Ebrahim, 2016), leadership types (Erben & Güneşer, 2008; Bahadori et al., 2021), and organizational commitment. For example, Abuzaid (2018) discovered that affective commitment and normative commitment, two aspects of organizational

dedication, have a favorable and significant link with ethical leadership. Rego, Lopes, and Nascimento (2016) found that organizational commitment is positively and significantly impacted by authentic leadership. Again, many leadership types like servant leadership (Lapointe & Vandenberghe, 2018) have been examined in the context of organizational commitment. There may be a potential link between health-oriented leadership and organizational commitment, based on the observed relationship between various leadership styles and commitment levels. Considering these theoretical and empirical foundations, we can propose the following hypothesis:

H_1: *Health-oriented leadership positively affects organizational commitment.*

2.3. Relationship between Health-Oriented Leadership and Psychological Safety

A key focus of this study is exploring the correlation between health-oriented leadership and psychological safety. Psychological safety and trust are not interchangeable concepts, even though they seem to have similar meanings. While psychological safety mostly manifests itself in the relationships of team members, trust focuses on how one person sees another, which reveals the communication between the two (Soyalın, 2019; Newman et al., 2017). The concept of psychological safety, defined as individuals' perceptions of the potential consequences of situations and actions in work environments, is recognized as a distinct and complementary phenomenon to trust. It can influence various behavioral and organizational outcomes (Edmondson, 2003). Psychological safety refers to the freedom to express oneself without apprehension of facing detrimental outcomes to one's self-esteem, status, or professional standing. It enables employees to articulate their concerns openly, communicate transparently, and receive constructive feedback (Kahn, 1990; Pearsall & Ellis, 2011).

Psychological safety enables employees to work without worrying about their jobs, themselves and their careers (Kahn, 1990). In other words, the employees believe that they feel safe about the situations they may encounter after expressing their opinions on issues that they see as wrong or that may be beneficial to the organization (Edmondson, 2003). Employees' high perception of psychological safety increases the chances of making the right decision by managing stress more successfully in problematic situations, under stress pressure, or when they make mistakes (Erkutlu, Kayacan & Özdemir, 2019). Therefore, when the perception of psychological safety increases, it reduces the likelihood of making mistakes as it enables employees to adopt a calm and

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unhurried structure. This can positively affect the quality of their work output, their motivation, job satisfaction and skills (Akduru & Semerciöz, 2020).

Leaders ought to foster a sense of belonging and integration among employees within the organization, cultivating an atmosphere characterized by trust, collaboration, shared interests, and empathy. This can be achieved by encouraging followers to voice their thoughts and by instilling a culture that embraces risk-taking while ensuring their comfort in doing so. In this respect, leaders need to instill psychological trust in their team for the future of the organization (Chen et al., 2019). Followers who perceive psychological safety are less inclined to fret over potential repercussions when sharing diverse ideas (Chen et al., 2019; Taştan & İşiaçık, 2020). Research investigating the correlation between various leadership styles and psychological safety corroborates this finding. For example, Wang, Liu and Zhu (2018) found that humble leadership has a positive and significant effect on psychological safety. Again, many studies on the relationship between other leadership types and psychological safety (Liu, Liao & Wei, 2015; Jin, Qing & Jin, 2022; Sürücü, Yıldız & Sağba, 2023) indicate that there may be a relationship between health-oriented leadership and psychological safety.

H$_2$: Health-oriented leadership positively affects psychological safety.

2.4. Relationship between Psychological Safety and Organizational Commitment

Psychological safety, which can also be evaluated as the feeling of inner security, can be related to the individual's ability to open oneself to others, take risks and be emotionally attached. In other words, psychological safety can be related to being in an environment where one feels emotionally and physically safe, and this can be considered the basis of healthy relationships. Therefore, it can be expressed as a person's beliefs about how others will react to him/her asking questions and receiving feedback, reporting a mistake, or coming up with a new idea without worrying that they will be hurt or embarrassed when he/she speaks up or expresses his/her ideas about a particular mistake (Edmondson, 2004). In addition, it is a fact that this concept, which represents a cognitive state, incorporates three constructs: psychological empowerment, job commitment and trust. Psychological safety, which is considered one of the modern management concepts in our age and is a state of intrinsic motivation in which working individuals feel that they have control over their work, is defined as a psychological state that must be experienced by employees for organizational actions to be successful (Spreitzer, 1995).

Work engagement pertains to the extent of emotional connection an

individual has with their workplace, indicating a strong emotional dedication and concern for their duties. It denotes a deep integration with and attachment to a specific job role (Kanungo, 1982). When employees feel psychologically safe within the organization, they perceive themselves as valued, cared for, and respected by the company, leading to positive outcomes such as heightened job satisfaction (Detert & Burris, 2007; O'Neill & Arendt, 2008). These favorable outcomes can foster organizational commitment and subsequently enhance work engagement. The relationship between psychological safety and organizational commitment can be explained through social identity theory, which correlates with the concept of the social self. Since the organization holds significant importance in employees' lives, it becomes central to their social identity. Consequently, a positive self-perception enables employees to demonstrate a high level of commitment to both their organization and their roles (Kim, 2020).

Furthermore, prior research (Frazier et al., 2017; Singh & Winkel, 2012) indicates a positive association between psychological safety and organizational commitment. This finding is significant as it suggests a potential link between these two factors. Given these findings alongside earlier studies, it is logical to anticipate that psychological safety impacts organizational commitment.

H₃: *Psychological safety positively affects organizational commitment.*

2.5. Psychological Safety as a Mediator Variable

Lastly, the study explores the mediating role of psychological safety in the relationship between health-oriented leadership and organizational commitment. In simpler terms, it explores how health-oriented leadership might influence organizational commitment through psychological safety. Literature has provided evidence that psychological safety can act as a mediator in the correlation between health-oriented leadership and organizational commitment. For instance, Timuroğlu and Gül (2023) found that psychological safety mediates the relationship between humble leadership and expressed personal initiative. The mediating role of psychological safety in the connection between health-oriented leadership and organizational commitment can also be explained by the Conservation of Resources Theory (Hobfoll, 2001). This theory emphasizes that the resources that employees have and want to obtain are important to them. Therefore, employees are psychologically empowered when their existing resources are protected and their efforts toward what they want to achieve are supported (Hobfoll, 2001). When examined from the perspective of the Conservation of Resources Theory (Hobfoll, 2001), perceived health-oriented leadership has the capacity to enhance employees' resources, particularly psychological safety. This enhancement of resources is likely to raise the level of

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organizational commitment. Hence, it is reasonable to expect that health-oriented leadership may influence organizational commitment through its impact on psychological safety.

H_4: Psychological safety mediates the relationship between health-oriented leadership and organizational commitment.

The research model in Figure 1 was created keeping in mind that the variables have a statistically positive relationship.
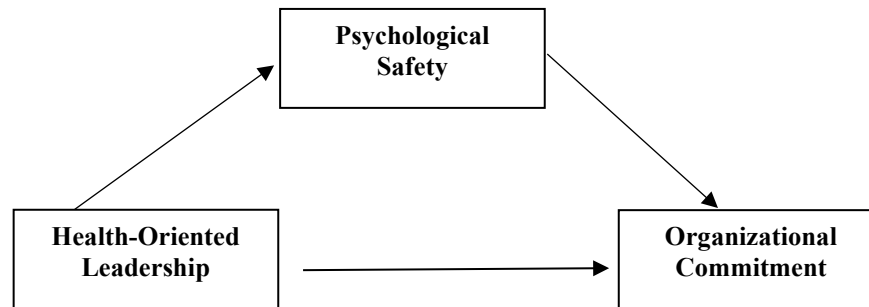
Figure 1: Research Model

3.   METHODOLOGY
3.1. Purpose

The primary objective of this study is to ascertain whether health-oriented leadership directly impacts organizational commitment and whether psychological safety plays an indirect role in this relationship. A review of the literature indicates that while research on health-oriented leadership and associated topics is growing, there is only one study on this subject in Turkey. By enhancing comprehension of the mediating role of psychological safety in the impact of health-oriented leadership on organizational commitment, this study aims to benefit both researchers in the field and managers in related domains.

3.2. Sample

Considering time and cost constraints, it was decided to conduct the research in only one city. Therefore, the population of the research consists of 190 people working in a private hospital in Aksaray. Simple random sampling was used. The study sample comprises approximately 190 individuals employed in a private hospital. 145 out of the 190 surveys given to the employees were

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returned. Following examinations, 15 surveys were deemed unsuitable for analysis due to inaccuracies and incompleteness. With a 5% margin of error at a 95% confidence level, it was determined that the remaining 130 questionnaires were sufficient to represent the sample.

3.3. Data Collection Tools

The researchers administered the questionnaire in person to the participants, and data from 130 responses were analyzed. The scales utilized in the study were chosen from measurement tools frequently employed in prior research, with established reliability and validity across diverse cultural settings. These scales, adapted into Turkish, had been utilized in previous studies.

Health-Oriented Leadership Scale: The study employs the Health-Oriented Leadership Scale, initially developed by Franke, Felfe, and Pundt (2014) and adapted into Turkish by Kerse et al. (2021). It utilizes 10 items representing the positive health behavior dimension of the scale.

Psychological Safety Scale: The study uses the 7-item 1-dimension Psychological Safety Scale developed by Edmondson (1999) and adapted into Turkish by Yener (2015).

Organizational Commitment Scale: The study utilizes the organizational commitment scale, originally developed by Jaworski and Kohli (1993) and adapted into Turkish by Şeşen (2010). A 5-point Likert-type rating scale was used in all measurements.

3.4. Ethical Permissions for the Research

This study adhered to all regulations outlined in the "Directive on Scientific Research and Publication Ethics of Higher Education Institutions." No actions listed under the second section of the Directive, titled "Actions Contrary to Scientific Research and Publication Ethics" were undertaken. The study, with protocol number 2022/08-46, underwent review by the Aksaray University Human Research Ethics Committee on December 27, 2022. Following examination, the committee unanimously determined that the study adhered to the ethical principles outlined in the Aksaray University Human Research Ethics Committee Directive.

4. FINDINGS

The data collected in the study were imported into the Statistical Package for the Social Sciences (SPSS 26.0) software for analysis in a computerized environment. Various analytical tools were employed, including SPSS, AMOS, and the Process MACRO software programs. The analysis encompassed confirmatory factor analyses, reliability assessments, correlation analyses, and

regression analyses. The quantitative findings from these analyses constitute the basis for the study's outcomes.

4.1. Demographic Findings

Demographic findings obtained from the 130 hospital employees who participated in the study are presented in Table 1.

Table 1: Demographic Findings of the Participants

VARIABLE	CATEGORY	FREQUENCY	%
Gender	Male	39	30
	Female	91	70
Marital Status	Single	51	39.23
	Married	79	60.77
Age	25 or less	31	23.85
	26-35	56	43.08
	36-45	35	26.92
	Over 45	8	6.15
Education Status	High School	38	29.23
	Associate degree	42	32.31
	Bachelor's	41	31.54
	Postgraduate	9	6.92
Work Experience	Less than 1 year	11	8.46
	1-4 Years	41	31.54
	5-8 Years	34	26.15
	9 Years and Over	44	33.85

Table 1 shows the frequency analysis results of the participants' gender, marital status, age, education level and work experience. Examining the data, it's apparent that a significant majority of participants are female (70%), outnumbering male participants (30%). A considerable portion of participants are married (60.77%). Analyzing age distribution, about 24% are 25 or younger, 43% are between 26-35, 27% are between 36-45, and 6% are 45 or older. In terms of education, the majority have an associate degree (32%), followed closely by those with a bachelor's degree (32%). As for work experience, 34% have more than 9 years, and 32% have 1-4 years of experience.

4.2. Reliability Analyses

Reliability analyses were conducted using Cronbach's Alpha value to evaluate the consistency of responses for each scale utilized. The health-oriented leadership scale, considered as an independent variable, exhibited a Cronbach's Alpha value of 0.959, indicating high consistency. Regarding the organizational commitment scale, treated as a dependent variable, the Cronbach's Alpha value was 0.854, meeting the standard criteria and indicating the scale's reliability. The psychological safety scale, employed as an intermediary variable, generated a Cronbach's Alpha value of 0.689, demonstrating acceptable reliability.

4.3. Confirmatory Factor Analysis of the Scales

Confirmatory Factor Analysis (CFA) is employed to evaluate the validity of a model established through the relationships among predetermined latent and observable variables. It assesses whether the proposed model aligns with the sample data (Yılmaz & Çelik, 2013). The initial CFA model for the scales was developed and tested using the AMOS 22 program. The confirmatory factor analysis for health-oriented leadership is presented in Figure 2.
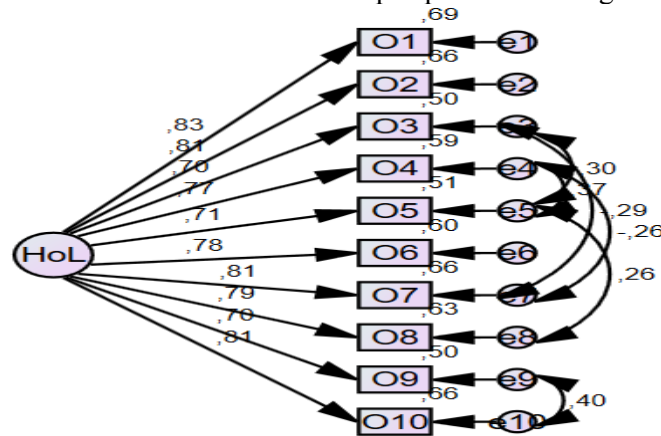
Figure 2: Confirmatory Factor Analysis of the Health-Oriented Leadership

The details presented in Figure 2 indicate that there are no issues with the standardized regression loadings, as the item values ranging from 0.70 to 0.83 surpass the minimum threshold of 0.50. Examining the estimation results for the health-oriented leadership scale model revealed that the goodness-of-fit indices did not meet the reference values. Consequently, adjustments were introduced among the model's items, resulting in improved fit values closer to the reference benchmarks. Following these modifications, the goodness-of-fit indices aligned

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closely with the reference values found in the literature, making the health-oriented leadership scale compatible with the model (Table 2).

Table 2: Model Fit Values for Health-Focused Leadership

Variable	CMIN/DF	RMSEA	CFI	NFI	IFI	TLI
HoL	1.749	0.76	0.977	0.948	0.977	0.964
Reference Values	0< χ2/sd ≤ 5	<.05-.08≤	≥.90	≥.90	≥.90	≥.90

The estimation outcomes for the model associated with the organizational commitment scale were then examined. The Ö6 item was removed from the model because its factor loadings were below the reference values. The goodness-of-fit indices did not meet the reference values. Therefore, modifications were introduced, specifically between items e2 and e5 of the model, resulting in improved fit values. The fit values subsequent to the modification between items e2 and e5 are presented in Table 3. Figure 3 illustrates the confirmatory factor analysis of the organizational commitment scale.
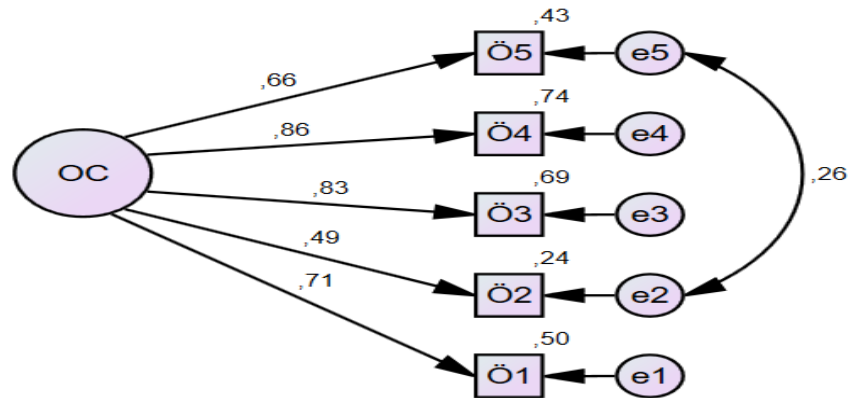
Figure 3: Confirmatory Factor Analysis of the Organizational Commitment Scale

Table 3: Model Fit Values for Organizational Commitment

Variable	CMIN/DF	RMSEA	CFI	NFI	IFI	TLI
OC	1.329	0.51	0.990	0.963	0.991	0.982
Reference Values	0< χ2/sd ≤ 5	<.05-.08≤	≥.90	≥.90	≥.90	≥.90

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Examining Table 3 reveals that the values obtained after the modification meet the reference values. Therefore, the organizational commitment scale becomes an acceptable model. Finally, the estimation results of the measurement model for the psychological safety scale were examined. The confirmatory factor analysis (Figure 4) and the fit values (Table 4) are presented below.
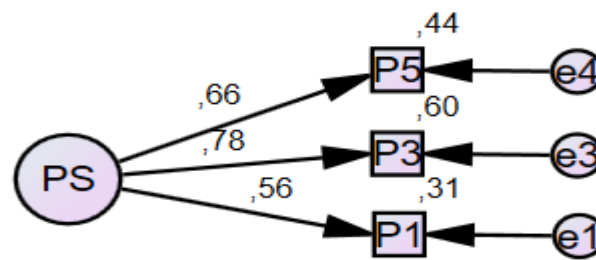
Figure 4: Confirmatory Factor Analysis of the Psychological Safety Scale

Table 4: Model Fit Values for Psychological Safety

Variable	CMIN/DF	RMSEA	CFI	NFI	IFI	TLI
PS	.579	.000	1.000	.985	1.011	1.036
Reference Values	0< χ2/sd ≤ 5	<.05-.08≤	≥.90	≥.90	≥.90	≥.90

Examining the estimation results of the psychological safety measurement model revealed that the scale had problems in terms of parameter estimates. Items P2, P4, P6 and P7 were removed from the model because their factor loadings were below the reference values. Consequently, the psychological safety scale model reached acceptable values and achieved compatibility.

4.4. Testing Hypotheses

The quantitative data collected in line with the study's objectives was transferred to a digital environment in the Excel program. Subsequently, an analysis was carried out using the SPSS 26.0 (Statistical Package for Social Sciences) and AMOS programs.

To determine appropriate tests for data analysis, the normal distribution was assessed using Kolmogorov-Smirnov and Shapiro-Wilk tests, along with

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Skewness and Kurtosis values. The results indicated normal distribution suitability (p>0.05, Skewness: 0.020, Kurtosis: -0.298). Consequently, parametric tests (reliability, correlation, regression) were applied. In line with the study's purpose, multiple correlation analyses tested the relationship between psychological safety and organizational commitment among hospital employees influenced by health-oriented leadership.

Table 6 displays the results of the Pearson Correlation analysis. Examining the correlation matrix in Table 5, it reveals that a simple correlation analysis was performed to assess the significance of the relationship between health-oriented leadership and employees' psychological safety in the hospital.

Analyzing Table 6 reveals the following results: the participants perceive Health-Oriented Leadership at a high level (Mean = 3.31), while their Perceived Psychological Safety is at a medium level (Mean = 3.09), and Organizational Commitment is also at a medium level (Mean = 3.22). Regarding the relationships between variables, Health-Oriented Leadership is positively correlated with Organizational Commitment (r = 0.474, p < 0.05) and Psychological Safety (r = 0.202, p < 0.05), and Psychological Safety in turn is positively correlated with Organizational Commitment (r = 0.401, p < 0.05).

Table 5: Mean, Standard Deviation, and Correlation Analysis Results for Variables

	Variables					
		Mn.	Sd.	1	2	3
1	HoL	3.31	.817	1.00		
2	PG	3,09	.513	.202*	1.00	
3	OC	3.22	.657	.474**	.401**	1.00
HoL: Health-Oriented Leadership, PG: Psychological Safety, OC: Organizational Commitment							
** p<0.01; * p<0.05					

As correlation analysis solely provides insight into the direction and strength of relationships between variables, it might be misleading to formulate conclusions solely based on its results (Kerse & Babadağ, 2019). Therefore, a regression analysis was conducted with the Bootstrap method to examine the mutual influence of variables and to test whether psychological safety acts as a mediator in health-oriented leadership's impact on organizational commitment. Hayes' Process Macro (2018) facilitated these analyses. The results are presented in Figure 5.

R² =0.329

a=0.127, P<0.05

Psychological Safety

b=0.407, P<0.05

c=0.381, P<0.05

Health-Oriented Leadership

Organizational Commitment

Direct effect (c¹)=0.329
Indirect effect=0.052; CI (0.0020-0.1172)
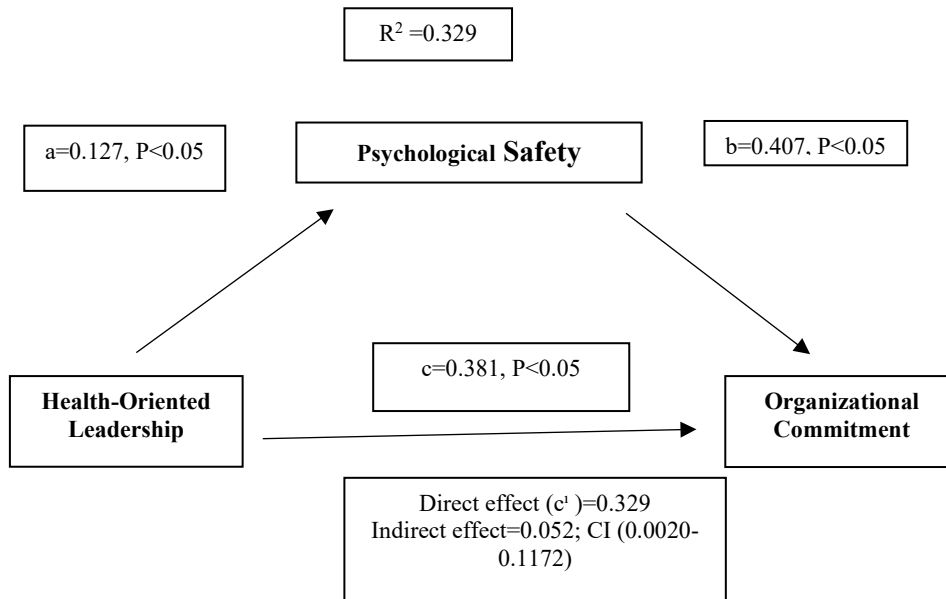
Figure 5: Findings Related to Hypothesis Testing

According to the findings in Figure 1, health-oriented leadership has a positive impact on psychological safety (b= 0.127, p < 0.05, 95% CI [0.0190, 0.2340]) and organizational commitment (b= 0.329, p < 0.05, 95% CI [0.4483, 0.4100]), also due to COVID-19. Additionally, Psychological safety positively affects Organizational commitment (b = 0.407, p < 0.05, 95% CI [0.2185, 0.5969]). Consequently, H1, H2, and H3 are accepted. In addition to health-oriented leadership's direct effect on organizational commitment (b = 0.329, p < 0.05, 95% CI [0.2109, 0.4483]), there is also an indirect effect (b = 0.052, p < 0.01, 95% CI [0.0019, 0.1157]) (Figure 5). This suggests partial mediation. In other words, health-oriented leadership positively affects organizational commitment not only directly but also by increasing the level of psychological safety. Therefore, H4 is accepted.

5. DISCUSSION AND CONCLUSION

Leaders play a key role in organizational activities and achievements by motivating employees (Durna & Eren, 2005), who themselves play a major role in the quality, efficiency and effectiveness of goods or services (Yeşil, 2016; Önen & Kanayran, 2016). Many problems such as complex staff structures with different areas of expertise, high workloads, and violence against

healthcare workers make leadership more important in healthcare services (Keklik, 2012; Şahne & Şar, 2015). In the health sector, as in other sectors, the elements that will lead the organization to success such as competition, profit and sustainability are emphasized. In order to achieve this, a career path for employees, incentives, bonuses and similar motivating factors are used as a tool. Efforts to keep up with new developments can also be considered in this context. Since all this is achieved through employees, who are seen as strategic resources, both the employees and the leadership that directs, mobilizes and influences them become more important. In this context, for effective and efficient results, the leadership style that will ensure that employees are committed to their organizations and the factors that can affect employees' organizational commitment are important.

This study examined health-oriented leadership, which is accepted to be a new leadership style. Health-oriented leadership (Franke et al., 2014), which includes important behaviors in terms of the value leaders place on employees' health, is expected to have a more specific and purposeful effect (Franke et al., 2014; Rudolph et al., 2020). This study examined the direct and indirect effects of health-oriented leadership on organizational commitment (through psychological safety). There is no other study examining the mediating role of psychological safety in health-oriented leadership's effect on organizational commitment.

The results indicated that perceived health-oriented leadership positively influences both psychological safety and organizational commitment. These findings align with previous studies examining various leadership styles (Wang et al., 2018; Liu et al., 2015; Jin et al., 2022; Sürücü et al., 2023; Abuzaid, 2018; Rego et al., 2016; Lapointe & Vandenberghe, 2018). The mediation analysis results indicated that psychological safety partially mediates the impact of perceived health-oriented leadership on organizational commitment. In essence, perceived health-oriented leadership was found to enhance organizational commitment directly as well as indirectly through its influence on psychological safety.

The findings clearly show that it is important for managers of healthcare institutions to exhibit attitudes and behaviors that will be good for employee health. Accordingly, health-oriented leadership contributes to the emergence of many positive individual and organizational outcomes by increasing the commitment of healthcare professionals to their organizations. The present study proves this.

Alongside its contributions to the literature, the study also has certain limitations. One of these limitations is that the sample consists of a limited

number of employees and was collected from a single organization. This makes the results difficult to generalize. Another limitation is that the data was collected during a period when there were concerns about whether the Covid-19 pandemic was over, which influenced how the participants answered the survey. Taking into account these limitations, future studies may benefit from larger samples, different variables and different sectors.

6. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

7. FINANCIAL SUPPORT

This study did not benefit from any funding or support.

8. AUTHOR CONTRIBUTIONS

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

9. ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS

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

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KÖKEN ÜLKE KURUMLARI VE İHRACAT PERFORMANSI: GELİŞMEKTE OLAN ÜLKE KOBİ'LERİ[1]

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ÖZ | Bu araştırma, gelişmekte olan ülkelerdeki KOBİ'lerin ihracat performansı üzerinde köken ülke kurumlarının etkisini araştırmayı amaçlamaktadır. Bu araştırma özellikle, gelişmiş düzenleyici kurumların ve politik/yasal kurumsal zorlukların, gelişmekte olan ülkelerde faaliyet gösteren KOBİ'lerin ihracat performansı üzerindeki etkisini incelemektedir. Kurumların iki farklı yönüne odaklanan bu araştırma, tek bir kurumsal yapıya odaklanan önceki araştırmalardan farklılık göstermektedir. Çalışma firma düzeyindeki verilerini 2009 ve 2013 Dünya Bankası İşletme Anketlerinden almaktadır. Toplamda, 27 Orta Asya ve Doğu Avrupa ekonomisinden 1359 KOBİ firmasından toplanan anket verilerini kullanarak hipotezlerini test etmektedir. Veri seti Logit ve Tobit yöntemleri ile analiz edilmiştir. Bulgular, gelişmiş düzenleyici kurumların gelişmekte olan ülkelerdeki KOBİ'lerin ihracat performansını olumsuz yönde etkilediğini göstermektedir. Sonuçlar ayrıca politik ve yasal kurumsal zorlukların firmaların ihracat performansını olumsuz etkilediğini göstermektedir. Bu bulgular ışığında, farklı özelliklere sahip kurumların ihracat performansı üzerindeki farklı etkilerini göstererek uluslararası işletme literatürüne katkıda bulunulmaktadır.

Anahtar Kelimeler: *Köken ülke kurumları, ihracat performansı, KOBİ*
JEL Kodlar: *O17, P30, L25*

Alan: *İşletme*
Türü: *Araştırma*

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[1] İlgili çalışmanın etik kurallara uygunluğu beyan edilmiştir.

HOME COUNTRY INSTITUTIONS AND EXPORT PERFORMANCE: EMERGING ECONOMY SMES

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ABSTRACT

This research examines the impact of different aspects of home country institutions on export performance of emerging economy SMEs. Specifically, this research explores the influence of developed regulatory institutions and political and legal institutional hardships on export performance of emerging economy SMEs. By focusing on two distinct aspects of institutions, this research differs from prior research that has focused on broad institutional constructs. This research draws its firm-level data from the 2009 and 2013 World Bank Enterprise Surveys. In total, this research has its dataset from 1359 SMEs from 27 Central Asia and Eastern Europe emerging economies to test its hypotheses. Logit and Tobit estimations are used to test its hypotheses. The findings suggest that developed regulatory institutions negatively influence export performance of emerging economy SMEs. The results also show that political and legal institutional hardships negatively affect export performance of such firms. These findings contribute to international business literature by showing the distinct impacts of different institutions on export performance.

Keywords: *Home country institutions, export performance, SMEs*
JEL Codes: *O17, P30, L25*

Scope: *Business administration*
Type: *Research*

1. GİRİŞ

Kurumsal teoriye göre, kural ve düzenlemeler firmaların stratejilerini etkilemektedir (Peng, Wang & Jiang, 2008). Uluslararasılaşma literatüründe, mevcut çalışmalar ev sahibi (*host country*) ve köken ülke (*home country*) kurumlarının gelişmiş ve gelişmekte olan ülke firmalarının uluslararasılaşmasını nasıl etkilediğini incelemişlerdir (Cuervo-Cazurra, 2012; Cuervo-Cazurra & Genc, 2008). Her şeyden önce araştırmacılar, yatırımların yeri, giriş şekli ve ihracat performansı gibi firmaların farklı stratejik seçimlerini etkilemede ev sahibi ülke kurumlarının önemine dikkat çekmişlerdir (Wu, Wang, Hong, Piperopoulos & Zhuo, 2016). Son zamanlarda dikkatler, firmaların uluslararasılaşma girişimlerini açıklamada köken ülke kurumların önemini anlamaya yönelmiştir (Nuruzzaman, Singh & Gaur, 2020). Ancak, köken ülke kurumlarının rolünün altında yatan teorik mekanizmalar tam olarak araştırılmamıştır. Bu çalışma, gelişmekte olan ülkelerdeki küçük ve orta büyüklükteki işletmeler (KOBİ)'lere kurumsal gelişmişlik (*institutional quality*) ve kurumsal zorluklar (*institutional hardships*) perspektifinden kurumsal bir bakış açısı önererek mevcut literatüre katkı yapmayı hedeflemektedir.

Kurumsal teori literatürü, kurumsal ortamların firma stratejisini ve performansını kritik olarak etkileyen iki temel yönünü tanımlamıştır. Kurumsal çevre hakkında düşünmenin yaygın yollarından biri kurumsal kalite yani gelişmişlik düzeyidir (Wu & Chen, 2014). Genel anlamda kurumsal kalite/gelişmişlik, düşük yolsuzluk, güçlü bir hukukun üstünlüğü ve yüksek düzeyde düzenleyici kalite olarak tanımlanmaktadır. Ayrıca Kaufman, Kraay ve Mastruzzi (2006) kurumların kalitesini gösteren altı boyut belirlemiştir; ifade özgürlüğü ve hesap verebilirlik, politik istikrar ve şiddetsizlik, hükümet etkinliği, idari kalite, hukukun üstünlüğü yolsuzluğu kontrol edebilme. Bahsedilen bu altı boyutun firmaların stratejisi ve performansı üzerinde eşit etkiye sahip olmadığını belirtmek önemlidir. Bu nedenle bu çalışma, gümrük ve ticaret düzenlemeleri, vergi idaresi, vergi oranları, işletme lisansları ve izinleri ve çalışma düzenlemeleri gibi iyi uygulanan kural ve düzenlemelerin varlığını ifade eden düzenleyici kurumların kalitesinin (*institutional regulatory quality*) etkisine odaklanmaktadır. Bu kural ve düzenlemeler piyasaların daha istikrarlı ve sağlıklı işlemesini sağlamaktadır. Yüksek kurumsal düzenleme kalitesi faktör piyasalarının işleyişinin kolaylaştığını ve işlem maliyetlerinin düştüğünü ifade etmektedir. Bu pozitif etki ise firmaların kaynaklarından değer elde etme yeteneğini ve becerisini olumlu yönde etkilemektedir. Örneğin, firmalar verimsiz vergi yönetimi ve yüksek kurumlar vergisi oranları nedeniyle yüksek vergi yüküyle karşı karşıya kalabilmekte, bu da firmaların uluslararası ticaretinde hileli raporlamalara yol açabilmektedir (Gökalp, Lee & Peng, 2017). Diğer bir örnek

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ise sınır ötesi işlemleri etkileyen gümrük ve ticaret düzenlemelerine ilişkin idari süreçlerin basitleştirilmesi olabilir. Genel olarak, verimsiz piyasa araçları işlem ve piyasa maliyetlerini arttırmakta ve firmaların rekabet gücünü ciddi şekilde azaltmaktadır (North, 1990).

Kurumsal çevrenin bir başka yönü kurumsal zorluklarla ilgilidir. Bu zorluklar firmaların faaliyet gösterme verimliliğini azaltan politik ve yasal kurumsal sınırlamalara (*institutional political and legal hardships*) atıfta bulunmaktadır. Verimsiz ve yetersiz politik ve yasal kurumlar, yolsuzluk ve kaynak elde etmek için siyasi ağlara güvenme ve gayri resmi iş yürütmeyi kapsamaktadır. Genel anlamda, önceki çalışmalar kurumsal boşlukların etkisini araştırırken az gelişmiş kurumlara odaklanmıştır (Wu & Chen, 2014). Aslında az gelişmiş kurumlar, mülkiyet haklarının korunması, zayıf ticaret kanunları, şeffaf olmayan hukuk sistemi, az gelişmiş faktör piyasaları ve verimsiz piyasa araçları gibi resmi kurumları kapsamaktadır. Gelişmekte olan ülkelerde özel çıkar için kamu gücü, gelişmiş ülkelere göre daha belirgindir. Hukuk sisteminin kalitesizliği ve siyasi sistemlerdeki hızlı değişimler nedeniyle kamu görevlileri kamu otoritesini kötüye kullanma konusunda birçok fırsata sahip olabilmektedirler. Bu nedenle, hükümet müdahalesi, siyasi maliyetler ve zayıf mahkeme sistemi gibi kurumsal zorluklar, verimli iş operasyonları için giderek artan zorluklar yaratmaktadır (Sharma, 2011). Örneğin, ihracatı kolaylaştırmak için gümrük yetkililerine ödeme yapmaya yönlendirilen para, aslında firmalar tarafından iş geliştirme için kullanılabilir (Krasniqi & Desai, 2016).

Kurumların farklı özellikleri, firmaların ve yöneticilerinin davranışlarını önemli ölçüde şekillendirmektedir (Hoskisson, Eden, Lau & Wright, 2000; North, 1990). Mevcut çalışmalar, kolaylaştırıcı ve kısıtlayıcı yönleri olan kurumların yan yana var olduğunu ancak farklı kökenlere, süreçlere ve mekanizmalara sahip olduğunu ileri sürmektedir (Nuruzzaman, Singh & Gaur, 2020; Wu & Chen, 2014). Ancak önceki araştırmalar hem daha geniş kurumsal yapılara odaklanmış (Tan ve Chintakananda, 2016) hem de kendi ülke kurumlarının bu iki rakip (*kolaylaştırıcı ve kısıtlayıcı*) yönünü birbirinin yerine kullanmıştır (Nuruzzaman vd., 2020). Bu nedenle, farklı yönlere sahip belirli ülke kurumlarının aynı anda firmaların stratejilerini nasıl etkilediğinin daha iyi anlaşılması, kurumsal çevre literatürün gelişmesine yardımcı olacaktır. Bu bağlamda, bu araştırma köken ülke kurumlarının birbiriyle rekabet eden iki yönünü tespit etmiştir; bunlar düzenleyici kurumların kalitesi ve politik/yasal kurumların zorluklarıdır.

Bu çalışma, kurumsal kalite literatüründen yararlanarak, düzenleyici kurumların kalitesinin KOBİ'lerin dış pazarlara açılmasını teşvik ettiğini, kurumsal zorlukların ise bu ilişkiye kısıtlamalar getirdiğini ileri sürmektedir. Bu

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çalışma ile kurumsal ortam iki farklı boyutta ele alınmaktadır: düzenleyici kurumların kalitesi ve politik/yasal kurumsal zorluklar. Kurumların iki önemli özelliğini dikkate alarak farklılaşan bu çalışma köken ülke kurumların önemini vurgulayarak gelişmekte olan ekonomideki KOBİ'lerin uluslararasılaşmasına ilişkin önceki çalışmalara katkı sağlamaktadır. Bu bağlamda, bu çalışma, düzenleyici kurumların kalitesi ile politik/yasal kurum zorluklarının, KOBİ'lerin ihracat performansına olan etkisi açısından farklılık gösterdiğini ileri sürmektedir.

2009 ve 2013 Dünya Bankası İşletme Anketlerini (World Bank Enterprise Surveys) ve Orta Asya ve Doğu Avrupa'daki 27 gelişmekte olan ülkeden 1359 firmadan oluşan bir örneklemi kullanan bu çalışma, düzenleyici kurumların kalitesinin ve politik/yasal kurumların zorluklarının gelişmekte olan ülke KOBİ'lerinin ihracat performansı üzerindeki etkilerini ampirik olarak test etmektedir. Çalışma sonuçları önemli bulgular göstermektedir. Beklenilenin aksine, düzenleyici kurumların kalitesinin, gelişmekte olan ülkedeki KOBİ'lerin ihracatı üzerinde negatif yönlü etkisini ortaya koymaktadır. Ayrıca, politik ve yasal etkisizliğin KOBİ'lerin ihracatı üzerinde olumsuz etkisi olduğunu göstermektedir.

2. TEORİ VE HİPOTEZLER

Kurumlar, firmaların davranış ve eylemlerini etkileyen oyunun kuralları olarak tanımlanmaktadır (North, 1990). Başka bir deyişle, iş ortamlarını yönetir, piyasa işlemlerini koordine eder ve firmaların sahip olduğu stratejik seçimlerin uygulanmasını sınırlandırır veya kolaylaştırırlar (Peng, 2003). Örneğin, eğer firmaların stratejileri, kurumsal mantık ile uyumlu değilse kurumlar firma davranışını kısıtlayabilirler (Khanna & Palepu, 1999). Bunun tersine, kurumsal çevreye uyum sağlamaları halinde ise kurumlar, firmaların tercihlerini destekleyebilir. Kurumları oyunun kuralları olarak belirleyen ve dolayısıyla firmaların uluslararası rekabet gücünü önemli ölçüde etkileyen kurumsal teori, uluslararası işletme literatüründe yaygın olarak kullanılmaktadır (North, 1990; Peng & Meyer, 2011). Kurumsal teoriye göre firmaların uluslararasılaşma stratejisi sadece firma kaynakları ve yetenekleri tarafından değil aynı zamanda çeşitli kurumsal koşullar tarafından da yönlendirilmektedir. Örneğin, firmalar kurumsal koşullara farklı şekillerde yanıt vermeyi seçebilirler (Hong, Wang & Kafouros, 2015). Kurumların etkilerindeki firmalar arası farklılıklar, zaman içinde kurumsal değişimler yaşayan gelişmekte olan ülkelerde özellikle önemlidir. Kurumsal teorinin gelişmiş ekonomi firmalarına uygulanan temel mekanizmalarının, gelişmekte olan ülke firmalarına uygulanan mekanizmalardan farklı olacağı anlamına gelmektedir. Bu farklılıklar, kurumsal yaklaşımı özellikle

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gelişmekte olan ülke firmalarının uluslararasılaşmasının analiziyle ilgili hale getirmektedir (Hong vd., 2015; Tang, Shu & Zhou, 2022).

Kurumsal çervelerdeki bu derin farklılıklar, araştırmacıları ev sahibi (*host country*) ve köken ülke (*home country*) kurumlarının gelişmekte olan ülke firmalarının uluslararasılaşmasını nasıl etkilediğini incelemeye yöneltmiştir. Her şeyden önce bilim insanları, gelişmekte olan ülke firmalarının farklı uluslararasılaşma stratejilerini etkilemede ev sahibi ülke kurumlarının önemine dikkat çekmişlerdir (Chang, Kao, Kuo & Chiu, 2012; Wright, Filatotchev, Hoskisson & Peng, 2005). Son zamanlarda dikkatler, gelişmekte olan ekonomideki firmaların uluslararasılaşma performansını açıklamada köken ülke kurumlarının önemini anlamaya yönelmiştir (Deng & Zhang, 2018; Ma, Ding & Yuan, 2016).

Köken ülkedeki kurumları inceleyen çalışmaların çoğu ise, kurumsal gelişim düzeyine veya kurumsal kaliteye odaklanmıştır (Nuruzzaman vd., 2020; Wu & Chen, 2014). Ngo, Janssen, Leonidou ve Christodoulides (2016), Ma, Ding ve Yuan (2016), Cardoza, Fornes, Farber, Duarte ve Gutierrez (2016) ve Estrin, Meyer, Nielsen ve Nielsen (2016) çalışmalarının haricinde kurumsal kalitenin farklı boyutlarının vurgulanmadığını belirtmek önemlidir. Ayrıca köken ülke kurumlarındaki kısıtlamaların/zorlukların etkisini yalnızca üç çalışma incelemiştir (Nuruzzaman vd., 2020; Rialp-Criado & Komochkova, 2017; Wu & Chen, 2014). Genel olarak, bu çalışmalar köken ülke kurumlarının gelişimi ve ihracat performansına ilişkin anlayışımıza katkıda bulunurken, hangi kurumların ihracat faaliyetlerinde firmaları desteklediği veya kısıtladığı konusunda daha ayrıntılı bir anlayış geliştirmeye ihtiyaç vardır.

Aslında kurumsal teori, kurumların hem kolaylaştırıcı hem de kısıtlayıcı yönlerinin firma stratejisini ve ihracat performansını kritik derecede etkilediğini öne sürmektedir. Özellikle Wu ve Chen (2014) ve Nuruzzaman, Singh ve Gaur (2020), bu iki rakip unsurun ev ortamında bir arada bulunduğunu ve aynı anda incelenmesi gerektiğini öne sürmüştür. Ancak kurumların bu iki rakip yönü benzer olarak değerlendirilmiş ve birbirinin yerine kullanılmıştır. Aslında, her kurum türünün farklı kökenleri ve süreçleri vardır, dolayısıyla firmaların değer elde etme şeklini etkilemede farklı roller oynamaktadırlar (Agostino, Nifo, Trivieri & Vecchione, 2020; Cerar, 2009; Li, Xia, Shapiro & Lin, 2018; Tan & Chintakananda, 2016). Bu nedenle, hem kolaylaştırıcı hem de kısıtlayıcı kurumların farklı ve spesifik özelliklerini aynı anda keşfetmek önemlidir (Nuruzzaman vd., 2020; Wu & Chen, 2014).

Bu bağlamda, bu araştırma özellikle ticari işlemleri yöneten hükümetle ilişkili kurumları incelemektedir. Gelişmekte olan ülkelerdeki firmalar, güçlü hükümet müdahalesi ve etkisi ile oldukça düzenlenmiş bir ortamda faaliyet

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göstermektedir ve bu nedenle hükümetlerin kaynakları, hükümet düzenlemeleri ve kanunlarla ilişkilendirilmektedir. Kolaylaştırıcı bakış açısıyla bu makale, gelişmiş düzenleyici kurumların etkisini dikkate almaktadır (Barasa, Knoben, Vermeulen, Kimuyu & Kinyanjui, 2017; Deng & Zhang, 2018). Gelişmiş düzenleyici kurumlar, hükümetin vergi idaresi, ticaret düzenlemeleri, izinler ve diğer düzenleyici yapılar gibi sağlam politika ve düzenlemeleri formüle etme ve uygulama becerisini ifade etmektedir (Barasa vd., 2017). Kısıtlayıcı bakış açısıyla bu araştırma politik ve yasal kurumların zorluklarını araştırmaktadır. Politik ve yasal kurumlar kurumsal ortamda firmaların ihracat performansını etkileyen temel unsurlardır (Nuruzzaman vd., 2020). Politik ve yasal kurumlar; kanunlar, mahkeme kararları ve istikrarlı politikalar gibi davranışları yönetmek için kullanılan kurallar sistemidir (North, 1990; Luo & Tung, 2007; Oliveira vd., 2018; Sharma, 2011). Gelişmekte olan ülkelerde özel kazanç için kamu gücü çok yaygın olduğundan, politik ve yasal kurumlar kuralların tekdüze olarak mı yoksa ihtiyari olarak mı uygulandığını yansıtmaktadır.

2.1. Düzenleyici Kurumların Etkisi

İyi çalışan düzenleyici kurumlar, KOBİ'lerinin ihracat yaparken karşılaştıkları işlem maliyetlerini azaltmakta ve böylece firmaların kaynaklarından değer elde etme yeteneklerini olumlu yönde etkilemektedir (Alonso & Garcimartin, 2013; North, 1990; Peng & Meyer, 2011; Peng vd., 2008). Aslında gelişmiş düzenleyici kurumlar, piyasadaki mevcut bilgileri firmalar ile paydaşlar, yabancı alıcılar veya ticaret ortakları gibi dış aktörler arasında şeffaf ve yaygın olarak erişilebilir hale getirmektedir (Cannizzaro & Weiner, 2018). Böylece aktörler arasındaki bilgi akışını kolaylaştırarak işlem verimliliğini arttırmaktadır. Aslına bakılırsa, gelişmekte olan ülkelerin düzenleyici kurumları artan bürokrasi ve karmaşık düzenlemelerle ilişkilidir. Örneğin, sınır ötesi işlemlere ilişkin idari prosedür, ihracat için gereken belge sayısının artması ve vergi dairesinde bizzat geçirilen uzun saatler nedeniyle bilgi akışını yavaşlatabilmektedir (Nuruzzaman vd., 2020; Zhou, Gao & Zhao, 2017). Firmalar ayrıca vergi idaresi ve oranları hakkında yeterince bilgi verilmemesi nedeniyle vergi yüküyle karşı karşıya kalabilmekte, bu da firmaların uluslararası ticaretinde hileli raporlar almasına yol açabilmektedir (Gökalp, Lee & Peng, 2017). Ayrıca onaylar, izinler ve lisanslar dış gözlemcilere karşı daha az şeffaf olabilmektedir (Millar, Eldomiaty, Choi & Hilton, 2005). Aslında çoğu işletme, yasal olarak faaliyet gösterebilmek için arazi izinleri, ithalat veya ihracat lisansları veya bir hükümet yetkilisi tarafından verilen proje onayları gibi yasal lisanslara ihtiyaç duymaktadır. Şeffaflığın olmaması, firmaların onay ve lisansları nispeten kolay alamamasına ve dolayısıyla işletme faaliyetleriyle ilgili işlem maliyetlerinin artmasına neden olmaktadır (Tonoyan, Strohmeyer, Habib &

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Perlitz, 2010). Bu, şeffaflığı azaltan ve bilgi akışını yavaşlatan bu karmaşık ve zorlu düzenleyici kurumlar nedeniyle dış ortakların bu tür ortamlardan gelen firmalarla ticaret yapmaktan uzak duracağı anlamına gelmektedir.

Üstelik gelişmekte olan ülkelerin verimsiz düzenleyici kurumları, doğru işgücünün bulunmasına ilişkin işlem maliyetlerini de artırabilir (Alston & Gillespie, 1989). Aslında gelişmekte olan ülkelerdeki hükümetler çalışma konusunda katı düzenlemelere gidebilmektedirler (World Bank, 2009). Hükümetler asgari ücreti belirleyebilir veya işverenlerin işçilere sağlık hizmeti, doğum izni vb. gibi ücret dışı faydalar sağlamasını zorunlu kılabilir. Hükümetler ayrıca firmaların işçi çıkarma olanağını da kısıtlayabilir. İşçi sözleşmelerinin hangi koşullar altında feshedilebileceğine dair karar verebilirler. Aşırı sertlik, işgücünün işe alınmasının maliyetini artırabilir. Aslında bu aşırılık, vasıflı üretime ve üretim dışı iş gücüne yapılan yatırımı azaltabilir ve dolayısıyla becerilerdeki eksikliği artırabilir (Alesina, Battisti & Zeira, 2018). Bu nedenle, uluslararası ticaret faaliyetlerinde önemli bir yere sahip olan vasıflı işgücünün (yani yöneticiler, idareciler) bu tür ülkelerde düşük olması muhtemeldir. Özetle, verimsiz düzenleyici kurumlar, gelişmekte olan ülkelerdeki KOBİ'ler için vasıflı işgücü bulma ve işe alma sorununu daha da kötüleştirebilmektedir.

Sonuç olarak, kurumsal destek mantığı, gelişmiş düzenleyici kurumların gelişmekte olan ülkelerdeki KOBİ'lerin ihracat performansını artırdığını ileri sürmektedir. Kurumsal destek mantığı, gelişmekte olan ülke firmalarının ülke içindeki düzenleyici kurumların avantajlarını alıp stratejik avantajlara dönüştürebileceğini öne sürmektedir (Cuervo-Cazurra, Luo, Ramamurti & Ang, 2018; Nuruzzaman vd., 2020; Sun, Peng, Lee & Tan, 2015). İyi işleyen düzenleyici ortam şeffaflığı artırmakta ve işlem maliyetlerini azaltıp, böylece dış paydaşlar, yani ticaret ortakları tarafından meşruiyet ve kabulü artırmaktadır (Doh & Kim, 2014; Gao, Murray, Kotabe & Lu, 2010). Bu açıklamalar doğrultusunda, aşağıdaki hipotez öne sürülmektedir:

H_1: Gelişmiş düzenleyici kurumlar, gelişmekte olan ülkedeki KOBİ'lerin ihracat performansını artırmaktadır.

2.2. Politik ve Yasal Kurumların Etkisi

Politik ve yasal kurumlardaki zorluklar, artan yolsuzluk ve rüşvetin yanı sıra politika riskleri ve belirsizlik yoluyla iş yapmanın maliyetlerini artırmaktadır (Krammer, 2019; Tonoyan vd., 2010). Bu durum, firmaları ekonomik işlemlerde fırsatçı davranışlara maruz bıraktığından ve dolayısıyla bu koşullar altında iş yaparken güven ve güvenilirliği azalttığından, firmaların mevcut kaynaklardan değer elde etme yeteneğini olumsuz yönde etkilemektedir (Cahen, Lahiri & Borini, 2016; Meyer, Estrin, Bhaumik & Peng, 2009; North, 1990). Politik ve yasal kurumların iyi işlemediği ekonomilerde, hükümet yetkililerinin kaynaklara,

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finansa veya bilgiye ayrıcalıklı erişim konusunda yüksek düzeyde kamu gücüne sahip olmaları muhtemeldir. Hükümet yetkilileri, firmaları düşük rütbeli kamu görevlilerine küçük ödemeler yapmaya zorlayarak bu gücü özel kazanç için kötüye kullanabilir. Zhou ve Poppo (2010), yöneticilerin hukuk sisteminin kendi çıkarlarını koruyabileceğini algıladıklarında, ilişkisel güvenilirlikten ziyade açık sözleşmeleri kullanma eğiliminde olduklarını ileri sürmektedir. Başka bir deyişle, eğer hukuk sistemi iyi çalışmıyorsa firmalar yolsuzluk ve rüşvet gibi resmi olmayan, piyasa temelli olmayan stratejilere yönelmekte ve dolayısıyla operasyon maliyetlerini artırmaktadır.

Ayrıca iyi işleyen politik ve yasal kurumlar, politika risklerini ve belirsizliği azaltarak firmalar için uygun bir ortam yaratabilir. Politika riskleri, hükümetin kuralları, düzenlemeleri ve bunların uygulanabilirliğini değiştirebileceği ve dolayısıyla firmaların faaliyetlerinde belirsizlik yaratabileceği anlamına gelmektedir. Daha spesifik olarak, beklenmeyen politika ve düzenleme değişiklikleri, geleceğe ilişkin doğru bilgi edinmenin maliyetlerini artırmakta ve dolayısıyla yöneticilerin riskli faaliyetler üstlenme konusundaki güvenini azaltmakta veya yöneticilerin karar verme süreçlerini olumsuz etkilemektedir (Xie, Qi & Zhu, 2019). Bu beklenmedik değişiklikler aynı zamanda hükümet yetkililerinin kaynak tahsisine ve kararlarına ilişkin belirsizlik de yaratmaktadır. Buna göre firma yöneticileri, ihracat gibi zorlu faaliyetlere kaynak ayırma konusunda isteksiz olabilmektedir (Wu & Chen, 2014).

Sonuç olarak, kurumsal boşluklar mantığı, politik ve yasal kurumlardaki dezavantajların, ek maliyetler, artan belirsizlik ve verimsiz kamu hükümleri yoluyla gelişmekte olan ülke firmalarının çabalarını azaltabileceğini, dolayısıyla daha fazla köken ülke merkezli hale gelebileceğini ve dış pazarlardaki yatırımlarını azaltabileceğini ileri sürmektedir (Cuervo-Cazurra, 2006; Tang vd., 2022). Bu sebeple, bu araştırma, verimsiz politik ve yasal kurumlar nedeniyle artan işlem maliyetlerinin, gelişmekte olan ülkelerdeki KOBİ'lerin ihracat performansını azaltacağını beklemektedir. Bu açıklamalar doğrultusunda, aşağıdaki hipotez öne sürülmektedir:

H₂: *Politik ve yasal kurumlardaki zorluklar, gelişmekte olan ülkelerdeki KOBİ'lerin ihracat performansını azaltmaktadır.*

Öne sürülen teoriksel çerçeve Şekil 1'de özetlenmektedir.
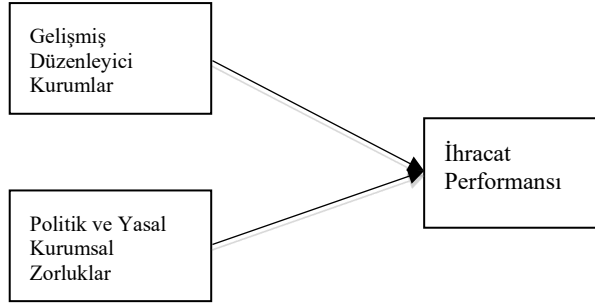
Şekil 1: Önerilen Teoriksel Model

3. YÖNTEM
3.1. Veri ve Örneklem

Firma düzeyindeki veriler, Avrupa İmar ve Kalkınma Bankası (European Bank for Reconstruction and Development) ile Dünya Bankası'nın ortak çalışması olan İş Ortamı ve İşletme Performansı Anketi (Business Environment and Enterprise Performance Survey - BEEPS) veri tabanından çekilen ikincil veri setlerinden elde edilmektedir. Anketler ile düzenli olarak farklı yıllarda veriler toplanmaktadır[2]. Bu çalışmada kullanılan veri seti, 2009 ve 2013 yıllarında gerçekleştirilen iki farklı anket ve gözlem yıllarına sahip firmaların bir alt örneğidir. Panel veri seti oluşturmak için hem 2009 hem de 2013 anketlerinde yer alan firmalar seçilmiştir. Örneklemdeki firmalar 27 farklı Orta Asya ve Doğu Avrupa gelişmekte olan ülke ekonomilerinden temin edilmiştir. Bu çalışma Avrupa Birliği İstatistik Kurumu Eurostat'ın KOBİ'leri 250'den az çalışanı olan işletmeler olarak tanımlayan tanımına dayanarak geliştirilen büyüklük kriterine göre gelişmekte olan ülke KOBİ'lerine odaklanmaktadır. Eksik verileri olan firmaları çıkararak veri setini temizledikten sonra çalışma, 2 basamaklı ISIC koduyla ölçülen 25 sektörü temsil eden 1359 KOBİ'den oluşan bir örneklemle sonuçlanmıştır. Tablo 1'de ülke ve sektöre göre örneklem dağılımı hakkında bilgi verilmektedir. Örneklem içerisinde 583 firma Orta Asya ülkelerinden ve 776 firma ise Doğu Avrupa ülkelerinden gelmektedir. Ülkelerin örneklem içerisindeki yüzdelik dağılımı çoğunluk için %0.1'in üzerindeyken Slovakya ve Polonya için bu değer %0.1'in altındadır. En yüksek yüzdelik paya Makedonya ve Ermenistan ülkeleri sahiptir. Örneklem içerisinde 817 firma hizmet sektöründe aktif iken, 542 firma ise üretim sektöründe yer almaktadır. Hizmet sektöründe en

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[2] Firma düzeyindeki bu veriler, https://www.enterprisesurveys.org/en/enterprisesurveys adresinden kaydolunarak temin edilebilmektedir (World Bank Group, 2020).

yüksek yüzdelik paya perakende sektörü sahip olmakla beraber en düşük yüzdelik paya ulaşım hizmetleri sahiptir. Üretim sektöründe en yüksek yüzdelik paya yapı işleri/inşaat sektörü sahip iken, kağıt ve metal işleri en düşük yüzdelik paya sahiptir.

BEEPS, yönetim alanında çok sayıda çalışma için köklü bir veri tabanıdır (Qi, Zou, Xie, Meng, Fan & Cao, 2020; Xie, Qi & Zhu, 2019). Çok çeşitli ülkeleri ve yılları kapsayan katmanlı bir firma örneğinden bilgi toplandığı için bu verileri kullanmak avantajlar sağlamaktadır. Bu anket, sektöre (imalat, perakende ticaret ve diğer hizmetler), işletme büyüklüğüne (<5 çalışan, 5-19 çalışan, 20-99 çalışan ve >99 çalışan) ve bölgeye göre rastgele örnekleme prosedürü ile katmanlara ayrılmıştır. Ankete her firmanın işletme sahibi veya yöneticisi yanıt vermektedir. Anket, firmaların düzenleyici ortamları ve altyapılarının yanı sıra firma düzeyindeki verilere ilişkin soruları içermektedir. İhracat performansı, mali destek ve kurumsal ortam dahil olmak üzere firma performansı göstergelerine ilişkin temel bilgileri içermektedir.

Anket yönteminin kullanılması, ortak yöntem varyansı (CMV) ile ilişkili endişeleri ortaya çıkarabilir. Dünya Bankası araştırma sürecinde potansiyel CMV'yi azaltmak için çeşitli yöntemler kullanmaktadır. Öncelikle ankete katılanlara anonimlik güvencesi verilmektedir. İkincisi, anketin tasarımında farklı yanıt formatları kullanılmaktadır. Örneğin bağımsız değişkenler Likert ölçeği ve evet/hayır sorularıyla ölçülürken, bağımlı değişken yüzdeyle ölçülmektedir. Üçüncüsü, her iki bağımlı değişken de algısal ölçümler olmayıp muhasebe verilerine dayanmaktadır ve bu da CMV endişelerini azaltmaktadır. Ayrıca bu çalışma verilerini iki farklı anket dalgasından almaktadır. Bu nedenle, aynı kişi muhtemelen farklı zaman dilimleri için her iki anketi de doldurmayacaktır; bu da ortak yöntem farklılığı potansiyelini azaltmaktadır.

Tablo 1: Ülkeye ve Sektöre Göre Örneklem Dağılımı

Ülke	Gözlem	ISIC-2 haneli endüstri kodu	Gözlem

	sayısı		sayısı
Arnavutluk	54	15 - Gıda	113
Belarus	40	17 - Tekstil	33
Gürcistan	43	18 - Giysiler	93
Tacikistan	25	19 - Deri	8
Türkiye	55	20 - Odun	23
Ukrayna	104	21 - Kağıt	5
Özbekistan	88	22 - Yayıncılık, basım	23
Rusya	78	24 - Kimya	36
Polonya	4	25 - Plastik ve kauçuk	28
Romanya	58	26 - Metalik olmayan mineral ürünler	44
Kazakistan	44	27 - Temel metaller	5
Moldova	98	28 - Fabrikasyon metal ürünler	54
Bosna-Hersek	62	29 - Makine ve ekipman	63
Azerbaycan	27	31-32 - Elektronik	17
Makedonya	116	33 - Hassas aletler	13
Ermenistan	120	35 - Taşıma makineleri	8
Kırgız Cumhuriyeti	28	36 - Mobilya	19
Estonya	51	45 - Yapı	121
Kosovo	11	50 - Motorlu taşıt hizmetleri	27
Çek Cumhuriyeti	10	51 - Toptan	134
Macaristan	29	52 - Perakende	348
Letonya	47	55 - Otel ve restoranlar	59
Litvanya	26	60-64 - Ulaşım	66
Slovak Cumhuriyeti	6	72 - Bilgi teknolojisi	19
Slovenya	67	Toplam	1359
Bulgaristan	46		
Hırvatistan	22		
Toplam	1359		

3.2. Değişkenler

Bağımlı değişkenler: Bu çalışma da önceki çalışmalarda da yaygın olarak kullanılan iki bağımlı değişken kullanılmaktadır (Cardoza, Fornes, Farber, Duarte & Gutierrez, 2016; Goedhuys & Sleuwagen, 2016; Krammer, Strange & Lashitew, 2018; Qi, Zou, Xie, Meng, Fan & Cao, 2020). İki bağımlı değişkenin kullanılması ampirik göstergeler hakkında daha sağlam sonuçlara varılmasına olanak sağlamaktadır. Birinci bağımlı değişken kukla değişken olarak ölçülen ihracat eğilimidir. Değişken, gelişmekte olan ülkedeki firmaların pozitif miktarda ihracat bildirmesi durumunda 1 değerini, aksi takdirde 0 değerini almaktadır. İkinci bağımlı değişken, bir firmanın doğrudan ihracat hacminin toplam satışlara oranı olarak ölçülen, 0 ile 100 arasında değişen ve daha yüksek değerler daha büyük ihracat yoğunluklarını gösteren ihracat yoğunluğudur.

Bağımsız değişkenler: Bu çalışma iki bağımsız değişkene odaklanmaktadır. Bunlardan ilki gelişmiş düzenleyici kurumlardır. Önceki çalışmaları takip ederek (Barasa vd., 2017; Deng & Zhang, 2018; Krasniqi & Desai, 2016), bu makale, işletme anketindeki a) gümrük ve ticaret düzenlemeleri, b) vergi idaresi, c) vergi oranları, d) ruhsatlandırma ve izinler ve e) çalışma düzenlemeleri gibi iş dünyası ile ilgili beş soruyu kullanarak düzenleyici kurumları ölçmektedir. Firmalardan bu boyutlardaki engeller hakkında ne hissettiklerini 5 puanlık bir ölçek kullanarak sıralamaları istenmektedir; burada 0 "engel yok" ve 4 "ciddi engel" anlamına gelmektedir. Gelişmiş düzenleyici kurumları yakalamak için öncelikle, anket yanıtında ilgili maddenin firma faaliyetlerine engel teşkil edip etmediğine bağlı olarak her bir kurumsal boyut için ikili bir değer atanır. Sıfır (engel yok) anket yanıtı 1 değerini alırken ve bir, iki, üç ve dört (küçük, orta, büyük ve çok ciddi engel) anket yanıtları 0 değerini almaktadır. Daha sonra bu ikili yanıtlar, genel değeri 0 ile 5 arasında değişen bileşik bir ölçüm oluşturmak üzere düzenleyici kurumların beş kategorisi için toplanır. Açıklayıcı faktör analizi, beş maddenin tamamının bir faktörde toplandığını ve faktör yüklerinin 0,60'dan yüksek olduğunu göstermektedir (Cronbach alfa = 0,72).

Bu araştırmanın ikinci bağımsız değişkeni politik ve yasal kurumlardaki kurumsal zorluklardır. Önceki çalışmaları (Barasa vd., 2017; Krasniqi & Desai, 2016; Nuruzzaman vd., 2020; Oliveira vd., 2018) takip eden bu makale, işletme anketinde: a) mahkemeler, b) siyasi istikrarsızlık, c) yolsuzluk ve d) resmi olmayan rekabet yer alan dört soruyu kullanarak politik ve yasal kurumlardaki zorlukları ölçmektedir. Firmalardan bu boyutlardaki engeller hakkında ne hissettiklerini 5 puanlık bir ölçek kullanarak sıralamaları istenmektedir; burada 0 "engel yok" ve 4 "ciddi engel" anlamına gelmektedir. Kurumsal zorlukları tespit etmek amacıyla, öncelikle anket yanıtında ilgili maddenin firma operasyonları için büyük veya ciddi bir engel olduğunu gösterip göstermediğine bağlı olarak her bir kurumsal boyut için bir ikili değer atanır. Üç ve dörtten oluşan bir anket yanıtı (büyük veya ciddi engeller) 1 değerini alırken ve sıfır, bir ve iki anket yanıtları (engel yok, küçük ve orta düzeyde engeller) 0 değerini almaktadır. Daha sonra bu ikili yanıtlar, genel değeri 0 ile 4 arasında değişen bileşik bir ölçüm oluşturmak üzere politik ve yasal kurumların dört kategorisi için toplanır. Açıklayıcı faktör analizi aynı zamanda bir tek faktörlü yapı göstermektedir ve burada dört öğe ilk faktöre >0,55 oranında yüklenmiştir (Cronbach alfa = 0,65). Ek olarak, sağlamlık testi için mevcut değişken farklı bir yöntemle tekrar kodlanmıştır. Bir, iki, üç ve dörtten oluşan bir anket yanıtı (küçük, orta, büyük ve çok ciddi engeller) 1 değerini alırken, sıfır (engel yok) yanıtı ise 0 değerini almıştır (Cronbach alfa = 0,68).

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Ayrıca hem düzenleyici kurumları hem de politik ve yasal kurumları kapsayan tüm maddeler faktör analizine dahil edildiğinde sonuçlar iki faktörlü yapı ortaya koymaktadır. Faktör yükleri, "gümrük ve ticaret düzenlemeleri, vergi idaresi, vergi oranları, işletme lisansları ve izinleri ve çalışma düzenlemelerinin" bir faktörü tanımladığını, "mahkemeler, siyasi istikrarsızlık, yolsuzluk ve gayri resmi rekabetin" ise bir faktörü tanımladığını göstermektedir.

Kontrol değişkenleri: Bu çalışma, ihracat literatüründe önemli sayılan bir dizi değişkeni kontrol etmektedir. Bu çalışma, çalışan sayısının logaritması olarak firma büyüklüğünü kontrol etmektedir. Bu çalışma aynı zamanda firmanın kuruluşundan bu yana geçen yıl sayısının logaritması olarak firma yaşını kontrol etmektedir. Yabancı mülkiyeti olan firmaların pazarlar hakkında daha iyi bilgiye sahip olma olasılıkları daha yüksektir, bu da ihracat performanslarını artırır. Bu sebeple üçüncü kontrol değişkeni yabancı mülkiyet oranıdır. Yabancı mülkiyet, özel yabancı kişilerin, şirketlerin veya kuruluşların sahip olduğu firmanın yüzdesi olarak ölçülür. Benzer şekilde, bu çalışma aynı zamanda devlet mülkiyetini de hükümet/devlet mülkiyetinin yüzdesi olarak kontrol etmektedir.

Buna ek olarak, bu çalışma yönetici yüklerini de kontrol etmektedir. Özellikle, hükümetler firmaları ve yöneticileri düzenleyici gereklilikleri elde edebilmek için daha fazla zaman harcamaya zorlayabilir, bu da firmaların ihracat eğilimini de etkiler. Bu kontrol değişkeni, üst yönetimin hükümet düzenlemelerinin zorunlu kıldığı gereklilikleri yerine getirmek için harcadığı toplam zamanın yüzdesi olarak ölçülür. Bu çalışma aynı zamanda firmaların uluslararası sertifikaya sahip olup olmadığını da kontrol etmektedir. Bu sertifikaya sahip firmalar dış pazarlarda daha fazla meşruiyete sahip olabilmektedir. Bir firmanın uluslararası kabul görmüş herhangi bir sertifikaya sahip olması durumunda 1'e, aksi takdirde 0'a eşit olan kukla değişken olarak ölçülür. Ayrıca bu çalışma, firmaların faaliyete başladıklarında kayıt dışı olup olmadıklarını da kontrol etmektedir. Faaliyete başladıklarında resmi olarak kayıtlı olan firmalar için 1'e, aksi takdirde 0'a eşit olan bir kukla değişken tarafından kontrol edilmektedir. Bu çalışmadaki diğer kontrol değişkeni ise devlet mali desteğidir. İşletme anketinde üç farklı soru: kamu kredisinin kullanılabilirligi, kamu sübvansiyonları ve kamu sözleşmeleri, hükümetin mali desteği olarak bileşik bir değişken oluşturmak için kullanılmaktadır. Bu çalışma aynı zamanda tüm ürün ve hizmetlerin toplam yıllık satışlarının logaritması olarak hesaplanan firma performansını da kontrol etmektedir.

Beşeri sermayeyi kontrol etmek için bu çalışma, gelişmekte olan ülkelerde belirli bir eğitim düzeyinde olan çalışan bulmak zor olabileceğinden, üniversite diplomasına sahip çalışanların yüzdesini dahil ederek işgücünün kalitesini kontrol etmektedir. Ayrıca yöneticinin sektördeki deneyimi de bir diğer

kontrol değişkeni olarak ele alınmakta olup yöneticinin firmanın sektöründe sahip olduğu deneyim yıllarının logaritması olarak ölçülmektedir. Son olarak bu çalışma, endüstriye, ülkeye veya yıla özgü gözlemlenmeyen heterojenliği kontrol etmek için endüstri, ülke ve yıl kukla değişkenlerini içermektedir.

3.3. İstatiksel Yöntem

Bu çalışmada değişkenler arasındaki ilişkileri doğrulamak için tanımlayıcı istatistikler ve Pearson korelasyonları sağlanmıştır. Bunu takiben, hipoteze dayalı ilişkileri test etmek için bir dizi regresyon modeli analiz edilmiştir. Daha sonra çoklu doğrusal bağlantı sorununu değerlendirmek amacıyla her modeldeki her katsayı için varyans enflasyon faktörü (VIF) hesaplanmıştır[3]. Bu araştırmada iki bağımlı değişken bulunmaktadır. İlk bağımlı değişken kukla değişken şeklinde kodlanmıştır. İkinci bağımlı değişken ise sıfırda sansürlenmektedir. Değişken ihracat satışlarının yüzdeleridir ve dolayısıyla değerler 0 ile 100 arasında değişmektedir. Bağımlı değişkenlerin yapısı göz önüne alındığında, doğrusal ve temel sıradan en küçük kareler (OLS) teknikleriyle tahmin yapmak yetersiz kalmakta, bunun yerine doğrusal olmayan bir regresyon modeli kullanılmaktadır. Buna göre Logit ve Tobit maksimum olabilirlik tahmini yapılarak hipotezler test edilmiştir (Greene, 2000).

4. BULGULAR
4.1. Tanımlayıcı Bilgiler

Tablo 2'de yukarıda açıklanan değişkenlere ilişkin bulgular sunulmaktadır. İhracat eğiliminin ortalama değeri, örneklemdeki firmaların %23'ünün ihracatçı olduğunu göstermektedir. Ortalama ihracat yoğunluğu ise %9'dur. Bu sonuçlar önceki çalışmalarla uyumludur (Krammer, Strange & Lashitew, 2018). Tablodaki sonuçlar aynı zamanda firmaların %36'sının devletten mali destek aldığını göstermektedir. Bulgulara kurumlar açısından bakıldığında firmaların politik ve yasal kurumlarda en az 1 engelle karşılaştıklarını, düzenleyici kurumlarda ise ortalama 2,5 engelle karşılaşmadıklarını göstermektedir. Ayrıca firmaların %43'ü politik ve yasal kurumlarda zorluklarla ve aynı zamanda düzenleyici kurumların desteğiyle karşılaşmaktadır. Kontrol değişkenlerine bakıldığında ortalama firma yaşı 18 olup, firmada ortalama 43 çalışan bulunmaktadır. Ayrıca ortalama yabancı sahipliği oranı %7, kamu sahipliği ise %1'dir. Tablo 3, bağımlı değişkenler ile bu çalışmada kullanılan tüm regresörler arasındaki ikili Pearson korelasyonlarını rapor etmektedir. Sonuçlara bakıldığında, beklenilenin aksine gelişmiş

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[3] Tüm regresyonlar, çeşitli özelliklere ve uygulamalara sahip güçlü bir istatistiksel yazılım olan STATA 14 istatistik paketi kullanılarak tahmin edilmektedir.

düzenleyici kurumlar ile ihracat bulguları arasında negatif bir ilişki olduğu görülmektedir. Belirli bir yüksek korelasyon gözlemlenmemiştir. Ek olarak, varyans enflasyon faktörleri (VIF'ler) önerilen 2,5 eşiğinin oldukça altındadır (ortalama VIF = 1,17), bu nedenle çoklu bağlantı ciddi bir endişe kaynağı gibi görünmemektedir.

Tablo 2: Değişkenlere İlişkin Bulgular

Değişkenler	Min.	Max.	Ortalama	Standart Sapma
İhracat eğilimi	0	1	0.23	0.42
İhracat yoğunluğu	0	100	9.01	23.40
Gelişmiş düzenleyici kurumlar	0	5	2.58	1.64
Politik ve yasal kurumlardaki zorluklar	0	4	0.96	1.17
Firma büyüklüğü	1	246	43.39	49.80
Firma yaşı	2	132	18.60	13.01
Devlet mali desteği	0	3	0.36	0.60
Yabancı mülkiyet	0	100	7.18	23.68
Devlet mülkiyeti	0	99	1.61	10.79
Yönetici yükü	0	100	14.24	19.72
Uluslararası sertifika	0	1	0.26	0.44
Yönetici deneyimi	1	57	17.53	10.29
İşgücü kalitesi	1	100	30.16	27.78
Kayıtsız olarak başlama	0	1	0.97	0.16
Firma performansı	0	25.54	16.15	2.82

4.2. Regresyon Sonuçları

Logit ve Tobit tahminlerinin sonuçları sırasıyla Tablo 4'de raporlanmaktadır. Kontrol değişkenleri açısından, Tablo 4'deki Logit ve Tobit tahmin sonuçlarına göre, firma büyüklüğü ve işgücü kalitesinin ihracat performansı üzerinde istatistiksel olarak anlamlı etkileri bulunmaktadır; bu, daha büyük firmaların ve vasıflı işgücüne sahip firmaların ihracat yapma olasılıklarının daha yüksek olduğunu göstermektedir. Devletin finansal desteğine sahip firmaların ihracat yapma ihtimalinin daha yüksek olduğu görülmektedir. Ek olarak, yabancı sermayeli firmaların ise mevcut literatürle uyumlu olarak ihracat performanslarının daha yüksek olduğu görülmektedir (Krammer, Strange & Lashitew, 2018). Devlet mülkiyetine sahip firmaların ihracatı gerçekleştirme olasılığına olan etkisi pozitif yönlü iken ihracat yoğunluğuna olan etkisi negatif yönlüdür. Yani ihracata başladıktan sonra devlet mülkiyetinin pozitif olan etkisi

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negatif yönlü olmaktadır. Bu durum özellikle devletin engelleyici politikalarının ihracatı engelleyebileceği ile ilişkilendirilebilir. Anlamsız olmasına rağmen, firma yaşının ihracat performansı üzerindeki etkisi negatif yönlüdür. Firmalar sektörde deneyimli hale geldikçe ihracatları azalmaktadır. Yönetici yükünün ihracat performansı üzerindeki pozitif etkisi Tobit tahmin sonuçlarına göre anlamsız olmakla beraber etkisi yine de pozitif yönlüdür. Yöneticinin deneyimli olması ve uluslararası sertifikaya sahip firmaların ihracat performansına olan etkisi anlamsız olmasına rağmen beklenildiği gibi pozitif yönlüdür. Resmi olarak kayıtsız bir şekilde işe başlayan firmaların ihracat performansına etkisi anlamsız olmasına rağmen pozitif yönlüdür. Bu sonuçlar genel olarak mevcut literatür ile desteklenmektedir.

Hipotez 1 gelişmiş düzenleyici kurumların KOBİ'lerin ihracat performansı üzerindeki etkisini olumlu yönde etkilediğini ileri sürmektedir. Beklenenin aksine Tablo 4 Model 2'deki sonuçlar, gelişmiş düzenleyici kurumların ihracat üzerindeki etkisinin negatif ve anlamlı olduğunu göstermektedir (β = -0,18, p < 0,01). Benzer şekilde Tablo 4'deki Tobit sonuçlarına göre etki katsayısı Model 2'de de negatif ve anlamlıdır (β = -4,37, p < 0,01). Dolayısıyla Hipotez 1 desteklenmemektedir. Bulunan bu sonuç aslında gelişmiş düzenleyici kurumların firmaların ihracat performansını arttırmadığını aksine azalttığını göstermektedir. Bu negatif etki kurumsal kaçış konseptiyle ilişkilendirilebilir. Kurumsal kaçış görüşüne göre firmalar ülkelerinde karşılaştıkları zorluklardan kaçarak daha iyi koşullara sahip olan ülkelerdeki fırsatlardan yararlanmak isterler.

Tablo 3: Korelasyon Sonuçları

Değişkenler	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. İhracat eğilimi	1.00														
2. İhracat yoğunluğu	0.70*	1.00													
3. Devlet mali desteği	0.19*	0.06*	1.00												
4. Gelişmiş düzenleyici kurumlar	-0.12*	-0.07*	-0.10*	1.00											
5. Politik ve yasal kurumlardaki zorluklar	-0.02	-0.0	0.01	-0.36*	1.00										
6. Firma büyüklüğü	0.27*	0.26*	0.21*	-0.08*	-0.05*	1.00									
7. Firma yaşı	0.14*	0.08*	0.10*	-0.08*	0.03	0.30*	1.00								
8. Yabancı mülkiyet	0.15*	0.22*	-0.00	-0.02	-0.09*	0.17*	0.02	1.00							
9. Devlet mülkiyeti	-0.02	-0.03	0.01	0.04	-0.06*	0.10*	0.06*	-0.03	1.00						
10. Yönetici	0.02	-0.00	-0.03	-0.12*	0.08*	0.04	0.03	-0.02	0.06*	1.00					
11. Uluslararası sertifika	0.28*	0.20*	0.16*	-0.08*	-0.02	0.30*	0.09*	0.22*	-0.02	0.03	1.00				
12. Yönetici deneyimi	0.07*	0.05*	0.01	0.01	0.02	0.03	0.26*	0.00	-0.08*	-0.01	0.03	1.00			
13. İşgücü kalitesi	-0.14*	-0.15*	-0.04	0.01	0.01	-0.27*	-0.19*	0.00	-0.04	-0.04	-0.05*	-0.08*	1.00		
14. Kayıtsız olarak başlama	0.04	0.03	-0.01	0.00	-0.01	0.03	-0.03	-0.00	-0.02	0.00	0.03	-0.01	-0.02	1.00	
15. Firma performansı	0.07*	0.04	0.08*	-0.03	-0.11*	0.48*	0.08*	0.11*	0.20*	0.03	0.16*	-0.07*	-0.00	0.02	1.00

* Korelasyon, 0.05 düzeyinde anlamlı

Tablo 4: Regresyon Sonuçları

Değişkenler	Logit (ihracat eğilimi)				Tobit (ihracat yoğunluğu)	
	Model 1	Marjinal etki	Model 2	Marjinal etki	Model 1	Model 2
Firma büyüklüğü	0.454*** (0.11)	0.0515***	0.458*** (0.11)	0.0514***	12.556*** (2.97)	12.611*** (2.97)
Firma yaşı	-0.020 (0.19)	-0.0023	-0.049 (0.19)	-0.0055	-2.986 (4.02)	-3.606 (3.98)
Yabancı mülkiyet	0.005* (0.00)	0.0006*	0.005* (0.00)	0.0005*	0.214*** (0.07)	0.220*** (0.07)
Devlet mülkiyeti	0.000 (0.01)	0.0000	0.001 (0.01)	0.0001	-0.090 (0.21)	-0.063 (0.21)
Yönetici yükü	0.006* (0.00)	0.0007*	0.005 (0.00)	0.0005	0.099 (0.09)	0.061 (0.09)
Uluslararası sertifika	0.269 (0.19)	0.0305	0.263 (0.19)	0.0295	6.433 (4.84)	6.034 (4.80)
Yönetici deneyimi	0.113 (0.14)	0.0129	0.132 (0.14)	0.0149	3.598 (3.20)	4.282 (3.20)
İşgücü kalitesi	0.007* (0.00)	0.0008*	0.007* (0.00)	0.0008*	0.087 (0.09)	0.089 (0.09)
Kayıtsız olarak başlama	0.775 (0.60)	0.0880	0.680 (0.58)	0.0764	22.157* (12.47)	19.559 (12.34)
Firma performansı	0.102* (0.06)	0.0115*	0.101 (0.06)	0.0114*	1.196 (1.70)	1.205 (1.71)
Devlet mali desteği	0.536*** (0.14)	0.0608***	0.501*** (0.14)	0.0562***	6.155* (3.17)	5.177 (3.17)
Gelişmiş düzenleyici kurumlar **(H1)**			-0.181*** (0.06)	-0.0204***		-4.374*** (1.42)
Politik ve yasal kurumlardaki zorluklar **(H2)**			-0.027 (0.07)	-0.0030		-0.276 (1.88)
Constant	-6.42***		-6.02***		-115.2***	-134.2***
Ülke, sektör ve yıl etkileri	Incl.		Incl.		Incl.	Incl.
Firma sayısı	1359		1359		1359	1359
Pseudo R-squared	0.3399		0.3467		9.42	9.12
Log likelihood	-488.0		-483.0		0.1112	0.1135

Not: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

Aksi durumda ise, kendi köken ülkelerinde kalmayı tercih ederler. Ortaya çıkan sonuca göre, gelişmiş düzenleyici kurumlar firmaları kendi köken ülkelerindeki fırsatlardan yararlanmaya daha fazla yöneltmekte olduğunu göstermektedir.

Hipotez 2 politik ve yasal kurumlardaki zorlukların KOBİ'lerin ihracat performansını olumsuz yönde etkileyeceğini öngörmektedir. Model 2 bu hipotezin test edilmesine yönelik sonuçları sağlamaktadır. Tablo 4'deki sonuçlar, kurumsal zorlukların ihracat üzerindeki etkisinin negatif ve anlamsız olduğunu göstermektedir (β = -0,02, p < n.s.). Benzer şekilde Tablo 4'deki Tobit sonuçlarına göre etki katsayısı Model 2'de de negatif ve anlamsızdır (β = -0,27, p < n.s.). Sağlamlık testi sonucuna göre ise politik ve yasal kurumlardaki zorlukların ihracat performansına olan etkisi negatif ve anlamsızdır (β = -0,072; p < n.s.; β = -2,53, p < n.s.). Anlamsız bir etki olmasına rağmen etki katsayısının işareti negatif yönlü olup, hipotezin beklentisi doğrultusundadır. Bu bulgu, KOBİ'lerin kendi kurumsal çevrelerinde politik ve yasal zorluklarla karşılaştıklarında ihracatlarının azaldığını göstermektedir. Bulunan bu sonuç kurumsal zorlukların firmaların ihracatlarını olumsuz bir şekilde etkilediğini göstermektedir. Kurumsal kaçış bakış açısına göre firmalar kendi köken ülkelerinde karşılaştıkları bu zorluklardan kaçarak ihracat performanslarını arttırabilirler. Ancak KOBİ'ler için mevcut stratejik seçenekler, daha büyük firmalarla karşılaştırıldığında sınırlı iç kapasiteleri ve kaynakları nedeniyle çok daha düşüktür. Bu sebeple KOBİ'ler için uluslararasılaşma yoluyla bu kurumsal zorluklardan kurtulma seçeneği sınırlıdır.

5. SONUÇ VE DEĞERLENDİRME

Bu araştırma, düzenleyici kurumlar ve politik ve yasal kurumların gelişmekte olan ülkelerdeki KOBİ'lerin ihracatını nasıl etkilediğini açıklamak için teorik bir çerçeve geliştirmektedir. Dünya Bankası İşletme Anketlerinden elde edilen bir panel veri kümesini kullanarak 27 gelişmekte olan ülkedeki 1359 firmadan oluşan bir örneklemden yararlanan bu araştırma, gelişmiş düzenleyici kurumların gelişmekte olan ülke KOBİ'lerinin ihracatını olumsuz yönde etkilediğini ortaya koymaktadır. Ek olarak, bu araştırma, politik ve yasal kurumlardaki zorlukların gelişmekte olan ülke KOBİ'lerinin ihracatını olumsuz etkilediğini ortaya koymaktadır. Aşağıda, köken ülke kurumlarına ilişkin uluslararası işletme literatürüne yapılan katkılar tartışılmaktadır.

Bu araştırma, gelişmekte olan ülkedeki KOBİ'lerin ihracatını desteklemede veya engellemede belirli yerel kurumların rolünün sistematik bir analizini sağlayarak uluslararası işletme literatürüne katkıda bulunmaktadır. Son zamanlarda, köken ülke kurumlarının uluslararasılaşmayı nasıl şekillendirdiğine

dair daha fazla araştırma yapılması yönünde birkaç çağrı yapılmıştır (Cuervo-Cazurra & Li, 2021). Mevcut birkaç çalışma köken ülke kurumlarının etkisini incelemiştir. Bu çalışmalar kurumlarının farklı boyutlarını incelemek açısından eksiktir. Bu bağlamda, bu araştırma, köken ülke kurumlarını kolaylaştırıcı/düzenleyici kurumlar ve kısıtlayıcı politik ve yasal kurumlar gibi iki rakip boyuta ayırmaktadır. İlk olarak, bu araştırma, iyi çalışan düzenleyici kurumların idari ve çalışma düzenlemeleri hakkındaki şeffaflık ve bilgi akışı sorunlarını azalttığını, dolayısıyla ihracat üzerindeki etkisini artırdığını ileri sürmektedir. Fakat sonuçlar beklenenin aksine, düzenleyici kurumların KOBİ'lerin ihracatı üzerinde negatif yönlü bir etkisi olduğunu göstermektedir. Bu sonuç aslında kurumsal kaçış (*institutional escape*) ile ilgili çalışmalara destek sağlamaktadır (Deng & Zhang, 2018). Kurumsal kaçış firmaların kendi ülkelerindeki sorunlardan uzaklaşmak için yurtdışı pazarlarını hedef aldığını ifade etmektedir. Kurumsal kaçış bağlamında, eğer köken ülkedeki kurumların gelişmişlik düzeyi firmalar için sorun yaratmıyorsa firmalar kendi köken ülkelerinde kalmaya devam etmektedirler. Bu durum özellikle KOBİ'ler gibi kaynak kısıtı olan firmalar özelinde daha anlaşılabilir olmaktadır (Deng & Zhang, 2018).

İkincisi, bu araştırma politik ve yasal kurumlardaki zorlukların piyasa dışı stratejilerin, politika risklerinin ve iç ortamdaki belirsizliğin etkisini artırdığını, dolayısıyla gelişmekte olan ülkelerdeki KOBİ'lerin ihracatını azalttığını göstermektedir. Bu sonuç, karşılaşılan zorlukların yönetimin dikkatini kurumsal soruna çözüm bulmaya yönelttiğini ve dolayısıyla dikkati ihracattan uzaklaştırdığını göstermektedir. Bu negatif durumun özellikle kaynak ve kapasite kısıtına sahip olan KOBİ'lerde karşılaşılması daha mümkün olmaktadır. Ayrıca, bu sonuç artan yolsuzluk ve zayıf mahkemelerin bir sonucu olarak ortaya çıkan kurumsal tehlikelerin, uluslararasılaşmadaki performansın azalmasıyla bağlantılı olduğunu öne süren önceki çalışmalarla uyumludur (Hernandez, Nieto & Rodriguez, 2022; Manolopoulos, Chatzopoulou & Kottaridi, 2018; Wu & Chen, 2014).

Gelişmiş düzenleyici kurumların ve politik/yasal kurumlardaki zorluklara ilişkin sonuçlar, ana ülke kurumlarının iki farklı yapısına dikkat çekmekte ve etkilerinin tekdüze olmadığı sonucuna varmayı mümkün kılmaktadır. Bu, kurumların kolaylaştırıcı ve kısıtlayıcı yönlerinin bir arada var olabileceğini ve firmanın uluslararasılaşmasını eşzamanlı olarak etkileyebileceği anlamına gelmektedir (Nuruzzaman, Singh & Gaur, 2020). Örneğin, (2013 Dünya Bankası Rekabet Edebilirlik Endeksi'ne göre) Ermenistan, hukuki karşılıklı bağımlılık açısından 110'uncu, hükümet düzenlemelerinin yükü açısından ise 41'inci sırada yer almaktadır; Çek Cumhuriyeti mülkiyet hakları

açısından 76., hükümet düzenlemelerinin yükü açısından ise 27. sırada yer almaktadır. Bu durum belirli kurumların özelliklerinin her zaman aynı yol ve mantıkta olmadığını göstermektedir. Genel olarak bu, belirli kurumların farklı rollere sahip olduğunu ve bunların ayrı ayrı değil aynı anda incelenmesi gerektiği fikrini desteklemektedir.

Çalışma bulgularının yönetim açısından önemli pratik sonuçları bulunmaktadır. Yükselen ekonomi KOBİ'lerinin yöneticileri, ihracata yönelik uluslararası yatırımlarını kolaylaştıran veya engelleyen fırsatları ve engelleri anlamalıdır. Bu tür firmaların yöneticileri için, menşe ülkenin kurumsal koşullarının tam olarak anlaşılması önem kazanmaktadır. Aslında gelişmiş düzenleyici kurumlar ve politik/yasal kurumlardaki kısıtlamalar, KOBİ yöneticilerinin ihracat gibi riskli faaliyetlerde bulunurken dikkatli olmaları gereken ekstra zorluklar yaratabilmektedir.

Bu araştırmanın gelecekteki araştırmalara yön veren bazı sınırlamaları vardır. Bu çalışmada panel veri seti oluşturmak ve anlamlı sayıda firmaya ulaşabilmek için 2009 ve 2013 verileri kullanılmıştır. Modelin daha güncel veriler kullanılarak test edilmesi gelecek çalışmalar için önemlidir. Kurumlar resmi ve gayri resmi kurumlardan oluşur. Bu araştırma kurumsal ortamın düzenleyici ve politik/yasal çerçevesine odaklanmıştır. Daha fazla araştırma, kurumların normlar, inançlar ve değerler gibi bilişsel yönlerine odaklanırsa ek bilgiler üretebilir. Bu araştırmada köken ülke kurumlarının özelliklerine odaklanılmıştır. Gelecekteki çalışmalar ev sahibi ülkelerdeki kurumların etkisini de dikkate alarak daha kapsamlı bir çalışma gerçekleştirebilirler. Ayrıca bu araştırma yalnızca gelişmekte olan ülkelere odaklanmaktadır. Gelecekteki araştırmalar, bu makalede tanıtılan bazı dinamiklerin gelişmiş ülkeler gibi diğer ülkelerde nasıl geçerli olduğunu araştırabilir. Üstelik bu araştırma, hükümet, kaynaklar ve yetenekler gibi farklı faktörlerin etkisini araştırmamıştır. Gelecekteki çalışmalar, kurumlar ve ihracat performansı arasındaki ilişkiyi etkileyen firmaya özgü bazı durumları incelemek için kaynak temelli bakış açısını kurumsal bakış açısıyla bütünleştirebilir.

6. ÇIKAR ÇATIŞMASI BEYANI
Çıkar çatışması bulunmamaktadır.

7. MADDİ DESTEK
Bu çalışmada herhangi bir fon veya destekten yararlanılmamıştır.

8. YAZAR KATKILARI
Çalışma tek yazarlıdır.

9. ETİK KURUL BEYANI VE FİKRİ MÜLKİYET TELİF HAKLARI

Çalışmada etik kurul izni gerektirecek bilgiler kullanılmamıştır. Çalışmada kullanılan veriler Dünya Bankası veri tabanından elde edilmiştir.

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THE MEDIATING ROLE OF HEDONIC CONSUMPTION AND MATERIALISM IN THE EFFECT OF THE CONSCIENTIOUSNESS PERSONALITY TRAIT ON ENVIRONMENTALLY CONSCIOUS CONSUMPTION[1]

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ABSTRACT

The transition from a production society to a consumption society has increased the destruction of the world's ecosystem. However, a growing number of customers are making efforts to lessen the impact of their purchases on the environment. To identify the determinants of influence on purchasing behavior, the mediating role of materialism and hedonic consumption in the relationship between conscientiousness and environmentally conscious consumption was investigated in this study. Quantitative research was used to collect data from 562 people through a survey technique. While environmentally conscious consumption and hedonism were investigated in one dimension, materialism was investigated in the dimensions of luxury tendency and feeling of deprivation, and the personality trait of conscientiousness was investigated in the dimensions of being planned and careful. Results of the study reveal that the luxury consumption tendency has a mediating impact on the relationship between sub-dimensions of conscientiousness personality traits (being careful, being planned) and environmentally conscious consumption behavior.

Keywords: *Environmental conscious consumption, conscientiousness, hedonic consumption, materialism*
JEL Code: *D91, E21, M14*

Scope: *Business administration*
Type: *Research*

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

SORUMLULUK KİŞİLİK ÖZELLİĞİNİN ÇEVRE BİLİNÇLİ TÜKETİME ETKİSİNDE HEDONİK TÜKETİM VE MATERYALİZMİN ARACI ROLÜ

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ÖZ

Üretim toplumundan tüketim toplumuna geçiş dünya ekosisteminin tahribatını da artırmıştır. Buna karşın satın alma ve tüketim davranışında çevresel kaygılarla hareket eden ve çevreye negatif etkisi olan ürünleri satın almaktan uzak duran tüketicilerin sayısı da gün geçtikçe artmaktadır. Kişilik özellikleri bireyleri çevreci davranışa yönelten en önemli faktörden biri olarak kabul edilmektedir. Bu çalışmada sorumluluk bilinci ile hareket etme kişilik özelliğinin çevre bilinçli tüketime etkisinde hedonik tüketim ve materyalizmin aracı rolü incelenmiştir. Nicel araştırma yöntemi ile gerçekleştirilen çalışmanın verileri anket tekniği ile 562 denekten toplanmıştır. Araştırmada hedonizm ve çevre bilinçli tüketim tek boyut üzerinden; sorumlu kişilik özelliği, planlı ve dikkatli olma boyutları üzerinden; materyalizm ise lüks eğilimi ve yoksunluk hissiyatı boyutları üzerinden ele alınmıştır. Araştırma sonucunda sorumluluk kişilik özelliği alt boyutlarının (dikkatli olma, planlı olma) çevre bilinçli tüketim davranışı üzerindeki etkisinde materyalizmin alt boyutlarından lüks tüketim eğiliminin aracı etkisi olduğu sonucuna ulaşılmıştır.

Anahtar Kelimeler: *Çevre bilinçli tüketim, sorumluluk, hedonizm, materyalizm*
JEL Kodları: *D91, E21, M14*

Alan: *İşletme*
Türü: *Araştırma*

1. INTRODUCTION

Consumption patterns of people have undergone significant changes as a result of the Industrial Revolution's rapid growth of mass production and the use of machines in manufacturing. Thus, as capitalism has expanded throughout society after 20th century, people's spending has grown, and consequently, consumption has increased in production-focused countries (Fromm, 1989).

In the past, profit-driven companies disregarded the harm they caused to the environment in order to produce more and increase their profits (Brown & Kasser, 2005; Manchanda, 2014). However, in the 1980s, customers started to protest against companies' environmentally damaging production methods, particularly in the United States and Great Britain (Saydan & Kanıbir, 2007). These protests lead customers to change their shopping decisions since these decisions are directly impacted by their growing environmental concern (Aracıoğlu & Tatlıdil, 2009). These protests also indicate that consumers are aware of environmental circumstances when they choose to buy things that are less detrimental to the environment and consider if the products are environmentally friendly. Moreover, this concern has been major reasons for the emergence of the notion of "Environmentally Conscious Consumption."

"Environmentally conscious consumption" refers to how customers' purchase decisions reflect their awareness on environmental issues (Ay & Ecevit, 2005). In general, the term "consumption" refers to the act of an individual purchasing, owning, and using products or services in order to fulfill a need (Doğrul, 2012). But in addition to satisfying needs, attempts are now being made to give consumers a sense of joy and excitement from the activities they engage in while satisfying their needs, which is intended to boost consumption (Açıkalın, 2017). The starting point of environmentally conscious consumption is accepted as providing pleasure to consumers as a result of purchasing products that are not detrimental to the environment while satisfying their needs.

Materialism is the belief that owning a product is essential to accomplishing one's objectives beyond just fulfilling one's needs or enjoying oneself after engaging in a purchase (Good, 2007). The most fundamental characteristics of materialism are demonstrated to be ownership of the purchased goods, a lack of generosity in sharing these goods, and—above all—the belief that material possessions should be the focal point of an individual's existence (Richins & Dawson, 1992; W. Belk, 1984).

Although the desire to meet needs is one of the basic motivations of purchasing behavior, materialism and hedonism also play a major role in purchasing behavior. For this reason, the effect of materialism and hedonism on purchasing behavior has been the subject of many studies recently (Cheng, Chang

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& Lee 2020; Guido, 2006; Manchanda, 2014; Öz & Tatlı, 2021; Solunoğlu & İkiz, 2020; Troisi, Christopher & Marek 2006). Nonetheless, consumers' purchase decisions are influenced by variables besides materialism and hedonism. Individuals' personality traits are accepted to have a significant role in influencing the purchasing behavior of consumers as well (Otero-López & Villardefrancos, 2013).

"Five Factor Personality Traits" developed by Costa and McCrae (1995) is a model that is frequently used to measure the concept of personality, which continues to be shaped from birth to death of the individual. "Five Factor Personality Traits", consisting of the dimensions of "*extraversion, neuroticism, conscientiousness, agreeableness, and openness to experience*" are used in many fields (Wood & Bell, 2008). For this reason, a variety of studies explore the effect of personality traits on purchasing behavior (Abdollahi et al., 2017; Guido, 2006; Milfont & Sibley, 2012). In addition, the effect of personality traits on environmentally conscious consumption has been studied by many researchers (Hirsh, 2010; Kaynak & Ekşi, 2014; Yılmaztürk & Akdoğan, 2023). In these researches, Abdollahi, Hosseinian, Karbalaei, Pajooh, Kesh & Najafi (2017) examined the mediating role of being individualistic and collective, Cheng et al. (2020) examined the level of environmental concern and consumer ethical belief, and Lu & Chang (2013) examined the effect of personality traits on environmentally conscious consumption. However, studies examining the mediating role of materialism and hedonism in the effect of environmentally conscious consumption and conscientiousness are quite limited in the literature.

Considering the related research, it seems that each factor of the Five Factor personality traits can be positively or negatively associated with environmentally conscious consumption. Nonetheless, the main explanation for selecting the conscientiousness component in this investigation is that individuals possessing a high level of conscientiousness typically exhibit purposeful and structured behavior. They also have a strong sense of duty and pay close attention to their task. These people are determined, they assimilate society norms and ideals, and they engage in peaceful interactions with others (Rae Perry, 2003). Lastly, future-focused activities are typically shown by conscientious people (Zimbardo & Boyd, 1999). Compared to other personality traits, it is thought that this trait will encourage people to take more responsible action in the future to stop environmental degradation. In this regard, this study aims to examine the mediating role of hedonism and materialism in the effect of the conscientiousness personality trait on environmentally conscious consumption.

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2. THEORETICAL FRAMEWORK

Conceptual details about the variables are included in this section of the study. First, the notion of environmentally conscious consumption—which is considered the dependent variable—is explained. The "Five Factor Personality Traits" are briefly explained, with particular focus on the conscientiousness personality trait dimension—which is considered to be an independent variable. Finally, the notions of hedonic consumption and materialism—which are supposed to serve as mediating variables—are discussed.

2.1. Environmentally Conscious Consumption

Consumers mostly focus on meeting their needs during their purchasing behavior. However, people now consider how their purchases may affect the environment when making decisions about what to purchase (Akdeniz Ar, 2011). The increased consciousness and sensitivity of consumers towards environmental matters has significantly contributed to the development of the conscious consumption pattern as environmentally conscious consumption.

Environmentally conscious consumption is characterized by customers who consider environmental issues to be significant in their purchasing decisions (Laroche, Barbaro-Forleo & Bergeron 2001). In other words, being environmentally conscious means avoiding the purchase or use of goods that are beneficial but environmentally harmful (Peattie, 2001). Because of this, consumers who care about the environment expect products to be safe to use, have a long shelf life, and be packaged eco-friendly. They also want products to not harm the environment or human health during production (Peattie, 2001).

While it may appear that environmentally conscious consumption is a relatively recent idea, environmentally conscious purchasing practices have been observed among consumers since the 1960s (Lampe & Gazdat, 1995). The primary driver of this purchase activity is customers' concern about environmental degradation and desire to combat it (Bozpolat, 2021). Although it initially appeared as a personal activity, the great majority of people today are in favor of this activity, which began with individual efforts and has now greatly impacted society's purchasing behavior (Dikmenli & Konca, 2016). This widespread activity sparked legislation to stop environmental degradation, prompted companies to manufacture fewer environmentally hazardous products, and finally sparked a full-scale environmental protection movement (Kaypak, 2011).

In order to capitalize on the growing trend of environmentally conscious consumption, manufacturers should reorganize their manufacturing, distribution, and marketing strategies and emphasize eco-friendly methods to draw in this customer base (Aytekin, 2007). Nevertheless, companies must incur additional

expenses to manufacture goods that will attract these customers, who still make up a small portion of the overall consumer base. This is mostly due to the expensive nature of the production, distribution, and marketing processes for these products, which have not yet achieved economies of scale (Wong, Turner & Stoneman, 1996). On the other hand, environmentally conscious consumers often bear this cost, even though the products they purchase are more expensive than non-environmentally friendly products (Peattie, 1999; Wong et al., 1996).

2.2. Five Factor Personality Traits

Individual behavior is greatly influenced by the concept of personality, which exists from birth, shapes and develops until death, and helps individuals stand out from each other (Mount, Barric, Scullen & Rounds 2005). Personal traits that influence behavior are categorized using a variety of typologies. Numerous models, including the five-factor personality type of Myers-Briggs, A/B personality types, and Holland and Eysenck personality types, are among the main typologies used in the literature to measure the impact of personality traits on human behavior. The Holland typology discusses people by categorizing them according to six fundamental dimensions: realistic, investigative, artistic, social, entrepreneurial, and conventional (Demirkol & Aslan, 2021). According to Eysenck typology, personality types are discussed through extraversion and neuroticism dimensions (Karancı, Dirik & Yorulmaz 2007). Personality typology also classifies personality traits into two groups: type B (less competitive, less dedicated to work, and less sensitive to time) and type A (more competitive, more dedicated to work, and more sensitive to time) (Durna, 2010). In the Myers-Briggs model, personality structure is discussed through the sub-dimensions of extroversion/introversion, emotionality, judgmental and thinking (Bulgur, 2022). When personality traits were categorized according to shared attributes, researchers concentrated on five variables, which were collectively dubbed "Five Factor Personality Traits" despite the fact that there is no widely recognized theory regarding personality traits (Friedman & Schustack, 1999). The continuity shown in the behaviors displayed as well as the people's sentiments and thoughts were taken into consideration when developing each dimension of the personality traits studied under the five different dimensions (Limont, Dreszer-Drogorób, Bedynska, Sliwinska & Jastrzebska 2014). "The Five Factor Personality Traits" developed by Costa and McCrae (1995) can be used to categorize personality structure using terms from any language spoken worldwide. Personality traits are discussed through the dimensions of extraversion, neuroticism, conscientiousness, agreeableness and openness to experience (Wood & Bell, 2008). The relationship between environmentally conscious consumption and personality traits has been the focus of several research investigations in the

literature (Abdollahi et al., 2017; Guido, 2006; Milfont & Sibley, 2012). Based on existing research, it appears that the five-factor personality model aligns better with environmentally conscious consumption behaviors.

According to the model, people with extrovert personality traits are warm-blooded, gregarious, energetic, and more adept at forming relationships with other people (Benet-Martinez & John, 1998), people who have a high degree of conscientiousness, behave in a planned way, feel a strong sense of obligation, act attentively at work, are resolute, absorb social norms and values, and interact with others in a harmonious way (Rae Perry, 2003). Individuals who are open to experience enjoy going beyond traditional patterns while being open to different experiences, adventurous and creative (Benet-Martinez & John, 1998; Costa & McCrae, 1995; Somer, Korkmaz & Tatar 2002). In accordance with the model, people who display the personality trait "agreeableness" tend to help others, form close relationships with people around them, express affection, and be understanding. The last dimension in the mode, "neuroticism" is stated to be individuals who do not trust their environment, exhibit anxious attitudes, are easily offended and get angry very easily (Somer et al., 2002).

2.3. Hedonic Consumption

Consumers essentially act with two senses when displaying purchasing behavior. The first of these senses is used for practical purposes to fulfill needs, but the second sense is used to satisfy passions rather than necessities (Batra & Ahtola, 1991). These behaviors are also called hedonic and utilitarian. While hedonic consumption behavior is expressed as the pleasure of the experience of using products, utilitarian consumption can be expressed as the functions of the product meeting the needs of the consumer (Voss, Spangenberg & Grohmann 2003). Additionally, in hedonic consumption, the most important factor that directs individuals to consumption is the entertainment and pleasure to be obtained from consumption (Hirschman & Holbrook, 1982). For this reason, in hedonic consumption—as opposed to materialistic consumption—the enjoyment that buyers derive from the transaction takes precedence over the usefulness of the product (Park, Kim & Forney 2006).

The majority of hedonistic consumers rarely put off their desires (Odabaşı, 2006). Businesses can profit from this scenario since this particular consumer group, which values pleasure in its consumption, searches for goods that will provide the greatest amount of pleasure. For this reason, businesses aim to produce products that appeal to people's emotions in addition to fulfilling functional needs when developing them, allowing customers to derive the most enjoyment from their purchasing endeavors (Özgül, 2011).

2.4. Materialism

Materialism is studied in many disciplines, including sociology, philosophy, and even religion. Today, psychology, marketing, and economics place a high value on the topic (Karahan & Söylemez, 2019). One of the main reasons why materialism has become one of the research topics of marketing and economics is that materialism plays a highly effective role in consumer behavior (Eastman, Goldsmith & Flynn, 1999).

Having material possessions is often the focal point of the life of those who tend to materialistic behavior. People feel that their possessions contribute to social advancement and that their ownership of these goods makes them happy. While materialistic consumers find joy in owning a product, there is also a significant correlation between the inability to buy a product and negative feelings in people (Parker, Haytko & Hermans 2009).

Rassuli and Hollander (1986) claim that materialism encourages people to spend money and acquire things, as well as leading them to make unneeded purchases. Furthermore, compared to other consumers, materialistic consumers are not hesitant to spend more time or money on the things they wish to purchase (Sevgili, 2012). Materialistic customers may feel the urge to buy more or other things soon after making a purchase, even if it means spending more time and money. They may also forget the satisfaction of the object they already own (Richins & Dawson, 1992).

3. LITERATURE REVIEW AND FUNDAMENTAL HYPOTHESES

A person's behavior is mostly driven by their personality traits, particularly their views, values, and attitudes. In this regard, personality traits have an important place in individuals' environmentally conscious attitudes and purchasing behavior (Pettus & Giles, 1987). According to Wojciechowska's (2017) research, personality traits have a beneficial impact on purchasing behavior when it comes to multicultural values, the desire to buy branded goods. While this beneficial impact was noted on environmentally friendly/green consumption in the studies of Duong (2022), Fraj and Martinez (2006), Fatoki (2020), Yang and Zhang (2021), and Akdoğan and Durmaz's (2021) study, it was also noted on sustainable consumption in the studies of Awais, Samin, Gulzar, Hwang and Zubair (2020), Can and Çağan (2024), Özdemir and Sunaoğlu (2023), Ribeiro, Veiga and Higuchi (2016), as well as on sustainability.

Hirsh (2010) examined how people's personalities affected their attitudes toward environmental issues. He concluded that while people with neurotic and conscientiousness personality traits are relatively less tactful

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to environmental degradation, those with agreeable and open-to-experience personality traits are more sensitive to it. Another study examining the relationship between personality traits and environmental awareness was conducted by Kaynak and Ekşi (2014). According to a study which examines the relationship between personal traits, healthy living and environmental awareness, people with agreeableness and conscientiousness personality traits have positive environmental awareness.

Another study investigating the relationship between five-dimensional personality traits and environmental consciousness is conducted by Abdollahi et al. (2017). The authors concluded that people who exhibit higher levels of neuroticism, extroversion, and conscientiousness also tend to behave in more environmentally conscious ways. Finally, Akdoğan and Durmaz (2021) examined the relationship between personality traits extroversion, conscientiousness and agreeableness dimensions, and environmentally conscious consumption. While the personality traits of conscientiousness and agreeableness have a positive and significant effect on environmentally conscious consumption, no statistically significant effect of the personal trait of extroversion on environmentally conscious consumption was found. The H1 hypothesis was established as follows in accordance with the relevant research.

H₁: *Conscientiousness personality trait has a significant impact on environmentally conscious consumption behavior.*

Although the subject of personality traits and environmentally conscious consumption is a subject that has been studied quite frequently, the literature is quite limited in terms of hedonism and environmentally conscious consumption and sustainable consumption. However, Bhardwaj and Manchiraju (2017) examined the effect of unplanned purchasing and hedonism on sustainable consumption in their study and concluded that while unplanned purchasing behavior has a negative effect on sustainable consumption, hedonism has a positive effect on sustainable consumption. Research indicates that the primary factor contributing to hedonism's beneficial impact on sustainable consumption is the way in which people transform sustainable consumption into an enjoyable activity for themselves. Choi and Johnson (2019) also carried out research to investigate the relationship between hedonism and environmentally conscious consumption (intention to purchase green products). The study's findings indicate that hedonic motives have a positive effect on consumers' intentions of purchasing green products. The authors observed that the primary explanation for the positive relationship between hedonism and the desire to buy environmentally friendly items is that people who exhibit hedonistic behavior are drawn to new

products, and environmentally friendly products are relatively new on the market.

H₂: *Hedonism has a significant impact on environmentally conscious consumption behavior.*

Contrary to hedonism and environmentally conscious consumption, the effect of personality traits on hedonism/hedonic consumption has been studied by many researchers (Guido, 2006; Öz & Tatlı, 2021; Solunoğlu & İkiz, 2020). According to the findings of Solunoğlu and İkiz's (2020) study, there is a negative relationship between hedonism and the personality traits of conscientiousness. Guido's (2006) research revealed a significant relationship between utilitarian consumption and conscientiousness, but no significant relationship was revealed between hedonism and conscientiousness. Lastly, in the study conducted by Öz and Tatlı (2021), a positive and significant relationship was found only between extraversion and hedonism. However, the relationship between conscientiousness and hedonism was not statistically significant.

H₃: *Conscientiousness personality traits have a significant impact on hedonism.*

People's buying habits and desire to possess goods are strongly influenced by personal traits. However, this effect is not always directly observed (Rose, 2007). In their study, Mowen and Spears (1999) stated that materialism plays a mediating role between individuals' personality traits and purchasing behavior. Moreover, in the study, it is demonstrated how the demand for stimulation, in particular, extroversion and openness, have a positive and indirect impact on materialism. Another study on the mediating role of materialism between personality traits and purchasing behavior was conducted by Otero-López and Villardefrancos (2013) and Bosnjak, Galesic and Tuten (2007). These studies concluded that materialism has a mediating role in the effect of extroversion, openness to new experiences, and agreeableness personality traits on excessive purchasing behavior. They also concluded that conscientiousness personality traits do not exhibit unnecessary purchasing behavior. Accordingly, materialism does not have a mediating effect on these two variables. In the study conducted by Troisi, Christopher and Marek (2006), it was observed that materialism has a negative effect on the unnecessary purchasing behavior of individuals with agreeableness and extroversion personality traits. Finally, in the study conducted by Başlar and Bozbay (2019) the influence of materialism and status consumption on the compulsive buying behavior associated with personality traits was examined. However, no significant relationship was observed between personality traits and materialism.

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H₄: *The conscientiousness personality trait has a significant impact on materialism.*

People are concerned about the limited resources in the ecosystem and the increasing environmental degradation resulting from excessive consumption (Brown & Kasser, 2005; Kilbourne & Pickett, 2008). And materialism is shown as one of the biggest reasons for excessive consumption since it encourages people to continuously acquire and own goods. For this reason, it has been viewed as a sinister and disagreeable idea (Manchanda, 2014). According to Kasser's (2016) research, materialistic people prioritize their enjoyment over their appreciation of the environment, which explains why they do not show environmental concerns. Additionally, Sreen, Purbey and Sadarangani (2020) concluded that materialistic emotions eliminate environmental impulses. Nonetheless, other research concludes that materialism promotes environmentally conscious and environmentally beneficial consumption. When environmentally conscious individuals act with the urge of materialism, this behavior can turn into the concept of having environmentally friendly products for them (Mai, 2019). In this regard, Mai (2019) and Yılmaztürk and Akdoğan (2023) concluded that materialism has a positive and indirect effect on protecting the environment and purchasing behavior of environmentally friendly products.

H₅: *Materialism has a significant impact on environmentally conscious consumption behavior.*

H₆: *Hedonism has a mediating role in the effect of conscientious personality trait on environmentally conscious consumption behavior.*

H₇: *Materialism has a mediating role in the effect of conscientious personality trait on environmentally conscious consumption behavior.*

4. RESEARCH MODEL AND RESEARCH METHOD

The aim of this research is to measure the mediating role of hedonism and materialism in the effect of conscientiousness personality trait on environmentally conscious consumption. The mediating impact can be measured in the literature using either the contemporary approach based on the bootstrap test or Baron and Kenny's causality approach (Gürbüz, 2019). In the traditional approach developed by Baron and Kenny (1986), in order to test the mediator effect, the relationship that exists between the independent and dependent variables, it is necessary for the effect of the independent variable on the mediator variable and the effect of the mediator variable on the dependent variable to be significant. Several academics, most notably Andrew Hayes, have criticized this approach, arguing that the bootstrap test is a more powerful test and that it is

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inappropriate to search for these conditions when evaluating the mediating impact (Bozkurt, 2021). According to this approach, the mediator effect can be measured even if the conditions required in the classical model are not met (Gürbüz, 2019). Addionally, it is revealed in the literature that the bootstrap technique gives more reliable and accurate results than the classical approach (Bozkurt, 2021; Hayes & Scharkow, 2013). In this study, the mediating impact was examined using the modern approach, taking into account its advantages over the traditional approach. Accordingly, the study's model was designed as follows.
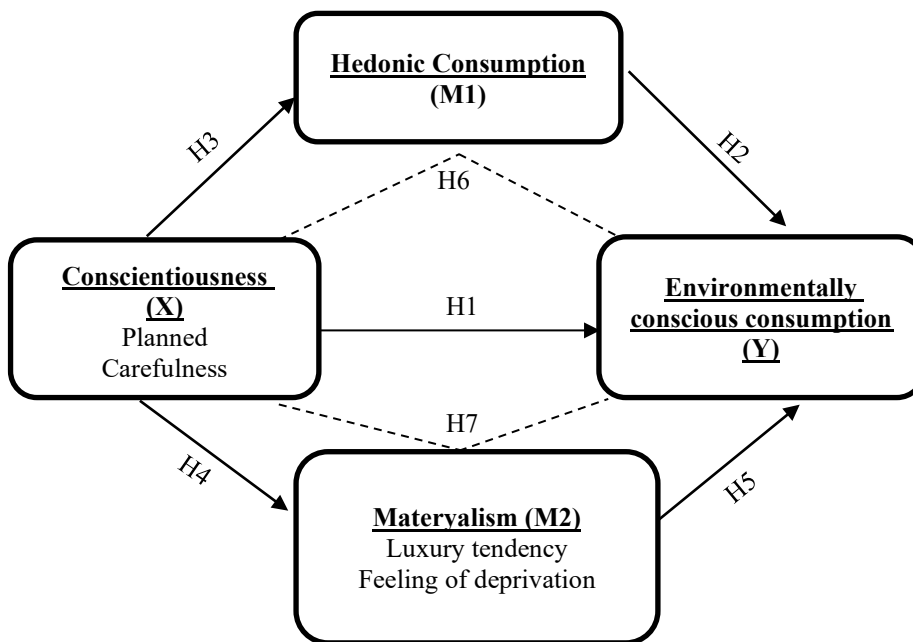
Figure 1: Research Model

According to model sub-hypotheses are as follows:

H₁ₐ: *Individuals' planned personal traits have a significant impact on environmentally conscious consumption behavior.*

H₁ᵦ: *Individuals' carefulness behavior has a significant impact on environmentally conscious consumption behavior.*

H₂ₐ: *Individuals planned personal traits have a significant impact on hedonic consumption behavior.*

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H₂ᵦ*: Individuals' carefulness personal traits have a significant impact on hedonic consumption behavior.*

H₃ₐ*: Individuals' planned personal traits have a significant impact on the luxury tendency.*

H₃ᵦ*: Individuals' planned personal traits have a significant impact on the feeling of deprivation.*

H₃ᵪ*: Individuals' carefulness personal traits have a significant impact on the luxury tendency*

H₃d*: Individuals' carefulness personal traits have a significant impact on the feeling of deprivation.*

H₅ₐ*: The luxury tendency has a significant impact on environmentally conscious consumption.*

H₅ᵦ*: Feelings of deprivation have a significant impact on environmentally conscious consumption.*

H₆ₐ*: Hedonic consumption has a mediating role in the effect of individuals' carefulness personal traits on environmentally conscious consumption.*

H₆ᵦ*: Hedonic consumption has a mediating role in the effect of individuals' planned personal traits on environmentally conscious consumption.*

H₇ₐ*: The feeling of deprivation has a mediating role in the effect of individuals' planned personal traits on environmentally conscious consumption.*

H₇ᵦ*: The luxury tendency has a mediating role in the effect of individuals' planned personal traits on environmentally conscious consumption.*

H₇ᵪ*: The feeling of deprivation has a mediating role in the effect of individuals' carefulness personal traits on environmentally conscious consumers.*

H₇d*: The luxury tendency has a mediating role in the effect of individuals' carefulness personal traits on environmentally conscious consumption.*

4.1. Ethical Permissions for the Research

The ethical evaluation of this study was carried out by the Inonu University Social and Human Sciences Scientific Research and Publication Ethics Committee. Ethical approval was given with decision number 25 dated 12.01.2024.

4.2. Research Population and Sample of the Research

The population of the research was determined as all individuals aged 18 and over living in Turkey. However, sampling was employed because it is challenging to reach the entire universe owing to both time and budgetary constraints and the sample was selected using the convenience sampling technique.

Convenience sampling is one of the non-random techniques used to obtain the data. The idea behind convenience sampling, which is widely

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employed in the social sciences, is to include each person who responds to the survey in the sample. Until the required sample size is attained, the subject recruiting procedure is repeated (Altunışık, Coşkun, Bayraktaroğlu & Yıldırım 2010).

The table created by Sekaran (2003) states that if the research population exceeds 100,000, the sample size should be 384 persons or more. Accordingly, analyses were conducted based on the observation that the 562 people that were reached were capable of representing the population.

4.3. Data Collection Tools

Data for testing the relationship between the variables to be used in the research were gathered using scales whose validity and reliability had already been tested in the literature.

Big Five Inventory (BFI) scale developed by Benet-Martinez and John (1998) to measure the conscientiousness personality trait, the scale to measure hedonic consumption behavior was developed by Babin, Darden and Griffin (1994). Materialistic behavior was measured using the scale developed by Richins and Dawson (1992), while environmentally conscious consumption was measured using the 'Purchasing Environmentally Friendly Products' dimension of the scale developed by Roberts and Bacon (1997). The Conscientiousness scale consists of eight items, the Environmentally Conscious Consumption scale consists of eight items, the Hedonic Consumption scale consists of eleven items, and finally the Materialism scale consists of seven items.

A 5-point Likert scale was employed in the survey to gauge respondents' degrees of agreement. In addition to the survey's predefined factors, characteristics like gender, age, and income were added to offer a better understanding of the participants' profiles.

The sample of the study consists of individuals aged 18 and over. The main reason for choosing the sample from these individuals is that individuals who have reached the age of 18 are considered adults in many parts of the world and can be freer in their behavior. The goal of this study, which measures environmentally conscious consumer behavior, is to reduce the likelihood that adult persons may adopt these practices as a result of familial influence.

608 persons were approached within the study's scope, and online questionnaires were filled out between January 5, 2024, and January 28, 2024. Only 562 surveys were determined to be appropriate for the study, and the analyses were carried out within this context. SPSS 22 and IBM AMOS 24 package programs were used in the analysis of the data.

5. RESULTS
5.1. Results on Demographic Statistics
Descriptive statistics regarding the sample that answered the questions within the scope of the research are shown in Table 1.

Table 1: Demographic Statistics

Demographic Statistics	Frequency	Ratio (%)
Gender (N:562)		
Female	332	59,1
Male	230	40,9
Age (N:562)		
18-24	171	30,4
25-34	190	33,8
35-44	74	13,2
45-55	71	12,6
55+	56	10,0
Income (N:562)		
17.002 TL or less	206	36,7
17.003-25.000 TL	89	15,8
25.001-30.000 TL	55	9,8
30.001-35.000 TL	27	4,8
35.001- 40.000 TL	35	6,2
40.001 TL +	150	26,7

According to the results stated in Table 1, it was observed that the majority of the participants in the study (59.1%) were women. When the distribution of participants according to age groups is examined, 30.4% of the participants are in the 18-24 age range, 33.8% of the participants in the 25-34 age range, 13.2% of the participants in the 35-44 age range, 12.6% of the participants in the 45-55 age range and finally, it was determined that participants over the age of 55 constituted 10% of the sample. When the distribution of the research participants according to their income status was examined, it was observed that the majority of the participants (36.7%) had an income of 17,002 TL or less. In addition, those with an income of 17,003-25,000 TL constitute 15.8%, those with an income of 25,001-30,000 TL constitute 9.8%, those with an income of 30.001-35.000 TL, constitute 4.8%, 35,001-40,000 TL constitute 6.2%, while those with an income of 40,001 TL and above constitute 26.7% of the sample.

5.2. Validity and Reliability Analysis
Within the scope of validity and reliability analyses of the scales, the mean, reliability, standard deviation, KMO, Barlett tests, Factor Loadings, df and significant values were examined. These values are shown in Table 2.

Table 2: Reliability and Validity Analysis Results

Scales	Variables	Mean	Cronbach' Alpha Value	St. Dev.	KMO Values	Bartlett Tests Values	Factor Loadings (>0,50)	df/Sig.
Cons.	Planned (PL)	3,94	0,87	,98	0.792	2206.98	0.779-0.870	28/.000
	Carefulness (CR)	3,04	0,85	1,21				
Env. Con. Con.	Env. Con. Con. (ECC)	3,54	0,74	,89	0.688	515.69	0.649-0.841	6/.000
Hed. Con.	Hed. Con. (HC)	2,86	0,85	,95	0.865	1534.41	0.539-0.823	21/.000
Mat.	Luxury Tendency (LT)	2,47	0,82	1,05	0.838	1583.26	0.716-0.866	21/.000
	Feeling of Deprivation (FD)	3,20	0,82	1,17				
Extraction method: Maximum likelihood, Rotation: Varimax								

In Table 2, it is seen that the KMO values are above 0.7 and the Bartlett test results are significant. These results indicate that the sample size is sufficient for the analysis (Karagöz, 2019). As a result of the factor analysis, 9 items (HDN1, HDN2, HDN3, HDN9, HDN11, ECC1, ECC2, ECC7, ECC8) were removed because the factor loading value was lower than 0.5 and had close values in more than one factor (the difference between the values is less than 0.1) (Karagöz, 2019). The Cronbach Alpha coefficient of the variables was checked to examine the internal consistency of the scales. The fact that the Cronbach's Alpha Coefficient for the variables is higher than 0.70, which is stated as the lowest acceptable value, indicates that the reliability of the scale is at an acceptable level (Coşkun, Altunışık & Yıldırım, 2019).

In order to determine whether the data showed a normal distribution, skewness and kurtosis values were examined. It was observed that the skewness (0,627/-0,987) and kurtosis (0,384/-1,049) values were within the sufficient range accepted in the literature (Collier, 2020).

5.3. Confirmatory Factor Analysis

The confirmatory factor analysis results for the scales are given in Table 3. Since the data showed a normal distribution, the Maximum Likelihood calculation method was used.

Table 3: Results of Confirmatory Factor Analysis of Scales

Scales	Model Fit Summary				Modificated Model Fit Summary			
	CMIN / DF <5	GFI >0,90	CFI >0,90	RMSEA <0,08	CMIN / DF <5	GFI >0,90	CFI >0,90	RMSEA <0,08
Planned (PL)	16,424	0,97	0,972	0,166	0,224	1	1	0,000
Carefulness (CR)	24,587	0,955	0,954	0,205	1,619	0,999	0,999	0,033
Env. Con. Con. (ECC)	21,538	0,961	0,920	0,191	1,746	0,998	0,999	0,036
Hedonic Con.(HC)	5,926	0,971	0,968	0,094	4,355	0,98	0,98	0,077
Luxury Tend.(LT)	3,628	0,993	0,993	0,068	3,628	0,993	0,993	0,068
Feeling of Dep.(FD)	-	1	1	-	-	1	1	-

In the literature, CMIN/DF value < 5, GFI value > 0.90, CFI value > 0.90 and RMSEA value < 0.08 are considered acceptable (Gürbüz, 2021). As a result of CFA, although the p values for the variables are significant, it is seen that some model fit values are not within the range accepted in the literature. Thereupon, the suggested covariance definitions in the modification indices were made and the analysis was repeated. After the modifications, it was observed that the fit values reached acceptable levels. The values before and after the modification are given in Table 3.

As a result of confirmatory factor analysis for the measurement model, it is seen that the p value is significant, but some values are not within the acceptable range. The suggested covariance corrections were made to move the values to the acceptable range. After the modification, the values were within the acceptable limits. The values before and after modification of the measurement model are given in Table 4.

Table 4: Results of Confirmatory Factor Analysis of Measurement Model

	Model Fit Summary						
	CMIN/DF <5	GFI >0,90	CFI >0,90	RMSEA <0,08	SRMR <0,08	NFI >0,90	NNFI/TLI >0,90
Measurement model	2,778	0,901	0,922	0,166	0,0528	0,884	0,910
	Modificated Model Fit Summary						
	CMIN/DF <5	GFI >0,90	CFI >0,90	RMSEA <0,08	SRMR <0,08	NFI >0,90	NNFI/TLI >0,90
	2,340	0,918	0,942	0,049	0,0523	0,904	0,932

Convergent validity determines if the indicators for a construct are all measuring the "same" thing (Collier, 2020). Convergent validity is achieved when the items in each factor are related to each other and to the factor they belong to. Convergent validity is determined according to the average variance explained (AVE) and the composite reliability (CR) values. To ensure convergent validity of the factors in a CFA model, CR>0.7, AVE>0.5 and CR>AVE (Gürbüz, 2021). According to Fornell & Larcker (1981), even if the AVE is less than 0.5, if the composite reliability value is greater than 0.6, the convergent validity of the structure is considered sufficient. The calculated values for convergent validity are given in Table 5. It can be seen that all the CR values greater than AVE values in Table 5. In addition, it is seen that all the CR and AVE values are within the range accepted in the literature. According to these results, it is possible to say that the convergent validity of the variables is achieved.

Table 5: Reliability, Average Variance Extracted (AVE) and Composite Reliability (CR)

Scales	Cronbach' Alpha Value	CR	AVE
Planned (PL)	0,87	0,858	0,604
Carefulness (CR)	0,85	0,842	0,576
Environmentally Conscious Con. (ECC)	0,74	0,722	0,414
Hedonic Con. (HC)	0,85	0,860	0,509
Luxury Tend. (LT)	0,82	0,820	0,532
Feeling of Dep. (FD)	0,82	0,825	0,613
CR>0,07, AVE>0,50, CR>AVE, Cronbach'Alpha>0,7			

After the measurement model was validated, the research hypotheses were tested through the structural model. The model fit index values obtained as a result of the analysis indicate that the measurement model is compatible with the data and is acceptable. (CMIN/DF= 3,15, GFI= 0,892, CFI=0,90, RMSEA=0,062). The standardized path diagram for the structural model is given in Figure 2.
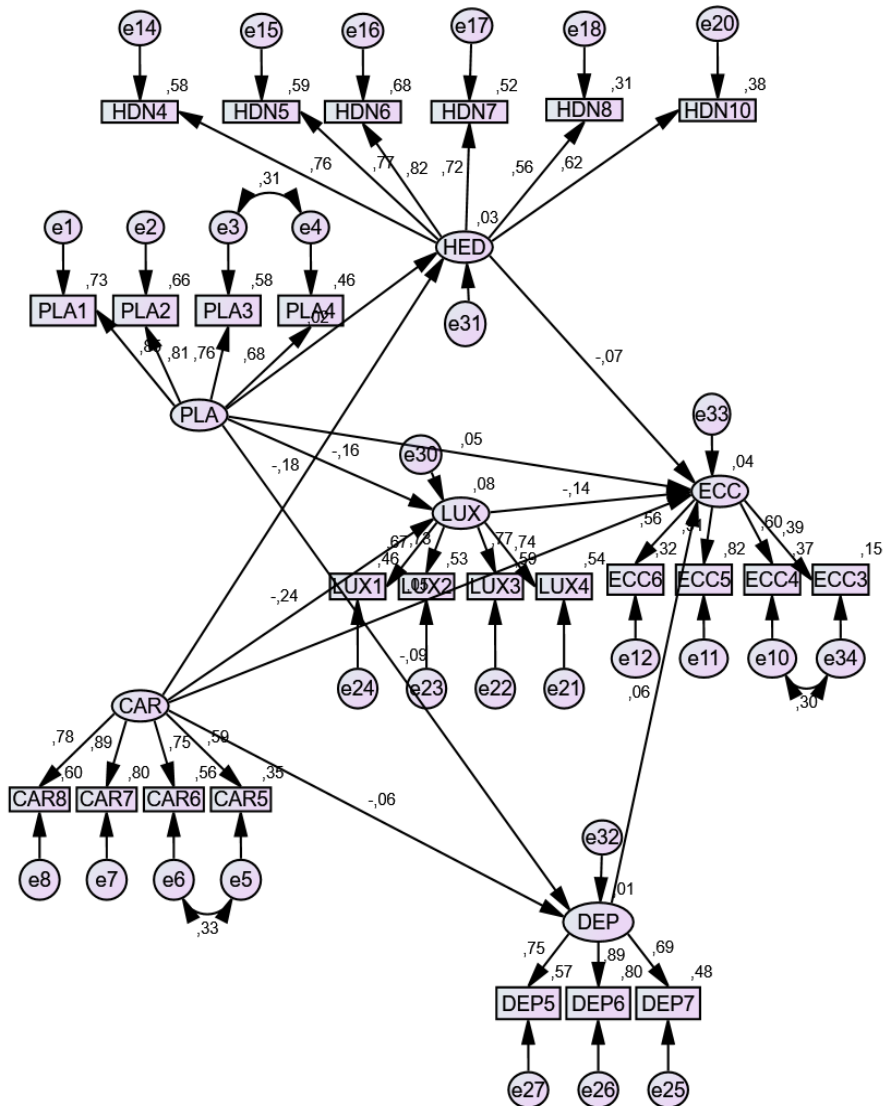
Figure 2: The Standardized Path Diagram for the Structural Model

The direct effect analysis results for the variables are summarized in Table 6.

Table 6: Direct Effect Analysis Results

Hyp.	Direct Effect	Stn. Reg. Weights	Critical Ratios	p values	Test Results
H1a	PL → ECC	0,055	1,097	0,273	Rejected
H1b	CR → ECC	0,054	1,041	0,298	Rejected
H2a	PL → HC	0,024	0,504	0,614	Rejected
H2b	CR → HC	-0,185	-3,741	0,000	Accepted
H3a	PL → LT	-0,161	-3,265	0,001	Accepted
H3b	PL → FD	-0,094	-1,909	0,056	Rejected
H3c	CR → LT	-0,240	-4,665	0,000	Accepted
H3d	CR → FD	-0,062	-1,268	0,205	Rejected
H4	HC → ECC	-0,074	-1,491	0,136	Rejected
H5a	LT → FD	-0,139	-2,561	0,010	Accepted
H5b	FD → FD	0,061	1,239	0,215	Rejected

Upon reviewing the results in Table 6, it is seen that carefulness, one of the sub-dimensions of responsibility, has a significant and negative effect (β=-0,185; p=0,000) on hedonic consumption. Moreover, it is seen that planned behaviour (β=-0,161; p=0,001) and carefulness (β=-0,240; p=0,000) which are the sub-dimensions of responsibility have a significant and negative effect on luxury tendency, one of the sub-dimensions of materialism. In addition, luxury tendency, one of the sub-dimensions of materialism, has a significant and negative effect (β=-0,139; p=0,010) on environmentally conscious consumption. On the other hand, it is seen that there is no significant effect in the remaining direct effect results. According to these results, H2b, H3a, H3c, H5a hypotheses were accepted, while H1a, H1b, H2a, H3b, H3d, H4, H5b hypotheses were rejected.

Mediation effect analyzes were carried out based on the bootstrap method. In the bootstrap analysis, 5000 resampling option was preferred. In order to test the existence of the mediation effect, Boot Lower CI and Boot Upper CI values must be examined (Bozkurt, 2021). The absence of 0 among these values indicates that there is a mediation relationship between the variables (Adıgüzel, Çakir & Atalay, 2021). It is stated that partial mediation is when the indirect and direct effects are significant; full mediation is when the direct effect is insignificant, and the indirect effect is significant (Collier, 2020). The mediating effect analysis results for the variables are summarized in Table 7.

Table 7: Mediating Effect Analysis Results

Hyp.	Mediating Effect	Direct Effect (p)	Indirect Effect	Confidence Interval		p values	Test Results
				Lower	Upper		
H6a	CR → HC → ECC	0,054 (0,298)	0,012	0,000	0,035	0,106	No Mediating Role
H6b	PL → HC → ECC	0,055 (0,273)	0,001	-0,013	0,001	0,249	No Mediating Role
H7a	PL → FD → ECC	0,055 (0,273)	-0,004	-0,024	0,001	0,190	No Mediating Role
H7b	PL → LT → ECC	0,055 (0,273)	0,016	0,002	0,038	0,043	Full Mediating Effect
H7c	CR → FD → ECC	0,054 (0,298)	-0,003	-0,022	0,001	0,253	No Mediating Role
H7d	CR → LT → ECC	0,054 (0,298)	0,030	0,008	0,068	0,023	Full Mediating Effect

When the results in Table 7 are examined, it is observed that the luxury tendency, one of the sub-dimensions of materialism, has a mediating role in the effect of planned (β=0,016; p=0,043) and carefulness (β=0,030; p=0,023) which are the sub-dimensions of responsibility, on environmentally conscious consumption. In the bootstrap technique, the mediator hypotheses were accepted because the values in the 95% confidence interval did not include the value zero (0). Since the direct effect is insignificant and the indirect effect is significant, luxury tendency has a full mediating role (Collier, 2020). On the other hand, it is seen that there is no significant effect in the remaining mediating effect results. According to these results, H7b and H7d hypotheses were accepted, while H6a, H6b, H7a and H7c hypotheses were rejected.

6. DISCUSSION

Customers are becoming more conscious of environmental issues as a result of rising environmental degradation, and this has an impact on people's buying patterns (Aracıoğlu & Tatlıdil, 2009). Consumers tend to purchase products that cause less harm to the environment during production processes or products that create less waste after consumption (Hopkinson & Pujari, 1999). It is stated in the literature that personality traits play an important role in the emergence of this behavior, which is also referred to as environmentally conscious consumption (Akdoğan & Durmaz, 2021).

As a result of this study, it was found that being planned, one of the sub-dimensions of conscientiousness personality trait, has a negative effect on luxury tendency one of the sub-dimensions of materialism. Unlike this finding in the literature, it has been concluded that conscientiousness has a positive effect on materialism (Burhan, Keshminder, Sabri, Salleh, Afthanorhan & Joey, 2022). Some studies in literature have concluded that conscientiousness has no effect on materialism (Başlar & Bozbay, 2019; Otero-López & Villardefrancos, 2013). In this study, it was found that being careful, one of the sub-dimensions of conscientiousness personality trait, has negative effect on feeling of deprivation, one of the sub-dimensions of materialism. Based on these findings obtained in the study, it is possible to state that consumers with conscientiousness personality traits will tend to have a lower level of materialism as they become more planned and show careful behavior.

In the study, it was also found that being careful, one of the sub-dimensions of the conscientiousness personality trait, has a negative effect on hedonism. Based on these results, it is possible to state that the conscientiousness personality trait has a partially negative effect on hedonism. The negative relationship between conscientiousness personality trait and hedonism is similar to the results of the study conducted by Solunoğlu and Ikiz (2020). Based on these results, it is possible to state that as the level of conscientiousness of consumers increases, they may tend to have lower levels of hedonism.

Researchers concluded that hedonism has a positive effect on sustainable consumption. However, our research found that the luxury tendency, one of the sub-dimensions of materialism, has a negative effect on environmentally conscious consumption. This finding is similar to the study results discussed in literature by Kasser (2016) and Sreen et al. (2020). Based on this finding in the literature, it is possible to state that as consumers' tendency towards luxury consumption increases, they move away from environmentally conscious consumption behavior. In the study conducted by Yılmaztürk and Akdoğan (2023), unlike these results, it is revealed that there is a positive relationship between materialism and environmentally friendly product purchasing behavior. These findings are assumed to be the consequence of the studies' various sample groups and times of conduct.

Finally, according to the results, it is concluded that hedonism does not have any effect on environmentally conscious consumption. This finding differs from research conducted by Choi and Johnson (2019) and Bhardwaj and Manchiraju (2017). There are a few explanations for this study's finding that hedonism has no impact on environmentally conscious consumption. The income distribution of the population that makes up the sample is the first of these factors.

Results show that 36.2% of survey respondents earn less than what is deemed modest in Türkiye. Low-income people might not purchase green products even if they shop hedonistically. Furthermore, green products are generally more expensive than comparable products on the market, and people might need to give up essential necessities in order to buy green products. Another reason why hedonism has no effect on environmentally conscious consumption is thought to be cultural. Although environmentally conscious consumption has become a shopping habit in developed countries, it is a relatively new concept in Türkiye. The fact that consumers do not fully know green products might cause these products not to be purchased with hedonic motivation.

As a result of the mediating effect analysis in the research, it was concluded that the luxury tendency, one of the sub-dimensions of materialism, has a mediating role in the effect of conscientiousness personality trait sub-dimensions (being planned, being careful) on environmentally conscious consumption. With the luxury tendency—a sub-dimension of materialism—included in the research, it was shown that, despite the lack of a direct effect between the dependent and independent variables, the mediating effect was substantial. The mediating effect of materialism in our study is significant in terms of adding novelty to literature, notwithstanding Hurst, Dimittar, Bond & Kasser (2013) claim that materialist values may generate a negative relationship with environmentally friendly attitudes.

7. CONCLUSION AND POLICY RECOMMENDATION

The main purpose of this research is to measure the mediating effect of hedonism and materialism in the effect of conscientiousness personality traits on environmentally conscious consumption. In the research, hedonism and environmentally conscious consumption are considered on a single dimension; through the sub-dimensions of conscientiousness personality trait, being planned and careful; Materialism is discussed through the dimensions of the luxury tendency and feeling of deprivation.

As a result of the mediating effect analysis in the research, it was concluded that the luxury tendency, one of the sub-dimensions of materialism, has a mediating role in the effect of conscientiousness personality trait sub-dimensions (being planned, being careful) on environmentally conscious consumption. In this study, the observed relationship between the independent variable and the dependent variable indicates that the luxury consumption tendency acts as a full mediator. The mediating effect of luxury tendency between conscientiousness personality traits and environmentally conscious consumption can be explained from two different perspectives. The mediating role of luxury

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tendency, one of the sub-dimensions of materialism in the study, requires the examination of the effect of conspicuous consumption on green consumption in different cultures. The first of these is that environmentally conscious consumption is more expensive than classical consumption, so these products are perceived as luxury and consumers with a luxury tendency may be considered to purchase these products. The second reason is that environmentally conscious products differ from other products in terms of content and packaging. It is observed that the underlying motivation of individuals with a tendency towards luxury consumption is the phenomenon of differentiation from society. For this reason, when individuals engage in purchasing behavior, they care more about the product's ability to distinguish individuals from others rather than its environmental sensitivity. People may purchase more green products out of materialistic motivations in countries where there is a notion of luxury consumption and where premium price, and packaging sets them apart from competitors in the market. However, especially in societies where income levels are lower and materialistic motives are more distinct from green products, luxury tendency will have less impact on green product purchasing behavior.

Both consumer behavior and manufacturing practices have changed as a result of customers' growing awareness of environmental issues and the influence of the environment on their purchase decisions. Undoubtedly, the actions of manufacturers will be impacted by consumers' pro-environment purchasing behavior. As a result, in order to get a larger market share and appeal to consumers who prioritize luxury and sustainability, businesses may need to create products that emphasize sustainability, excellent quality, and appealing design. Meeting the demands of consumers and producing environmentally friendly products will also contribute to manufacturers gaining a sustainable competitive advantage by distinguishing themselves from their competitors.

Although the study contributes to literature, it has many limitations. The first limitation of the study is the collection of data from the sample since it is not possible to contact the complete population within the constraints of time and money. In this particular setting, studies on Turkish consumers were carried out. A similar study can be carried out in different countries depending on the level of development and the results can be compared. Additionally, in this study, the impact of the conscientiousness personality trait on environmentally conscious consumption was measured using the variables of materialism and hedonism. These variables considered within the scope of the research constitute a limitation in the study. Future research can investigate the impact of factors including social responsibility, environmental concern, and lifestyle on environmentally conscious consumption.

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8. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

9. FINANCIAL SUPPORT

No funding or support was used in this study.

10. AUTHOR CONTRIBUTIONS

EÖ, SS, KÇ: Idea;

EÖ, SS, KÇ: Design;

KÇ: Supervision;

EÖ, SS: Collection and/or processing of resources;

SS, EÖ: Analysis and/or interpretation;

EÖ, SS: Literature review;

EÖ, SS: Written by;

KÇ: Critical review

11. ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS

In this study, all rules specified within the scope of the "Higher Education Institutions Scientific Research and Publication Ethics Directive" were followed. None of the actions specified under the second part of the directive, "Actions Contrary to Scientific Research and Publication Ethics", have been carried out. The ethical evaluation was made by İnönü University Social and Human Sciences Scientific Research and Publication Ethics Committee. Ethics approval was given with decision number 25 dated 12.01.2024.

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THE EFFECT OF THE PERCEPTION OF ORGANIZATIONAL SUPPORT AND WORK-FAMILY CONFLICT ON THE JOB PERFORMANCE OF FEMALE EMPLOYEES: A MEDIATED MODEL[1]

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ABSTRACT

The purpose of this study is to reveal the relationship between the perception of organizational support, job performance and work-family conflict for female employees. For this purpose, data were collected via a survey technique from 176 female employees working at Bayburt University. The obtained data were analyzed using SPSS and AMOS statistical package programs. The findings of the study which used the structural equation model indicate that the perception of organizational support negatively and significantly affects work-family conflict and positively and significantly affects work performance; It has been revealed that work-family conflict negatively and significantly affects work performance. In addition, the study also concluded that work-family conflict plays a full mediating role in the relationship between the perception of organizational support and job performance. In other words, the perception of organizational support was found to lead to an increase in job performance by reducing work-family conflict (mediating variable).

Keywords: *Perception of organizational Support, work-family conflict, job performance*
JEL Code: *M10, M12, M19*

Scope: *Business administration*
Type: *Research*

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

ÖRGÜTSEL DESTEK ALGISI VE İŞ-AİLE ÇATIŞMASININ KADIN ÇALIŞANLARIN İŞ PERFORMANSINA ETKİSİ: ARACILI BİR MODEL

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ÖZ |
Bu çalışmanın amacı kadın çalışanlar açısından örgütsel destek algısı, iş performansı ve iş-aile çatışması arasındaki ilişkiyi ortaya koymaktır. Bu amaçla; Bayburt Üniversitesinde görev yapan 176 kadın çalışandan anket tekniği ile veri toplanmıştır. Elde edilen veriler SPSS ve AMOS istatistik paket programları aracılığıyla analiz edilmiştir. Yapısal eşitlik modelinin kullanıldığı çalışma bulguları örgütsel destek algısının iş-aile çatışmasını negatif yönde ve anlamlı, iş performansını ise pozitif yönde ve anlamlı etkilediğini; iş-aile çatışmasının ise iş performansını negatif yönde ve anlamlı etkilediğini ortaya koymuştur. Ayrıca çalışmada örgütsel destek algısı ile iş performansı arasındaki ilişkide iş-aile çatışmasının tam aracılık rolü üstlendiği sonucuna da ulaşılmıştır. Bir diğer ifadeyle, örgütsel destek algısının iş-aile çatışmasını azaltarak (aracı değişken) iş performansının artmasına yol açtığı tespit edilmiştir.

Anahtar Kelimeler: *Örgütsel destek algısı, iş-aile çatışma, iş performansı*
JEL Kodları: *M10, M12, M19*

Alan: *İşletme*
Türü: *Araştırma*

1. INTRODUCTION

The most important source of competition in today's competitive conditions is employees. Organizations should make continuous arrangements and improvements for their employees to perform efficiently and effectively. Because the performance of employees is related to the achievement of organizational goals. In other words, the performance of employees is equivalent to the performance of the organization. Therefore, elements that will contribute positively to performance should be emphasized. In this regard, this research focuses on examining the relationship between employees' perceptions of organizational support (POS) and their job performance (JB).

Organizational support, a key concept for 21st-century businesses, refers to employees' perception of feeling valued by their organization. Employees who perceive this support are more likely to display positive behaviors towards their organization (Eisenberger, Huntington, Hutchison & Sowa, 1986). Campbell & Wiernik (2015) define JB as the behaviors employees exhibit that contribute to organizational goals. Consequently, this study considers that POS can enhance JP. However, literature shows that the relationship between these two variables is complex and the relationship can be positive, negative or insignificant (Çelenk, 2024; Liu, Jing & Sheng, 2023). Some studies suggest POS may JP indirectly through mediators (Zhou & Ba, 2005; Turunç & Çelik, 2010), though few explore the underlying mechanisms (Patnaik, Mishra & Mishra, 2023). Therefore, it is assumed in the study that WFC may mediate this relationship.

Work and family are deeply intertwined and significantly influence each other in the lives of working individuals. People must fulfill the responsibilities of both roles, but sometimes these roles overlap, leading to conflict. For instance, family-related duties might interfere with work, or work might take precedence over family time. This role confusion, known as work-family (WFC) or family-work conflict (FWC), causes stress and can create problems both at home and at work. Given the difficulty of balancing these demands, it's essential to examine the impact of conflict on individuals and organizations, and to explore ways to minimize it for improved productivity. Organizations are only as successful as their weakest link, so support must be extended to all employees, with everyone expected to perform at a high level. However, studies on WFC often focus on women (Çarıkçı, Çiftçi & Derya, 2010; Kengatharan & Kunatilakam, 2020; Tolay & Baysal, 2020; Stankevičienė, Šimelytė, Tamaševičius, & Petkinytė, 2023). Although WFC can affect all employees, women are more likely to experience it due to the additional roles they take on. Despite their participation in the workforce, women still shoulder family responsibilities, increasing their

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role conflict (Çarıkçı et al., 2010). This imbalance leads to constant conflict between work and family life, making it essential for organizations to recognize WFC and address female employees' needs to enhance their performance.

Literature has studied the individual effects of POS, WFC and JP, but there is no research exploring all three variables together. Specifically, there is a gap in understanding how WFC mediates the relationship between POS and JP. Examining this could fill existing gaps and offer a more comprehensive understanding of the topic. While POS and JP are typically studied across all employees regardless of gender, WFC is often examined specifically among women. This study's focus on women, considering academic and administrative roles within a university setting, offers a unique perspective. Understanding how WFC affects female employees' well-being and JP can improve support strategies and inform practical recommendations for work-life balance, ultimately enhancing JP. These insights can deepen our understanding of organizational behavior, human resource management, and work psychology.

2. THEORETICAL FRAMEWORK

POS refers to the general belief held by employees regarding the extent to which the organization values their contributions and cares about their well-being (Eisenberger et al., 1986). It implies that employees trust the organization to reward their extra efforts, fulfill their socio-emotional needs, and assist them in managing stressful situations (Rhoades & Eisenberger, 2002). Therefore, it represents employees' perception that their employers prioritize their personal well-being and value their efforts and contributions (Maan, Abid, Butt, Ashfaq, & Ahmed, 2020). Since organizational support is based on perception, employees may perceive it differently, even when sharing similar values and experiences within the same organization. Thus, it is not always necessary to implement numerous concrete actions to support employees. Simply creating an environment where employees feel that supportive activities exist can be enough to foster this perception (Kerse & Karabey, 2017).

POS is derived from the organizational support theory introduced by Eisenberger et al. (1986) and is underpinned by social exchange theory. Social exchange theory (Blau, 1964; Gouldner, 1960) suggests that employees who feel supported by their organization are more likely to appreciate it and engage actively in achieving its objectives (cited in Hong, Jeong, & Downward, 2019). If the organization treats its employees well despite having the option to act differently, employees feel supported. In this case, as a response to this positive

behavior, employees become more committed to and work harder for the organization (Howes, Cropanzano, Grandey, & Mohler, 2000). Therefore, an enhanced POS instills a sense of obligation in employees to prioritize the organization's well-being and assist in achieving its goals, which can be manifested through increased organizational commitment (Fuller, Hester, Barnett, & Relyea, 2006). Research indicates that POS is linked to numerous positive outcomes for both employees and organizations. For employees, it boosts intrinsic motivation, emotional commitment, and job satisfaction, thereby fostering greater job engagement (Maan et al., 2020). For organizations, it contributes to enhanced creativity, improved customer orientation, higher JP, and reduced employee turnover rates (Sun, 2019).

WFC is a subset of role conflict, a concept introduced by Kahn, Wolfe, Quinin, Snoek, and Rosenthal (1964). According to Kahn et al. (1964), role conflict emerges when an individual must simultaneously fulfill multiple roles that are potentially incompatible. In this framework, WFC represents a specific type of inter-role conflict where the demands of professional and personal life are to some degree mutually exclusive (cited in Greenhaus & Beutell, 1985). The conflict between family and work-related roles, or their negative impact on each other, leads to FWC or WFC (Cheung & Wong, 2013). FWC occurs when domestic responsibilities impinge on professional life, while WFC describes occupational pressures interfering with family life. Although these conflicts are closely related, research indicates that work roles tend to have a more significant impact on family roles (Mahpul & Abdullah, 2011).

WFC is often more prevalent among women, as they typically take on a larger share of family responsibilities due to traditional gender roles (Frone, Russell & Cooper, 1992; Eby, Casper, Lockwood, Bordeaux, & Brinley, 2005). This conflict arises when the demands of work and family roles become incompatible, leading to difficulties in effectively fulfilling both roles. In other words, WFC occurs when women's efforts to meet the demands of their work life impact their ability to fulfill family responsibilities, or vice versa (Gao, Shi, Niu, & Wang, 2013).

Elevated levels of WFC are associated with various factors, including competing demands, excessive workloads, and stress. The increasing prevalence of remote work and childcare responsibilities further exacerbates this conflict (Rabin, Goldberg & Blau, 2024). Research by Eby et al. (2005) indicates that high levels of FWC conflict are associated with increased stress, lower job satisfaction, and reduced career progression for women. This conflict can also affect their mental health and JP, as they may struggle to balance the dual demands of work and family.

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WFC can stem from three primary sources: time, stress, and behavior. Time-based conflict arises when the temporal demands of one role limit the time available for another. Stress-based conflict occurs when pressure from one role affects performance in another. Behavior-based conflict emerges when the behavioral expectations of different roles are inconsistent with each other (Tewal, Lengkong, Pandowo, & Nelwan, 2021).

In order for organizations to survive under intense competitive conditions, their employees need to do their jobs as well as possible, that is, to show high JP. Because the overall performance of the organization is determined by the JP of its employees. In this context, JP can be expressed as the level of helping the employee to achieve the goals of the organization to which he/she is affiliated (Tewal et al., 2021). Therefore, the set of behaviors exhibited by the employee that are compatible with the goals and objectives of the organization are associated with JP (Williams & Anderson, 1991). According to Jamal (2007), job performance is the ability of individuals to successfully fulfill the tasks given at work by using the available resources. JP is a concept used to evaluate the performance of employees while performing job-related tasks (Caillier, 2010). In other words, JP deals with the measurable behaviors of employees that help the organization achieve its goals and the results of these behaviors (Viswesvaran & Ones, 2000). According to Chen & Silverthorne (2008), performance can be evaluated in three ways. The first is based on outputs, such as the number of sales; the second is individual appraisal by superiors; and the third is employee self-appraisal. As a result of this evaluation, performance can be perceived as productive or inefficient by the organization (Meyer & Peng, 2016). Therefore, JP refers to an employee's effectiveness and efficiency in fulfilling job responsibilities and achieving organizational goals. It encompasses the behaviors, actions, and outcomes that contribute to the employee's overall success and productivity while performing their duties (Vandai, 2024).

The study suggests that gender differences often influence the extent of WFC. Societal expectations position men as dominant in the workplace and women as primary caregivers at home. As women take on more active roles at work, they face increased conflict (Çarıkçı, 2002). Despite working, women are still expected to prioritize their roles as mothers and wives, putting them at a disadvantage in professional success and career advancement (Çarıkçı et al., 2010). This conflict can negatively impact women's job performance, but organizational support can help them overcome these challenges.

The study assumes that WFC is primarily examined from the perspective of women in the literature, so the sample consists only of women. To enhance the model, additional variables were included. Since other studies on 'employees' also

encompass female employees, these studies have been incorporated, leading to the development of the following hypotheses.

Today's competitive conditions have turned employees into individuals with high levels of education and the need to constantly compare themselves with others. Therefore, these employees will have high expectations from their organizations. Organizations, on the other hand, should be able to create a working environment where employees with this expectation can feel belonging to the organization, own it and establish commitment in order to increase their performance. At this point, it is thought that organizational support may be effective (Turunç & Çelik, 2010). Organizational support theory posits that employees form general perceptions about the extent to which their organization values their contributions and cares about their well-being. According to the principle of reciprocity, this POS creates a sense of obligation in employees to care for the organization's welfare and assist in achieving its objectives. Employees fulfill this obligation by developing stronger emotional ties to the organization and enhancing their performance (Eisenberger, Armeli, Rexwinkel, Lynch & Rhoades, 2001). Consequently, organizational support can be considered a significant factor in employees' decisions to increase their efforts and improve their performance (Eisenberger et al., 1986). A review of the literature reveals numerous studies demonstrating a positive correlation between POS and JB (Rhoades & Eisenberger, 2002; Arshadi & Hayavi, 2013; Serinikli & Kara, 2020; Kara, Kırpık & Kaya, 2021; Alagöz, 2023). Based on these findings, it can be inferred that POS is a predictor of JP. This understanding forms the basis for the hypothesis proposed in the current study.

H₁: POS has a positive and significant effect on JP.

When the work-family relationship is not effectively managed, it can result in conflict that may cause significant damage to individuals, organizations, and society as a whole (Obrenovic, Jianguo, Khudaykulov & Khan, 2020). Among the various factors contributing to WFC, organizational factors play a particularly crucial role. In today's environment, where organizations and workplaces face numerous daily challenges and pressures, and employees grapple with heavy workloads and various issues, organizational support can serve as a valuable resource in addressing these difficulties (Ebrahimi, Faraji, Nouri & Valiee, 2021). This support can help mitigate the negative impacts of WFC and contribute to a more balanced and productive work environment.

Organizational support plays a crucial role in enabling employees to perform their assigned tasks effectively and enhancing their overall well-being. Supportive organizations typically extend assistance to all employees, with

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particular emphasis on those who must balance work demands with family responsibilities (Winston, 2022). Employees who perceive strong organizational support are likely to experience lower levels of WFC. This is because the support provided often mitigates the negative effects of such conflicts. Specifically, when employees feel that their organization actively creates conditions to reduce WFC, they are less prone to experiencing it (Andrade & Neves, 2022). Conversely, as WFC intensifies, employees may perceive their organization as inattentive to their needs, leading to a decrease in their POS. Therefore, when organizations successfully reduce WFC, employees' satisfaction with organizational performance increases, as does their POS (Ebrahimi et al., 2021). These assertions are corroborated by numerous research findings in the literature, demonstrating that organizational support can effectively mitigate WFC (Gurbuz, Turunc & Celik, 2011; Zheng & Wu, 2018; Zhao, Wang, Law & Fan, 2020; Ebrahimi et al., 2021; Ekmekci, Xhako & Camgoz, 2021; Rabin et al., 2024). Based on these studies, it can be inferred that POS is a predictor of WFC. This understanding forms the basis for the hypothesis proposed in the current study.

H₂: POS has a negative and significant effect on WFC.

The need for individuals to assume more than one role in their lives due to being a husband, wife, parent and social being constitutes the concept of WFC. Conflict arises when some motives cannot be fulfilled because they interfere with each other. Conflict at work or at home occurs when the individual is unable to fulfill their responsibilities, and one of the consequences of this conflict is related to JP (Rini, Yustina & Santosa, 2020). WFC that is not handled properly can become a long-term problem, which can have negative consequences on the work performance of the organization and employees (Tewal et al., 2021). When the literature is examined, it is seen that there are research results that WFC negatively affects JP (Çelik & Turunç, 2010; Yılmaz & Çağatay, 2023; Kengatharan & Kunatilakam, 2020; Warokka & Febrilia, 2015; Nart & Batur, 2014) and therefore the following hypothesis is formed.

H₃: WFC has a negative and significant effect on JP.

Organizational performance, which is shaped by the performance of employees, indicates that there is a reciprocal relationship between the employee and the organization. Employee performance is necessary for the performance of the organization, but for the performance of the employee, the organization must pay for it. In other words, in order for the employee to show high performance and thus achieve the goals of the organization, the organization needs to improve the working environment for the benefit of the employee. One of the steps the

organization can take in this direction should be to make the employee feel supported. Although it is stated that POS positively affects JP, there are also studies that show that the relationship is negative or insignificant (Çelenk, 2024). These differences between the study results suggest that the relationship between the two variables is shaped by other variables (Zhou & Ba, 2005; Turunç & Çelik, 2010). Therefore, in this study, WFC is considered as a mediating variable and the following hypothesis is formulated.

H₄: *WFC plays a mediating role in the relationship between POS and JP.*

3. METHOD

The population of the study consisted of 280 administrative and academic female staff working at Bayburt University in the 2022-2023 academic year. The survey form created with Google Form was shared with the appropriate channels and 176 surveys suitable for analysis were obtained. This number met the sample adequacy number calculated as 162 (http://www.surveysystem.com/sscalc.htm; Cohen, Manion & Morrison, 2002; Yıldırım & Şimşek, 2011).

Table 1 shows information about the demographic characteristics of the participants. 113 (64.2%) of the female employees participating in the research are in academic positions and 63 (35.8%) are in administrative positions; 79 (44.9%) were 25-25, 84 (47.7%) were 36-45, 11 (6.3%) were 46-55, and 2 (1.1%) were 56-56, 31 of them (17.6%) have a managerial position. 103 female personnel (58.5%) are married, and the husbands of 91 (51.7%) of the married female personnel are working. When evaluated in terms of the number of children, 36 (20.5%) have one child, 35 (19.9%) have two children, 11 (6.3%) have three children, 2 (1.1%) have more than three children and 19 of them (10.8%) do not have children. Finally, 51 (29%) of the employees are helped by their spouses, 16 (9.1%) by family members, 12 (6.8%) by paid helpers, and 24 (24%) 13.6) cannot receive any assistance.

Table 1: Demographic Information About the Employees Participating in the Research

Variable	Category	f	%	Variable	Category	f	%
Type of position	Academic	113	64,2	**Spouse working**	Yes	91	51,7
	Administrative	63	35,8		No	12	6,8
Age	25-35	79	44,9	**Number of children**	None	19	10,8
	36-45	84	47,7		One	36	20,5
	46-55	11	6,3		Two	35	19,9
	56-65	2	1,1		Three	11	6,3
Managerial position	Yes	31	17,6		More than three	2	1,1
	No	145	82,4	**Support**	Spouse	51	29
Marital status	Married	103	58,5		Family members	16	9,1
	Single	73	41,5		Paid help	12	6,8
					No help	24	13,6

3.1. Scales

The questionnaire consists of 4 sections. The first section includes seven questions to determine demographic characteristics. In the second section, the scale developed by Eisenberger et al. (1986) and shortened by Eisenberger et al. (2001), which consists of 6 items and a single factor, was used to measure POS. In the third section, the scale developed by Netemeyer, Boles, & McMurrian, (1996), which consists of 2 factors (WFC and FWC) and a total of 10 items, was used to measure WFC. In the last section, a scale consisting of 4 items and a single factor, created by Kirkman & Rosen (1999), developed by Sigler & Pearson (2000), and adapted into Turkish by Çöl (2008), was used to measure JP. Responses to the items on the scales were requested using a 5-point likert scale (1 - Strongly Agree, 5 - Strongly Disagree).

3.2. Ethical Permissions for the Research

In this study, all the rules specified in the "Higher Education Institutions Scientific Research and Publication Ethics" were followed. None of the actions

specified under the second section of the Directive, "Actions Contrary to Scientific Research and Publication Ethics", have been carried out.

Ethics committee permission information

Name of the ethics review board = Bayburt University

Date of ethical assessment decision = 25.04.2023

Ethics assessment certificate number number = 130292-155/8

4. FINDINGS

The collected data underwent analysis using SPSS and AMOS software packages. The research methodology involved confirmatory factor analysis, followed by structural equation modeling to evaluate the complete theoretical model.

4.1. Factor and Reliability Analysis

Since the exploratory factor analysis of the scales used in the study was previously conducted, Confirmatory Factor Analysis (CFA) was directly applied. Since WFC will be considered in its entirety, the 2-factor structure confirmed by CFA was connected to a single factor with second-level CFA. In addition, necessary modifications were made among the items in the scales. Model fit indices for the scales appear to be within acceptable reference values (Table 2).

Table 2: Fit Index Values of the Scales

Indexes	Reference Value	POS	WFC	JP
CMIN/DF	$0 < \chi^2/sd \leq 5$	2,017	1,730	,419
GFI	>,90	,975	,941	,999
CFI	>,90	,984	,972	1
NFI	>,90	,968	,938	,999
TLI	>,90	,965	,962	1,010
RMSEA	<,08	,076	,065	,000

Cronbach's alpha values for reliability of the scales used in the research are .859 for POS; ,859 for WFC and ,871 for JP. Cronbach Alpha value can range between 0 and 1, and as it approaches 1, the reliability of the scale increases (Morgan, Leech, Gloeckner, & Barrett, 2004). Therefore, it can be stated that the scales are reliable.

4.2. Testing the Research Model

In order to test the effect of the WFC mediator variable, firstly, WFC was removed from the model and the extent to which the POS independent variable predicts the JP dependent variable was examined. As seen in Table 3, POS predicts JP to a low and significant extent. The fact that the direction of the effect is positive reveals that POS of female employees increases their job performance, albeit slightly. These data show that H1 is supported.

Table 3: Estimation Results of the Relationship between POS and JP

Predicted Variable	Predictor Variable	Standardized Regression Weights	S.E.	C.R.	p
JP	**POS**	,191	,173	2,136	,033

Then, the significance level of the effect of the mediating variable was evaluated using the bootstrap method. In the bootstrap method, the sample was increased by 2000, the (Bias-corrected confidence intervals) method, which gives confidence intervals at 95% level, was selected and a value of 1 was preferred as Bootfactor. Figure 1 shows the estimation results of the model tested in the AMOS program using the bootstrapping method. When the fit indices of the model are examined, it is seen that the goodness of fit values are at an acceptable level (Table 4).

Table 4: Fit Index Values of the Model

Indexes	Reference Value	POS
CMIN/DF	$0 < \chi2/sd \leq 5$	1,681
GFI	>,90	,926
CFI	>,90	,964
NFI	>,90	,917
TLI	>,90	,951
RMSEA	<,08	,062
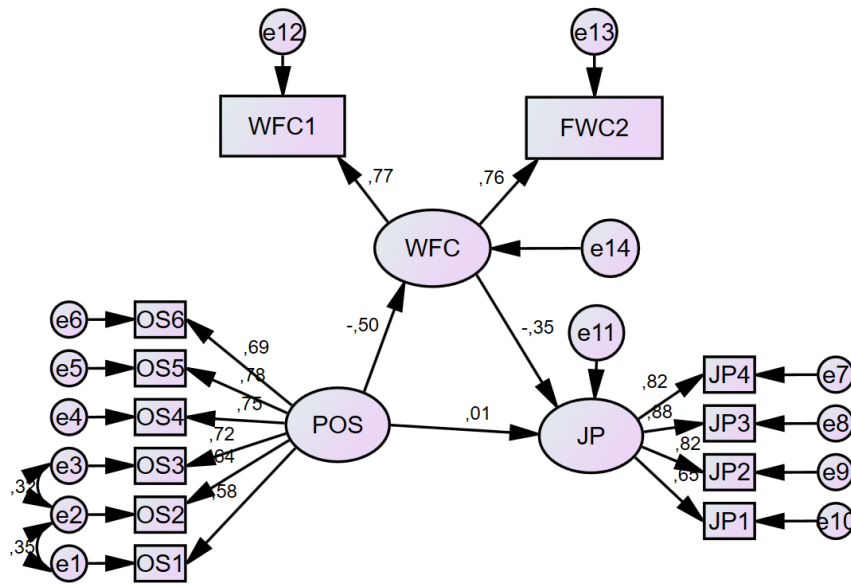
Figure 1: Displaying Standardized Estimation Results on the Model

While testing the hypotheses, the estimation results of the model are given in Table 5. As can be seen from the table, the hypothesis 'POS has a positive and significant effect on job performance.' is not significant. POS significantly and negatively affects WFC (-0,499 and p=0,000). This shows that H2 is supported and an increase in POS decreases WFC. The effect of FWC on JP is negative and significant (-0,352 and p=0,003). This reveals that an increase in WFC decreases JP and therefore hypothesis H3 is supported.

Table 5: Estimation Results of the Structural Model

Predicted Variable	Predictor Variable	Standardized Regression Weights	S.E.	C.R.	p
WFC	POS	-,499	,112	-4,418	,000
JP	WFC	-,352	,226	-2,981	,003
JP	POS	,009	,199	,085	,932

p<,05

Direct effects, indirect effects and total effects in the model in terms of the mediating variable (WFC) are shown in Table 6. WFC has a mediating role in the effect of POS on JP. Because, besides the direct effect between POS and JP (0,009), there is an indirect effect between POS and JP (0,176) which is transmitted through WFC and this indirect effect indicates that WFC plays a

mediating role between POS and JP. The direct effects between WFC and JP (-0,352) and between POS and WFC (-0,499) are significant.

Table 6: Direct, Indirect and Total Effects of Latent Variables

Variables	Impacts	POS	WFC	JP
WFC	Direct	-,499	,000	,000
	Indirect	,000	,000	,000
	Total	-,499	,000	,000
JP	Direct	,009	-,352	,000
	Indirect	,176	,000	,000
	Total	,185	-,352	,000

In order to measure the mediating role of WFC in the effect of POS on JP, firstly, WFC was excluded from the model and the direct effect of POS on JP was examined. This effect was found to be significant (0,191 and p=0,033). Then, the analysis was renewed by adding WFC to the model. In this case, the effect of POS on JP was not significant (0,009 and p=0,932). According to the Bootstrap test result, the effect of the mediating variable was also significant (Table 7). The fact that the effect of POS on JP loses its significance with the addition of WFC to the model shows that WFC plays a full mediating role in the interaction between POS and JP. In this case, H4 was supported.

Table 7: Significance Level of the Mediator Variable

Relation	Unmediated Direct Impact	Mediated Direct Impact	Indirect Impact
POS-WFC-JP	,191 (p=,033)	,009 (p=,932)	,176; %95; CI (,039; ,369) (significant, full mediator)

5. CONCLUSION AND SUGGESTIONS

The long-term survival of organizations depends on their competitiveness. One of the factors indicating competitiveness is performance. Performance is the result of the employee's labor and effort in a certain period of time (Barutçugil, 2002). Therefore, the performance of the employees of the organization shapes the overall performance of the organization. In this context, it can be stated that organizations should make improvements on both personal and organizational factors in order to increase the performance of their employees.

In this study, JP is discussed only in terms of female employees and it is emphasized that female employees should be supported for their performance. In addition, it was thought that WFC, which is stated to be frequently experienced especially by female employees, may mediate the relationship between support and performance. Modern life has raised the level of education and increased career expectations. This situation has brought economic difficulties and caused women to actively participate in business life (Tolay & Baysal, 2020). Women who start to show themselves in business life can either disrupt their work life because of their home life or their home life because of their business life. This can create an imbalance in their lives and lead to conflict. Conflict can create stress and unrest for women. Therefore, not being able to keep up with housework or work-related tasks and not being able to do justice to what needs to be done that lead to conflict, in short, not being able to carry the responsibilities of home and work, can also lead to low work-related performance. As an employee, a decrease in a woman's JP is an undesirable situation for their organization. Because the organization can achieve its goals at the level of performance of its employees. Being aware of this situation, the organization should be aware of the fact that it should not withhold its support in order for the employee not to experience conflict and to have high JP.

This study proposed and confirmed two hypotheses. The first hypothesis, "POS positively and significantly influences JP," was supported by the analysis, indicating that organizational support enhances JP. This finding aligns with previous research in the field (Rhoades & Eisenberger, 2002; Arshadi & Hayavi, 2013; Serinkli & Kara, 2020; Kara et al., 2021; Alagöz, 2023). The second hypothesis, "POS negatively and significantly affects WFC", was also confirmed. The results demonstrate that organizational support mitigates WFC. This outcome is consistent with existing literature (Gurbuz et al., 2011; Zheng & Wu, 2018; Zhao et al., 2020; Ebrahimi et al., 2021; Ekmekci et al., 2021; Rabin et al., 2024). In the study, a third hypothesis was developed as 'WFC has a negative and significant effect on JP. According to this hypothesis, it is expected that female employees who experience conflict will have low JP. The results of the analysis confirm this expectation and therefore this hypothesis is also accepted. This result supports the studies in the literature that there is a negative and significant interaction between variables (Çelik & Turunç, 2010; Yılmaz & Çağatay: 2023; Kengatharan & Kunatilakam, 2020; Warokka & Febrilia, 2015; Nart & Batur, 2014). The study also investigated the mediating role of WFC and found that it fully mediates the relationship between POS and JP. These results indicate that POS influences JP both directly and indirectly through its impact on WFC.

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The obtained results have revealed that female employees need to perceive that the organization supports them, and this can lead to positive outcomes within the organization. For this reason, organizational managers are recommended to create a supportive environment for their employees. In other words, managers should be able to provide an organizational environment where women are proud of their achievements, their well-being is considered, they are valued, they are taken into consideration, and they are ready to help when needed. Finally, one of the factors that managers evaluate in order for organizations to gain and maintain competitive advantage is job performance. Although it is desirable for JP need to be implemented for this is to reduce WFC. As the research results show, if female employees do not experience WFC, their JP may increase. Therefore, identifying factors that will reduce WFC and creating an organizational environment that will enable this may be beneficial. This study can raise awareness about the impact of WFC on women's job performance and highlight the positive role of organizational support. It can guide managers by showing the importance of implementing policies that reduce WFC. Additionally, by emphasizing that women may face more conflict in the workplace, the study can promote gender equality policies and help create more equal working conditions. It can also encourage further research on women's work-family balance and contribute to expanding the literature in this area.

The study focuses solely on female employees at a university, limiting the generalizability of its results. Future research could address both genders and compare variables between men and women. Additionally, the study could be replicated in various sectors, and the research model could be enhanced by incorporating additional relevant variables.

6. CONFLICT OF INTEREST STATEMENT
There is no conflict of interest between the authors.

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No funding or support was received from this information.

8. AUTHOR CONTRIBUTIONS
SK: Idea, Design, Supervision, Collecting and processing resources, Analysis and interpretation, Literature review, Writer, Critical Review

9. ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS

Ethics committee principles were complied with in the study and necessary permissions were obtained in accordance with the principles of intellectual property and copyrights.

10. REFERENCE

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AN IMPLEMENTATION FOR THE FUTURE OF MOTOR VEHICLE TAX IN THE SHADOW OF THE PARIS CLIMATE SUMMIT: THE EXAMPLE OF TÜRKİYE[1]

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ABSTRACT

Türkiye is committed to lowering its greenhouse gas emissions, adhering to the terms of the Paris Climate Agreement, which it has endorsed. In this context, there is significant interest in environmental tax reform that merges carbon regulation with reducing other taxes that are distorting. This study assesses the effects of motor vehicle tax (MVT), energy consumption, and economic growth on Türkiye's carbon footprint from 1995 to 2020, framed by the Environmental Kuznets Curve (EKC). The research uses the ARDL technique to analyze time series data, and reveals that the EKC hypothesis does not apply. Additionally, the study finds that MVT, as an included variable in the EKC model, does not significantly influence the carbon footprint. It is crucial to acknowledge that all variables in the model interact and collectively influence the analysis of variable relationships. As a result, crafting policy recommendations on this matter requires a comprehensive, multidisciplinary approach. Therefore, adjusting and implementing MVT in a manner consistent with the objectives of the Paris Climate Agreement could serve as a pivotal strategy for advancing both Türkiye's economic and environmental goals.

Keywords: *MVT, CO_2, EKC, environmental quality, ARDL*
JEL Code: *G18, H20, H21*

Scope: *Economics*
Type: *Research*

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

PARİS İKLİM ZİRVESİ GÖLGESİNDE MOTORLU TAŞITLAR VERGİSİNİN GELECEĞİNE YÖNELİK BİR UYGULAMA: TÜRKİYE ÖRNEĞİ

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ÖZ| Türkiye, taraf olduğu Paris İklim Anlaşması çerçevesinde sera gazı emisyonlarını azaltmayı planlamaktadır. Bu bağlamda, karbon düzenlemesi ile mevcut çarpık vergilerin azaltılmasının birleşimi olan çevre vergisi reformu büyük ilgi görmektedir. Bu çalışmada, 1995–2020 dönemi için Türkiye'de Çevresel Kuznets Eğrisi (EKC) çerçevesinde motorlu taşıtlar vergisi (MTV), enerji tüketimi ve ekonomik büyümenin karbon ayak izi üzerindeki etkisi incelenmektedir. Zaman serisi tekniklerinden ARDL tekniğinin kullanıldığı çalışmada, ulaşılan ampirik bulgular, EKC hipotezinin geçerli olmadığı yönündedir. Ayrıca EKC modeline açıklayıcı değişken olarak dâhil edilen MTV'nin de karbon ayak izi üzerinde istatistiki olarak anlamlı bir etkisi söz konusu değildir. Değişkenler arasındaki ilişkilerin ortaya koyulmasında modele dâhil edilen tüm değişkenlerin birbirini etkilediği unutulmamalıdır. Dolayısıyla konuya ilişkin politik önerilerde multidisipliner bakış açısı ile yaklaşılması gerekmektedir. Bu doğrultuda MTV, Paris İklim Antlaşması hedefleriyle uyumlu bir şekilde düzenlenerek uygulanabilirse hem ekonomik hem de çevresel kalkınma yolunda stratejik bir hamle olarak değerlendirilebilir.

Anahtar Kelimeler: *MTV, CO$_2$, EKC, çevresel kalite, ARDL*
JEL Kodları: *G18, H20, H21*

Alan: *İktisat*
Türü: *Araştırma*

1. INTRODUCTION

Environment and environmental protection are among the issues that concern all humanity. Humans are the creatures that cause the most damage to the environment and are most affected by this damage. If the damage to the environment is not prevented, all humanity will be affected by this damage. For these reasons, international agreements are being made, and states are trying to produce standard global environmental policies (McCormick, 2023, p. 54). The United Nations Conference on the Human Environment, convened in Stockholm in 1972, marked the first inclusion of the right to the environment within an international legal framework (United Nations Environment and Sustainable Development, 2023). Following this landmark conference, efforts to protect the environment have persisted. The Kyoto Protocol, adopted by the United Nations Framework Convention in 1997, mandates the reduction of greenhouse gas emissions to levels that would prevent climate change (United Nations Climate Change, 2020). 2016 the Paris Climate Agreement was enacted as a legally binding international treaty addressing global climate change. The transition of the Motor Vehicle Tax in Türkiye is a notable example, where the tax structure has been adjusted to favor vehicles with lower emissions, thereby encouraging the adoption of more environmentally friendly transportation options. This shift reflects Türkiye's alignment with global environmental priorities and demonstrates the practical integration of environmental concerns into economic and fiscal policies (Ökde, 2022, p. 415).

Addressing the impacts of climate change necessitated by global warming requires reducing carbon and other harmful emissions (Şencan, 2021, p. 20). Using primary energy sources leads to the release of CO_2, which has detrimental effects on the environment (Özdemir, 2023, p. 2). The combustion of fossil fuels significantly contributes to the increase in CO_2 emissions, accounting for approximately 76% of greenhouse gases and exacerbating climate change. The Kyoto Protocol, established in 1997, strongly advocates for the shift from fossil fuels to renewable energy sources, mandating developed countries to reduce their CO_2 emissions (International Energy Agency, 2023). Taxation has emerged as the most prevalent and effective method for environmental protection (Grossman, 1999, p. 539). Consequently, there have been proposals for implementing global taxes to support the financing of global public goods (Betz & Hein, 2023, p. 241). Environmental taxes, referred to as ecological, pollution, or green taxes, vary in name but share the common goal of environmental preservation (Jamali, 2007, p. 80; Sarpong, Xu, Gyamfi, & Ofori, 2023, p. 337).

While taxes cover public expenses, they are also collected for the state to regulate economic and social life. Regulatory taxes collected aim to change

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people's preferences and behaviors without distinguishing between the public and private sectors. Therefore, ecological taxes, managed by targeting polluting activities without distinguishing between public and private sectors, are called regulatory taxes (Jamali, 2007, p. 100). Carbon taxes, the most common subcomponent of ecological taxes, constitute the majority of taxes collected to reduce CO_2. The carbon tax is an environmental tax implemented under the name "green tax reform" (Köppl & Schratzenstaller, 2023, p. 1353). Environmental taxes, often called "environmental taxes or green taxes," change the behavior of companies or individuals that disrupt the ecological order to protect the environment. Given that CO_2 gas constitutes the highest proportion of greenhouse gases contributing to climate change, it can be asserted that the majority of climate change is attributable to the accumulation of CO_2 (Raihan, 2023, p.9). The carbon tax is beneficial due to its predefined amount, simplicity, market-based nature, predictability in pricing, and its potential as a revenue source. However, when implementing a carbon tax, its drawbacks include political uncertainty, the unpredictability of benefits, exemptions from the tax, and the potential for unfair taxation (Köppl & Schratzenstaller, 2023, p. 1354).

Regarding the environment, taxes' regulatory and guiding feature comes to the fore. Most European Union countries collect motor vehicle tax as regulatory taxes. For this reason, they turned it into an environmental tax because it minimizes the damage of motor vehicles to the environment and reduces the emissions emitted due to transportation (Haywood & Jakob, 2023, p. 99). Thus, taxing cars according to their CO_2 has become critical. One of the most influential reasons for the greenhouse effect that causes climate change is the amount of CO_2 emitted from motor vehicles (Zhu, Lu, Song, Shao & Yue, 2023, p. 2). Since losses and evasion in taxation of motor vehicles are shallow, they constitute a severe source of income that must be addressed in the country's economy. For these reasons, MVT is the government's most preferred tax type (Demir, 2013, p. 133; Öncel, Çağan, Kumrulu & Göker, 2020).

MVT is a type of tax collected on wealth in Türkiye. Taxation of motor vehicles was first started in 1957 under the name of Private Automobile Tax. Later, the Motor Vehicle Tax Law No. 197 was enacted in 1963, which was changed to the Motor Vehicle Tax Law in 1980 with Law No. 2348. With this change, motor air and sea vehicles and motor land vehicles were also subject to tax. However, in 2009, sea vessels were excluded from the scope of the tax (Öncel et al., 2020; Gürdal, Demirtaş & Koç, 2024, p. 46). While the share of motor vehicle tax revenues in total tax revenues in Türkiye was 2% until 2014, it decreased to 1% after 2014. 2022, the question share fell below 1% (Revenue Administration, 2023). In Türkiye, a developing country, motor vehicles are

taxed; taxes on expenditures (VAT and SCT) and wealth tax (MVT) are used. In developed countries, motor vehicles are taxed for social purposes such as environmental awareness rather than wealth and expenditure taxes (Gürdin, 2017, p. 39). Carbon emissions are not considered when taxing motor vehicles in Türkiye. Taxation is carried out by considering specific characteristics such as age, engine cylinder volume, number of seats, maximum total weight, and type of vehicle. However, it seems that environmental factors are considered in our country, and the amount of tax collected increases as the engine cylinder volume increases; this is not enough. Low taxes on older vehicles can be considered a sign that goals such as environmental awareness have not yet been adopted in Türkiye (Polat, 2014, p. 48).

Since the early 1980s, the Turkish economy has exhibited significant growth. With the global acceleration of globalization, Türkiye has seen an increase in energy use, foreign direct investments, resource consumption, and production-consumption volumes. Amidst these increases, Türkiye has grown awareness regarding environmental degradation, particularly CO_2 emissions, although it remains insufficient. In this context, it has been determined that MVT collected in Türkiye is not collected by fully considering environmental quality. Our study, undertaken to draw attention to this problem, investigates the relationship between motor vehicle taxation, energy consumption, economic growth, and CO_2 emissions in Türkiye. The study contributes to the literature by (i) using CO_2 emissions as an indicator of environmental quality, marking the first investigation into the relationship between motor vehicle tax, energy consumption, economic growth, and environmental degradation in Türkiye; (ii) arguing that environmental innovation and the adoption of clean energy are crucial for meeting the objectives of COP-26 and the Paris Climate Agreement, as expanding environmental taxes can increase clean energy use and reduce emissions. This expansion could enhance clean energy production and carbon capture storage, provided the motor vehicle tax is fully recognized as an environmental tax. Therefore, the motor vehicle tax should be promoted as a tax conducive to carbon neutrality in Türkiye; (iii) employing an innovative econometric method that yields robust results; and (iv) generating practical policy recommendations for Türkiye in terms of the relationship between motor vehicle tax, energy consumption, economic growth, and CO_2 emissions. The study initially highlights the role of environmental taxes in curbing CO_2 emissions to mitigate environmental pollution, examining motor vehicle tax within the framework of the Paris Climate Agreement. The literature on the topic is summarized in the second section. The third section describes the study's data and presents the findings from the econometric analysis. Finally, the last section

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discusses these findings and offers policy recommendations based on the study results.

2. THEORETICAL FRAMEWORK

Türkiye has no legal framework for establishing a taxation system to reduce carbon emissions caused by transportation. The motor vehicle tax system, in practice, is an application that considers the vehicle's age. No legal regulation will provide tax exemption or discount for cars with low greenhouse gas emissions and high energy efficiency (Ekinci & Gönüllüoğlu, 2012, p. 35). Therefore, while taxing motor vehicles, various regulations need to be made in the taxes collected from motor vehicles to reduce greenhouse gases, taking into account the damage caused to the environment. In recent years, some steps have begun to be taken to protect the environment in Türkiye, although it is delayed compared to the European Union countries. In this context, Türkiye signed the Kyoto Protocol within the scope of Law No. 5836 on February 5, 2009. This protocol entered into force by being published in the official gazette on 13.05.2009. Within the framework of the Kyoto Protocol, countries make commitments to reduce environmentally harmful greenhouse gas emissions between 2008 and 2012. Since Türkiye joined the protocol in 2009, there has been no reduction obligation for the targets set between 2008 and 2012 (Polat & Eser, 2014).

The Paris Climate Agreement stands out as the most significant and extensive initiative to safeguard the environment by curbing greenhouse gas emissions. Rooted in the United Nations Framework Convention on Climate Change, this agreement seeks to manage the climate change framework beyond the expiration of the Kyoto Protocol in 2020. Its overarching aim is to limit the global temperature rise to less than 2 degrees Celsius above pre-industrial levels, with a further ambition to maintain the increase at no more than 1.5 degrees. An essential feature of the Agreement that differs from the Kyoto Protocol is that developed and developing countries participate in the action to reduce greenhouse gases through National Contribution Declarations. National Contribution Declarations are contributions determined by the countries party to the Convention within their national conditions and consist of entirely voluntary targets that are not binding. In this context, Türkiye submitted the intended National Contribution Declaration to the Convention Secretariat on 15.09.2015, aiming to reduce greenhouse gas emissions by 21% in 2030, according to the reference scenario. It is essential for Türkiye to ratify the Paris Climate Agreement and for Türkiye to participate in global cooperation within the framework of achieving the Agreement's goals. Türkiye ratified the Paris Climate

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Agreement. It has been acknowledged that the parties will be affected by climate change and the measures taken against climate change. Food security must be guaranteed against the adverse effects of climate change. Among the main goals are increasing the ability to adapt to the negative impacts of climate change, improving resilience to climate change, and encouraging low-emission development in a way that does not threaten food production. Türkiye has declared that it is sensitive to ending the nutritional problem in the world. It also acknowledged the importance of keeping the greenhouse gas sinks and reservoirs, which are emphasized in the Convention, under appropriate control and the participation of the Contracting Parties within the framework of their national legislation at every stage in the fight against climate change. In the Paris Climate Agreement, Türkiye is also a party, and each party is encouraged to set absolute emissions reduction targets throughout the economy and move towards these targets. All parties are trying to develop low-emission development strategies in the light of their national possibilities. At the same time, parties should take action to protect and strengthen greenhouse gas sinks and reserves, including forests. In addition, various incentives provided for sustainable development should support the reduction of greenhouse gases and carbon emissions, which have the largest share in greenhouse gases, and encourage participation by public institutions in reducing these emissions. At this point, Türkiye needs to innovate from the current motor vehicle tax to a more environmentally friendly tax structure due to its commitments to reduce greenhouse gases through international agreements to which it is a party[2].

Many developed and developing countries, especially European Union member countries, use taxation as an effective environmental policy tool. However, Türkiye still has not implemented a tax policy change that considers the environment in the field of taxation. The most concrete example is the Motor Vehicle Tax still in force in Türkiye. Although there is no environmental tax in Türkiye other than the Environmental Cleaning Tax, which is directly applied for ecological purposes in combating pollution and protecting natural resources, various user fees are used to solve environmental problems. Some of the main ones are hunting fees, oil exploration and operation permit fees, and aircraft noise fees (Yalçın, 2013, p. 141). In Türkiye's current motor vehicle tax system, the taxation amounts for older model vehicles are lower. However, as vehicle models age, fuel consumption and carbon emissions gradually increase. European Union countries take fuel efficiency and carbon emissions into account in motor vehicle

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[2] Proposal of Law Concerning the Approval of the Paris Agreement (Articles No. 2.4.5.6.14 of the Agreement)

taxation. In this context, it is possible to integrate the practices of European Union countries into our country in taxing low-carbon emission vehicles (Kaplan, 2012, p. 216).

One effective approach to protecting the environment involves individuals compensating for their environmental impact by contributing financially via environmental taxes. Environmental pollution presents a significant threat to all living beings. The primary objective of ecological taxes is to foster a pattern of consumption and production that is mindful of environmental considerations, aiming to reduce environmental pollution and achieve economic benefits through ecological improvements (Öner, 2014, p. 140). Environmental taxes are monetary charges levied on individuals and legal entities by public administrations to preserve environmental values, prevent ecological damage, and mitigate or reverse environmental degradation. These taxes adhere to the "polluter pays" principle, aiming to minimize the harm caused by environmental pollution (Reyhan, 2014, p. 113). In Türkiye, the taxation of motor vehicles that pollute the environment is not yet recognized as a part of modern taxation techniques. It does not align with trends in ecological taxation. Article 56/2 of the 1982 Constitution mandates, "The state and its citizens are obligated to enhance the environment, protect environmental health, and prevent environmental pollution." In line with this article, exercising taxation powers should consider environmental considerations. It is constitutionally mandated for the state to utilize taxation as a tool for environmental protection (Üstün, 2012, p. 175).

Eurostat classifies transportation taxes as the last tax type among environmental taxes (Europan Commission, 2023). If we look at the Turkish tax system, only motor vehicle tax can fall into the transportation tax category. In transportation, there is no type of tax other than the motor vehicle tax that can provide services to protect the environment. However, between 2003 and 2004, those who scrapped their passenger cars over twenty years old to reduce CO_2 were given a SCT discount when purchasing a new vehicle. Thus, 274,000 old passenger vehicles were scrapped (OECD, 2008, p. 147). Nowadays, due to the enormous investments made by especially developed countries in the transportation sector, while the industry in question is growing, it has also brought environmental pollution. Although the transportation sector ranks second in terms of industries emitting CO_2, CO_2 ranks first among the most significant air pollutants in today's world (TÜİK, 2022).

3. LITERATURE REVIEW

Most of today's carbon tax practices are seen in Europe. Carbon tax practices in the European Union are considered a significant financial tool for achieving environmental policy goals (Balı & Yaylı, 2019, p. 308). In the academic field, research on the environmental effects of motor vehicle taxation encompasses theoretical and empirical investigations. The majority of practical studies focus on countries within the European Union that have adopted national carbon taxes. Türkiye, on the other hand, does not have a national carbon tax; instead, it levies environmental taxes referred to as ecological taxes. Currently, there is a lack of empirical research examining the influence of these taxes on CO_2 in Türkiye. This study aims to bridge this gap in the existing literature.

3.1. The Relationship between Economic Growth and Environmental Pollution within the Scope of the Environmental Kuznets Model (EKC)

The Environmental Kuznets Curve (EKC) hypothesis, introduced by Grossman and Krueger in 1991, posits an inverted U-shaped relationship between economic growth and environmental degradation. This theory suggests that while economic progress initially leads to increased pollution, environmental impacts begin to decline once a certain income threshold is reached. This concept supports the idea that economic growth and environmental sustainability can be achieved simultaneously by fostering environmental awareness and encouraging technological innovation in the later stages of development. Research by Stern (2017) supports the presence of this inverted U-shaped correlation between national income and environmental degradation. Naimoğlu (2023) in the study tested the EKC hypothesis in 15 energy-importing developing economies. The study, using the ARDL approach with panel data from 1990 to 2019, confirmed the validity of the EKC model. Similarly, Aydın, Söğüt, and Altundemir (2023) examined the EKC hypothesis for 20 European Union countries using data from 1995 to 2018. Their panel cointegration tests indicated that the EKC hypothesis holds true for Austria, the Netherlands, Poland, and Slovenia. Several other studies, including those by Liddle (2015), Akkaya and Hepsağ (2021), Pata and Aydın (2020), Chen and Taylor (2020), Wang, Wang, and Li (2022), and Aydın, Söğüt, and Erdem (2024), have explored the EKC hypothesis under various conditions. This extensive body of research is crucial for understanding the nuanced relationship between economic growth and environmental pollution.

3.2. Relationship Between CO_2 and MVT

In their study, Walls and Hanson (1999) conducted a study on California using survey data from the US Department of Transportation, considering MVT within the scope of environmental taxes. Annual income and lifetime income

were taken into consideration in the study. As a result, it was determined that the share of emission-based taxes paid was higher in the income of poor households. Additionally, as a result of the analysis, it was determined that poor households pay more per vehicle than non-poor households, and these results vary depending on the income taken into account. In their study, Chia and Phang (2001) evaluated the MVT implemented in Singapore from an environmental perspective. He suggested that the current MVT system should be re-harmonised regarding environmental and economic targets. Within this framework, there should be tax reductions for public vehicles and the promotion of environmentally friendly cars. Braathen (2012) compares carbon dioxide-related tax rate differentiation in motor vehicle taxes in OECD member countries in his study. In the survey, MVT was considered a tool for reducing carbon emissions, and various evaluations were made on incentive systems. In his research, Karadeniz (2009) compared MVT with practices in multiple countries and suggested that MVT in Türkiye should have a structure that considers environmental protection and income-generating aspects. As a result, the study reported that MVT was not implemented as a tax to protect the environment in Türkiye. Yalçın (2013) sees MVT as a potential environmental tax in his research. He also examined MVT practices in European Union countries and stated that extremely successful results were achieved within the environmental protection framework. This study indicates that MVT should be abandoned as a wealth tax in Türkiye and transformed into a tax for ecological protection. This transformation can be achieved with the state's minimum measures for environmental protection.

In their study, Polat and Eser (2014) stated that MVT is a wealth tax, but the applied tariff is insufficient to tax wealth because it does not consider the vehicle's wealth value. Considering world practices, it is suggested that MVT has started to be implemented from a more environmentally friendly perspective, and therefore, MVT in Türkiye should be implemented as two separate taxes, namely Motor Vehicle Wealth Tax and Emission Tax. In their study, Sugözü, Yıldırım, and Aydın. (2014) do not find the tax tariff in practice successful in Türkiye because they are subject to tax without considering the age of the vehicles and their values. In addition, Türkiye is criticized for applying the motor vehicle tax as a wealth tax instead of an environmental tax, unlike the practices in European Union countries. Er (2015), who discussed MVT from a theoretical perspective, evaluated the problems in the current tax system within the scope of taxation principles. In this context, he suggested that obsolete vehicles should be withdrawn from the market and the production of cars suitable for new technology and with low carbon emissions should be encouraged. Vardar (2016), who discussed the MVT practices in the UK and Türkiye and evaluated the

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criteria considered when regulating tax tariffs with a comparative method, stated that the MVT applied in Türkiye is behind the UK regarding environmental quality and low carbon emissions. In this context, it is more environmentally friendly and suggested increasing incentives for low-carbon emission vehicles.

In his study, Karadeniz (2018) examined the tariff structure of the MVT applied from a theoretical perspective within the scope of tax justice. Evaluating the shortcomings in the current tariffs, they suggested a more fair MVT application, stating that while the same taxation criteria are applied to vehicles with different fuel types, vehicles with increasing age are subject to a lower tax rate even though they pollute the environment more. The study by Wappelhorst, Mock and Yang (2018) analyzes European vehicle taxation policies, examining how governments can steer consumers towards choosing low-emission vehicles. It reviews automobile taxation frameworks in European countries, focusing on France, Germany, the Netherlands, Norway, and the United Kingdom. The research evaluates the impact of taxation policies on the costs associated with selected vehicle models. It compares these policies across five markets to identify the most significant advantages for consumers opting for low-emission vehicles. The findings suggest several recommendations: substantial tax incentives at the time of purchase for low-emission vehicles, ongoing tax advantages for vehicles with low emissions throughout their usage, incorporating a vehicle's emissions into the company car tax system, and regularly adjusting the tax system to ensure its sustainability. He, Sun, Niu, Long, and Li (2021) utilized an autoregressive distributed lag (ARDL) model to empirically evaluate the collective influence of energy taxes, vehicle traffic taxes, and environmental taxes on energy efficiency, drawing on data from 1995 to 2016 across OECD countries. Their analysis showed that energy taxes significantly increase energy efficiency in the short term, vehicle traffic taxes have a notable positive impact on energy efficiency in the long term, and environmental taxes improve energy efficiency over both short and long terms, with a more substantial effect over the latter. Meireles, Robaina, and Magueta (2021) explored the relationship between vehicle taxation policies and the reduction of carbon emissions in Mediterranean countries, using panel data econometric techniques and vehicle registration data from 2008 to 2018. Their study modeled new vehicle demand and its sensitivity to carbon-based and circulation taxation changes, revealing that fiscal policies could play a critical role in reducing emissions in these nations. Natarajan, Wadhwa, Sri Preethaa, and Paul, (2023) conducted a study focusing on the observation and forecasting of emissions across different vehicle brands and types, utilizing sensor-based data from the Canadian government, which included observations of 7,384 light commercial vehicles between 2017 and 2021. Their predictive analysis offered

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valuable insights into choosing vehicles with lower CO_2 emissions, benefiting both consumers and manufacturers. Lastly, Ptak, Neneman, and Roszkowska (2024) examined CO_2 emissions from road travel, specifically targeting passenger and gasoline vehicle emissions in 28 EU member states, including the United Kingdom and Croatia, from 2010 to 2019. They also looked into the indirect tax rates on diesel in these countries, finding that fuel taxes generally have a slight but negative impact on CO_2 from passenger vehicles. Additionally, Montag (2015) mentions the inadequacy of taxes such as MVT in terms of environmental quality. He drew attention to fuel taxes and taxes such as MVT in the fight against environmental sustainability. Moreover, it mentioned the necessity of various regulations in this direction. Similarly, when reviewing the study results of Regalado, Quintero, and Villamar (2023) examined for Indonesia, environmental quality was ignored when collecting MVT. In addition, Eremina (2023) showed in his study that the current regulations on MVT do not meet humanity's needs in terms of greening.

While some studies confirm the EKC hypothesis, others, such as this study examining Türkiye's 1995-2020 data, suggest that the EKC hypothesis may not be universally valid. This suggests that more comprehensive, region-specific studies are needed to validate the EKC model in different contexts. The impact of MVT on reducing carbon emissions and promoting environmental sustainability is discussed. Studies such as Karadeniz (2009) and Yalçın (2013) show that MVT is not effectively implemented as an environmental tax in Türkiye. Considering the experiences of other countries, research is needed to explore how MVT can be better structured to achieve environmental goals. Many studies, such as Wappelhorst et al. (2018) and He et al. (2021), have compared vehicle taxation policies across countries. However, more detailed comparative analyses that consider different regions' unique socio-economic and environmental contexts are needed to derive best practices for implementing effective MVT systems. The literature suggests multidisciplinary approaches are needed in policy recommendations, considering the complex interplay between economic growth, environmental sustainability and social equity. This Research aims to integrate insights from economics, environmental science and social policy to develop holistic and effective environmental tax reforms. By addressing these gaps, future research can contribute to a more detailed understanding of the EKC hypothesis and the design of MVT systems that effectively balance economic, environmental, and social objectives.

4. RESEARCH HYPOTHESIS, DATA, MODEL, METHODOLOGY AND EMPIRICAL FINDINGS

4.1. Research Hypothesis

Nowadays, as economic activities continue to accelerate, environmental problems are increasing. In Türkiye, situations such as production, consumption, energy use, and depletion of natural resources trigger environmental problems. One of the most important environmental problems is the serious increase in carbon emissions. Based on these relationships, the study investigates whether there is any relationship between MVT, energy consumption, economic growth, and carbon footprint. The main problem of this research is the need to examine at what level a possible relationship occurs. The relationship between variables is tested through the EKC hypothesis. Based on the theory, the main hypothesis of the research and its sub-hypotheses were created as follows:

H1: The EKC hypothesis is valid in Türkiye.

H1a: MVT has an impact on CO_2.

H1b: EC has an impact on CO_2.

H1c: GDP has an impact on CO_2.

4.2. Data

The study investigates the effects of motor vehicle taxation, economic growth and energy consumption on the carbon footprint in Türkiye from 1995 to 2020 within the EKC framework. The availability and suitability of data guided the choice of representative variables. The analysis utilized annual GDP (in constant 2015 US dollars), motor vehicle tax (MVT), carbon footprint (CO_2), and energy consumption (in million tons) as data points. GDP figures were sourced from the World Bank database, CO_2 metrics from the Global Footprint Network database, and energy consumption and MVT information were retrieved from the OECD statistical database.

In order to test the EKC hypothesis, the model is formulated as follows based on Liddle (2015) and Akkaya and Hepsağ (2021);

Model: $\ln CO_2 it = \beta_0 + \beta_1 \ln GDP it + \beta_2 \ln GDP^2 it + \beta_3 \ln EC it + \beta_4 \ln MVT_{it} + \varepsilon_{it}$

In the model, $\beta 1$, $\beta 2$, $\beta 3$, and $\beta 4$ are the coefficients of lnGDP, lnGDP2, lnEC, and lnMVT. The error term is εit coefficients. According to the validity criteria of the EKC hypothesis, when we examine the relationship between economic growth and pollution, the coefficient of lnGDP should be positive; that is, as economic growth increases, environmental pollution also increases.

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Likewise, the coefficient of lnGDP^2 should be negative, indicating that when economic growth reaches a certain threshold, there is a decrease in environmental pollution. Both lnGDP and lnGDP^2 are statistically significant, meaning that this relationship is reliable and essential.

Additionally, the fact that the established model is cointegrated indicates a long-term equilibrium relationship between the variables. In this context, the EKC hypothesis suggests that economic growth increases environmental degradation up to a point, but after a particular threshold value, it positively affects the environment. This emphasizes the importance of balanced management of economic growth and environmental protection measures to ensure a sustainable environment.

4.3. Methodology

This study adopted a three-stage econometric methodology. The first stage involved assessing the stationarity of the series via the Fourier Augmented Dickey-Fuller (ADF) unit root test. In the second stage, long-term associations among the variables were examined using the ARDL Bounds testing approach. The third stage was dedicated to identifying causality links among the variables with the help of the Fourier Toda Yamamoto causality test.

Time series can experience sudden changes known as structural breaks, often triggered by economic shocks, natural disasters, or political events. These breaks can profoundly alter the time series' stochastic properties. Thus, factoring in structural breaks is essential for accurate analytical outcomes. Literature on structural breaks reveals that these shifts can be abrupt or gradual. In this vein, Becker, (2004) introduced a method for detecting gradual structural breaks in time series through the use of Fourier terms. Specifically, they, along with Enders and Lee (2012), utilized Fourier terms to enhance the Augmented Dickey-Fuller (ADF) test, allowing it to account for gradual structural breaks. The following equation illustrates the method.

$$\alpha(t) = \alpha 0 + \gamma_2 \sin(2\pi kt/\text{T}) + \gamma_2 \cos(2\pi kt/T) \tag{1}$$

In the equation, k represents the frequency number of Fourier terms. The extended model proposed by Enders and Lee (2012) using the deterministic term in equation 1 is as follows:

$$\Delta yt = a_0 + \beta \Delta y_{t-1} + \gamma_1 \sin(2\pi kt/\text{T}) + \gamma_2 \cos(2\pi kt/T) + \sum_{i=1}^{p} = \theta i \Delta y_{t-i} + ut \tag{2}$$

The Fourier ADF (FADF) unit root test adopts a two-step approach, as Enders and Lee (2012) recommended. Model 2 is estimated for $1 \leq k \leq 5$ in the

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initial step. The model that yields the lowest sum of squared errors (SSR) within this range is the most fitting. In the second step, the FADF test's effectiveness depends on the Fourier terms' statistical significance. The test's results are considered reliable when the Fourier terms are significant. If these terms are not significant, the Augmented Dickey-Fuller (ADF) test is recommended as the preferable method. The significance of the Fourier terms is determined using the standard F-test.

The autoregressive distribution lag approach (ARDL), which was introduced to the literature by Pesaran, Shin and Smith, (2001) due to its features, was used in the study. The ARDL approach has the following advantages compared to traditional methodology: This method provides solid predictions for I(0), I(1), and mixed stationarity orders (provided it is not I(2)). It presents short and long-term forecasts in a single model. It also offers consistent estimates in small samples. Finally, the ARDL approach makes predictions by considering endogeneity and autocorrelation issues (Usman, Balsalobre-Lorente, Jahangir & Ahmad, 2023). The ARDL method incorporates both explanatory and dependent variables, utilizing lagged values as regressors in a framework based on standard least squares regression. This method is further extended to test for long-term relationships or cointegration among variables through the ARDL-Bounds test. To achieve this, the model is transformed into an unconstrained error correction model using the ARDL approach and analyzed using the least squares (EKK) estimator. Subsequently, the Bounds test, which employs either an F or Wald statistic, is conducted to ascertain the presence of cointegration (Özdamar, 2015, p. 2).

Based on the model of the study, the ARDL-Bounds test equation created to determine the cointegration relationship between variables is as follows:

$$\Delta \ln CO2_t = a_0 + \sum_{i=1}^{m} a_{1i}\Delta \ln CO2_{t-i} + \sum_{i=0}^{n} a_{2i}\Delta \ln EC_{t-i} + \sum_{i=0}^{p} a_{3i}\Delta \ln GDP_{t-i}$$

$$+ \sum_{i=0}^{r} a_{4i}\Delta \ln GDP^2_{t-i} + \sum_{i=0}^{s} a_{5i}\Delta \ln MTV_{t-i} + \beta_1 \ln CO2_{t-1} + \beta_2 \ln EC_{t-1} + \beta_3 \ln GDP_{t-1}$$

$$+ \beta_4 \ln GDP2_{t-1} + \beta_5 \ln MTV_{t-1} + e_t \tag{3}$$

The a coefficients in the equation expressed short-term dynamics, and the β coefficients represent long-term dynamics. In the Autoregressive "Distributed Lag (ARDL) methodology, the long-term relationship between variables is determined by the F statistic value, following the approach of Pesaran et al. (2001). The calculated F statistic is compared against the asymptotic significance levels, with distinct lower and upper bounds depending on the

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integration order of the variables, either I(0) or I(1). If the F statistic falls below the lower bound, it suggests the absence of a cointegration relationship. Conversely, an F statistic above the upper bound indicates the presence of cointegration. When the statistic lies between these bounds, a definitive conclusion on cointegration cannot be made (Westerlund, 2006, p. 120).

The final step of the econometric analysis involves examining the causal links between variables. This investigation utilized the Fourier Toda-Yamamoto (TY) causality method proposed by Nazlıoğlu, Görmüş, and Soytaş (2016). Enders and Jones (2016) pointed out that causal inferences from the Vector Autoregression (VAR) model could be flawed and inconsistent due to neglecting structural changes. Traditional Toda and Yamamoto causality tests also fail to account for structural breaks, which can lead to biased conclusions if a structural break is present. To address these issues, Nazlıoğlu et al. (2016) introduced the Fourier TY causality test, designed to accommodate smooth structural breaks, and deterministic terms were included in the TY causality test model as described by Aydın (2022, p. 470).

The equation for the Fourier TY causality test is as follows;

$$y_t = a_0 + \gamma_1 \sin(2\pi kT) + \gamma_2 \cos(2\pi kT) + \beta_1 y_{t-1} + ... + \beta_{p+d\max} y_{t-(p+\max)} + \varepsilon_t \quad (4)$$

4.4. Empirical Findings

This section of the study presents the empirical results obtained from econometric testing. Initially, the outcomes of the unit root tests for the variables are detailed. As indicated in Table 1 and affirmed by Enders and Lee, if the calculated F statistic is below the critical thresholds, traditional unit root tests are applicable. In our case, the calculated F statistic falls below the required levels, rendering the trigonometric terms insignificant and necessitating conventional tests. Among these traditional tests, the Augmented Dickey-Fuller (ADF) unit root test results demonstrate that all variables achieve stationarity at the I(1) level, except for lnMVT, which is stationary at the I(0) level.

Table 1: Unit Root Test Results

Variables	FADF					ADF	
	I(0)	I(1)	k	p	F-stat	I(0)	I(1)
LnCO$_2$	-0.2878	-2.8742	2	4	3.97	-1.2059	-5.7698*
lnEC	0.9239	-2.6682	3	4	3.77	-0.7855	-5.5789*
lnGDP	-0.2930	-3.7563	1	4	4.42	-1.7715	-4.3154*
lnGDP^2	-0.2311	-3.6173	1	4	4.42	-1.8077	-4.3748*
lnMVT	-4.9432	-1.5576	1	4	4.42	-2.6780*	-

Note: k refers to the number of available frequencies, and p refers to the appropriate delay length. Critical

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values: They are 12.21 (1%), 9.14 (5%), and 7.78 (10%). Fist. Essential values are taken from Enders and Lee (2012). * indicates statistical significance at 1%.

The variation in stationarity levels among the variables indicates the appropriateness of using the Autoregressive Distributed Lag (ARDL) method to explore their cointegration relationship. The model's dependent variable, $lnCO_2$, achieves stationarity at the I(1) level. Considering that the independent variables are stationary at both I(1) and I(0) levels, the ARDL approach was employed to examine the long-term cointegration relationship between the variables and to calculate their coefficients. The results of the bounds test, shown in Table 2, confirm that the ARDL method is apt for this analysis.

Table 2: Results of ARDL Bound Test

			Lower bound I(0)	Upper bound I(1)
F Statistics	**4.0515**	1%	3,29	4.37
k	**4**	5%	2.56	3.49
		10%	2,2	3.09
Diagnostic tests				
			Statistics	*Prob.*
Breusch-Godfrey LM test			*1.286*	*0.284*
White test			*0.490*	*0.870*
J-B Normality test			*2.070*	*0.355*
Ramsey Reset			*0.754*	*0.403*

Note: In the bounds test model, 'k' represents the number of independent variables. Diagnostic checks reveal that the model is free from autocorrelation as indicated by the Breusch-Godfrey LM test, exhibits constant variance as confirmed by the White test, and possesses normally distributed error terms as demonstrated by the Jarque-Bera test. Furthermore, the Ramsey RESET test results confirm the model's functional form is correctly specified, verifying that the model meets the necessary stability conditions.

In the first stage of the ARDL model, the appropriate lag length should be determined. At this stage, the variables are tested with different lag combinations, and the model with the lowest value according to the information criterion (according to AIC, SIC, or HQ criteria) is selected as the appropriate model. The maximum number of lags in the analysis is two, and the appropriate lag lengths for the variables are determined according to the Akaike information criterion. While selecting the proper lag length, using annual data in the study led us to keep the lag length short. In addition, the observational method allows the performance of models estimated with different lag lengths to be compared to determine the most appropriate lag length. The appropriate lag length chosen by taking these factors into account meets the relevant assumptions of the ARDL model. According to this criterion, the ARDL (2, 1, 2, 2, 0) model was determined. The results of the model estimated by the least squares method are

presented in Table 3.

Table 3: ARDL (2, 1, 2, 2, 0) Model Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
$LNCO_2$(-1)	0.747583*	0.187795	3.980858	0.0018
$LNCO_2$(-2)	-0.106874	0.083394	-1.281556	0.2242
LNEC	0.952437*	0.100384	9.487948	0.0000
LNEC(-1)	-0.703570*	0.195453	-3.599688	0.0006
LNGDP	-0.731125	0.652487	-1.120520	0.2844
LNGDP(-1)	0.811270	0.640620	1.266383	0.2294
LNGDP(-2)	-1.511040**	0.509952	-2.963103	0.0119
LNGDP2	3.192625	2.794223	1.142581	0.2755
LNGDP2(-1)	-3.419661	2.727574	-1.253737	0.2338
LNGDP2(-2)	6.539710**	2.177255	3.003650	0.0110
LNMVT	-0.011776	0.007204	-1.634591	0.1281
C	-15.52463*	6.125406	-2.534465	0.0002

Note: *, **, and *** notations express significance at 1%, 5%, and 10%, respectively.

Since the calculated F statistic surpasses the upper boundary, it is deduced that the variables have a cointegration relationship. In the cointegration model, with $lnCO_2$ serving as the dependent variable, a long-term association has been found between the variables. The estimated long-term coefficients, reflecting the strength of this relationship, are detailed in Table 4.

Table 4: ARDL Long-Term Coefficients

Variables	Coefficient	t statistics	Probability value
lnEC	0.692664*	4.906788	0.0004
lnGDP	-3.982563	-1.479641	0.1647
lnMVT	-0.032776	-1.490602	0.1619
$lnGDP^2$	17.569854	1.497492	0.1601
C	-43.209172	-1.563384	0.1439

Note: *, **, and *** notations express significance at 1%, 5%, and 10%, respectively.

Energy consumption exerts a statistically significant positive impact on the dependent variable, whereas other independent variables in the model do not have a substantial effect. To explore the short-term dynamics of the model, an error correction model was estimated, with its estimates presented in Table 5.

Table 5: Error Correction Model

Variables	Coefficient	t statistics	Probability value
d(lnCO$_2$ (-1))	0.106874***	1.791356	0.0985
d(lnEC)	0.952437*	18.09578	0.0000
d(lnGDP)	-0.731125***	-1.843668	0.0901
d(lnGDP(-1))	1.511040*	3.975117	0.0018
d(lnGDP^2)	3.192625***	1.883249	0.0841
d(lnGDP^2(-1))	-6.539710*	-4.018046	0.0017
CointEq(-1)	-0.359290*	-6.064772	0.0001

Note: *, **, and *** notations express significance at 1%, 5%, and 10%, respectively.

Table 5 presents the results from the error correction model. The error correction term is negative and statistically significant, indicating that approximately 35% of deviations from equilibrium in the model are adjusted in the long term. Similar to the long-term analysis, the net effect in the short term is also positive and significant.

Additionally, the diagnostic tests for the ARDL model include assessing the presence of structural breaks through the Cusum and Cusum-sq structural break tests, as devised by Brown et al. (1975). These tests are designed to detect the long-term stability of consecutive error estimations, particularly whether they consistently share the same sign or remain unchanged over an extended period. The findings, with Cusum and Cusum-sq test statistics falling within the 5% critical value range, indicate that the model's coefficients are stable over the long term without any structural breaks. This outcome further underscores the consistency of the estimated coefficients within the model.
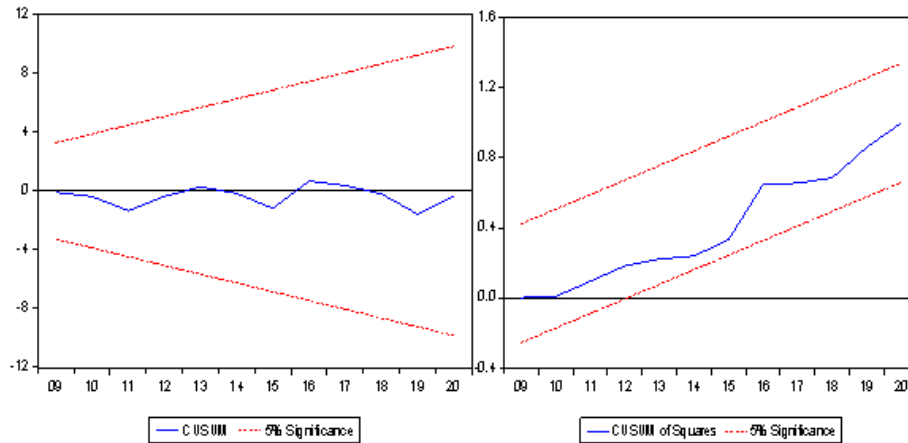
Figure 1: Cusum and Cusum-sq Test

The concluding part of the econometric analysis in this study involves presenting the results of the Fourier Toda-Yamamoto (TY) causality test. In order to assess the reliability of the ARDL results and the causal relationship between the variables included in the model, FTY causality analysis is used. The empirical outcomes are documented in Table 6. The test reveals a one-way causal link from CO_2 to MVT and another one-way causal relationship from energy consumption to CO_2. These findings indicate that the variables may function as predictors of each other. Consequently, future measures should adopt a comprehensive approach, considering these causal relationships when addressing the issue.

Table 6: Fourier Toda-Yamamoto Causality Results

Causality	Test Statistics	P value	k	p
$lnco_2 \rightarrow lnmvt$	8.762***	0.087	1	3
$lnmvt \rightarrow lnco_2$	2.876	0.470	1	3
$lnco_2 \rightarrow lnec$	0.786	0.383	1	1
$lnec \rightarrow lnco_2$	26.524*	0.000	1	3
$lnco_2 \rightarrow lngdp$	0.206	0.977	1	3
$lngdp \rightarrow lnco_2$	9.087	0.071	1	3

Note: ∗ and ∗∗∗ indicate that the null hypothesis is rejected at 1% and 10% significance levels, respectively.

5. CONCLUSION AND POLICY RECOMMENDATIONS

The Paris Climate Agreement, an essential international treaty enacted in 2016, aims to mitigate global climate change. It involves commitments from various countries to limit worldwide greenhouse gas emissions and advance sustainable development goals. As a signatory to the Paris Climate Agreement, Türkiye has pledged to cut greenhouse gas emissions and promote a sustainable future. In this regard, the motor vehicle tax (MVT) is seen as a crucial instrument for diminishing the adverse environmental effects of carbon emissions and facilitating the shift towards a greener transportation infrastructure. The MVT's purpose within the Paris Climate Agreement framework is to bolster efforts to curb greenhouse gas emissions through various policy initiatives and tax regulations.

This research focused on assessing the impact of the motor vehicle tax, energy consumption, and economic growth on Türkiye's carbon footprint from 1995 to 2020, using the EKC framework. While numerous studies have tested the EKC hypothesis in the Turkish context, only a few have incorporated MVT as an explanatory variable. The study employed the ARDL Bounds Test to evaluate the EKC hypothesis. The empirical results did not support the EKC hypothesis. The anticipated negative impact of MVT on pollution was observed, but the obtained coefficient, though negative, was not statistically significant. Moreover, the

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coefficients required to validate the EKC hypothesis were not achieved. The failure to confirm the EKC hypothesis reveals that environmental pollution does not decrease after a certain growth threshold in Türkiye. These findings indicate that the EKC hypothesis does not hold for Türkiye. This conclusion aligns with the research findings of Ceylan and Karaağaç (2020), Öztürk and Acaravcı (2010), and Akbostancı, Türüt-Aşık, and Tunç (2009). The fact that economic growth does not create pollution after a certain stage reveals the need to review Türkiye's production composition. Particularly, the fact that technological and institutional development is not at the desired levels is one of the most important reasons for this result. Another important reason why the EKC hypothesis cannot be verified in Türkiye is the low environmental awareness and sustainability awareness. Collecting motor vehicle tax in the wealth tax category without taking environmental sustainability into account is one of the concrete examples of this. In addition, one of the other important reasons is that economic activities in Türkiye are based on non-renewable energy-intensive industries and the construction sector. According to the 2020 energy consumption data, the industrial sector relies heavily on fossil fuels, which account for approximately 83% of its total energy use (Ministry of Energy and Natural Resources, 2024). The construction sector, making up about 6% of the GDP and providing employment for 1.5 million people, plays a crucial role in Türkiye's economic development. When considering its direct and indirect effects on other sectors, the construction industry's share of the Turkish economy reaches up to 30%. Given the significant pollution emissions from construction materials and structures, it is inevitable that the EKC is not validated. On the other hand, rapid urbanization and population growth suppressing the unconscious use of natural resources are among the factors why the EKC hypothesis has not been realized for Türkiye. According to World Bank data, the proportion of the population living in urban areas in Türkiye has increased significantly from around 30% in 1960 to 77% in 2022 (Minister of Environment, Urbanisation and Climate Change, 2024). This rise in urbanization has led to issues such as irregular urban development and increased environmental pollution. R&D activities in Türkiye need to be expanded in all areas, especially economic activities, with the aim of environmental sustainability. On the other hand, increasing resource diversity is one of the steps that will ensure the validity of the EKC hypothesis. The main reasons for the findings obtained for Türkiye are the deficiencies in terms of steps to improve efficiency and positive green initiatives in terms of sustainability. Moreover, the model's findings suggest that energy consumption positively correlates with CO2 emissions. The results imply that Türkiye needs to adopt more effective environmental and sustainability measures. Enhancing the

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effectiveness of MVT from a tax policy perspective and rapidly advancing necessary investments and R&D for green energy transition is imperative.

Policy suggestions such as considering environmental impacts in calculating MVT, increasing incentives for environmentally friendly vehicles, and excluding vehicles with low carbon emissions from taxation can enable essential steps to create a tax policy more suitable for Türkiye's environmental and sustainability goals. Considering the amount of emissions emitted by vehicles into the environment in the MVT calculation can promote sustainability. In this context, tax advantages and incentives can be applied to vehicles with low carbon emissions. Increasing these incentives could increase demand for environmentally friendly vehicles as emissions decrease. Excluding vehicles that cause low carbon emissions from taxation may make ecologically friendly vehicles more attractive. This can contribute to promoting sustainable transport. Excluding electric vehicles from MVT could encourage transitioning to a transportation system based on renewable energy sources. In addition, additional taxes may be collected from luxury vehicles with an engine power of 2000 and above, and vehicles with high carbon emissions may be held under additional financial liability. Considering the vehicle mileage during the year when determining the MVT amount may ensure that the vehicles are taxed based on their actual use. This could offer additional benefits to less used and greener vehicles. Using MVT revenues to develop public transportation infrastructure and finance sustainable transportation projects can be effective in reducing private vehicle dependency. High MVT rates can be applied in city centers to reduce vehicle use. This could reduce traffic congestion and air pollution in city centres. In terms of urban planning strategies, especially the planning of density and mixed-use areas allows people to carry out their vital activities without the need for special vehicles. In addition, supporting alternative transportation models will be included in the planning of cities and will pave the way for broader political interventions.

Finally, discounts or incentives applied to environmentally friendly vehicles can be made more visible by creating a unique incentive program called "environmentally friendly vehicle discount." Such incentives can encourage the adoption of sustainable transportation. These recommendations can contribute to building a comprehensive tax policy to reduce environmental pollution, promote sustainable transportation, and increase energy efficiency. In this context, regulations envisaged under the Paris Climate Agreement should consider incentives for scrapping old vehicles, mileage-based annual taxation, differentiated taxation for urban and rural use, incentives for the use of renewable energy fuels, and measures to reduce private car usage by promoting public

transportation and car-sharing.

As a result, regulating and implementing Türkiye's motor vehicle tax policies in line with the Paris Climate Agreement targets can be part of the steps taken by the country towards sustainable development. These measures can be considered part of a strategy to increase environmental sustainability and contribute to efforts to combat global climate change. The policy recommendations developed in light of the findings of this study serve as a precursor to future research that addresses gaps in the literature and enables the expansion of the scientific field.

6. CONFLICT OF INTEREST STATEMENT
There is no conflict of interest between the authors.

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YS, HY: Idea
YS, VI: Design
AB, YS: Processing and/or processing of resources;
VI: Analysis and/or interpretation;
YS, AB: Literature review;
YS, VI: Written by;
HY, AB: Critical review

9. ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS
Ethics committee approval is not required for the study.

10. REFERENCE

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YÖNETİŞİM GÖSTERGELERİNİN DOĞRUDAN YABANCI YATIRIMLARA ETKİSİ: SEÇİLMİŞ ÜLKE EKONOMİLERİ ÜZERİNE BİR UYGULAMA[1]

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ÖZ | Doğrudan yabancı yatırım (DYY) ile yönetişim arasındaki ilişki karmaşık ve çok yönlüdür. Bir ülkenin siyasi, kurumsal ve yasal ortamını kapsayan yönetişim altyapısı, DYY'nin hem girişini hem de çıkışını önemli ölçüde etkilemektedir. Bu çalışmada, 2022 yılında en fazla DYY alan ilk 20 ülkenin, DYY ile yönetişim göstergeleri arasındaki ilişki incelenmiştir. Bu amaçla, çalışmada 2002-2022 dönemine ait yıllık veri setleri kullanılarak, değişkenler arasındaki ilişki panel veri analizi ile test edilmiştir. Bağımlı değişken olarak DYY, bağımsız değişkenler olarak dünya bankası yönetişim göstergelerini oluşturan altı gösterge ve GSYH değişkenleri kullanılmıştır. Çalışmadan elde edilen ampirik sonuçlara göre, incelenen ülkelerde ifade özgürlüğü-hesap verebilirlik, hükümetin etkinliği ve yolsuzluğun kontrolü değişkenleri ile DYY'ları ters yönlü hareket etmektedir. Siyasi istikrar ve şiddetin/terörizmin olmaması, düzenleyici kalite, hukukun üstünlüğü ve kontrol değişkeni olarak kullanılan GSYH değişkenleri ile doğrudan yabancı yatırımlar aynı yönlü hareket etmektedir. Çalışmada elde edilen bu sonuçlar, iyi yönetişimin DYY çekmek için gerekli olduğu yönündeki geleneksel görüşünün aksine, yönetişim göstergelerinin bir bütün olarak DYY ile pozitif yönlü bir ilişkiye sahip olmadığı, bu durumun aksinin de geçerli olabileceği yönündeki görüşleri desteklemektedir.

Anahtar Kelimeler: *Yönetişim, doğrudan yabancı yatırım, panel veri analizi*
JEL Kodlar: *F21, C01, O16*

Alan: *İktisat*
Türü: *Araştırma*

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[1] İlgili çalışmanın etik kurallara uygunluğu beyan edilmiştir.

THE EFFECT OF GOVERNANCE INDICATORS ON FOREIGN DIRECT INVESTMENT: AN APPLICATION ON SELECTED COUNTRY ECONOMIES

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ABSTRACT

The relationship between foreign direct investment (FDI) and governance is complex and multifaceted. A country's governance infrastructure, including its political, institutional and legal environment, significantly affects both the inflow and outflow of FDI. In this study, the relationship between FDI and governance indicators of the top 20 countries receiving the highest FDI in 2022 is analyzed. For this purpose, the relationship between the variables is tested by panel data analysis using annual data sets for the period 2002-2022. FDI is used as the dependent variable and six indicators of World Bank governance indicators and GDP variables are used as independent variables. According to the empirical results obtained from the study, the variables of freedom of expression-accountability, government effectiveness and control of corruption move inversely with FDI in the countries analyzed. Political stability and absence of violence/terrorism, regulatory quality, rule of law and GDP used as control variables move in the same direction. These results support the view that contrary to the traditional view that good governance is necessary to attract FDI, governance indicators as a whole do not have a positive relationship with FDI and vice versa.

Keywords: *Governance, foreign direct investment, panel data analysis*
JEL Codes: *F21, C01, O16*

Scope: *Economics*
Type: *Research*

1. GİRİŞ

Doğrudan yabancı sermaye yatırımları (DYY), dünya genelinde iktisat politikalarında liberalleşme, sermayenin önündeki engellerin kaldırılması, ülkeler arasındaki ticarette serbestleşme ve tüketim kalıplarının birbirine benzeşmesi vb. etkenler nedeniyle tüm ülkeler için oldukça büyük bir öneme sahiptir (Erim, 2018, s. 3). DYY'lerin bu önemine binaen, bir ülkenin DYY'leri kendi ülkesine çekme düzeyini belirleyen ana faktörlerin araştırılması önem arz etmektedir. Genel olarak ev sahibi ülkenin DYY çekme veya caydırma yeteneğini belirlemede temel açıklayıcı faktörler olarak pazar büyüklüğü, işgücü maliyetleri, döviz kurları ve altyapı gibi ekonomik faktörlere odaklanılmıştır. 1990'larda, North'un (1990) çalışmasının ardından, DYY araştırmacıları, "toplumdaki oyunun kuralları veya insan etkileşimini şekillendiren, insan tarafından tasarlanmış kısıtlamalar" olarak tanımlanan kurumların etkisine daha fazla odaklanmaya başlamışlardır. DYY, "yatırımcının ekonomisi dışında faaliyet gösteren bir işletmede kalıcı bir pay veya etkin bir kontrol elde etmek için yapılan yatırımdır" şeklinde tanımlanmaktadır. Bu tanım, çokuluslu şirketler (ÇUŞ) tarafından dikkate alınmadan üstlenilmeyen uzun vadeli bir ilişkiyi ima etmektedir. Önceki araştırmalar, ÇUŞ'ları bir ev sahibi ülkeye diğerine yatırım yapmayı tercih etmeye hangi faktörlerin ikna ettiğine odaklanmıştır. Başlangıçta ekonomik faktörler öncelikli odak noktası olmuşken son zamanlarda ise kurumlar tartışmada daha belirgin bir rol oynamaya başlamıştır (Bailey, 2018, s. 139).

Bu anlamda bir ülkenin siyasi, yasal ve kurumsal çerçevelerinin kalitesini kapsayan yönetişim kavramı ile DYY arasındaki etkileşim üzerinde durmak önem kazanmaktadır. Yönetişim kavramı, ülkelerin kurumsal yapılarının kalitesinin bir göstergesi olarak düşünülebilir. Her ne kadar genellikle yönetişim ve kurum kavramları benzer anlamı ifade eden kavramlar olarak düşünülse de, bu kavramlar taşıdıkları anlamlar açısından birbirlerinden farklıdır. Ağırlıklı olarak sonuca yönelik bir kavram olan yönetişim, sadece hükümetlerin değil, aynı zamanda sivil toplum kuruluşları, özel sektör ve vatandaşların da katılımını içerir. Kurumlar ise, yönetişimin sonucunu ortaya çıkaran sebeplerdir (Özdemir & İmamoğlu, 2021, s. 117).

Bu çalışmada yönetişim ile DYY arasındaki ilişki araştırılmaktadır. Bu çerçevede çalışmanın giriş bölümünü takiben birinci bölümde konuyla alakalı olarak teorik arka plan verilecek ve ikinci bölümde yönetişim ve DYY arasındaki ilişkiyi inceleyen seçili literatür incelenecektir. Üçüncü bölümde çalışmada kullanılan veri seti ve kullanılan ekonometrik yöntem tanıtılacaktır. Dördüncü bölümde ampirik bulgular verilerek sonuçlar değerlendirilecek ve son olarak sonuç kısmında çalışmanın genel bir değerlendirmesi yapılacaktır.

2. TEORİK ARKA PLAN

Yönetişim kavramı yaygın olarak tartışılsa da, yönetişim kavramının üzerinde uzlaşmaya varılmış bir tanımı yoktur. Her ne kadar üzerinde uzlaşı olmasa da kavram üzerine çeşitli yazarlar ve kuruluşlar tarafından çok çeşitli tanımlar yapılmıştır. Bu tanımlardan bir kısmı oldukça geniştir. Nitekim bu tanımlar, Dünya Bankası tarafından yayınlanan Dünya Kalkınma Raporunda (2002) yapılan "kurallar, uygulama mekanizmaları ve organizasyonlar" tanımı gibi neredeyse her şeyi kapsamaktadır. Diğer bir takım tanımlar ise, Dünya Bankası tarafından 1992 yılında önerilen "kalkınma için bir ülkenin ekonomik ve sosyal kaynaklarının yönetiminde gücün kullanılma şekli" tanımı da dahil olmak üzere, daha dar bir şekilde kamu sektörü yönetimi konularına odaklanmaktadır (Kaufman, Kraay & Mastruzzi, 2010, s. 3). Diğer taraftan neo-liberal bir söylem olarak düşünülen yönetişim, 1980'lerden günümüze minimal devlet amacı ile devletin yeniden yapılanması, devletin bazı işlevlerinin özel sektöre ya da diğer bir değişle sermayeye devrinin söz konusu olması ve bu vasıtayla devletin birçok alanda devre dışı bırakılmasıyla, neo-liberal ideolojinin toplumsal ilişkiler bütünü üzerinde bir hegemonya girişimi olarak da görülmektedir (Güzelsarı, 2003). Burada dikkat çeken husus ise yönetişimin yeni iktidar modeli olarak sunulması ve hükümet olmadan, birlikte yönetme unsurları ile öne çıkacak bir siyasi ve yönetsel model olarak sunulması ve ticaret hakkı, insan hakları gibi dokunulmaz bir statüye oturtulmaya çalışılmasıdır (Bayramoğlu, 2005, akt, Algan, 2021, s. 795).

Yönetişim kavramının üzerinde uzlaşılan bir tanımı olmamasıyla birlikte ülkelerin yönetişim seviyelerini belirlemek amacıyla bir takım raporlar ve endeksler yapılmaktadır. Bu anlamda Dünya Bankası tarafında oluşturulan yönetişim endeksi literatürde geniş bir kullanımı ve düzenli veriye sahip olan endekslerden biridir (Gündoğdu & Aytekin, 2020, s. 302). Kaufmann, Kraay ve Mastruzzi (2010) mevcut yönetişim kavramlarından yola çıkarak geniş ve dar tanımlar arasında bir yol bulmaya çalışmış ve yönetişimi "bir ülkede otoritenin kullanıldığı gelenekler ve kurumlar" olarak tanımlamıştır. Bu tanıma hükümetlerin seçilmesi, denetlenmesi, değiştirilmesi süreci; hükümetin sağlam politikaları etkin bir şekilde formüle etme ve uygulama kapasitesi; vatandaşların ve devletin aralarındaki ekonomik ve sosyal etkileşimleri yöneten kurumlara duyduğu saygı dahil edilmiş ve bu üç alanın her birine karşılık gelen toplam altı yönetişim boyutu elde edilerek, Dünya Bankası öncülüğünde "Küresel Yönetişim Endeksi" oluşturulmuştur. Dünya Bankası Yönetişim Göstergelerini oluşturan altı başlık şunlardır: ifade özgürlüğü ve hesap verilebilirlik, siyasi istikrar ve şiddetin/terörizmin olmaması, hükümetin etkinliği, düzenleyici kalite, hukukun üstünlüğü, yolsuzluğun kontrolü (Kaufman vd, 2010: 4).

Yönetişim ve ekonomi arasındaki ilişki, bir ülkenin iç ve dış ekonomik durumunu doğrudan etkileyebilir. Örneğin yönetişim kalitesinin arttırılması, bir ülkeyi uluslararası yatırımcılar için daha cazip bir destinasyon haline getirebileceğine yönelik hakim bir görüş söz konusudur. Aynı zamanda bir ülkenin siyasi, kurumsal ve yasal ortamını kapsayan yönetişim altyapısı, DYY'nin hem girişini hem de ülkeden çıkışını önemli ölçüde etkileyebilmektedir. Özellikle küreselleşmenin hız kazanmasıyla ülkeler açısından önemi artan DYY, aynı zamanda bir takım avantajları da bünyesinde barındırır. Örneğin dış ticaret ulusal pazarlar ile yerel pazarlar arasındaki entegrasyonu sağlamaktadır ancak dış ticaretin ulaşım masrafı gibi belli başlı kısıtları bünyesinde barındırması sebebiyle dış ticarete nispeten DYY yolu ile pazara girmek daha avantajlı olmaktadır. Bu gibi avantajları ve sermayenin önündeki engellerin kaldırılması ile birlikte, ülkeler arasında DYY artmıştır. DYY ile sermayenin geldiği ülke ve yatırımın yapıldığı ülke çeşitli kazançlar sağlamaktadır. Çünkü DYY, sermaye ve teknolojinin bir bütün halinde işleyişini içermektedir. Aynı zamanda DYY, sermaye sahibi ve sermaye ithal eden ülkeler arasında risk paylaşımını da sağlamaktadır (Erim, 2018, s. 2). Diğer taraftan DYY girişi, ev sahibi ülkelerin büyüme dinamiklerinde de önemli bir rol oynamaktadır. DYY'lerin, yatırım için yabancı sermaye ve döviz sağlaması, eşleşen fonlarda yerli yatırım oluşturabilmesi, yönetim becerilerinin ve teknolojik bilginin transferini kolaylaştırması, yerel pazar rekabetini artırabilmesi, modern iş fırsatları oluşturabilmesi, ihraç malları için küresel pazar erişimini artırabilmesi vb. yararları olabilir. DYY'lerin yararları göz önüne alındığında, gelişmekte olan ülkeler 1980'lerin başlarından bu yana yabancı sermaye akışına yönelik kısıtlamaları genel olarak hafifletmişlerdir. Bilgi ve iletişim teknolojilerindeki ve küreselleşmedeki eğilimler aynı zamanda sermaye piyasalarının daha fazla entegrasyonuna yol açarak sermayenin dünya genelinde akışını kolaylaştırmıştır (Quazi, 2014, s. 231). Şekil 1'de dünya genelinde ve gelişmiş ve gelişmekte olan ülkelere yönelik DYY girişleri verilmiştir.

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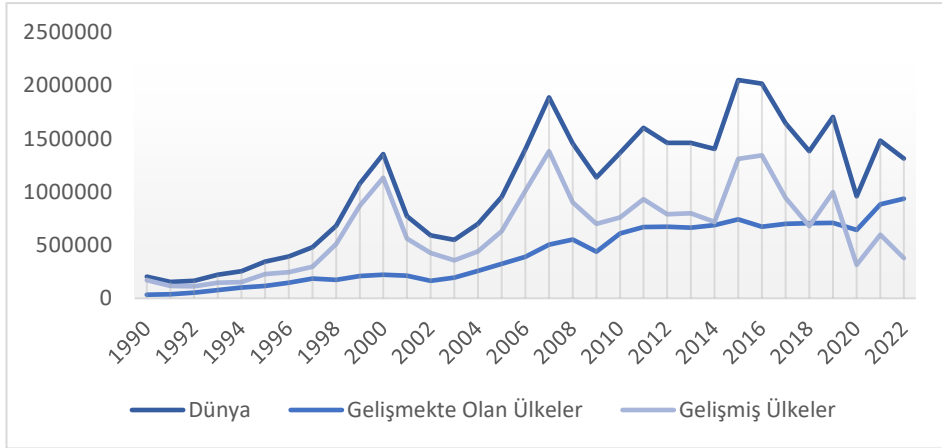
Şekil 1: Yıllara Göre DYY (1990-2022 milyon $)
Kaynak: UNCTAD, 2024.
https://unctadstat.unctad.org/datacentre/dataviewer/US.FdiFlowsStock

Şekil 1'den de görüleceği üzere 1990'lı yıllar ile birlikte DYY ağırlıklı olarak gelişmiş ülkelere yönelik olmuşken son yıllarda bu durum değişmiş ve yatırımlar ağırlıklı olarak gelişmekte olan ülkelere yönelmiştir. 2022 yılına bakıldığında DYY'lerin %71'lik kısmı gelişmekte olan ülkelere yönelirken bu girişlerin %70'lik kısmı (662 milyar dolar) Asya ülkelerine olmuştur. DYY akışları, 2020'deki düşüş ve 2021'deki toparlanmanın ardından 2022'de yüzde 12 azalarak 1,3 trilyon dolara gerilemiştir. Küresel sahnedeki çok sayıda kriz ve zorluk (Ukrayna'daki savaş, yüksek gıda ve enerji fiyatları, resesyon riskleri ve birçok ülkedeki borç baskıları) küresel DYY'yi olumsuz etkilemiştir (UNCTAD, 2023, s. 5).

Yukarıda bahsedilen hususlar dikkate alındığında yönetişim kalitesi ve DYY akışları arasındaki dinamikleri anlamak politika yapıcılar, yatırımcılar ve araştırmacılar için kritik önemini korumaktadır. Bu sebepten bu konuyla alakalı yapılan çalışmalar tablonun netleşmesine imkân tanıyacaktır.

3. LİTERATÜR

Yönetişim ve ekonomik göstergeler arasındaki ilişkiye yönelik literatür incelendiğinde, genellikle çalışmaların yönetişim-ekonomik büyüme arasındaki ilişkiye odaklandığı görülmektedir. Dolayısıyla görebildiğimiz kadarıyla yönetişim ile DYY arasındaki etkileşim üzerine yapılan çalışmalar oldukça az sayıdadır. Bu literatür incelemesi, yönetişim ile DYY arasındaki ilişkiyi araştırmaktadır.

Yönetişim kavramı siyasi istikrar, düzenleyici kalite, yolsuzluk seviyeleri ve yasal çerçeveler gibi çeşitli faktörleri kapsamaktadır. Bu unsurlar, DYY'nin hem girişini hem de etkinliğini etkileyen ortamın şekillenmesinde önemli bir rol oynamaktadır DYY, birçok ülke ekonomisi açısından kritik itici güçtür. Sermaye, teknoloji ve uzmanlık getirerek istihdam yaratılmasına ve ekonomik büyümeye yol açabilir. Ancak, bir ülkenin çektiği DYY seviyesi, yönetişim kalitesine bağlı olarak önemli ölçüde değişebilir. İyi yönetişim, yabancı yatırımların çekilmesi ve elde tutulması için giderek daha önemli bir faktör olarak kabul edilmektedir. Yönetişim ve DYY arasındaki ilişkiye yönelik yapılan seçili çalışmalar aşağıda incelenmiştir.

Globerman ve Shapiro (2002), 1995-97 yılları arasında gelişmiş ve gelişmekte olan ülkeler için yaptıkları çalışmada, iyi yönetişimin DYY'nin hem girişini hem de çıkışını etkilemede önemli bir rol oynadığı sonucuna varmışlardır. Çalışmaya göre iyi yönetişim sadece yabancı sermayeyi çekmekle kalmadığını, aynı zamanda yerli ÇUŞ'ların ortaya çıkmasını da desteklemektedir. Yönetişim altyapısı, daha küçük ve gelişmekte olan ekonomilerde DYY'yi daha büyük ölçüde etkilemektedir. Globerman ve Shapiro (2003) 1994-1997 döneminde ABD ekonomisinde DYY'nin bir belirleyicisi olarak yönetişim altyapısının etkisi üzerine yaptıkları çalışmada da benzer sonuçlara ulaşmışlardır. Çalışmanın sonuçlarına göre, şeffaf yasal sistemler ve güvenli mülkiyet hakları da dahil olmak üzere etkili yönetişim altyapısı, ABD'nin DYY çekmesi için çok önemlidir. Bu tür bir yönetişimden yoksun ülkelerin, yatırım alma olasılığı daha düşüktür. İyi yönetişim altyapısına sahip ülkeler, daha önemli miktarda DYY çekilmesine elverişli bir ortam sağlar.

Li (2005), Çin üzerine yaptığı çalışmasında kötü yönetişim ortamı ile DYY arasındaki ilişkiyi araştırmıştır. Çalışma, iyi bir yönetişim ortamının DYY'yi çekeceğine dair hakim görüşün eksik olduğunu savunmaktadır. Çalışmaya göre aslında Çin, iyi bir yönetişim ortamına sahip olmamasına rağmen, bu ortam nedeniyle büyük miktarda DYY çekmektedir. Kötü bir yönetişim ortamıyla karşılaştıklarında, yatırımcılar doğrudan yatırımı dolaylı (portföy) yatırıma tercih ederler, çünkü dolaylı yatırım özel araçlarla daha iyi korunabilir. Kötü yönetişimin olduğu bir ortamda, ÇUŞ'lar stratejik olarak yerel iş ortamına uyum sağlar ve iş sözleşmeleri elde etmek için rüşvet öderler. Kötü yönetişim aynı zamanda ÇUŞ'lar için gelişmiş yatırım fırsatları da sunabilir. Kötü yönetişimin olduğu bir ortamda, rant arama faaliyetleri yalnızca politikacılar ve politika yapıcılar tarafından değil aynı zamanda büyük ÇUŞ'lar tarafından da sürdürülmektedir.

Gani (2007), Asya, Latin Amerika ve Karayipler bölgelerinden on yedi ülkeden oluşan bir örneklemi kullanarak yönetişim göstergeleri ile DYY

arasındaki bağlantıya ilişkin yaptığı çalışmada, hukukun üstünlüğü, yolsuzluğun kontrolü, düzenleyici kalite, hükümet etkinliği ve siyasi istikrarın DYY ile güçlü bir şekilde ilişkili olduğuna dair kanıtlar sunmaktadır. Çalışmaya göre yönetişim göstergelerinin DYY ile pozitif yönde ilişkili olduğuna dair bulgular, bu göstergelerdeki başarıların iyileştirilmesinin daha iyi anlaşılmasını sağlar.

Mengistu ve Adhikary (2011), 1996-2007 dönemi için 15 Asya ülkesinde iyi yönetişimin altı göstergesinin DYY girişleri üzerindeki etkisini analiz etmişlerdir. Ampirik sonuçlar, iyi yönetişimin DYY girişlerinin temel belirleyicileri olduğunu ortaya koymaktadır.

Ochi, Saidi ve Ghadri (2012), 1998-2010 döneminde 20 gelişmiş ve gelişmekte olan ülkede yönetişim göstergelerinin ve makroekonomik değişkenlerin, DYY üzerindeki etkisini incelemişlerdir. Sonuçlar, genel olarak sadece iki yönetişim göstergesinin, yani siyasi istikrar ve düzenleyici kalitenin, DYY girişleri üzerinde önemli bir etkiye sahip olduğunu göstermektedir. Bu durum, incelenen örneklemin geneli için, yabancı yatırımcıların yurtdışında yatırım tercihlerinde siyasi istikrar ve düzenleyici kalite ile ilgilendiklerini göstermektedir. Yönetişim ve DYY arasındaki ilişki gelişmiş ve gelişmekte olan ülkeler arasında önemli farklılıklar göstermektedir. Örneğin, siyasi istikrar ve düzenleyici kalite, gelişmekte olan ülkelere kıyasla gelişmiş ülkelerde DYY çekmek için daha önemlidir.

Subasat ve Bellos (2013), 1985-2008 dönemi için 18 Latin Amerika ülkesinde yaptıkları çalışmada, kötü yönetişimin her zaman DYY'yi caydırmayabileceğini, hatta bazı durumlarda DYY'yi çekebileceğini öne sürmektedir. Hakim görüşe aykırı bu bulgu, ÇUŞ'ların bazen zayıf yönetişim sistemlerinden faydalandığını öne sürmekte ve özellikle geçiş ve gelişmekte olan ülkelerde zayıf yönetişimin bazen DYY'yi artırabileceği bir paradoksa işaret etmektedir.

Pinto ve Zhu (2016), farklı kalkınma düzeylerinde çok sayıda ülkenin aldığı DYY'nın yolsuzlukla nasıl bağlantılı olduğunu analiz etmişlerdir. Çalışmaya göre DYY, ev sahibi ülkelerdeki piyasa dinamiklerini değiştirerek rant yaratılmasına veya dağıtılmasına neden olabilir. Etkisinin yönü ev sahibi ekonominin koşullarına ve yerel kaynakların mevcudiyetine bağlıdır. DYY girişleri, DYY'nin yerli yatırımı dışladığı ve rekabetin kısıtlandığı ekonomik ortamlarda yüksek yolsuzluk seviyeleriyle ilişkilendirilmektedir. DYY, yerel piyasa dinamiklerini değiştirerek rant yaratma veya dağıtma süreçlerini etkileyebilmektedir. Bu süreçler, hem kamu görevlileri hem de yatırımcılar için yolsuzluk yapma teşviklerini şekillendirir.

Hossain ve Rahman (2017), 1998-2014 yılları arasında 80 gelişmekte olan ülkeden oluşan bir örneklem için yönetişimin DYY üzerindeki önemini

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tahmin etmeye çalışmışlardır. Sonuçlar yönetişim değişkenleri olan, ifade özgürlüğü ve hesap verebilirlik, siyasi istikrar ve şiddetin yokluğu, hükümetin etkinliği, düzenleyici kalite, hukuk üstünlüğü ve yolsuzluğun kontrolündeki bir standart sapmalık iyileşmenin DYY'yi sırasıyla %29.4, %29.2, %28.6, %20.5, %23.1 ve %23.6 oranında artırdığını göstermektedir. DYY'nin kesintisiz girişini sağlamak için gelişmekte olan ülkenin yolsuzluğu azaltan, şeffaflığı ve hesap verebilirliği sağlayan, hükümetin etkinliğini artıran ve çalkantılı ve karışık durumu hafifleten önemli yönetişim uygulamalarına odaklanması gerekir. Yönetişim aynı zamanda ekonomik rekabet gücünün artırılmasına ve girişimcilerin işlerini sakin bir şekilde yerine getirebilmeleri için uygun bir iş ortamının düzenlenmesine yardımcı olur.

Bouchoucha ve Yahyaoui (2019), 1996-2016 döneminde Afrika ülkelerindeki iyi yönetişim, DYY ve ekonomik büyüme ilişkisini araştırmışlardır. Çalışma daha fazla DYY çekmeyi ve böylece ekonomik büyümelerini iyileştirmeyi amaçlayan Afrika ülkelerinin, yönetişim yapısını iyileştirmeleri gerektiğini öne sürmektedir. İyi yönetişim kalitesinin eşlik etmediği DYY'lerin, ekonomik faaliyetler üzerinde olumsuz etkileri vardır.

Karpuz ve Sayılır (2021), 20 orta gelirli ülkedeki kurumsal yönetişim göstergelerinin DYY girişlerine etkisini 2002-2018 dönemi için araştırmışlardır. Çalışmanın sonuçlarına göre, DYY akışları üzerinde politik istikrar ve şiddetin yokluğu ile düzenleyici kalite değişkenleri pozitif; hükümetin etkililiği değişkeni ise negatif etkilidir. Ayrıca, kontrol değişkenleri olarak ticari açıklık ve yurtiçi yatırım seviyelerindeki artış, ülkelerdeki DYY girişlerinin artmasına katkıda bulunmaktadır.

Barış ve Bekteş (2021), Avrupa Birliği ülkelerine ait 2002-2017 dönemi yıllık verileri kullanarak, yönetişimin DYY üzerindeki etkisini incelemişlerdir. Çalışmanın bulgularına göre, siyasi istikrar-şiddetsizlik ve düzenleyicilik kalitesi ile DYY arasında istatistiksel olarak anlamlı ve pozitif ilişki vardır. Diğer taraftan, ifade özgürlüğü ve hesap verilebilirlik ile DYY arasında istatistiksel olarak anlamlı ve negatif ilişki bulunmuştur.

Köstekçi, Yıldız, Gülcü ve Çakır (2023), Orta Asya Türk Cumhuriyetleri ve Türkiye'de 2004-2020 dönemi verilerini kullanarak yönetişim göstergelerinin ekonomik ve sosyal etkilerini araştırmışlardır. Çalışmanın bulgularına göre, Türkiye'de katılım ve hesap verebilirliğin DYY'yi beklentilerin aksine azalttığı görülmektedir. Politik istikrardaki iyileşmenin Orta Asya Türk Cumhuriyetleri ve Türkiye'ye yönelik DYY'yi istatistiksel olarak anlamlı düzeyde etkilemediği görülmüştür. Hükümet etkinliğinin ve devletin düzenleme işlevindeki kalitenin artmasının DYY'yi Özbekistan'da artırdığı, Azerbaycan'da ise azalttığı belirlenmiştir. Yolsuzluğun kontrolüne yönelik çabaların DYY'yi Özbekistan'da

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azalttığı görülmüştür. Son olarak hukukun üstünlüğündeki olumlu gelişmelerin DYY'leri Kazakistan ve Özbekistan'da azalttığı belirlenmiştir. Bu sonuçların sebebinin ise yeterince kurumsallaşmayan ülkelerde rant kollama faaliyetlerinin sadece yozlaşmış politika yapıcı ve uygulayıcıları tarafından değil, aynı zamanda büyük şirketler tarafından da yürütüldüğü olabileceği söylenmiştir.

Yönetişim ve DYY arasındaki ilişki incelendiğinde genel kabulün, yönetişim kalitesinin DYY akışlarının önemli bir belirleyicisi olduğu, iyi yönetişimin yatırımlar, ticari faaliyetler için elverişli bir ortam oluşturması ve yatırımların güvenliğini temin etmesi açısından DYY girişlerini arttırdığı yönünde olduğu görülmektedir. Bu anlamda iyi yönetişim uygulamaları, yabancı yatırımcıların çıkarlarını koruyan istikrarlı, öngörülebilir ve şeffaf bir ortam sağlayarak bir ülkenin yatırım cazibesini arttırır. Bu genel kabulün dışında bazı çalışmalar, DYY ve yönetişim arasındaki bu ilişkinin eksik olduğu veya her zaman geçerli olmadığını söylemektedir. Bu çalışmalara göre, iyi yönetişim kalitesine sahip olmayan ülkelerde, yatırımcılar yatırım şekillerini değiştirerek dolaylı yatırımlara yönelebilirler, ancak ne olursa olsun ülkeye yatırım çekilmiştir. Diğer taraftan, zayıf bir yönetişim yapısı rüşvet vb. durumlara yol açabilecek, ayrıca ülke içinde rant kollama, kayırma faaliyetleri vasıtasıyla yatırım cazibesi oluşabilecek ve bu durum ise ÇUŞ'ların yatırımlarını bu ülkelere yöneltmelerine neden olabilecektir.

4. VERİ SETİ VE YÖNTEM
4.1. Veri Seti

Yönetişim göstergeleri ile DYY arasındaki ilişkiyi araştıran bu çalışmada, 2022 yılında en fazla DYY almış ilk 20 ülkenin[2] 2002-2022 dönemine ait verileri kullanılmıştır. Çalışmada incelenen ülkelerin yönetişim verilerinin aralıksız olarak 2002 yılından başlaması ve 2022 yılında son bulması sebebiyle çalışma 2002-2022 dönemi ile sınırlandırılmıştır. Kullanılan değişkenler ve verilen elde edildiği kaynaklar Tablo 1'de verilmiştir.

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[2] Amerika Birleşik Devletleri, Çin, Singapur, Brezilya, Avustralya, Kanada, Hindistan, İsveç, Fransa, Meksika, İspanya, Japonya, Polonya, İsrail, Birleşik Arap Emirlikleri, Endonezya, İtalya, Şili, Güney Kore, Suudi Arabistan

Tablo 1: Modelde Kullanılan Değişkenler ve Açıklamaları

Değişken		Kısaltılmış Adı	Kaynak
Doğrudan Yabancı Yatırımları		DYY	UNCTAD (2024) İstatistiksel Veri Tabanı
Yönetişim Göstergeleri	İfade Özgürlüğü ve Hesap Verilebilirlik	İH	Dünya Bankası, Küresel Yönetişim Göstergeleri (WGI) (2024)
	Siyasi İstikrar ve Şiddetin/Terörizmin Olmaması	Sİ	
	Hükümetin Etkinliği	HE	
	Düzenleyici Kalite	DK	
	Hukukun Üstünlüğü	HÜ	
	Yolsuzluğun Kontrolü	YK	
Gayri Safi Yurtiçi Hasıla		GSYH	Dünya Bankası, Dünya Kalkınma Göstergeleri (WDI) (2024)

Yönetişim göstergeleri ile DYY arasındaki ilişkinin analizi için STATA 14 paket programı kullanılmıştır. Yönetişim göstergeleri ile DYY ilişkisini tespit edebilmek için kullanılan veriler, hem yatay kesit hem de zaman serisi boyutundan oluşan panel veriler olduğu için bu çalışmada "Panel Veri Analizi" yapılmıştır.

4.2. Yöntem

Panel veri setleri, boylamsal veriler veya kesitsel zaman serisi verileri olarak da bilinir. Bu veriler, mekansal (N) ve zamansal (T) boyutlara sahiptir. Panel verileri, bireyler, firmalar ve ülkeler gibi kesitsel birimlerin bir dizi gözlemini zaman içinde içermekte olup, araştırmacıların kısa zaman serisi verilerindeki değişim dinamiklerini analiz etmelerine olanak tanır. Panel veri analizi birçok avantaj sunar. En bariz olanı, daha büyük bir örneklem kullanılarak yapılan çıkarımlar olup, serbestlik derecelerinin eksikliği oldukça olasılık dışıdır. Ayrıca daha karmaşık ilişkiler modellenebilir; örneğin, kesitlerdeki zamansal değişiklikler analiz edilebilir. Ancak, en önemli avantajlardan biri, panel veri modellemesinin örnekteki heterojenliği kontrol etmesine olanak tanımasıdır. Panel veri analizi, bu yapı sayesinde zaman içindeki değişimleri ve bireyler arasındaki farklılıkları daha iyi anlamaya yardımcı olur. Bu da, daha doğru ve

güvenilir sonuçlar elde etmeyi sağlar (Seetaram & Petit, 2012, s. 2).

Panel veri modelinin genel kullanımı eşitlik 1'de verilmiştir;

$$Y_{it} = a_{it} + \beta_{it} X_{it} + u_{it} \qquad i = 1, \dots\dots\dots, N; t = 1, \dots\dots\dots, T \qquad \textbf{(1)}$$

Eşitlik 1'de Y bağımlı değişkeni, X bağımsız değişkeni, α sabit parametreyi, β eğim parametresini ve u hata terimini ifade eder. Eşitlik 1'deki i alt simgesi birimleri, t alt simgesi ise zamanı göstermektedir. Değişkenler, parametreler ve hata terimleri için i ve t alt simgelerinin varlığı bir panel veri setine sahip olunduğunu gösterir. Bu modelde, sabit ve eğim parametreleri hem birimlere hem de zamana bağlı olarak değer alır. (Yerdelen Tatoğlu, 2013, s. 4).

5. AMPİRİK BULGULAR

2002-2022 döneminde en fazla DYY çeken 20 ülke için, yönetişim göstergeleri ve DYY arasındaki ilişkiyi araştırmak için oluşturulan model eşitlik 2'de verilmiştir.

$$DYY_{it} = a_0 + \beta_1 \dot{I}H_{it} + \beta_2 S\dot{I}_{it} + \beta_3 HE_{it} + \beta_4 DK_{it} + \beta_5 H\ddot{U}_{it} + \beta_6 YK_{it} + \beta_7 GSYH_{it} + u_{it} \qquad \textbf{(2)}$$

$i = 1, \dots\dots, 20$ ve $t = 1, \dots\dots, 21$

Eşitlik 2' verilen modelin klasik model mi sabit etkili model mi olduğuna karar vermek için F test sonuçlarına bakılmaktadır. Daha sonra klasik model mi rassal etkili model mi olduğuna karar vermek için Olabilirlik Oranı (LR) test sonuçlarına bakılmaktadır. Modelin klasik model, sabit etkili model veya rassal etkili model mi olduğunun belirlenmesi sonrası, modelin sabit veya rassal etkili olduğuna karar vermek için Hausman Testi yapılmaktadır. F, LR ve Hausman test sonuçları Tablo 2'de verilmiştir.

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Tablo 2: Modelin Kararı için Yapılan Test Sonuçları

F Testi (Klasik Model - Sabit Etkiler Modeli)	17.64 (Prob=0.0000)
LR Testi (Klasik Model -Rassal Etkiler Modeli)	652.56 (Prob=0.0000)
Hausman Testi	
H Test İstatistiği	6.72 Prob= 0.3477

Modelin klasik model mi sabit etkili model mi olduğuna karar vermek için F test sonuçlarına bakıldığında 0.05 önem seviyesinde H_0 hipotezi reddedilerek klasik modelin geçerli olmadığı ve sabit etkilerin geçerli olduğu sonucuna varılmıştır. Modelin klasik model mi rassal etkili model mi olduğuna karar vermek için LR testi sonuçlarına bakıldığında 0.05 önem seviyesinde H_0 hipotezi reddedilmiş, dolayısıyla klasik model reddedilerek, rassal etkili modelin geçerli olduğuna karar verilmiştir. Bu sonuçların ardından modelin sabit veya rassal etkili olduğunu belirlemek için yapılan Hausman test sonucuna bakıldığında 0.05 önem seviyesinde H_0 hipotezi reddedilmeyerek modelin rassal etkiler modeli olduğuna karar verilmiştir.

Hausman testi sonucuna göre uygun modelin kararı sonrası oluşturulan modelde temel varsayımlardan herhangi bir sapma olup olmadığını belirlemek için yapılan otokorelasyon, değişen varyans ve birimler arası korelasyon test sonuçları, Tablo 3'de verilmiştir. Uyarlanmış Wald Testi sonuçlarına göre *değişen varyans-heteroskedasite yoktur* şeklinde kurulan H_0 hipotezi reddedilmiş ve modelde değişen varyans sorunu olduğu görülmüştür. Hata terimleri arasında ilişkinin olup olmadığını anlamak için yapılan otokorelasyon testi sonuçlarına bakıldığında DW ve LBI test istatistiklerinin 2'den küçük olduğu ve dolayısıyla *otokorelasyon yoktur* şeklinde kurulan H_0 hipotezi reddedilerek modelde otokorelasyon sorunu olduğu görülmüştür. Son olarak modelde birimler arası korelasyonun sınanmasına bakıldığında *birimler arası korelasyon yoktur* şeklinde kurulan H_0 hipotezi reddedilmiş ve modelde birimler arası korelasyon olduğu tespit edilmiştir.

Tablo 3: Temel Varsayımların Test Sonuçları

Değişen Varyans (Uyarlanmış Wald Testi)	14.265736 (Prob=0.0000)
Otokorelasyon	DW=1.3941426
	LBI=1.4745998
Birimler Arası Korelasyon	6.035 (Prob = 0.0000)

Yapılan temel varsayım testlerine göre modelde otokorelasyon, değişen varyans ve birimler arası korelasyon vardır. Bu durumda, her üç varsayımdan sapmayı düzeltmek için rassal etkiler modellerinde dirençli tahminci olarak kullanılan Driscoll ve Kraay tahmincisi kullanılmıştır. Driscoll-Kraay rassal etkiler tahmincisine ait sonuçlar, Tablo 4'te verilmiştir.

Tablo 4: Rassal Etkiler Modeli İçin Driscoll-Kraay Tahmin Sonuçları

Bağımlı Değişken DYY	Katsayı	Driscoll Kraay Std. Hata	t İstatistiği	Olasılık
İH	-20006.72	5352.225	-3.74	0.001
Sİ	7950.434	5158.282	1.54	0.139
HE	-7358.179	7847.866	-0.94	0.360
DK	16476.73	9037.223	1.82	0.083
HÜ	25569.16	7164.554	3.57	0.002
YK	-20321.36	9377.148	-2.17	0.042
GSYH	1.38e-08	2.89e-09	4.78	0.000
Sabit katsayı	5632.671	8451.82	0.67	0.513
F İstatistiği	194.34			
Prob>F	0.0000			
Adj-R^2	0.7117			

Driscoll ve Kraay dirençli standart hataları kullanılarak yapılan tahminde F istatistik değerine göre modelin bir bütün olarak anlamlı olduğu görülmektedir. Modelin R^2 değerlerinin yüksekliği, modelin açıklama gücünün yüksek olduğunu

göstermektedir. Tablo 4'ten de görüleceği üzere modelde siyasi istikrar ve şiddetin/terörizmin olmamasını temsil eden Sİ ve hükümetin etkinliğini temsil eden HE değişkenleri istatistiksel olarak anlamsız çıkmıştır. İfade özgürlüğü ve hesap verilebilirlik (İH), hukukun üstünlüğü (HÜ) ve GSYH değişkenleri 0.01 önem seviyesinde istatistiki açıdan anlamlı çıkmıştır. Yolsuzluğun kontrolü (YK) değişkeni 0.05 önem seviyesinde, düzenleyici kalite (DK) değişkeni ise 0.10 önem seviyesinde istatistiki açıdan anlamlı çıkmıştır. Katsayıların yönüne bakıldığında İH, HE ve YK katsayıları negatiftir. Bu durumda incelenen ülkelerde ifade özgürlüğü-hesap verilebilirlik, hükümetin etkinliği ve yolsuzluğun kontrolü değişkenleri ile DYY ters yönlü hareket etmektedir. Diğer taraftan Sİ, DK, HÜ ve GSYH katsayıları pozitif yönlüdür. Bu sonuçlara göre, siyasi istikrar ve şiddetin/terörizmin olmaması, düzenleyici kalite, hukukun üstünlüğü ve GSYH değişkenleri ile DYY aynı yönlü hareket etmektedir. Bu sonuçlar literatürde elde edilen yaygın sonuçların aksine, iyi yönetişimin DYY çekmek için gerekli olduğu yönündeki geleneksel görüşe karşı çıkmaktadır. Yönetişim göstergelerinin bir bütün olarak DYY ile pozitif yönlü bir ilişkiye sahip olmadığı yönünde sonuçlara ulaşılmıştır. Analiz bulguları, Subasat & Bellos (2013), Pinto & Zhu (2016) ve Barış & Bekteş (2021) gibi çalışmaların bulguları ile benzerlik göstermektedir.

6. SONUÇ

Doğrudan yabancı yatırımlar (DYY), ekonomi politikalarında liberalleşme ve ticarette serbestleşme gibi faktörlerle birlikte birçok ülke açısından önem kazanmıştır. DYY düzeyini belirleyen faktörler arasında pazar büyüklüğü, işgücü maliyetleri, döviz kurları, altyapı gibi ekonomik faktörler yer almaktadır. Bununla birlikte 1990'lı yıllarla, DYY üzerinde kurumların etkisi de incelenmeye başlanmıştır. Yönetişim siyasi, yasal ve kurumsal çerçevelerin kalitesini kapsar ve literatürde DYY ile güçlü bir ilişkiye sahip olduğu görüşü hâkimdir. Çeşitli çalışmalar, iyi yönetişimin DYY'nin girişini ve çıkışını olumlu etkilediğini göstermektedir. Ancak bazı araştırmalar, kötü yönetişimin bazı durumlarda DYY'yi engellemeyeceğini ve hatta artırabileceğini öne sürmektedir. Çalışmada, 2022 yılında en fazla DYY almış 20 ülkenin 2002-2022 dönemi verileri kullanılarak panel veri analizi yapılmıştır. Elde edilen bulgular, rassal etkiler modeli kullanılarak yorumlanmıştır. Yönetişim göstergeleri ile DYY arasında çeşitli ilişkiler bulunmuştur. İfade özgürlüğü ve hesap verebilirlik, hükümetin etkinliği ve yolsuzluğun kontrolü değişkenleri DYY ile negatif yönlü ilişki göstermiştir. Siyasi istikrar, düzenleyici kalite, hukukun üstünlüğü ve GSYH değişkenleri ise DYY ile pozitif yönlü ilişkiye sahiptir. Bu sonuçlar iyi yönetişimin DYY'yi olumlu etkileyeceği yönündeki hakim görüşün aksine bu

durumun her zaman geçerli olmayacağı, bazı durumlarda kötü yönetişimin de yatırım çekebileceği görüşünü desteklemektedir.

Yüksek DYY girişi olan ülkelerde yabancı firmalar yerli firmaları dışlayarak yerel piyasalara hakim olabilecek ve dolayısıyla bu ülkelerde daha az rekabetçi bir ortam ortaya çıkabilecektir. Bu durum kamu görevlileri arasında rant kollama davranışı için fırsatlar yaratabilir. Diğer taraftan yönetişim kalitesinin iyi olmadığı ülkelerde, verimsiz düzenlemeleri atlatma fırsatları bulabilen ÇUŞ'lar bu ülkelere yönelebilir. Zayıf yasa ve düzenleme ortamları daha fazla DYY çekebilir, çünkü muhtemelen ÇUŞ'lar düzenlemelerin sıkı bir şekilde uygulanmamasından faydalanabilmektedir. Piyasa ekonomisi koşulları altında karlarını maksimize etmeye çalışan sermaye sahipleri, bu amaca yönelik her türlü faaliyette bulunabilirler. Dolayısıyla ülkelerde iyi yönetişim ortamının olmaması yatırımcılar açısından uygun bir yatırım ortamı olabilecektir. Ancak bur noktada gelişmiş ve gelişmekte olan ülkelerin şartları dikkate alınmalıdır. Son tahlilde, bu çalışma, iyi yönetişimin DYY çekmek için gerekli olduğu yönündeki hakim görüş yerine, ÇUŞ'ların düzenleyici yetersizliklerin üstesinden gelebilecekleri veya bunlardan yararlanabilecekleri ortamları tercih edebileceklerini öne sürmektedir. Bu sebeple ülkelerin, DYY çekme çabasının yanı sıra, mevcut yönetişim koşullarını ve bu koşulların yabancı yatırımcıların stratejileriyle nasıl etkileşime girebileceğini dikkate alması gerekmektedir.

Sonuç olarak, iyi yönetişim ve DYY arasındaki ilişkinin pozitif olduğu (Globerman & Shapiro, 2002; Gani, 2007; Mengistu & Adhikary, 2011) yaygın bir görüş olsa da, bu ilişkinin ülkeden ülkeye değişiklik gösterebildiği ve kötü yönetişim koşullarının bazen DYY'yi caydırmaktan ziyade teşvik edebileceği görülmektedir (Li, 2005; Subasat ve Bellos, 2013; Pinto & Zhu, 2016). Yatırımcıların yatırım kararları, sadece yönetişim yapısına değil, aynı zamanda ülkenin ekonomik ve stratejik durumuna da bağlıdır. Özellikle bazı büyük şirketler, zayıf yönetişim sistemlerinden fayda sağlayabilirken, rant arama faaliyetleri ve rüşvet gibi unsurların yatırım süreçlerini etkilediği görülmektedir.

7. ÇIKAR ÇATIŞMASI BEYANI
Çalışmada çıkar çatışması bulunmamaktadır.

8. MADDİ DESTEK
Bu çalışmada herhangi bir fon veya destekten yararlanılmamıştır.

9. YAZAR KATKILARI
ST: Fikir;
ST: Tasarım;

ST: Denetleme;

ST: Kaynakların toplanması ve/veya işlemesi;

ST: Analiz ve/veya yorum;

ST: Literatür taraması;

ST: Yazıyı yazan;

ST: Eleştirel inceleme

10. ETİK KURUL BEYANI VE FİKRİ MÜLKİYET TELİF HAKLARI

Bu çalışmada etik kurul izni gerekmemektedir.

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DÜNYA SAĞLIK ÖRGÜTÜ'NE ÜYE ÜLKELERİN OBEZİTE VE SOSYO-EKONOMİK GÖSTERGELER AÇISINDAN DEĞERLENDİRİLMESİ[1]

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ÖZ

Tüm ülkelerde obezite prevalansı artmaktadır. Obezite bir takım sağlık, sosyal ve ekonomik gösterge ile ilişkili olup bazılarının da temel nedenidir ve obeziteye göre ülkeler arasında söz konusu göstergeler açısından farklılıklar bulunabilmektedir. Bu çalışmada, Dünya Sağlık Örgütü'ne (DSÖ) üye 164 ülkenin obezite prevalansı ve kişi başına günlük kalori tüketimi göstergelerinden faydalanarak panel kümeleme analizi ile homojen gruplara ayrılması ve ANOVA analizi ile kümelerin sağlık, sosyal ve ekonomik göstergelere göre karşılaştırılması amaçlanmaktadır. Analiz sonucunda, gelişmekte olan Güney Amerika, Doğu Avrupa ve Orta Asya ülkeleri A kümesinde; gelişmiş Avrupa ve Kuzey Amerika ülkeleri B kümesinde; az gelişmiş Afrika ve Asya ülkeleri C kümesinde; Doğu ve Güney Asya ülkeleri ise D kümesinde yer almıştır. Gelişmiş ülkelerin yer aldığı B kümesi, yüksek obezite ve günlük tüketilen kalori değerlerine sahip olmasına rağmen diğer kümelere kıyasla daha iyi sağlık, sosyal ve ekonomik göstergelere sahip olduğu belirlenmiştir.

Anahtar Kelimeler: *Kümeleme, kalori, sosyo-ekonomik göstergeler*
JEL Kodlar: *H51, I15, I18*

Alan: *İktisat*
Türü: *Araştırma*

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[1] İlgili çalışmanın etik kurallara uygunluğu beyan edilmiştir.

EVALUATION OF THE MEMBER COUNTRIES OF THE WORLD HEALTH ORGANISATION IN TERMS OF OBESITY AND SOCIO-ECONOMIC INDICATORS

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ABSTRACT   The prevalence of obesity is increasing in all countries. Obesity is associated with a number of health, social and economic indicators and is the main cause of some of them and there may be differences between countries in terms of these indicators according to obesity. This study aims to classify 164 World Health Organization (WHO) member countries into groups using panel clustering analysis based on indicators of obesity prevalence and daily calorie intake per capita, and to compare these groups using ANOVA analysis on health, social and economic indicators. The analysis results show that developing countries in South America, Eastern Europe and Central Asia are in cluster A; developed countries in Europe and North America are in cluster B; underdeveloped countries in Africa and Asia are in cluster C; and countries in East and South Asia are in cluster D. Despite having high obesity rates and daily calorie intake levels, cluster B, which includes developed countries, has better health, social and economic indicators compared to the other clusters.

Keywords: *Clustering, calories, socio-economic indicators*
JEL Code: *H51, I15, I18*

Scope: *Economics*
Type: *Research*

1. GİRİŞ

Son yüzyılda, ülkelerin ekonomik olarak birbirilerine olan bağlılıkları artmış ve aynı zamanda insanların iş ve sosyal yaşam tarzlarında önemli değişiklikler meydana gelmiştir (Uluslararası Çalışma Örgütü, 2004). Söz konusu süreç içerisinde ülkelerin ve hane halklarının gelir düzeyleri de artmış ve beraberinde nüfusların gıda, teknoloji, konut gibi olanaklara erişimleri artarak yaşam standartları gelişmiştir (Talukdar, Seenivasan, Cameron & Sacks, 2020; McKinsey Global Institute, 2024). Bu gelişmelerin sonucunda ülkelerin kentleşme oranı önemli ölçüde artmış, gelişmiş ülkeler başta olmak üzere birçok ülkede fiziksel aktivite gerektiren işlere olan talep azalmış ve sedanter yaşam tarzına sahip bireylerin oranı artmıştır (Birleşmiş Milletler Ticaret ve Kalkınma Konferansı, 2024; Choi vd., 2010). Bunlara ek olarak kentsel alanlarda, düşük fiyatlara ve yüksek enerji yoğunluğuna sahip çok çeşitli hazır yiyecekler bulunmakta ve besin sanayisinin modernizasyonu, küreselleşme ve artan gelir seviyesi gibi faktörler doymuş yağ, şeker ve tuz içeriği yüksek işlenmiş hazır yiyecekleri uygun fiyatlı ve kolayca erişilebilir hale getirmiştir (Halıcıoğlu, 2013; Aydın, 2019). Söz konusu durum insanların günlük ihtiyaçlarından daha fazla kalori almasına sebep olmakta ve bu durumun sonucunda ise obez nüfusta artış meydana gelmektedir. Obezite, sağlığı olumsuz şekilde etkileyen küresel bir tehdit olarak görülmektedir ve 2022 yılında Dünya'da her 8 kişiden 1'inin obez olduğu bildirilmektedir (Dünya Sağlık Örgütü, 2024a). Besinler aracılığıyla vücuda alınan enerjinin harcanan enerjiden fazla olduğu durumda, tüketilemeyen enerji vücutta yağ olarak birikmektedir ve bu durumun sonucunda da genellikle obezite meydana gelmektedir. Obezitenin kardiyovasküler hastalıklar, diyabet, kanserler, kronik solunum yolu hastalıklar gibi bulaşıcı olmayan hastalık riskini artırdığı belirtilmektedir (Sağlık Bakanlığı Halk Sağlığı Genel Müdürlüğü, 2023).

Obezite, alınan enerji ile harcanan enerjiden fazla olması durumunda gelişen bir rahatsızlık olarak bilinmekle birlikte bu basit açıklama, obeziteye neden olan davranışların karmaşık doğasını tam olarak yansıtmamaktadır. Nitekim, enerji alımına (besin tüketimi) ve enerji harcamasına (fiziksel aktivite) yol açan davranışlar pek çok faktöre bağlıdır ve bu faktörler birbirleriyle etkileşim içindedir. Obeziteyi genetik yapı, çevresel faktörler, ruhsal durum, alışkanlıklar ve sosyal çevre gibi pek çok unsur etkilemektedir (Dünya Sağlık Örgütü, 2024b). Yürütülen araştırmalarda, gelir ve kentleşmenin yüksek enerjiye sahip besinlere erişimin önemli ölçüde artırdığı; teknolojik gelişmelerin etkisinde sağlık maliyetlerinin azalması ile diyet ve fiziksel aktivite motivasyonunun azaldığı ve bu durumların sonucunda obezitenin arttığı vurgulanmaktadır (Okunogbe vd., 2022; Talukdar vd., 2020; Costa-Font & Mas, 2016; Halıcıoğlu,

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2013). Obezite, bulaşıcı olmayan hastalıklardaki küresel artışın önemli bir nedeni olarak görülmektedir ve artık obezite de kronik bir hastalık olarak kabul edilmektedir. Obezite aynı zamanda sağlık harcamaları üzerinde artırıcı yönde etkiye sahiptir ve çalışan üretkenliğinin azalması, artan sakatlık ve erken ölümler yoluyla ek ekonomik maliyetler doğurmaktadır (Purnell, 2023). Küresel bir salgın olarak da ifade edilen obezite çok yönlü belirleyicileri (sosyal belirleyiciler dahil) olan karmaşık bir durumdur ve hiçbir müdahalenin tek başına bu halk sağlığı sorununun artışını durduramayacağı açıklanmaktadır (Dünya Sağlık Örgütü, 2024b; 2024c). Bu sebepten obezite, obeziteye neden olan ve obezitenin neden olduğu göstergelerin irdelenmesi ve ulusal ya da uluslararası düzeyde karşılaştırmalar yapılması sağlık sistemlerinin obeziteye karşı güçlendirilmesine, obeziteye yönelik politikalar geliştirilmesine ve daha kötü göstergelere sahip ülkelerden çıkarımlar yapılarak önlemler alınmasına katkı sağlayacaktır.

Gelişmiş ülkelerin yaşadığı bir sorun olarak düşünülen obezitenin gelişmekte olan ve düşük gelirli ülkeler açısından da önemli bir sorun olduğu açıklanmaktadır (Goryakin & Suhrcke, 2014). Barrera ve Shively (2022) tarafından 156 ülkenin 1890-2015 yılları arasında kalori tüketimi ile obezite arasındaki ilişkinin incelendiği çalışmada, yıllar itibarıyla kalori arzının ve tüketiminin artığı ve kalori tüketimi ile obezite arasında pozitif yönde bir ilişkinin olduğu saptanmıştır. Ayrıca çalışmada yıllar itibarıyla uygulanan politikaların, sosyal ve ekonomik gelişmelerin kalori arzının ve tüketiminin temel nedenleri olarak vurgulanmaktadır. Costa-Font ve Mas (2016) tarafından OECD ülkelerinin 1989-2005 yılları verilerinden faydalanarak sosyal ve ekonomik gelişimde etkili olan küreselleşme ile obezite arasındaki ilişkinin incelendiği araştırmada, ekonomik ve sosyal boyutlarıyla küreselleşmenin kalori ve obezite üzerinde arttırıcı yönde etkiye sahip olduğu belirlenmiştir. Goryakin ve Suhrcke (2014) tarafından 56 ülkede yaklaşık 1 milyon kadın üzerinde yürütülen çalışmada da benzer bir sonuç bulunmuş olup gelir, kentleşme ve teknolojik gelişmeler ile aşırı kiloluluk arasında pozitif bir ilişki bulunmuştur. Ülkelerin kişi başı gayri safi yurtiçi hasıla (GSYİH) ile obezite göstergeleri arasındaki ilişkinin incelendiği araştırmalarda da gelir ile obezite arasında pozitif yönde ilişkinin olduğu saptanmıştır. Ancak gelişmiş ve yüksek gelir düzeyine sahip ülkelerde bu ilişkinin ters yönde olduğu belirtilmektedir (Talukdar vd., 2020; Aydın, 2019). Obeziteye neden olan faktörler kadar obezitenin neden olduğu olumsuz sağlık sonuçları da Dünya açısından önemli bir problem olup obeziteye neden olan faktörlerle birlikte ele alınması gerekmektedir. GBD 2015 Obesity Collaborators (2017) tarafından 195 ülkede obezite ile çeşitli hastalıklar arasındaki ilişkinin incelendiği araştırmada obezite kaynaklı ölümlerin en başında kardiyovasküler hastalıklar ve diyabetin geldiği belirtilmektedir. Obezite ile ilgili yukarıda yer

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alan çalışmalar incelendiğinde genellikle çalışmaların kısıtlı sayıda gösterge ile obezite arasındaki ilişkinin incelendiği görülmektedir. Bunun yanı sıra çok sayıda ülkeye ait veriler kullanılarak gerçekleştirilen araştırmalarda ülkelerin ya gruplara ayrılmadan bir bütün olan obezite ile ilişki faktörler ile ilişkisi değerlendirilmiş ya da Dünya Bankası tarafından gelir düzeyine göre yapılan sınıflamaya göre ülkelerin gruplara ayrılarak değerlendirildiği saptanmıştır. Bunlara ek olarak ülkelerin obezite ile ilişkili faktörler açısından değerlendirildiği çalışmalarda obeziteye neden olan ve obezitenin neden olduğu göstergelerin bir arada değerlendirilmediği ya da ülkelerin söz konusu göstergeler açısından karşılaştırılmadığı görülmektedir. Genellikle çalışmalarda uluslararası düzeyde veriler kullanılarak obeziteye etki eden göstergeler ya da obezite ile ilişkisi olan göstergelerin saptanmaya çalışıldığı belirlenmiştir. Bu çalışmada ise söz konusu çalışmalardan farklı olarak ülkeler obezite ve obezite ile doğrudan ilişkili olan günlük tüketilen kalori tüketimi göstergelerine göre kümelenecektir. Kümeleme sonrası ülkeler obezitenin neden olduğu ve obeziteye neden olan faktörlere göre sağlık, sosyal ve ekonomik göstergeler açısından karşılaştırılacaktır. Elde edilen sonuçlar ülke sağlık yöneticileri açısından obezite risk durumlarını değerlendirmeleri ve politikalar geliştirmelerini sağlayabilecektir.

Tüm bu bilgiler ışığında bu çalışmada, Dünya Sağlık Örgütüne (DSÖ) üye 161 ülkenin 2000-2021 yılı obezite prevalansı ve kişi başına günlük tüketilen kalori göstergelerinden faydalanarak kümelere ayrılması amaçlanmaktadır. Çalışmada 2000-2021 yıllarının baz alınmasının nedenleri farklı zaman dilimlerinde ve farklı ülkeler arasında ortak desenler ve ilişkiler tespit ederek analiz edilen verilerin daha derinlemesine anlaşılmasını sağlamaktır. Çalışma kapsamında yer alan ülkelerin çok farklı sosyal ve ekonomik özelliklere sahip olması sebebiyle ülkelerin tek bir grup halinde değerlendirilmesi yanıltıcı sonuçlar doğurabileceğinden ülkeler kümelere ayrılacaktır. Literatürde benzer konuda yürütülen araştırmalarda ülkelerin homojen gruplara ayrılması için kümeleme analizinin sık şekilde kullanıldığı tespit edilmiştir (Qiu vd., 2020; Yılmaz Işıkhan & Güleç, 2021). Bu sebepten bu çalışmada panel veri kullanıldığından panel kümeleme analizinden faydalanılacaktır. Çalışma kapsamında kümeleme analizinin yürütülmesinde söz konusu göstergelerin seçilmesinin nedenleri aşağıda detaylı şekilde açıklanmaktadır. Obezitenin değerlendirilmesi için literatürde beden kütle indeksi (BKİ), bel-kalça oranı, bel çevresi, vücut yağ yüzdesi gibi yöntemlerin kullanıldığı belirtilmektedir (Taşlı & Sağır, 2021). Her yöntemin kendine özgü avantajları ve sınırlılıkları bulunmakla birlikte ölçümünün basit ve kolay olması sebebiyle özellikle ulusal düzeyde yürütülen araştırmalarda BKİ en sık kullanılan yöntemdir (Liakh vd., 2020; Dünya Obezite Federasyonu, 2023). Dünya Sağlık Örgütü (2024a) BKİ'si 18,5'in

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altında olanları zayıf, 18,5-24,9 arasında olanları normal kilolu, 25,0-29,9 arasında olanları aşırı kilolu ve 30,0 ve üzerinde olanları ise obez olarak sınıflandırmaktadır. Ayrıca Dünya Sağlık Örgütü (2024a) obeziteyi değerlendirmek için BKİ yöntemini sık şekilde tercih etmektedir. Bu sebeplerden bu çalışmada da obezite durumunu değerlendirmek için BKİ değişkeni kullanılacaktır. Obezite ile mücadelede temel amaç, kalori tüketimini azaltmak ve kalori harcamasını artırmaktır. Günlük alınan kalorinin, harcanan kaloriden fazla olması doğrudan obeziteye neden olduğundan (Camacho & Ruppel, 2017), panel kümeleme analizinde BKİ değişkeninin yanı sıra kişi başına günlük tüketilen kalori değişkeni de kullanılacaktır. Panel kümeleme analizinde BKİ'nin yanı sıra kişi başına günlük tüketilen kalori göstergesinin kullanılacak olması kümelerin obezite açısından daha homojen gruplara ayrılmasını sağlayacaktır.

Panel kümeleme analizi sonrası homojen gruplara ayrılan ülkelerin sağlık, sosyal ve ekonomik göstergeler açısından karşılaştırılması çalışmanın bir diğer amacıdır. Obezitenin kalori alımının ötesinde dolaylı olarak sosyal, ekonomik ve sağlık faktörlerinin karmaşık bir etkileşimi sonucu ortaya çıktığı bilinmektedir (Bollapragada, Shantaram, & Kumar, 2017, s. 12). Bu göstergelerin başında yetersiz fiziksel aktivite gelmektedir. Fiziksel aktivite düzeyinin yetersiz olması ve günlük tüketilen kalorinin fazlalığı, bireylerin daha az kalori yakmasına neden olur. Bu durum, vücutta fazla enerjinin yağ olarak depolanmasına yol açar ve dolaylı olarak obezite riskini artırır. Yeterli fiziksel aktivite yapılmadığında ve aşırı kalori alımı devam ettiğinde, enerji dengesizliği oluşur. Bu dengesizlik, vücut yağ oranının artmasına ve obeziteye neden olabilir (Choi vd., 2010, s. 1089). Bu sebepten yetersiz fiziksel aktivite oranı değişkeni kümelerin karşılaştırılmasında kullanılacaktır. Yetersiz fiziksel aktivite oranının yanı sıra hekim sayısı, hemşire ve ebe sayısı, sağlık harcamaları gibi sağlık hizmetlerine erişimin önemli göstergeleri olan faktörler ile kişi başı GSYİH ve kentleşme oranı sosyo-ekonomik göstergelerinin obezite ile dolaylı olarak ilişkili olduğuna yönelik çalışma sonuçları bulunmaktadır (Ralston, Cooper, & Powis, 2021; Okunogbe vd., 2022; Talukdar vd., 2020; Costa-Font & Mas, 2016; Halıcıoğlu, 2013). Bu bakımdan söz konusu göstergeler de kümelerin karşılaştırılmasında kullanılacaktır.

Obezitenin en fazla kardiyovasküler hastalıklar, hipertansiyon ve diyabete neden olduğu bildirildiğinden (Sağlık Bakanlığı Halk Sağlığı Genel Müdürlüğü, 2023) bu çalışmada kardiyovasküler hastalıklar kaynaklı ölüm hızı, diyabet kaynaklı ölüm hızı ve hipertansiyon prevalansı değişkenleri kümeler arasında farklılık değerlendirilmesinde kullanılacaktır. Söz konusu hastalıklar sebebiyle erken yaşlarda ölüm riski artmakta ve obezite dolaylı olarak doğuşta beklenen yaşam süresinin kısalmasına neden olmaktadır (Bansal & Jin, 2023;

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Vidra, Trias-Llimós, & Janssen, 2019). Bu sebepten doğuşta beklenen yaşam süresi de kümelerin karşılaştırılmasında kullanılacak bir diğer değişkendir.

Kümeleme analizi sonucunda kümelerin çalışma kapsamında yer alan göstergelere göre karşılaştırılmasında grup sayısına bağlı olarak ANOVA ya da bağımsız gruplar T testinin kullanıldığı belirlenmiştir (Teleş, Çakmak & Konca, 2018; Balçık, Demirci & Konca, 2021). ANOVA analizi birden fazla grup ortalaması arasındaki farkların test edilmesi için kullanılan istatistiksel bir tekniktir (Denis, 2021). Bu çalışmada yukarıda bahsedilen göstergelere göre kümeler karşılaştırılmak istendiğinden ANOVA analizinden faydalanılacaktır. ANOVA analizi sayesinde daha kötü sağlık, sosyal ve ekonomik göstergelere sahip kümeler tespit edilebilecektir.

Tüm bu bilgiler ışığında bu çalışmada şu sorulara cevap aranmaktadır: (1) BKİ ve günlük tüketilen kalori göstergelerine göre hangi ülkeler hangi küme içerisinde yer alacaktır? (2) Sağlık, sosyal ve ekonomik göstergelere göre kümeler arasında farklılıklar bulunmakta mıdır? (3) Sağlık, sosyal ve ekonomik göstergelere göre en iyi ya da en kötü ortalamalara sahip kümeler hangileridir?

Bu çalışmanın diğer bölümlerinde ilgili literatüre, çalışmanın veri setine ve yöntemine ilişkin bilgilere, analizler sonucunda bulgulara ve çalışmanın sonucuna yer verilecektir.

2. LİTERATÜR ARAŞTIRMASI

Obezite besin ve diğer şekillerde alınan enerjinin ihtiyaç duyulan ve harcanan enerjiden daha fazla olması durumunda ortaya çıkan bir sağlık sorunu olup birçok bulaşıcı olmayan hastalığın temel nedeni olarak görülmektedir. Dünya Sağlık Örgütü (2024a) obezitenin kardiyovasküler hastalıklar, diyabet, kanserler, nörolojik bozukluklar, kronik solunum yolu hastalıkları ve sindirim bozukluklarına neden olduğunu ve söz konusu hastalıklar sebebiyle her yıl milyonlarca insanın yaşamını yitirdiğini bildirmektedir. Ayrıca obezitenin ülkeler üzerinde olumsuz ekonomik sonuçlarının olduğu ve daha önce yüksek gelirli ülkeler ile ilişkilendirilen obezitenin artık düşük ve orta gelirli ülkelerde de hızla arttığı belirtilmektedir (Dünya Sağlık Örgütü, 2024a). Bu bakımdan obezite küresel bir sorundur ve sadece daha fazla kalori tüketimi ve yetersiz fiziksel aktivite ile ilişkili değildir; sosyal ve ekonomik faktörlerden de etkilendiği açıklanmaktadır. Ayrıca obezitenin etkisinin her ülke için aynı düzeyde olmayabileceği ve ülkelere göre etkilerinin veya ilişkili göstergelerde farklılıkların olabileceği vurgulanmaktadır (Okunogbe vd., 2022; Talukdar vd., 2020; Costa-Font & Mas, 2016; Halıcıoğlu, 2013; Ralston vd., 2021). Bu sebepten bu çalışmada obeziteye neden olan ve obezitenin neden olduğu göstergeler açısından ülkeler karşılaştırılacaktır. Literatür incelendiğinde obezite

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ile ilişkili göstergeler açısından ülkelerin kıyaslandığı çalışmalara rastlanmamıştır. Aşağıda da detaylı olarak ele alınacak obezite ve ilişkili göstergelerin değerlendirildiği çalışmalarda, obeziteye etki eden veya obezite ile ilişkili göstergelerin neler olduğunun saptanmaya çalışıldığı belirlenmiştir. Bu bakımdan bu çalışmanın sonuçları literatürde ilgili alana ait boşluğun doldurulmasını sağlayacaktır. Bu çalışmanın bulguları sunulmadan önce çeşitli analiz teknikleri kullanılarak ülkelerin obezite ve ilişkili değişkenlere göre incelendiği çalışmalara ait sonuçlar, aşağıda detaylı olarak ele alınmıştır.

Lin ve diğerleri (2020) tarafından gelir ve obezite arasındaki ilişkinin 195 ülke üzerinde incelendiği araştırmada, Dünya'da obezite ve obezite kaynaklı bulaşıcı olmayan hastalıklardan ölümlerin arttığı belirtilmektedir. Ayrıca çalışmada obezite ile bağlantılı bulaşıcı olmayan hastalık kaynaklı ölümlerin çoğunlukla düşük-orta ve orta gelir düzeyinde sahip gelişmekte olan Doğu Avrupa, Orta Asya, Orta Afrika ve Orta Doğu ülkelerinde yüksek olduğu tespit edilmiştir.

McLaren (2007) tarafından obezite ile gelir, eğitim ve meslek gibi durumları içeren sosyo-ekonomik düzey arasındaki ilişkinin değerlendirildiği çalışmada, yüksek sosyo-ekonomik düzey ile obezite arasında ters yönlü bir ilişkinin varlığından bahsedilmektedir. Jaacks ve diğerleri (2019) tarafından sosyo-ekonomik düzey ile obezite arasındaki ilişkinin dört aşamalı bir süreç olarak değerlendirildiği çalışmada, obezitenin birinci aşamasında yüksek sosyoekonomik statüye sahip olanlar ve yetişkinlerde obezite prevalansının daha yüksek olduğu belirtilmekte olup Güney Asya ve Sahra altı Afrika'da yer alan ülkelerin bu aşamada olduğu açıklanmaktadır. İkinci aşamadaki ülkelerde, yetişkinler arasında obezite prevalansında büyük bir artış, çocuklar arasında daha küçük bir artış ve sosyoekonomik farklılıklar arasındaki boşlukta daralma yaşandığı belirtilmektedir. Birçok Latin Amerika ve Orta Doğu ülkesinin bu aşamada olduğu bildirilmektedir. Yüksek gelirli Doğu Asya ülkeleri de düşük prevalanslar sahip olmalarına rağmen bu aşamada yer almaktadır. Üçüncü aşamada, daha düşük sosyoekonomik düzeye sahip olanlar arasında obezite prevalansı daha yüksek sosyoekonomik statüye sahip olanlarınkini aştığı açıklanmaktadır. Çoğu Avrupa ülkesinin bu aşamada yer aldığı düşünülmektedir. Obezite prevalansının azaldığı dördüncü aşamada ise çocuklarda obezite prevalansının daha fazla arttığı bildirilmekle birlikte yeterince sosyo-demografik işaretin bulunmadığı da açıklanmaktadır (Jaacks vd., 2019).

Thomas-Lange ve Urra-Miguieles (2024) tarafından yürütülen araştırmada 153 ülke, Dünya Bankası tarafından gelir düzeyine göre yapılan sınıflamaya göre gruplara ayrılmış ve obezite ile Gini katsayısı (gelir dağılımındaki eşitsizliğin ölçülmesinde kullanılmaktadır) ve bulaşıcı olmayan

hastalıklardan ölüm hızı arasındaki ilişki korelasyon analiziyle incelenmiştir. Tüm gelir gruplarında obezite ile söz konusu göstergeler arasında zayıf düzeyde ilişki tespit edilmiştir.

Aydın (2019) tarafından 20 ülkede obezite ile kişi başı GSYİH ve işsizlik oranı arasındaki ilişkinin ARDL Sınır Testi ile incelendiği araştırmada, kişi başı GSYİH'daki artışın belirli bir düzeye eriştikten sonra obezite üzerinde azaltıcı yönde etkiye sahip olduğu belirlenmiştir. Çalışmada işsizlik oranındaki azalışın bazı ülkelerde obeziteyi arttırıcı yönde etkiye sahip olduğu bulunmuş iken bazı ülkelerde ise azaltıcı yönde etkiye sahip olduğu saptanmıştır.

Barrera ve Shively (2022) tarafından 156 ülke üzerinde yürütülen araştırmada obezite ile sağlık harcaması, kırsal nüfus oranı ve ithalat/ihracat arasındaki ilişki regresyon analizi ile değerlendirilmiştir. Çalışmanın sonuçlarına göre sağlık harcaması ve ihracat/ithalat ile obezite arasında pozitif yönde ilişki kırsal nüfus oranı ile ise ters yönlü bir ilişkinin olduğu saptanmıştır.

Agrawal ve Agrawal (2016) tarafından düşük ve orta gelirli ülkelerde yürütülen araştırmada obezite ile birden fazla kronik hastalığa sahip olma durumu değerlendirilmiştir. Çalışma sonuçlarına göre obez bireylerin normal kilo bireylere kıyasla daha fazla kronik hastalığa sahip oldukları belirlenmiştir.

Fox, Feng ve Asal (2016) tarafından 190 ülke üzerinde yürütülen araştırmada obezite üzerinde etkili olan göstergeler regresyon teknikleri kullanılarak tespit edilmeye çalışılmıştır. Araştırmanın sonucunda kişi başı GSYİH, kentleşme ve kadının güçlendirilmesinin obezite üzerinde arttırıcı yönde etkili olduğu saptanmıştır.

3. YÖNTEM

Bu çalışmada, DSÖ'ye üye obezite prevalansı ve kişi başına günlük tüketilen kalori verileri bulunan 161 ülkenin 2000-2021 yılı verilerinden faydalanarak panel kümeleme analizi ile kümelere ayrılması amaçlanmıştır. Obezite prevalansı verisi için beden kütle indeksi (BKİ) değişkeni seçilmiştir.

Ülkeler kümelere ayrıldıktan sonra kümeler arasında obezitenin neden olduğu ve obeziteye dolaylı olarak neden olan değişkenlere göre farklılık olup olmadığı değerlendirilmiştir. Söz konusu değişkenlerin seçiminde literatürde obezite ile ilişkili olduğu belirtilen ve bunun yanı sıra çalışma kapsamında yer alan ülkelere ait verileri bulunan değişkenler seçilmiştir. Tablo 1'de yer alan değişkenlere göre farklılık olup olmadığı ANOVA analizi ile değerlendirilmiştir. Hangi kümeler arasında farklılığın olduğunu belirlemek için ise Tukey testinden yararlanılmıştır. Tablo 1'de yer alan ANOVA için kullanılan değişkenlere ilişkin veriler uzun dönemli olarak bulunmadığından, eksik yıllar bulunduğundan ya da kısıtlı sayıda ülke için uzun dönemli veri bulunduğundan sadece 2021 yılı

verilerinden faydalanılarak (bazı ülkelerin 2021 yılı verileri bulunmadığından en yakın yıl verileri alınmıştır) analizler yürütülmek durumunda kalınmıştır. Bu durum çalışmanın önemli bir sınırlılığını oluşturmaktadır.

Çalışma kapsamında, Panel Kümeleme Analizi için R Studio, ANOVA analizi için ise SPSS v23 programlarından faydalanılmıştır.

Tablo 1: Çalışmada Kullanılan Değişkenler

Kısaltma	Açıklama	Veri Tabanı
PANEL KÜMELEME ANALİZİ		
OBZ	Beden kütle indeksi (BKİ) 30 kg/m² veya üzerinde olan 18 yaş üstü yetişkinlerin oranı	DSÖ
KAL	Kişi başına günlük tüketilen kalori	Birleşmiş Milletler Gıda ve Tarım Örgütü (FAO)
ANOVA		
KVÖH	Kardiyovasküler hastalıklar için yaşa göre standardize edilmiş ölüm hızı (100.000 nüfus başına)	DSÖ
DBÖH	Diyabete bağlı kronik böbrek hastalığından ölümler de dahil olmak üzere diyabet için yaşa göre standardize edilmiş ölüm hızı (100.000 nüfus başına)	DSÖ
HİP	30-79 yaş arası yetişkinlerde hipertansiyon prevalansı (sistolik kan basıncının ≥140 mmHg, diyastolik kan basıncının ≥90 mmHg olması veya hipertansiyon için ilaç alınması olarak tanımlanmıştır)	DSÖ
YFAO	Haftada 150 dakikadan daha az orta yoğunlukta fiziksel aktivite veya haftada 75 dakikadan daha az şiddetli yoğunlukta fiziksel aktivite veya eşdeğerini gerçekleştiren 18 yaş üstü yetişkinlerin oranı	DSÖ
DBYS	Doğuşta beklenen yaşam süresi (toplam yıl)	Dünya Bankası
HEKS	Hekim sayısı (10.000 nüfus başına)	DSÖ
HEMS	Hemşire ve ebe sayısı (10.000 nüfus başına)	DSÖ
SH	Kişi başı toplam sağlık harcaması (satın alma gücü paritesine göre Amerikan Doları olarak)	Dünya Bankası
CSH	Kişi başı cepten sağlık harcaması (satın alma gücü paritesine göre Amerikan Doları olarak)	Dünya Bankası
GEL	Kişi başı GSYİH (satın alma gücü paritesine göre Amerikan Doları olarak)	Dünya Bankası
KENT	Kentleşme oranı	Dünya Bankası

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3.1. Panel Kümeleme Analizi

Panel veri, bireyler, hane halkları, firmalar, şehirler, eyaletler veya ülkeler gibi gözlemlenen birimlerin belirli bir süre boyunca belirli sayıda değişkenin tekrarlanan ölçümlerini ifade etmektedir (Miller vd., 2007). Örneğin, Dünya Sağlık Örgütüne üye ülkelerin 2000-2021 yılları obezite prevalansı ve kişi başına günlük tüketilen kalori verileri panel verilerdir. Kümeleme analizi, değişkenlerden yararlanılarak benzer birimlerin benzer gruplar altında kümelendirilmesidir (Akın, 2022). Birçok panel veri kümeleme yönteminde, kümeleme analizi sadece bir değişken ile yapılırken R programında bulunan "kml3d" paketiyle birden fazla değişken ile kümeleme analizi yapılabilmektedir (Genolini, Alacoque, Sentenac & Arnaud, 2015). "kml3d" paketinde kümeleme yöntemi olarak K-Ortalamalar (K-means) yöntemi kullanılmaktadır. Pakette uzaklık ölçüsü olarak Öklid uzaklık ölçüsü kullanılmaktadır. Değişkenlere ilişkin veriler farklı ölçüm yöntemleri ile elde edildiğinden analiz öncesi veriler Z-skor yöntemi ile normalleştirilmektedir. Optimum küme sayısına karar vermek için "kml3d" paketinde Calinski-Harabasz, Ray-Turi ve Davies-Bouldin indeksleri bulunmaktadır. Varsayılan seçenek olarak Calinski-Harabasz indeksi kullanılmaktadır (Genolini vd., 2013). "kml3d" paketinde K-Ortalamalar kümeleme yönteminin rastgele etkisini azaltmak ve en iyi küme çözümünü bulmak için analiz farklı koşullar altında defalarca tekrar edilmektedir (Genolini vd., 2015).

4. BULGULAR

Çalışmada, DSÖ'ye üye ülkelerin "OBZ" ve "KAL" göstergeleri açısından homojen gruplara ayrılabilmesi için R Studio programında bulunan "kml3d" paketinden faydalanılarak panel kümeleme analizi yapılmıştır. DSÖ'ye üye ülkelerin "OBZ" ve "KAL" verilerden faydalanılarak yürütülen analiz sonucunda Calinski-Harabasz indeksine göre en uygun küme sayısının dört olabileceği belirlenmiştir ve ülkeler A, B, C ve D kümeleri olmak üzere dört gruba ayrılmıştır (Şekil 1). Tablo 2'de panel kümeleme analizi sonucu ortaya çıkan kümeler ve söz konusu kümeler içerisinde yer alan ülkelere yer verilmiştir.

Şekil 1 incelendiğinde A kümesi içerisinde, Güney Amerika, Doğu Avrupa ve Orta Asya ülkelerinin çoğunlukta olduğu belirlenmiştir. Söz konusu ülkeler genellikle orta gelir grubunda yer alan gelişmekte olan ülkelerdir. Avrupa ve Kuzey Amerika ülkeleri başta olmak üzere yüksek ve üst-orta gelir düzeyinde yer alan gelişmiş ülkeler ise B kümesinde yer almaktadır. C kümesinde ise düşük gelirli az gelişmiş ve gelişmekte olan Afrika ve Güney Asya ülkelerinin yer aldığı saptanmıştır. Son olarak D kümesinde ise Orta Afrika ile Doğu ve Güney Asya ülkelerinin yer aldığı görülmektedir.

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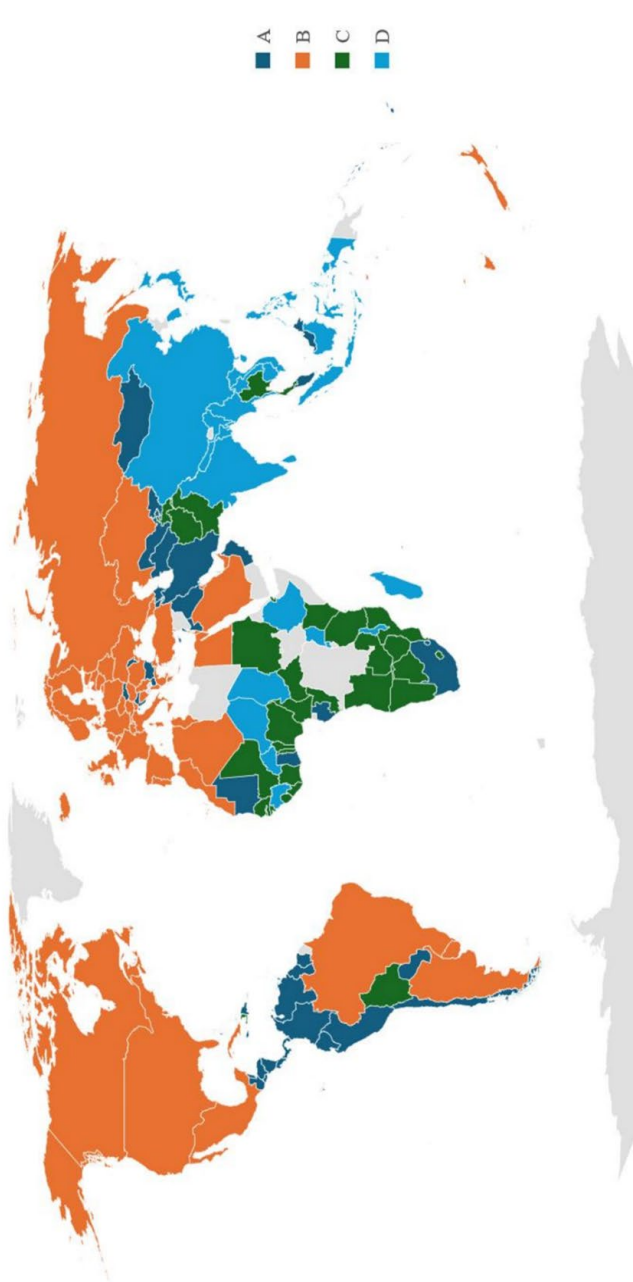
A Kümesi: Antigua ve Barbuda, Azerbaycan, Bahamalar, Barbados, Belize, Bulgaristan, Dominik Cumhuriyeti, Ekvador, El Salvador, Ermenistan, Esvatini, Fiji, Gabon, Gana, Grenada, Guatemala, Guyana, Güney Afrika, Güney Kıbrıs Rum Yönetimi, Honduras, Hırvatistan, İran, Irak, Jamaika, Kiribati, Kırgızistan, Kolombiya, Kosta Rika, Kuzey Makedonya, Lübnan, Malezya, Mauritius, Moğolistan, Moldova, Moritanya, Nikaragua, Umman, Panama, Paraguay, Peru, Saint Lucia, Saint Vincent ve Grenadinler, Samoa, Slovakya, Solomon Adaları, Surinam, Şili, Trinidad ve Tobago, Türkmenistan, Ürdün, Özbekistan, Vanuatu, Venezuela

B Kümesi: Almanya, Amerika Birleşik Devletleri, Arjantin, Arnavutluk, Avusturya, Avustralya, Belçika, Belarus, Birleşik Arap Emirlikleri, Birleşik Krallık, Bosna Hersek, Brezilya, Cezayir, Çek Cumhuriyeti, Danimarka, Estonya, Fas, Finlandiya, Fransa, Gürcistan, Hollanda, İrlanda, İsrail, İsveç, İsviçre, İspanya, İtalya, İzlanda, Kanada, Kazakistan, Kuveyt, Küba, Letonya, Litvanya, Lüksemburg, Macaristan, Malta, Meksika, Mısır, Norveç, Polonya, Portekiz, Romanya, Rusya Federasyonu, Suudi Arabistan, Sırbistan, Slovenya, Tunus, Türkiye, Ukrayna, Uruguay, Yunanistan, Yeni Zelanda

C Kümesi: Afganistan, Angola, Benin, Bolivya, Botsvana, Kamerun, Orta Afrika Cumhuriyeti, Kongo, Fildişi Sahili, Cibuti, Gambiya, Gine-Bissau, Haiti, Kenya, Lesotho, Liberya, Maldivler, Mali, Mozambik, Namibya, Nijerya, Pakistan, Sao Tome ve Prensipe, Senegal, Sierra Leone, Sudan, Tacikistan, Tanzanya, Tayland, Togo, Zambiya, Zimbabve

D Kümesi: Bangladeş, Burkina Faso, Kamboçya, Çad, Çin, Doğu Timor, Etiyopya, Gine, Hindistan, Endonezya, Japonya, Laos, Madagaskar, Malavi, Myanmar, Nepal, Nijer, Filipinler, Ruanda, Güney Kore, Sri Lanka, Uganda, Vietnam

Şekil 1: Panel Kümeleme Analizi Sonucu Ülkelerin Yer Aldığı Kümeler

a) Obezite Prevalansı

b) Günlük Tüketilen Kalori
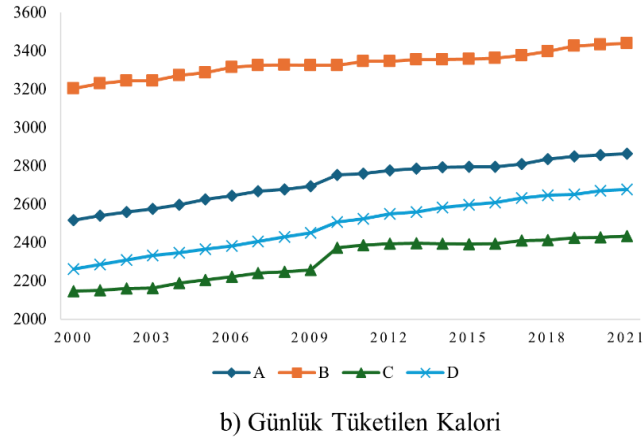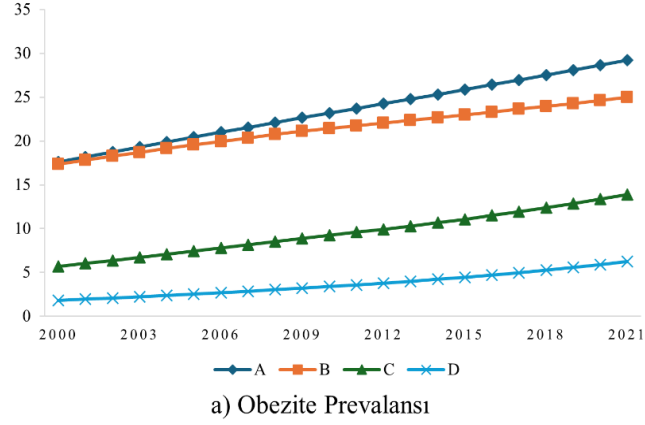
Şekil 2:Kümelere Göre Obezite Prevalansı ve Günlük Tüketilen Kalori
Göstergelerine İlişkin Bilgiler

Şekil 2'de çalışma kapsamında yer alan ülkelerin kümelere göre 2000-2021
yılları arasında OBZ ve KAL değişkenlerine göre verileri bulunmaktadır. Şekil 2
incelendiğinde hem OBZ hem de KAL değişkenleri açısından tüm kümelerin
değerlerinin yıllar itibarıyla arttığı saptanmıştır. A kümesine ait OBZ değerinin
2000 yılında %17'lerden 2021 yılında %30'lara; B kümesinin %17'lerden
%25'lere; C kümesinin %5'lerden %17'lere ve D kümesinin %2'lerden %6'lara

çıktığı belirlenmiştir. KAL değişkenine ait değerler incelendiğinde, A kümesine ait değerin 2000 yılında 2517 kaloriden 2021 yılında 2863 kaloriye; B kümesinin 3204'ten 3440'a; C kümesinin 2145'ten 2435'e ve D kümesinin 2262'den 2676'ya çıktığı tespit edilmiştir. Söz konusu sonuçlara göre dört küme arasında B kümesinde yer alan ülkelerin günlük tüketilen kalori değerleri daha yüksek olmasına rağmen obezite prevalansı açısından A kümesinde yer alan ülkelerin prevalans değerinin daha yüksek olduğu görülmektedir.

Tablo 2'de kümelerin çalışma kapsamında belirlenen değişkenlere ilişkin ortalama, standart sapma ve ANOVA analizi sonuçları yer almaktadır. Değişkenlere ilişkin ortalama değerleri incelendiğinde B kümesinin hastalık değişkenleri olan KVÖH, DBÖH ve HİP haricinde diğer değişkenlerde en yüksek değere sahip küme olduğu belirlenmiştir. B kümesini sırasıyla A, D ve C kümeleri takip etmektedir. Kümeleme analizi sonucunda kümelerin kendi içerisinde homojen kümeler arasında ise heterojen olması beklenmektedir. ANOVA analizi sonuçları incelendiğinde tüm değişkenler açısından kümeler arasında istatistiki açıdan farklılık olduğu görülmektedir. Değişkenlere göre kümeler arasındaki farklılıklar şu şekildedir:

- KVÖH değişkenine göre B kümesinin D kümesi hariç diğer kümeler ile arasında istatistiki açıdan anlamlı farklılık olduğu ve en düşük değere sahip olduğu belirlenmiştir.
- Benzer şekilde DBÖH değişkenine göre de B kümesinin tüm kümeler ile arasında istatistiki açıdan anlamlı farklılık bulunmakta olup B kümesi diğer kümelere kıyasla en düşük değere sahiptir.
- KVÖH ve DBÖH değişkenleri açısından A ve C kümeleri en yüksek değerlere sahiptir.
- HİP değişkenine göre D kümesi en düşük değere sahiptir ve D kümesinin A ve C kümeleri ile arasında istatistiki açıdan anlamlı bir farklılık bulunmaktadır.
- YFAO açısından A ve B kümelerinin C ve D kümeleri ile arasında istatistiki açıdan farklılığın olduğu belirlenmiştir ve A ile B kümelerinin diğer kümelere kıyasla YFAO değerlerinin yüksek olduğu saptanmıştır.
- DBYS'ye göre tüm kümeler arasında istatistiki açıdan anlamlı bir şekilde farklılık vardır ve B kümesinin DBYS değerinin en yüksek, C kümesinin ise en düşük olduğu tespit edilmiştir.
- HEKS'ye göre C ve D kümesi arasında fark olmayıp diğer kümeler arasında istatistiki açıdan anlamlı bir farklılık bulunmaktadır ve B

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kümesinin değerinin daha yüksek C ve D kümelerinin en düşük olduğu belirlenmiştir.

- HEMS değişkenine göre A, B ve C kümeleri arasında, D kümesinin ise sadece B kümesi ile arasında istatistiki açıdan anlamlı bir farklılık vardır ve B kümesi en yüksek değere C kümesi ise en düşük değere sahiptir.
- SH'ye göre sadece B kümesinin diğer kümeler ile arasında anlamlı farklılık bulunmaktadır. B kümesi en yüksek değere C kümesi ise en düşük değere sahiptir.
- CSH değişkenine göre A, B ve C kümeleri arasında, D kümesinin ise sadece B kümesi ile arasında istatistiki açıdan anlamlı bir farklılık vardır ve B kümesi en yüksek değere C kümesi ise en düşük değere sahiptir.
- GEL açısından A, B ve C kümeleri arasında, D kümesinin ise sadece B kümesi ile arasında anlamlı bir farklılık bulunmaktadır ve B kümesi en yüksek değere C kümesi ise en düşük değere sahiptir.
- Son olarak KENT değişkenine göre C ve D kümesi arasında fark olmayıp diğer kümeler arasında istatistiki açıdan anlamlı bir farklılık bulunmaktadır ve B kümesinin değerinin daha yüksek D kümesinin ise en düşük olduğu belirlenmiştir.

Tablo 2: Kümelerin Belirlenen Değişkenlere Göre ANOVA Analizi Sonuçları

	A Kümesi	B Kümesi	C Kümesi	D Kümesi	f	p*
KVÖH	$275{,}29 \pm 141{,}01^a$	$190{,}71 \pm 115{,}82^b$	$315{,}81 \pm 107{,}01^a$	$251{,}14 \pm 80{,}34^{ab}$	8,41	0,001
DBÖH	$58{,}34 \pm 51{,}71^a$	$16{,}02 \pm 15{,}90^b$	$56{,}88 \pm 27{,}19^a$	$40{,}42 \pm 16{,}38^a$	16,58	0,001
HİP	$39{,}69 \pm 6{,}52^a$	$36{,}62 \pm 7{,}44^{ab}$	$38{,}14 \pm 4{,}62^a$	$32{,}82 \pm 4{,}82^b$	6,75	0,001
YFAO	$30{,}63 \pm 10{,}34^a$	$32{,}37 \pm 9{,}43^a$	$22{,}87 \pm 8{,}73^b$	$20{,}87 \pm 9{,}12^b$	12,29	0,001
DBYS	$71{,}49 \pm 4{,}26^a$	$77{,}78 \pm 4{,}50^b$	$62{,}55 \pm 5{,}92^c$	$68{,}06 \pm 7{,}58^d$	59,08	0,001
HEKS	$19{,}57 \pm 13{,}26^a$	$38{,}28 \pm 15{,}42^b$	$3{,}86 \pm 4{,}93^c$	$7{,}11 \pm 7{,}85^c$	65,93	0,001
HEMS	$39{,}01 \pm 22{,}61^a$	$91{,}71 \pm 51{,}33^b$	$14{,}16 \pm 13{,}84^c$	$22{,}27 \pm 28{,}99^{ac}$	43,74	0,001
SH	$1025{,}21 \pm 706{,}22^a$	$3747{,}57 \pm 2441{,}12^b$	$282{,}75 \pm 326{,}52^a$	$601{,}16 \pm 1163{,}35^a$	48,00	0,001
CSH	$308{,}18 \pm 254{,}61^a$	$631{,}78 \pm 318{,}01^b$	$75{,}20 \pm 62{,}91^c$	$167{,}56 \pm 232{,}83^{ac}$	39,37	0,001

GEL	16820,92 ± 10238,06[a]	45726,58 ± 25433,10[b]	5250,95 ± 4876,88[c]	9627,45 ± 12578,01[ac]	52,68	0,001
KENT	59,20 ± 20,35[a]	76,46 ± 13,48[b]	48,95 ± 14,50[c]	36,91 ± 19,87[c]	34,59	0,001

*Anlamlılık düzeyi p<0,05 olarak belirlenmiştir.
Aynı satırda ve aynı harflere (a-d) sahip gruplar arasında anlamlı farklılık yoktur.

5. TARTIŞMA VE SONUÇ

DSÖ, obeziteyi Dünya'yı tehdit eden küresel bir sağlık sorunu olarak görmektedir (Dünya Sağlık Örgütü, 2024c). Ayrıca obezitenin Sürdürülebilir Kalkınma Amaçlarının başarılması üzerinde de etkili olduğu bildirilmekte olup sadece bir sağlık sorunu olarak görülmemesi gerektiği aynı zamanda sosyal ve ekonomik yönünün de bulunduğu belirtilmektedir (Okunogbe vd., 2022; Ralston vd., 2021; Dünya Sağlık Örgütü, 2024b). Bu bakımdan obezite çok yönlü bir sorundur ve Dünya'da neredeyse tüm ülkelerde obezite prevalansının arttığı açıklanmaktadır (Dünya Sağlık Örgütü, 2024a). Nitekim DSÖ üye 164 ülke üzerinde yürütülen bu çalışmanın sonuçları da bu sonucu desteklemektedir. Bu araştırmada gerçekleştirilen panel kümeleme analizi sonuçlarına göre DSÖ'ye üye 164 ülke homojen bir dağılım göstererek dört kümeye ayrılmıştır: A kümesi içerisinde, alt-orta ve düşük gelir grubunda yer alan ülkeler; B kümesinde Avrupa ve Kuzey Amerika ülkeleri başta olmak üzere yüksek ve üst-orta gelir düzeyinde yer alan ülkeler; C kümesinde düşük gelirli Afrika ve Güney Asya ülkeleri ve D kümesinde orta ve yüksek gelir grubunda yer alan Orta Afrika ve Uzak Doğu ülkelerinin yer aldığı görülmektedir. Tüm kümelerin obezite prevalanslarının ve günlük tüketilen kalori değerlerinin 2000 yılından itibaren sürekli arttığı görülmüştür. Bu çalışmada yüksek gelir düzeyine sahip ülkelerin yer aldığı B kümesinin günlük tüketilen kalori değerinin en yüksek düzeyde olduğu görülmesine karşılık alt-orta ve düşük gelir grubuna sahip ülkelerin yer aldığı A kümesinin obezite prevalansının daha yüksek olduğu saptanmıştır. Daha fazla kalori tüketiminin obeziteyi artırdığı bilinmesine karşılık belirli bir gelir düzeyine ulaştıktan sonra insanların sağlıklı beslenme ve sağlıklılık hallerini korumaya yönelik farkındalıklarının arttığı bildirilmektedir (Grecu & Rotthoff, 2015). Bu sebepten yüksek gelir düzeyine sahip ülkelerin yer aldığı B kümesinin obezite prevalansı, gelir düzeyi artmaya devam eden A kümesindeki ülkelere kıyasla düşük kalmış olabilir. Aydın (2019) tarafından yürütülen araştırmanın sonuçları da bu durumu desteklemekte olup obezite prevalansının gelir düzeyi artıkça artacağı, ancak dönüm noktasına ulaşıldığında veya aşıldığında obezite prevalansının düşeceği belirtilmektedir.

Bu çalışmanın bir diğer sonucunda Afrika ülkelerinin çoğunlukta olduğu C kümesinin günlük tüketilen kalori değerleri dört küme içerisinde en düşük

düzeyde olmasına karşılık içerisinde Asya ülkelerinin çoğunlukta olduğu D kümesinin obezite prevalans değerlerinin daha düşük olduğu saptanmıştır. Asya ülkelerinde obezite prevalansının düşük olmasının nedenleri olarak sağlıklı besin tüketim alışkanlıklarına sahip olmaları, fiziksel aktivite gerçekleştirmeleri, zayıf görünüme sahip olma ile ilgili sosyal baskıya maruz kalmaları görülmektedir (Helble & Sato, 2018; Ramachandran, Chamukuttan, Shetty, Arun, & Susairaj, 2012).

Bu araştırmada kümeler obeziteyle ilişkili olduğu belirtilen sağlık ve sosyo-ekonomik göstergeler açısından karşılaştırılmıştır. Kümeler birbirleriyle karşılaştırılırken ANOVA analizinden faydalanılmıştır. Analiz sonuçlarına göre gelişmiş ülkelerin çoğunlukta olduğu B kümesinin kardiyovasküler hastalıklar kaynaklı ölüm hızı (D Kümesi hariç) ve diyabet kaynaklı ölüm hızı göstergeleri açısından diğer kümelere kıyasla en düşük ortalamaya sahip küme olduğu ve sonuçların istatistiki açıdan anlamlı olduğu belirlenmiştir. Yetersiz fiziksel aktivite oranı açısından ise B kümesinin A kümesi hariç C ve D kümelerine kıyasla en yüksek ortalamaya sahip küme olduğu belirlenmiş olup sonuçlar istatistiki açıdan anlamlıdır. Dünya'da gerçekleşen ölümlerin yaklaşık %80'inin nedeni olarak bulaşıcı olmayan hastalıklar görülmektedir ve bulaşıcı olmayan hastalıklar içerisinde de kardiyovasküler hastalıkların ölüm nedenleri arasında birinci sırada yer aldığı bildirilmektedir. Ayrıca kardiyovasküler hastalıklar ve diyabet kaynaklı ölümlerin gelişmiş ülkelerde azaldığı, düşük ve orta gelirli ülkelerde ise arttığı belirtilmekte olup söz konusu bulgu bu çalışmanın sonuçlarını desteklemektedir (T.C. Sağlık Bakanlığı, 2021). Gelişmiş ülkelerde söz konusu hastalıklar kaynaklı ölümlerin daha az olmasının nedenleri olarak gelişmiş bir sağlık sistemine sahip olmaları, toplumda sağlık bilincinin yüksek olması, çevresel faktörlere maruziyetin daha az olması ve karşılanamayan sağlık ihtiyacının düşük olması görülmektedir (Şahin & İlgün, 2022; Amini, Zayeri, & Salehi, 2021). Yetersiz fiziksel aktivite başta obezite olmak üzere birçok bulaşıcı olmayan hastalığın temel nedeni olarak görülmektedir ve gelişmiş ülkeler başta olmak üzere tüm Dünya ülkeleri açısından önemli bir tehdit olarak görülmektedir (Dünya Sağlık Örgütü, 2022). Gelişmiş ülkelerde fiziksel aktivite düzeylerinin yetersiz olmasının nedenleri arasında ulaşım, iletişim ve eğlence alanlarında meydana gelen teknolojik gelişmeler görülmektedir (Graf & Cecchini, 2017). DBYS, HEKS, HEMS, SH ve CSH sağlık göstergeleri ile GEL ve KENT sosyo-ekonomik göstergeleri açısından da B kümesinin diğer kümelere kıyasla en yüksek ortalamaya sahip küme olduğu tespit edilmiştir ve sonuçlar istatistiki açıdan anlamlıdır. B kümesinde yer alan ülkeler yüksek ya da üst-orta gelirli ülkeler arasında yer almaktadır ve bu sebepten B kümesinde yer alan ülkelerin

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söz konusu göstergeler açısından daha iyi ortalamalara sahip olduğu düşünülmektedir.

Bu çalışmada A ve C kümeleri içerisindeki ülkeler düşük ve orta gelir düzeyde bulunmaktadır ve büyük bir çoğunluğu gelişmekte olan ülkedir. Gelişmekte olan ülkelerde genellikle ekonomik, sosyal ve yapısal faktörlerde kontrolü güç bir şekilde hızlı değişiklikler gerçekleşmektedir. Gelişmekte olan ülkelerde gelirde yaşanan artışın etkisiyle kentsel alanlarda yaşayan nüfus oranı artış göstermekte, kentlere göçlerin artmasıyla sağlık hizmetlerine olan ihtiyaç ve harcamalar artmakta, kentlerde altyapının yetersizliği sebebiyle olumsuz çevresel faktörlere maruziyet artmakta, besin sanayinde gelişmeler yaşanmakta ve enerji yoğunluğu yüksek olan besinler kolayca erişilebilir hale gelmektedir (The SEI-Milieu Consortium, 2015; Halıcıoğlu, 2013; Aydın, 2019). Tüm bu faktörlerin sonucunda ise hastalıklara neden olan risk faktörlerine maruziyet artmakta ve bulaşıcı olmayan hastalıklar kaynaklı ölümler artmaktadır. Boutayeb (2010) gelişmekte olan ülkelerin coğrafi, demografik ve sosyo-ekonomik faktörler de dahil olmak üzere çok sayıda faktör nedeniyle obezite, yetersiz fiziksel aktivite gibi risk faktörleri ve bulaşıcı olmayan hastalıklara daha fazla maruz kaldığını bildirmektedir. Bu çalışmanın sonuçları da bu durumu desteklemekte olup kardiyovasküler hastalıklar kaynaklı ölüm hızı, diyabet kaynaklı ölüm hızı, hipertansiyon prevalansı ve yetersiz fiziksel aktivite oranı (B kümesi sonrasında) açısından A ve C kümeleri en yüksek ortalamaya sahip ülkelerdir ve kümeler arasında istatistiki açıdan anlamlı farklılık bulunmaktadır. DBYS, HEKS, HEMS, SH ve CSH sağlık göstergeleri ile GEL ve KENT sosyo-ekonomik göstergeleri açısından A kümesi B kümesinden sonra en yüksek ortalamaya sahip kümedir ve diğer kümeler ile arasında istatistiki açıdan anlamlı farklılık bulunmaktadır. C kümesi ise KENT göstergesi haricindeki DBYS, HEKS, HEMS, SH ve CSH sağlık göstergeleri ile GEL ekonomik göstergesi açısından en düşük ortalamalara sahip kümedir. C kümesinin bahsi geçen göstergeler açısından en düşük ortalamaya sahip olmasının temel nedeni olarak düşük gelirli Afrika ülkelerinin çoğunlukta olması görülmektedir.

Son olarak D kümesine ilişkin sonuçlar incelendiğinde D kümesi içerisinde Asya ülkeleri çoğunlukta olmak üzere bazı Afrika ülkeleri de bulunmaktadır. D kümesi içerisinde Japonya ve Güney Kore haricinde yer alan ülkelerin büyük bir çoğunluğu gelişmekte olan ülkedir ve ülke nüfusları yüksek düzeydedir. D kümesi KENT göstergesi haricindeki DBYS, HEKS, HEMS, SH ve CSH sağlık göstergeleri ile GEL ekonomik gösterge ortalamaları açısından kümeler arasında üçüncü sırada bulunmaktadır. KENT göstergesi açısından ise en düşük ortalamaya sahiptir. D kümesi hastalıklar ve risk faktörleri açısından değerlendirildiğinde kardiyovasküler hastalıklar kaynaklı ölüm hızı ve diyabet

kaynaklı ölüm hızı ortalamaları B kümesinden sonra gelmektedir. Hipertansiyon prevalansı ve yetersiz fiziksel aktivite oranı ortalamaları ise en düşüktür. Çoğunluğunu Asya ülkelerinin oluşturduğu ve obezite prevalansı da en düşük küme olan D kümesinde, hastalık ve risk faktörleri ortalamalarının düşük olmasının temel nedenleri olarak geleneksel diyet tarzını benimsemiş olmaları ve enerji yoğunluğu düşük besinleri tüketmeleri, yoga gibi fiziksel aktiviteler gerçekleştirmeleri, koruyucu sağlık hizmetlerini önceliklendirmeleri, güçlü toplumsal destek ve sağlıklı olma konusunda farkındalığa sahip olmaları, hükümetlerin risk faktörlerine maruziyeti engelleyen düzenlemeler yapıyor olmaları görülmektedir (Hu, 2008; Guthold, Stevens, Riley, & Bull, 2018; Ikeda vd., 2011; Mackay, Dorotheo, Assunta, & Ritthiphakdee, 2022).

Sonuç itibarıyla bu çalışmada DSÖ'ye üye 164 ülke; 2000 ile 2021 yıllarına ait obezite prevalansı ve kişi başına günlük tüketilen kalori göstergelerinden faydalanılarak panel kümeleme analizi yöntemi ile dört farklı kümeye ayrılmıştır. Gelişmekte olan Güney Amerika, Doğu Avrupa ve Orta Asya ülkeleri A kümesinde; Avrupa ve Kuzey Amerika ülkeleri başta olmak üzere yüksek ve üst-orta gelir düzeyinde yer alan gelişmiş ülkeler B kümesinde; az gelişmiş ve gelişmekte olan Afrika ve Asya ülkeleri C kümesinde ve içerisinde Japonya, Güney Kore, Çin ve Hindistan'ın yer aldığı çoğunluğu Doğu ve Güney Asya ülkelerinden oluşan ülkeler D kümesinde yer almıştır. Çalışma kapsamında belirlenen sağlık, sosyal ve ekonomik göstergeler ile kümeler karşılaştırılmış, hastalık kaynaklı ölümler ve risk faktörleri prevalansları açısından kümeler arasında fark olduğu belirlenmiştir. Gelişmiş ülkelerin yer aldığı kümenin en iyi ortalamalara sahip küme olduğu, az gelişmiş ve gelişmekte olan ülkelerin ise en kötü ortalamalara sahip olduğu tespit edilmiştir. Bu sonuçlara göre gelişmişlik ile obezite arasında pozitif bir ilişki olduğu belirtilebilir. Söz konusu sonuçlar ışığında sağlık politikacılar ve yöneticilerinin obezite ile mücadele stratejilerinin ülkelerinin gelişmişlik düzeyine ve özgün ihtiyaçlarına göre özelleştirilmesi gerektiğini göstermektedir. Erken müdahale programları, toplum temelli yaklaşımlar ve sosyoekonomik eşitliği ve sağlık hizmetlerine erişimi teşvik eden politikalar geliştirilmelidir. Gelişmekte olan ve az gelişmiş ülkelerde beslenme eğitimine, sağlık hizmetlerine erişime ve fiziksel aktivitenin teşvikine daha fazla önem verilmelidir. Son olarak gelecekte yürütülecek araştırmalarda bu çalışmada yer alan kümelerin obezite prevalansları üzerinde etkili olan sosyo-ekonomik faktörlerin hane halkı düzeyinde yürütülecek çalışmalar ile değerlendirilmesi önerilmektedir.

6. ÇIKAR ÇATIŞMASI BEYANI

Çalışmada çıkar çatışması bulunmamaktadır.

7. MADDİ DESTEK
Bu çalışmada herhangi bir fon veya destekten yararlanılmamıştır.

8. YAZAR KATKILARI
ŞD: Fikir;
ŞD: Tasarım;
ŞD: Denetleme;
ŞD: Kaynakların toplanması ve/veya işlemesi;
ŞD: Analiz ve/veya yorum;
ŞD: Literatür taraması;
ŞD: Yazıyı yazan;
ŞD: Eleştirel inceleme.

9. ETİK KURUL BEYANI VE FİKRİ MÜLKİYET TELİF HAKLARI
Bu çalışmada etik kurul izni gerekmemektedir.

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ARTIFICIAL INTELLIGENCE AND SERVICE, INDUSTRIAL, AND AGRICULTURAL EMPLOYMENT: COMPREHENSIVE INTERNATIONAL MACROECONOMIC EVIDENCE[1]

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ABSTRACT

Recent advancements in artificial intelligence (AI) technology have revived concerns about technological unemployment. Regarding the issue, this study examines the impact of AI on employment rates across 17 leading AI countries from 1998 to 2017 using two panel econometric techniques, DOLS and FMOLS, to ensure robust results. For the first time, as far as is known, the effect of AI on employment in distinct sectors is analyzed separately. By uniquely combining different countries and sectors within a macroeconomic framework, this study provides a more comprehensive understanding through a total of eight estimates. The findings indicate that, according to both DOLS and FMOLS techniques, increased AI innovation may raise employment rates in the overall economy and in the service sector, while reducing employment rates in the industrial and agricultural sectors. Consequently, while AI positively impacts overall employment, considering industrial and agricultural sectors, employment policies should be adjusted to meet evolving needs in the AI era.

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

YAPAY ZEKA VE HİZMET, SANAYİ VE TARIM İSTİHDAMI: KAPSAMLI ULUSLARARASI MAKROİKTİSADİ ANALİZ

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ÖZ | Yapay zeka (YZ) alanındaki son gelişmeler teknolojik işsizlik konusu tekrardan gündeme getirmiştir. Bununla bağlantılı olarak, bu çalışmada YZ'nin istihdam oranları üzerindeki etkisi, YZ teknolojisinde öncü olan 17 ülkenin 1998 ve 2017 yılları verileri kullanılarak ve sonuçların güvenirliliğini güçlendirilmesi adına DOLS ve FMOLS olmak üzere iki farklı teknikle analiz edilmiştir. Dahası, bilindiği kadarıyla literatürde ilk defa YZ'nin farklı sektörlerdeki etkisinin makroekonomik olarak ölçülebilmesi adına dört farklı model ve iki farklı yöntemle sekiz farklı analiz yapılmıştır. Bulgulara göre, hem DOLS hem de FMOLS tekniği için, YZ alanında inovasyon arttıkça, hem ekonominin bütünündeki, hem de sadece hizmetler sektöründeki istihdam oranları artmaktayken, sanayi ve tarım sektörlerinde istihdam oranları düşmektedir. Sonuç olarak, her ne kadar YZ'nin ekonominin bütününde pozitif bir istihdam etkisi yaratabileceği görülse de, sanayi ve tarım sektöründeki olumsuz etkileri göz önüne alınarak, istihdam politikalarının YZ çağındaki değişen ihtiyaçlara göre yeniden dizayn edilmesi tavsiye edilmektedir.

Anahtar Kelimeler: *Yapay zeka, teknolojik işsizlik, patent, istihdam politikaları*
JEL Kodları: *C23, J21, O33*

Alan: *İktisat*
Türü: *Araştırma*

1. INTRODUCTION

Recent advancements in Artificial Intelligence (AI) and related technologies, such as Machine Learning (ML), the Internet of Things (IoT), neural networks, Big Data (BD), and robotics, have accelerated digitalization and mechanization across nearly all economic sectors. Given that AI technology is still in its early stages, it is expected to significantly transform various aspects of human life. According to Moore's Law, named after Gordon Moore of Intel, as chip sizes decrease, processor power typically doubles approximately every two years (Rowland, Delehanty, Dwyer & Medintz, 2017). However, the most significant impact of computing advances often comes from rapidly evolving algorithms rather than just improvements in chip technology. For example, from 1988 to 2003, standard optimization problems improved by a factor of 1,000 due to chip advancements, while improvements in algorithms and programming led to a 30,000-fold increase, enabling computers to solve problems previously considered unsolvable (Fallows, 2011).

The ongoing increase in both hardware and software computing power suggests that AI technologies may soon achieve levels currently beyond our foreseeable capabilities. This advancement could positively impact humanity in various ways, such as improving medical diagnosis, enabling error-free surgical procedures, enhancing logistics through autonomous vehicles, increasing energy efficiency, and strengthening cybersecurity.

Despite the numerous claimed benefits of AI, its impact on the labor market remains controversial. This is not surprising given the limited data sources and the relatively few academic studies available, which means there is insufficient empirical evidence to draw definitive conclusions on this emerging topic (Acemoglu, Autor, Hazell & Restrepo, 2022). Most existing studies do not directly address the relationship between AI and unemployment, but rather focus on the broader impacts of technological development, automation, and robotization on unemployment. The implications of these studies vary and are inconclusive. Some argue that technological development and automation may exacerbate unemployment, a phenomenon known as the "replacement effect." Conversely, others believe that AI advancements could create more job opportunities in the future, referred to as the "displacement effect."

Although many studies have explored the relationship between mechanization, robotization, and unemployment, as explained briefly above, the impact of AI on the labor market may differ from previous disruptions caused by the industrial revolution. The context of AI presents unique challenges compared to earlier technological shifts. For example, 20th-century advancements in computer technology automated many data processing tasks, but a significant

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amount of work still required human involvement (Korinek & Stiglitz, 2018). Additionally, earlier developments in information technology and robotization focused on automating routine and repetitive tasks, whereas AI has the potential to automate both cognitive and non-routine tasks (Georgieff & Hyee, 2022).

To understand the specific relationship between AI and unemployment, as opposed to general technological development, more rigorous scientific analyses are required to make accurate predictions and propose effective policies. However, there is a lack of comprehensive studies in the existing literature. Some studies are purely theoretical, with no empirical analyses, while others focus on narrow geographical areas, examining only a single country or region. Additionally, some research investigates the impact of AI on unemployment in specific sectors or professions, such as its use in medical diagnostics and procedures.

However, different countries and sectors may exhibit varying relationships between AI and employment due to structural differences. Each of these studies offers valuable insights, but this study uniquely combines different countries and sectors within a macroeconomic framework to provide a more comprehensive understanding of the relationship between AI and employment. This approach represents a significant and original contribution to the literature, as studies in the existing literature are either based on microeconomic data, specific sectors, or individual regions, and therefore may not yield generalizable conclusions.

Therefore, this study examines 17 leading countries in AI patent applications from 1998 to 2017. Two empirical methods, Dynamic Ordinary Least Squares (DOLS) and Fully Modified Ordinary Least Squares (FMOLS), are used to ensure the robustness of the results. To explore variations in the relationship between AI and employment, four different estimations are conducted. Using these two methods and four models, a total of eight different estimations are conducted to analyze the impact of AI on employment in the overall economy, as well as in the industrial, service, and agricultural sectors. This approach allows for the differentiation of AI's effects on various sectors.

Thus, this study represents a significant contribution to the literature. Since, due to variations in capital or labor intensity and other structural differences, the impact of AI on different sectors may vary significantly. The remainder of the study is organized as follows: Section 2 reviews the relevant literature briefly. Section 3 describes the data used and the empirical methods employed. Section 4 discusses the findings from the empirical analysis. Finally, Section 5 presents the conclusions drawn from the analysis and discusses policy implications.

2. LITERATURE REVIEW

The concern that machines and automation might replace human labor is a longstanding issue that has been debated by academics and the public for centuries. This concern is discussed in the literature under the term "technological unemployment," which dates back to the late 18th century, during the Industrial Revolution in the U.K. One of the earliest classical thinkers to address this topic directly was David Ricardo. In the revised third edition of his book On the Principles of Political Economy and Taxation, Ricardo, in the chapter "On Machinery," argued that emerging machines could render some workers obsolete and increase unemployment, contrary to his earlier views (Kurz, 2010). John Maynard Keynes was among the first to explicitly define and name the issue as technological unemployment, although he acknowledged this problem as a short-term challenge, he believed that technological development would ultimately benefit the labor force by reducing working hours in the long term (Floridi, 2014).

Since Keynes, technological unemployment has remained a topic of intense discussion, especially with the rapid development of computer and internet technologies. The advent of AI and Machine Learning in the last decade has renewed public and academic interest in technological unemployment. While AI technologies might seem similar to previous machine and robotic technologies in their impact on the labor market, there are crucial differences. Historically, the introduction of machinery, such as in the textile industry, replaced repetitive tasks with large and expensive machines, posing a limited threat to labor within specific sectors. In contrast, AI has the potential to affect all industries due to its broad applicability. Additionally, the cost of implementing AI technologies is relatively lower and more accessible compared to the large, expensive machinery of the past. Moreover, as explained earlier in the introduction section, AI has the potential to automate many more tasks and duties, which may affect a much broader range of labor domains than earlier periods.

Therefore, the issue of technological unemployment should be investigated separately from previous developments, such as those observed with robotics technologies. However, since AI and ML technologies are relatively new, academic inquiries in this area are quite limited. Most studies have examined the effects of technological development and robotization or mechanization in general, rather than focusing specifically on the impact of AI on employment. Additionally, some studies have been case studies related to a single sector or specific professions, yielding mixed findings. For example, in the medical sector, research has compared AI-based optical image interpretation with radiologists, assessing its potential impact on unemployment in the profession (Pesapane, Codari & Sardanelli, 2018; Castagno & Khalifa, 2020; Tajaldeen &

Alghamdi, 2020; Botwe, Antwi, Arkoh & Akudjedu, 2021; Murugesan, Patel, Viswanathan, Bhargava & Faraji 2023). Similar investigations have been conducted in other sectors such as the legal sector, tourism, banking, finance, and various others (McGinnis & Pearce, 2013; Remus & Levy, 2017; Kong et al., 2021; Koo, Curtis & Ryan, 2021; Batiz-Lazo, Efthymiou & Davies, 2022; Campbell, 2023). Some studies (Rifkin, 1995; Ford, 2015) are based on philosophical or theoretical discussions without robust empirical investigation. Consequently, most research relies on microdata studies based on questionnaires (Kong et al., 2021; Kambur & Akar, 2022; Yakar, Ongena, Kwee & Haan, M. 2022), time series studies covering very narrow geographical regions, or purely theoretical discussions, as already reviewed previously. However, very few studies have examined the issue from a macroeconomic perspective using a comprehensive cross-country panel database.

The outputs of studies investigating the effect of technological development or mechanization are generally categorized into two perspectives: pessimistic and optimistic. The pessimistic view, which involves the replacement effect, predicts that unemployment will rise in the future. The optimistic view suggests that unemployment will decline or remain relatively unchanged.

In the pessimistic camp, Ford (2015) argues that this era might differ from the Industrial Revolution, which created job opportunities and increased workers' welfare. He claims that while machines were once seen as tools to boost worker productivity, AI machines are now becoming new workers themselves. Brynjolfsson and McAfee (2011) also note that following the 2008 global crisis, American companies resumed economic growth by investing in new machines rather than rehiring people, suggesting that if this trend continues, unemployment could worsen. Frey and Osborne (2017) found that nearly half of the jobs in the United States are at risk of computerization, based on their analysis of over 700 occupations. Webb (2019) concluded that, unlike robots and software, AI technologies pose more significant risks to high-skilled jobs. Additionally, Acemoglu and Restrepo (2017) estimated that for each new robot introduced per thousand workers, the employment ratio in US labor markets decreases by between 0.18 and 0.34.

On the other side, counterarguments based on the displacement effect suggest that technological development or automation may increase employment opportunities rather than reduce them. For instance, Gregory, Salomons, and Zierahn (2018), in their analysis of Europe, found that while routine-replacing technological change had a displacement effect from 1999 to 2010, it also created new employment opportunities by increasing the demand for goods, potentially resulting in a net positive employment effect. Similarly, Jacobs and Karen (2019),

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using U.S. labor market data from 1870 to 2015, concluded that a significant wave of future unemployment, as predicted by pessimists, is unlikely. They argue that new technologies can reduce costs, increase demand, and create new sectors and jobs.

Similar to studies that have investigated technological unemployment from a broader perspective, those examining the effect of AI using cross-country empirical data have yielded mixed results. Some studies have concluded that advancements in AI technology may reduce future employment opportunities, while others suggest the opposite—that AI may boost employment opportunities. For example, Guliyev (2023), using panel GMM system estimation with data from 24 high-tech developed countries between 2005 and 2021, estimated the effect of AI on unemployment and concluded that AI might reduce unemployment levels.

Guliyev, Huseynov and Nuriyev (2023) investigated the relationship between AI and big data technologies in G7 countries from 2005 to 2020. They concluded that there may be a negative relationship between AI, big data, and unemployment. Bordot (2022), using panel data analysis on 33 OECD countries, found that both robotics and AI technologies tend to increase unemployment, although the results for AI are statistically less significant compared to robotics. Keskin and Kasri (2023) examined 26 countries over an 8-year period using dynamic panel SGMM estimation and found no statistically significant relationship between AI and unemployment rates. Finally, Mutascu (2021) studied the issue from a nonlinear perspective and concluded that AI increases employment levels at low inflation rates, but has no effect at higher inflation levels. Conversely, Nguyen and Vo (2022) found that AI increases unemployment up to a certain inflation threshold, after which this effect decreases.

3. METHODOLOGY

Although the effect of technological development on unemployment has a long history dating back to the 19th century, the impact of the relatively new and emerging technology of AI on unemployment is still a novel and underexplored issue. In this section, two methodological approaches used to ensure the robustness of the results are described. The first method is DOLS and the second is FMOLS panel cointegration technique, which estimates long-term coefficients. The dataset covers the period from 1998 to 2017 and includes 17 developed countries: Austria, Australia, Belgium, Canada, Finland, France, Germany, Ireland, Israel, Italy, the Republic of Korea, the Netherlands, Spain, Sweden, Switzerland, the United States, and the United Kingdom. These

countries are selected because, given the relatively recent emergence of AI technology, there are limited nations with extensive records of AI patents. To ensure the robustness of the estimations, only countries with sufficiently long histories of AI patent activity are included. All variables, except those already in percentage form or with negative values, are transformed and used in their natural logarithm form. Variables like employment rates, which are already in percentage form, have a normal scale dispersion and are used in nominal form. Similarly, inflation, which is in percentage form and has negative values, is also used in nominal form. However, data for explanatory variables like the total population and the total number of AI-related patents show wide dispersion and are therefore transformed using natural logarithms. Descriptive statistics and details about the datasets are provided in Table 1 below.

Table 1: Descriptive Statistic and Databases

Var.	Mean	Std. Dev.	Min	Max	Database
Emp	56.3	5.8	41.5	66.1	WDI, Employment to population ratio, 15+, total (%), ILO Est.
Ser	72.7	5.1	59.9	81.6	WDI, Employment in services. (% of total emp.), ILO Estimate
Agr	3.5	1.9	1.0	12	WDI, Employment in agriculture(% of total emp.), ILO Estimate
Ind	23.6	3.9	16.2	34.3	WDI, Employment in industry (% of total employment), ILO Estimate
Gdp	1.9	3.6	0.1	18.9	WDI, Gross Domestic Product (constant 2015 US$billion)
Inf	1.8	1.3	-4.4	7.5	WDI, Inflation, consumer prices (annual %)
Pop	46.2	68.6	3.7	325.1	WDI, Population, Total(million)
Cap	22.8	3.4	15.7	35.8	WDI, Gross fixed capital formation (% of GDP)
Ai	70.6	156.1	0.8	1315.1	OECD, AI Patents, IP5, based on inventors country of residence

The employment variables are categorized into four groups: overall economy, services, agriculture, and industry, based on data from the World Bank World Development Indicators. Since AI is a very new technology, there are limited options to measure its utilization. This lack of measurement tools is a primary reason for the scarcity of macroeconomic studies examining the relationship between AI and employment. Consequently, most studies in this area

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rely on microeconomic approaches using questionnaires. Some research, such as Guliyev (2023), employs Google Trend Index data to gauge AI utilization. However, a high frequency of searches for the term "artificial intelligence" in a particular country does not necessarily indicate substantial production and utilization of AI technology in national economies.

However, it is reasonable to assume that countries with significant patent creation and innovation in AI technology are more likely to utilize these technologies effectively in their industries. Since, while patents are often considered output indicators, they are also widely used as input indicators because they can serve as valuable information sources for other entrepreneurs and inventors (OECD). Additionally, some studies use proxies such as robot's usage (Acemoglu & Restrepo, 2017) to represent technological development, expecting a similar relationship between these proxies and unemployment as with AI. However, as previously discussed, AI may present different future implications for unemployment compared to earlier technological advancements. Therefore, in the context of AI data, patents related to AI are the most relevant choice for use as an independent variable. In this context, following the method used by Mutascu (2021), Nguyen and Vo (2022), Bordot (2022), and several other researchers, patents related to AI are used as a proxy for AI-related technological capabilities of countries to estimate the relationship between AI and employment rates.

However, there are various patent offices globally that receive and issue patents to choose from. To obtain most comprehensive patent data, this study uses patents from IP5 patent families, sourced from the OECD Patents by Technology database. IP5 patent families include patents protected in at least two patent offices worldwide, one of which must be within the Five IP offices (IP5): the Korean Intellectual Property Office (KIPO), the Japan Patent Office (JPO), the European Patent Office (EPO), the United States Patent and Trademark Office (USPTO), and the China National Intellectual Property Administration (CNIPA). Fractional counts in AI patent data arise from patents with multiple inventors or applicants. To avoid multiple counting, the contributions of each country are considered.

This study examines the effect of technological development, specifically innovations in AI, on employment across three sectoral categories and one general category for overall employment rates. To achieve this, four different models are analyzed using two techniques, DOLS and FMOLS, resulting in a total of eight estimations. The equations for the different models are listed below, with variable definitions provided in Table 1. Control variables, including GDP, population, fixed capital formation, and inflation, are selected based on a

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literature review and are commonly used and available variables.

Model 1: $Emp_{it} = \beta_0 + \beta_1 \ln Gdp_{it} + \beta_2 \ln Ai_{it} + \beta_3 \ln f_{it} + \beta_4 \ln Pop_{it} + \beta_5 LnCap_{it} + u_{it}$ **(1)**

Model 2: $Ind_{it} = \beta_0 + \beta_1 \ln Gdp_{it} + \beta_2 \ln Ai_{it} + \beta_3 \ln f_{it} + \beta_4 \ln Pop_{it} + \beta_5 LnCap_{it} + u_{it}$ **(2)**

Model 3: $Ser_{it} = \beta_0 + \beta_1 \ln Gdp_{it} + \beta_2 \ln Ai_{it} + \beta_3 \ln f_{it} + \beta_4 \ln Pop_{it} + \beta_5 LnCap_{it} + u_{it}$ **(3)**

Model4: $Agr_{it} = \beta_0 + \beta_1 \ln Gdp_{it} + \beta_2 \ln Ai_{it} + \beta_3 \ln f_{it} + \beta_4 \ln Pop_{it} + \beta_5 LnCap_{it} + u_{it}$ **(4)**

The four different models are employed to investigate the varying effects of AI on employment across different sectors and to compare the results, which can offer important policy implications. Before performing these estimations, several preliminary tests and methodological steps must be conducted to select and apply the most appropriate estimation technique, ensuring the most reliable results based on the data characteristics. These methodological steps are outlined in Figure 1 below.
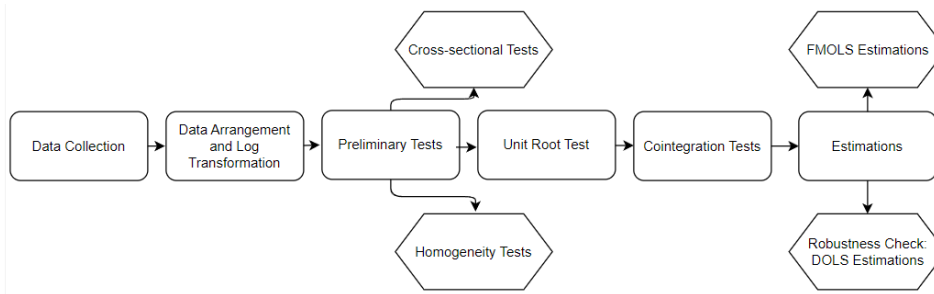
Figure 1: Methodological Procedure

One of the initial important preliminary tests in panel econometrics involves assessing homogeneity and cross-sectional dependence. Slope heterogeneity can lead to biased estimation results if it is present in the data. Since datasets often exhibit heterogeneous slope characteristics, they should be analyzed using specific econometric techniques designed to account for this heterogeneity. To test for slope heterogeneity, the Pesaran and Yamagata (2008) test, also known as the Delta test, is employed. The null hypothesis of the Delta test posits that slope coefficients are homogeneous across different cross-sectional units, meaning the slope coefficients are identical for all units. The Delta

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test is implemented using the "xthst" command in Stata, developed by Bersvendsen and Ditzen (2020).

The next step is to examine the potential presence of cross-sectional dependence among different units. This is important because, when the assumption of cross-sectional independence is violated, a shock affecting one country or unit may also impact other units. This issue is common due to the highly interconnected nature of the global economy in the 21st century. Therefore, testing for cross-sectional dependence is a crucial step. To address this problem, various unit root and econometric tests have been developed. In this study, potential cross-sectional dependence is assessed using the Breusch & Pagan (1980) LM test, the Pesaran (2004) CD test, and the Pesaran, Ullah, and Yamagata (2008) bias-adjusted LM test.

Understanding the homogeneity and cross-sectional dependency characteristics of the data is crucial for assessing its stationarity. Unit root tests are divided into first-generation and second-generation tests, with second-generation tests being more robust for analyzing cross-sectional dependency when present. Given the characteristics of the dataset, this study employs the Multivariate Augmented Dickey-Fuller (MADF) panel unit root test. The MADF test is preferred for two reasons: first, it is based on a higher-order autoregressive equation rather than a first-order, and second, it can accommodate different autoregressive coefficients (Taylor & Sarno, 1998; Furuoka, 2012). MADF statistic is akin to the Wald statistic, as shown in Equation 5 (Adalı, Toygar, Karataş & Yıldırım, 2024). Additionally, the test is applicable when T > N (Tatoğlu, 2020), which is suitable for this study.

$$MADF = \frac{(1-\varphi\widehat{\beta})\{\varphi[Z(\widehat{\Lambda}^{-1}\otimes 1_T)Z]^{-1}\varphi'\}(1-\varphi\widehat{\beta})N(T-k-1)}{(Y-Z\widehat{\beta})'(\widehat{\Lambda}^{-1}\otimes 1_T)(Y-Z\widehat{\beta})} \qquad \textbf{(5)}$$

To analyze the presence of long-term relationships among the series, the Westerlund (2005) panel cointegration method is employed. This method involves subtracting cross-sectional means from the averages in the series across the panel, as recommended by Levin et al. (2002), due to the data's cross-sectional dependence characteristics.

After completing all preliminary tests, including unit root and cointegration tests, the next step is to implement the coefficient estimation procedure. Two different econometric techniques are used to ensure the robustness of the results. FMOLS and DOLS methods, both suitable for heterogeneous data with cointegrated panels (Ghazali & Ali, 2019), are employed to determine the magnitude and direction of the independent variables' effects on

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employment variables. Both DOLS and FMOLS are robust against issues such as series correlation and small sample bias, which can affect traditional Ordinary Least Squares (OLS) estimators (Sulaiman, Abdul-Rahim & Ofozor 2020; Ngoma & Yang, 2024). Additionally, while standard OLS is not appropriate for estimating long-run coefficients when variables are cointegrated, DOLS and FMOLS are valid methods for this purpose (Rahman, Hosan, Karmaker, Chapman & Saha, 2021).

FMOLS estimator, initially developed by Phillips and Hansen (1990) and refined by Pedroni (2001), is considered highly effective for estimating cointegrating regressions in heterogeneous panels (Hamit-Haggar, 2012; Khan, Panigrahi & Almuniri, 2019). The FMOLS estimator is defined as shown in Equation 6 (Khan et al., 2019) below.

$$\beta^*_{NT} - \beta = \left(\sum_{i=1}^{N} L_{22i}^{-2} \sum_{i=1}^{T} (\chi_{it} - \bar{\chi}_{it})^2 \right) \sum_{i=1}^{N} L_{11i}^{-1} L_{22i}^{-1} \left(\sum_{i=1}^{T} (\chi_{it} - \bar{\chi}_i) \mu_{it}^* - T \hat{\gamma}_i \right) \qquad (6)$$

The DOLS estimator is used as a second technique to verify the consistency of the estimation results. An important benefit of DOLS methodology is its consideration of presence of a mix allowing the integration of the variables in the cointegrated perspective and by regressing one of the I(1) variables against other I(1) and I(0) variables by taking leads (p) and lags (-p) handles the potential minor sample bias and endogenous bias problems (Lustrilanang et al., 2023). Moreover, as detailed by Stock and Watson (1993) and Saikkonen (1992) DOLS technique is both effective tool in the case of autocorrelation problem and relatively simple to implement on the cointegrating vector parameters' as the utilization of the standard testing methodology is valid (Saikkonen, 1992; Stock & Watson, 1993; Modeste, 2016).

$$Y_t = \beta_0 + \vec{\beta} X + \sum_{j=-q}^{p} \vec{d}j \Delta X_{t-j} + \mu_t \qquad (7)$$

The equation for DOLS methodology is defined in the equation 7, where $\vec{\beta}$ is a cointegrating vector, p and q is the lag and lead length which intended to ensure its stochastic error term independent of all past innovations in stochastic regressor (Lustrilanang et al., 2023).

4. EMPIRICAL FINDINGS

Contemporary econometric models exhibit a wide range of techniques, limitations, and perspectives. To ensure robust analysis and accurate estimation results, it is essential to first examine the nature of the data and then select the appropriate estimation model. One crucial step in this process is assessing the homogeneity of the data. Table 2 below presents the results of the Delta test (Pesaran & Yamagata, 2008). The results indicate that, at the 1% significance level, the null hypothesis of homogeneous slopes is rejected, suggesting the presence of slope heterogeneity across all four models.

Table 2: Homogeneity Tests Results

	Δ	p-value	Δ_{adj}	p-value
Model 1	9.64	0.00***	11.96	0.00***
Model 2	14.31	0.00***	17.75	0.00***
Model 3	13.84	0.00***	17.17	0.00***
Model 4	11.16	0.00***	13.84	0.00***

The next step is to test for cross-sectional dependency among the units. Table 3 below displays the results of three different cross-sectional dependence tests—LM, LM Adj., and LM CD—across the four models. The results indicate that cross-sectional dependency is present in all four models. This suggests that an external shock affecting one unit may also influence other units.

Table 3: Cross Sectional Dependence Tests Results

	LM Test		LM Adj.		LM CD	
	Statistic	P-value	Statistic	P-value	Statistic	P-value
Model 1	234.5	0.00***	8.20	0.00***	2.77	0.00***
Model 2	211.60	0.00***	5.50	0.00***	4.24	0.00***
Model 3	212.60	0.00***	5.63	0.00***	5.12	0.00***
Model 4	262.8	0.00***	11.47	0.00***	5.38	0.00***

To assess the stationarity of the variables, the Multivariate Augmented Dickey-Fuller (MADF) panel unit root test is conducted. The results for all variables are presented in Table 4 below. The null hypothesis of this test posits that all series are non-stationary. According to the results, all variables are stationary at the level, as the MADF test statistics exceed the critical values (C. V. 5%)

Table 4: Unit Root Tests Results

Variable	**MADF**	**C. V. 5%**	**Variable**	**MADF**	**C. V. 5%**
Emp	256.27	41.70	Inf	9932.49	41.70
Ser	2193.26	41.70	Pop	51369.70	41.70
Ind	361.58	41.70	Cap	960.85	41.70
Agr	5514.32	41.70	Ai	26306.76	41.70
Gdp	331.49	41.70			41.70

Before proceeding with coefficient estimations, it is crucial to verify the panel cointegration condition of the data to confirm the existence of a long-term relationship among the variables. The results of the Westerlund (2005) panel cointegration test for all four models are presented in Table 5 below. The findings indicate that, with the exception of Model 2, which pertains to the industrial sector, all models show statistically significant long-term relationships among the variables.

Table 5: Cointegration Tests

Model	Statistic	P value	Model	Statistic	P value
Model 1	1.59	0.05**	**Model 3**	2.09	0.01***
Model 2	1.12	0.13	**Model 4**	1.70	0.04**

Estimating the existence of a long-term relationship is a crucial step in assessing the robustness of a model. However, confirming only this relationship is not always sufficient. In econometric models, it is also important to determine the magnitude and direction of the relationship. Therefore, coefficient estimations are conducted for all four models. To ensure the robustness of the results, these estimations are repeated using two different econometric techniques, namely FMOLS and DOLS models.

In Table 6, the results for Model 1, which estimates the relationship between AI and general employment rates, are presented for both FMOLS and DOLS methods. For both models, the GDP variable indicates a positive relationship between the use of AI and general employment rates. In all four models, the dependent variable is in linear form, while some of the independent variables are linear and others are in natural logarithmic form. To interpret the coefficients of the logarithmically transformed variables, the coefficients are divided by 100.

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Table 6: FMOLS and DOLS Estimation of Model1

Fmols Model1

Emp	Coefficient	Standard Error	z	P> |z|	95% Coefficient Interval	
Gdp	10.37	1.54	6.70	0.00***	7.34	13.41
Inf	0.89	0.33	2.65	0.00***	0.23	1.55
Pop	-12.58	1.46	-8.57	0.00***	-15.45	-9.70
Cap	10.32	3.01	3.42	0.00***	4.40	16.23
AI	2.81	0.43	6.39	0.00***	1.94	3.67
Constant	-58.73	24.43	-2.40	0.01**	-106.62	-10.84

Dols Model1

Emp	Coefficient	Rescaled Std. Error	z	P> |z|	95% Coefficient Interval	
Gdp	10.32	1.61	6.38	0.00***	7.15	13.49
Inf	1.40	0.53	2.74	0.00***	0.41	2.50
Pop	-12.86	1.56	-8.25	0.00***	-15.92	-9.81
Cap	10.09	3.35	3.01	0.00***	3.52	16.66
AI	3.04	0.47	6.35	0.00***	2.10	3.98
Constant	-53.60	25.73	-2.08	0.03**	-104.03	-3.17

For the AI variable specifically, ceteris paribus, a 1% increase in AI innovation is projected to raise the employment rate by 0.0281 and 0.0304 point in the FMOLS and DOLS models, respectively, with a significance level of 1%. These empirical findings are consistent with the optimistic perspective in the literature. For instance, Guliyev et al., (2023) examined the relationship between AI, big data, and unemployment for G7 countries using panel econometric techniques. They found that these technologies boost productivity and capital accumulation, leading to the creation of new jobs. The authors concluded that, despite some job displacement, the overall effect of these technologies is expected to be positive for employment.

For the GDP variable, ceteris paribus, a 1% increase in GDP is projected to raise the employment rate by 0.1037 and 0.1032 point in the FMOLS and DOLS models, respectively, at a 1% significance level. Similarly, ceteris paribus, a 1% increase in inflation is expected to increase the employment rate by 0.89% and 1.4% according to the FMOLS and DOLS models, respectively. Additionally, ceteris paribus, a 1% increase in gross fixed capital accumulation is anticipated to raise the employment rate by 0.1032 and 0.1009 point in the FMOLS and DOLS models, respectively.

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These results align with expectations, as growth in GDP and gross fixed capital accumulation, along with rising inflation, generally lead to increased employment opportunities. However, both estimation methods indicate that an increase in population correlates with a decrease in the unemployment rate. Specifically, ceteris paribus, a 1% increase in population is expected to reduce the general employment rate by 0.1258 and 0.1286 point for the FMOLS and DOLS models, respectively. This may be attributed to the possibility that economic capacity might not keep pace with a rapidly growing population, potentially leading to a decline in overall employment rates in the long term.

Table 7: FMOLS and DOLS Estimation of Model2

Fmols Model2

Ind	Coefficient	Standard Error	z	P> |z|	95% Coefficient Interval	
Gdp	-3.71	1.79	-2.07	0.03**	-7.23	-0.19
Inf	0.07	0.39	0.20	0.84	-0.68	0.84
Pop	5.49	1.70	3.23	0.00***	2.15	8.83
Cap	5.88	3.50	1.68	0.09*	-0.98	12.74
AI	-1.49	0.51	-2.93	0.00***	-2.49	-0.49
Constant	18.94	28.36	0.67	0.50	-36.63	74.53

Dols Model2

Ind	Coefficient	Rescaled Std. Error	z	P> |z|	95% Coefficient Interval	
Gdp	-3.52	2.00	-1.76	0.07*	-7.46	0.40
Inf	0.09	0.66	0.15	0.88	-1.19	1.39
Pop	5.40	1.93	2.79	0.00***	1.61	9.20
Cap	5.92	4.15	1.42	0.15	-2.22	14.07
AI	-1.62	0.59	-2.74	0.00***	-2.79	-0.46
Constant	15.60	31.92	0.49	0.62	-46.96	78.16

In Model 2, which examines the relationship between AI innovation and employment rates in the industrial sector, the results for the FMOLS and DOLS models are presented in Table 7. These results reveal a divergence from those observed in the general employment rates. Specifically, for the industrial sector, an increase in AI adoption is associated with a decrease in the employment rate.

Similarly, GDP and population variables yield opposite results compared to those found in the general employment model. Although gross fixed capital

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formation shows results consistent with Model 1 in the FMOLS technique, it is not statistically significant in the DOLS technique. Additionally, the inflation variable is not statistically significant in either model. These findings should be interpreted with caution, as the earlier cointegration tests did not indicate a long-term relationship among the variables.

Table 8: FMOLS and DOLS Estimation of Model3

Fmols Model3

Ser	Coefficient	Standard Error	z	P> |z|	95% Coefficient Interval	
Gdp	6.28	2.27	2.77	0.00***	1.83	10.73
Inf	-0.04	0.49	-0.08	0.93	-1.01	0.92
Pop	-8.25	2.15	-3.83	0.00***	-12.47	-4.03
Cap	-12.71	4.42	-2.87	0.00***	-21.38	-4.04
AI	1.87	0.64	2.91	0.00***	0.61	3.13
Constant	73.30	35.82	2.05	0.04**	3.08	143.51

Dols Model3

Ser	Coefficient	Rescaled Std. Error	z	P> |z|	95% Coefficient Interval	
Gdp	5.73	2.60	2.20	0.02**	0.63	10.82
Inf	-0.10	0.85	-0.12	0.90	-1.78	1.57
Pop	-7.81	2.50	-3.11	0.00***	-12.72	-2.89
Cap	-12.37	5.38	-2.30	0.02**	-22.93	-1.81
AI	2.12	0.77	2.76	0.00***	0.61	3.63
Constant	79.43	41.35	1.92	0.05**	-1.62	160.49

In Model 3, which examines the relationship between AI innovation and employment rates in the service sector, similar results to those observed in Model 1 are noted. Specifically, ceteris paribus, a 1% increase in AI innovation is expected to raise the employment rate in the service sector by 0.018 and 0.021 point with 1% significance levels for the FMOLS and DOLS techniques, respectively. The findings for GDP and population variables in the service sector also align with those from Model 1. However, the results for gross fixed capital formation differ, likely due to the fact that increased fixed capital may replace human labor, particularly in a sector that is highly labor-intensive. Coefficient estimates for the inflation variable are not statistically significant in either technique.

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Table 9: FMOLS and DOLS Estimation of Model 4

Fmols Model4

Agr	Coefficient	Standard Error	z	P> |z|	95% Coefficient Interval	
Gdp	-2.46	0.43	-5.73	0.00***	-3.31	-1.62
Inf	0.04	0.09	0.51	0.61	-0.13	0.23
Pop	2.13	0.42	5.08	0.00***	1.31	2.96
Cap	6.07	0.85	7.11	0.00***	4.40	7.75
AI	-0.76	0.17	-4.35	0.00***	-1.10	-0.41
Constant	16.94	6.21	2.73	0.00***	4.76	29.12

Dols Model4

Agr	Coefficient	Rescaled Std. Error	z	P> |z|	95% Coefficient Interval	
Gdp	-2.20	0.93	-2.36	0.01*	-4.03	-0.37
Inf	0.004	0.30	0.02	0.98	-0.59	0.60
Pop	2.40	0.90	2.67	0.00***	0.63	4.16
Cap	6.45	1.93	3.34	0.00***	2.66	10.24
AI	-0.50	0.27	-1.81	0.07*	-1.04	0.04
Constant	4.96	14.84	0.33	0.73	-24.12	34.04

In Model 4, which examines the impact of AI innovation on the agricultural sector, the results differ from those observed in the general and service sector cases. Specifically, ceteris paribus, a 1% increase in AI innovation is expected to reduce the employment rate in the agricultural sector by 0.0076 and 0.0050 point for FMOLS and DOLS techniques, respectively. These findings are consistent with expectations. In the early stages of economic development, the agricultural sector typically holds the largest share of the economy and is highly labor-intensive. As economic development progresses and technological advancements occur, the industrial sector's share of total production increases, leading to a shift of labor from agriculture to industry and services. Countries with high levels of AI innovation are usually more technologically advanced and economically developed, and their agricultural sectors are often capital-intensive with lower employment rates. Conversely, countries with lower AI adoption, such as many in Africa and the southern hemisphere, often have highly labor-intensive agricultural sectors. Thus, as technological development and AI innovation advance, a corresponding reduction in employment rates in the agricultural sector may be observed.

A similar pattern is observed for the GDP variable, where increases in GDP are associated with a decrease in employment rates within the agricultural sector. This phenomenon likely reflects the economic development processes previously discussed. Conversely, increases in both population and gross fixed capital formation are linked to higher employment rates in agriculture. However, there is no statistically significant relationship between inflation and employment in the agricultural sector.

5. CONCLUSION AND POLICY IMPLICATIONS

This study examines the relationship between AI and employment rates across 17 countries, including those with significant AI innovation. The analysis uses data from 1998 to 2017, the most recent available. Two panel data estimators, DOLS and FMOLS, are employed to ensure the robustness of the empirical findings. To explore potential sector-specific variations, four models are estimated, covering employment rates in the overall economy, industrial sectors, service sectors, and agricultural sectors. Each model is rerun using both estimation techniques, resulting in a total of eight models. This approach aims to identify how AI impacts employment rates across different sectors. By analyzing AI's effects on various labor markets within a macroeconomic, cross-country panel data framework, this study provides a significant contribution to the literature, as no other research has investigated AI's effects on employment in different sectors in such detail, as far its known.

The findings reveal that both the DOLS and FMOLS methodologies indicate an increase in employment rates across the overall economy with the rise in AI-related patents. Similarly, in the service sector, employment rates also increase with more AI-related patents, as shown by both methodologies. Conversely, in the industrial and agricultural sectors, an increase in AI-related patents is associated with a decrease in employment rates according to both DOLS and FMOLS techniques. This suggests that while AI development may pose a threat to jobs in the industrial and agricultural sectors, it generally benefits employment in the service sector. Consequently, job losses in the industrial and agricultural sectors are offset by gains in the service sector, leading to a net positive effect on overall employment. This outcome is expected, as service sector jobs have increasingly surpassed those in agriculture and industry since the latter half of the 20th century. For instance, in the EU, 73% of jobs were in the service sector in 2021 (Eurostat), a trend also observed globally.

Based on the empirical findings, which indicate that AI does not pose a threat to the overall labor market and may even increase employment rates, it is important to revise employment policies globally. While AI appears to generate

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new employment opportunities across various sectors, particularly in the service industry, there is a need to focus policy efforts on the industrial and agricultural sectors. To fully capitalize on the new job opportunities created by AI in these sectors, employment policies should be adjusted to align with the evolving skill demands. This can be achieved through targeted training and skill enhancement programs facilitated by educational institutions. Such measures are crucial to adapting to the rapidly changing global labor markets.

6. CONFLICT OF INTEREST STATEMENT
There is no conflict of interest between the authors.

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8. AUTHOR CONTRIBUTIONS
YA: Idea, Design, Supervision, Collecting and processing resources, Analysis and interpretation, Literature review, Writer, Critical Review

9. ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS
Ethics committee approval is not required for the study.

10. REFERENCE

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YOUTH RADICALIZATION AND APPROACHES TO PREVENTION: EXPERIENCES OF YOUTH WORKERS[1,2]

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ABSTRACT| This study aims to understand youth radicalization and develop prevention-oriented recommendations based on the observations and experiences of youth workers. The research was conducted using qualitative methods and is based on semi-structured interviews with 15 youth workers from various provinces in Türkiye in 2024. Data analyzed using MAXQDA software were categorized under the themes of "Understanding Radicalization," "Factors Influencing Radicalization,", "Combating Radicalization," and "Recommendations for Preventing and Combating Radicalization." The findings reveal that youth radicalization is shaped by ideological beliefs, aggressive behaviors, and the influence of digital media. Social media use, economic deprivation, and the search for belonging are identified as key factors that increase youth susceptibility to radicalization. The study highlights the importance of education, awareness efforts, and community collaboration in combating radicalization. Critical thinking education has been found to be effective in fostering youth resilience to radical ideologies, while resource allocation and inter-institutional collaboration are deemed crucial for sustainability. The findings underline the need for comprehensive strategies to prevent radicalization effectively.

Keywords: *Radicalism, youth radicalization, youth worker, Türkiye.*
JEL Code: *F5, F52, H56*

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[1] Compliance with the ethical rules of the relevant study has been declared.
[2] This study's earlier version was presented as an abstract at the at the 4th Hitit International Congress on Security Studies, 12-14 December 2024.

GENÇLİK RADİKALLEŞMESİ VE ÖNLEME YAKLAŞIMLARI: GENÇLİK ÇALIŞANLARININ DENEYİMLERİ

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ÖZ | Bu çalışma, gençlik çalışanlarının gözlemleri ve deneyimleri temelinde gençlik radikalleşmesini anlamayı ve önlemeye yönelik öneriler geliştirmeyi amaçlamaktadır. Araştırma, nitel yöntemle yürütülmüş ve 2024 yılında Türkiye'nin çeşitli illerinden 15 gençlik çalışanıyla yapılan yarı yapılandırılmış görüşmelere dayanmaktadır. MAXQDA yazılımı kullanılarak analiz edilen veriler, "Radikalleşmeyi Anlamak," "Radikalleşmeyi Etkileyen Faktörler," "Radikalleşmeyle Mücadele," ve "Radikalleşmenin Önlenmesi ve Mücadele için Öneriler" temaları altında kategorize edilmiştir. Bulgular, gençlik radikalleşmesinin ideolojik inançlar, agresif davranışlar ve dijital medyanın etkisiyle şekillendiğini ortaya koymaktadır. Sosyal medya kullanımı, ekonomik yoksunluk ve aidiyet arayışı, gençlerin radikalleşmeye yatkınlığını artıran temel faktörler olarak tanımlanmıştır. Araştırma, radikalleşmeyle mücadelede eğitimin, farkındalık çabalarının ve toplumsal iş birliğinin önemini vurgulamaktadır. Eleştirel düşünme eğitiminin, gençlerin radikal ideolojilere karşı direnç kazanmalarını desteklemede etkili olduğu, kaynak tahsisi ve kurumlar arası iş birliğinin ise sürdürülebilirlik açısından kritik öneme sahip olduğu belirlenmiştir. Bulgular, radikalleşmenin etkili bir şekilde önlenmesi için kapsamlı stratejilere duyulan ihtiyacı vurgulamaktadır.

Anahtar Kelimeler: *Radikalizm, gençlik radikalleşmesi, gençlik çalışanı, Türkiye.*
JEL Kodları: *F5, F52, H56*

Alan: *Siyaset bilimi ve uluslararası ilişkiler*
Türü: *Araştırma*

1. INTRODUCTION

Radicalization can be defined as a process of mental and personal transformation that provides the intellectual groundwork for extremism and fundamentalism. This process encompasses the mental development of individuals who plan, execute, or legitimize actions that are violent or result in violence (Köse & Coşkun, 2019). According to Borum (2011), radicalization is the progression of extreme ideas aimed at legitimizing violence; Moghaddam (2005) describes it as a metaphorical staircase leading toward terrorism. McCauley and Moskalenko (2008) define radicalization as a set of beliefs, emotions, and behaviors that demand sacrifice for a group or cause and, in the process, legitimize violence.

Radicalization is regarded as a significant threat due to its impact on public safety, social cohesion, economic stability, and individual well-being. Horgan (2008) and Neumann (2013) highlight that radicalization can lead individuals or groups to engage in actions that harm society, potentially resulting in violent extremism and terrorist acts directed against the state or society. Furthermore, McCauley and Moskalenko (2008) suggest that radicalization undermines social cohesion by eroding trust and cooperation between groups. Economically, radicalization-driven violence can lead to workforce losses and decreased investment, impeding national development efforts (Brück & Wickström, 2004). Radicalization is also known to negatively affect individuals' physical and psychological health. Veldhuis and Staun (2009) note that radicalization can isolate individuals and drive them toward criminal behavior. Finally, Schmid (2013) argues that radicalized groups challenge democratic institutions by rejecting democratic processes and seeking to reshape society according to their ideologies. Given these factors, preventing radicalization is critical to preserving societal security and cohesion. Notably, the September 11 attacks, followed by the 2004 Madrid and 2005 London bombings, led to a marked increase in literature focused on radicalization (Dalgaard-Nielsen, 2010; Ranstorp, 2010; Neumann, 2008; Nesser, 2006).

In radicalization processes, youth emerge as a particularly vulnerable group, a subject extensively explored in the literature. Horgan (2008) notes that during their identity-seeking phase, young people are more susceptible to radical ideologies if they lose their sense of belonging. McCauley and Moskalenko (2008) emphasize that feelings of exclusion, injustice, or marginalization can accelerate the radicalization process among youth. Similarly, Sageman (2004) asserts that young individuals may be drawn to radical groups in their pursuit of social ties and friendships, while Veldhuis and Staun (2009) highlight that youth facing unemployment and socioeconomic disadvantages become prime targets

for such groups. Schmid (2013) further warns that youth participation in radical groups poses long-term threats to public safety. Consequently, developing preventive strategies that reduce young people's susceptibility to radicalization is crucial for maintaining social security.

Youth workers play a crucial role in observing young individuals, contributing to their developmental processes, and identifying potential risks at an early stage. These professionals, with continuous access to observing the social environments, behaviors, and thought patterns of young people, are positioned to detect tendencies toward radicalization at an early stage (Borum, 2011; Davies, 2008). Youth workers include social service professionals, psychologists, guidance counselors, and even academics; they guide young people's development, supporting them in cultivating positive identities and a sense of belonging (McCauley & Moskalenko, 2008). Academics, too, contribute by providing educational and personal development guidance, helping steer youth toward healthy social connections (Horgan, 2008; Verschelden, Coussée, Van de Walle, & Williamson, 2009). In this context, Schmid (2013) emphasizes the role of youth workers in fostering social inclusion, reducing feelings of exclusion among young individuals, and thereby helping to shield them from radical group influences. Veldhuis and Staun (2009) note that the positive role models offered by youth workers can prevent youth from being drawn to radical ideologies. Ultimately, youth workers serve as a preventative barrier against young individuals gravitating toward radical thoughts; by guiding them toward safe and supportive social environments, they also contribute to the future security of society. Thus, in addressing radicalization, the observations and experiences of youth workers are of particular significance.

This study is motivated by a dual contribution to the literature on radicalization. First, it seeks to generate insights into understanding and preventing youth radicalization based on the observations and experiences of youth workers. Second, it aims to provide a unique case contribution by examining radicalization within Turkey, where youth comprise a significant portion of the population, offering an alternative perspective to radicalization studies that have largely evolved in Western literature, particularly post-9/11. Accordingly, the study's objective is to understand youth radicalization through the experiences of youth workers and to offer preventative recommendations. The research questions framing this study are as follows: How is radicalization perceived? What are the factors influencing radicalization? What are the experiences in combating radicalization? What are the strategies for preventing radicalization?

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2. LITERATURE REVIEW

Radicalization, among people in Türkiye, has become an area of research interest, particularly in response to socio-political developments and the growing participation of youth in various radical factions. In Türkiye, this phenomenon has been examined through perspectives. The theory of socio-deprivation suggests that individuals from backgrounds are more susceptible to radicalization due to feelings of exclusion, by society. Conversely, as Demirden (2021) suggests, the identity crisis theory focuses on people grappling with religious identity conflicts suggesting that these challenges could lead them to embrace extremist ideologies as a form of self-expression or belonging. Social movement theory introduces another element by exploring how radicalization is influenced by the dynamics of movements and the persuasive power of leaders who can guide individuals toward extreme beliefs. In Türkiye, during the Cold War era in the 1960s and 1970s decades, there was a rise in movements mainly linked to left-wing beliefs, especially at universities where there was a surge of activism focused on anti-imperialist and socialist ideals. As it was argued in Bozarslan (2007) and Doğanoğlu (2026), various groups such as the Federation of Thought Clubs (FKF) and Workers' Party of Türkiye (TİP) played a role in engaging young people which eventually gave rise to radical factions, like the Revolutionary Youth (Dev Genç). Groups such as the People's Liberation Army of Türkiye (THKO) and the Revolutionary People's Liberation Party/Front (DHKP C) resorted to violence to further their objectives.

Ethnic radicalization has also played a significant role in Türkiye's political landscape. The Kurdist separatist movement[3], which began in the 1960s with connections to leftist ideologies, gradually evolved into an ethnically driven stance. The establishment of the Kurdistan Workers' Party (PKK) in 1978 marked a turning point in the radicalization of the Kurdist separatist movement, with a strategy of armed struggle being adopted. As Çolak (2013) argued, the actions of the PKK have had profound impacts not only on Türkiye's internal security but also on its foreign relations. The unrest in Northern Iraq and Syria provided opportunities for the PKK to strengthen its position, further complicating ethnic radicalization.

Religious radicalization in Türkiye has been influenced by the conflict between religious values and secularism during the modernization process.

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[3] The reason to use the term "Kurdist Separatist Movement" is to clarify that PKK is not the representative of Kurds and to emphasize the existence of anti-PKK ethnic Kurds and anti-PKK Kurdish movements. Similarly, Lyon and Uçarer (2001) and Köylü (2024) used Kurdish Separatist Movement to refer PKK and ethnic terrorism in Türkiye. Also to oppose the literature on this topic that mostly tends to hold PKK as "Kurdish Movement".

Organizations like Fethullah Terrorist Organization (FETÖ), Hezbollah, and ISIS represent different aspects of religious radicalization in Türkiye (Başdemir, 2013). The failed coup attempt by FETÖ in 2016 exemplifies how religious and political radicalization can intertwine, illustrating the deep impact of religious radicalization on Türkiye's social and political fabric (Avcı, 2011).

Radicalization in Türkiye has also become a key focus for researchers, particularly in response to socio-political developments and the increasing participation of youth in various radical factions. Studies have shown a strong link between youth radicalization and socioeconomic factors. Indeed, numerous research studies have found a link, between socio factors, particularly poverty, and unemployment, and the radicalization of young people in Türkiye. According to Mardin (1978) and Kaya and Koca (2024) economic hardship in Southeast Türkiye significantly contributes to radicalization among youth who are attracted to groups such as the PKK. According to Kubar (2019), gender identity and financial standing play a role in shaping the likelihood of students engaging in violent behavior while parental job loss also contributes significantly to this trend among young individuals. The research underscores the importance of implementing tailored strategies within school protocols and family environments to reduce the likelihood of violence, among adolescents. The education system also plays a role in either reducing or worsening these tendencies. Research by Aslan and Kıyıcı (2017) and Kaplan (2020) indicates that the lack of emphasis on thinking and civic education, in the curriculum creates a void that allows radical ideologies to flourish exacerbating the problem further. Indeed, deficiencies in educational access and the lack of focus on critical thinking have created fertile ground for the spread of radical ideologies (Borum, 2003; Uslu, 2021). Field research by Köse and Coşkun (2019) highlights how poverty and high unemployment rates in economically disadvantaged regions such as Southeast Anatolia are exploited by radical groups to their advantage.

The role of religious influences in the process of radicalization has been examined, particularly in the context of education and religious institutions. In Kaya and Koca (2024), religious influences play a role, in radicalization especially when examining the impact of education and institutions. While mainstream teachings in Türkiye generally discourage violence, unconventional interpretations and informal religious networks in regions can contribute to radicalization. Likewise, Doosje, Loseman and Van den Bos (2013) point out that factors like uncertainty perceived injustice, and perceived group threat are drivers of radicalization among youth.

Furthermore, Kurt (2023) delves into the political reasons, behind the radicalization of people in Türkiye with a particular focus on the impact of the

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Syrian conflict and the Kurdist separatist movement. The study introduces the concept of "habitus" to elucidate how disparities in society's perceived injustices and power dynamics between non-governmental entities play a role in fostering radical views. Based on an 18-month ethnographic investigation carried out from 2015 to 2018 in border cities between Türkiye and Syria, Istanbul, and a refugee camp in Greece this research offers an examination of how young individuals' political perspectives are influenced by their surroundings pushing them towards radicalization. It emphasizes that factors do not solely drive radicalization but is deeply rooted in the political backdrop of the area where ongoing political conflicts and power struggles create fertile ground for extremist views to take hold. Additionally, it explores how critical events like the 2014 Kobani protests act as catalysts for actions further solidifying beliefs among youth involved in various movements such, as Salafi jihadi groups and Kurdist separatist factions.

The impact of media on radicalization, particularly through the role of social media platforms in spreading ideologies, has been a focus of analysis. Scholars, like Filibeli and Ertuna (2021) and Yıldız (2020) have extensively analyzed the impact of media on promoting ideologies. Their research points to the growing trend of using platforms to recruit and radicalize individuals often bypassing traditional influencers such as family or religious figures. While exposure to media alone may not lead to radicalization a study by Wolfowitz, Hasisi and Weisburd (2022) suggests that it can play a role when combined with factors, like challenges or political concerns. These findings highlight the nature of youth radicalization shaped by socio-economic, educational, religious, and media-related elements.

Youth workers play a role, in Türkiye's efforts to prevent and combat radicalization. Our understanding of their perspectives and challenges is still developing. According to UNAOC (2016), many youth workers feel ill-equipped to address radicalization because they lack training in recognizing warning signs and engaging effectively with young people. Güneş (2020) further delves into the obstacles they encounter citing tape, limited resources, and concerns about retaliation from extremist groups as major barriers to implementing anti-radicalization initiatives. Further, Özbey (2018) claims by advocating for a more comprehensive and detailed national strategy that involves better inter-agency coordination, increased academic collaboration, and a long-term commitment to addressing the root causes of radicalization. These issues resonate on a scale well; Mattssons (2023) study in Sweden illustrates how well-meaning youth programs can inadvertently bolster criminal organizations when not properly coordinated and anticipated. Underlining the critical importance of a trauma-informed approach, Siegel, Goldberg and Pat-Horenczyk (2019) propose comprehensive

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intervention strategies across multiple levels, encompassing family, educational, and community settings, as essential to effectively countering radicalization.

Detecting radicalization poses a challenge due, to its nature as highlighted in a study by Van de Weert and Eijkman (2019) on youth workers in the Netherlands. The absence of guidelines often leads to relying on judgments, which can inadvertently lead to biases and stereotypes. This highlights the importance of having defined criteria and standardized procedures to support youth workers. Moreover, cultural sensitivity plays a role in radicalization endeavors as emphasized by Koklu, Tutuncu, Sulak and Kocak (2019) stressing the need for approaches that honor local traditions while fostering inclusivity. Collaboration among institutions is also crucial with Koklu et. al. (2019) discovering that youth workers advocate for partnerships between educational establishments, law enforcement agencies, and community groups for a comprehensive approach, to combating radicalization.

Additionally, Coppock and McGovern (2014) raise concerns, about the British Prevent policy and Channel program pointing out how these approaches can contribute to racism and Islamophobia by portraying Muslims as both vulnerable and suspicious. They suggest a reevaluation of the underlying principles of these terrorism strategies. While research has made strides in this area there are still gaps in understanding within the context. It is important to conduct studies over the term to track the progression of radicalization compare findings across various regions and nations and adopt interdisciplinary methods that incorporate perspectives from different fields. Moreover, there is a pressing need, for research involving youth workers directly in underserved communities to create effective interventions that support these frontline individuals in their critical role of preventing youth radicalization.

3. METHODOLOGY

This research, framed within the interpretive paradigm, aims to understand the processes of radicalization among youth, the factors influencing these processes, and the strategies that can be developed to counter radicalization, based on the experiences of youth workers. The interpretive paradigm posits that social reality is not characterized by a single objective truth; rather, individuals construct their own meanings through their experiences (Schwandt, 1994). This paradigm focuses on how individuals perceive and interpret the social world they inhabit. It treats social reality as dynamic, relational, and contextual, acknowledging the uniqueness of each individual's experiences and concentrating on understanding these experiences (Denzin & Lincoln, 2018). Within this framework, the qualitative research method adopted in the study

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offers a flexible approach for exploring individuals' experiences, perceptions, and the underlying meanings of these experiences in depth (Creswell, 2013). The qualitative approach provides researchers with a broader perspective for comprehending the complexities of human behavior and social phenomena, thereby contributing to a deeper understanding of complex, multifaceted social processes like radicalization.

The study is designed using the phenomenological research approach. Phenomenology aims to explore a phenomenon through individuals' experiences and perceptions, seeking to understand the essence of the phenomenon (Moustakas, 1994). In this approach, researchers strive to understand how participants experience a particular phenomenon and how these experiences reflect on their worldviews. Phenomenological research centers on individuals' lived experiences and examines how these experiences are understood in their minds and social contexts. Within this framework, the study aims to elucidate participants' subjective perceptions and experiences related to radicalization.

During data collection, semi-structured interviews were conducted with participants. Semi-structured interviews allow the researcher to follow a set of predetermined questions while also granting participants the flexibility to express their thoughts and experiences in their own words (Kvale, 2007). This method enabled participants to articulate their perspectives and experiences regarding radicalization, thereby yielding in-depth, rich data.

In qualitative research, the adequacy of sample size is evaluated based on data saturation rather than frequency. Therefore, participants should be selected in a way that best represents the research topic (Reilly & Parker, 2013; Hennink & Kaiser, 2022). In this context, purposive sampling was employed to select participants. Purposive sampling is a strategy aimed at selecting participants who can provide in-depth data relevant to the research question. This strategy involves the intentional selection of individuals who have experienced a specific phenomenon or can contribute to its understanding. In this study, criterion sampling was used within purposive sampling to select participants. Criterion sampling ensures that only individuals meeting specific criteria are included in the research (Miles & Huberman, 1994; Patton, 2002). The first criterion for participants in this study was to be youth workers who contribute to the personal, social, and educational development of young people; the second was having at least five years of experience working with youth; and the third was having encountered at least one case they identified as showing a tendency toward radicalization. This selection was made to gain valuable insights from participants' interactions with young people and their observations regarding the phenomenon of radicalization. Data saturation was achieved through 15

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interviews conducted with youth workers from various cities who met all specified criteria. In this context, data saturation in the study was achieved at the point where no new information, themes, or insights emerged during the interviews with participants, and the collected data began to repeat itself (Creswell, 2013; Guest, Bunce & Johnson, 2006). During the purposive sampling process, data saturation indicators were carefully monitored, and data collection was concluded when new information and themes ceased to emerge (Fusch & Ness, 2015).

The interview questions, designed as 21 items, aimed to explore how youth workers perceive radicalization, what factors influence radicalization, their experiences in combating radicalization, and their recommendations for addressing it. At least one structured question was developed for each theme, while other questions were open-ended and sub-open-ended. Interviews were completed between January and March 2024. The interviews were conducted online or face-to-face according to participant preferences; only participants who consented had their interviews recorded, and transcriptions were performed verbatim using a standardized transcription protocol in Microsoft Word by field staff (McLellan, MacQueen, & Niedig, 2003). Subsequently, data were analyzed through qualitative content analysis. Qualitative content analysis goes beyond merely counting words or extracting objective information from texts; it aims to uncover explicit and implicit meanings, themes, and patterns within the data. This approach enables researchers to understand social reality in a subjective yet scientific manner (Hsieh & Shannon, 2005, p. 1279; Krippendorff, 2018). In this context, participant responses to open-ended and semi-open-ended questions were subjected to an additional in-depth analysis. This approach aimed to uncover implicit meanings, perceptions, and patterns.

In this study, data were analyzed by creating main themes and sub-themes. The coding process was conducted using the MAXQDA 2024 software (VERBI, 2021), which is designed to organize, code, and analyze qualitative data systematically. Throughout the research, main and sub-codes were developed under the categories "Understanding Radicalization," "Factors Influencing Radicalization," "Combating Radicalization," and "Recommendations for Preventing and Combating Radicalization" resulting in a total of 59 codes. The coding paradigm developed by Corbin and Strauss (1990) was applied during the coding process. This paradigm provides a three-step process to organize data meaningfully: open, axial, and selective coding. In the open coding phase, key concepts in the data were identified; in the axial coding phase, relationships among these concepts were defined. Finally, in the selective coding phase, themes were synthesized in a comprehensive manner. This coding process facilitated the

systematic interpretation of the data and contributed to establishing a robust foundation for the research findings. Coding tables were prepared following Creswell's (2015) technique, including headings for main code, sub-code, definition, and example as Table 1.

The trustworthiness of the research was ensured based on the four main criteria established by Lincoln and Guba (1985): credibility, transferability, dependability, and confirmability. Credibility and dependability were enhanced through investigator triangulation; three authors collaborated in analyzing the data to ensure the accuracy and consistency of the findings. Additionally, the analysis, supported by direct quotations, contributed to the reliable representation of participants' experiences. The involvement of researchers from the fields of international relations, political economy, and sociology further supported these principles. Transferability was achieved by providing detailed information on purposive sampling, research context, and participant demographics. Lastly, confirmability was established through comparative analysis among researchers. Each of these criteria played a critical role in ensuring the reliability of the research.

Table 1: Example Coding Table

Main Code	Sub code	Description	Example
Indicators	Sympathy for radical tendencies	Interest in and involvement with radical actions, ideas, and groups	Showing interest in or joining radical groups and promoting their propaganda. (K3)
Indicators	Isolation	Individual and social isolation, withdrawal	It can be observed that individuals lose group motivation, show a tendency to act more individually, exhibit shyness in expressing themselves at certain points, prefer to stay outside societal motivations, and make this a habit. These are potential indicators. (K13)
Indicators	Changes	Changes in individuals' beliefs, religious views, ideologies, social environment, and appearance	In my work with young people, I define "radicalization" as an extreme and rapid change in an individual's beliefs, attitudes and behavior influenced by a political, religious, or ideological framework. (K7)
Indicators	Discriminatory tendencies	Exclusionary and marginalizing approaches on any issue (such as religion, race, sect, gender, appearance, etc.)	Radicalized youth may begin to use overly ideological or discriminatory language and fiercely defend a particular ideology. They may harbor intense feelings of hostility and hatred towards certain groups, societies, or countries. Radicalized youth may justify or use violence to defend a particular ideology. (K9)
Indicators	Aggressive tendencies	Aggression, anger, tendency toward violence, intolerance, manifestation of aggression in discourse and actions, peer bullying, general state of dissent, and becoming closed off to communication	Indicators to watch for include tendencies towards various forms of violence (verbal, physical, psychological, etc.) and instances of peer bullying. (K1)

3.1. Ethical Permission for the Research

All rules specified within the "Scientific Research and Publication Ethics Directive for Higher Education Institutions" were adhered to in this study. None of the actions specified under the "Actions Contrary to Scientific Research and Publication Ethics" section of the directive was carried out. For ethical evaluation regarding the study's content, methodology, and measurement instruments, an application was submitted to the Ankara Yıldırım Beyazıt University Social and

Human Sciences Ethics Committee. Ethical approval was granted during the committee's meeting held on April 24, 2024, under decision number 04-387.

4. FINDING AND DISCUSSION

In this study, semi-structured interviews were conducted with 15 youth workers from different cities and various professional backgrounds. The interviews were carried out either online or face-to-face, based on the participants' preferences. To ensure participant confidentiality, each individual was assigned a code name. Table 2 provides the profiles of the participants. The data were analyzed using MAXQDA 2024 software and categorized into main and sub-codes (N=59) under the themes of "Understanding Radicalization," "Factors Influencing Radicalization," "Combating Radicalization," and "Recommendations for Preventing and Combating Radicalization."

Table 2: Participant Profile

Participant	Occupation	Professional Experience (years)	City
K1	Teacher	25	Bursa
K2	Public Sector Employee	8	Sivas
K3	High School Teacher	10	Afyon
K4	Psychologist	5	Hatay
K5	Think tank researcher	8	İstanbul
K6	Project Coordinator	6	Mardin
K7	Project Director	12	Konya
K8	NGO Worker	7	Diyarbakır
K9	Academic	13	Çorum
K10	NGO Worker	6	Antalya
K11	Academic	14	Ankara
K12	NGO Volunteer Worker	7	İzmir
K13	Academic	12	Sakarya
K14	Music Teacher	15	Trabzon
K15	Sports Instructor	15	Kocaeli

4.1. Understanding Radicalization

Under this theme, efforts are made to understand how radicalization is perceived by youth workers and how their awareness is interpreted. Additionally, the study investigates how youth workers assess the approach of society and government toward radicalism. Eight main codes were created under this theme. The distribution percentages of the main codes related to this theme are shown in

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Figure 1. Accordingly, it is observed that participants have more insights into the effects, indicators, and understanding of radicalization. While these codes focus on how radicalization is perceived, other codes reveal the stance of the country and the approach of youth workers.

Understanding Radicalization

Category	Percentage (frequency)
Effects	22% (39)
Indicators	21% (37)
Understanding	17% (31)
Youth workers' perspective	13% (23)
Increasing prevalence	10% (17)
Government's attitude	8% (15)
Motivation of Youth Workers	7% (13)
Community's attitude	2% (3)
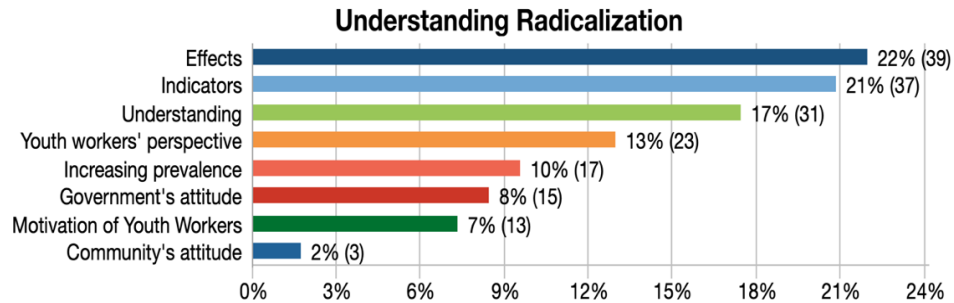
Figure 1: Distribution of Main Codes Within the Theme

In Figure 2, the frequencies of all sub-codes are provided, expanding the analysis. According to these results, the "increasing prevalence" code (f=17) indicates the presence of radicalization tendencies in Türkiye. Indeed, the government is aware of this and thus does not remain indifferent, implementing "combative" (f=10) measures. However, whether these measures are sufficient could be debated with the "inadequate" (f=5) code. While youth workers agree that society does not have a positive approach toward radicalization, they lack sufficient observations regarding society's approach. Youth workers have experienced perceptual "changes" (f=10) and increased awareness (f=13) during their work processes and generally approach their work on radicalization from a youth-focused perspective (f=7).

Understanding Radicalization	
Increasing prevalence	17
Youth workers' perspective	
Increased awareness	13
Perceptual change	10
Community's attitude	
Positive approach	
Negative approach	3
Government's attitude	
Combative approach	10
Inadequate approach	5
Uninterested	
Effects	
Emotional negativity	5
Shallow thinking	3
Structural problems	6
Insecurity	6
Separation	10
Social conflict	9
Indicators	
Sympathy for radical tendencies	6
Isolation	6
Changes	9
Discriminatory tendencies	5
Aggressive tendencies	11
Understanding	
Non-normative	3
Demand for change	4
Rigid beliefs	7
Aggression	6
Threat	3
Limited positivity	2
Process	6
Motivation of Youth Workers	
Youth-focused	7
Community-focused	2
Values-driven	4

Figure 2: Frequencies of Sub-Codes

For example:

"In recent years, there has been significant radicalization, especially concerning political events. Youth often display blind loyalty to specific political groups. Additionally, some young people become radicalized by the ideas they encounter on certain websites, especially if these ideas are

presented by well-known individuals, even if the information is incomplete or incorrect." (K3)

"In my country, measures are taken to correct the errors that trigger radicalization, but these are not sufficient." (K2)

The participants' statements align with the definitions of radicalization in the literature. McCauley and Moskalenko's (2008) conceptualization of radicalization as beliefs requiring sacrifice corresponds with K3's observation of "blind loyalty" among youth. Borum's (2011) emphasis on the progression of extremist ideas, along with Yıldız (2020) and Filibeli & Ertuna's (2021) findings on the influence of social media, supports the participants' references to digital platforms. K2's critique of the insufficiency of government measures resonates with Güneş's (2020) findings on resource inadequacies, while the participants' recognition of government awareness reflects Özbey's (2018) call for a comprehensive national strategy. K3's emphasis on the impact of political events is consistent with Kurt's (2023) analysis of Kobani protests as catalysts for radicalization. Additionally, Köse and Coşkun's (2019) research on economic disadvantages corroborates observations of increasing tendencies toward radicalization. While the findings are broadly aligned with the literature, they highlight a need for further exploration of societal roles and the adequacy of governmental responses.

Table 3: Prominent Terms in the Sub-Codes of Understanding

Sub-Code	Frequencies of the Top Two Words in Coded Segments
Non-normative	-Associations, Illegal, Legal, Process (f=2)
Demand for change	-Often, Political, Structures (f=3)
Rigid beliefs	-Political (f=5) -Ideology (f=4)
Aggression	-Students (f=5) -Violent (f=4)
Threat	-Individuals (f=3) -Coup, Ideology, Poses, Tools, Witnessed (f=2)
Limited positivity	-Form (f=4) -Norms (f=3)
Process	-Extreme, Political, Social (f=4) -Defined (f=3)

Youth workers have primarily defined radicalization as "rigid beliefs", "aggression", and as a "process." Table 3 shows the frequency of the top two terms in the sub-coded texts of "Understanding". The association of the "rigid beliefs" code with terms like "political" and "ideology" indicates that radicalization develops on a political and ideological basis. Similarly, the prominence of terms such as "students" and "violent" with the "aggression" code suggests that radical tendencies, especially among students, may be closely linked with violence. These findings highlight the extent to which political, ideological, and violent tendencies are influential in the radicalization process. The "process" sub-code draws attention to radicalization being defined as an extreme, political, and social process.

The "non-normative" code points to the connections that youths establish with legal processes and illegal structures in their involvement in radical processes. This suggests that youths become more inclined toward non-normative behaviors when they experience discord with existing social and political structures. Similarly, the demand for political changes under the "demand for change" code emerges as a factor reinforcing youths' relationship with radical thoughts. These findings are critical for understanding how the motivational factors behind radicalization are shaped by the desire for changes in social and political structures. For example:

> "The most dominant feature of radicalism is the unwavering belief in the absolute correctness of one's ideology. There is a passionate effort to see other criticisms, ideologies, and lifestyles as definitely wrong and faulty, and to eliminate them in some way. (K15)

> "In the context of my work, I define "radicalization" as the process where young people significantly deviate from mainstream social, political, or religious beliefs and resort to extreme or violent methods to challenge these beliefs." (K11)

Youth workers' definitions of radicalization align closely with the theoretical frameworks found in the literature. McCauley and Moskalenko (2008) describe radicalization as a combination of beliefs, emotions, and behaviors demanding sacrifice for a cause, which resonates with the participants' emphasis on "rigid beliefs" and "aggression." The association of "political" and "ideology" with rigid beliefs mirrors the findings of Borum (2011), who highlights the progression of extreme ideas legitimizing violence. Furthermore, Köse and Coşkun (2019) emphasize how ideological and political motivations often underpin radical behaviors, supporting the participants' observations regarding students' violent tendencies. The participants' description of radicalization as a "process" aligns with Moghaddam's (2005) staircase metaphor, where

radicalization unfolds as a gradual progression influenced by social, political, and personal factors. The connection between "non-normative" behaviors and discord with existing structures also finds support in Sageman's (2004) research, which discusses how feelings of exclusion and marginalization can drive individuals toward radical groups. Similarly, the role of dissatisfaction with political structures, reflected in the "demand for change" code, aligns with Kurt's (2023) findings on the impact of political events like the Kobani protests in catalyzing youth radicalization. These findings collectively underline the importance of addressing the socio-political and ideological dimensions of radicalization. The motivational factors identified—such as discord with existing systems and demands for political change—highlight the need for strategies that promote inclusion and address structural inequalities, as emphasized by Veldhuis and Staun (2009).

Table 4: Prominent Terms in the Sub-Codes of Indicators

Sub-Code	Frequencies of the Top Two Words in Coded Segments
Sympathy for radical tendencies	-Social (f=5) -Groups, Media (f=4)
İsolation	-Family, Friend, Groups, Withdrawal (f=2)
Changes	-İdeological (f=5) -Radicalized (f=4)
Discriminatory tendencies	-Rights, Day (f=6) -Labor, students, theme (f=4)
Aggressive tendencies	-Day, Language, Use (f=5) -Labor, Violence (f=4)

In the "indicators" sub-codes, the signs of radicalization are associated with various social and ideological transformations, as shown in Table 4. The high frequency of the "Sympathy for radical tendencies" code with terms such as "social", "groups", and "media" underscores the importance of social media and group dynamics in the dissemination and manifestation of radical thoughts. Additionally, the "isolation" and "discriminatory tendencies" codes indicate that individuals become more susceptible to the radicalization process through social disconnection and the adoption of discriminatory thoughts. These findings provide significant insights into how radicalization is shaped through social isolation, discrimination, and media influence. For example,

"Labels of radicalization are often seen in young people's behavior and discourse. These include showing interest in radical ideologies, justifying violence, isolation and loneliness, using radical language, associating with radical groups, emotional and psychological changes and excessive use of computers and the Internet." (K6)

The findings highlight key indicators of radicalization, offering insights distinct from its influencing factors. The frequent co-occurrence of the "Sympathy for radical tendencies" code with terms such as "social," "groups," and "media" emphasizes the role of social media and group dynamics in the manifestation of radical ideologies, aligning with Yıldız (2020) and Filibeli and Ertuna (2021). Similarly, the "isolation" and "discriminatory tendencies" codes underscore how social disconnection and discriminatory behaviors serve as observable signs of individuals' susceptibility to radicalization. K6's observations, such as the use of radical language, justification of violence, isolation, emotional changes, and excessive internet use, reflect behaviors that correspond with Borum's (2011) discussion on the psychological and social changes associated with radicalization. These indicators provide a framework for identifying the early stages of radicalization and suggest the need for targeted strategies to address these specific manifestations.

Table 5: Prominent Terms in the Sub-Codes of Effects

Sub-Code	Frequencies of the Top Two Words in Coded Segments
Emotional negativity	-Different, Groups, Ideologies, Social (f=3) -Anger (f=2)
Shallow thinking	-Ability, develop, individual (f=2), -Multi-dimensionally, Achieve (f=1)
Structural problems	-Democracy, Social (f=5), -Society (f=4)
Insecurity	-Social (f=8) -Democratic (f=4)
Separation	-Social (f=9) -Polarization (f=8)
Social conflict	-Social (f=12) -Society (f=7)

According to youth workers' observations, the effects of radicalization (Table 5) predominantly manifest as "separation" and "social conflict". In areas coded as "separation", the prominent terms "social" and "polarization" indicate that radicalization leads to social fragmentation. Similarly, in areas coded with "social conflict", there is an emphasis on society. In areas coded as "emotional negativity", the high frequency of terms such as "different", "groups", "ideologies", "social", and "anger" highlights the emotional impacts of radicalization on youth and underscores the importance of managing these effects. Additionally, an examination of other coded areas suggests that radicalization could pose a threat to democratic and social norms. For example,

"Radicalization increases polarization among youth and closes communication channels, leading to communication problems. Consequently, tolerance levels decrease. More broadly, radicalization can cause societal divisions and conflicts, create a general atmosphere of insecurity and fear, lead to violent or dangerous actions, weaken democratic values, and negatively impact the future of the youth involved." (K3)

According to youth workers' observations, the effects of radicalization primarily manifest as "separation" and "social conflict," as reflected in Table 5. The prominence of terms such as "social" and "polarization" under the "separation" code highlights how radicalization fosters social fragmentation. Similarly, the "social conflict" code underscores the societal implications of radicalization, emphasizing its role in exacerbating discord. In areas coded as "emotional negativity," frequent terms like "different," "groups," "ideologies," "social," and "anger" illustrate the emotional toll radicalization takes on youth, pointing to the need for interventions to manage these effects. K3's observations align with these findings, noting that radicalization not only increases polarization and communication barriers but also erodes tolerance, undermines democratic values, and poses long-term risks to societal cohesion and youth well-being. These observations echo the literature, including McCauley and Moskalenko's (2008) emphasis on the societal and emotional disruptions caused by radicalization, as well as Schmid's (2013) warnings about its impact on democratic and social norms.

4.2. Factors Influencing Radicalization

The data from this theme reveal how various factors influencing the radicalization process are perceived by youth workers.

Factors Influencing Radicalization

Media and internet	37% (32)
Personal quests	17% (15)
Economic factors	14% (12)
Social environment	10% (9)
Negative experiences	9% (8)
Political climate	8% (7)
Family	3% (3)
Inadequate education	1% (1)

0% 4% 8% 12% 16% 20% 24% 28% 32% 36% 40%
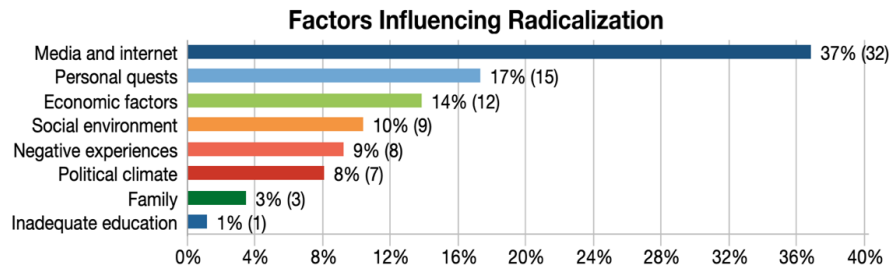
Figure 3: Distribution of Main Codes Within the Theme

The observations of youth workers align with the literature on factors influencing radicalization, as shown in Figure 3. The most influential factor, "media and internet" (37%), is associated with terms such as "social" (f=57) and "ideas" (f=19), emphasizing the role of social media and shared ideologies in spreading radical views. Yıldız (2020) and Filibeli and Ertuna (2021) highlight the significant role of digital platforms in exposing young people to radical ideologies, supporting these observations. K1 exemplifies this by stating, "One of the clearest examples I have observed is the rapid spread and adoption of radical ideas through social media platforms and the internet… youth from various nationalities and beliefs are being recruited by terrorist organizations like ISIS through social media." This finding illustrates how digital media catalyzes radicalization by fostering a sense of community and belonging among youth.

Table 6: Prominent Terms in Coded Areas

Main Code	Frequencies of the Top Two Words in Coded Segments
Economic factors	-Social (f=11) -Family (f=5)
İnadequate education	-
Negative experiences	-Political, Society (f=5) -Polarization (f=4)
Political climate	-Family (f=5) -Society (f=4)
family	-Crises, Economic, İdentity (f=2)
Personal quests	-Groups (f=9) -Identity (f=8)
Media and internet	-Social (f=57) -Ideas (f=19)
Social environment	-Social (f=10) -Economic (f=4)

Additionally, "personal quests" (17%) and "economic factors" (14%) play critical roles. Within "personal quests," terms such as "groups" (f=9) and "identity" (f=8) indicate that the search for belonging drives young people toward radical groups. McCauley and Moskalenko (2008) argue that the need for identity and belonging is a key motivator in radical engagement. K4 supports this by stating, "The primary cause of radicalization is the struggle for emotional independence, identity formation, and the search for acceptance." Economic difficulties, often associated with terms such as "social" (f=11) and "family" (f=5), further exacerbate vulnerability to radicalization, consistent with Köse and Coşkun's (2019) findings on how deprivation and social exclusion drive youth toward radical groups.

These findings reveal the multidimensional nature of radicalization, shaped by digital media, economic challenges, and identity needs. The high frequency of codes like "negative experiences" (e.g., "political" and "society," each f=5) and "political climate" (e.g., "family" f=5, "society" f=4) suggests that young individuals experiencing societal polarization are more susceptible to radical ideologies. Schmid (2013) supports this perspective, noting how social fragmentation and threats to democratic values accelerate radicalization. Consequently, comprehensive strategies are essential, including mitigating online influences, providing economic support, and fostering inclusive social environments to reduce youth vulnerability to radicalization.

4.3. Combating Radicalization

The data related to this theme elaborate on the challenges faced in combating radicalization and the effectiveness of the methods employed.
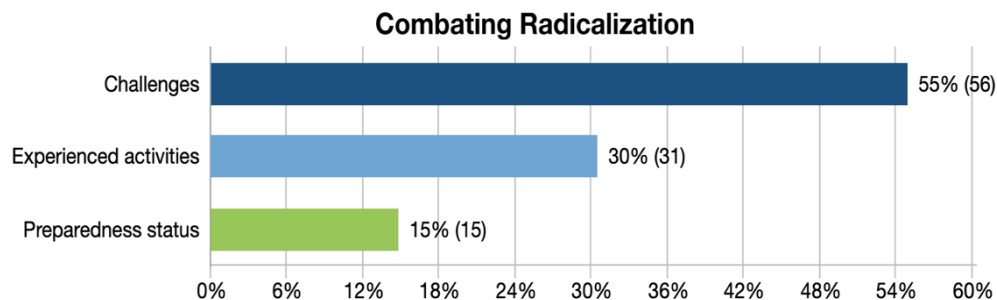
Figure 4: Distribution of Main Codes Within the Theme

As seen in Figure 4, youth workers encounter more challenges than activities when dealing with radicalization.
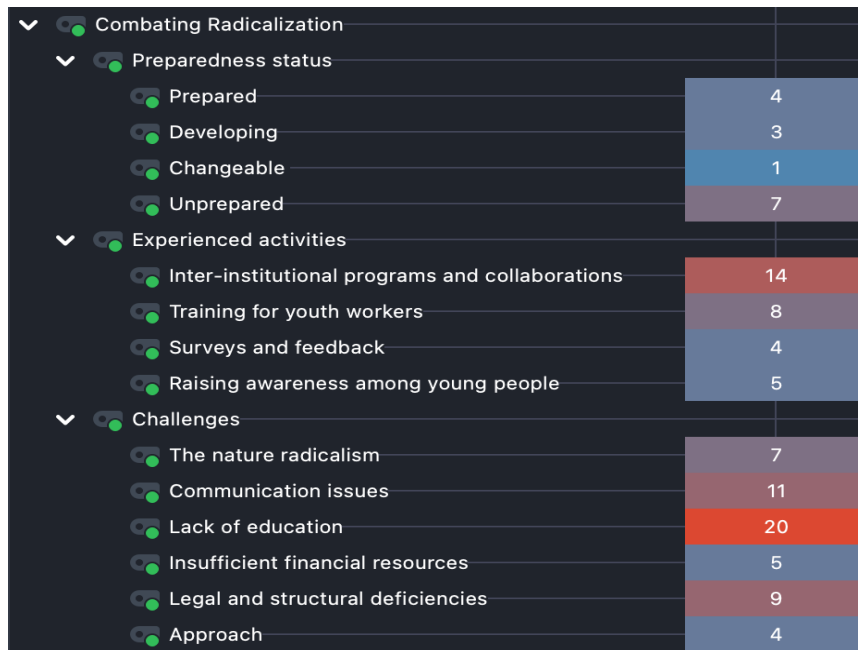
Figure 5: Frequencies of Sub-Codes

The frequency of sub-codes in Figure 5 reveals that youth workers often lack full preparedness and resources when it comes to countermeasures. The most commonly experienced activity involves inter-institutional programs and collaborations, while the most significant challenge identified is the lack of adequate training.

Table 7: Prominent Terms in the Sub-Codes of Challenges

Sub-Code	Frequencies of the Top Two Words in Coded Segments
The nature radicalism	-Difficult (f=6) -Signs (f=5)
Communication issues	-Student/s (f=7) -Difficulty, Significant (f=3)
Lack of education	-Training (f=17) -Received (f=10)
İnsufficient financial resources	-Groups (f=6) -Difficult (f=4),
Legal and structural deficiencies	-Student, Training (f=4) -Groups, İmportant (f=3)
approach	-Societal (f=4) -Social (f=3)

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The challenges in combating radicalization, as illustrated in Table 7, align with various factors highlighted in the literature. The "nature of radicalism" code reflects the inherent complexity of radicalization and the difficulty in recognizing its signs. The frequent occurrence of terms such as "difficult" and "signs" underscores how challenging it is to fully grasp radicalism and identify early indicators. This aligns with Dalgaard-Nielsen's (2010) emphasis on the multidimensional nature of radicalization, which complicates early intervention efforts, particularly for those working with youth. The "communication issues" code reveals significant barriers to effectively engaging with at-risk youth. Terms such as "student" and "difficulty" highlight how communication becomes increasingly strained as young individuals become more susceptible to radicalization. K1 explains, "I believe new generations think differently from us, which makes communicating in their language essential in prevention efforts. Achieving this requires effective strategic communication." Benotman and Malik (2016) similarly emphasize the importance of tailored communication strategies that resonate with youth, noting that adaptive communication is essential for successful counter-radicalization efforts.

The "lack of education" code highlights vulnerabilities created by deficiencies in knowledge and training among those combating radicalization. The frequent use of "training" reflects critical gaps in the preparedness of youth workers. As K12 states, "Not everyone working in this field has a background in sociology, social work, or psychology; people come from a variety of professions. This results in a lack of training." Ranstorp (2009) underscores the importance of education programs in fostering resilience against radical ideologies, asserting that a lack of structured training leaves youth more susceptible to extremist influences. These findings suggest that expanding education and training programs aimed at increasing awareness and prevention is crucial.

Finally, the "insufficient financial resources" and "legal and structural deficiencies" codes highlight systemic barriers to effective counter-radicalization efforts. Limited resources and gaps in the legal framework hinder youth workers' ability to implement comprehensive interventions. Githens-Mazer and Lambert (2010) note that financial constraints and inadequate legal support significantly impede sustainable action in this field. Addressing these challenges requires increased resource allocation and policy reforms to support youth workers' efforts effectively.

These findings underscore the complexity of combating radicalization and highlight the need for comprehensive strategies addressing early detection, effective communication, and structural support. Such strategies are essential to

enhance the effectiveness of intervention efforts and mitigate the vulnerabilities that contribute to radicalization.

Table 8: Prominent Terms in the Sub-Codes of Experienced Activities

Sub-Code	Frequencies of the Top Two Words in Coded Segments
Inter-institutional programs and collaboration	-Projects, Universities (f=9) -Organization (f=7)
Training for youth workers	-Awareness (f=6) -Programs (f=5)
Surveys and feedback	-Impact, Project (f=5) -Participations (f=4)
Raising awareness among young people	-Legal (f=5) -Educational, Political (f=3)

The experiences of youth workers in combating radicalization, as illustrated in Table 8, are based on various practices and align with findings in the literature. The "inter-institutional programs and collaboration" code emphasizes the importance of collaboration with different institutions and organizations in efforts to prevent radicalization. The frequent use of terms such as "projects" and "universities" under this code indicates that joint projects are being conducted with stakeholders such as local authorities, educational institutions, civil society organizations, and law enforcement agencies. K7 highlights the significance of these collaborations: "We work in close cooperation with other institutions and organizations in our efforts to prevent radicalization. We carry out joint projects with stakeholders such as local authorities, educational institutions, civil society organizations and law enforcement agencies. Working together, we develop more comprehensive and effective strategies to prevent radicalization among young people." Relevant literature, including research by Schmid (2013) and Githens-Mazer (2010), supports the idea that inter-institutional collaboration enhances the effectiveness of anti-radicalization efforts and allows for the development of more comprehensive strategies.

The "training for youth workers" code demonstrates the positive impact of training sessions and workshops on radicalization and extremism for youth workers. The prominence of terms like "awareness" and "programs" reflects how these trainings help youth workers understand the radicalization process, identify its signs, and develop effective intervention strategies. K9 shares, "I attended training courses and workshops on radicalization and extremism. These trainings

and workshops helped me understand the process of radicalization, identify its symptoms, evaluate risk factors, and develop effective intervention strategies, helping me to work more consciously and actively on radicalization as a youth worker." This finding supports Borum's (2011) work, which underscores the importance of education and awareness in recognizing signs of radicalization and strengthening prevention efforts.

The "surveys and feedback" code highlights the significance of evaluating the impact of interventions and collecting feedback from participants. The frequent use of terms like "impact" and "project" indicates a need for assessing the effectiveness of anti-radicalization programs. Similarly, in the "raising awareness among young people" code, the emphasis on terms like "legal" and "educational" reflects the importance of educational and legal awareness efforts in increasing understanding of radicalization. Ranstorp (2009) highlights the critical role of educational and legal awareness programs in protecting youth from radicalization.

These findings reflect the experiences gained by youth workers in combating radicalization. Inter-institutional collaboration, training programs, and feedback mechanisms contribute to the development of more effective strategies by youth workers and enhance awareness among young people. These experiences highlight the significant role that youth workers play in strengthening the resilience of young people against radical ideologies.

4.4. Recommendations for Preventing and Combating Radicalization

Under this theme, the needs and recommendations of youth workers regarding the prevention and combatting of radicalization were examined.

Recommendations for Preventing and Combating Radicalization

Category	Percentage
Education for young people	35% (28)
Counseling services for young people	14% (11)
Collaboration	14% (11)
Policies	13% (10)
Resource provision	11% (9)
Political and social participation	10% (8)
Local governments	1% (1)
Training for youth workers	1% (1)
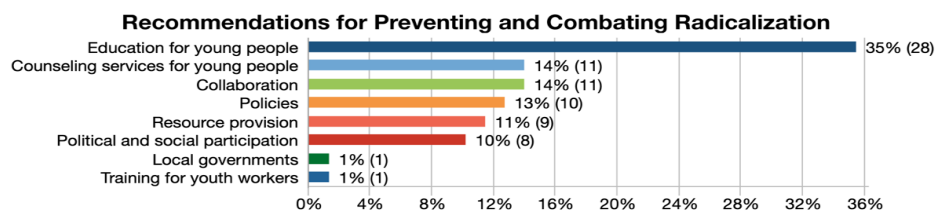
Figure 6: Distribution of Main Codes Within the Theme

According to the distribution in Figure 6, the most critical need identified is the education of youth. Following this, counseling services for youth also emerged as a significant requirement. These findings suggest a recommendation to develop a youth-centered approach to combating radicalization. Furthermore,

the importance of supporting these efforts with policies and collaboration was emphasized.

Table 9: Prominent Terms in Coded Areas

Main Code	Frequencies of the Top Two Words in Coded Segments
Training for youth workers	-Education (f=4) -Important (f=3)
Resource provision	-Resources (f=10) -Support (f=9)
Counseling services for young people	-Programs (f=8) -Support (f=7)
Local governments	-Councils (f=4) -Government, Represented (f=3)
Political and social participation	-Social (f=7) -Communication, Effective (f=5)
Collaboration	-Support (f=9) -Organizations, Resources (f=5)
Policies	-Resource (f=4) -Education, Important, Necessary (f=3)
Education for young people	-Awareness (f=14) -Media (f=12)

The recommendations of youth workers for combating radicalization align with the findings in Table 9 and are supported by the literature. The "Education for young people" code emphasizes the critical role of education in raising awareness and preventing radicalization. K2 states, "I think training that raises awareness about social media use would support efforts to prevent radicalization," highlighting the importance of awareness programs focused on social media usage for young people. This recommendation aligns with Borum's (2011) emphasis on the role of awareness and education in radicalization prevention efforts.

The "Resource provision" code highlights the importance of financial support for anti-radicalization projects. The frequent use of terms like "resources" and "support" underscores the necessity of funding for such initiatives, as expressed by K9: "In our work to address radicalization among young people, we need more financial resources for projects that aim to combat radicalization, raise awareness of youth workers on this issue, and develop effective communication and intervention strategies with young people with radical views." This aligns

with Githens-Mazer and Lambert's (2010) findings on how financial support limitations restrict the sustainability of counter-radicalization efforts.

The "Counseling services for young people" code underscores the importance of supportive services to reduce the risk of radicalization among youth. K4 emphasizes that "Effective strategies include providing education and awareness programs that focus on critical thinking, promoting emotional independence, and offering opportunities for young people to engage in positive social activities," thus highlighting the value of supportive counseling and engagement programs. This recommendation is consistent with Dalgaard-Nielsen's (2010) findings on the importance of social and psychological support programs for youth in countering radicalization.

The "Local governments" and "Political and social participation" codes underscore the importance of collaboration with stakeholders such as families, community leaders, and civil society organizations in the fight against radicalization. K6 expresses this by saying, "It is important to collaborate with stakeholders such as families, schools, community leaders and civil society organizations. I think it is important to educate and raise awareness among young people about the dangers of radicalization." This recommendation aligns with Schmid's (2013) findings on how community cooperation enhances the effectiveness of anti-radicalization strategies.

These recommendations demonstrate that youth workers require multifaceted approaches, including education for young people, financial support, counseling services, and community collaboration, to develop effective strategies in combating radicalization. Such comprehensive approaches contribute to raising awareness among young people and enhancing their resilience against radical ideologies.

5. CONCLUSION

This study provides significant contributions to the literature by addressing the complex dynamics of youth radicalization in Turkey, offering valuable insights from the perspectives of youth workers who play a pivotal role in understanding and combating this phenomenon. Youth radicalization, as supported by primary data and literature findings, is identified as a multidimensional issue driven by various social, economic, political, and psychological factors. Employing qualitative methods, the study focuses on the experiences and observations of youth workers, revealing that radicalization is influenced by rigid ideological beliefs, aggressive behaviors, the impact of digital media, economic inequalities, and societal fragmentation. By uncovering the socio-economic and cultural background of radicalization, the study sheds light on the unique conditions of Turkey.

The findings emphasize the critical importance of education, resource allocation, counseling, and collaboration across different societal sectors in mitigating risks associated with radicalization. Youth workers highlight the necessity of developing targeted communication strategies for young people, providing financial support, and creating specialized training programs. These recommendations align with previous studies that underscore the importance of a multidimensional approach to addressing the root causes of radicalization and fostering resilience among vulnerable youth populations.

The results also underline the necessity of inter-agency collaboration, involving local governments, educational institutions, and civil society organizations, in combating radicalization. The study's recommendations for enhancing awareness, strengthening support structures, and promoting inclusive policies reflect a holistic approach aimed at reducing the appeal of radical ideologies. This framework advocates for comprehensive prevention strategies that address both socio-economic and ideological dimensions, offering actionable insights for practitioners and policymakers.

However, the limitations of the study should be acknowledged. The relatively limited number of participants and the focus on a single national context constrain the generalizability of the findings. Future research could expand the knowledge base in this field through larger-scale studies, diverse methodologies, and comparative analyses conducted across different socio-cultural contexts. In particular, the influence of digital media on youth behaviors and the evolving dynamics of radicalization emerges as critical areas for further exploration.

In conclusion, this study examines interviews with youth workers, structured under four key themes: "Understanding Radicalization," "Factors

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Influencing Radicalization," "Combating Radicalization," and "Recommendations for Preventing and Combating Radicalization." By focusing on the critical role of youth workers in understanding and addressing youth radicalization, the study offers valuable perspectives. It provides both theoretical and practical insights, laying a foundation for the development of comprehensive prevention strategies that tackle the root causes of radicalization while fostering inclusive and supportive environments for youth development.

6. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

7. FINANCIAL SUPPORT

8. AUTHOR CONTRIBUTIONS

Oğuzhan Bilgin conceptualized the study, developed the theoretical framework, and supervised the research process. He also contributed significantly to the data analysis and interpretation. Merve Zorlu was responsible for conducting the semi-structured interviews, transcribing the data, and performing analysis using MAXQDA. She also contributed to the drafting of the manuscript and integrating the findings into the broader context of the literature. Recep Yorulmaz led analysis and supported the development of the coding framework. He provided critical feedback on the manuscript and helped refine the overall structure of the article. Additionally, all authors were involved in the oversight of transcription and coding as required by the study's methodology. All authors participated in the review and approval of the final manuscript.

9. ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS

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

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İKLİM DEĞİŞİKLİĞİNİN ÖNLENMESİNDE GIDA VE TARIMA İLİŞKİN DAVRANIŞ DEĞİŞİKLİĞİ TEMELLİ AZALTIM STRATEJİLERİ[1]

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ÖZ

Sanayi Devrimi sonrası artan antropojenik aktiviteler nedeniyle iklim değişikliğinin Dünya üzerindeki etkisi her geçen gün daha da artmaktadır. Yapılan araştırmalar, iklim değişikliği krizinin artık devrilme noktasına ulaştığını göstermektedir. Ekosistemlerde, küresel yüzey sıcaklıklarında ve iklim sistemlerinde çok büyük yıkıcı etkileri olan bu noktanın aşılması, gezegenimiz için telafisi mümkün olmayan sonuçlarla karşılaşmak anlamına gelmektedir. Bu durum önümüzdeki yüzyıl boyunca iklim değişikliğinin başat sebebi olarak bilinen sera gazı emisyonların azaltılmasının önemini daha da arttırmıştır. Bu çalışmada Paris Anlaşması'nda koyulan ve 2050 yılında gerçekleştirilmek istenen net sıfır karbon hedefine ulaşabilmek için gıda ve tarıma ilişkin bireysel davranış değişikliği temelli azaltım stratejileri üzerinde durulmuştur. Davranış değişikliklerinin hangi şartlarda ne kadar zamanda ve ne tür etkiler oluşturabileceği ılımlı ve iyimser senaryolar çerçevesinde aktarılmıştır. Nihayetinde ise gıda ve tarıma ilişkin davranış değişikliği temelli azaltım stratejilerinin, ulusüstü kuruluşlar ve devletler tarafından teşvik edilip uygun altyapıların oluşturulması halinde, başarıya ulaşılabileceği yargısına ulaşılmıştır.

Anahtar Kelimeler: *Küresel ısınma, iklim değişikliği, gıda ve tarım, azaltım stratejileri, davranış değişikliği*
JEL Kodlar: *Q54, Q18, D1*

Alan: *Siyaset bilimi ve kamu yönetimi*
Türü: *Araştırma*

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[1] İlgili çalışmanın etik kurallara uygunluğu beyan edilmiştir.

MITIGATION STRATEGIES BASED ON BEHAVIORAL CHANGE REGARDING FOOD AND AGRICULTURE IN PREVENTING CLIMATE CHANGE

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ABSTRACT | The impact climate change on Earth due to increasing anthropogenic activities after the Industrial Revolution is increasing day by day. Research shows that the climate change crisis has now reached the tipping point. Exceeding this point, which has huge devastating effects on ecosystems, global surface temperatures and climate systems, means facing irreparable consequences for our planet. This situation has further increased the importance of reducing greenhouse gas emissions, which are known to be the main cause of climate change over the next century. Study focused on mitigation strategies based on behavioral change regarding food and agriculture in order to achieve the net zero carbon target set in the Paris Agreement. The effects of behavioral changes are explained within the framework of moderate and optimistic scenarios. Finally, it was concluded that mitigation strategies based on behavioral change regarding food and agriculture can be successful if certain conditions are met.

Keywords: *Global warming, climate change, food and agriculture, mitigation strategies, behavior change*
JEL Codes: *Q54, Q18, D1*

Scope: *Political science and public administration*
Type: *Research*

1. GİRİŞ

Küresel ısınma ve iklim değişikliği etkilerini hayatın her alanında günden güne gün daha da fazla hissettirmektedir. Halen tartışılıyor olsa da küresel ısınma ve iklim değişikliğinin sebebinin büyük oranda antropojenik faaliyetlerden kaynaklandığı; matematiksel hesaplamalara dayandırılan iklim modelleri ve öngörülerle bilimsel olarak kanıtlanmış durumdadır (IPCC, 2023). 18. yüzyılın ikinci yarısına kadar oldukça istikrarlı bir gelişim gösteren yeryüzü sıcaklıkları ve iklim değişiklikleri, bu tarihten itibaren yaşanan Sanayi Devrimi sonrası artan insan aktiviteleri neticesinde çağımızın en önemli küresel sorunu halini almıştır. 20. yüzyıldan bu yana iklim sistemlerinde yaşanan hızlı değişimler dünyamızda geriye dönülmez geniş çaplı yıkıcı etkilere yol açmıştır. Söz konusu değişimler, dünyamız üzerinde yüzbinlerce yıl sürecek ciddi ve geri dönüşü hasarlara yol açarak, yerkürenin her bir köşesindeki canlıların yaşamını tehdit eder hale gelmiştir.

Küresel ısınma ve iklim değişikliği ile mücadele edebilmek, enerji ve gıda üretim şeklinden, mal ve hizmetleri tüketme biçimine kadar ekonomideki üretim ve tüketim sistemlerinin dönüşümünü gerektirmektedir. Bu değişim ve dönüşümün çoğunun merkezinde hükümetlerin verecekleri kararlar ve büyük endüstrilerin üretim anlayışındaki değişiklikler yer almaktadır. Bu makro ölçekli değişim ve dönüşümlerin yanı sıra birey, hane halkı ve topluluk düzeyindeki davranış değişikliklerinin de küresel ısınma ve iklim değişikliği ile mücadelede büyük farklar oluşturabileceği son zamanlarda bilim insaları, sivil toplum örgütleri ve araştırma kuruluşlarınca kabul edilmektedir.

Kamuoyundaki algı, küresel ısınma ve iklim değişikliği gibi çok büyük ölçekli bir sorun karşısında bireysel girişim ve çabaların etkisinin önemsiz olduğu yönündedir. İnsanlar arasında yaygın olan görüş, küresel ısınma ve iklim değişikliği gibi çok boyutlu ve kapsamlı bir krizin çözümünün kişisel gayretlerin ötesinde, milletlerarası iş birliğinden ve ulusüstü şirketlerin üretim politikalarından geçtiğidir. Ancak bireysel davranış değişikliklerinin milyarlarca insan tarafından ele alındığında belirleyici bir fark yaratma kapasitesi olduğu da bir gerçektir.

Küresel emisyonların neredeyse üçte ikisinin insan tüketiminin hem doğrudan hem de dolaylı biçimleriyle alakalı olduğu düşünüldüğünde, davranış değişikliklerinin oluşturabileceği etkilerin küçümsenmemesi gerektiği açıkça görülecektir. Doğal kaynakların tüketimi noktasında verilecek kararlar neticesinde değişen insan davranışları, küresel sera gazı emisyonlarının azalmasına muazzam bir katkı sağlayabilecektir. Ancak, böylesi radikal değişiklikleri insanlara kabul ettirebilmek başlı başına çok zor süreçleri içermektedir. Öncelikle yapılması gereken bireyleri, haneleri ve toplulukları

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harekete geçirmenin yenilikçi yollarının bulunmasıdır. Böylece insanların yaşam rutinlerine yerleşmiş olan üretim ve tüketim kalıplarını değiştirmek mümkün olabilecektir.

Küresel ısınma ve iklim değişikliğinin etkilerini azaltmaya yönelik geleneksel çözümler; kapsamlı küresel iklim politikalarında reform yapmak, tarım ve sanayi üretimindeki aşırı kaynak kullanımında istikrar sağlamak, ekonomik teşvik uygulamaları ve bilinçlendirme faaliyetleri etrafında toplanmıştır. Bunların her biri, küresel ısınmayı durdurmaya yönelik dünya çapındaki çabanın önemli bileşenlerindendir. Ancak insanları etkileyip, uzun yıllar boyunca edinmiş oldukları alışkanlıklarından onları vazgeçirmek yukarıda sayılan çözüm kalıplarından daha karmaşık ve zor süreçleri içermektedir.

Davranış bilimine getirilen yeni anlayışlar, insanları neyin motive ettiğine dair kabullerimizi değiştirmiş durumdadır. Yeni yapılan çalışmalar insan davranışlarında duyguların sanıldığından daha büyük bir rol oynadığını göstermiştir. Günümüzde duygularımız, karar alma süreçlerimiz üzerinde oldukça belirleyici olabilmektedir. Evrimsel biyolojideki gelişmeler ise bize insanların doğası gereği sosyal hayvanlar olduklarını ve insanlar arasındaki kişisel çıkarların bir zamanlar varsayıldığından çok daha karmaşık olduğunu göstermiştir. Nitekim, insanlar bugün olduğu gibi eskiden de doğru koşullar altında iş birliğine yatkın bir yaşam biçimi benimsemişlerdi. Günümüzde de insanların karar verme süreçleri, karar verilen bağlamsal ortamdan ve seçimlerin bize sunulma biçiminden güçlü bir şekilde etkilenmektedir. Bu yüzden insanların üretim ve tüketim alışkanlıklarının değişmesini sağlamak için, duygusal çekiciliği, sosyal teşvikleri ve seçim mimarisinin gücün ön plana çıkarılmalıdır. Değişmesi istenilen alışkanlığın insanların bulundukları yerdeki şartlara göre yenilikçi çözümlerle tasarlanması gerekir.

Bilim insanlarının büyük çoğunluğu, küresel ısınma ve iklim değişikliğinin temel nedeninin insanlar olduğu ve bu sürecin benzeri görülmemiş bir hızla gerçekleştiği konusunda hemfikirdirler (IPCC, 2021). Küresel ısınma ve iklim değişikliğinin en olumsuz sonuçlardan kaçınmak, üzerinde anlaşmaya varılan küresel sıcaklık hedeflerine ulaşmak ve harekete geçmek için artan siyasi iradeye ihtiyaç duyulmaktadır. Ancak küresel ısınma ve iklim değişikliği sadece siyasi iradenin getireceği kısıtlamalar ve alacağı önlemlere bırakılamayacak kadar büyük bir sorundur. Bu yüzden sorun tüm insanların ortak meselesi haline gelmelidir. Bu çalışmada sera gazı azaltımına yönelik gıda ve tarım alanındaki bireysel davranış değişikliklerinin ne ölçüde sera gazı emisyonlarını azaltabileceği ortaya koyulmaya çalışılmıştır. Bu kapsamda, 2020-2050 yılları arasında küresel sera gazı emisyonlarının "net sıfır karbon" hedefine ilişkin olarak davranışsal çözüm önerilerinin işe yarayıp yaramayacağı tartışılmıştır.

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Çalışmada öncelikle, küresel ısınma ve iklim değişikliğinin antropojenik faaliyetler nedeniyle mi yoksa iklim ve yerkürenin kendi iç dinamikleri neticesinde mi gerçekleşip gerçekleşmediği en son bilimsel veriler ışığında tartışılmıştır. Daha sonra ise küresel ısınma ve iklim değişikliğinin etkilerini azaltmaya yönelik gıda, tarım ve arazi kullanımına ilişkin bireysel insan davranışlarının neler olabileceği, bu davranış değişikliklerinin oluşturdukları etki miktarları ile açıklanmıştır. Son olarak ise hangi şartlar altında bireysel davranış değişikliğinin küresel çapta bir etki yaratabileceği üzerinde durulmuştur.

2. KAVRAMSAL ÇERÇEVE
2.1. Küresel Isınma ve İklim Değişikliğinin Doğal ve Yapay Nedenleri

Dinamik bir yapıya sahip olan iklimler, dünyanın varoluşundan bu yana sürekli olarak değişmiş, hiçbir dönemde statik bir yapıya dönüşmemiştir. 2,5 milyon yıl önce Pleistosen döneminde başlayan buzul çağlarında ortalama sıcaklılar günümüzden 5°C ila 10°C daha soğuk, yağışların daha az ve havanın da azalan yağışların etkisiyle daha kuru olduğu tahmin edilmektedir. Buzul çağının yaşandığı pleistosen dönem yaklaşık 10.000 veya 14.000 yıl önce sona ermiş ve Dünya'da buzullar arası Holosen çağı başlamıştır. Bu dönemin başlarında iklimin günümüze nazaran daha nemli ve yağışlı bir özellik gösterdiği, sıcaklıkların ise günümüze göre birkaç derece daha yüksek olduğu tespit edilmiştir (Erol, 1979). Bu farklılıklar bölgesel ve yerel ölçekte daha da fazla olmuştur. Tarih öncesi görülen bu değişimlerin, o dönemlerdeki insan nüfusu ve aktivitesi göz önüne alındığında, doğal süreçlerin bir sonucu olarak ortaya çıktığı kesin bir şekilde söylenebilir.

İklim ve hava durumu çoğu zaman birbiri yerine yanlış şekilde kullanılabilen terimler olmalarına rağmen; bambaşka durumları ifade etmektedirler. Hava durumu denildiğinde; atmosferde oluşan meteorolojik olaylar anlaşılmalıdır. Başka bir deyişle hava durumu; belirli bir bölgede, belirli ve kısa bir zamanda oluşan soğuk, sıcak, yağmurlu, karlı ve rüzgârlı gibi atmosfer koşullarıdır. Hava durumu havanın o andaki fotoğrafıdır. Bir yerdeki hava durumu tanımlanırken birden fazla iklim faktörü aynı anda yaşanıyor olsa bile en baskın iklim faktörü hava durumunu belirler. Yani hava durumunun "yağmurlu" olarak ifade edilmesi havanın aynı zamanda bulutlu ya da rüzgârlı olmadığı anlamına gelmez.

İklim ise belirli bir yerde uzun dönemler boyunca gözlemlenen meteorolojik olayların (sıcaklık, hava basıncı, yağış, rüzgâr vb.) ortalamasıdır. İklim hakkındaki genel kanılar, hava durumundan farklı olarak belirli bir bölgenin meteorolojik faaliyetlerinin uzun periyodlara ayrılarak takip edilmesiyle

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oluşur. Bir bölgenin iklimi o bölgenin yeryüzü şekillerine, rakımına, konumuna göre değişebilmektedir.

İklim sistemleri ise atmosfer (havaküre), hidrosfer (suküre), kriyosfer (buz küre), litosfer (taşküre) ve biyosferin (yaşamküre) birbiriyle etkileşiminden oluşan karmaşık süreçleri içermektedir. İklim sistemleri tarihsel süreç içerisinde kendi iç dinamikleri ve dış etmenler nedeniyle (doğal faktörler) değişime uğrayabildiği gibi antropojenik faaliyet nedeniyle de (yapay faktörler) değişebilmektedir. İklim değişikliğine neden olan doğal faktörler biyolojik, astronomik, kimyasal ve jeolojik faktörler şeklinde 4 gruba ayrılabilir.

İklim değişikliğinin biyolojik nedenlerinden birisi olarak 2,5 milyar yıl önce bakterilerde fotosentez yeteneğinin gelişmesi neticesinde atmosferdeki oksijen seviyelerinin katlanarak arttırması görülmektedir. Dünyanın eksen eğikliği (presesyon), eliptik yörüngesi (eksantrisite) ve güneş etrafındaki yörünge değişikliği (inklanasyon) iklim değişikliğinin astronomik nedenlerindendir (PNAS, 2020). Yine güneşte meydana gelen, nükleer ve manyetik değişimler de dünyadaki iklim sistemi bileşenlerini doğrudan etkileyerek iklim değişikliğine yol açan kimyasal nedenleri oluşturmaktadır (PNAS, 2020). Son olarak volkanik faaliyetler (Fahey vd., 2017) sonucu yaşanan püskürmeler, üst atmosferde güneş ışığını yansıtan ve yüzeyi soğutan küçük parçacıkların (aerosoller) sayısını artırmak suretiyle iklimde birkaç yıllık değişimlerin yaşanmasına sebep olabilmektedir (IPCC, 2021, s. 515). Bu ise iklim değişikliğinin doğal jeolojik nedenlerindendir.

Küresel ısınma ve iklim değişikliğinin doğal nedenleri zaman periyodlarına ayrılarak değerlendirildiğinde, bu değişimlerin iklim üzerindeki etkisi genellikle çok sınırlı kalmaktadır. 1850–2020 döneminde doğal nedenlerin küresel yüzey sıcaklığında -0,23°C ila +0,23°C arasında bir değişime sebep olduğu tespit edilmiştir. Aynı dönemde doğal süreçlere antropojenik faaliyetlerin eklenmesi ile ortaya çıkan 1,1°C'lik küresel yüzey sıcaklığı, doğal süreçlerin bu sıcaklık artışlarındaki payının çok az olduğunu göstermektedir (IPCC, 2021, s. 515).
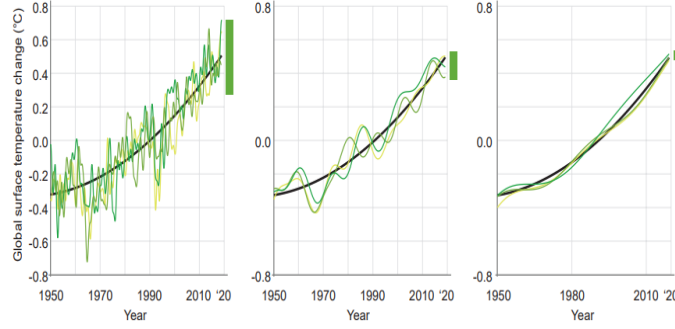
Şekil 1: Doğal Nedenlerin İklim Değişikliğine Etkisi (Yıllık, 10 yıllık, 30 yıllık)
Kaynak: IPCC, 2021, s. 518.

Yukarıdaki grafiklerde de görülebileceği üzere, doğal faktörlerin, küresel yüzey sıcaklığını etkileyebilme yeteneği süre uzadıkça azalmaktadır. Başka bir deyişle doğal faktörler küresel yüzey sıcaklıklarını hissedilir şekilde birkaç yıl içerinde etkileyebilmektedir. Ancak bu etki, uzun zaman periyodları içerisinde minimum olmaktadır (IPCC, 2021, s. 518). İnsanların atmosfer üzerindeki 150-200 yıllık yoğun baskısı ise tüm çağlar boyunca en yüksek seviyelere ulaşmıştır. Yeryüzünün ısınma süreci, geçmiş dönemlerden farklı olarak çok kısa bir süre içerisinde gerçekleşmiştir.

Antropojenik faaliyetler sonucu atmosfere salınan; su buharı (H_2O), karbondioksit (CO_2), metan (CH_4), azotoksit (N_2O), ozon (O_3) ve kloroflorokarbonlar (FCF_s) gibi sera gazları, iklim değişikliğinin yapay faktörlerini oluşturmaktadır. Salınan bu gazlar, atmosferde bulunan ve dünyayı yaşanabilir kılan doğal sera gazı dengesini bozmaktadır. Bu durum geçmiş dönemlerde doğal olarak yaşanan iklim değişikliği ile açıklanamayacak düzeyde iklimin değişmesine sebep olmaktadır.

İklim sistemlerine ilişkin olarak yapılan çok sayıdaki bilimsel değerlendirmede, antropojenik sera gazı emisyonlarının artmasının, 20. yüzyılın ortalarından bu yana küresel ısınmanın temel nedeni olduğunu göstermektedir (UNEP, 2017; American Chemical Society, 2013). Dünya atmosferindeki sera gazı konsantrasyonları tarih boyunca değişerek yalnızca son 650.000 yılda yedi buzul ilerlemesi ve geri çekilmesi döngüsüyle sonuçlanmıştır. Oysa bugün gözlemlenen hem sera gazı konsantrasyonlarında hem de küresel sıcaklıktaki hızlı artış, değişen zaman dilimlerinde gözlemlenen herhangi bir oranla kıyaslanamayacak seviyelere ulaşmıştır.

Sera gazı salınımındaki artışlar, fosil yakıt kullanımının artması, tarımsal alanlarda kimyasal gübre ve ilaçların miktarının çoğalması, donmuş ve suya doymuş toprağın eriyerek içerdiği organizmaların çürümesi gibi gelişmelerle

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açıklanabilmektedir. Diğer taraftan doğal karbon yutakları olan orman, okyanus ve toprakların hızla bozulması da karbon saklama kapasitesini azaltarak, atmosferdeki sera gazı salınımını arttırmaktadır (American Chemical Society, 2013).

Son dönemdeki iklim değişikliği üzerindeki insan etkisine dair bilimsel kanıtlar, Uluslararası İklim Değişikliği Paneli (IPCC) İkinci Değerlendirme Raporu'ndan, IPCC Beşinci Değerlendirme Raporu'na kadar güçlenerek kamuoyunun taktirine sunulmuştur. IPCC İkinci Değerlendirme Raporu (SAR, 1995), elde edilen kanıtların, küresel iklim üzerinde fark edilebilir bir insan etkisinin olduğunu göstermiştir. Daha sonraki değerlendirmelerde (TAR, 2001; AR4, 2007; & AR5, 2013), iklim sistemi üzerinde insanın etkisine ilişkin kanıtların giderek güçlendiği tespit edilmiştir. Beşinci değerlendirme raporunda (AR5), iklim sistemi üzerindeki insan etkisinin açık olduğu, atmosferdeki antropojenik sera gazı konsantrasyonunun artmasıyla küresel ısınma ve iklim değişikliği arasında doğrudan bir ilişkinin gözlemlendiğini açıklanmıştır.

2.2. İklim Değişikliği ile Mücadelede Davranışsal Değişiklikler

Küresel ısınma ve iklim değişikliğinin yıkıcı etkilerini azaltabilmek, bu soruna sebep olan faktörleri ortadan kaldırabilme yeteneği ile doğru yönde gelişim gösterir. Küresel ısınma ve iklim değişikliği ile mücadele yöntemlerinden olan azaltım stratejileri de büyük oranda birey ve hanehalklarının enerjiyi, tarım/orman arazilerini ve doğal kaynakları kullanım şekillerine ilişkin davranış biçimleriyle ilgilidir.

İnsanların doğadaki sınırlı kaynakları kullanarak ürettiği mal ve hizmetlerin üretim şekli sera gazı emisyon miktarı açısından ne kadar önemli ise, bu mal ve hizmetlerin tüketim şekli de sera gazı emisyon miktarı için en az o kadar önemlidir. Nitekim yaşayan her bireyin doğal kaynakların sunduğu imkânlar çerçevesinde üretilen ürün ve hizmetleri tüketme biçimini zorla da olsa değiştirmesinin, sera gazı emisyonlarını ölçülebilir miktarda azalttığı Covid 19 Pandemi sürecinde deneyimlenmiştir (Smith, Tarui & Yamagata 2021).

Covid 19 Küresel Salgın döneminde sera gazı emisyon miktarında gözle görülür düzeyde azalma tespit edilmiştir. Salgın döneminde verilen kapanma kararları insan aktivitesini ciddi oranda azaltmıştır. Uluslararası hava taşımacılığına ve sanayileşmeye getirilen kısıtlamalar, CO_2 emisyonlarının önemli ölçüde düşmesine sebep olmuştur (Kumar vd., 2022). 69 ülkedeki altı ekonomik bölgeye ilişkin emisyon verilerinin analiz edildiği bir çalışmada, 2019 yılındaki ortalama CO_2 emisyon miktarının, Nisan 2020 dönemi itibari ile günlük olarak toplam %17 oranında azaldığı tespit edilmiştir. Ayrıca, 2020 yılının ilk çeyreğinde fosil yakıt tüketiminden kaynaklanan CO_2 emisyonlarında 2019 yılının ilk çeyreğine kıyasla %7,8 oranında bir düşüş yaşanmıştır (Liu, Ciais,

Deng, Lei, Davis, Feng & Schellnhuber, 2020).

Bu çalışmada sera gazı emisyonlarını azaltmaya yönelik getirilen çözümlerin birçoğu birey veya hane düzeyindeki üretim ve tüketim kalıplarına dayanmaktadır. Bazı araştırmacılar, bu tür bireysel davranış değişikliklerini, sera gazı emisyonlarını azaltmak için gerekli adımlar olarak kabul etmekle birlikte, oluşturabilecekleri etki bakımından daha kötümser yaklaşımlar sergileyebilmektedirler (Dietz, Gardner, Gilligan, Stern, & Vandenbergh, 2009; Socolow & Pacala, 2006). Bazı araştırmacılar ise 2020-2050 dönemini kapsayan 30 yıl içerisinde Paris İlkim Anlaşması'nda koyulan küresel hedeflere ulaşabilmek için bireysel davranış kalıplarının ve alışkanlıkların değiştirilmesinin büyük fark yaratacağına inanmaktadır (Hawken, 2017).

Bireysel davranış değişikliklerinin küresel ısınma ve iklim değişikliği ile mücadelede fark oluşturabilmesi için bu davranış kalıplarının kitlesel olarak benimsenmesine yardımcı olacak altyapıların oluşturulması şarttır. Oluşturulacak fiziki, ekonomik ve sosyal altyapının yanı sıra bu davranış kalıplarının benimsenmesini kolaylaştıracak gerekli politika, düzenleme, teşvik ve sübvansiyonların hükümetler ve ulusüstü kuruluşlarca halka sunulması gereklidir. Birey ve hanehalklarının tüketim ve davranış alışkanlıklarını benimseme noktasında gösterecekleri istek de sera gazı emisyon miktarını azaltım hedefi için belirleyici olacaktır.

Bireysel davranış değişikliklerinin küresel ısınma ve iklim değişikliğinin etkilerini azaltma potansiyelini ortaya koyabilmek amacı ile beşeri faaliyetler 2 başlık altında sistematize edilmiştir (gıda, tarım ve arazi yönetimi). Bu başlıklar altında ise bireysel ve hanehalkı düzeyindeki davranış değişikliklerinin sera gazı emisyonunu ne oranda düşürebileceği yapılan bilimsel araştırma ve ölçümlerle karşılaştırmalı olarak gösterilmiştir. 2 başlık altında sayılan çözümlerden pirinç tarımı ve geri dönüşüm uygulamalarındaki davranış değişikliklerinin tek başına 2020-2050 dönemi için makul senaryoya göre 393 GtCO2-eq; iyimser senaryoya göre ise, 729 GtCO2-eq sera gazının salınımını azaltacağı hesaplanmıştır (Hawken, 2017).

Aynı matematiksel modelin kullanıldığı bir diğer tahminde ise, söz konusu davranış değişikliklerinin tamamının 2020-2050 dönemine ilişkin toplam karbondioksit eşdeğeri sera gazı emisyonlarını 1979 GtCO2-eq azaltması beklenmektedir (Kriegler, Riahi, Bauer & Schwanitz, 2015). Bu davranış değişikliklerinin sera gazı emisyonlarını 2020-2050 döneminde %19,9 ila %36,8 oranında düşürerek, sanayi öncesi döneme kıyasla 2°C hedefine ulaşılabileceği belirtilmiştir (Hawken, 2017). Azaltım stratejisi olarak benimsenmesi istenen davranış değişiklikleri, sadece küresel ısınma ve iklim değişikliği ile mücadelede kullanışlı bir araç olarak değerlendirmek, söz konusu davranış değişikliklerinin

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etkilerini küçümsemek anlamına gelebilir. Nitekim hayatın her alanına tesir edebilecek olan bu değişikliklerin ekonomi, sağlık ve refah düzeyi üzerinde de önemli etkileri uzun vadede görülecektir.

3. ARAŞTIRMA YÖNTEMİ

Çalışmada doküman analizi yöntemi kullanılmıştır. Nitel araştırma yöntemlerinden doküman analizinin kullanılmasının sebebi, yazılı ve elektronik belgelerin içeriğini titizlikle ve sistematik olarak analiz etmeye imkân vermesidir. Ayrıca doküman analizi, küresel ısınma ve iklim değişikliği ile mücadelede bireysel davranış değişikliklerinin oluşturacağı etkilerin neler olabileceğini öngörebilmek ve konu hakkında yorum yapabilmek için kapsamlı verilerin incelenmesini gerektirmesi nedeniyle bu çalışma kapsamında kullanılmıştır. Çalışmada; bireysel davranış değişikliklerine ve bunların 2020-2050 yıllarını kapsayacak şekilde oluşturacağı etkiler hakkında bilgi içeren yazılı, sözlü ve görsel materyaller, matematiksel modellemeler, iklim projeksiyonları ve geleceğe ilişkin iklim senaryoları incelenmiştir. Doküman analizi için gereken nicel veriler ise Birleşmiş Milletler Çevre Örgütü (UNEP), Uluslararası İklim Değişikliği Paneli (IPPC), Birleşmiş Milletler Gıda ve Tarım Örgütü (FAO) rapor, Dünya Sağlık Örgütü (WHO) ve ABD Ulusal Çevre Bilgi Merkezi (NOAA) gibi uluslararası teşkilatların bülten, yayın, rapor ve bölgesel araştırmalarından elde edilmiştir.

4. ARAŞTIRMA BULGULARI
4.1. Gıdaya ve Gıda Tüketimine İlişkin Davranışsal Değişiklikler

Gıda üretimi, küresel sera gazı emisyonlarının yaklaşık dörtte birini (%26) oluşturmaktadır (Poore & Nemecek, 2018). Yine Dünya'da üretilen gıdaların yaklaşık dörtte biri tedarik zincirlerinde meydana gelen bozulmalar/fireler nedeniyle; üreticiler, tedarikçiler, perakendeciler, restoranlar ve tüketiciler tarafından israf edilmektedir (Searchinger, Waite, Hanson , Ranganathan & Matthews, 2019). Bu gıdaları üretmek için toprağa, suya, enerjiye ve gübreye ihtiyaç duyulduğundan gıda tüketilirken tüm bu girdilerin çevresel maliyetine de katlanmak zorunda kalınmaktadır.

Varlığımızı sürdürmenin en öncül gereklerinden olan beslenme şeklimiz; neyi nasıl pişirip tükettiğimizden, sofradan arta kalanları nasıl imha ettiğimize kadar, edinmiş olduğumuz davranışsal alışkanlıklarımıza bağlı olarak, sera gazı emisyonları üzerinde önemli etkiler oluşturmaktadır. Bu yüzden küresel ısınma ve iklim değişikliği ile mücadelede, gıdalar ve bunların tüketimi temelinde oluşturulan azaltım stratejileri önemli bir yer tutmaktadır. Tarımla bağlantılı olan bu çözümler, özellikle bireysel davranış değişikliğine büyük ölçüde bağımlı olan

gıda tedarik zincirini hedef almaktadır (IPCC, 2014). Gıda ve gıda tüketim temelli çözümlere yatırım yapmanın çok boyutlu sonuçları ortaya çıkabilmektedir. İnsan sağlığının iyileştirilmesi, gıda güvenliğinin sağlanması ve tarım arazilerinin verimli hale getirilmesi gibi insan refahını arttıracak olumlu gelişmeler bu çok boyutlu sonuçlardan bazılarıdır.

4.1.1. Gıda israfının önlenmesi

Tarımsal ürünlerin üretiminden tüketime kadar uzanan gıda tedarik zinciri boyunca gıda kaybını ve israfını en aza indirmek, gıda güvenliği ve kıtlık gibi sorunlar dikkate alındığında hayati önem taşımaktadır. BM Gıda ve Tarım Örgütü (FAO), insan tüketimi için üretilen küresel gıdaların üçte birinin nihai tüketicilere ulaşmadan kullanılmaz hale geldiğini söylemektedir. Bu israfın yılda 4,4 GtCO2-eq sera gazına, insan kaynaklı toplam sera gazı emisyonlarının ise yüzde %6 ila %8'ine sebep olduğu tahmin edilmektedir (Poore & Nemecek, 2018; FAO, 2014). Bu durum, gıda atıklarından kaynaklanan küresel emisyonların neredeyse küresel karayolu taşımacılığından kaynaklanan emisyonlara eşdeğer olduğu anlamına gelmektedir. Ayrıca, FAO kişi başına düşen milli geliri yüksek olan ülkelerde gıda israfından kaynaklanan kişi başına düşen emisyon miktarının, kişi başına düşen milli geliri düşük olan ülkelerdekinin iki katından fazla olduğunu söylemektedir.

Gıda israfı, tedarik zincirinin tüm aşamalarında meydana gelebilmektedir. Ancak gıda israfından kaynaklanan en yüksek karbon ayak izi, nihai tüketimde ortaya çıkmaktadır. Nihai tüketimde ortaya çıkan israf, toplam gıda israfının %22'sine karşılık gelirken, bu israf toplam emisyonların %35'inden fazlasını oluşturmaktadır. Bu durumun yaşanmasının sebebi, gıda tedarik zincirinin en sonunda oluşan gıda israfının, karbon yoğun özelliğinden kaynaklanmaktadır (FAO, 2015).

Gelişmekte olan ülkelerde gıda israfının çoğu üretimde ve tarımsal ürünlerin sevkiyatı sırasında meydana gelmektedir. Gelişmiş ülkelerde ise tüketiciler, bazı gıdaların görüntüsünü beğenmemekte veya gıdaların son kullanma tarihinin yaklaşması nedeniyle bu gıdaları tüketmek istememektedirler (Parfitt, Barthel & Macnaughton, 2010). Gıda israfını önlemeye yönelik davranış değişikliklerinin 2050 yılına kadar toplam 70,5 GtCO2-eq ila 93,7 GtCO2-eq sera gazının salınımını azalması beklenmektedir (Bajzelj, Richards, Allwood, Smith, Dennis, Curmi & Gilligan, 2014; Wollenberg, Richards, Smith & Havlik, 2016).

4.1.2. Vejetaryen beslenme alışkanlığı

Hayvancılık faaliyetleri, sera gazı emisyonlarının önemli bir kaynağını oluşturmaktadır. Bitki temelli gıdaların beslenmede öncelikli tercihler arasına girmesi hayvansal ürünlere olan talebin azalmasına sebep olacaktır. Böyle bir talep azalışı ise, arazilerdeki kirlenmeleri, mera alanları oluşturmak için girişilen

ormansızlaşma faaliyetlerini, gübre kullanımını ve dolayısıyla da sera gazı emisyonlarını azaltacaktır. Et, tavuk ve süt gibi hayvansal proteinler yerine diyetlerde daha fazla meyve, sebze, tahıl ve baklagiller grubundan gıda ürünlerine yer verilmesi, insan sağlığı açısından olumlu sonuçlar ortaya çıkarırken, lokal besin kaynaklarının da dengeli şekilde tüketilebilmesine fırsat tanıyacaktır (Gerber, Steinfeld, Mottet, Opio, Dijkman, Falcucci, & Tempio, 2013).

Büyükbaş hayvan tarımı, ortaya çıkan azot, karbondioksit ve metan gibi sera gazları nedeniyle hayvancılık sektöründeki sera gazı emisyonlarının %60'ından fazlasını atmosfere salmaktadır. Diğer kümes ve çiftlik hayvanlarının üretimi sürecinde ise %15 ila %20 oranında sera gazı emisyonu ortaya çıkmaktadır (Ranganathan, Vennard, Waite, Dumas, Lipinski & Searchinger, 2016). Dünya Kaynakları Enstitüsü'ne (WRI) göre, 2009 yılında kişi başına küresel ortalama protein tüketimi tüm dünyadaki beslenme gereksinimlerini aşmıştır. Hayvansal besin tüketiminin çok fazla olduğu ABD ve Avustralya gibi ülkelerde, ortalama bir kişi, hayvansal gıda tüketimini azaltarak beslenmeyle ilgili emisyonları %45 oranında düşürebilecektir (Ranganathan vd. 2016). Sebze ve tahıl ağırlıklı beslenme şeklinin benimsenmesi, günlük 2.300 kalorilik bir beslenme programının takip edilmesi ve mümkün oldukça yerel olarak üretilen yiyeceklerin tüketilmesinin, küresel sera gazı emisyonunu 2030 yılına kadar yılda yaklaşık 1,5 GtCO2-eq, 2050 yılına kadar ise toplam 66,1 GtCO2-eq ila 87 GtCO2-eq kadar azaltması beklenilmektedir (Stehfest, Bouwman, van Vuuren, den Elzen, Eickhout & Kabat, 2009).

4.1.3. Daha çevreci yemek pişirme yöntemleri

Yemek pişirmek, Dünya'nın neresinde ve hangi şartlarda yaşarlarsa yaşasınlar, insanların günde en az bir ya da iki kez tatbik etmek zorunda oldukları hayat rutinlerinden birisidir. Yemek pişirip ailece bir sofranın etrafında toplanmak aileleri bir araya getiren, kültürel ve sosyal öneme sahip bir etkinliktir. Yemek pişirilirken kullanılan ısı kaynakları ülkelerin gelişmişlik düzeyine göre farklılık gösterebilmektedir. Bugün büyük çoğunluğu az gelişmiş ya da gelişmekte olan ülkelerde olmak üzere yaklaşık üç milyar insan (WHO, 2016) yemeklerini genellikle odun ya da kömürün kullanıldığı, açık ocaklarda, fırınlarda, sobalarda veya kuzinelerde pişirilmektedir.

2020 yılı itibarıyla, düşük ve orta gelirli ülkelerdeki ailelerin tahminen %43'ünün, yemek pişirmek için halen geleneksel odun veya kömür ocağı kullandığı tahmin edilmektedir. Yemek pişirmek için kullanılan bu yöntemler yalnızca pişirme işlemi yoluyla karbon salınımını arttırmakla kalmamaktadır. Aynı zamanda yakıt için ihtiyaç duyulan kaynağın elde edilmesi sürecinde ormanların tahrip edilmesi nedeniyle de küresel sera gazı emisyonları %2 ila %5 oranında artmaktadır (Hawken, 2017). Diğer taraftan bu tür kirletici yakıtların ve

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araçların kullanımı evdeki ve eve yakın çevredeki havayı kirletmekte; solunum yolu hastalıklarına, kalp sorunlarına ve hatta ölümlere neden olabilmektedir.

Temiz enerjiye küresel düzeyde erişime ilişkin BM Sürdürülebilir Kalkınma Hedefi rehberliğinde ve çevreci şekilde yemek pişirmeyi teşvik eden politikaların etkin bir şekilde uygulanması halinde, küresel karbondioksit eşdeğeri emisyonların 2050 yılına kadar 31,38 GtCO2-eq ila 76,34 GtCO2-eq kadar azalabileceği tahmin edilmektedir (Anand, 2023). Böylesi bir uygulamanın ekonomiye katkısının ise 136.64 ila 302.76 milyar ABD Doları seviyelerinde olması beklenmektedir. Ömür boyu temiz enerji kullanmak suretiyle yemek pişirilmesi alışkanlığının toplumlara kazandırılması ile de yaklaşık 1.96 ila 4.38 trilyon ABD Doları tasarruf edilebileceği öngörülmektedir (Anand, 2023).

Kirli yakıtların yemek pişirmek için kullanılmasının çevre, halk sağlığı ve cinsiyet eşitliği üzerindeki olumsuz etkileri ise yıllık olarak 2,4 trilyon dolar olarak hesaplanmıştır (WB, 2010; ESMAP, 2020). Yine temiz baca sistemlerinin ve teknolojilerinin yemek pişirilen mutfaklarda kullanılması halinde geleneksel ocak ve sobalarda pişirilen yemeklerin atmosfere saldığı sera gazlarının %95 oranında azaltarak küresel sera gazı emisyonunu %11 ila %17 oranında azaltabileceği tahmin edilmektedir (Putti vd., 2015). Bu dönüşümün %16 seviyelerine ulaşması halinde 2050 yılında 15.8 GtCO2-eq ila 24.3 GtCO2-eq karbon tasarrufu sağlanabilecektir (Person, Loo, Owuor, M. Ogange, Jefferds & Cohen 2012; Hawken, 2017).

4.1.4. Kompostlama (Gübreleme) uygulaması

Kompostlama, biyolojik olarak ayrışabilen bitki ve yemek atıklarının doğrudan çöp alanlarına gönderilmek yerine, toprağın kalitesini ve verimliliğini arttırmak için gübre olarak kullanılması faaliyetidir. Diğer bir değişle kompostlama, gözle görülmeyen mikroorganizmaların, içinde bulundukları ortamın oksijenini kullanarak çöp içerisindeki organik maddeleri biyokimyasal yollarla ayrıştırması işlemidir. Kompostlama, hanelerin bahçelerindeki saksılardan endüstriyel ölçekteki tarım arazilerine kadar değişebilen kapasitelerde yapılabilmektedir. Kompostlama sayesinde organik atıklar topraktaki karbona dönüşmektedir. Böylece çöp depolama alanlarında çoğalan metan emisyon yükü azaltılabilmektedir.

Dünyanın dört bir yanındaki kentsel alanlarda, her yıl ortaya çıkan 1,3 milyar ton katı atığın neredeyse yarısı organik özellik taşımaktadır (Hoornweg & Bhada-Tata). Bu organik atıkların doğrudan çöp toplama alanlarına gönderilmesi halinde organik atıklar havasız ortamlarda sıkışarak ayrışmakta ve güçlü bir sera gazı olan metanı üretebilmektedir. Kompostlama işleminin doğru şekilde yapılması halinde ise, organik atıkların metan üretmeden stabil toprak karbonuna dönüştürülmesi sağlanabilmektedir. Bu durumda toprak, daha verimli hale

gelirken aynı zamanda karbonu da bünyesinde hapsederek doğal bir yutak alanı haline dönüşmektedir. Tüm ülkelerin, Avrupa Birliği ülkelerinde yaygın olarak uygulanan kompostlama oranlarına ulaşması halinde, 2050 yılına kadar küresel sera gazı emisyonlarını yaklaşık 2,3 GtCO2-eq ila 3,6 GtCO2-eq aralığında azaltması beklenmektedir (Lou & Nair, 2009).

Tablo 1: Gıdaya İlişkin Davranış Değişiklikleri

GIDA			
ÇÖZÜM ÖNERİSİ	**AÇIKLAMA**	**MAKUL SENARYO (GtCO2-eq)**	**İYİMSER SENARYO (GtCO2-eq)**
Gıda İsrafının Azaltılması	Gıda üretiminden tüketime kadar gıda tedarik zinciri boyunca gıda kaybını ve israfının en aza indirilmesi	70,5	93,7
Vejetaryen Beslenme Alışkanlığı	Daha fazla sebze ve bakliyat, daha az hayvansal gıda tüketilmesi	66,1	87,0
Daha çevreci yemek pişirme	Yemek pişirilen araçlarda kullanılan enerjinin daha efektif ve temiz olması	15,8	24,3
Gübreleme alışkanlığı	Doğada biyolojik olarak çözülebilen gıdaların çöpe atılmak yerine toprağa gübre olarak gömülmesi	2,3	3,6
	TOPLAM	**154,97**	**241**

4.2. Tarım ve Arazi Yönetimi

Uluslararası İklim Değişikliği Paneli (IPCC); tarım, ormancılık ve diğer arazi kullanımı faaliyetlerinin yılda yaklaşık 10 GtCO2-eq ila 12 GtCO2-eq yani küresel insan kaynaklı sera gazı emisyonlarının neredeyse dörtte birine karşılık geldiğini tahmin etmektedir. Bu alanlardaki emisyonları düşürmeye yönelik çözümler, sürdürülemeyecek düzeydeki yüksek emisyonlu arazi kullanımı ve tarım uygulamaları üzerine yoğunlaşmaktadır. Tarım ve arazi yönetimi alanlarında değişen davranış biçimleri, ekosistem ve ekonomi üzerinde pozitif dışsallıklar oluşturabilmektedir. Bu alanlardaki davranış değişiklikleri sayesinde

aynı zamanda önemli bir azaltım potansiyeli de ortaya koyulabilmektedir (IPCC, 2014).

4.2.1. Silvootlak uygulaması

Silvootlak uygulaması; ağaçların, meraların ve çiftlik hayvanlarının otlatılmasının karşılıklı yarar sağlanacak şekilde entegre edilmesi işlemlerini içerir. Başka bir deyişle silvootlak; ağaçları, meraları ve hayvan yemlerini tek bir sistemde birleştirerek, ağaçların tarıma dahil edilmesidir. Açık alanlarda yapılan hayvancılık faaliyetlerinde verimliliği artırmak için meraların ağaçlandırılması silvootlak uygulamasının bir örneğidir.

Bünyesinde ağaç ve koruluk alanlar bulunduran meralarda, ağaçsız meralara oranla karbon tutma kapasitesi 5 ila 10 kat daha fazladır (Toensmeier, 2016). Silvootlaklar, hayvanların ve ağaçların karşılıklı olarak fayda sağlayabildikleri alanlar olduğundan, yemiş ve meyve gibi ekonomik değeri olan ürünlerin verimliliğini arttırarak üreticilere ekonomik anlamda da fayda sağlayabilmektedir.

Şu anda 550 milyon hektar alanda silvootlak uygulamasının yapıldığı tahmin edilmektedir. 2050 yılına kadar silvootlaklar için uygun olan 823 milyon hektar alanın, 720,55 ila 772,25 milyon hektar alana ulaşılması halinde, sera gazı emisyonlarının 26,58 GtCO2-eq ila 42,31 GtCO2-eq aralığında bir değerde azalması beklenmektedir (Williamson, Satre-Meloy, Velasco, & Green, 2018).

4.2.2. Tropik bitki tarımının yapılması

Dünyadaki tarım arazilerinin çoğu mısır, buğday, pirinç, patates ve soya fasulyesi gibi yıllık olarak hasadı yapılan temel mahsullerin üretimi için kullanılmaktadır. Bu tip ürünleri elde edebilmek için her yıl tekrar tekrar tarım alanlarına ekim yapmak gerekmektedir. Her yıl tekrarlanan yoğun tarımsal faaliyetler sera gazı emisyonlarını önemli ölçüde arttırmaktadır.

Tropik bölgelerde ise, uzun ömürlü tek bir ağaçtan her yıl düzenli olarak mahsul elde edilebilmektedir. Bu tip uzun ömürlü tropik özellikteki bitkiler aynı zamanda toprakta ve bünyesinde de büyük miktarda karbon tutma kapasitesine sahip olabilmektedir. Yine tropikal özellik taşıyan bu bitkiler erozyonu önleyerek toprak kaybının da önüne geçebilmektedir. Dik yamaçlarda ve çok çeşitli topraklarda büyüyebilirler. Bu bitkiler, üretim sürecinde daha az yakıt ve gübre gerektirdiği gibi pertisit ve herbisit gibi kimyasal tarım ilaçlarına da daha az ihtiyaç duyarlar. Ayrıca bu tip bitkiler yüksek sıcaklığın yaşandığı ortamlarda da ürün verebilmektedirler. Bu bakımdan küresel sıcaklıkların her geçen gün arttığı dünyamızda nemli ve yarı kurak bölgelerde, bozulmamış otlaklarda ve geleneksel tarım faaliyetlerinin yapıldığı ekili alanlarda üretilebilirler.

Uzun ömürlü tropik bitkilerin, çoğunluğu tropik ve subtropik bölgelerde olmak üzere yaklaşık 50 milyon hektar alanda tarımı yapılabilmektedir. Bu

bitkiler yılda hektar başına 3,34 metrik ton karbon tutma kapasitesine sahiptirler. Tropik bitkilerle tarım yapılan alanların 2050 yılına kadar 128,80 ila 213,34 milyon hektar genişletilmesi halinde, 16,34 GtCO2-eq ila 32,87 GtCO2-eq karbondioksit eşdeğeri sera gazının bu alanlarda tutulabileceği hesaplanmaktadır (Wartenberg, Mehra, Toensmeier & Frischmann, 2023).

4.2.3. Ara ekim sisteminin geliştirilmesi

Tarım alanlarının, kentleşme, toprak kaybı, kuraklık, hastalık vb. gibi nedenlerle daralması; gıda güvenliğinin sağlanması ve birim alandan daha fazla ürün elde edilmesi için bazı ekim stratejilerinin geliştirilmesini zorunlu kılmıştır. Bu stratejilerden birisi ara ekim sistemidir (Intercropping System).

Ara ekim, tarım alanlarında yakın mesafede ve birbirinin yerine geçecek şekilde iki farklı ürünün aynı anda yetiştirilmesi işlemidir. Aynı tarım alanında çiftçilerin üç sıra buğday, ardından üç sıra pamuk ve ardından tekrar üç sıra buğday daha ekmeleri ara ekim uygulamasına bir örnektir.

Sonbaharda ekimi, yazın ise hasadı yapılan buğday, arpa, çavdar vb. tahıllar, iklim şartlarına da bağlı olarak yaklaşık olarak 8 ay boyunca tarım alanlarında kalabilmektedir. Yılın geriye kalan 3-4 aylık dönemde ise kısa vejetasyon süresine sahip bitki çeşitleri ikinci ürün olarak yetiştirilmektedir. Eğer o dönem ekim yapılmayacaksa tarım alanları bu süre zarfında boş bırakılmaktadır. Ekim yapılması halinde ise ikinci ürünlerin, kısa sürede mahsul vermelerinden dolayı verim ve kalitelerinde düşüşler meydana gelebilmektedir. Bu nedenle tarım alanlarında buğday, arpa, çavdar vb. tahıllar varken aynı zamanda aralarına sonradan pamuk, soya ve mısır gibi bitkiler ekilebilir. Bu sayede, tarım alanları hem daha efektif kullanılmakta hem de birim alandan daha fazla ürün elde edilebilmektedir.

Her yıl ekilen tarım alanlarının sistematik biçimde ağaçlandırılması işlemi de bir çeşit ara ekim uygulamasıdır. Ekim alanlarındaki ağaçlandırma faaliyetleri ekilen alandaki karbon tutma kapasitesini arttırırken tarımsal üretimde de verimliliğin yükselmesine sebep olmaktadır. Ara ekim sistemi doğru şekilde uygulandığında bu yöntem, erozyonu önlemekte, ışığa hassasiyeti olan bitkileri örtmekte, sellerin veya rüzgarların mahsullere vereceği zarara karşı koruma sağlamaktadır.

Bu uygulamaların, bölge, toprak yapısı, iklim ve sulama koşullarındaki farklılıklar göz önünde bulundurularak 2050 yılına kadar toplam 15,03 GtCO2-eq ila 24,40 GtCO2-eq karbondioksit eşdeğeri sera gazını tutabileceği tahmin edilmektedir. Bu etkinin ortaya çıkabilmesi için ara ekim sisteminin 416,93 ila 490,43 milyon hektarlık alanlarda yapılması gerekmektedir (Williamson vd. 2018).

4.2.4. Yenileyici/İyileştirici tarım uygulamaları

Yenileyici/iyileştirici tarım uygulamaları; toprağa kompost uygulaması, toprağı ve diğer tarım ürünlerini koruyan örtü bitkilerinin ekimi, ürün rotasyonu, yeşil gübre kullanımı, topraksız tarım, organik üretim ve azaltılmış toprak işleme gibi tekniklerle toprağın ve ekosistemin korunmasını içermektedir. Yenileyici/iyileştirici tarım uygulamaları, toprağın karbon içeriğini eski haline getirerek, toprağın gübre ve tarımsal ilaç kullanımı ile yorulan yapısını iyileştirmektedir. Böylece, toprağın üretkenliği ve karbon tutma kapasitesi artmaktadır. Yenileyici/iyileştirici tarım uygulamalarının yapıldığı tarım alanlarının 11,84 milyon hektardan 2050 yılına kadar 219,16 ila 320,45 milyon hektara çıkabileceği öngörülmektedir. Bu artışın gerçekleşmesi halinde, uygulamaların, toplam 15,12 GtCO2-eq ila 23,21 GtCO2-eq karbondioksit eşdeğeri sera gazı salınımını azaltması beklenmektedir (Eichler, Han, Metzel, Mehra, Toensmeier & Frischmann, 2023)

4.2.5. Tarım alanlarının iyileştirilmesi

Dünya çapında milyonlarca hektar tarım arazisi, toprak yapısının bozulması nedeniyle terk edilmiş durumdadır. Dünya genelinde 950 milyon ila 1,1 milyar dönüm arasında terkedilmiş şekilde bırakılan ve kullanılmayan tarım arazisi bulunduğu tahmin edilmektedir (Campbell, Lobell, Genova & Field, 2008). Daha önce hayvancılık ve diğer tarımsal faaliyetler sonucu ürün hasadının gerçekleştirilebildiği bu araziler, terk edildikten sonra ormanlık alanlara dönüştürülüp yenilenmemişlerdir. Yenileyici/iyileştirici tarım uygulamaları; yerel bitki örtüsünün geliştirilmesi (Gardiner, 2016) ve ormanlaştırma faaliyetleri ile terkedilmiş ve atıl konumda olan eski tarım arazilerinde yeniden tarımsal üretimin yapılmasını ve bu yerlerin etkin şekilde karbon yutak alanlarına dönüşmesini sağlayabilecektir.

2050 yılına kadar 189,51 ila 296,12 milyon hektar terkedilmiş tarım alanın iyileştirilebileceği öngörülmektedir. Uygulanacak olan iyileştirici yöntemlerle yeniden üretilecek olan verimli ve karbon yutak kapasitesi yüksek arazilerin 2050 yılına kadar karbondioksit eşdeğeri emisyonları 12,48 GtCO2-eq ila 20,32 GtCO2-eq arasında azaltabileceği tahmin edilmektedir (Eichler vd., 2023).

4.2.6. Çayır ve otlakların iyi yönetilmesi

Otlak ve çayırlar; gruplar halinde hareket eden, yoğun şekilde otlanan, toynaklarıyla toprak üzerinde izler bırakan hayvan sürülerinin yoğun etkisine maruz kalmaktadır. Çayır ve otlakların iyi yönetilmesi, besi hayvanlarının belirli bir alanda ne kadar süre otlayacağının ve ardından o arazinin tekrar otlatılmadan önce ne kadar süre dinlendirileceğinin bir plan dahilinde kontrol edildiği uygulamaları içermektedir. Bu yöntem otlak ve meraların üzerindeki hayvan

yükünün ve otlatma yoğunluk, süre ve sıklığının dikkatli bir şekilde kontrol edilmesi ile başarılı olabilmektedir.

Otlak ve çayırların planlı ve sistematik şekilde yönetilmesi halinde bunların karbondioksit eşdeğeri sera gazı tutma kapasitesinin 2050 yılına kadar 13,72 GtCO2-eq ila 20,92 GtCO2-eq arasında gerçekleşmesi beklenmektedir (Kane, Daphne, Mehra, Toensmeier & Frischmann 2023). Günümüzde bu rakamlar 10 GtCO2-eq seviyelerindedir. 2050 yılı hedefine ulaşabilmek için planlı ve sistematik şekilde yönetilen otlak ve çayır alanlarını 30 yıl içinde 71,6 milyon hektardan 502,1 ila 749,02 milyon hektara çıkarılması gerekmektedir (Kane vd., 2023).

4.2.7. Pirinç yoğunlaştırma sistemi

Çeltiğin kabuğundan ayrılması ile ortaya çıkan pirinç, suyun içerisinde yetiştiği için, sulak bölgelerde tarımı yapılabilmektedir. Pirinç, tropikal ve subtropikal iklim şartlarına uyum göstermiş bir bitkidir. Bol yağmur alan veya sulanabilir topraklarda yaygın şekilde üretilmektedir. Pirinç ekilen yerler bu özelliği nedeniyle aynı zamanda önemli bir metan üretim alanıdır da. Pirinç ekim alanları toplam tarımsal sera gazı emisyonlarının en az %10'una sebep olmaktadır (Searchinger, Adhya, Linquist, Wassmann & Yan, 2014). Pirinç tarımında sulama ve ekim modellerinin değiştirilmesi gibi bir dizi yenilikçi teknik yoluyla düşük metan salınımlı pirinç üretimi mümkün olabilmektedir.

"Pirinç Yoğunlaştırma Sistemi", sürdürülebilir pirinç yetiştiriciliğine yönelik bütünsel bir yaklaşımdır. Bu sistem, su kullanımını en aza indirerek ve nem koşullarını değiştirerek metan üretimini ve metan emisyonlarını en aza indirmeye yardımcı olmaktadır. Yine "Pirinç Yoğunlaştırma Sistemi", geleneksel pirinç üretimine göre çok daha yüksek verim sağlamaktadır. "Pirinç Yoğunlaştırma Sistemi" nin uygulandığı çeltik tarlalarının 2050 yılına kadar 6,7 milyon hektardan 40,21 ila 52,00 milyon hektara çıkarılabilmesi halinde, 30 yıl içinde 2,90 GtCO2-eq ila 4,44 GtCO2-eq karbondioksit eşdeğeri sera gazı emisyonunu önleyebileceği öngörülmektedir (Grecequet, Mehra, Toensmeier & Frischmann, 2023a).

4.2.8. Korumalı tarım uygulaması

Korumalı tarım (conservation agriculture), bozulan arazileri yenilerken ekilebilir arazi kayıplarını önleyebilen bir tarım sistemidir. Korumalı tarım uygulamaları, toprak örtüsüne zarar vermeden toprağın yeniden ekim için hazır hale gelmesini sağlar. Bunun için de toprak üstündeki bitki çeşitliliğini arttırır. Böylece toprak yüzeyinin üstünde ve altındaki biyolojik çeşitlilik artarak doğal biyolojik süreçler gelişir. Tüm bu gelişmeler ise su ve besin kullanım verimliliğinin artmasına, mahsul üretiminin iyileştirilip sürdürülebilir hale gelmesine katkıda bulunur (FAO, 2024).

Korumalı tarım uygulamalarında, tarım makinelerinin toprağın biyolojik bütünlüğüne verdiği zararlar minimuma indirilir. Tarım ilaçları, harici mineraller veya organik kökenli bitki besinleri, biyolojik süreçlere müdahale etmeyecek veya bunları bozmayacak şekillerde ve miktarlarda optimum biçimde uygulanır (FAO, 2024). Korumacı tarım uygulamaları sayesinde, elde edilecek mahsul verimliliği artarken; toprak erozyonunu ve toprak bozulmalarının da önüne geçilebilmektedir. Ayrıca iyi hale getirilen tarım alanlarındaki toprağın karbon tutma kapasitesi de artabilmektedir.

Gerçekleştirilecek büyük tarım alanı reformları ile korumalı tarım uygulamalarının tatbik edildiği 148 milyon hektar alanın 2035 yılına kadar 400 ila 327 milyon hektara çıkarılması beklenmektedir. Bununla birlikte, koruyucu tarım uygulamalarının, bölgesel farklıklar göstermekle birlikte hektar başına yıllık ortalama 0,25 ila 0,78 metrik ton karbon tutma kapasitesi oluşturması beklenmektedir. 2050 yılına kadar ise korumalı tarım uygulamalarının, karbondioksit eşdeğeri sera gazı emisyonlarını 8,08 GtCO2-eq ila 12,81 GtCO2-eq azaltması beklenmektedir (Eichler vd. 2023).

4.2.9. Gübre yönetimi

Azotlu gübrelerin tarımsal üretimde kullanılmaya başlanmasından bu yana tarımsal verimlikte önemli ölçüde artışlar görülmüştür. Ancak tarım alanlarında bu tip gübrelerin kullanılması güçlü bir sera gazı olan nitröz oksit (N_2O) emisyonlarının da atmosfere salınımını arttırmıştır (Myhre, Shindell, Bréon, Collins, Fuglestvedt, Huang, Koch, Lamarque, Lee, Mendoza & Nakajima, 2013). Pek çok ülkede tarım arazilerinde gereğinden fazla kullanılan azotlu gübreler, bitkiler tarafından yeterince emilemeyip, atmosfere N_2O olarak salınmaktadır. Ayrıca, gübrelerin içinde bulunan ve bitkilerin kullanmadığı nitrojen, topraktaki organik maddeyi yok etmekte ve su kaynaklarını kirletmektedir. Ayrıca gübre üretimi başlı başına aşırı karbondioksit emisyonuna neden olan, enerji yoğun bir süreçtir.

Çiftçiler, gübre seçimlerini bitkinin ihtiyaçlarıyla uyumlu hale getirip, gerektiğinde ve gereken yerde toprağa uygulayıp, aşırı kullanımdan kaçınarak bu zararların ortaya çıkaracağı riskleri azaltabilirler. Gübre üretimi çok fazla enerji gerektirdiğinden ve çok fazla karbondioksit ortaya çıkardığından, gübre uygulamasının azaltılması aynı zamanda gübre üretimiyle ilişkili emisyonları da azaltacaktır. Tarım arazilerinde 2050 yılına kadar 373,98 ila 750,52 milyon hektar alanda (şu anki tahmini 139 milyon hektar) aşırı gübre kullanımının azaltılması, 2,77 GtCO2-eq ila 11,48 GtCO2-eq karbondioksit eşdeğeri sera gazı emisyonlarını önlemesi beklenmektedir (Grecequet vd., 2023b).

4.2.10. Tarım arazilerinin sulanması

Tarımsal üretim faaliyetleri dünyadaki tatlı su kaynaklarının %70'ini tüketmektedir (WWAP, 2012). Dünya Su Değerlendirme Programı'na (WWAP) göre sulama, dünya gıda üretiminin yüzde 40'ı için hayati önem taşımaktadır. Sulama sistemleri, suyu pompalamak ve dağıtmak için yüksek enerji girdisi gerektirdiğinden, sulama faaliyetleri önemli bir karbon emisyon kaynağı haline gelmektedir. Damlama ve yağmurlama yöntemleri gibi gelişmiş sulama teknolojileri, çiftçilerin suyu daha hassas ve verimli kullanmalarına yardımcı olabilmektedir.

Arazinin yapısı ve suyun basıncı, suyun toprakla buluşmasında önemli bir etkiye sahiptir. Suyun ölçülmeden ve kontrolsüz bir şekilde toprağa verilmesi şeklinde geleneksel olarak yapılan vahşi sulama hem toprağa hem ürüne hem de su kaynaklarına zarar vermektedir. Damla ve yağmurlama şeklinde yapılan sulama ile suyun tarımsal üretimde daha az enerji/yakıt yoğun olarak kullanılması sağlanır. Bu yöntemler tatlı suların kullanımı bakımından oldukça tasarrufludur.

Yağmurlama ve damla sulama kullanımı dünya çapında büyük farklılıklar göstermektedir. Yapılan araştırmalar, iyileştirilmiş sulama tekniklerinin uygulandığı toplam alanın 2050 yılında 187,71 ila 286,47 milyon hektara çıkması beklemektedir. İyileştirilmiş sulama tekniklerine geçişte en yüksek artışın, toplam sulanan alanın %62'sinin bulunduğu ve şu anda bu arazinin yalnızca %7' sinin mikro sulama teknikleri ile yapıldığı Asya ülkelerinde meydana gelmesi beklenmektedir. Böyle bir gelişmenin 1,13 GtCO2-eq ila 2,07 GtCO2-eq karbondioksit eşdeğeri sera gazı emisyonunu önlemesi ve 37 ila 68 milyar galon su tasarrufu sağlaması beklenmektedir (Grecequet vd., 2023c).

Tablo 2: Tarım ve Arazi Yönetimine İlişkin Davranış Değişiklikleri

ÇÖZÜM ÖNERİSİ	AÇIKLAMA	MAKUL SENARYO (GtCO2-eq)	İYİMSER SENARYO (GtCO2-eq)
TARIM VE ARAZİ YÖNETİMİ (2020-2050)			
Silvootlak uygulaması	Ağaçların, yemlerin ve çiftlik hayvanların otlatılmasının karşılıklı yarar sağlayacak şekilde entegre edilmesi	26,48	42,31
Uzun ömürlü tropikal bitkilerin yetiştirilmesi	Protein, yağ ve nişasta bakımından zengin ve uzun ömürlü bitkilerin tarımının yapılması	16,34	32,87
Ara ekim sisteminin geliştirilmesi	Birim tarımsal alandan daha fazla ürün elde edilebilmesi için birden fazla tarım ürününün aynı tarımsal alana ekilmesi	15,03	24,4
Yenileyici/ İyileştirici tarım uygulamaları	Kompost uygulaması, toprağı ve diğer tarım ürünlerini koruyan örtü bitkilerinin ekimi, ürün rotasyonu, yeşil gübre kullanımı, topraksız tarım, organik üretim ve azaltılmış toprak işleme gibi tekniklerle toprağın ve ekosistemin korunması	15,12	23,21
Tarım alanlarının iyileştirilmesi	Bozulmuş, tahrip edilmiş ya da terk edilmiş tarım arazilerinin mahsul veya doğal bitki örtüsü yetiştirmek için restore edilmesi	12,48	20,32
Çayır ve otlakların yönetimi	Çayır ve meraların aşırı kullanımının önlenmesi	13,7	20,92
Yoğun ve etkin pirinç tarımı	Büyük ya da küçük ekim alanlarında düşük metanlı pirinç tarımının yapılması	2,9	4,4
Korumalı tarım uygulaması	Ürün rotasyonu, örtü bitkileri ve azaltılmış toprak işleme uygulamaları ile tarım arazilerinin korunması	17,4	10,3
Gübre yönetimi	Tarım arazilerinde gübre kullanımının azaltılması	2,77	11,48
Tarım arazilerinin sulanması	Damla sulama gibi su ve enerji tasarruflu sağlayan sulama sistemlerinin kullanılması	1,1	2,07
TOPLAM		**123,32**	**192,28**

5. DEĞERLENDİRME VE SONUÇ

Küresel ısınma ve iklim değişikliği, hayatın her alanında mücadele edilmesi gerektiren bir sorun haline gelmiştir. Uluslararası toplantılardaki sonuç bildirgelerinde yer alan kararları gerçekleştirebilmek ve koyulan hedeflere ulaşabilmek için yukarıda bireysel ve hanehalkı düzeyindeki davranış değişikliklerinden gıda, tarım ve arazi kullanımına ilişkin olanlar açıklanmaya çalışılmıştır. Yalnızca yukarıda belirtilen davranış değişikliklerinin, projeksiyonlarda kullanılan senaryoların ılımlı ya da iyimser olmalarına bağlı olarak, 2050 yılına kadar 278,29 GtCO2-eq ila 433,28 GtCO2-eq karbondioksit eşdeğeri sera gazı emisyonunu azaltılması beklenmektedir. Özellikle yüzey sıcaklıkları 1,5°C veya 2°C'nin altında sınırlanmak isteniyorsa, bu hedeflere ulaşmak için davranışsal çözümler son derece önem arz etmektedir.

Küresel ısınma ve iklim değişikliği ile mücadele etmek adına sera gazı emisyonlarını azaltmak için geliştirilen davranış değişiklikleri, bu amacı gerçekleştirmeye çalışmanın yanı sıra başka birçok fayda da sağlamaktadır. Bunlardan en önemlileri, insan sağlığı ve doğanın iyileştirilmesine yönelik olanlarıdır. Yine israfın önüne geçen davranışlar, verimli kaynak kullanımına ilişkin çözümler ve yenilikçi tarım uygulamaları ülke ekonomilerine büyük faydalar sağlamaktadır.

Yukarıda kurulan senaryolar üzerinden tahmin edilen azaltım miktarları, davranış değişikliği çabalarını destekleyen pek çok kolaylaştırıcı teknolojinin gelecek yıllarda daha da gelişmesi halinde etkinliğini artırarak devam ettirecektir. Böylesi bir durumda, sunulan davranışsal çözümlerin birçoğunun, emisyon azaltım potansiyelini bugün tahmin edilenden çok daha öteye taşıması kaçınılmaz olacaktır.

Gıda, tarım ve arazi kullanımına ilişkin bireysel ve hanehalkı düzeyindeki davranış değişikliklerinin gerçek azaltım potansiyeline ulaşmak için insanların tüketim kalıplarına yönelik yeni yaklaşımların geliştirilmesi gerekmektedir. Bu da davranış kalıplarının günün koşullarına göre belli aralıklarla güncellenmesini zorunlu kılmaktadır. Sosyoloji, psikoloji, davranışsal ekonomi, sosyal psikoloji, evrimsel biyoloji ve siyaset bilimi gibi bilim dalları aşırı tüketimi azaltmak ve doğal kaynakları koruyabilmek için davranış değişikliklerine ilişkin yeni stratejiler ve yol haritaları sunmaktadır. Karar verici mekanizmaların, bilim çevreleri tarafından üretilen bu strateji ve planları dikkate almaları gerekmektedir.

Gıda, tarım ve arazi kullanımına ilişkin bireysel davranış değişikliği temelli azaltım stratejilerinin başarısı büyük ölçüde, ulusüstü kuruluşlar ve devletler tarafından üretilecek politika ve uygulamalara bağlıdır. Uluslararası örgütlerin toplantılarında küresel ısınma ve iklim değişikliği ile mücadelede

ülkelere düşen görevlere ilişkin imzalanan kararların yaptırım gücüne sahip olması son derece önemlidir. Aksi taktirde ekonomisi güçlü, refah seviyesi ve kişi başına düşen milli geliri yüksek olan ülkelerin vatandaşları, sebep oldukları ekolojik ayak izi ve sera gazı bakiyeleri ile diğer ülke vatandaşları üzerinde adaletsiz bir şekilde baskı kurmuş olacaklardır. Ayrıca hükümetlerin, sera gazı salınımını azaltacak stratejilerin hayata geçirilmesini kolaylaştıracak kanun, teşvik ve altyapı çalışmalarını bir an önce hayata geçirmesi gerekmektedir.

Son olarak, küresel ısınma ve iklim değişikliğinin olumsuz ve yıkıcı etkileri uzun vadede ve fazla hissedilmeksizin ortaya çıktığından halk arasında bireysel ölçekte alınabilecek aksiyonlar ve değiştirilecek alışkanlıklar yeterince önemsenmemektedir. Genel algı, küresel ısınma ve iklim değişikliği gibi büyük ölçekli bir sorun karşısında bireysel girişim ve çabaların etkisinin önemsiz olduğudur. Bu algının ortadan kaldırılması, verilen mücadelenin başarıya ulaşabilmesi için önemlidir. Bireysel davranış değişikliklerinin milyarlarca insan tarafından benimsenmesi halinde küresel ısınma ve iklim değişikliğine karşı verilen mücadelede başarıya ulaşılabilecektir.

6. ÇIKAR ÇATIŞMASI BEYANI
Çalışmada çıkar çatışması bulunmamaktadır.

7. MADDİ DESTEK
Bu çalışmada herhangi bir fon veya destekten yararlanılmamıştır.

8. YAZAR KATKILARI
MA: Fikir;
MA: Tasarım;
MA: Denetleme;
MA: Kaynakların toplanması ve/veya işlemesi;
MA: Analiz ve/veya yorum;
MA: Literatür taraması;
MA: Yazıyı yazan;
MA: Eleştirel inceleme

9. ETİK KURUL BEYANI VE FİKRİ MÜLKİYET TELİF HAKLARI
Çalışmada etik kurul ilkelerine uyulmuştur ve fikri mülkiyet ve telif hakları ilkesine uygun olarak gerekli izinler alınmıştır.

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KAHRAMANMARAŞ METROPOLITAN MUNICIPALITY'S APPROACH TO SUSTAINABLE SOLID WASTE MANAGEMENT: AN ANALYSIS BASED ON PLANS, PROJECTS, AND REPORTS[1]

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ABSTRACT

This study aims to analyze the approach of Kahramanmaraş Metropolitan Municipality regarding solid waste management, focusing on its plans, projects, and reports. Utilizing document analysis as a qualitative research method, the study systematically evaluates the municipality's documents related to solid waste management. The findings indicate that Kahramanmaraş Metropolitan Municipality has made significant efforts to address the solid waste issue, particularly following the February 6th earthquakes, which heightened the city's challenges in this area. The municipality's commitment to sustainable waste management is demonstrated through key initiatives, such as the implementation of the "Kürtül Solid Waste Integrated Facility", marking a notable improvement in waste management practices. Furthermore, progress on the "Northern Districts Integrated Solid Waste Facility Project", now nearing completion, reinforces the municipality's ongoing dedication to enhancing solid waste management and sustainability. These initiatives are vital for tackling the environmental challenges faced by the city and promoting a more sustainable future.

Keywords: *Sustainability, solid waste management, Kahramanmaraş Metropolitan Municipality*
JEL Code: *H7, Q53, Q56*

Scope: *Political science and public administration*
Type: *Research*

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

KAHRAMANMARAŞ BÜYÜKŞEHİR BELEDİYESİNİN SÜRDÜRÜLEBİLİR KATI ATIK YÖNETİMİNE DAİR YAKLAŞIMI: PLANLAR, PROJELER VE RAPORLAR ÜZERİNDEN BİR ANALİZ

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ÖZ | Bu çalışmada Kahramanmaraş Büyükşehir Belediyesinin plan, proje ve raporlarında katı atık ve yönetimine dair yaklaşımını ortaya koymak amaçlanmaktadır. Nitel araştırma yöntemlerinden doküman analizi yapılmak üzere kurgulanan çalışmada, Kahramanmaraş Büyükşehir Belediyesinin planları, projeleri ve raporları katı atık ve yönetimi çerçevesinde detaylı incelenmiş ve belgelerin sistematik olarak analizi yapılmıştır. Çalışmanın sonucunda Kahramanmaraş Büyükşehir Belediyesinin kentte özellikle de yaşanan 6 Şubat Depremleri neticesinde ciddi düzeyde bir problem haline gelen katı atık sorununu azaltmaya ve bunun yönetiminin sürdürülebilir olmasına yönelik önemli çalışmalar yaptığı görülmüştür. Bu kapsamda uygulamaya koyduğu "Kürtül Katı Atık Entegre Tesisi" önemli bir adım olmaktadır. Yine uygulamaya geçme noktasında son aşamaya gelen "Kuzey İlçeleri Entegre Katı Atık Tesisi Projesi" de katı atık yönetiminin sürdürülebilirliğinde belediyenin çalışmalarının devam ettiğinin göstergesi olmaktadır.

Anahtar Kelimeler: *Sürdürülebilirlik, katı atık yönetimi, Kahramanmaraş Büyükşehir Belediyesi*
JEL Kodları: *H7, Q53, Q56*

Alan: *Siyaset Bilimi ve Kamu Yönetimi*
Türü: *Araştırma*

1. INTRODUCTION

In the historical process, the increasing population worldwide, especially the recent rise in refugee population in Türkiye, along with industrialization and rising living standards brought about by developments worldwide, have changed the balance of production and consumption. Naturally, this has led to increases and variations in the amount and types of waste. All these developments have prompted countries to reconsider their waste infrastructure systems according to current conditions and have compelled them to take steps to reduce and dispose of these wastes.

As a result of the dense population in cities and the effects of the global changes and transformations, solid waste has become a serious problem. Termed as municipal solid waste, mixed household solid waste, recyclable materials (newspapers and magazines, aluminum cans, milk cartons, plastic beverage bottles, metal cans, corrugated cardboard, etc.), hazardous household waste (batteries, light bulbs, paint cans, etc.), commercial and institutional waste (from businesses, schools, and other public buildings), household-like industrial solid waste, garden, market, and bazaar waste (green waste), street, sidewalk, and square sweepings, bulky waste (furniture, appliances, etc.) are increasing in quantity in cities day by day (Öztürk, 2011, p. 44). These wastes not only reflect the culture that produces them but also seriously impact the health of people and their surrounding environment. Globally, people are generating increasing amounts of waste, and the composition of this waste is becoming more complex than ever. This is due to the proliferation of plastic and electronic consumer products and the rapid urbanization of the world. These trends pose a challenge for cities. It is crucial to manage the resulting waste in a socially and environmentally appropriate manner (Vergara & Tchobanoglous, 2012, p. 278). In this context, waste management has become an important unit within the municipalities responsible for urban management, and efforts have been made by municipalities to ensure its sustainability.

In the context of solid waste and its management, various studies are observed in both foreign and Turkish literature. When these studies are generally examined, it is seen that they are either predominantly literature-based or field studies. Additionally, the number of recent studies is limited. This study provides a broad conceptual framework for solid waste and its management, and it is believed that the examination of good practice examples from around the world adds uniqueness to the study. Furthermore, the approaches to solid waste and its management specific to Kahramanmaraş are thought to enhance the study's originality and provide guidance for future research in this field.

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Based on this, in the study, sustainability and solid waste management were first discussed conceptually in detail. Additionally, to support this section, the study provides a historical overview of the regulations and policies related to solid waste management in the EU and Türkiye, particularly focusing on metropolitan municipalities. Subsequently, cities prominent in solid waste management worldwide and in Türkiye, and the municipal practices that made these cities successful, were examined. Finally, the current situation of solid waste management in Kahramanmaraş Metropolitan Municipality, which became a metropolitan municipality in 2012, and its approach to this issue were analyzed based on the municipality's relevant documents and the projects it has implemented so far.

2. SUSTAINABLE SOLID WASTE MANAGEMENT: A CONCEPTUAL FRAMEWORK

The Industrial Revolution marked a significant turning point for humanity. With this revolution, large industrial establishments emerged, and subsequently, extensive production was initiated to meet the increasing consumption needs of the growing population. This situation, viewed positively on one hand, is even considered normal to meet the demand for consumption. However, it became evident in the 20th century that the situation was not improving, as observed worldwide. Particularly in the 1970s, significant environmental problems were observed globally. During this period, humanity faced serious environmental degradation, the problem transcended nations and became global, posing a threat to the future of mankind. When we look at the root causes of environmental degradation, excessive production and consumption are seen to be major factors. Among the most significant factors causing environmental degradation today are solid waste. Countries are implementing many practices to solve this problem. Sustainable development also becomes an important solution for countries to minimize this problem.

2.1. Sustainability and Sustainable Development

The earliest studies on sustainability date back to the 18th and 19th centuries. Although the concept has a long intellectual history extending to the "stationary" or "steady-state" economy concept used by economists of those periods, it was in the 20th century, particularly due to serious environmental problems, that the concept of sustainable development emerged. In this century, the concept of sustainability was expanded to include other aspects of environmental issues such as the relationship with the living world (nature) and pollution (Hueting & Reijnders, 1998, p. 19). With industrialization, the acceleration of economic growth has created unsustainable demands on natural

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resources, and the increasing technology has also increased the damage to the economy and the environment (López, Anríquez & Gulati, 2007, p. 308). In the 1960s and 1970s, particularly awareness-raising studies were conducted on the environment. Because the problem became global, and environmentalists saw industrialization, excessive population growth, and economic growth as the root causes of environmental problems. Therefore, environmentalists emphasized that natural resources should not be excessively consumed for the sustainability of population growth and industrialization. Additionally, it was stated that serious efforts could cope with the waste materials and pollution resulting from excessive consumption by people (Yeni, 2014, p. 183). Because sustainability suggests that the future of humanity will be possible through the protection of the environment and the prevention of environmental problems (Tosun, 2009, p. 4). From this perspective, sustainability can be defined as the perpetual use of the vital functions (possible uses) of the biophysical environment (Hueting & Reijnders, 1998, p. 19).

The first studies on sustainability emerged based on the principles set forth in the Declaration of the United Nations Conference on the Human Environment held in Sweden in 1972. The concept first appeared in the literature in the report "Limits to Growth 2" published by the Club of Rome in 1972. In summary, this report indicates that the exploitation of limited global resources due to factors such as population growth, industrialization, and excessive production and consumption will further exacerbate environmental pollution. Additionally, the report emphasizes the need to prevent the economy from growing further before environmental disaster progresses, and it suggests that concerted action must be taken worldwide for this purpose (Metlioğlu & Yakın, 2021, p. 1886). In the Brundtland Report (Our Common Future) published in 1987, the concept began to be used globally. In this report, sustainability is defined as "meeting the needs of the present without compromising the ability of future generations to meet their own needs". At the 1992 Rio de Janeiro Earth Summit, the use and awareness of the concept increased further with the widespread use of computers and the internet. This summit was attended by 182 world leaders, and the concept gained international dimensions through this event (Özgün & Ayvaz, 2017, p. 112; Yanık & Türker, 2012, p. 292).

Today, the concept of sustainability is frequently used in various fields such as economics, environment, agriculture, construction, architecture, tourism, health, education, and many more. Generally, the concept implies the balanced use of natural resources, reducing waste resulting from consumption, ensuring the recycling of resources, and the continuous protection of the environment, acknowledging the right of future generations to benefit from nature (Koçak &

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Balcı, 2010, p. 214). As seen, sustainability encompasses economic development, social development, and environmental protection (Saban et al., 2017).

Sustainable development, on the other hand, emerges as a concept aiming to preserve the economic, social, and environmental well-being of both present and future generations with a balance between economic, social, and environmental sustainability. This concept (Hamilton, 1995, p. 393) is also coded as the benefits that do not diminish in economic, social, and environmental areas, while sustainable development, in essence, aims to ensure that the opportunities for future generations do not decrease compared to the present and that the needs of today are met as fully as possible (Howarth & Norgaard, 2017, p. 193). In fact, the concept (Köşker & Gürer, 2020, p. 90) is used interchangeably with sustainability, but it provides a more comprehensive perspective. There are three main perspectives dominant in sustainable development: basic needs, eco-development, and sustainable utilization (Şen et al., 2018, p. 15). In this regard, while the primary goal of sustainable development is to protect and improve the environment and social equality, it should not ignore the economy, although it is evident that the concept prioritizes environmental and social aspects. It should also be noted that in sustainable development, there is no situation of giving up one for the other among the environment, social development, and the economy (Gowdy & O'Hara, 1997, p. 240), and ensuring the sustainability of each is necessary. The emphasis in the concept of sustainable development is to carry out all kinds of economic and social development activities while protecting and improving the environment and social development (Gedik, 2020, p. 202).

Sustainability and sustainable development, as seen in the aforementioned studies, are used in a similar sense. When we look at the historical emergence and development of sustainable development, it was proposed as a solution to a problem in the world and set goals accordingly (Tutulmaz, 2012, p. 610). It is observed that among these problems in the world and in Türkiye, solid waste and the negative consequences arising from its management are at the forefront.

2.2. Solid Waste Management and Sustainable Solid Waste Management

Recently, the concept of sustainability, which has been frequently used and sought to be implemented, is also being applied in the field of solid waste management today (Akdoğan & Güleç, 2007, p. 43). This is because the increase in waste over time has sparked discussions on how to manage waste effectively. Questions about how to develop an economically feasible, environmentally effective, and socially acceptable urban solid waste management system were on the agenda of countries in the early days (Junquera, Brío & Muniz, 2001, p. 51).

However, the practical aspects of urban waste management (such as collection, treatment, and disposal) and countries' views on source separation, recycling, incineration, and landfilling remained uncertain (Wilson, McDougall & Willmore, 2001, p. 328).

Initially, the idea of removing waste from living areas gained popularity when waste was recognized to cause serious environmental degradation. However, with the increase in waste quantities over time, the need for new disposal areas grew, making this approach unsustainable. Moreover, economically feasible and environmentally acceptable disposal has been a major concern in many industrialized countries. The main challenge faced by policymakers in the waste management sector is how to predict the future quantity and composition of solid waste to design the most appropriate treatment/disposal strategy (Daskalopoulos, Badr & Probert, 1998, p. 155). Additionally, the presence of materials within solid waste that can be reused has led to a fundamental change in thinking. The new approach aims to maximize economic and social benefits from waste while minimizing environmental harm (Bilgili, 2020, p. 89).

From this perspective, solid waste management is defined as the controlled implementation of methods developed to take measures against waste that do not harm human health and the environment (Demirarslan & Başak, 2018, p. 118).

Solid waste management is a discipline consisting of stages such as controlling the quantity of waste, collection, accumulation, transportation, processing, recycling, reuse, and disposal (Beyhan & Gödel, 2021, p. 62), with the preference for the most suitable method in these stages (Menteşe & Kızılçam, 2021, p. 111). Looking at industrialized and developed countries worldwide, it is observed that most of them have adopted a philosophy in urban solid waste management hierarchy that includes waste prevention or minimization in production, material recovery, recycling, incineration, and disposal in controlled and sanitary landfills (Garcıa, Esteban, Marquez & Ramos, 2005, p.781).

In other words, solid waste management encompasses a series of processes, including waste collection, transportation, recycling, and managerial, economic, legal, engineering, and planning aspects, to prevent environmental degradation, improve environmental quality, protect public health, implement sustainable development, and subsequently achieve economic growth (Bilgili, 2020, p. 92). When planning solid waste management, some key issues need to be considered. These include protecting human health and the environment, ensuring the sustainability of natural resources, economic conditions, engineering principles, the aesthetics of the environment/nature, and the daily habits of the

relevant community (Beyhan & Gödel, 2021, p. 62).

With the environmental degradation experienced in the 20th century, solid waste management gained prevalence as a discipline, leading to the idea of ensuring sustainability over time, which gave rise to sustainable solid waste management. Sustainable solid waste management is an approach that preserves natural resources, minimizes environmental damage, and requires participation. In this approach, environmental sustainability is important, as well as economic and social sustainability. Furthermore, sustainable solid waste management has economic, political, administrative, socio-cultural, technical, and institutional dimensions. Additionally, this approach serves various purposes. These are (Tekel, 2007, p. 73):

●Creating sustainable environments in cities and preserving the quality of the environment, Protecting the health and well-being of the urban population,

●Achieving social progress that meets the needs of the urban population (Adams, Phillips & Morris, 2000, p. 221),

●Prudent use of natural resources (Daly, 2017, p. 97),

●Enhancing the value of the city's existing economy and ensuring its productivity,

●Creating new job opportunities and income prospects.

●To achieve the diverse and comprehensive objectives mentioned above in sustainable solid waste management, there are key actors involved. These include (Baud, Grafakos, Hordijk & Post, 2001, p. 4):

●Public sector (national authorities and local government agencies)

●Private sector (large and small registered businesses engaged in collection, transportation, disposal, and recycling activities)

●Small-scale, unrecognized private sector (waste pickers, itinerant buyers, waste material traders, and unregistered small-scale businesses)

●Local governments, communities, and representatives (NGOs).

Sustainable solid waste management is an important part of the idea of sustainable development. Based on sustainable development, sustainable solid waste management has been implemented with the idea of disposing of waste in an environmentally friendly and least harmful way. Thus, the first rule in sustainable solid waste management is the prevention of waste generation and the protection of natural resources, i.e., the environment (Bilgili, 2020, p. 94). This idea has now influenced all countries.

As can be seen, the increasing environmental problems globally, and specifically the solid waste problem, have prompted action worldwide, and international law has evolved over time regarding solid waste management and its sustainability. Particularly in the 1970s, environmental problems paved the

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way for environmental regulations to take place in international law. Subsequently, the European Union (EU), aiming to complete its economic integration, began to place more emphasis on the environment during this process. Therefore, it started to consider the environmental impact and assess the environmental costs of any economic activity (Dönmez & Değirmen: 2016, p. 252). In this context, the EU has made significant progress in addressing the solid waste problem and its management.

When looking at the historical development of the EU's environmental policy, waste management appears as the first area of regulation. Especially in the 1970s and 1980s, poorly managed waste led to major environmental disasters, necessitating mandatory measures by policymakers. The development of better waste management policies across the Community began in the first half of the 1970s. The first Waste Framework Directive was adopted in 1975. Similarly, the Council Directive on Toxic and Hazardous Waste came into force in 1978. The Union also established a Waste Management Commission to assist the European Commission in formulating policy in the field of waste management. The shipment of hazardous waste was later regulated in 1984. These three directives, evolving alongside technical and political developments within the Union, form the framework legislation for waste management in the EU (EU Waste Management Legislation, 2024). In subsequent years, environmental regulations on solid waste across the Community increased disposal costs for the industry. This led to the export of hazardous waste to developing countries and Eastern European countries in the late 1980s. In developing countries, disasters and increasing awareness, especially with the support of non-governmental actors like Greenpeace, ensued. Subsequently, many developing countries regarded these practices as "Toxic Colonialism". In 1989, facing growing opposition to these practices, the international community adopted the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, which prohibits the export or import of hazardous waste to or from non-party countries and requires prior written consent from the recipient country before shipment. In response, the EU established its Waste Management Strategy the same year, introducing higher standards for waste disposal and imposing restrictions on waste transportation (Veral & Yiğitbaşıoğlu, 2018, p. 3).

With the developments in the EU, a process of building a more comprehensive waste policy has been initiated. Subsequently, in the EU, the Waste Framework Directive (2008/98/EC), which includes the waste hierarchy, was established along with the regulations. The Waste Framework Directive includes concepts and definitions related to waste management, such as waste, recycling, and recovery. It also explains when waste ceases to be waste and

becomes a secondary raw material and how waste and by-products are to be distinguished. According to the Directive, waste legislation and policies in EU member states must comply with the waste management hierarchy. This hierarchy prioritizes waste policies in the following order: prevention, preparation for reuse, recycling, recovery, and as the least preferred option, disposal (including landfill and incineration without energy recovery). Additionally, the Directive includes the "polluter pays" principle and the "extended producer responsibility" principle. Regulations have been made regarding hazardous waste and waste oils. Targets for recycling and recovery by 2020 have also been set and work has begun (Uçar, Şemsit & Yüksel, 2018, p. 748).

The development of the EU's waste management policies has been significantly influenced by the Environmental Action Programs (EAPs) prepared since 1973 (Dönmez & Değirmen: 2016, p. 253). In this context, the concept of Thematic Strategies was developed for the first time in the 6th EAP covering the period from 2002 to 2010, and the Thematic Strategy on Waste Prevention and Recycling is one of the seven thematic strategies created in this context. The main elements of the EU's waste management policies are to promote recycling in addition to waste prevention, to use unavoidable waste as a resource, and to minimize the extraction of additional natural resources to ensure resource efficiency and sustainable growth (Veral & Yiğitbaşıoğlu, 2018, p. 4). In the 7th EAP, covering the years 2013 to 2020, it is seen that the importance given to resource use, resource efficiency, and waste increased. In this context, goals such as reducing the amount of waste generated, maximizing reuse and recycling, and restricting landfilling to waste that cannot be recycled or recovered are included in the relevant EAP. In the current 8th EAP, covering the years 2021 to 2030, it is stated that by 2050 at the latest, the EU aims to achieve a priority long-term goal of living well within planetary boundaries, with nothing being wasted, growth being renewable, and climate neutrality being achieved in a prosperous economy. Indirectly, the importance given to waste reuse and the increase in the importance given to waste are noted. Ensuring the full implementation of waste policy targets in all EU member states is also emphasized (İMMİD EU Projects Department, 2024).

The EU's waste management policy is said to have five main objectives. These can be listed as follows (EU Waste Management Legislation, 2024):

● Promotion of environmentally friendly and less waste-intensive technologies and processes, and the production of recyclable products to prevent waste.

●Encouragement of the reuse and recycling of waste, particularly as raw materials.

●Improvement of waste disposal through the establishment of binding environmental standards at the European level (especially in terms of legislation).

●Tightening of provisions related to the transport of hazardous substances.

●Remediation of polluted lands.

As can be seen, detailed studies on solid waste issues and management have been conducted in the EU, with significant goals set for the coming years. The EU, which has formed its environmental policy, has reinforced it with plans and legislation such as the EU Sustainable Development Strategy, Environmental Action Plans, and the EU Waste Framework Directive. In this context, when looking at Türkiye, as a candidate country for the EU, it manages the environment in alignment with EU directives. Additionally, Türkiye has undertaken new legal regulations, capacity-building efforts, plans, projects, reports, and analysis studies in the environmental field, based on the EU framework (Dönmez & Değirmen, 2016, p. 255). It is said that the history of developments regarding solid waste management and sustainability in Türkiye is similar to the EU due to its candidate status. Furthermore, the global environmental issues that occurred worldwide have affected all countries simultaneously, though the responses to these issues have not been the same across all countries.

In Türkiye, the first regulation on environmental matters is found in Article 56 of the 1982 Constitution. This was followed by the Environmental Law No. 2872 enacted in 1983. The legal infrastructure for solid waste management in Türkiye has generally been prepared based on the directives and decisions formulated by the EU. In this context, in 2006, the Ministry of Environment and Forestry developed the EU Integrated Environmental Approximation Strategy for the period 2007-2013. This strategy included information on the technical and institutional infrastructure and the environmental obligations that needed to be fulfilled. Parallel to this Environmental Strategy, the Ministry of Environment also adopted the Waste Management Action Plan (2008-2012). The "Regulation on General Principles of Waste Management" dated July 5, 2008, established the framework legislation for waste management in Turkish law. The Waste Management Regulation incorporated certain provisions of the EU's Waste Framework Directive 2008/98/EC into national law. Furthermore, the Regulation on the Regular Landfilling of Waste, transferred from Directive 1999/31/EC, and other similar regulations derived from EU directives include regulations in this field (Uçar, Şemsit & Yüksel, 2018, p. 752). The latest regulation on solid waste management in Türkiye is the 2015 Waste Management Regulation.

At the national level in Türkiye, various regulations concern solid waste management. The responsibility for removing waste from urban areas or disposing of it in a way that does not harm the environment belongs to many institutions, with the greatest responsibility falling on municipalities that manage urban areas (Solak & Pekküçüksen, 2018, p. 658). Municipalities also have many regulations regarding waste management in their legislation. Municipalities are required to reflect waste management in local policies. This is especially mandatory in the process related to the EU.

In the context of regulations concerning municipalities related to solid waste and its management, Article 7/i of Law No. 5216 on Metropolitan Municipalities states that:

"To ensure the protection of the environment, agricultural plans, and water basins in accordance with the principle of sustainable development; to carry out afforestation; to designate and regulate storage areas for excavation soil, debris, sand, and gravel, as well as for wood and coal sales and storage; to take measures to prevent environmental pollution during their transportation; to prepare and implement the metropolitan solid waste management plan; to provide services related to the recycling, storage, and disposal of solid waste and excavation waste, excluding the collection and transportation of waste from the source to transfer stations; to establish, operate, or contract facilities for this purpose; to provide services related to industrial and medical waste, and to establish, operate, or contract the necessary facilities for this; and to collect, process, and regulate waste from marine vessels" (Law No. 5216, 2004).

According to Article 14/a of Law No. 5393 on Municipalities, "It performs or arranges environmental and environmental health services, cleanliness, and solid waste services." Additionally, according to Article 15/g of the same law, "It is among the municipality's powers and privileges to carry out and arrange all services related to the collection, transportation, separation, recycling, disposal, and storage of solid waste" (Law No. 5393, 2005). There are also many regulations concerning metropolitan municipalities in Türkiye.

When looking at the activities carried out by local governments in Türkiye in the field of solid waste, it is observed that they initially began with the collection and storage of waste. Metropolitan municipalities have started to act based on the principle of separately collecting waste according to its recyclability and environmental impact. Subsequently, uncontrolled waste disposal areas have gradually been replaced by regulated landfill sites. Later, the waste in these landfill areas began to be utilized for energy production. Finally, integrated solid waste management, where all these processes are coordinated in a single center, has started to come to the forefront (Uçar, Şemsit & Yüksel, 2018, p. 755; Yılmaz

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& Bozkurt, 2010, p. 18).

In a general assessment, solid waste is no longer considered merely as garbage but as resources that need to be recovered and reused (Bilgili, 2020, p. 94). This can be seen in the waste management policies of the EU and Türkiye. This perspective has also affected cities worldwide. Cities and the actors managing them have implemented plans, projects, and reports to meet changing societal expectations and to create healthy and high-quality living spaces by ensuring sustainable solid waste management.

3. EXAMPLES OF MUNICIPALITIES SETTING AN EXAMPLE FOR SUSTAINABLE SOLID WASTE MANAGEMENT IN THE WORLD AND TÜRKİYE

In today's world, economic, social, and cultural developments have forced cities to change, leading to a qualitative and quantitative differentiation in the services expected by the city and its residents. Municipalities, primarily responsible for cities and urban management, have to adapt their municipal experiences to the conditions of the day in response to these changing expectations. In this context, municipalities focus on fundamental values such as sustainability, accountability, transparency, and participation, and collaborate with various stakeholders responsible for urban management to implement new practices. Sustainable solid waste management has also become an area that cities and subsequently municipalities have been intensively working on in recent years (Dünya Kentlerinden İlham Veren Proje Uygulamaları, 2024; Taş & Durgun, 2022, p. 227).

When we look at the common characteristics of the selected sample countries below, these countries utilize the organic parts of their urban waste for energy production and make their solid waste management sustainable. Instead of simply dumping solid waste into empty land and considering it as a solution, these countries extract economic value from this waste and contribute to the city's economy without harming the environment (Gökpur, Zıba & Dolaz, 2019, p. 350).

3.1. Examples from Around the World

Municipalities have developed various plans and projects to establish, implement, and improve sustainable solid waste management in their respective cities in line with the current conditions. Having facilities and projects in different areas for the disposal of solid waste puts countries ahead in solid waste management. Below are examples of municipalities from around the world and from Türkiye. These selected municipalities have been included in the study

because they are good examples of solid waste and management practices in the world.

The sustainable solid waste management practice of the Groningen Municipality in the Netherlands, known as "Smart and Connected Garbage Bins," has reduced the municipality's carbon footprint by one-fifth. Significant steps have been taken in waste collection in the Netherlands through a collaboration between Vodafone and the entrepreneurial firm Mic-O-Data. The initiative enabled local governments in the Netherlands to reduce their CO_2 emissions by almost one-fifth while improving the services they provide and reducing waste collection costs. In collaboration with Vodafone, waste management company Mic-O-Data has introduced 6,000 connected garbage bins in apartment complexes nationwide to promote recycling. Equipped with a Vodafone M2M SIM that sends daily status signals to waste collectors and alerts them when bins are full or not properly closed, these bins help waste collectors adjust their schedules for emptying full bins or leaving empty ones, thus preventing unnecessary trips. As a direct result, waste collectors now make fewer trips and use less fuel. In some cases, it has been observed that municipalities require fewer garbage trucks. The bins can only be opened using an identification card. The initiative has also facilitated the establishment of a more accountable and transparent system towards the public, allowing local authorities to track who is using the facilities and bill accordingly, while also encouraging the increased use of recycling facilities (IoT Business, 2024).

Brazil (Belo Horizonte) has established the "Integrated Solid Waste Management System." Belo Horizonte, Brazil's third-largest city, realized in the 1990s that it was struggling to manage increasing waste levels, particularly given rapid population growth. It sought to address this issue by improving recycling, creating sustainable waste disposal areas, and partnering with an unusual workforce group (local waste pickers' cooperatives). In 1993, Belo Horizonte introduced the "Integrated Solid Waste Management" (ISWM) model, a selective approach to waste collection and processing. ISWM aims to improve waste collection and management and increase recycling rates. By 2012, 93% of total waste in Belo Horizonte was disposed of in controlled landfill sites or environmentally sensitive waste disposal areas. The vast majority of the population (95%) benefited from the city's household waste collection services. Additionally, through various cooperatives with individual contracts with the city, approximately 600 people were formally employed in the waste management sector. The working conditions of waste pickers have improved significantly, and it has been reported that they earn a profit from the minimum wage of $321 per month (Centre for Public Impact A BCG Foundation, 2024).

In Houston, Texas, USA, the project "Reuse of Construction and Building Materials" has been implemented. According to this project, construction and building materials, including doors, electrical fixtures and equipment, lighting, lumber, metal, plumbing fixtures, plywood, sinks, and showers, account for 38% of the waste stream in the Houston area. The Building Materials Reuse Warehouse, implemented with a grant from the Houston-Galveston Area Council and the Houston Solid Waste Management Department, provides space for excess construction materials that would otherwise be disposed of in local landfills, benefiting the community. The warehouse accepts materials from individuals, supply companies, and contractors and offers these materials for reuse by any nonprofit organization free of charge. The concept behind this project is simple: the more materials they receive, the more space the warehouse has to accept additional materials. Additionally, the warehouse has built a workshop and meeting space and constructed a community center to further promote the concepts of "reuse" and "resource sharing". The Houston Solid Waste Management Department's Building Materials Reuse Warehouse is part of a network of Houston-based community organizations working to keep reusable building materials out of landfills and into the hands of those who can use them. While the Reuse Warehouse focuses on providing materials to nonprofit organizations, many other local organizations make materials available to individuals. As of 2015, the project has diverted 3,000 tons of material from landfills and distributed 90% of it. In addition to helping reduce waste, the project brings the Houston community together and allows businesses and individuals donating materials to clear storage space (C40 Cities, 2024).

In the UK (London), the FoodSave program, implemented by the Mayor of London in 2016, works with small and medium-sized food businesses (SMEs) across the capital to reduce food waste. The program offers free support to help businesses prevent waste and redistribute surplus food to people in need and farm animals. In cases where waste is unavoidable, FoodSave ensures that food is recycled. The project is based on the principles of the London Food Waste Hierarchy. Funding for the project is provided by the Mayor of London, the European Regional Development Fund, and the London Waste and Recycling Board. FoodSave has been largely successful in helping businesses reduce food waste. Since 2013, 97 businesses have supported the program and have made progress toward the following goals together: diverting 964 tons of food waste from landfills annually, preventing 83 tons of food waste annually, and achieving annual cost savings of £366,000. Considering that there are over 800,000 SMEs in London, supporting this group will have a significant impact. However, these businesses are among the most challenging to engage with. Nevertheless,

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significant feedback has been received so far, with The Imperial Arms business attributing savings of over three tons of food and £10,000 annually to the program, with plate waste reduced by 54% (Home, 2024).

Milan, Italy, has developed an integrated waste collection plan since 2012, aiming to recycle the highest possible amount of material, including organic waste. Thanks to the food waste collection program for households citywide, Milan ranks very high among European metropolises in terms of separation and collection rates. The city initiated the food waste collection program for households and the transparent bag program for recyclable materials in late 2012, completing its citywide rollout by mid-2014. The city works in coordination with the municipal waste company and citizens and collaborates with building managers to increase awareness of program details. Additionally, the plan allows for efficiency tracking and field optimization measurements. Through the integrated waste collection program, Milan has managed to reduce residual waste from 450,000 tons in 2011 to 316,000 tons in 2015, achieving a recycling rate of 52.7% for municipal solid waste collected in 2015, including 136,000 tons of organic waste (compared to 40,000 tons in 2012). This has enabled the city to meet the EU target of reusing or recycling at least 50% of municipal solid waste by 2020 (C40 Cities, 2024).

3.2. Examples from Türkiye

Istanbul is the province with the highest amount of solid waste in Türkiye. Additionally, it takes a leading role among other provinces in ensuring the recycling and reintroduction of solid waste into sectors. Municipalities in Istanbul have developed various projects to solve the solid waste problem arising from the city being a major metropolis. One of these projects is the "Smart Mobile Waste Transfer Stations Project" implemented by the Istanbul Metropolitan Municipality, aiming to recycle plastic and metal bottles. These stations are placed at metro stops, various educational institutions, and public organizations in Istanbul. The stations are produced and supervised by municipal subsidiaries. Additionally, various statistical and mechanical reactions are measured and recorded through these stations. Apart from this project, the Istanbul Metropolitan Municipality has launched two different game projects called "Waste Sorter" and "Waste Hunter" to instill environmental awareness, waste disposal, and recycling in children. These projects can be downloaded for free on phones and tablets, allowing children to learn about and separate glass, paper, plastic, and metal materials for recycling (İstanbul Metropolitan Municipality, Department of Environmental Protection and Control, 2024).

The "Electricity Generation from Waste and Solid Waste Recycling Facility Project" of Eskisehir Metropolitan Municipality started its operation in

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2018. This facility utilizes modern technology products and converts methane gas obtained from the remaining part of the waste after solid waste separation into electricity. Another project, the "Integrated Solid Waste Recycling and Energy Production Facilities Project", which started its operation in 2017, is another project. With this project, Eskisehir Metropolitan Municipality sustainably obtains energy equivalent to the electricity consumption of 95 thousand households from the city's municipal waste. Moreover, this facility has provided employment opportunities for thousands of people. Additionally, the heat generated during this process allows the municipality to grow thousands of plants in the greenhouses located in the facility (Eskişehir Metropolitan Municipality, 2024).

With the implementation of the "Long Nose Solid Waste Disposal Facility and Landfill Project" by Manisa Metropolitan Municipality in 2017, it became possible to significantly reduce serious problems such as continuous explosions in garbage areas and subsequent serious air pollution, as well as the waste problem. Since the implementation of the project until today, around 2.5 million tons of solid waste have been processed and recycled, contributing to the economy. When the project was first implemented, its capacity was 650 tons per day, but with the use of new technologies, its capacity has been renewed to process over 2,000 tons of household waste per day. Additionally, a wastewater treatment plant has been built within this facility. Thanks to these projects, Manisa Metropolitan Municipality is recognized as an environmentally friendly city on the national agenda, making significant progress in waste separation, disposal, and economic contribution (Manisa Metropolitan Municipality, 2024).

Van Metropolitan Municipality implemented the "Integrated Solid Waste Facility Project" in 2018, with a cost of 200 million, significantly addressing the city's waste problem. Additionally, with this facility, electricity is generated from waste, meeting the electricity needs of 35 thousand households. This facility, prepared in accordance with EU standards, also provides income by professionally separating solid waste, contributing to the economy (Van Metropolitan Municipality, 2024).

4. PERCEPTION OF SOLID WASTE MANAGEMENT IN THE PLANS, PROJECTS, AND REPORTS OF KAHRAMANMARAŞ METROPOLITAN MUNICIPALITY

In recent years, solid waste and its management problem, which has become a serious environmental issue in Türkiye, is generally being tackled under the leadership of local governments, especially municipalities. The duty of providing the public with a healthy, clean, and high-quality environment within

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the scope of municipalities' direct environmental services has directed municipalities to undertake serious efforts in this area. As mentioned above, there are municipalities in Türkiye that have implemented exemplary projects in solid waste management.

Within the scope of the aim of this study, the approach of Kahramanmaraş Metropolitan Municipality towards solid waste management has been examined through various plans, projects, and reports. However, first, the current position of Kahramanmaraş in terms of solid waste is provided.

Kahramanmaraş is a province whose economy is based on agriculture and animal husbandry. However, like many other provinces in Türkiye, it entered a rapid industrialization process since the 1980s. In this context, many sectors such as textiles, copper processing, cotton processing (ginning), steel kitchenware, construction, feed, packaging, food, paper, and machinery manufacturing, as well as heating and cooling systems, have become leading sectors in the province's industrialization. Looking at the facilities in the province, textile, metal industry, and food facilities stand out (Zıba, Gökpur & Dolaz, 2019, p. 347). When looking at the population of the province (Durgun & Taş, 2022), according to the 2023 population statistics of the Turkish Statistical Institute (TÜİK), it is stated to be 1 million 166 thousand. Additionally, the province is affected by intensive refugee migration, and according to TÜİK's 2023 data, the total number of registered refugees within the province is 90,575, and the proportion of this number to the population of the province is 7.18%. Looking at the data, it can be seen that the population of the province is at a significant level. The growing industry and increasing population in Kahramanmaraş naturally lead to an increase in solid waste over time. As a result, urgent intervention is required in the existing services and management systems of the metropolitan municipality. In this regard, significant steps have been taken across the province regarding solid waste management.

When looking at the organization structure of the metropolitan municipality in terms of solid waste management before examining its relevant documents, it is observed that there is a Waste Management Branch Directorate under the Directorate of Environmental Protection and Control. This information has been shared on the municipality's website, and a telephone number has been provided for citizens' requests and complaints regarding waste. Thus, it is aimed to increase public awareness regarding the recycling of waste into the economy.

In the "Kahramanmaraş Province 2021 Environmental Status Report" prepared for Kahramanmaraş province in 2022, solid wastes were classified, and their average quantities were specified. Below are the solid waste amounts for Kahramanmaraş both in terms of quantity and type (Kahramanmaraş Province

2021 Environmental Status Report, 2024):
- ●Municipal solid waste: 652.49 tons per day
- ●Excavation soil, construction, and demolition waste: 452,490 m3 per year
- ●Packaging waste: 501,656,486 units
- ●Hazardous waste: 5,652,825 kg
- ●Waste oils: 272,438 kg
- ●Waste batteries and accumulators: 21,081 kg
- ●Vegetable waste oils: 15,569 kg
- ●End-of-life tires: 9,190 tons per year
- ●Waste electrical and electronic equipment: 293 tons
- ●End-of-life scrap vehicles: (not specified)
- ●Non-hazardous waste: 3,449,644 tons per year
- ●Medical waste: 1,479,812 tons per year

Due to the earthquakes that occurred on February 6, the amounts of solid waste mentioned above have significantly increased. This situation can be seen in detail in the table below (Doğdu & Alkan, 2023, p. 45):

Table 1: Solid Waste Indicators of Kahramanmaraş Province

	Approximate Mass Waste Amount (tons)	Hazardous Materials (tons)	Soil and Stone Mixture (tons)	Bituminous Mixtures and Wood Waste (tons)	Mineral Fraction Waste (tons)	Reinforced Concrete Waste Amount (tons)	Scrap Iron Waste Amount (tons)
Kahramanmaraş	18.573.962,00	278.609,43	3.120.425,62	4.160.567,49	10.958.637,58	7.429.584,80	179.343,00

Reference: Doğdu & Alkan, 2023, p. 45

Looking at the solid waste quantities in Kahramanmaraş from 2012 to 2022 as presented in the regularly published Kahramanmaraş Environmental Status Reports, it is observed that the solid waste amounts mentioned above have been increasing steadily every year parallel to industrialization and population growth[2]. This situation has led Kahramanmaraş Metropolitan Municipality to take measures to reduce solid waste and to try to solve the waste problem. In this

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[2] Additionally, the solid waste amounts mentioned above have significantly increased as a result of the earthquakes that occurred on February 6th.

regard, various facilities have been established, and efforts have been made to address the waste issue. One of these facilities is the "Solid Waste Disposal Facility" (Kahramanmaraş Province 2021 Environmental Status Report, 2024).

The Kürtül Solid Waste Integrated Facility, located in Kürtül, implemented by Kahramanmaraş Metropolitan Municipality, was put into operation in 2013 under the climate change action plan. The facility constitutes a significant step in solving the solid waste problem in the province. Through this facility, 4.8 megawatts of energy is generated from 600 tons of waste collected daily in the city, meeting the electricity needs of 15 thousand households. This step indicates the presence of renewable and sustainable energy applications in the province, as well as the consideration of solid waste issues and management. The daily collected 600 tons of waste are separated for recycling, and the unsorted waste is stored in accordance with environmental health and safety regulations. Following the "National Climate Change Strategy and Action Plan", which is an important document implemented nationwide, the existing solid waste integrated facility in Kahramanmaraş province aims to reduce carbon footprint. With the electricity generated by the Kürtül Solid Waste Integrated Facility, the need for fossil fuels decreases. Additionally, economic savings are achieved since the material used for electricity production is waste. Furthermore, environmental problems are mitigated, and environmentally friendly practices are implemented. (Kahramanmaraş Metropolitan Municipality, 2024a; Governorship of Kahramanmaraş Provincial Directorate of Environment, Urbanisation and Climate Change, 2024). Additionally, this facility has taken significant steps in addressing the increased solid waste problem in the city resulting from the February 6th earthquakes. The substantial amount of waste generated in the city has been sorted at this facility for recycling and continues to be sorted.

Kahramanmaraş Metropolitan Municipality processes the domestic waste collected from seven districts throughout the year by recycling it at Solid Waste Disposal Facilities. Domestic waste collected from the districts of Onikişubat, Dulkadiroğlu, Türkoğlu, Pazarcık, Çağlayancerit, Andırın, and Göksun is recycled and disposed of properly. In contrast, domestic waste collected from the districts of Elbistan, Afşin, Ekinözü, and Nurhak is gathered in uncontrolled disposal sites within their own boundaries. The Environmental Protection and Control Department is the responsible unit for this process. Additionally, collected waste is transported to disposal facilities by municipal vehicles, where it is separated for recycling and then disposed of. The domestic waste from the other four districts—Elbistan, Afşin, Ekinözü, and Nurhak—is collected in uncontrolled disposal areas within their own boundaries (Kahramanmaraş Metropolitan Municipality, 2024b).

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Moreover, a project titled "Kahramanmaraş Northern Districts Integrated Solid Waste Facility" is currently in the tender stage with the support of grants and credit funds provided by the EU. Within the scope of the project, actions have been taken in compliance with EU environmental regulations and national regulations to minimize the harmful effects arising from the processing and disposal of solid waste to protect and improve the environment and not to jeopardize public health. Under this project, waste in the districts of Göksun, Elbistan, Nurhak, Ekinözü, and Afşin will first be collected sustainably and then recycled. Additionally, within the project scope, a leachate treatment plant will be established in Afşin, the In-Situ Rehabilitation of Elbistan and Afşin Irregular Landfill Areas will be conducted, and finally, the relocation of Nurhak and Ekinözü Irregular Landfill Areas to Afşin will be carried out. This comprehensive project is expected to significantly reduce the waste problem in the northern districts of Kahramanmaraş Province, especially aiming to reduce the waste problem originating from the Elbistan - Afşin thermal power plants (İLBANK, 2024; Kahramanmaraş Metropolitan Municipality, 2024c).

The Strategic Plan of Kahramanmaraş Metropolitan Municipality covering the years 2020-2024 has been thoroughly examined in terms of solid waste and its management. The plan outlines the municipality's goals to ensure control over solid and liquid waste, provide environmental awareness training related to waste, collaborate with sister cities on waste management, ad plan accordingly in this regard, as well as activate the zero waste project (Kahramanmaraş Metropolitan Municipality, 2024d). Additionally, the most important step in solid waste management within the strategic plan is to expedite the construction of the Elbistan Solid Waste Disposal Facility and complete it by the end of 2024, in line with the goals outlined in the plan. It has been stated that this facility, which is planned to be completed by the end of this year, is essential for Kahramanmaraş, particularly in addressing the waste problem caused by the February 6th earthquake. It is believed that this facility will help reduce the solid waste problem that has increased in the city following the earthquake.

The Activity Report of Kahramanmaraş Metropolitan Municipality for the year 2022 shows that it is consistent with the municipality's Strategic Plan in terms of solid waste and its management. In addition to the Strategic Plan, it is stated that all types of waste should be removed from being considered as garbage and their recycling should be ensured, with efforts being made to reintroduce them into various sectors as raw materials. As a result, it is emphasized that waste will contribute economically to the city (2020-2024 Kahramanmaraş Metropolitan Municipality Strategic Plan, 2024e).

Kahramanmaraş Metropolitan Municipality organizes various trainings,

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seminars, and workshops on solid waste, zero waste, and related topics, primarily for students and citizens, as part of its social municipal services. These activities are also announced on their website. The Waste Management Branch Directorate provides information on several critical issues through its activities, including waste prevention, efficient resource use, preventing waste generation, the impact of climate change on the environment and daily life, and water conservation (Kahramanmaraş Metropolitan Municipality, 2024f).

5. CONCLUSION AND EVALUATION

Kahramanmaraş entered a rapid industrialization process in the 1980s, like many other cities in Türkiye, and made significant progress in industries such as textiles. Subsequently, this process accelerated urbanization and led to population growth in the province. Additionally, Kahramanmaraş hosts a significant population of refugees. With all these factors, the expectations for municipal services have changed since Kahramanmaraş became a metropolitan city in 2012. Providing a healthy environment, clean, and quality surroundings have become a priority because these changes in the province have created a serious solid waste management problem. Especially after the earthquakes on February 6 in Kahramanmaraş, the solid waste generated from the debris further exacerbated this problem. In this disaster centered in Kahramanmaraş, approximately 8 thousand buildings throughout the province became unusable, which of course created a serious pile of debris in the city. As a result, it has further increased the existing solid waste problem in the city.

The approach of Kahramanmaraş Metropolitan Municipality to solid waste issues, its management, and sustainability is significant compared to other examples globally. This can be seen in the municipality's relevant plans, reports, and projects. However, when we look at the world cities taken as examples, it is seen that these countries have seriously implemented smart city applications regarding solid waste and management. At this point, it can be said that the work carried out by Kahramanmaraş Metropolitan Municipality is inadequate.

Among the municipality's priority goals in its strategic plan and activity report is the resolution of solid waste issues. It is stated that these goals will be urgently implemented within the processes covered by this plan and report. This is because, as indicated in the Kahramanmaraş Province 2021 Environmental Status Report, there is a serious increase in solid waste quantities every day.

The most important step taken by Kahramanmaraş Metropolitan Municipality to solve the solid waste problem was the implementation of the Kürtül Solid Waste Integrated Facility in 2013. This facility's ability to process 600 tons of urban waste daily, generate electricity, and meet the electricity needs

of 15,000 households is a significant development for the province. Additionally, its ability to perform all these processes without harming the environment, in harmony with the environment, and ultimately contributing to the province's economy is important. Moreover, with this facility, Kahramanmaraş Metropolitan Municipality can be considered among the exemplary provinces in Türkiye. Furthermore, the municipality's Kahramanmaraş Northern Districts Integrated Solid Waste Facility project has reached its final stages and is planned to be implemented. With this facility covering districts like Göksun, Elbistan, Nurhak, Ekinözü, sustainable waste collection and recycling will take place. This project is also an important step to prevent the significant damage caused by the waste generated from the Afşin-Elbistan Thermal Power Plants. Additionally, this new project demonstrates the metropolitan municipality's commitment to a sustainable approach to the solid waste issue. Similarly, these facilities have somewhat mitigated the serious solid waste problem that arose after the earthquake. The debris piles and various types of solid waste have been sorted at these facilities and continue to be sorted for recycling.

Finally, it can be suggested that Kahramanmaraş Metropolitan Municipality should take advantage of the benefits of Smart City applications, one of the modern world's advancements, in addressing the solid waste problem. Likewise, the study is expected to inspire research on this topic and method in different cities.

6. CONFLICT OF INTEREST STATEMENT
There is no conflict of interest between the authors.

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8. AUTHOR CONTRIBUTIONS
YA: Idea, Design, Supervision, Collecting and processing resources, Analysis and interpretation, Literature review, Writer, Critical Review

9. ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS
Ethics committee principles were complied with in the study and necessary permissions were obtained in accordance with the principles of intellectual property and copyrights.

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JANDARMA İÇİN TERÖRİZMLE MÜCADELEDE KAPASİTE KULLANIMI ÖNERİSİ[1]

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ÖZ

Modern bir devletin her bir kurumunun kamu hizmetini etkin ve verimlilikle yerine getirebilmesi için hem merkez hem de taşra teşkilatıyla birlikte kurumsal kapasitesini her zaman sorgulaması ve kurum dışı kaynaklarını uygun kullanmasının önemi açıktır. Bu çalışma, jandarmanın sorumluluk bölgesinde yer alan 2020 yılı il terör olay sayılarını temel alarak iller arasında kapasite kullanıma olumlu katkı sağlayacak anlamlı ilişki kurabilmeyi amaçlamıştır. Terör olay sayıları için kamuya açık olan jandarma dokümanından faydalanılmıştır. Terör olay sayılarının analizinde ise, ucinet sosyal ağ analizi programından istifade edilmiştir. Analiz sonucunda elde edilen bulgular neticesinde jandarmanın terörizmle mücadele faaliyetlerinde önem derecesi öne çıkan illere yönelik olarak, diğer illerden daha fazla kapasite desteği sağlanmasının kurumun terörizmle mücadele faaliyetlerine olumlu katkı sağlayacağı değerlendirilmiştir.

Anahtar Kelimeler: *Kurum kapasitesi, terörizmle mücadele, jandarma*
JEL Kodlar: *H83, H56, F52*

Alan: *Siyaset bilimi ve kamu yönetimi*
Türü: *Araştırma*

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[1] İlgili çalışmanın etik kurallara uygunluğu beyan edilmiştir.

CAPACITY UTILIZATION PROPOSAL FOR GENDARMERIE IN COMBATING TERRORISM

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ABSTRACT |

It is clear that in order for each institution of a modern state to perform public services effectively and efficiently, it is important to always question its institutional capacity, both central and provincial, and to use its external resources appropriately. This study aims to establish a meaningful relationship that will contribute positively to capacity utilization among provinces based on the amount of terrorist cases in 2020 in the gendarmerie's area of responsibility. Publicly available gendarmerie documents were utilized for the amount of terrorist cases. In the analysis of the amount of terrorist cases, ucinet social network analysis program was used. It is assessed that the findings obtained as a result of the analysis will contribute positively to the institution's capacity in the gendarmerie's activities in the combat terrorism. It is clear that providing more capacity support to provinces with a high level of importance than other provinces will make a positive contribution to the institution's anti-terrorism activities.

Keywords: *Institutional capacity, combating terrorism, gendarmerie*
JEL Codes: *H83, H56, F52*

Scope: *Political science and public administration*
Type: *Research*

1. GİRİŞ

Modern devletin her bir kurumundan vatandaşın beklentileri, kendisine tanımlanan yasal yetkiler temelinde görevli ve sorumlu olduğu işlevsel alanında kurum kapasitesini sürekli sorgulaması ve geliştirmesidir (Kocaoğlu, 2019, s.117-119). Bunun için devletin her bir kurumu, kamu hizmetlerinin yerine getirirken icra ettikleri faaliyetlerin zaman içerisindeki dönüşümlerini dikkate alarak sürekli kendisini ve işlevini sürdürebilir kılmalıdır (Ellies, 2010, s. 1). Kamu kurumlarının kendi kapasitelerini kullanma gerekliliği, ilk bakışta özel sektör örgütlenmelerinin piyasa koşullarında kendi sürdürülebilirliğini sağlama zorunluluğuna benzemediği algısı oluştursa da; modern devletlerin çağdaşları arasında varlık göstermesi ve kendisini idame edebilmesi, kapasitesinin uygun kullanımıyla gerçekleşebilmektedir. Bu açıdan kamu kurumlarının da geleceğe ilişkin politika, strateji ile planlamalarını oluştururken ve faaliyetlerini icra ederken (Burch, 2007, s.1), kendi kapasite kullanımlarını değişimi tahmin eden ve uyum sağlayan bir şekilde dinamik bir süreç olarak görmesi önemlidir (Kocaoğlu, 2019, s. 118).

Bu çalışma, Jandarma Genel Komutanlığı (J.Gn.K.lığı)'nın sorumluluk alanında bulunan 2020 yılı il terör olay sayılarını temel alarak iller arasında anlamlı ilişki kurabilmek ve bu sayede kurum kapasitesinin daha etkin kullanılmasına katkı sağlanmasını amaçlamaktadır. Söz konusu terör olay sayılarının tespitinde, kamuya açık olarak yer alan J.Gn.K.lığı'nın 2021 yılı basımı *"Jandarma Asayiş 2020 Eğitim ve Faaliyet Yıllığı"* dokümanından[2] yararlanılmıştır. Terör olay sayılarının analizinde ise, *"Ucinet Sosyal Ağ Analizi"* programı kullanılmıştır. Analiz sonucunda elde edilen bulgulardan hareketle, jandarmanın terörizmle mücadele faaliyetlerinde önem derecesi öne çıkan illere yönelik diğer illerden kapasite desteği sağlanması ya da kapasite artırımına yönelik öneriler getirebilmek hedeflenmiştir. Bu kapsamda çalışmada ilk olarak literatür taraması bölümünde, devletin kurumlarında kapasite kullanımı, devletin güvenlik sektöründe icra edilen faaliyetleri ve birimlerin arasında koordinasyonun önemi, terörizmle mücadele ve jandarmanın bu mücadelede önemi açıklanmıştır.

Çalışmaya ilişkin araştırma sorularının belirlenmesini müteakip, çalışmaya temel olan jandarma sorumluluk bölgesindeki terör olay sayıları temel alınarak ucinet ağ analizi üzerinden bulgular elde edilmiştir. Elde edilen sonuçlar araştırma sorularıyla karşılaştırılmış ve yorumlanmıştır. Bu bağlamda elde edilen analize konu sonuçlarla jandarmanın illere göre terörizmle mücadelesinde hangi

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[2] J.Gn.K.lığı (2021). *2020 yılı J.Gn.K.lığı Asayiş Başkanlığı Eğitim ve Faaliyet Yıllığı.* Ankara: J.Gn.K.lığı.

illere daha fazla kapasite desteği veya artışının sağlanması gerektiği yönünde öneriler sunulmuştur.

2. KAVRAMSAL ÇERÇEVE

Jandarma, terörizmle mücadele başarısına katkı sağlamak maksadıyla; taşrada icra edilen görevlerinde her zaman kurumsal düzeyde etkinlik ve verimliliğini artıracak faaliyetleri ve görev önceliğini destekleyecek çalışmaları stratejik bir hedef olarak belirlemiştir (J.Gn.K.lığı, 2024a, ss. 8-11). Jandarma'nın bu amacı gerçekleştirmesinde temel alınacak literatürün devlette kamu kurumlarının kapasite kullanımı (Haque vd., 2021, s. 216), merkez ve taşra teşkilatları arasında koordinasyonun önemi, güvenlik hizmetinin eşgüdümü, terör örgütlerinin temel yapı ve özelliklerinin bilinmesi ile jandarmanın terörizmle mücadele boyutu üzerine oluşturulması uygun olur.

2.1. Kamu Kurumlarında Kapasite Kullanımı

Bir örgütlenme olarak devletin kurumsal kapasitesi, vatandaşları için gerçekleştirilen her bir kamu hizmeti alanına yönelik görevlerini ifa edilmesini, bunu sağlayan şartların devamını, görevin icrasını engelleyen sorunlar var ise, çözümünün öngörüldüğü ve ilgili kaynaklara ulaşılması olarak ifade edilebilir (Baser, 2011, s. 2). Söz konusu kaynaklar, fiziksel, beşeri, mali ve teknik hususlar olmakla birlikte (Kutlu, 2013, s.462); bu kaynaklar kurum kültürü, yönetim anlayışı, yöneticinin liderlik faktörü, çevresel şartlar ile yasal yetki ve sorumluluklarıyla birlikte inşa edilmektedir (Kim, 2009, s. 350; Kocaoğlu, 2019, s. 118).

Kapasite kullanımında Şekil 1'de görüldüğü üzere iç ve dış faktörler olarak insan *(sayısı, eğitim düzeyi ve kalitesi, işgücü maliyeti vb.)*, yönetim *(yönetimi kolaylaştıran temel ilkelere uyum, yönetsel yapı, örgütlenmenin büyüklüğü, koordinasyon),* bütçe ve alt yapı *(örgüt kültürü, iletişim yeteneği)* önemli olurken dış faktörler açısından piyasanın ekonomik koşulları, yasal düzenlemeler, ülkenin sosyal ve politik faktörleri, vatandaşın beklentileri ve politikalara katılımı ile diğer kurumlarla ilişkileri öne çıkmaktadır (Christensen & Gazley, 2008, ss. 273-278). Bu bağlamda kurumun kapasitesi insan gücü sayısı gibi nicel veriler yanında, her bir personelin yeteneği, bilgi düzeyi, çalışkanlığı ve işbirliğine açıklığı gibi nitel verilerle birlikte dikkate alınmaktadır. Kamu kurumlarının ilgili olduğu kamu hizmetini en uygun şekilde yapacak kapasiteye ulaşmasında; insan, eğitim düzeyi, ekipman ve teknoloji yeteneğinin en doğru şekilde kullanılması önemlidir (Honadle, 1981, s. 578). Ancak özel sektör ile karşılaştırıldığında özel sektör örgütlenmelerinin kurumsal kapasitesinde, daha fazla üretim ve karlılık öne çıkarken, kamu kurumlarında hesap verebilir şekilde etkinliğe ve verimliliğe odaklanıldığı açıktır (Kutlu, 2013, ss. 464-465).
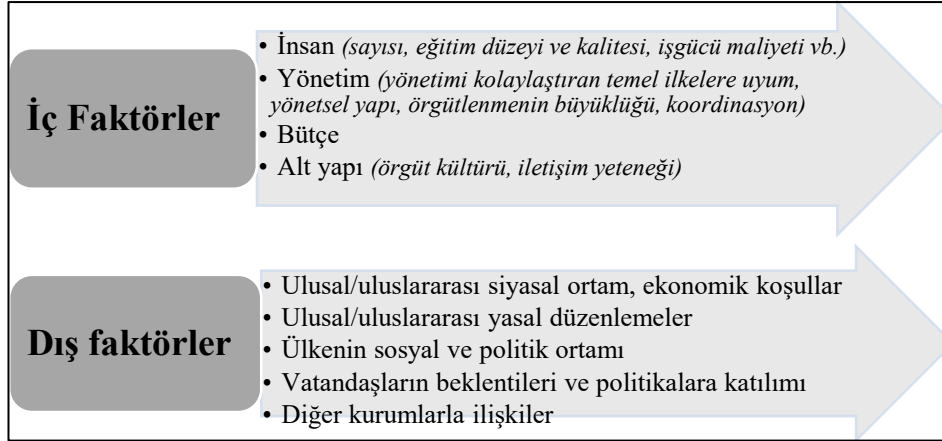
Şekil 1: Kurumsal Kapasite Kullanımını Etkileyen Faktörler
Kaynak: (Kocaoğlu, 2019, ss. 120-121)

Kamu kurumlarında yönetsel kapasite ise, kapasite kullanımını yönetim kavramı bağlamında açıklamaktadır. Kurum yönetiminin kapasitesi; uygun yönlendirilmesi, liderlik edilmesi, yönetim ve karar süreçlerini içermektedir. Geçmişten günümüze kamu kurumlarında yönetsel kapasitesinin artırılması ihtiyacının ortaya çıkışı, kurumların geleneksel bürokratik örgütlenme yaklaşımından çağdaş modellere doğru kurumların şeffaflaşması ve bu sayede hesap verebilir olması, bunun da etkinliğine ve verimliliğine katkı sağlaması beklentileriyle birlikte gelişmiştir (Kim, 2009, s. 348; Kocaoğlu, 2019, s. 117). Yönetsel kapasite sahip olunan bilgi, personel, mali güç, teknoloji yeteneği, örgütlenmenin uygunluğu (El-Taliawi & Van Der Wal, 2019, ss. 245-246), kurum içinde yönetime güven duyulması ve toplum desteğinin sağlanmasıyla birlikte öne çıkmaktadır (Honadle, 1981, s. 576; Kocaoğlu, 2019, s. 118). Kamu yönetimi hesap verme sorumluluğu sorunlarıyla mücadele etmeye devam etmektedir (Ellies, 2010, s. 8).

Yönetsel kapasite, kurumun stratejisi temelinde politika, mali yönetim ve uygulama süreçleri üzerine inşa edilebilir (Rivenbark, 2004, ss. 31-33). Yönetimin temel fonksiyonlarında politikanın yönetimine odaklanırken, politika yönetimindeki süreç temelli işlemler program yönetimini; bilgi düzeyi, personel ve sermaye kaynaklarının idaresini ise kaynak yönetimi olarak benimsemektedir (Christensen & Gazley, 2008, ss. 272-273; Kocaoğlu, 2019, s. 123). Devletler yönetsel kapasitesini artırabilmek için küreselleşmenin getirdiği rekabet koşullarını dikkate alarak siyasal ve ekonomik koşullarını geliştirecek uygun politik kararlar alabilmelidir (Ellies, 2010, s. 2). Bu açıdan kamu kurumlarının iç

ve dış şartlardaki değişimleri dikkate alarak kurumsal kapasitesini geliştirecek tedbirlerin alınması, kapasitenin bileşenlerinin tespit edilerek bunlara odaklanılması önemlidir (Kocaoğlu, 2019, s. 124).

2.2. Kamu Kurumlarında Koordinasyon ve Güvenlik

Gulick, koordinasyonu bir örgütlenmede beraber çalışanların bir amaç için kararlılık ve şevkle bütüne uygun bir şekilde iradelerinin gösterilmesi olarak belirtmektedir. Örgütlenmenin küçüklüğü koordinasyonda basitlik ve amacın anlaşılmasını kolaylaştırırken, büyüklüğü personelin ortak amaca yöneltilmesini zorlaştırmaktadır. Bu nedenle kurum, temel amaç ve hedeflerine yönelik faaliyetlerini yerine getirirken; merkez yönetim ve bağlı birimleri birlikte planlanan zamanı, ilgili mekânı, personelin gayretini bütüncül bir şekilde gözetmelidir (Gulick, 1937, ss. 8-9; Demirol, 2018, ss. 86-87). Bu sayede ulaşılan daha iyi yönetim ve uygulamalar ise, kurumun kapasite kullanımında artışa, görev etkinliğine ve verimliliğine doğrudan katkı sağlayabilmektedir (Fayol, 1937, ss. 103-104).

Bir devletin güvenlik alanında tüm ülkede etkili olabilecek terör olayları, yaygın şiddet hareketleri, düzensiz göç, afet ve acil durumlar, örgütlü siber saldırılar ve organize suç örgütleriyle mücadele gereksinimine yönelik koordinasyon ihtiyacı, sahip olduğu kurum kapasitesi ve örgütlenmesi için önemlidir. Bunun için devlet kurumları kapasitelerini uygun şart, yer ve zamanda kullanılmasına temel olacak şekilde yönetim etkinliği ve koordinasyonda merkezileşmeye yönelmiştir. Örneğin Türkiye'de devletin iç güvenlik alanında maruz kalabileceği her türlü tehdit ve soruna karşı bütünleşik yönetim anlayışını öngören *"Güvenlik ve Acil Durumlar Koordinasyon Merkezi" (GAMER)*'in kuruluşu buna örnek verilebilir. GAMER, İçişleri Bakanlığı'nın yurt içinde kamu güvenliğini sağlama görevi nedeniyle[3] 2016 yılında Bakanlık bünyesinde ve illerde taşra il ölçeğinde kurulmuştur (Şitoğlu, 2017, s.42). Merkez ve mahalli idareler arasında koordinasyon ve işbirliğinin sağlanmasını amaçlamıştır (Bedük, 2017, s. 29). Yine J.Gn.K.lığı da, ana karargahı ve il jandarma komutanlıkları vasıtasıyla görev alanına giren faaliyetlerin takip ve koordinasyonunu yapmak için *"Harekat Merkezi"* teşkil etmiştir. Bu merkezler, 24 saat esasına göre sorumluluk sahasında meydana gelen terör, kaçakçılık ve asayiş olaylarını takip ederek koordinasyon görevi icra ederler (J.Gn.K.lığı, 2024b).

2.3. Jandarma ve Terörizmle Mücadele

J.Gn.K.lığı'nın kamu düzenini sağlamak maksadıyla öncelikli görevleri

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[3] 3152 sayılı İçişleri Bakanlığı Teşkilat ve Görevleri Hakkında Kanunu gereğince *"İç güvenliğinin ve asayişinin sağlanması, kamu düzeninin"* sağlanmasında İçişleri Bakanlığı görevlendirilmiştir (Resmi Gazete, 1985).

arasında terörizmle mücadele gelmektedir (J.Gn.K.lığı, 2024a, s. 8). Terör, silahlı eylemler gerçekleştirilmesi suretiyle örgütün kendisinin, davasının ve ideolojisinin duyurulmasıdır. Terörizm ise, gerçekleştirilen eylemlere sahip çıkılması ve stratejilerinin belirlenmesidir (Ak, 2022, ss. 14-17). Terör örgütleri genel olarak bulundukları ülke veya coğrafyada hâkim kılmak istedikleri ideoloji, din, kültür ya da etnik kimlik adına şiddet eylemlerinden faydalanarak, devlet ve toplum üzerinde bir inisiyatif alma hedefinde olan gruplaşmalardır. Bulundukları toplumda maddi hayatın olağan akışında yaşama engel olmak için insanlar arasında korku salmak isterler. Terör örgütleri hak ve özgürlüklerin güvence altında olduğu demokratik rejimlerde daha rahat hareket imkânı bulurlar (Akmaral, 2004, ss. 41-60).

Terör örgütü üyelerinin hayatına devam ederek eylemlerini sürekli tekrarlamak istemeleri ve işledikleri suçların cezai müeyyidelerini bilmeleri; örgütlenmelerini birer gizli ağ olarak düşünmelerini sağlar. Bir diğer ifadeyle terör örgütlerinin aktörleri ve ilişkileri görünür olmamaktadır (Raab & Milward, 2003, ss. 371–373). Bu açıdan zaman ve mekâna göre örgütlenmeler dikey/yatay, katı/esnek, merkeziyetçi/âdemi merkeziyetçi hiyerarşide ya da birbirleri arasında güçlü bağ veya zayıf bağ oluşturabilirler (Lindelauf vd., 2009, ss. 3-4). Terör eyleminin azalması ya da örgüt üyeleri arasında irtibatın seyrekleşmesi ağların yoğunluğunu ve izini azaltmaktadır (Ünal, 2020, ss. 182-193). Eylemlerdeki artışlar ise örgütün görünürlüğünü ve örgüt üyeleri arasındaki koordinasyonu artırır ve örgütü görünür kılar (Sparrow, 1991, ss. 252-253). Terör örgütleri büyüdükçe, ülke çapında veya farklı coğrafyalarda ağı ve ilişki yoğunluğu hacmi genişler (Ünal, 2020, ss. 192-193; Ak, 2022, ss. 63-66).

Günümüzde modern devletler, kamu hizmetlerini tüm ülkede yaygınlaştırmak ve yerine getirmek için taşra teşkilatları oluştururlar. Türkiye'de taşra teşkilatları, merkezi idarenin bir uzantısı olarak ülkenin coğrafi durumu, ekonomik şartları ile kamu hizmetleri ihtiyaçlarına göre il adı verilen bölümlendirmelere ayrılmıştır. İllerde mülki idare taksimatı adı verilen ilçelere bölünmektedir. Bu haliyle il, Türkiye'de merkezi idarenin en büyük taşra teşkilatı birimi olmaktadır ve günümüzde il sayısı 81 adettir. İllerde kurulmuş olan İl Jandarma Komutanlıkları da valinin emri altında valiye karşı sorumlu olarak teşkil edilmiştir. Vali, kamu düzeni sağlamakla görevli olarak bir kolluk makamı olarak jandarma da dâhil olmak üzere kolluk kuvvet ve teşkilatın amiridir. Gerekli gördüğünde düzenleyici ve bireysel tedbirler alabilir (Gözler & Kaplan, 2018, ss. 136-142).

J.Gn.K.lığı'nın Türkiye genelinde konuşlanması İçişleri Bakanlığınca düzenlenmektedir. Kuruluş ve konuşlarının belirlenmesinde mülki taksimat esas alınmaktadır. Jandarma, mülki ve adli görevler kapsamında kamu düzenini ve

güvenliğini sağlamak maksadıyla suç işlenmesini önlemek ve işlenmiş suçlarda adli hizmetleri için gerekli tedbirleri almakla görevlidir. Bu görevlerden bir tanesi de terörizmle mücadele etmektir. Jandarman bu görevini il ve ilçe belediye hudutları haricinde olan veya polis kolluğunun bulunmadığı alanlarda görev ve sorumluluklarını yerine getirmektedir. Sorumluluk alanında terörizmle mücadele operasyonları yaparak devletin kamu düzeninin sağlanması işlevini yerine getirirler (J.Gn.K.lığı, 2024a, s. 9).

3. ARAŞTIRMANIN AMACI VE SORULARI

Bu çalışmanın amacı, jandarmanın kapasite kullanımı olumlu katkı sağlanması maksadıyla jandarmanın sorumluluk bölgesinde gerçekleşen 2020 yılı il terör olay sayılarının temel alınarak iller arasında anlamlı ilişki kurabilmeyi amaçlamıştır. Bu kapsamda Türkiye (Şekil 2) genelinde merkez ve taşra teşkilatlarıyla birlikte 81 ilde konuşlanmış J.Gn.K.lığı'nın terörizmle mücadelesinde etkinlik sağlayan ve terör olayları açısından önemli olan ve öne çıkan illerin belirlenmesinden yola çıkılmıştır. Böylece il terör olay sayılarını temel alarak iller arasında anlamlı ilişki kurulması öngörülmüştür. Bu sayede öne çıkan bu illere yönelik J.Gn.K.lığı'nın örgütlenme gereklilikleri ya da koordinasyonun artırılması gibi kurum kapasitesinin yükseltilmesine katkı sağlanması hedeflenmiştir. Bu bağlamda jandarmanın terörizmle mücadelesine öne çıkan illerin tespit edilmesinde 2020 yılı terör olayları sayıları temel alınarak test etmek için araştırma soruları belirlenmiştir.

Araştırma sorusu-1: İl jandarma sorumluluk bölgesinde her bir il açısından kendi çevre il sayısı ve terör olay miktarlarıyla birlikte dikkate alındığında Türkiye'de öne çıkan iller hangileridir?

Araştırma sorusu-2: İl jandarma sorumluluk bölgesinde her bir il açısından kendi çevre il sayısı ve tüm ülke terör olay sayılarıyla birlikte dikkate alındığında Türkiye'de öne çıkan iller hangileridir?

Araştırma sorusu-3: Tüm ülkede terörizmle mücadele faaliyetleri yüksek olan illerin birbirleriyle arasında etkileşim kuran ve arasındalık oluşturan iller hangileridir?
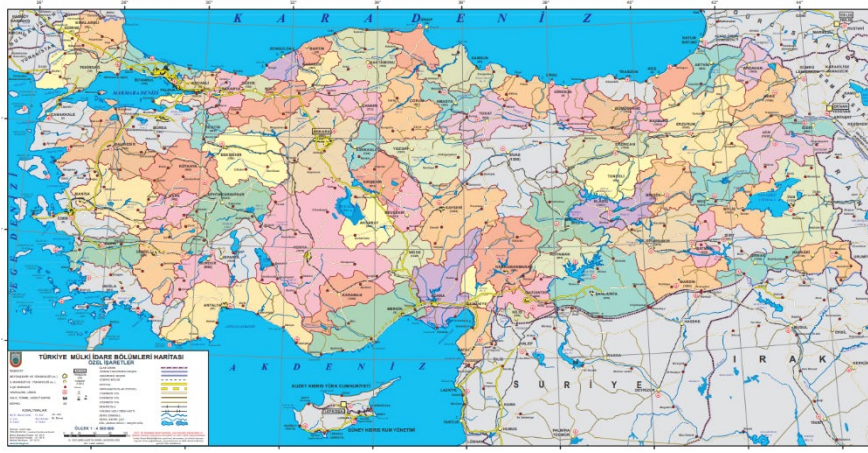
Şekil 2: Türkiye Siyasi Haritası
Kaynak: (HGK, 2024)

4. ARAŞTIRMANIN YÖNTEMİ

Çalışmada, analizleri yapmak için ucinet sosyal ağ analizi programı kullanılmıştır. Analiz programında 2020 yılı jandarma sorumluluk bölgesinde olan terör olayları, her bir ilin çevre illeri ile bağ kurularak ağ yapısı oluşturulmuş, buradan merkezilik ölçümlerine ulaşılmıştır. Merkezilik ölçümleri sonucunda bulgular elde edilmiş ve yorumlanmıştır. Çalışmada, ucinet programının tercih edilmesinin nedeni sosyal ağ analizlerinde sık kullanılan bir yazılım olmasıdır. Yazılımın temel özellikleri içerisinde ağ kurulumunda temel olan matrislerin oluşturulması, aktörler arasında etkileşimlerin tespit edilmesi, oluşturulan ağda kümelenme katsayılarının gösterilmesi bulunmaktadır. Program, istatiksel hesaplamaların ölçümü, merkezilik ölçümleri, aktörlerin rol ve konumlarını tanımlama imkânı vermektedir (Gökmen, 2020, s. 107).

4.1. Araştırma Örneklemi

Araştırma örneklemi olarak Tablo 1'de görüldüğü üzere J.Gn.K.lığı'nın *"2020 yılı J.Gn.K.lığı Asayiş Başkanlığı Eğitim ve Faaliyet Yıllığı"*nda belirtilen il bazında yayınlanan terör olayları esas alınmıştır.

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Tablo 1: İllere göre 2020 yılı Terör Olay Sayısı

İl Adı	Terör Olayları Sayısı	İl Adı	Terör Olayları Sayısı
ADANA	47	KONYA	88
ADIYAMAN	77	KÜTAHYA	16
AFYONKARAHİSAR	24	MALATYA	31
AĞRI	61	MANİSA	81
AMASYA	16	KAHRAMANMARAŞ	55
ANKARA	91	MARDİN	229
ANTALYA	65	MUĞLA	31
ARTVİN	12	MUŞ	133
AYDIN	24	NEVŞEHİR	10
BALIKESİR	45	NİĞDE	4
BİLECİK	5	ORDU	17
BİNGÖL	151	RİZE	2
BİTLİS	167	SAKARYA	9
BOLU	10	SAMSUN	48
BURDUR	14	SİİRT	104
BURSA	36	SİNOP	12
ÇANAKKALE	31	SİVAS	20
ÇANKIRI	5	TEKİRDAĞ	41
ÇORUM	28	TOKAT	254
DENİZLİ	33	TRABZON	24
D.BAKIR	246	TUNCELİ	73
EDİRNE	129	ŞANLIURFA	224
ELAZIĞ	36	UŞAK	7
ERZİNCAN	29	VAN	218
ERZURUM	49	YOZGAT	8
ESKİŞEHİR	17	ZONGULDAK	4
GAZİANTEP	110	AKSARAY	3
GİRESUN	6	BAYBURT	5
GÜMÜŞHANE	2	KARAMAN	4
HAKKÂRİ	329	KIRIKKALE	3
HATAY	128	BATMAN	65
ISPARTA	25	ŞIRNAK	314
MERSİN	61	BARTIN	1
İSTANBUL	220	ARDAHAN	23
İZMİR	108	IĞDIR	39
KARS	37	YALOVA	6
KASTAMONU	27	KARABÜK	1
KAYSERİ	80	KİLİS	17
KIRKLARELİ	9	OSMANİYE	46
KIRŞEHİR	9	DÜZCE	11
KOCAELİ	22	**TOPLAM**	**4.902**

Kaynak: (J.Gn.K.lığı, 2021)

4.2. Veri Kullanma Yöntemi

İl bazında ortaya çıkan terör olay sayılarının ucinet ağ analizi program matrisine işlenmesini sadeleştirmek için, veriler "sturges kuralı"ndan faydalanılarak gruplandırılmıştır. Sturges kuralı, verilerin gruplandırılması ya da kaç grupta sınıflandırılacağının belirlenmesinde kullanılmaktadır. Buna göre, veri setindeki gözlem sayısına (n) bağlı olarak, gruplandırma sayısı (k) tespit edilmektedir. Bu kapsamda ilgili formül olarak; $k = 1 + 3.322 \log_{10}(n)$ kullanılmıştır (Sturges, 1926, s.65; Scott, 2009).

Türkiye genelinde 2020 yılı için olay sayısı 4902 adettir. 10 Tabanında logaritma ($\log_{10}$) hesaplaması temelinde işlem; $k = 1 + 3.322 \log_{10}(4902)$'dir. İşlem sonucunda ise $k \approx 13.2594$'ye ulaşılmıştır. Meydana gelen 4902 adet olaya ilişkin bir gruplandırmaya gidildiğinde, veri seti 13'lü gruba ayrılabilmektedir. Terör olayları sayıları, ağ analizi matrisine işlenirken Tablo 2'de gösterildiği üzere söz konusu ölçeklendirme kullanılmıştır.

Tablo 2: İllerdeki Terör Olayları Sayısı ve Ölçeklendirme Miktarı

İllerde Terör Olay Sayısı	Ölçek Miktarı	İllerde Terör Olay Sayısı	Ölçek Miktarı
1-25	1	251-275	11
26-50	2	276-300	12
51-75	3	301-329	13
75-100	4		
101-125	5		
126-150	6		
151-175	7		
176-200	8		
201-225	9		
226-250	10		

Kaynak: (Yazar tarafından hazırlanmıştır)

Çalışmada J.Gn.K.lığı'nın terör olaylarına müdahalesinde kapasitesinin etkin ve verimli olması amaçlanmıştır. Bu kapsamda illerde meydana gelen terör olayları sayısından hareketle, her bir ilin çevre illeri arasında ilişki kurduğu ve birlikte koordinasyon içerisinde bulunduğu üzerinden hareket edilmiştir. İllerin terör olaylarına müdahale ederken kapasitesini daha da artırmak maksadıyla önce çevre illeriyle koordinasyon kuracağı ve sonra tüm ülke ile ağ oluşturması hususuna odaklanılmıştır. Türkiye'de her bir ilin çevre illeri Tablo 3'de gösterilmiştir.

Tablo 3: Türkiye'de Her Bir İlin Çevre İlleri

1	Adana, Hatay, Osmaniye, Kahramanmaraş, Kayseri, Niğde, Mersin	42	Konya, Antalya, Karaman, Mersin, Niğde, Aksaray, Ankara, Eskişehir, Afyon, Isparta
2	Adıyaman, Şanlıurfa, Diyarbakır, Malatya, Kahramanmaraş, Gaziantep	43	Kütahya, Manisa, Uşak, Afyon, Eskişehir, Bilecik, Bursa, Balıkesir
3	Afyon, Isparta, Konya, Eskişehir, Kütahya, Uşak, Denizli, Burdur	44	Malatya, Kahramanmaraş, Adıyaman, Diyarbakır, Elâzığ, Erzincan, Sivas
4	Ağrı, Van, Igdır, Kars, Erzurum, Muş, Bitlis	45	Manisa, İzmir, Aydin, Denizli, Uşak, Kütahya, Balıkesir
5	Amasya, Yozgat, Tokat, Samsun, Çorum	46	Kahramanmaraş, Gaziantep, Adıyaman, Malatya, Sivas, Kayseri, Adana, Osmaniye
6	Ankara, Konya, Aksaray, Kırşehir, Kırıkkale, Çankırı, Bolu, Eskişehir	47	Mardin, Şanlıurfa, Diyarbakır, Batman, Siirt, Şırnak
7	Antalya, Mersin, Karaman, Konya, İsparta, Burdur, Muğla	48	Muğla, Antalya, Burdur, Denizli, Aydin
8	Artvin, Rize, Erzurum, Ardahan	49	Muş, Diyarbakır, Batman, Bitlis, Ağrı, Erzurum, Bingöl
9	Aydin, Muğla, Denizli, Manisa, İzmir	50	Nevşehir, Niğde, Kayseri, Yozgat, Kırşehir, Aksaray
10	Balıkesir, İzmir, Manisa, Kütahya, Bursa, Çanakkale	51	Niğde, Nevşehir, Kayseri, Adana, Mersin, Konya, Aksaray
11	Bilecik, Kütahya, Eskişehir, Bolu, Sakarya, Bursa	52	Ordu, Samsun, Tokat, Sivas, Giresun
12	Bingöl, Diyarbakır, Muş, Erzurum, Erzincan, Tunceli, Elâzığ	53	Rize, Artvin, Erzurum, Bayburt, Trabzon
13	Bitlis, Siirt, Van, Ağrı, Muş, Batman	54	Sakarya, Düzce, Bolu, Bilecik, Bursa, Kocaeli
14	Bolu, Eskişehir, Ankara, Çankırı, Zonguldak, Düzce, Sakarya, Bilecik, Karabük	55	Samsun, Ordu, Tokat, Amasya, Çorum, Sinop
15	Burdur, Muğla, Antalya, Isparta, Afyon, Denizli	56	Siirt, Van, Bitlis, Batman, Mardin, Şırnak
16	Bursa, Balıkesir, Kütahya, Bilecik, Sakarya, Kocaeli, Yalova	57	Sinop, Samsun, Çorum, Kastamonu
17	Çanakkale, Balıkesir, Tekirdağ, Edirne	58	Sivas, Kayseri, Kahramanmaraş, Malatya, Erzincan, Giresun, Ordu, Tokat, Yozgat
18	Çankırı, Ankara, Kırıkkale, Çorum, Kastamonu, Bolu, Karabük	59	Tekirdağ, İstanbul, Kırklareli, Edirne, Çanakkale
19	Çorum, Yozgat, Amasya, Samsun, Sinop, Kastamonu, Çankırı, Kırıkkale	60	Tokat, Sivas, Ordu, Samsun, Amasya, Yozgat
20	Denizli, Muğla, Burdur, Afyon, Uşak, Manisa, Aydin	61	Trabzon, Rize, Bayburt, Gümüşhane, Giresun
21	Diyarbakır, Şanlıurfa, Mardin, Batman, Muş, Bingöl, Elâzığ, Malatya, Adıyaman	62	Tunceli, Elâzığ, Bingöl, Erzincan
22	Edirne, Çanakkale, Tekirdağ, Kırklareli	63	Şanlıurfa, Gaziantep, Adıyaman, Diyarbakır, Mardin
23	Elâzığ, Diyarbakır, Bingöl, Tunceli, Erzincan, Malatya	64	Uşak, Manisa, Denizli, Afyon, Kütahya
24	Erzincan, Elâzığ, Tunceli, Bingöl, Erzurum, Bayburt, Gümüşhane, Giresun, Sivas, Malatya	65	Van, Hakkâri, Şırnak, Siirt, Bitlis, Ağrı
25	Erzurum, Bingöl, Muş, Ağrı, Kars, Ardahan, Artvin, Rize, Bayburt, Erzincan	66	Yozgat, Kayseri, Sivas, Tokat, Amasya, Çorum, Kırıkkale, Kırşehir, Nevşehir

26	Eskişehir, Afyon, Konya, Ankara, Bolu, Bilecik, Kütahya	67	Zonguldak, Bartın, Bolu, Düzce, Karabük
27	Gaziantep, Kilis, Şanlıurfa, Adıyaman, Kahramanmaraş, Osmaniye, Hatay	68	Aksaray, Niğde, Nevşehir, Kırşehir, Ankara, Konya
28	Giresun, Gümüşhane, Trabzon, Erzincan, Sivas, Ordu	69	Bayburt, Erzincan, Erzurum, Rize, Trabzon, Gümüşhane
29	Gümüşhane, Erzincan, Bayburt, Trabzon, Giresun	70	Karaman, Mersin, Konya, Antalya
30	Hakkâri, Van, Şırnak	71	Kırıkkale, Kırşehir, Yozgat, Çorum, Çankırı, Ankara
31	Hatay, Kilis, Gaziantep, Osmaniye, Adana	72	Batman, Mardin, Siirt, Bitlis, Muş, Diyarbakır
32	Isparta, Antalya, Konya, Afyon, Burdur	73	Şırnak, Mardin, Siirt, Van, Hakkâri
33	Mersin, Adana, Niğde, Konya, Karaman, Antalya	74	Bartın, Kastamonu, Zonguldak, Karabük
34	İstanbul, Kocaeli, Tekirdağ, Kırklareli	75	Ardahan, Kars, Erzurum, Artvin
35	İzmir, Aydın, Manisa, Balikesir	76	Iğdır, Ağrı, Kars
36	Kars, Ağrı, Igdir, Ardahan, Erzurum	77	Yalova, Kocaeli, Bursa
37	Kastamonu, Çorum, Sinop, Çankırı, Bartın, Karabük	78	Karabük, Zonguldak, Bartın, Kastamonu, Çankırı, Bolu
38	Kayseri, Adana, Kahramanmaraş, Sivas, Yozgat, Nevşehir, Niğde	79	Kilis, Gaziantep, Hatay
39	Kırklareli, Edirne, Tekirdağ, İstanbul	80	Osmaniye, Gaziantep, Kahramanmaraş, Adana, Hatay
40	Kırşehir, Nevşehir, Yozgat, Kırıkkale, Ankara, Aksaray	81	Düzce, Zonguldak, Bolu, Sakarya
41	Kocaeli, Yalova, İstanbul, Bursa, Sakarya		

Kaynak: (Yazar tarafından hazırlanmıştır)

Jandarma, Türkiye'nin 81 ilinde konuşlu olarak kamu güvenliği görevini icra etmektedir. Bu görevin icrasında kapasitesine temel olan mevcut personel, bütçe ve altyapı kaynağını kullanmaktadır. Kurumun merkez teşkilatının önemli işlevlerinden biri, ülke genelinde etkinliğini artırmak maksadıyla taşra teşkilatlarının kurum kapasitelerini birbirlerine verimliliklerine katkı sağlayacak nitelikte destek olmalarını sağlamalarıdır (Brix, 2019, s. 13). Bu açıdan taşra teşkilatlarının verimliliğini artırmak maksadıyla iller arasında terör olay sayısı fazla olan illere çevre illerden daha fazla istihbarat akışı ve asayiş görev desteği sağlanması önemlidir. Bu bağlamda terör olay sayısı fazla olan şehirlerin çevre iller ile oluşturdukları ağlarda çekim merkezi olmaları olağandır. Bir diğer ifadeyle oluşturulacak bir ağ analizinde kendilerinin olay sayısı az olan illerden çok olan illere doğru "giden bağ" ile bağlı olmaları uygun olur. Her bir ilde terör olayları fazla olanların ise, çevre illerden kapasite akışı açısından "gelen bağ" ile bağlanacağı ifade edilebilir. Bu bağlamda terör olayları sayısına göre ve yapılan ölçeklendirmeye göre iller arasında bir ağ matrisi oluşturulabilir. Ağ analizine temel teşkil edecek matris Tablo1, 2 ve 3 temelinde hazırlanmış ve Şekil 3'te

sunulmuştur.
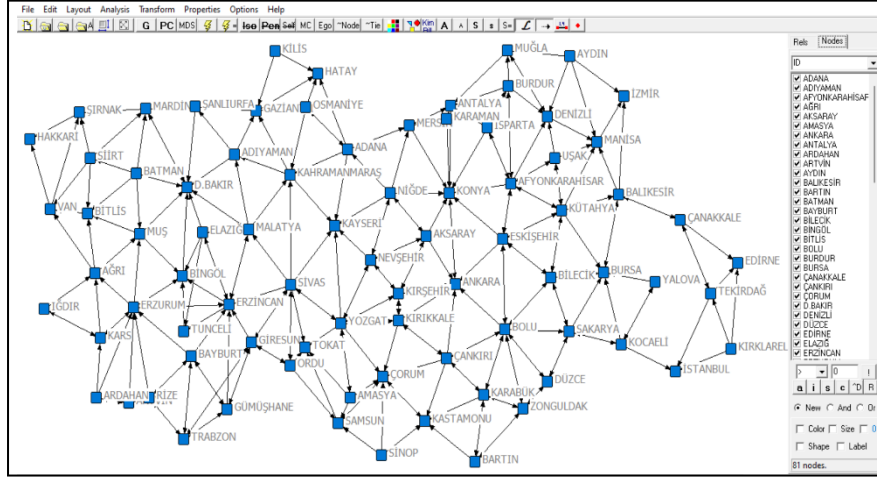
Şekil 3: İllerin Terör Olayları Sayısı ile Çevre İlleri ve Bu İllerin Olay
Sayılarına Göre Hazırlanan Asimetrik Ağ
Kaynak: (Yazar tarafından hazırlanmıştır)

5. BULGULAR

Her bir ilin çevre illerle birlikte gruplandırılmış olay sayılarının ağ analizi matrisine gelen-giden bağ şeklinde işlenmesi neticesinde ortaya çıkan bulgular ucinet ağ analizi sonuçlarına göre tespit edilmiştir. Söz konusu ağ, analiz edilirken ağda konumlandırılan illerin çevre iller ile iletişimleri kendi olay sayıları ile çevre illerin olay sayıları arasında, gelen-giden bağ diğer bir ifadeyle asimetrik bir ağ şeklinde oluşturulmuştur. Bu sayede illerin çevre illere göre olay sayıları az olan illerden fazla olanlara doğru kapasite desteği sağlanması hususu vurgulanmıştır.

Sosyal ağda gelen ve giden bağların olması ve "merkezilik" ölçümlerinin yapılabilmesi, kurumun kapasite kullanımı ve desteği açısından odaklanması gereken yerleri de belirlemede imkân verebilmektedir. Merkezilik, bir ağda aktörün ve bağlantılarının önem düzeyini tespit edebilmektedir. Örneğin bir ağda aktör, ne kadar bilgi akışına sahipse veya köprü görevi görüyorsa o ölçüde önemli olmaktadır (Gürsakal, 2018, s. 93). Bu bağlamda ağ için *"derece merkeziliği" (degree centrality), "yakınlık merkeziliği" (closeness centrality), "Arasındalık Merkeziliği" (betweenness centrality)* ölçümleri yapılabilir (Sözen ve Öztürk, 2020, s.338). Farklı merkezilik ölçümleri sayesinde, illerin her biri için farklı önemli ve kritiklik düzeyini tespit edilebilir.

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Derece merkeziliği, ağda her bir aktörün tek bir bağ ile bağlandığı birinci dereceden komşularının sayısı ile ilgilidir. Her bir ilin çevre illere göre terör olay sayılarını dikkate alan ağda, illerdeki olay miktarı çevre illerden gelen ve giden bağ sayılarına göre asimetrik bir ağ niteliği kazandırmaktadır. Ayrıca, her bir ilin çevre il sayısı ne kadar fazla ise o kadar merkezi olabileceği de unutulmamalıdır. Çevre il sayısının fazlalığının illerin birbirine kapasite desteği bakımından fayda sağlayacağını da unutmamak gerekir.

İllerin olay sayılarına göre asimetrik oluşturulan söz konusu ağda, analizlerde ölçümlerine temel olan bağlara bakıldığında illerden diğerlerine akış olarak giden bağlar *"dış derece merkezilik" (outgoing/outdegree centrality)*, diğer illerden akış olarak gelen bağlar için ise *"iç derece merkezilik" (incoming/indegree centrality)* ölçümlerine bakılmalıdır. Dış derece merkezilik, illerin çevre illere göre dışarıya kapasitesi desteği aktarılmasında tercih edilirken, iç derece merkezilik ağda illerin çevre illere göre dışarıdan kapasite desteğine daha fazla ihtiyaç duyulabilecek illerin tespit edilmesine olanak sağlayabilir.

5.1. Derece Merkeziliği Ölçümü

Şekil 3'te ulaşılan ağ temelinde, çevre illerine *(çevresindeki il sayısı ve olay sayısı)* göre kendi terör olay sayılarının fazlalığı bakımından kapasite desteğine ihtiyacı olan iller, gelen bağ derece merkeziliği açısından ölçülebilir. Analiz sonucu Ek-1'de sunulmuş olup, öne çıkan iller; Diyarbakır, Tokat, Mardin, Şırnak, Konya, Bingöl, Bitlis, Ankara, İstanbul, Hakkâri, Kayseri, Hatay'dır.

5.2. Yakınlık Merkeziliği Ölçümü

Bir ağda derece merkeziliği bir aktöre ilk dereceden komşu olan aktörlerle ilgiliyken, söz konusu aktöre dolaylı olarak bağlantılı olanlar da vardır. Aktörün yakınlık merkeziliği, kendisine dolaylı bağlı olan aktörle birlikte tespit edilmektedir. Yakınlık merkeziliği, bir aktörün ağdaki diğer aktörler arasındaki en kısa yol ortalama uzunluğudur. Bir ağ yapısında bir aktörün tüm diğer aktörlere olan mesafesini ifade etmektedir. Bir aktörün her birisinin ortalama kaç bağlantıyla ağdaki diğer aktörlere erişebildiğini ölçmektedir. Yakınlık merkeziliği bir aktörün tüm diğer aktörlere *"ortalama en kısa uzaklıkları"*nın *(jeodezik uzaklık-geo desic distance)* toplamını göstermektedir. Asimetrik bir ağda kısa yönlerin tespitinde gelen *"yakınlık" (in-closeness)* ve *"giden yakınlık" (out-closeness)* ayrı olarak belirtilmektedir. Terör olay sayısı fazla olan illerin daha fazla kapasitesi desteğine ihtiyacı olacağından, iller arasında en kısa yollar üzerinden erişim hesaplandığında gelen yakınlık derecesi, kapasite desteğine ihtiyacı olan illeri gösterebilir.

Bir ağda bir aktörün gelen yakınlık merkeziliğinin yüksek olması, onu terör olay sayısı fazlalığı ve çevre il sayısına göre diğer aktörlere karşı az sayıda

yolla ve hızla etkileşim kurabileceğini göstermektedir. Bu aktörlerin, diğer aktörlere en kısa yol ile yakınlığı fazla olmasıyla yönetim kapasitesi desteği açısından önem düzeyini gösterebilir. Analiz sonucu Ek-2'de sunulmuş olup, öne çıkan iller; Hakkâri, Şırnak, Diyarbakır, Mardin, Şanlıurfa, Hatay, Gaziantep, Van, Bingöl, Ankara, Konya, Bitlis, Adıyaman'dır.

5.3. Arasındalık Merkeziliği Ölçümü

Arasındalık merkeziliği, ağda bir aktörün kendi üzerinden geçen en kısa yolların oranı gösteren bir ölçüttür. Bu ölçütte, önceki ölçütlerdeki derece ve yakınlık merkeziliğinde bağ kurulan aktörler ve sayılarından farklı olarak söz konusu aktörün ağda nerede konumlandığı önemli hale gelir. Bir ağda herhangi bir aktör, iki ayrılmış parça veya aktör arasında bulunuyorsa arasındalık merkeziliği yüksek kabul edilmektedir. Arasındalığı yüksek olan bir aktörün, ağdan çıkarılmış olması ağdaki en kısa yolların ortalamasını yükselteceğinden ağdaki akışın etkinliğini azaltabilmektedir. Diğer bir ifadeyle arasındalık, bir aktörün bilgiyi ağda yayma etkisidir. Bu durumda arasındalığı yüksek olan aktör bilgi yayma açısından yüksek olduğunu göstermektedir (Gürsakal, 2018, ss. 100-101; Gökmen, 2020, s. 75; Sözen & Öztürk, 2020, ss. 339-340).

Her bir ilin terör olay sayısı ve çevre illerine göre oluşturulan ağda, derece merkeziliği öne çıkmış olan illerin kurum kapasitesini aktarmak açısından arasındalığı yüksek diğer bir ifadeyle aracı olan iller ölçülebilir. Analiz sonucu Ek-3'de sunulmuş olup, öne çıkan iller; Yozgat, Çankırı, Kırıkkale, Bolu, Sivas'tır.

6. TARTIŞMA

Jandarmanın sorumluluk alanında her bir ilde meydana gelen terör olay sayıları ve çevre il sayılarına göre oluşturulan bir ağa ilişkin merkezilik ve arasındalık analizleriyle sonuçlar üretilmiştir. Bu analiz sonuçları araştırmaya ilişkin araştırma sorularından hareketle anlamlandırılacak ve açıklanması önemlidir.

İlk araştırma sorusu, il jandarma sorumluluk bölgesinde her bir il açısından kendi çevre il sayısı ve terör olay miktarlarıyla birlikte dikkate alındığında Türkiye'de öne çıkan iller hangileridir? Maruz kalınan terör olayları sayısının daha fazla olduğu illerin iş yoğunluğunun fazla olacağından hareketle merkezi yönetim tarafından kapasite artışı desteği sağlanması önemlidir. Bu bağlamda ağda gelen bağ derece merkeziliği ölçümü yapılmıştır. Bunun nedeni, olay sayısı fazla olan bir ilin çevre illere göre daha fazla kapasite desteğine ihtiyacı olmasıdır. Derece merkeziliği bir aktörde ilk dereceden komşu olan aktörlerle ilgili olduğundan çevrede ilk dereceden olay sayıları karşılaştırmasına göre gelen ve giden bağ sayılarının önemi ile çevre illerin sayılarının fazlalığının

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önem kazandığı açıktır. Ağ analizinde yapılan ölçüme bakıldığında 13 ilin öne çıktığı görülmektedir. Türkiye'de tüm illerin çevre illerin olay sayılarına göre birbirlerine gelen ve giden bağlarla ile bağlandığı matriste gelen bağ derece merkeziliğine öne çıkan iller; Diyarbakır, Tokat, Mardin, Şırnak, Konya, Bingöl, Bitlis, Ankara, İstanbul, Hakkâri, Kayseri, Hatay olduğu tespit edilmiştir. Bu illere diğer çevre illere göre hem merkez hem de taşra birimlerinden daha fazla istihbarat akışı ve asayiş görev desteği sağlanması önerilir.

İkinci araştırma sorusu, il jandarma sorumluluk bölgesinde her bir il açısından kendi çevre il sayısı ve tüm ülke terör olay sayılarıyla birlikte dikkate alındığında Türkiye'de öne çıkan iller hangileridir? Bir ağda derece merkeziliği bir aktöre ilk dereceye ilaveten dolaylı olarak bağlantılı olan bağları da dikkate alırlar. Tüm ülke terör olay sayılarına bağlı olarak her bir ilin yakınlık merkeziliğinin yüksek olması ölçeği büyüyen bağ/etkileşimde olduğu il sayısına göre daha fazla kapasite desteğine ihtiyacı olan illeri belirtebilmektedir. Analiz sonucu öne çıkan iller; Hakkâri, Şırnak, Diyarbakır, Mardin, Şanlıurfa, Hatay, Gaziantep, Van, Bingöl, Ankara, Konya, Bitlis, Adıyaman olduğu görülmüştür. Tüm ülke dikkate alındığında bu illere hem merkez hem de taşra birimlerinden daha fazla istihbarat akışı ve asayiş görev desteği sağlanması önerilir.

Üçüncü araştırma sorusu, tüm ülkede terörizmle mücadele faaliyetleri yüksek olan illerin birbirleriyle arasında etkileşim kuran ve arasındalık oluşturan iller hangisi olduğudur. Arasındalık merkeziliği, herhangi bir ağda aktörün ağda nerede konumlandığına odaklanır. Bu sayede illerin terör olay sayısı, çevre illerin sayısı ve olay miktarına göre derece merkeziliği öne çıkmış olan illere kurum kapasitesinin aktarılmasında aracı olan iller tespit edilebilir. Analiz sonucu öne çıkan iller; Yozgat, Çankırı, Kırıkkale, Bolu, Sivas olduğu görülmüştür. Bu iller terör olay sayısı fazla olan iller arasında *"arasındalık"* özelliği bakımından öne çıktığından bu illerde olay olmasa bile, üzerinden terör örgütleri açısından eylem akışının yüksek olduğu illerdir. Kolluk açısından ise bu iller, terör olay sayılarının yüksek olduğu illerdeki olaylara karşı istihbarat, asayiş ve devriye faaliyetleri gibi önlem ve tedbir geliştirilmesi önemli olan illerdir.

7. SONUÇ

Modern bir devletin her bir kurumunun kamu hizmetini etkin ve verimlilikle yerine getirebilmesi için hem merkez hem de taşra teşkilatıyla birlikte kurumsal kapasitesini her zaman sorgulaması ve kurum dışı kaynaklarını uygun kullanmasının önemi açıktır (Kutlu, 2013, s. 467). Özellikle kurum içinde personel, örgütlenme ve koordinasyon yeteneklerini artıracak tedbirlere yönelmesi gerekir. Bu çalışma, jandarmanın sorumluluk bölgesinde yer alan 2020 yılı il terör olay sayılarını temel alarak iller arasında kapasite kullanıma olumlu

katkı sağlayacak anlamlı ilişki kurabilmeyi amaçlamıştır. Terör olay sayıları için kamuya açık olarak yayınlanmış 2021 yılı basımı "Jandarma Asayiş 2020 Eğitim ve Faaliyet Yıllığı" dokümanından faydalanılmıştır. Terör olay sayılarının analizinde ise, ucinet sosyal ağ analizi programından istifade edilmiştir. Analiz sonucunda elde edilen bulgular neticesinde jandarmanın terörizmle mücadele faaliyetlerinde önem derecesi öne çıkan illere yönelik olarak, diğer illerden daha fazla kapasite desteği sağlanmasının kurumun terörizmle mücadele faaliyetlerine olumlu katkı sağlayacağı değerlendirilmektedir. Çalışma kapsamında üç adet araştırma sorusu belirlenmiş ve bu sorulara cevap aranmıştır. İlk soru, il jandarma sorumluluk bölgesinde her bir il açısından kendi çevre il sayısı ve terör olay miktarlarıyla birlikte dikkate alındığında Türkiye'de öne çıkan illerin hangileri olduğudur. İkinci soru, il jandarma sorumluluk bölgesinde her bir il açısından kendi çevre il sayısı ve tüm ülke terör olay sayılarıyla birlikte dikkate alındığında Türkiye'de öne çıkan illerin hangileri olduğudur. Üçüncü soru, tüm ülkede terörizmle mücadele faaliyetleri yüksek olan illerin birbirleriyle arasında etkileşim kuran ve arasındalık oluşturan illerin hangileri olduğudur.

Araştırma soruları neticesinde, her bir ilin kendi çevre illerindeki terör olayları sayılarıyla birlikte dikkate alındığında öne çıkan Diyarbakır, Tokat, Mardin, Şırnak, Konya, Bingöl, Bitlis, Ankara, İstanbul, Hakkâri, Kayseri, Hatay'dır. Söz konusu illere diğer çevre illere göre hem merkez hem de taşra birimlerinden daha fazla istihbarat akışı ve asayiş görev desteği sağlanması önemlidir. Her bir ilin hem çevre illeri ve tüm ülke terör olay sayılarıyla birlikte dikkate alındığında öne çıkan iller Hakkâri, Şırnak, Diyarbakır, Mardin, Şanlıurfa, Hatay, Gaziantep, Van, Bingöl, Ankara, Konya, Bitlis, Adıyaman'dır. Tüm ülke ölçeğinde bakıldığında söz konusu illere hem merkez hem de taşra birimlerinden daha fazla istihbarat akışı ve asayiş görev desteği sağlanması önerilebilir. Tüm ülkede terör mücadele faaliyetleri yüksek olan illerin birbirleriyle arasında etkileşim kuran ve arasındalık oluşturan iller ise; Yozgat, Çankırı, Kırıkkale, Bolu, Sivas olduğu tespit edilmiştir. Bu iller ise, terör olay sayısı fazla olan iller için arasındalık özelliğine sahip olduğundan terör örgütleri açısından eylem olmayan ancak eylem akışının yüksek olduğu illerdir. Kolluk açısından bu illerde, terör olay sayılarının yüksek olduğu illerdeki olaylara yönelik önlem ve tedbir geliştirmek açısından istihbarat ve bilgi akışının artırılmasının önemli olduğu illerdir.

8. ÇIKAR ÇATIŞMASI BEYANI
Yazarlar arasında çıkar çatışması bulunmamaktadır.

9. MADDİ DESTEK
Bu çalışmada herhangi bir fon veya destekten yararlanılmamıştır.
10. YAZAR KATKILARI
TA: Fikir;

TA: Tasarım;

TA: Denetleme;

TA: Kaynakların toplanması ve/veya işlemesi;

TA: Analiz ve/veya yorum;

TA: Literatür taraması;

TA: Yazıyı yazan;

TA: Eleştirel inceleme

11. ETİK KURUL BEYANI VE FİKRİ MÜLKİYET TELİF HAKLARI

Yapılan bu çalışmada "Yükseköğretim Kurumları Bilimsel Araştırma ve Yayın Etiği Yönergesi" kapsamında uyulması belirtilen tüm kurallara uyulmuştur. Yönergenin ikinci bölümü olan "Bilimsel Araştırma ve Yayın Etiğine Aykırı Eylemler" başlığı altında belirtilen eylemlerden hiçbiri gerçekleştirilmemiştir. Araştırmanın uygulaması etik kurul izin zorunluluğu gerektirmemektedir.

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13. EKLER
13.1. Ek-1 Derece Merkeziliği

```
FREEMAN'S DEGREE CENTRALITY MEASURES
--------------------------------------------------------------------

Diagonal valid?          YES
Model:                   ASYMMETRIC
Input dataset:           C:\Users\LENOVO\Desktop\Ölçümler\ver.3


                            1            2            3            4
                        OutDegree    InDegree     NrmOutDeg    NrmInDeg
                        ---------- ------------ ------------- ------------
    56        SİİRT       39.000        5.000        3.704       0.475
    72       BATMAN       38.000        0.000        3.609       0.000
    65          VAN       26.000       27.000        2.469       2.564
    58        SİVAS       25.000        3.000        2.374       0.285
    49          MUŞ       24.000       18.000        2.279       1.709
    23       ELAZIĞ       24.000        4.000        2.279       0.380
     2     ADIYAMAN       24.000        8.000        2.279       0.760
    47       MARDİN       23.000       40.000        2.184       3.799
     4         AĞRI       22.000        9.000        2.089       0.855
    66       YOZGAT       22.000        5.000        2.089       0.475
    44      MALATYA       21.000        6.000        1.994       0.570
    63    ŞANLIURFA       20.000       18.000        1.899       1.709
    25      ERZURUM       20.000       12.000        1.899       1.140
     1        ADANA       18.000        4.000        1.709       0.380
    59     TEKİRDAĞ       17.000        4.000        1.614       0.380
    39    KIRKLARELİ      17.000        0.000        1.614       0.000
    80      OSMANİYE       16.000        2.000        1.519       0.190
     5       AMASYA       16.000        1.000        1.519       0.095
    24     ERZİNCAN       16.000       14.000        1.519       1.330
    51        NİĞDE       15.000        2.000        1.425       0.190
    27    GAZİANTEP       15.000       20.000        1.425       1.899
    52         ORDU       15.000        2.000        1.425       0.190
    41      KOCAELİ       13.000        2.000        1.235       0.190
    73       ŞIRNAK       13.000       39.000        1.235       3.704
    10    BALIKESİR       13.000        6.000        1.235       0.570
    46 KAHRAMANMARAŞ      13.000       12.000        1.235       1.140
    55       SAMSUN       13.000        8.000        1.235       0.760
     9        AYDIN       13.000        0.000        1.235       0.000
    43      KÜTAHYA       12.000        4.000        1.140       0.380
    26     ESKİŞEHİR      12.000        4.000        1.140       0.380
    18      ÇANKIRI       11.000        3.000        1.045       0.285
    68      AKSARAY       11.000        3.000        1.045       0.285
    14         BOLU       11.000        7.000        1.045       0.665
     3 AFYONKARAHİSAR     11.000        5.000        1.045       0.475
    79        KİLİS       11.000        0.000        1.045       0.000
    17    ÇANAKKALE       10.000        4.000        0.950       0.380
    70      KARAMAN       10.000        0.000        0.950       0.000
    12       BİNGÖL       10.000       35.000        0.950       3.324
    21      D.BAKIR       10.000       80.000        0.950       7.597
    32      ISPARTA        9.000        2.000        0.855       0.190
    71    KIRIKKALE        9.000        3.000        0.855       0.285
    15       BURDUR        9.000        2.000        0.855       0.190
    13       BİTLİS        9.000       28.000        0.855       2.659
    50     NEVŞEHİR        8.000        4.000        0.760       0.380
    40     KIRŞEHİR        8.000        4.000        0.760       0.380
    64         UŞAK        8.000        2.000        0.760       0.190
     7      ANTALYA        7.000       15.000        0.665       1.425
    36         KARS        7.000        6.000        0.665       0.570
    62     TUNCELİ        7.000        6.000        0.665       0.570
    33       MERSİN        7.000       12.000        0.665       1.140
    69      BAYBURT        7.000        3.000        0.665       0.285
    11      BİLECİK        6.000        4.000        0.570       0.380
    28      GİRESUN        6.000        4.000        0.570       0.380
    57        SİNOP        6.000        0.000        0.570       0.000
    20      DENİZLİ        6.000       10.000        0.570       0.950
    78      KARABÜK        6.000        4.000        0.570       0.380
    54      SAKARYA        6.000        4.000        0.570       0.380
    76        IĞDIR        5.000        2.000        0.475       0.190
    48        MUĞLA        5.000        6.000        0.475       0.570
    75      ARDAHAN        5.000        1.000        0.475       0.095
    45        MANİSA       5.000       20.000        0.475       1.899
    29     GÜMÜŞHANE       5.000        3.000        0.475       0.285
    53         RİZE        5.000        3.000        0.475       0.285
    67    ZONGULDAK        4.000        4.000        0.380       0.380
    61      TRABZON        4.000        4.000        0.380       0.380
    42        KONYA        4.000       36.000        0.380       3.419
```

```
74      BARTIN        4.000      2.000      0.380      0.190
 6      ANKARA        4.000     28.000      0.380      2.659
 8      ARTVİN        4.000      2.000      0.380      0.190
19       ÇORUM        4.000     14.000      0.380      1.330
77      YALOVA        3.000      1.000      0.285      0.095
81       DÜZCE        3.000      3.000      0.285      0.285
37   KASTAMONU        2.000     10.000      0.190      0.950
16       BURSA        2.000     12.000      0.190      1.140
35       İZMİR        0.000     15.000      0.000      1.425
30     HAKKARİ        0.000     26.000      0.000      2.469
22      EDİRNE        0.000     18.000      0.000      1.709
38     KAYSERİ        0.000     24.000      0.000      2.279
34    İSTANBUL        0.000     27.000      0.000      2.564
60       TOKAT        0.000     55.000      0.000      5.223
31       HATAY        0.000     24.000      0.000      2.279


DESCRIPTIVE STATISTICS

                        1            2            3            4
                  OutDegree     InDegree    NrmOutDeg     NrmInDeg
                ------------ ------------ ------------ ------------
 1      Mean       10.728       10.728        1.019        1.019
 2   Std Dev        8.109       13.536        0.770        1.285
 3       Sum      869.000      869.000       82.526       82.526
 4  Variance       65.753      183.210        0.593        1.652
 5       SSQ    14649.000    24163.000      132.115      217.919
 6     MCSSQ     5326.025    14840.024       48.034      133.838
 7  Euc Norm      121.033      155.445       11.494       14.762
 8   Minimum        0.000        0.000        0.000        0.000
 9   Maximum       39.000       80.000        3.704        7.597

Network Centralization (Outdegree) = 2.752%
Network Centralization (Indegree) = 6.744%

Note: For valued data, the normalized centrality may be larger than 100.
      Also, the centralization statistic is divided by the maximum value in the input dataset.

Actor-by-centrality matrix saved as dataset FreemanDegree

----------------------------------------
Running time:  00:00:01
Output generated:  19 Tem 24 14:12:25
Copyright (c) 1999-2005 Analytic Technologies
```

13.2. Ek-2 Yakınlık Merkeziliği

```
CLOSENESS CENTRALITY
-------------------------------------------------------------------------
Input dataset:                    C:\Users\LENOVO\Desktop\Ölçümler\ver.3
  5      AMASYA     4108.000    912.000     1.947      8.772
 28     GİRESUN     4109.000    902.000     1.947      8.869
 68     AKSARAY     4114.000    928.000     1.945      8.621
 52        ORDU     4115.000    916.000     1.944      8.734
 74      BARTIN     4116.000    981.000     1.944      8.155
 43     KÜTAHYA     4118.000    973.000     1.943      8.222
  3 AFYONKARAHİSAR  4120.000    978.000     1.942      8.180
 41     KOCAELİ     4128.000   1002.000     1.938      7.984
 61     TRABZON     4130.000    956.000     1.937      8.368
 51       NİĞDE     4132.000    943.000     1.936      8.484
 29   GÜMÜŞHANE     4133.000    950.000     1.936      8.421
 64        UŞAK     4145.000   1033.000     1.930      7.744
 32     ISPARTA     4149.000   1042.000     1.928      7.678
 15      BURDUR     4149.000   1040.000     1.928      7.692
 53        RİZE     4155.000    993.000     1.925      8.056
 69     BAYBURT     4156.000    985.000     1.925      8.122
 77      YALOVA     4158.000   1067.000     1.924      7.498
  8      ARTVİN     4183.000   1042.000     1.913      7.678
 75     ARDAHAN     4213.000   1090.000     1.899      7.339
 56       SİİRT     6400.000   6002.000     1.250      1.333
 72      BATMAN     6480.000   5765.000     1.235      1.388
 39   KIRKLARELİ    6480.000   5852.000     1.235      1.367
  9       AYDIN     6480.000   5848.000     1.235      1.368
 57       SİNOP     6480.000   6161.000     1.235      1.298
 70     KARAMAN     6480.000   6161.000     1.235      1.298
 79       KİLİS     6480.000   5932.000     1.235      1.349


Statistics

                     1            2            3            4
             inFarness    outFarness   inCloseness outCloseness
             ------------ ------------ ------------ ------------
  1    Mean     3981.136     3981.136        2.094        4.154
  2 Std Dev      878.078     2478.918        0.415        3.484
  3     Sum   322472.000   322472.000      169.622      336.434
  4 Variance   771021.188  6145036.000        0.172       12.139
  5     SSQ 1346257536.000178155276B.000      369.132     2380.665
  6   MCSSQ 62452716.000497747904.000        13.927      983.280
  7 Euc Norm  36691.383    42208.445       19.213       48.792
  8 Minimum    2283.000      845.000        1.235        1.235
  9 Maximum    6480.000     6480.000        3.504        9.467

Network centralization not computed for unconnected graphs
Output actor-by-centrality measure matrix saved as dataset C:\Users\LENOVO\Desktop\Ölçümler\Closene
ss

----------------------------------------
Running time:  00:00:01
Output generated:  19 Tem 24 14:29:12
Copyright (c) 1999-2005 Analytic Technologies
```

13.3. Ek-3 Arasındaki Merkeziliği

```
FREEMAN BETWEENNESS CENTRALITY
--------------------------------------------------------------------------------

Input dataset:                 C:\Users\LENOVO\Desktop\Ölçümler\ver.3


Important note: this routine binarizes but does NOT symmetrize.


Un-normalized centralization: 81122.575

                         1            2
                  Betweenness nBetweenness
                  ------------ ------------
     66    YOZGAT    1129.810      17.877
     18   ÇANKIRI    1048.562      16.591
     71  KIRIKKALE   1033.429      16.352
     14      BOLU    1012.798      16.025
     58     SİVAS     988.893      15.647
     28    GİRESUN     438.271       6.935
     26  ESKİŞEHİR     425.768       6.737
     24   ERZİNCAN     361.136       5.714
      3 AFYONKARAHİSAR 290.643       4.599
     25    ERZURUM     288.671       4.568
     61    TRABZON     257.567       4.075
     54    SAKARYA     256.300       4.055
     43    KÜTAHYA     185.184       2.930
     44    MALATYA     174.805       2.766
     50    NEVŞEHİR     174.486       2.761
     11    BİLECİK     174.061       2.754
     53      RİZE     161.486       2.555
     40   KIRŞEHİR     160.019       2.532
     10  BALIKESİR     135.690       2.147
     41    KOCAELİ     123.250       1.950
     51      NİĞDE     122.145       1.933
     78    KARABÜK     111.954       1.771
     46 KAHRAMANMARAŞ   98.358       1.556
      4      AĞRI      94.600       1.497
     21   D.BAKIR      90.358       1.430
      8    ARTVİN      80.000       1.266
     17  ÇANAKKALE      79.750       1.262
     16      BURSA      74.852       1.184
      1     ADANA      70.417       1.114
     47    MARDİN      66.483       1.052
     36      KARS      49.833       0.789
      2  ADIYAMAN      49.467       0.783
     27  GAZİANTEP      47.417       0.750
     19     ÇORUM      46.517       0.736
     68   AKSARAY      41.493       0.657
     29  GÜMÜŞHANE      38.579       0.610
     65       VAN      38.267       0.605
     49       MUŞ      30.352       0.480
     15    BURDUR      28.621       0.453
     73    ŞIRNAK      27.083       0.429
      7   ANTALYA      23.555       0.373
     67  ZONGULDAK      22.546       0.357
     20    DENİZLİ      22.131       0.350
     33    MERSİN      22.000       0.348
     63  ŞANLIURFA      20.875       0.330
     55    SAMSUN      20.833       0.330
     69   BAYBURT      18.564       0.294
     52      ORDU      18.500       0.293
     45    MANİSA      13.810       0.219
     32   ISPARTA      13.236       0.209
     12    BİNGÖL      12.664       0.200
     42     KONYA      11.083       0.175
      6    ANKARA      10.667       0.169
     59  TEKİRDAĞ       9.750       0.154
     48     MUĞLA       8.667       0.137
     81     DÜZCE       7.831       0.124
     37 KASTAMONU       5.667       0.090
     80  OSMANİYE       4.958       0.078
     23    ELAZIĞ       4.312       0.068
     64      UŞAK       3.579       0.057
     13    BİTLİS       3.250       0.051
      5    AMASYA       2.233       0.035
```

```
56        SİİRT      1.500    0.024
74       BARTIN      1.417    0.022
75      ARDAHAN      1.000    0.016
62      TUNCELİ      0.000    0.000
22       EDİRNE      0.000    0.000
39   KIRKLARELİ      0.000    0.000
30      HAKKARİ      0.000    0.000
70      KARAMAN      0.000    0.000
57        SİNOP      0.000    0.000
72       BATMAN      0.000    0.000
 9        AYDIN      0.000    0.000
34     İSTANBUL      0.000    0.000
35        İZMİR      0.000    0.000
76        IĞDIR      0.000    0.000
77       YALOVA      0.000    0.000
38      KAYSERİ      0.000    0.000
79        KİLİS      0.000    0.000
60        TOKAT      0.000    0.000
31        HATAY      0.000    0.000


DESCRIPTIVE STATISTICS FOR EACH MEASURE

                         1            2
               Betweenness nBetweenness
               ------------ ------------
1      Mean        128.296        2.030
2   Std Dev        254.151        4.021
3       Sum      10392.000      164.430
4  Variance      64592.613       16.171
5       SSQ    6565257.000     1643.681
6     MCSSQ    5232002.000     1309.887
7  Euc Norm       2562.276       40.542
8   Minimum          0.000        0.000
9   Maximum       1129.810       17.877


Network Centralization Index = 16.04%

Output actor-by-centrality measure matrix saved as dataset FreemanBetweenness


-----------------------------------------
Running time:  00:00:01
Output generated:  19 Tem 24 15:10:01
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```

GLOBAL COOPERATION: IMPACT OF PANDEMICS AND GLOBAL CRISES ON TRADE AND ECONOMIC STABILITY [1,2]

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ABSTRACT | This study examines the impact of pandemics on trade and economic stability, emphasizing the need for global cooperation and the involvement of least developed and developing countries in decision-making. Investigates the impact of pandemics, trade disruptions, and geopolitical tensions shape global economic dynamics, identifies the key factors influencing trade volumes and economic stability, and the strategies for fostering global cooperation to manage these complexities and promote resilience. A case study approach was used, focusing on COVID-19. Reports from 2009 to 2022 of the IMF, WTO were analyzed. All documents were subjected to a comprehensive, holistic analysis in accordance with predefined criteria. The findings of the study reveal the adverse effects of trade protectionism on international trade and global welfare, with a particular focus on the disproportionate impact on developing and least developed countries. In conclusion, the study emphasizes the necessity for reform of the international financial architecture to ensure fair representation and effective global cooperation.

---

[1] This study is derived from the doctoral thesis titled "The Effects of Global Pandemics on International Trade and the Importance of Global Cooperation" written by Özden Sevgi AKINCI under the supervision of Prof. Dr. Ercan TAŞKIN.

[2] Compliance with ethical principles regarding the relevant study has been declared.

KÜRESEL İŞBİRLİĞİNİN YENİDEN DEĞERLENDİRİLMESİ: SALGIN VE KÜRESEL KRİZLERİN TİCARET VE EKONOMİK İSTİKRAR ÜZERİNDEKİ ETKİSİ

,

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ÖZ | Çalışma, salgın hastalıkların ticaret ve ekonomik istikrar üzerindeki etkisini incelemekte, küresel iş birliğine ve az gelişmiş ve gelişmekte olan ülkelerin karar alma süreçlerine katılımına duyulan ihtiyacı vurgulamaktadır. Küresel ekonomik dinamikleri şekillendiren salgın hastalıkların, ticari aksaklıkların ve jeopolitik gerilimlerin etkisini araştırmakta, ticaret hacimlerini ve ekonomik istikrarı etkileyen temel faktörleri ve bu karmaşıklıkları yönetmek ve dayanıklılığı teşvik etmek için küresel iş birliğini teşvik etme stratejilerini tanımlamaktadır. COVID-19'a odaklanan bir durum çalışması yaklaşımı kullanılmıştır. IMF ve WTO'nun 2009-2022 yılları arasındaki raporları analiz edilmiştir. Tüm belgeler, önceden belirlenmiş kriterlere uygun olarak kapsamlı ve bütüncül bir analize tabi tutulmuştur. Çalışmanın bulguları, özellikle gelişmekte olan ve az gelişmiş ülkeler üzerindeki orantısız etkiye odaklanarak, ticari korumacılığın uluslararası ticaret ve küresel refah üzerindeki olumsuz etkilerini ortaya koymaktadır. Sonuç olarak çalışma, adil temsil ve etkin küresel iş birliğinin sağlanması için uluslararası finansal mimaride reform yapılması gerekliliğini vurgulamaktadır.

Anahtar Kelimeler: *Uluslararası ticaret, küresel salgınlar, küresel iş birliği*
JEL Kodları: *F17, I19, F02*

Alan: *Uluslararası ticaret ve lojistik*
Türü: *Araştırma*

1. INTRODUCTION

The emergence of global pandemics has precipitated a cascade of challenges, profoundly altering the landscape of international trade and the global economy. From the relentless advance of COVID-19 to the haunting memories of SARS and Ebola, these infectious diseases have breached not only the defenses of the nation's healthcare systems but also the foundations of international commerce, leaving behind a wake of devastation and upheaval (Qiu, Rutherford, Mao & Chu, 2017).

Once propelled by the currents of globalization, nations now find themselves entangled in a labyrinth of uncertainty and disruption as pandemics infiltrate every facet of economic activity (Yaya, Sanni, Otu, & Labonté, 2020). Supply chains, formerly emblematic of seamless global trade, now resemble intricate knots, their flow hindered by fractured connections and shattered expectations. The harmonious rhythm of consumer demand has been replaced by a discordant uncertainty, with fear and apprehension dampening market sentiment (Senir & Büyükkeklik, 2020).

The combination of the uncertainties caused by the COVID-19 pandemic with the direct or indirect effects of the ongoing wars in Ukraine and the Middle East, as well as the tension in the Gulf of Aden on the supply chain, has resulted in a significantly unfavorable situation. A stagnant trend is exhibited by trade volumes, previously indicative of economic vibrancy, under the influence of uncertainty and volatility. The resurgence of protectionism, once a relatively marginal concern, now emerges as a significant issue, fostering an atmosphere of isolationism and distrust in international relations. Concurrently, unemployment, which was previously largely contained, is now spreading indiscriminately.

In the context of crises such as pandemics, international trade turbulence, and economic instability, the necessity for global cooperation is becoming increasingly evident. To fully comprehend the intricate interrelationship between these factors, it is essential to recognize that no single nation or entity can effectively address these challenges in isolation (WTO, 2020). By developing a comprehensive understanding of these dynamics and fostering a spirit of global cooperation, the Earth can effectively navigate the uncertain waters ahead and emerge stronger and more resilient (Aybet, 2020).

In addressing global challenges, it is imperative to recognize the importance of giving voice to the least developed and developing countries. These nations often bear a disproportionate burden of challenges such as pandemics, economic instability, and environmental degradation, yet their perspectives and contributions are often sidelined in global decision-making processes (Taşkın & Akıncı, 2021). By ensuring their active participation and

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representation, we can harness diverse insights, innovative solutions, and collective wisdom to address common challenges. Empowering these countries not only promotes inclusiveness and equity, but also enhances the effectiveness and legitimacy of global efforts. By fostering a truly collaborative approach where all voices are heard and valued, we can forge a path towards a more just, resilient, and sustainable world.

Amidst ongoing conflicts and geopolitical tensions, compounded by uncertainties caused by the COVID-19 pandemic, the study aims to explore the intricate dynamics of pandemics, trade turbulence, and economic instability. It seeks to emphasize the urgent need for global cooperation to navigate these multifaceted challenges effectively.

The methodology employed in this study involves a comprehensive analysis approach. A case study analysis focusing on the impact of the COVID-19 pandemic is supplemented by qualitative content analysis of reports from key international organizations such as the International Monetary Fund (IMF) and World Trade Organization (WTO).

By delving into the complexities of global economic challenges, this study contributes to the existing literature by providing insights into the effects of pandemics on trade dynamics, policy responses, and most importantly international cooperation efforts. It also highlights the disproportionate impact of these challenges on developing and less developed countries, shedding light on the need for inclusive and equitable global responses.

Initial findings reveal the exacerbation of trade protectionism amidst pandemics, leading to adverse effects on international trade and global welfare. This study aims to fill gaps in the literature by providing a nuanced understanding of the economic implications of pandemics and the necessity for reforms in international financial architecture to ensure fair representation and effective global cooperation.

The research process involves a systematic analysis of relevant literature, data collection from authoritative sources, and rigorous qualitative analysis methods to derive meaningful insights into the complexities of global economic challenges.

2. THEORETICAL FRAMEWORK
2.1. Literature Review

The literature presents a range of studies examining the economic repercussions of past pandemics and their implications for various countries and sectors. Donaldson and Keniston (2016) uncovered profound consequences of the Spanish flu outbreak in India, revealing how the high mortality rate prompted significant shifts in agricultural practices, resulting in increased wealth per capita and subsequent investments in child welfare. This led to marked improvements in child health and education in the regions most affected by the pandemic.

Obrizan, Karlsson, and Matvieiev (2020) delved into the enduring impact of the Spanish flu on the Swedish economy, highlighting the significant loss of life and the complex economic fallout, particularly within the context of Sweden's neutrality during World War I. Alpago and Oduncu (2020) conducted a comprehensive analysis of the socio-economic effects of the Coronavirus pandemic, predicting a widespread shift towards digitalization and online commerce across various sectors as a response to the crisis. James and Sargent (2007) found limited direct economic ramifications of the 1957 Asian flu pandemic on consumer behavior in Canada or personal savings in the United States, despite widespread health impacts. However, Yoneyama and Krishnamoorthy (2010) explored the interplay between Cold War dynamics and the spread of the 1957-58 Asian flu, highlighting the diverse impact of the pandemic based on international relations.

Erdoğdu (2020) proposed a critique of neoliberalism's role in managing pandemics, advocating for a more coordinated national approach to pandemic management. The study argues that neoliberal policies, particularly evident during the 2008-2009 global financial crisis, are ill-suited to address the social challenges posed by the COVID-19 pandemic, suggesting a need for a paradigm shift in policy approaches. Giroux (2020) emphasized the necessity for new conceptual frameworks regarding solidarity, politics, and democracy considering the global pandemic. The author calls for a departure from neoliberal paradigms towards a more democratic and just society. Ranald (2020) warned against the potential exacerbation of corporate consolidation during economic crises through trade agreements, underscoring the importance of government oversight in protecting public health and environmental interests. Aybet's (2020) research anticipates a shifting global landscape post-COVID-19, envisioning the emergence of new cooperation mechanisms and a pragmatic approach to international relations less constrained by ideological divisions.

Analysis of these studies reveals that pandemics have significant economic implications, influencing trade dynamics, policy responses, and

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international cooperation efforts. However, further research is needed to fully understand the complexities of these interactions and inform effective policy interventions.

2.2. Impact of Global Pandemics on International Trade and Economic Stability

The global spread of the novel coronavirus (COVID-19) has demonstrated that viruses do not respect national boundaries. Consequently, the efficacy of acting in isolation has been called into question. The emergence of global pandemics has led to several challenges that have a profound impact on the landscape of international trade and the global economy (OECD, 2022).

Table 1: 15 Major Epidemic Events That Resulted in at Least 100,000 Human Casualties

Pandemic	Beginning	End	Number of Casualties
Black Death	1347	1352	75.000.000
Italian Plague	1623	1632	280.000
Great Plague of Sevilla	1647	1652	2.000.000
Great Plague of London	1665	1666	100.000
Great Plague of Marseille	1720	1722	100.000
First Asia Europe Cholera Pandemic	1816	1826	100.000
Second Asia Europe Cholera Pandemic	1829	1851	100.000
Russia Cholera Pandemic	1852	1860	1.000.000
Global Flu Pandemic	1889	1890	1.000.000
Sixth Cholera Pandemic	1899	1923	800.000
Encephalitis Lethargica Pandemic	1915	1926	1.500.000
Spanish Flu	1918	1920	100.000.000
Asian Flu	1957	1958	2.000.000
Hong Kong Flu	1968	1969	1.000.000
H1N1 Pandemic	2009	2009	203.000

Source: (Jordà, Singh, and Taylor, 2020, p. 14)

Table 1 provides an overview of 15 notable pandemic events that have resulted in a minimum of 100,000 human casualties. In order to gain a deeper understanding, four historic global pandemics were briefly examined. These pandemics were selected for their historical and geographical diversity, significant and wide-ranging impacts on societies, well-documented data, and relevance to modern pandemics. The selected pandemics included the plague outbreak from 1347 to 1350, the chickenpox epidemic spanning the late 15th to 16th centuries, the Spanish flu during World War I, and the Asian flu in 1957.

This selection allows for meaningful comparisons with contemporary pandemics. Economic landscapes, social and economic repercussions, post-pandemic scenarios, and impacts on international trade for each event was considered. Furthermore, the analysis examines the prevailing international financial structures and dynamics of global cooperation during these periods.

2.2.1. The Plague Pandemic (1347-1350)

In the 14th century, the Plague Pandemic, also known as the Black Death, devastated Europe, causing significant demographic and socio-economic upheaval. The pandemic originated in Asia and spread to Europe via trade routes, particularly affecting port cities. The disease, transmitted by fleas from black rats, led to a rapid spread and high mortality rate (Pirenne, 2009; Tuchman, 1978).

The socio-economic impacts of the pandemic were profound, resulting in a labor shortage and the end of the medieval serfdom system. Despite the tragedy, the pandemic resulted in increased wages for workers and a redistribution of wealth, improving living standards for many. International trade was severely affected, with both sea and land trade coming to a halt due to the pandemic's adverse conditions. However, post-pandemic Europe saw improved economic opportunities and living standards (DeWitte, 2014; Acemoğlu & Robinson, 2014; Genç, 2011).

2.2.2. Smallpox (15th Century-16th Century)

Smallpox, which originated in the agricultural era approximately 12,000 years ago, spread widely across Europe, Asia, and Africa, with an estimated mortality rate of 3%. However, upon the discovery of the New World, the death toll surged, leading to a dramatic decline in Native American populations. European contact introduced diseases like smallpox, which decimated populations from 5 million to approximately 240,000 by the late 19th century. This catastrophic decline, attributed to epidemic outbreaks and colonialism, underscores the devastating impact of European conquest (Madley, 2015).

The economic consequences of European exploration in America, alongside military advancements, were compounded by the spread of infectious diseases like smallpox and measles. While isolated communities in the northern New World limited major epidemics, cities in regions like Peru and Mexico faced devastating outbreaks (Fenn, 2001; Diamond, 1997). Smallpox, initially brought by European explorers, played a pivotal role in the downfall of empires like the Inca and Aztec, with Mexico's population plummeting from 28 million to 1.6 million between 1519 and 1620. The subsequent settlement by African populations, immune to these diseases, further illustrates the profound demographic upheaval caused by European contact (Lewis & Bell, 2004; Domingo & Barquet, 1997).

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The impact of the smallpox epidemic on international trade and the economy was significant, arising from the discovery of the New World and the subsequent spread of the disease. The Columbian Exchange introduced new species to the Old World and provided fertile lands for cultivating sought-after crops, making the New World a major global supplier. However, this exchange also resulted in negative outcomes, including the decimation of indigenous populations due to introduced diseases and the perpetuation of the transatlantic slave trade to sustain crop production, which had profound economic, social, and political repercussions for Africa (Taşkın & Akıncı, 2021; Manning, 1990; Nunn, 2008).

2.2.3.   Spanish Influenza (1918-1920)

The Spanish Flu pandemic of 1918-1920 occurred amidst the chaos of World War I, affecting approximately 45 countries and causing the deaths of around 50 million people in a short span. Despite the lack of consensus on its origin, some theories suggest it may have started in various countries, including China, France, the United States, and the United Kingdom. The pandemic's name, however, derived from the relatively freer press in Spain compared to warring nations, which accurately reported on the outbreak. Despite subsequent research indicating that the virus did not originate from Spain, the name persisted. The pandemic, characterized by extreme contagion, coincided with wartime conditions, where populations with minimal prior contact were brought together, leading to its rapid spread. Furthermore, the inadequate healthcare, low hygiene standards, and overcrowded living conditions prevalent among soldiers served to facilitate the transmission of the virus (Davies, 2000; Collier, 1996; Taşkın & Akıncı, 2021).

The economic impact of the Spanish Flu pandemic, viewed in the context of its effects on international trade, was predominantly short-term. Most businesses, particularly those in the entertainment and service sectors, experienced significant profit losses, while enterprises supplying the healthcare sector saw increased revenues. While some academic studies suggested that the labor shortage resulting from the pandemic temporarily led to higher wages for workers, it is unclear whether this benefit outweighed the overall economic disruptions and extraordinary loss of life. It is challenging to separate the economic effects of the Spanish Flu from those of World War I, given that wartime production created upward pressure on wages due to increased labor demand (Garrett, 2007; Milas , 2020).
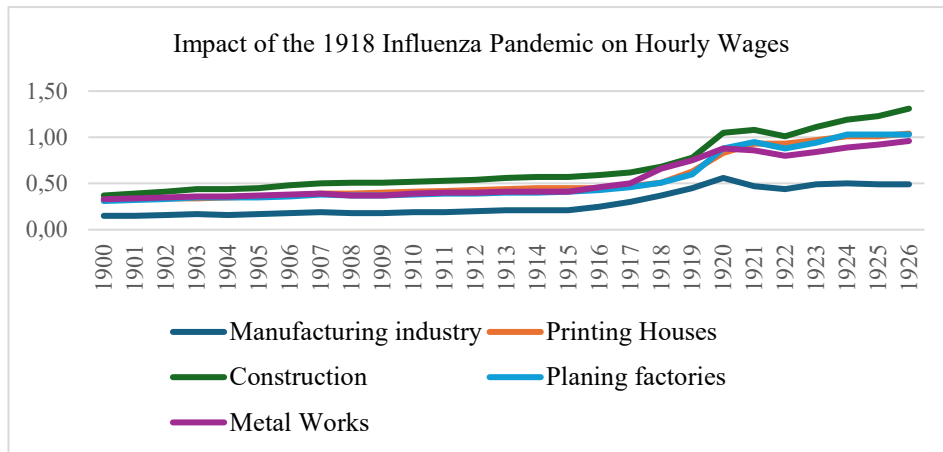
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Impact of the 1918 Influenza Pandemic on Hourly Wages

Figure 1: The Impact of the 1918 Influenza Pandemic on Hourly Wages in Certain Industries in the United States from 1900 to 1926.
Source: (Statista, 2023, p. 1)

A review of the literature indicates that cities in the United States with higher influenza mortality rates experienced greater real wage increases during the post-pandemic period. This trend is illustrated in Figure 1. Similarly, data from the United Kingdom showed a substantial increase in real wages for construction workers in London during 1918-1919, despite an overall decline in the country's real GDP. In Sweden, which remained neutral during the war, the pandemic had a negative impact on capital returns and led to an increase in the number of residents of the poorhouse, without any observed wage increases (Karlsson, Nilsson & Pichler, 2014).

2.2.4. Asian Flu (1957-1958)

The Asian Flu of 1957-1958, originating in East Asia, rapidly spread worldwide, causing significant mortality and infection rates. Despite its severity, there were few references to its economic impact in reports or publications by international organizations and governments. The outbreak coincided with a global recession, but little association was made between the flu and the economic downturn. Nevertheless, there was a discernible decline in U.S. exports and capital investments, which contributed to an economic decline in the United States and Canada. The pandemic also led to an abrupt decrease in international trade from the third quarter of 1957 to the first quarter of 1958, followed by a robust recovery immediately after the outbreak (Taşkın & Akıncı, 2021; Rogers, 2020).

While some scholars contended that the influenza pandemic had no direct impact on stock market crashes or recessions, others highlighted significant declines in car sales and consumer spending. During the peak period of the 1957 influenza pandemic, there was a global recession, as well as in the United States. International trade declined suddenly starting in the third quarter of 1957 and lasting until the first quarter of 1958. However, a strong recovery process commenced immediately after the pandemic. But the precise economic consequences, including its impact on international trade, remain a matter of debate (FED, 1958; Stepek, 2020).

2.2.5. COVID-19 Pandemic

Prior to the emergence of the COVID-19 pandemic in early 2020, discussions primarily centered on the decline in oil prices at the end of 2019 and the uncertainty surrounding the duration of this downturn, in addition to concerns about the persistence of trade wars. IMF's October 2019 Global Financial Stability Report identified several weaknesses in the global financial system at that time. These included increased reliance on external borrowing by frontier and emerging market economies, a rise in illiquid and riskier assets driven by institutional investors and growing corporate debt burdens (IMF, 2019). However, with the onset of the COVID-19 pandemic in early 2020, this landscape underwent significant transformation. This was further shaped by Russia's attempted invasion of Ukraine.

Figure 2 presents a temporal analysis of global commodity trade volume from the first quarter of 2015 to the end of 2019 (see next page). It reveals a 1.0% decline compared to the fourth quarter of 2018 and a 1.2% decrease compared to the third quarter of 2018. On an annual basis, there was a 4.6% reduction. The trade dispute between China and the United States, which resulted in tariff increases, contributed to trade policy instability in 2019. This was compounded by other factors, including changes in major economies' monetary policies, the United Kingdom's Brexit, and the United States federal government shutdown in 2018-19 (WTO, 2020). The inclusion of data from 2015-2019 provides a baseline to compare the pre-pandemic economic conditions with those observed during and after the pandemic, allowing for a clearer understanding of the pandemic's specific impacts.
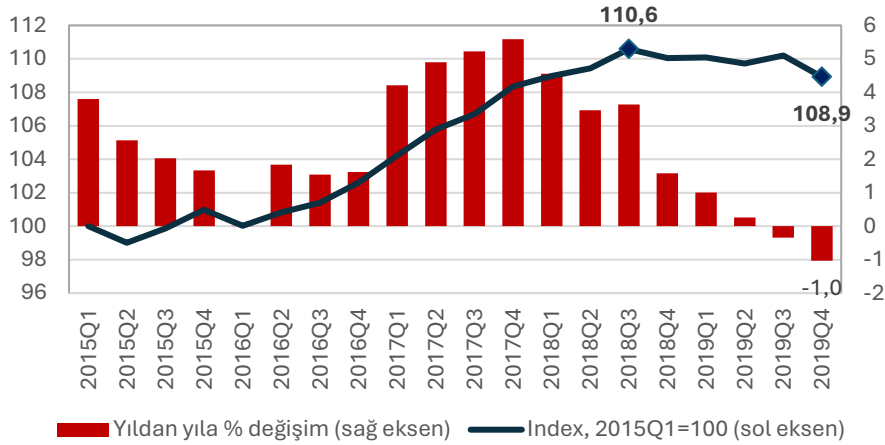
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Figure 2: World Commodity Trade Volume, 2015 Q1 - 2019 Q4 (Volume index 2015=100 and annual % change)
Source: (WTO, 2020).

The novel coronavirus, initially identified in late 2019 in Wuhan, China, rapidly spread worldwide, resulting in millions of deaths and a global recession. Quarantine measures aimed at controlling the outbreak significantly reduced international trade, contributing to an economic downturn (Senir & Büyükkeklik, 2020). In January 2020, the World Health Organization declared it a Public Health Emergency of International Concern and a global pandemic in March 2020. As of March 29, 2023, the pandemic has resulted in over 761 million cases and 6.88 million confirmed deaths, making it one of the deadliest global pandemics in history.

The administration of COVID-19 vaccines has prevented an estimated 14.4 million to 19.8 million additional deaths across 185 countries and regions from December 8, 2020, to December 8, 2021. This has significantly altered the trajectory of the pandemic. However, limited access to vaccines in low-income countries underscores the critical need for global vaccine equity and coverage (Watson et al., 2022).

The global economic crisis precipitated by the COVID-19 pandemic has been the most severe since the 2007-2009 global financial crisis. It has resulted in a significant increase in unemployment and a sharp decline in production. International trade has also been significantly disrupted by supply and demand shocks.

Since 1870, the world has experienced 14 global recessions, each marked by a sharp decline in global GDP. These recessions have occurred approximately

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once every decade, with exceptions in the 1950s and 1960s. It is noteworthy that the economic downturn associated with the 2019 novel coronavirus (COVID-19) was predicted to be one of the most severe since the end of World War II, surpassing the severity of the 2007-09 global financial crisis (Köse & Sugawara, 2020).

In response to the global economic impact of the pandemic, international financial institutions and individual countries have introduced a range of economic packages. These packages vary in their composition, with some offering low-interest, long-term loans, while others provide direct cash assistance and rescue packages for businesses. In the initial six months of the pandemic, trade and investment weakened due to uncertainty, deterring planned investments, and causing temporary withdrawals from global value chains. This trend has also impacted international technology transfer. The pandemic has prompted nations to implement a range of economic measures to address its effects (Dieppe, 2020).

The PMI indicates a notable decrease in new export orders due to the pandemic, with both the manufacturing and service sectors affected. In April 2020, many economies saw a sharp decline in commodity exports compared to the previous year, accompanied by negative trends in import growth for certain Asian countries like Thailand and China (WTO, 2020).

As final remarks for this section, it is evident that historical global economic crises have been attributed to both protectionist policies and unregulated free-market practices. The 1929 Great Depression was attributed to protectionist policies, while the 1997 Asian Crisis and the 2008-2009 Global Crisis were attributed to unregulated free-market practices. Furthermore, recurring issues such as volatile capital flows and currency wars have been identified as impacting international trade by increasing trade barriers. Despite a reduction in the number of protectionist measures during the 2007-2009 Global Economic Crisis, there was still an increase in global trade barriers, including the use of covert protectionist measures that circumvented WTO rules. Each pandemic has been demonstrated to result in temporary downturns and supply chain disruptions. The analysis then turns to the impact of the COVID-19 pandemic on international trade, which has been negative overall but has seen a gradual recovery with the introduction of vaccination efforts. However, the emergence of new variants has led to the continuation of measures to combat the ongoing effects of the pandemic.

3. METHOD

Qualitative research is conducted when there is a need to explore a particular topic. This need is identified by the researcher when they are working on a study with a defined group, seeking to identify variables that are not easily measurable, or desiring to hear silenced voices. In such cases, the researcher chooses to conduct qualitative research (Creswell, 2013, pp. 47-48). In this context, the present study employed qualitative research methodology to investigate the effects of global pandemics on international trade and to identify solutions for what kinds of improvements need to be made in the international financial architecture to integrate more effective and efficient global cooperation into the current economic structure.

The research questions addressed in this study are as follows:

1. How do pandemics, trade disruptions, and geopolitical tensions interact to shape global economic dynamics?

2. What are the key factors influencing trade volumes and economic stability in the face of these challenges?

3. How can global cooperation be fostered to manage these complexities and promote resilience?

As a result of the comprehensive literature review conducted, it has been deemed appropriate to use the holistic multiple case study design from qualitative research models to develop an in-depth understanding of several situations that can be compared to verify the research questions presented in this study. Hancock, Algozzine, and Lim (2021) define case study as studies built on deep foundations that richly describe events occurring in their natural conditions using a set of data collection tools with spatial and temporal constraints. Gerring (2007) defines a case study as the in-depth study of a single case to explain multiple cases. Gerring also defines a case study involving multiple cases as a multiple-case study. In such studies, it is difficult to study these cases in-depth due to the large number of cases. In this context, it is appropriate for the samples of cases, rather than the entire universe of cases, to become the focus of the study (Subaşı & Okumuş, 2017).

In the holistic multiple case design, multiple cases are considered individually, each with a single unit of analysis. After each case is holistically evaluated within itself, all cases are compared with each other using the predetermined unit of analysis, and a report is created (Yıldırım & Şimşek, 2008). The unit of analysis for the study has been determined as the "international financial architecture". In accordance with the exploratory nature of the holistic multiple case design, two case studies have been identified for the study prepared based on this methodology:

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1. The Effects of Global Crises on International Trade – Example of the 2007-2009 Crisis
2. The Effects of Global Pandemics on International Trade – Example of the COVID-19 Pandemic

Table 2: Summary Table of Examined Documents

No	Document Title	Author	Publication Year	Key Topics Covered
1	Annual Reports	IMF	2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019	Effects of global crises on international trade and global economy
2	Annual Reports	IMF	2020, 2021, 2022	Effects of global pandemics on international trade and global economy
3	World Economic Outlook Reports (Semiannual-April)	IMF	2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019	Effects of global crises on international trade and global economy
4	World Economic Outlook Reports (Semiannual-April)	IMF	2020, 2021, 2022, 2023	Effects of global pandemics on international trade and global economy
5	World Economic Outlook Report (Semiannual-October)	IMF	2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019	Effects of global crises on international trade and global economy
6	World Economic Outlook Reports (Semiannual-October)	IMF	2020, 2021, 2022	Effects of global pandemics on international trade and global economy
7	Annual Reports	WTO	2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019	Effects of global crises on international trade and global economy
8	Annual Reports	WTO	2020, 2021, 2022	Effects of global pandemics on international trade and global economy
9	Public Forum Report	WTO	2009	Effects of global crises on international trade and global economy

Table 2 has been constructed for the purpose of illustrating the examined

documents that have been subjected to analysis. Both case studies were examined based on the following criteria: The annual reports published by the IMF and WTO between 2009 and 2022, as well as the World Economic Outlook reports published twice a year by the IMF in April and October from 2009 to 2022, were consulted. Additionally, the Public Forum Report of the WTO from 2009 and the April 2023 report of the IMF covering 2022 data were included. Thus, the research questions were attempted to be answered using the data analysis method chosen for the study, with a total of 58 examined documents and the codes determined to answer the research questions serving as the basis. The reports from 2009 to 2019 served as samples for analyzing the effects of global crises on international trade and the global economy. To analyze the effects of global pandemics on international trade and the global economy, reports from 2020 to 2022 were utilized. Additionally, given that the effects of the 2007-2009 global crisis continue to be felt in the present, all reports from 2009 to 2022 were analyzed holistically according to predetermined criteria. The data were coded and analyzed using the MAXQDA 2022 qualitative data analysis software, which is a widely used tool in the social sciences.

The descriptive analysis method of content analysis was used in the study. First, the data were searched for patterns that appeared consistently with at least two repetitions. The raw data were coded, and then the coded data were categorized based on similarity, difference, order of occurrence, causality, and interaction/frequency. From the categorized data, themes were created to answer the research questions. The data were coded and analyzed using MAXQDA 2022, a qualitative data analysis program widely used in the social sciences. The first step in the qualitative analysis cycle is the creation of the database, which is completed with the collection of data. The second and third phases are the coding phase, which involves the disassembly and reassembly of the data. The coding phase is followed by the interpretation and conclusion phases (Yin, 2016).

In the process of coding the document data analyzed in the study, an inductive approach was followed. The coding paradigm (Kuckartz, 2014; Strauss, 2003), which has been accepted in the literature within the scope of grounded theory studies, was taken as a methodological basis in this study.

3.1. Reevaluating Global Cooperation Amidst Global Challenges

A more organized and effective global collaboration is essential to ensure an effective response to the challenges posed by the pandemics and other global issues. Enhanced coordination among nations, international organizations and stakeholders would facilitate the sharing of resources, information, and expertise, leading to cohesive strategies that address public health, economic stability, and social well-being worldwide (Aybet, 2020). In addition, incorporating the

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perspectives and input of the least developed countries (LDCs) is critical to ensuring an inclusive and equitable global response. LDCs face unique vulnerabilities during crises such as the pandemic, and their insights can address the needs of the most vulnerable populations and promote more effective and sustainable solutions. In addition, engagement with emerging market economies (EMEs) is critical, as they offer valuable perspectives on economic recovery, trade, investment, and innovation. By actively involving EMEs in decision-making processes, global efforts to address challenges can become more inclusive and reflective of diverse needs, ultimately leading to more sustainable and equitable outcomes for all stakeholders.

The establishment of common rules to mitigate the adverse impacts of individual policies is essential. While countries tend to collaborate based on their interests, a system of shared principles and institutions has fostered significant progress since World War II. However, in today's complex economy, some countries are less inclined to engage in collective action. International cooperation, encompassing various domains such as the economy, trade, the environment, and poverty, plays a pivotal role in surmounting global challenges (Frieden, Pettis, Rodrik & Zedillo, 2012; Gaspar, Hagan & Obstfeld, 2018). Calls for "better global governance" underscore the inadequacy of relying solely on global markets or temporary international cooperation. While examples of cooperation by international organizations are invaluable in times of crisis, they may be insufficient in addressing other critical global economic issues. Therefore, while international cooperation has demonstrated relative success in certain areas, it necessitates improvement to address other significant global challenges (Velarde, 2015; Frieden et al., 2012).

In theory, legal regulations can mitigate the impact of global crises like pandemics. However, opposition from stakeholders and affected countries is likely due to potential profit loss (Yamin, Grogan & Villarreal, 2021). Nevertheless, the necessity of these regulations for the most affected countries is evident. Therefore, it is necessary to examine how current international institutions function, such as the IMF and WTO, to ensure effective global cooperation.

3.2. A Holistic Analysis of the Impact of Pandemics, with a Focus on the Example of the Global Crisis and COVID-19 Pandemic, on International Trade and Economic Stability

In the content analysis of the analyzed documents, coding was initially employed to support inferences regarding the effects of global pandemics on international trade. The content analysis focused on two key themes, "Impact on Trade" and "Global Economy Response," with the objective of categorizing the

codes. A total of 1,213 sections were coded, and their relationships with each other were subsequently investigated. The codes with the highest frequencies under each theme are discussed and analyzed in the subsequent section. The theme "Global Economy Response" examines the global economy's response to the effects of the Global Crisis and COVID-19 pandemic on international trade and the global economy. The "Trade Impact" theme aims to analyze the extent of the effects of the pandemic on international trade. Both themes are first considered as separate processes and then analyzed holistically. Table 3 displays the distribution of the sub-codes of the "Impact on Trade" category, which examines the effects of global pandemics on international trade. It also shows the analysis of code frequencies based on the number of coded sections.

Table 3: Frequency Table Showing the Number of Coded Sections on the Effects of Global Crisis on International Trade in the Documents (2009-2019) Analyzed

Impact on Trade	Sections
Food safety	138
Decline in trade	46
Impact of changing demographics	42
Demand Growth	29
Decline in imports	21
Disruption of supply chains	17
Decline in exports	16
Food chain issues	12
Decline in demand	11
TOTAL	**332**

A total of 332 sections were coded under the theme "Impact on Trade" in the analyzed documents. Table 3 provide an overview of the basis for the codes that are referred to throughout the implementation section. The "food security" code represents the measures taken by governments and international financial institutions to control rising food prices and secure access to food in the wake of the 2007-2009 Global Crisis and the COVID-19 pandemic.

The "decline in trade" code is used to analyze the impact of the chain effects of the 2007-2009 Global Crisis and the COVID-19 pandemic on the

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decline in trade. The analysis revealed a direct correlation between the decline in trade and the implementation of protectionist policies by governments. The documents reviewed frequently highlighted the detrimental impact of such policies on the orderly functioning of trade. The subsequent paragraphs present the findings of the analysis, which provide a foundation for significant contributions to the study.

The code "Impact of change in demographics" highlights the crisis and pandemic's effects on trade due to demographic shifts. Other codes, such as "Increase in demand," "Decline in imports," "Disruption of supply chains," "Decline in exports," "Food chain problems," and "Decrease in demand," are closely linked to the "Decline in trade" code. Trade protectionism is often cited as a significant factor in this decline. The most frequently mentioned impact is that of food safety, with discussions on threats to food security and potential measures. This finding is crucial given current global conflicts, as illustrated in Figure 3 using the MAXQDA 2022 program for visualizing and analyzing word associations. Therefore, the code "Food Safety" was selected as it is a crucial factor in understanding the impact of pandemics on international trade. During pandemics, food safety becomes a critical issue affecting the continuity and sustainability of international trade. Pandemics can disrupt supply chains, decrease agricultural and food production, and consequently lead to significant interruptions in international trade. Therefore, the "Food Safety" code was prioritized to analyze the multifaceted effects of pandemics on trade.
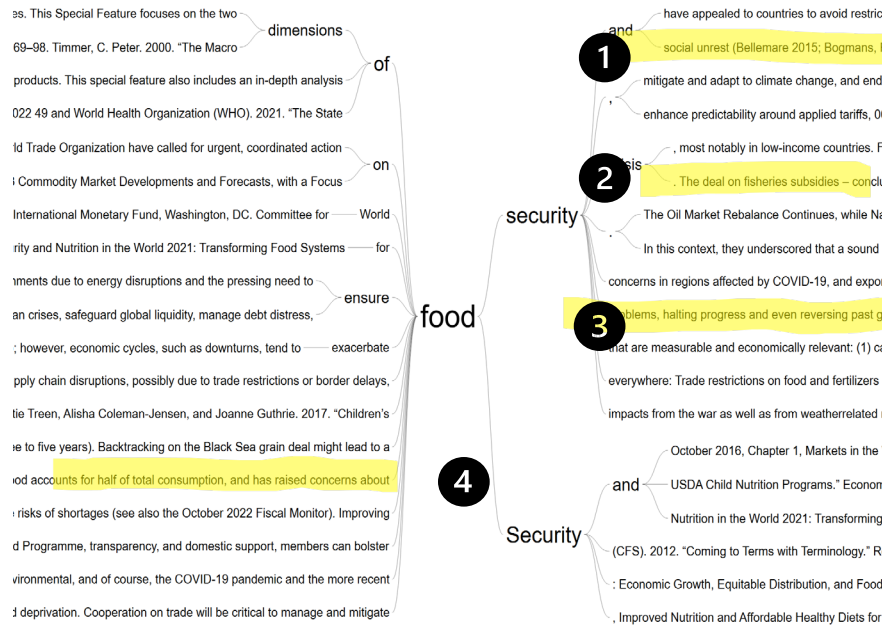
Figure 3: Word Combination Analysis on the Effect of "Food Safety"
Source: Authors results

For instance, the 2010 WTO report on "Global Solutions to Global Challenges" (WTO, 2010) underscores the necessity for countries to exert pressure on the WTO and Bretton Woods institutions to integrate trade into the broader effort to guarantee food security. As evidenced by the phrase in the highlighted area labeled "1" in the interactive word tree, it is imperative to recognize that the promotion of food security on an economic, social, and ecological level hinges upon the establishment of sustainability and the removal of trade-impeding barriers. Consequently, it is evident that the utilization of subsidies and customs duties by countries represents a significant challenge in addressing the chronic food security problem. In the highlighted area labeled "2," it is stated that food security crises have a particularly detrimental impact on low-income countries. In the highlighted area labeled "3," it is emphasized that food security concerns in regions affected by the COVID-19 pandemic and export restrictions imposed by major food exporters represent important sources of upward price risk for food. Finally, in the highlighted area labeled "4," the significant contributions that the Black Sea Grain Agreement can make to ensure global food security are highlighted.

Table 4: Frequency Table Showing the Number of Coded Sections Analyzing the Global Economy's Response to COVID-19 in Documents from 2019 to 2022.

The Response of the Global Economy to Global Crises	Sections
Increase in unemployment, job losses	264
Global Recession	163
Global Cooperation	139
Poverty Reduction	103
Inflation Increase	84
Slow recovery	52
GDP declines sharply	41
Repairing loss of trust	35
TOTAL	**881**

Table 4 shows the basis for the codes used in the implementation section. Among the 881 sections analyzed under the theme "Global economy response," the code "Increase in unemployment, job loss" is of particular interest. This code highlights the significant job losses resulting from both the 2007-2009 Global Crisis and the COVID-19 Pandemic. It also encompasses measures aimed at preventing further unemployment spikes. In contrast, sections addressing the global recession, which originated from the crisis and was further exacerbated by the pandemic, as well as discussions on solutions, are coded under "Global recession". While "Global cooperation" ranks third in frequency within the theme, it holds pivotal importance due to its direct correlation with all other codes and its role in addressing their effects.

In Table 4, the code "Global Recession" was chosen to evaluate the broad-scale impacts of the COVID-19 pandemic on the global economy. A global recession represents the extensive and lasting effects of the pandemic on economic activities. This code encompasses the macroeconomic impacts of the pandemic on international trade, production, consumption, and overall economic activities.

While the code "Increase in Unemployment" is also important, the "Global Recession" code provides a broader perspective on the pandemic's overall economic impact. This code includes multiple components such as increased unemployment, decreased production, reduced consumer confidence,

and economic contraction, offering a more comprehensive reflection of the pandemic's systemic and extensive impacts on the economic system.
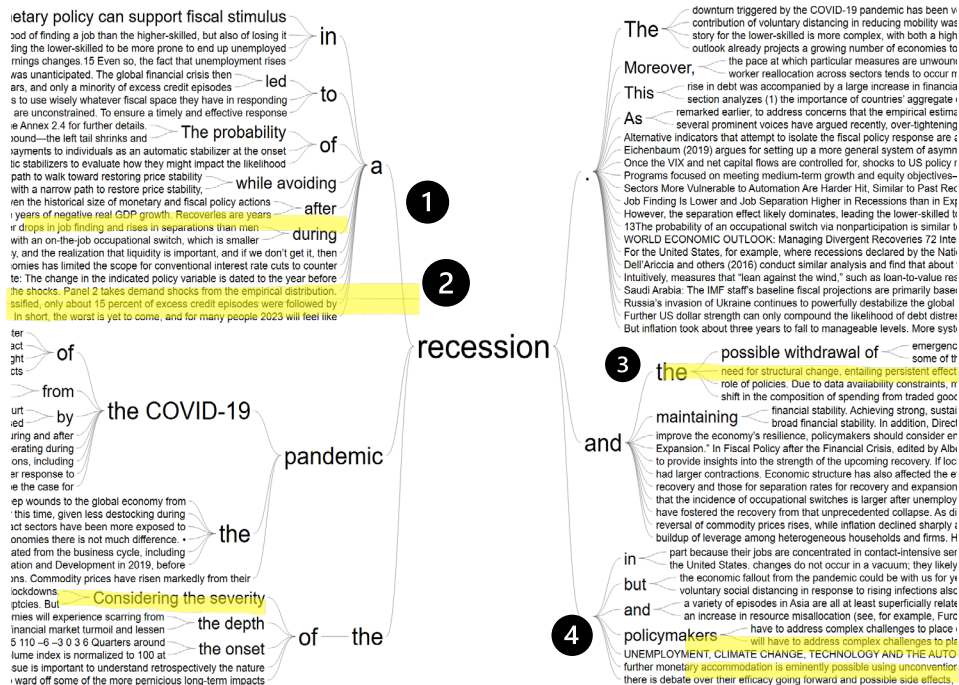

Figure 4: Word Combination Analysis on the Effect of "Global Recession"
Source: Authors results

In Figure 4, the area marked "1" highlights how the pandemic has exacerbated the longstanding issue of low growth rates across economies. This is due to the recession deepening further due to the conflict in Ukraine (IMF, 2022). The area marked "2" anticipates a worsening recession in 2023. The area marked "3" emphasizes the necessity of structural changes to alleviate its effects. Finally, the area marked "4" acknowledges that policymakers are facing increasingly intricate challenges as the recession persists.

The analysis reveals that "global cooperation" is the third most frequently occurring theme within the "Global Economy Response" category. Figure 5 presents an interactive word tree that illustrates the analysis of the impact of "global cooperation."

In the highlighted area marked "1," the statement emphasizes the IMF's indispensable role in global cooperation. In area "2," the focus is on establishing

regulations and institutions to bolster this cooperation. Furthermore, marked area "3" underscores the IMF's pivotal role as a leader in global cooperation, with marked area "4" highlighting its central position in efforts to ensure global stability.

Figure 5: Word Combination Analysis on the Effect of "Global Cooperation"
Source: Authors results

The IMF clearly articulates its significance in global cooperation efforts. While this study does not assess the adequacy of this stance, it directs attention to another aspect: examining how the IMF evaluates structural reforms. To explore this, the same documents were analyzed using word combination analysis with the keywords "structural reforms," as depicted in Figure 6 (see next page).

The word tree generated from the analyzed documents reveals a consistent emphasis on structural reforms within the IMF's reports. These emphasize the reforms member countries must undertake domestically to enact IMF decisions. This highlights the IMF's persistent push for member countries to reinforce neoliberal structures, while neglecting reforms within its own structure—an oversight significant for global cooperation.
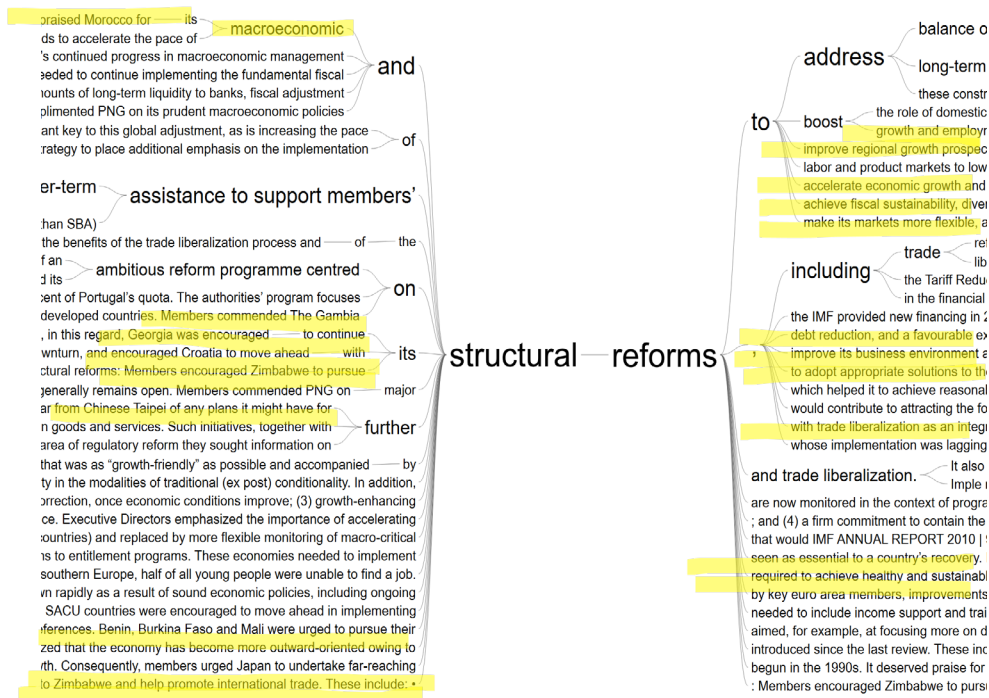
Figure 6: Word Combination Analysis on the Effect of "Structural Reforms"
Source: Authors results

4. FINDINGS

The findings of the two case studies, when considered holistically, indicate that trade protectionism poses a significant threat to the healthy functioning of international trade and global welfare. Consequently, it can be concluded that trade protectionism is an important phenomenon that contributes to a range of adverse effects, including high unemployment, extreme poverty, a decline in trade, food insecurity, and global recession.

The practice of trade protectionism, often depicted as "beggar thy neighbor," has the effect of benefiting the employing nation economically while harming others. For instance, a dominant oil supplier limiting supply to raise prices gains at the expense of the global economy. The practice of "optimum tariff" further manipulates trade terms by imposing tariffs on imports. These examples underscore the necessity of global cooperation to restrict or eliminate such harmful policies (Frieden et al., 2012).

It's evident that the World Trade Organization's efforts have fallen short in preventing trade protectionism, particularly among nations with substantial production capacities. Additionally, the IMF's influence on these countries to foster global cooperation has been limited. Descriptive analysis reveals that trade protectionism disproportionately impacts less developed and developing countries.

The IMF's decision-making process operates on a weighted voting system, where member countries' votes are based on economic size and financial contributions to the IMF fund. This unequal structure renders underdeveloped and developing countries ineffective in decision-making. Consequently, these economies are beholden to the interests and decisions of developed countries with the highest voting rights.

As presented in Figure 7, in a striking reversal from the 1980s, EMEs and LDCs now hold a significant 62% share of the global economy, surpassing advanced economies. This profound shift represents a complete reversal of the 1980s outlook. Despite this progress, EMEs and LDCs remain underrepresented in global decision-making mechanisms, failing to secure the position they rightfully deserve. In this manner, Figure 7 is crucial in illustrating this dramatic shift and highlighting the ongoing disparity in global economic governance.
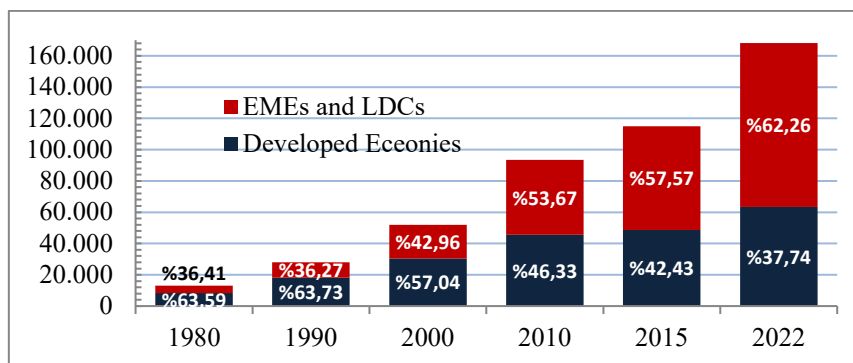
Figure 7: Illustration of the Evolution of EMEs, LDCs and Advanced Economies' Shares in the Global Economy from the 1980s to 2022
Source: Data sourced from the IMF database in the World Economic Outlook April 2022, and prepared by the author

5. CONCLUSION AND RECOMMENDATIONS

The emergence of global pandemics has precipitated a cascade of challenges, profoundly altering the landscape of international trade and the global economy. Once propelled by the currents of globalization, nations now find

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themselves entangled in a labyrinth of uncertainty and disruption as pandemics infiltrate every facet of economic activity. Supply chains, formerly emblematic of seamless global trade, now resemble intricate knots, their flow hindered by fractured connections and shattered expectations. The previously harmonious rhythm of consumer demand has been replaced by a discordant uncertainty, with fear and apprehension dampening market sentiment.

This study has investigated methods for mitigating the impact of global pandemics and global crises on international trade and economic stability, emphasizing the imperative of global cooperation dynamics that provide opportunities for developing and less developed countries in global decision-making mechanisms. By examining the historical development of the current international financial architecture, this study has sought solutions to integrate effective global cooperation into the prevailing global framework. In addressing the research questions, the analysis of descriptive data aimed to cultivate a healthy economic environment and contribute to the enhancement of welfare and living standards.

The comprehensive analysis conducted in this study reinforces the substantial threat posed by trade protectionism to international trade and global well-being, in alignment with existing literature. The exacerbation of issues such as unemployment, poverty, trade decline, food insecurity, and global recession aligns with prior research findings (Donaldson & Keniston, 2016; Obrizan et al., 2020). Moreover, the findings of this study indicate that the adverse effects of trade protectionism disproportionately impact emerging market economies (EMEs) and least developed countries (LDCs). This further emphasizes the urgent need for reforms to foster equitable global cooperation.

In the contemporary context of a multipolar world, the challenge of maintaining cooperation persists, yet its importance remains undiminished. This sentiment is echoed in the literature, as evidenced by the works of Erdoğdu (2020) and Giroux (2020). Effective global cooperation is of paramount importance for addressing the challenges of the 21st century. To this end, enhanced collaboration, communication, and accountability within global institutions are essential, as advocated by numerous scholars, including Aybet (2020) and Ranald (2020).

Furthermore, this study highlights the necessity of incorporating the perspectives and contributions of developing and less developed countries in global decision-making processes to ensure the implementation of inclusive and equitable solutions to global challenges. The empowerment of these nations not only promotes fairness and inclusivity but also enhances the effectiveness and legitimacy of global efforts, a finding that is consistent with the research

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outcomes of this study.

The reform of the international financial architecture is identified as a crucial step for the sustainable global trade. This conclusion is supported by the literature, which calls for a fairer distribution of decision-making power to include developing and less developed countries (Aybet, 2020; Ranald, 2020). Such reforms are essential for the realization of the solutions proposed in this study and the achievement of effective global cooperation. Ultimately, the resolution of global problems hinges on the development of effective global cooperation and the establishment of common rules to mitigate the negative impacts of states' policies on others. This aligns with broader discussions in the academic community (Erdoğdu, 2020; Giroux, 2020). As a final remark for this conclusion section, this necessitates a significant overhaul of the current global economic approach or the creation of a new, universally agreed-upon global economic architecture.

6. CONFLICT OF INTEREST STATEMENT

There is no conflict of interest between the authors.

7. FINANCIAL SUPPORT

No funding or support was received from this information.

8. AUTHOR CONTRIBUTIONS

ÖSA, ET: Idea,
ÖSA: Design,
ET: Supervision
ÖSA: Data collection and/or organization
ÖSA: Analysis and/or interpretation
ÖSA: Literature review
ÖSA: Writing,
ET: Critical review.

9. ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS

The data of the study were not collected through questionnaires, interviews, etc., but were based on document analysis method. Since ethical approval was not required for data collection, information and forms related to ethical approval were not included in the study. Otherwise, all the ethics committee principles required in the study were followed.

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BEHAVIORAL ANTECEDENTS OF NOMOPHOBIA: INSIGHTS FROM A STUDY ON SMARTPHONE USERS IN TURKEY[1] [2]

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ABSTRACT |

The aim of this study is to determine individuals' levels of nomophobia and to examine the relationship between nomophobia and demographic variables. The research targets a general population, encompassing participants from different age groups, genders, educational backgrounds, and socioeconomic statuses. Data were collected through surveys administered to participants from Istanbul. The collected data were analyzed using the SMART PLS 3.0 program. The findings revealed that among the sampled smartphone users, social usage had no positive impact on utilitarian motivation and hedonic motivation, while social motivation positively influenced social usage. It was inferred that utilitarian motivation and social motivation positively affected functional usage, whereas hedonic motivation did not. Functional usage was associated with lower levels of nomophobia, while social usage did not have a significant impact on nomophobia. The analysis also revealed that female participants exhibited higher levels of nomophobia compared to males, that nomophobia was more prevalent among younger individuals, and that nomophobia levels increased with daily smartphone usage.

Keywords: *Nomophobia, smartphones, types of motivation, social use, functional use*
JEL Code: *C40, I10, O33*

Scope: *Management information systems*
Type: *Research*

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[1] This study is derived from the Master's thesis titled "A Study on the Antecedents of Fear of Missing Out (Nomophobia)" conducted by the Department of Management Information Systems at Atatürk University.

[2] Compliance with the ethical rules of the relevant study has been declared.

NOMOFOBİNİN DAVRANIŞSAL ÖNCÜLLERİ: TÜRKİYE'DEKİ AKILLI TELEFON KULLANICILARI ÜZERİNE BİR ÇALIŞMADAN BULGULAR

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ÖZ | Bu çalışmanın amacı, bireylerin nomofobi düzeylerini belirlemek ve nomofobi ile demografik değişkenler arasındaki ilişkiyi incelemektir. Araştırma, farklı yaş grupları, cinsiyetler, eğitim düzeyleri ve sosyoekonomik statülerden katılımcıları kapsayan genel bir popülasyonu hedeflemektedir. Veriler, İstanbul ilinden katılımcılara uygulanan anketler aracılığıyla toplanmıştır. Toplanan veriler SMART PLS 3.0 programı kullanılarak analiz edilmiştir. Bulgular, örneklemdeki akıllı telefon kullanıcıları arasında sosyal kullanımın faydacıl motivasyon ve hazsal motivasyon üzerinde olumlu bir etkisi olmadığını, ancak sosyal motivasyonun sosyal kullanımı olumlu yönde etkilediğini ortaya koymuştur. Faydacıl motivasyon ve sosyal motivasyonun işlevsel kullanımı olumlu etkilediği, ancak hazsal motivasyonun etkisinin olmadığı sonucuna varılmıştır. İşlevsel kullanımın daha düşük bir nomofobi düzeyi ile ilişkili olduğu, sosyal kullanımın ise nomofobi üzerinde anlamlı bir etkisinin olmadığı görülmüştür. Kadınların erkeklere göre daha yüksek nomofobi düzeyine sahip oldukları, nomofobinin genç bireyler arasında daha yaygın olduğu ve günlük akıllı telefon kullanım süresi arttıkça nomofobi düzeyinin de arttığı belirlenmiştir.

Anahtar Kelimeler: *Nomofobi, akıllı telefonlar, motivasyon türleri, sosyal kullanım, fonksiyonel kullanım*
JEL Kodları: *C40, I10, O33*

Alan: *Yönetim bilişim sistemleri*
Türü: *Araştırma*

1. INTRODUCTION

The rapid advancements in digital technologies since the early 21st century have dramatically transformed various aspects of daily life. Among these technological innovations, smartphones stand out as one of the most significant, influencing communication, work, education, and entertainment. While these devices have greatly enhanced convenience and connectivity, they have also given rise to new challenges, including technology addiction and excessive usage. One particularly concerning issue is smartphone addiction, which has been increasingly recognized as a threat to individuals' emotional and psychological well-being in today's fast-paced world (Elhai, Levine, Dvorak & Hall, 2017; Panova & Carbonell, 2018).

In recent years, the term "Nomophobia"—short for "No Mobile Phone Phobia"—has emerged in psychology and social sciences literature to describe the anxiety, fear, and stress experienced when individuals are unable to access or use their smartphones. This condition stems from a dependency on digital technologies and reflects a complex interplay of psychological and social factors. Individuals' increasing reliance on smartphones for tasks that extend beyond communication, such as accessing information, managing schedules, and socializing, has led to a deep-seated psychological attachment to these devices, often tied to one's identity and sense of security (Yildirim & Correia, 2015; King, Valença & Nardi, 2010).

Several theoretical frameworks provide insights into the mechanisms underlying nomophobia. Psychological perspectives, such as attachment theory and cognitive-behavioral frameworks, offer explanations for the emotional and cognitive processes that drive individuals' attachment to smartphones (D'Arcy, Herath & Shoss, 2014; Beck, 1976). Additionally, social identity theory and social comparison theory elucidate how smartphone usage influences self-perception and social interactions (Tajfel & Turner, 1986; Festinger, 1954).

Understanding and addressing nomophobia require interdisciplinary approaches that integrate psychological, sociological, and technological perspectives. By analyzing the underlying mechanisms and correlates of nomophobia, researchers can develop targeted interventions to foster healthier smartphone usage habits and mitigate the adverse effects of technology dependency on mental health (Tams, Legoux & Léger, 2018).

In this regard, research on nomophobia holds critical importance in understanding the complexity of this phenomenon and developing effective strategies to safeguard individuals' emotional and psychological health. In this article, data collected using structural equation modeling were analyzed to better understand the origins and impacts of the nomophobia phenomenon. Specifically,

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the relationships between individuals' motivational factors and smartphone usage, as well as their effects on nomophobia, were examined, and hypotheses were tested.

The findings of this study will provide a significant contribution to gaining a more comprehensive understanding of the nomophobia phenomenon and supporting individuals in establishing healthier relationships with digital technologies. Additionally, by offering a framework for future research, this study may facilitate a broader perspective on addressing the nomophobia phenomenon.

2. CONCEPTUAL FRAMEWORK

The primary difference between internet and smartphone addiction and substance addictions such as alcohol or drugs is behavioral and does not involve dependence on a substance. Behavioral addiction can be defined as a disorder characterized by (1) pleasure-seeking and relief from feelings of pain and stress, (2) inability to control or limit behavior (Shaffer, 1996). In behavioral addictions, individuals perceive the use of smartphones and social media as a reward for themselves (Whang, Lee & Chang, 2003). Digital addictions often result from habitual behaviors used to escape reality (Huisman, Garretsen, and Eijnden 2000). When internet or smartphone usage becomes addictive, it can have negative effects on various aspects of life, including financial, physical, psychological, and social aspects (Young, 1999). The increasing prevalence of addiction types such as smartphone or mobile internet addiction may be attributed to the abundance of applications and the flexibility they offer in terms of both time and space (Nielsen & Fjuk, 2010). The wide variety of available applications encourages intense smartphone usage and the need to be online (Okazaki & Hirose, 2009).

Studies have shown that many people are strongly attached to their smartphones (Rush, 2011). Easy addiction to smartphones occurs due to users' desire to be reachable, leading to immediate stress or anxiety when not accessible (Carbonell, Oberst & Beranuy, 2013). The feeling that one cannot access their smartphone, communicate with friends, or stay updated can cause distress and stress in users (Lee, Chang, Lin & Cheng, 2014; Sayrs, 2013). Since smartphones are highly visible in daily life, they have become a critical tool for impression management. For example, being unreachable can lead to stress symptoms because such unreachability may lead to negative impressions when someone expects instant communication.

Most people regulate their behavior based on anticipation; individuals motivate and control their behavior to achieve desired outcomes, a process also

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known as self-regulation (Bandura, 1997). The failure of self-regulation is controlled by emotions and automatic behaviors, guided by impulses (Metcalfe and Mischel, 1999). It can decrease a person's self-efficacy, self-esteem, and lead to stress (Kaysi, Aydemir & Yavuz, 2021). To alleviate such negative effects and regulate themselves, individuals may use media to escape, feel better, or gain a sense of belonging (LaRose and Eastin, 2004). Consciously using the smartphone to escape self-regulation failure and relieve negative emotions can be a starting point. Habits form when actions do not result in desired outcomes and behavior is not adapted. As behavior is no longer consciously observed, it can be defined as addiction. The introduction of smartphones and smartphone applications into our lives creates addictions in individuals.

Nomophobia is a type of phobia characterized by anxiety or distress when one is not with their cell phone or unable to use it for reasons such as no signal or low battery (Argumosa-Villar et al., 2017). Nomophobia is also suggested to exhibit symptoms similar to psychological imbalances, anxiety disorders, or mood disorders. Therefore, it can be defined as an irrational phobia involving anxiety and fear. The irrationality lies in the degree of discomfort users feel at the thought of being separated from their smartphones. Individuals with nomophobia exhibit physical symptoms such as stress, uncontrollable anger, excessive sweating, panic attacks, and so on (Pavithra, Madhukumar & Mahadeva, 2015).

3. RELATED STUDIES

Nomophobia, the fear of being without access to a mobile phone or computer connection, has emerged as a significant concern in the digital age. The pioneering study on nomophobia was conducted in the United Kingdom in 2008, shedding light on this phenomenon and prompting subsequent research endeavors (Yildirim & Correia, 2015). This definition extends beyond the fear of being without a mobile phone to include the apprehension of being technologically disconnected or unable to access the internet, thereby encompassing computers as well.

With the proliferation of smartphones, scholarly attention shifted towards investigating mobile addiction, synonymous with nomophobia (Yilmaz, Yel & Griffiths, 2018). Bianchi and Phillips (2005) laid the groundwork for understanding mobile phone addiction by asserting its classification as a form of technology addiction. They explored the relationship between mobile phone addiction and self-esteem, as well as extraversion personality traits. Subsequent studies have corroborated a heightened propensity for mobile phone addiction, particularly among young individuals.

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Reid and Reid (2007) highlighted those interactions facilitated by the internet and internet-based applications trailed behind addictive mobile phone use. Lee et al. (2014) underscored the conceptualization of technology addiction as a behavioral disorder, emphasizing its alignment with compulsive behaviors. Using Young's (1999) internet addiction scale, Kwon et al. (2013) delineated six factors contributing to mobile addiction, including tolerance, withdrawal, daily-life disturbances, virtual relationships, excessive use, and positive expectations.

Yen et al. (2009) posited that excessive cell phone use could signify a manifestation of technology addiction. Merlo et al. (2013) developed a scale based on DSM criteria to identify symptoms of problematic cell phone use. Fidan (2016) observed variables affecting mobile addiction through a study based on DSM diagnostic criteria, categorizing them under withdrawal, lack of control, and tolerance factors.

Kazem et al. (2021) developed and validated the Interactive Electronic Nomophobia Test (IENT) to assess nomophobia in children and adolescents. They utilized Structural Equation Modeling (SEM) to examine the construct validity of the IENT, revealing nuanced insights into nomophobia characteristics across gender and grades. Fuady et al. (2023) conducted validity and reliability tests on the Nomophobia Instrument using the Rasch model. Their analysis identified four dimensions of nomophobia: loss of connectedness, giving up convenience, inability to communicate, and inability to access information, demonstrating the feasibility of measuring the nomophobia construct using SEM.

Valenti (2023) explored the psychometric multidimensionality of the Nomophobia Questionnaire (NMP-Q) using bifactor exploratory structural equation modeling. This advanced modeling approach aimed to unveil the underlying dimensions of nomophobia, shedding light on its complex nature. Arpaci et al. (2017) delved into individual differences in the relationship between attachment styles and nomophobia among college students. Through a structural equation model, they elucidated the mediating role of mindfulness in this relationship, providing insights into the psychological mechanisms underlying nomophobia.

Gentina et al. (2023) conducted a cross-national study on nomophobia among young people from different countries, emphasizing the role of materialism. By employing SEM, they revealed how materialism influences nomophobia differently across national identities, showcasing the importance of considering cultural factors in understanding nomophobia.

Some studies have explored clinical implications and psychological associations related to nomophobia. For instance, King et al. (2010) investigated the relationship between nomophobia and panic disorder with agoraphobia,

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emphasizing the significance of addressing mobile phone dependence in specific clinical populations. Their utilization of SEM identified a tailored approach for managing nomophobia in individuals with panic disorder.

Lin et al. (2023) employed SEM to analyze the impact of social media use on psychological well-being through the mediator of nomophobia. The findings revealed a complex interplay where social media use influenced psychological well-being both positively and negatively through nomophobia and perceived social support. Arslan et al. (2019) examined the fear of missing out (FoMO) and nomophobia among teachers using validated scales. This study shed light on the prevalence of nomophobia among educators and its potential impact on their well-being and professional lives.

Torpil et al. (2022) investigated the relationship between nomophobia and sleep quality in university students, revealing its negative influence on students' psychosocial well-being, including stress, depression, and insomnia. Farchakh et al. (2021) conducted a study in Lebanon to validate a nomophobia scale and explore its association with psychological aspects. Their findings underscored the importance of demographic factors in nomophobia research, with age influencing the likelihood of experiencing nomophobia. Tolan (2022) explored the relationship between nomophobia and mental health issues among university students. The study revealed significant associations between nomophobia, depression, anxiety, and stress levels, highlighting the psychological implications of excessive phone use.

4. METHOD
4.1. Research Purpose and Importance
There are various reasons why smartphones have become integral to people's daily lives, including staying connected with their surroundings, communicating with family and friends through calls or messages, desiring constant communication regardless of time or location, browsing the internet, playing games, and fulfilling the need for listening to music. However, there is a limited number of studies that examine these reasons based on their social, hedonic, and utilitarian motivational dimensions. This study aims to investigate the effects of utilitarian, social, and hedonic motivations on both smartphone usage and nomophobia. Specifically, it explores the relationships between utilitarian, hedonic, and social motivations and smartphone addiction, as well as the impact of these motivations on nomophobia.

4.2. Ethical Permissions for the Research
This study was reviewed and approved by the Ethics Committee of Social and Human Sciences at Atatürk University. The approval process, conducted

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during session number 15 with decision number 211 on 06.08.2024, ensured that the research adhered to the ethical standards in terms of its objectives, methodology, and potential impacts. Following this rigorous evaluation, the committee granted permission for the study to proceed, acknowledging that it met all ethical requirements without any concerns regarding risks or violations.

4.3. Methodology

The research data were collected through a questionnaire consisting of two sections. The first section included a "Demographic Information Form" developed by the researcher, which contained five multiple-choice questions covering gender, age group, income level, and education level. The second section introduced a scale focusing on participants' perceptions of nomophobia and smartphone use. This scale comprised 45 items, utilizing a 5-point Likert scale format (ranging from 1-Strongly Disagree to 5-Strongly Agree).

The measurement instruments used in the research model include a total of 45 items. The Nomophobia Scale, validated through structural and validity analysis by Yildirim and Correia (2015), consists of 20 items. Additionally, the motivation scale, re-tested for reliability by Kim et al. (2013) to assess motivation levels, comprises 25 items.

Participants for this study were residents of Istanbul, and data were gathered through an online survey form distributed via Google Forms. The sampling method employed both convenience and snowball sampling techniques. Convenience sampling involved selecting participants who were easily accessible and considered representative of the population, while snowball sampling was utilized by reaching new participants through referrals from those already participating in the study (Tuna, 2016).

To inform participants, short explanatory notes regarding the types of motivation related to mobile phone usage, social usage, and functional usage factors were included in the survey. To minimize missing or invalid responses, all questions were made mandatory. Before conducting the structural model test, the measurement model's appropriateness in terms of reliability, validity, and convergent validity was confirmed. Structural Equation Modeling (SEM) analysis was performed using Smart PLS 3.0 software for this study.

4.4. Research Model and Hypotheses

In the realm of academic research, formulating hypotheses is a critical step that guides the direction of inquiry and helps to define the scope of the study. However, to ensure that these hypotheses are grounded in established knowledge and relevant theoretical frameworks, it is essential to provide a strong rationale

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supported by existing literature. Justifying hypotheses with empirical evidence and theoretical perspectives not only strengthens the credibility of the research but also aligns the study within the broader academic discourse. By referencing previous studies and established theories, researchers can demonstrate how their hypotheses build upon or challenge existing knowledge, thus contributing to the advancement of the field. This approach also aids in identifying potential gaps in the literature, offering opportunities for new insights and deeper understanding of the phenomena under investigation. In this context, the hypotheses formulated in this study, along with their supporting literature, are thoroughly discussed below.

H_1: Social motivation has a positive effect on social usage.

Social motivation has a positive effect on social usage. Individuals with strong social motivation use smartphones to maintain and enhance social connections through activities like messaging, social media interaction, and video calls. Research supports that social motivation is a significant predictor of social media use and online communication (Kim, 2014; Yang & Lin, 2019).

H_2: Utilitarian motivation has a positive effect on social usage.

While primarily practical, utilitarian motivation can also drive social usage when social interactions serve a practical purpose, such as networking or professional communication (Chu & Choi, 2011; Shin & Shin, 2016).

H_3: Hedonic motivation has a positive effect on social usage.

Hedonic motivation often drives users to engage in social activities that are enjoyable, such as sharing photos, participating in online communities, or gaming with friends. Research indicates that hedonic motivations are strong predictors of social media and entertainment use (Van Deursen, Hegner & Kommers, 2015; Turel, Serenko & Bontis, 2010).

H_4: Social motivation has a positive effect on functional usage.

Beyond social interactions, social motivation can extend to functional uses, such as coordinating activities and managing group tasks. This is supported by studies showing that social contexts drive functional smartphone use (Baumer, Ames, and Burrell, 2010; Quan-Haase and Young, 2010).

H_5: Utilitarian motivation has a positive effect on functional usage.

Utilitarian motivation is closely associated with functional smartphone use, such as for productivity tools, information retrieval, and task management. Studies confirm that users with high utilitarian motivation are more likely to engage in functional usage (Kim, Mirusmonov, and Lee, 2010; Liang, Li, and Turban, 2014).

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H₆: *Hedonic motivation has a positive effect on functional usage.*

Hedonic motivation may also influence functional usage when tasks are perceived as enjoyable or when the interface is designed to be engaging. Studies suggest that hedonic elements in apps can increase their functional usage (Park & Lee, 2012; Ghani & Deshpande, 1994).

H₇: *Social motivation has a positive effect on nomophobia.*

The literature suggests that heavy social media users are more prone to nomophobia due to their reliance on constant connectivity (Elhai et al., 2017; Oberst, Wegmann, Stodt, Brand & Chamarro, 2017).

H₈: *Utilitarian motivation has a positive effect on nomophobia.*

Given that utilitarian motivation leads to frequent functional usage, disruptions in access to the device can cause significant anxiety, contributing to nomophobia (Cheever, Rosen, Carrier & Chavez, 2014; Clayton, Leshner & Almond, 2015).

H₉: *Hedonic motivation has a positive effect on nomophobia.*

As individuals seek entertainment and pleasure through their smartphones, they may develop a strong attachment to these devices, which can exacerbate nomophobia (King, Valença, Silva, Sancassiani, Machado & Nardi, 2013; Leung, 2014).

H₁₀: *Functional usage has a positive effect on nomophobia.*

Frequent functional usage, such as reliance on smartphones for daily tasks, can lead to increased dependency, thereby contributing to nomophobia. Studies show that individuals who frequently use smartphones for functional purposes are more likely to experience anxiety when unable to access their devices (Samaha & Hawi, 2016; Park, 2019).

H₁₁: *Social usage has a positive effect on nomophobia.*

Social usage can lead to increased reliance on smartphones for maintaining social connections, which can contribute to nomophobia (Gezgin, Cakir & Yildirim, 2018; Horwood & Anglim, 2019).

The model built based on the hypotheses is shown in Figure 1.
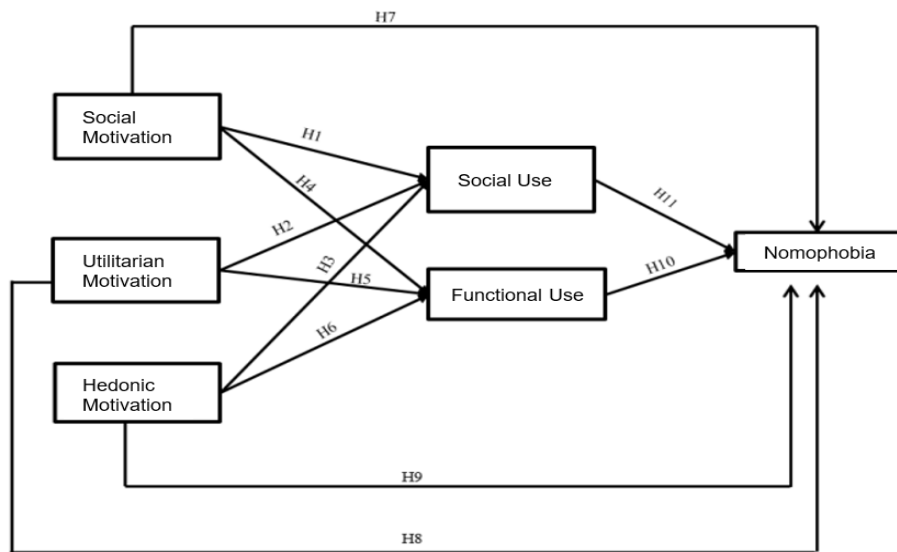
Figure 1: Research Model

5. DATA ANALYSIS

The structural equation model (SEM) is utilized to measure latent variables and their corresponding indicators. The results of the model are calculated using statistical methods and estimations. Data is employed to test the model and confirm or refute hypotheses. For the statistics of the tests to be valid, the data must be of high quality. In this study, the two-stage approach proposed by Anderson and Gerbing (1988) for SEM analysis is adopted. According to this approach, the research model consists of both a measurement model and a structural model. The measurement model expresses variables along with their indicators. Indicators measure and define subfactors, even if they are not primary factors.

5.1. Validity and Reliability Analysis

The results of the internal consistency analysis, calculated based on the Cronbach's Alpha reliability coefficient of the scales used in the study, are presented in Table 1.

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Table 1: Factor Analysis Results

Dimensions	Cronbach's Alpha	Rho A	CR	AVE
Nomophobia	0,935	0,936	0,945	0,658
Utilitarian Motivation	0,934	0,935	0,946	0,686
Social Motivation	0,927	0,928	0,939	0,632
Hedonic Motivation	0,920	0,923	0,934	0,612
Social Use	0,855	0,859	0,902	0,698
Functional Use	0,865	0,869	0,899	0,597

Based on the findings, all scales utilized in the model exhibit Cronbach's Alpha values exceeding 0.70, indicating satisfactory internal consistency. Hence, there are no apparent issues regarding the reliability of the measurement model. It is also recommended in studies employing structural equation models to calculate the composite reliability coefficient to assess the overall reliability of the scale. According to Hair et al. (2011), values ranging between 0.60 and 0.70 are deemed acceptable for the composite reliability coefficient, whereas values surpassing 0.70 are considered excellent. Thus, the composite reliability values for all scales employed in the study substantially exceed 0.70, affirming the reliability of the measurement model.

Validity stands as a pivotal criterion for any scale. A scale demonstrating both convergent and discriminant validity is deemed structurally valid. Therefore, prior to testing the study hypotheses, the measurement model underwent confirmatory factor analysis to scrutinize its convergent and discriminant validities. Additionally, for the convergent validity values to be deemed acceptable, the Average Variance Extracted (AVE) values should exceed 0.50.

Table 2: Square Root of Average Variance Extracted (AVE) Values for Factors

	Nomophobia	Utilitarian Motivation	Social Motivation	Hedonic Motivation	Social Use	Functional Use
Nomophobia	**0,351**					
Utilitarian Motivation	0,535	**0,697**				
Social Motivation	0,525	0,762	**0,880**			
Hedonic Motivation	0,545	0,858	0,895	**0,888**		
Social Use	0,643	0,860	0,901	0,928	**0,936**	
Functional Use	0,762	0,865	0,906	0,943	0,951	**0,975**

In Table 2, the bold values represent the square root of the Average Variance Extracted (AVE) for each respective variable, while the remaining values constitute the correlation matrix between factors. Upon examining Table 3, it is observed that, except for nomophobia, the variables included in the model demonstrate sufficient discriminant validity according to the Fornell–Larcker criterion.

The coefficient of determination, R^2, ranges between 0 and 1, with higher values indicating better results (Ringle, Wende and Becker, 2015). Other values to consider during path analysis are the Standardized Root Mean Square Residual (SRMR) and Normed Fit Index (NFI). An SRMR value below 0.08 is desirable, while the NFI value should exceed 0.700. As seen in Table 3, the SRMR value is 0.078, the Chi-square value is 3903.330, and the NFI value is 0.766, indicating that our measurement model is appropriate and reliable (See Table 4).

Table 3: R^2, SRMR, and NFI Values

	R^2 Value	Average R-squared Value
Nomophobia	0,468	0,466
Social Use	0,595	0,592
Functional Use	0,649	0,646

Table 4: SRMR, Chi-Square, and NFI Values for Standard and Structural Models

	Standard Model	**Structural Model**
SRMR	0,075	0,078
Chi-square	3873,509	3903,330
NFI	0,768	0,766

5.2. Demographic Findings of the Participants

Among the participants in the sample group, 82 individuals (20.7%) are aged between 18 and 20 years, 230 individuals (58.1%) are aged between 21 and 30 years, 60 individuals (15.2%) are aged between 31 and 40 years, 18 individuals (4.5%) are aged between 41 and 50 years, and 6 individuals (1.5%) are 51 years or older. The sample consists of 144 males (36.3%) and 252 females (63.7%). In terms of educational background, 100 participants (25.3%) hold an associate degree, 254 participants (64.1%) hold an undergraduate degree, and 42 participants (10.6%) are either pursuing or have completed graduate-level education. Nearly half of the participants (44.4%) report an income in the range of 0-10,000 TL, a figure that likely reflects a combination of family contributions and scholarships, considering that a significant proportion of the participants are students.

Table 5: Demographic Findings of the Participants

Variable	**Characteristics**	**Frequency**	**Percent (%)**
Age	18-20	82	20.7
	21-30	230	58.1
	31-40	60	15.2
	41-50	18	4.5
	+51	6	1.5
Gender	Male	144	36.3
	Female	252	63.7
Education	Associate	100	25.3
	Undergraduate	254	64.1
	Graduate	42	10.6

Variable	Characteristics	Frequency	Percent (%)
	0-10,000	176	44.4
Income (TL)	10,001-20,000	47	12.0
	20,001-30,000	58	14.6
	30,001-40,000	42	10.6
	+40,000	73	18.4

5.3. Hypoteshis Testing

This section presents the hypothesis testing results, examining the relationships among the key variables of the study across four distinct dimensions. First, the impacts of utilitarian, social, and hedonic motivations on social usage are analyzed to understand the drivers of engagement in social activities. Next, the influences of these motivations on functional usage are explored, highlighting the role of practicality, collaboration, and enjoyment in task-oriented behaviors. The third dimension focuses on the effects of these motivations on nomophobia, uncovering how different motivational factors contribute to mobile dependency. Finally, the relationship between social and functional usage and nomophobia is investigated to assess the differential impacts of these usage types on the fear of being without a mobile device. Using structural equation modeling (SEM), the analysis evaluates the strength, direction, and significance of these relationships, offering comprehensive insights into the validity of the proposed hypotheses.

5.3.1. The Impact of Utilitarian, Social and Hedonic Motivation on Social Usage

Social motivation has the strongest influence on social usage, with a path coefficient of 0.626 (T=8.329, P<0.001). This finding highlights that individuals are primarily driven to engage in social usage due to their intrinsic need for connection, interaction, and maintaining relationships. Such motivations align with the social nature of human behavior, where the desire for communication plays a key role. In contrast, utilitarian motivation, represented by a path coefficient of 0.119 (T=1.702, P=0.089), has a weaker and statistically insignificant effect. This indicates that practical benefits like efficiency or convenience are less relevant in purely social contexts. Similarly, hedonic motivation, with a path coefficient of 0.056 (T=0.832, P=0.405), demonstrates a negligible impact, suggesting that entertainment or pleasure-seeking behaviors are not major drivers of social interactions.

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In contrast, utilitarian motivation, represented by a path coefficient of 0.119 (T=1.702, P=0.089), has a weaker and statistically insignificant effect. This indicates that practical benefits like efficiency or convenience are less relevant in purely social contexts, where the primary purpose is relational rather than task-oriented.

Hedonic motivation, with a path coefficient of 0.056 (T=0.832, P=0.405), demonstrates a negligible impact, suggesting that entertainment or pleasure-seeking behaviors are not major drivers of social interactions. This may be because social usage, by nature, often involves purposeful communication rather than entertainment. Users may prioritize meaningful connections and goal-directed interactions over leisure-driven activities in social platforms. Moreover, hedonic motivation could be more relevant in contexts such as media consumption or gaming rather than in social usage, where relational engagement dominates (See Table 6).

Table 6: The Impact of Utilitarian, Social and Hedonic Motivation on Social Usage

	Path Coefficient	**T Value**	**P Value**
Utilitarian Motivation	0,119	1,702	0,089
Social Motivation	0,626	8,329	0,000
Hedonic Motivation	0,056	0,832	0,405

5.3.2. The Impact of Utilitarian, Social and Hedonic Motivation on Functional Usage

Utilitarian motivation emerges as the most significant factor influencing functional usage, with a path coefficient of 0.498 (T=8.946, P<0.001). This reflects the critical role of practicality and task efficiency in activities where achieving functional outcomes is prioritized. Functional usage often involves activities such as productivity tasks, professional work, or process optimization, where individuals rely on tools and platforms that facilitate efficiency and effectiveness.

Social motivation also plays a notable role in functional usage, with a path coefficient of 0.394 (T=6.316, P<0.001). This suggests that collaborative dynamics and group interactions contribute to the adoption of functional tools and platforms. For instance, individuals might be motivated to use functional tools that enhance teamwork, enable communication, or facilitate collective

productivity, demonstrating the influence of social factors even in task-oriented contexts.

However, hedonic motivation, with a path coefficient of -0.043 (T=0.855, P=0.393), has no significant impact. This result implies that functional tasks are less aligned with enjoyment or entertainment, which are central to hedonic motivations. Hedonic motivation may be more relevant in recreational or leisure activities, such as media consumption or gaming, where enjoyment and pleasure are primary drivers. In contrast, functional usage focuses on utility and efficiency, leaving little room for hedonic considerations (See Table 7).

Table 7: The Impact of Utilitarian, Social and Hedonic Motivation on Functional Usage

	Path Coefficient	**T Value**	**P Value**
Utilitarian Motivation	0,498	8,946	0,000
Social Motivation	0,394	6,316	0,000
Hedonic Motivation	-0,043	0,855	0,393

5.3.3. The Impact of Utilitarian, Social, and Hedonic Motivation on Nomophobia

When examining nomophobia, utilitarian motivation stands out as the strongest predictor, with a path coefficient of 0.412 (T=5.262, P<0.001). This finding suggests that individuals who rely heavily on mobile devices for practical and task-oriented purposes are more likely to experience dependency, leading to fear of being without their devices. The significant impact of utilitarian motivation highlights the central role of mobile devices in supporting everyday functional needs, where their absence may disrupt critical activities, intensifying feelings of discomfort or anxiety.

Social motivation also significantly contributes to nomophobia, with a path coefficient of 0.269 (T=3.397, P=0.001). This reflects the fear of losing social connections or missing important interactions when separated from one's device. The desire to remain socially connected and engaged aligns with the intrinsic human need for communication and social belonging. The strong influence of social motivation indicates that mobile devices are not just tools for interaction but vital enablers of continuous social presence and relationship management.

Hedonic motivation, with a path coefficient of 0.161 (T=2.780, P=0.006),

has a positive but more moderate effect. This suggests that entertainment-oriented usage contributes to dependency, albeit to a lesser extent compared to utilitarian and social motivations. The relatively lower impact of hedonic motivation may be because entertainment-based usage is often situational and less critical to daily functioning. Individuals may engage in hedonic usage primarily for leisure or short-term gratification, which might not foster the same level of dependency as practical or social use.

Overall, these findings underscore the dominant role of utilitarian motivation in predicting nomophobia, as it fulfills critical task-oriented needs. Social motivation, while secondary, also plays a significant role due to its alignment with the fundamental need for social connection. Hedonic motivation, although impactful, has a more situational and limited influence (See Table 8).

Table 8: The Impact of Utilitarian, Social, and Hedonic Motivation on Nomophobia

	Path Coefficient	**T Value**	**P Value**
Utilitarian Motivation	0,412	5,262	0,000
Social Motivation	0,269	3,397	0,001
Hedonic Motivation	0,161	2,780	0,006

5.3.4. The Impact of Social and Functional Use on Nomophobia

The relationship between usage dimensions and nomophobia reveals that functional usage has a robust and significant impact, with a path coefficient of 0.680 (T=15.762, P<0.001). This strong relationship reflects the critical reliance on mobile devices for productivity, task completion, and essential daily functions. Functional usage meets individuals' practical needs, making mobile devices indispensable in their daily routines. The absence of such functionalities can lead to significant disruption, reinforcing dependency and contributing to nomophobia. Functional usage emerges as a key driver of dependency, highlighting its central role in the development of nomophobia.

In contrast, social usage shows a minimal and statistically insignificant effect, with a path coefficient of 0.030 (T=0.698, P=0.486). While social interactions via mobile devices are important, they appear to contribute less to dependency compared to functional usage. This may be because social interactions are often perceived as replaceable through alternative communication methods or platforms, such as in-person interactions or other

devices. Additionally, social usage may not induce the same level of urgency or indispensability, as it is less tied to task-oriented or critical functions. The limited impact of social usage suggests that while valued, it does not play a significant role in driving nomophobia (See Table 9).

Table 9: The Impact of Social and Functional Use on Nomophobia

	Path Coefficient	**T Value**	**P Value**
Social Use	0,030	0,698	0,486
Functional Use	0,680	15,762	0,000

6. DISCUSSION AND CONCLUSION

In this study, the effects of functional and social usage on nomophobia among smartphone users in Turkey were investigated. Nomophobia has become a significant psychological issue in the modern digital age. As smartphones become an integral part of daily life, the level of dependency on these devices increases. The study revealed that young people and heavy users are particularly prone to nomophobia.

The increasing importance of smartphones in daily life causes users to experience emotional stress when they are unable to use these devices or are deprived of them as a means of communication. The findings of the study indicate that functional usage increases nomophobia levels, whereas social usage does not have a significant impact on nomophobia. Functional usage is seen as an essential tool for individuals to carry out their daily tasks and duties, thus the anxiety of being deprived of these devices increases. However, the reason why social usage does not have a significant impact on nomophobia might be that the participants' motivations for social usage are not strong enough to lead to nomophobia. In other words, it is believed that individuals' dependency on smartphones for maintaining social connections is lower compared to functional usage.

The study's results indicate that social, utilitarian, and hedonic motivations all contribute to nomophobia. Individuals with high social motivation use their smartphones to maintain social connections and engage in social interactions. When separated from their smartphones, these individuals may feel socially isolated, leading to anxiety. Those with high utilitarian motivation rely on their smartphones to complete daily tasks, gather information, and carry out work-related activities. Separation from their smartphones may result in feelings of being unable to perform tasks or missing important information, which causes anxiety. Individuals with high hedonic motivation use their smartphones for

entertainment, gaming, and self-gratification. When separated from their smartphones, these individuals may experience distress, leading to anxiety.

Utilitarian usage has an impact on increasing nomophobia. In other words, individuals who use their smartphones to complete daily tasks, gather information, and carry out their work tend to experience more anxiety and stress without these devices. However, social usage does not have a significant impact on nomophobia. This does not mean that individuals who use their smartphones for maintaining social connections do not experience anxiety without these devices. However, the results of the study indicate that social usage contributes less to nomophobia compared to utilitarian usage.

The finding that functional usage increases nomophobia suggests that smartphones are increasingly performing many important tasks in daily life, such as work, education, communication, and access to information, and individuals may have difficulty performing their daily tasks and duties without these devices. This situation increases the anxiety and stress of being deprived of their smartphones, leading to nomophobia. This finding is consistent with previous research by King et al. (2010), Lopez-Fernandez et al. (2014), and Yen et al. (2009). For example, King et al. (2010) examined the relationship between smartphone addiction and panic disorder and agoraphobia and reached similar conclusions.

However, the finding that social usage does not have a significant impact on nomophobia differs from previous research by Reid and Reid (2007), Lenhart and Madden (2007), and Pempek et al. (2009). For example, Reid and Reid (2007) found a relationship between social anxiety and loneliness and mobile phone usage. The reason for this difference might be that the participants in our study did not have strong enough motivations for social usage to lead to nomophobia. This suggests that individuals' dependency on smartphones for maintaining social connections is lower compared to functional usage.

Our study's findings align with Bianchi and Phillips (2005)'s assertion that smartphone addiction can be considered a form of technology addiction. Additionally, they are consistent with Lee et al. (2014)'s perspective that technology addiction should be understood as a behavioral disorder. Kwon et al. (2013)'s identification of six factors contributing to mobile addiction (tolerance, withdrawal, daily life disturbances, virtual relationships, excessive use, and positive expectations) can help explain the impact of functional usage on nomophobia in our study.

Fidan (2016)'s categorization of variables affecting mobile addiction based on DSM diagnostic criteria under factors such as withdrawal, lack of control, and tolerance shows parallels with the findings of our study. The results

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of this study are also consistent with the findings of Arpaci et al. (2017), which highlight the complex nature of nomophobia and the importance of individual differences. Arpaci et al. (2017) examined the mediating role of awareness in the relationship between attachment styles and nomophobia, emphasizing the importance of individual differences.

The results indicate the necessity of various intervention strategies to combat nomophobia. In particular, digital detox and smartphone usage limitation strategies can help reduce individuals' levels of nomophobia (Argumosa-Villar et al., 2017; De-Sola et al., 2017; Merlo et al., 2013). Additionally, educational programs can be implemented to raise awareness about the negative effects of smartphone usage and to develop healthy digital habits (Al-Barashdi et al., 2014; Choi et al., 2009; Gibb et al., 2013). These programs can help individuals balance their smartphone usage, practice digital detox, and develop healthy social media usage strategies.

This study provides valuable insights into the complex phenomenon of nomophobia, particularly in the context of Turkish smartphone users. The findings highlight the significant role that functional usage plays in exacerbating nomophobia. As smartphones become increasingly essential for daily tasks, work, and communication, it is not surprising that individuals experience heightened anxiety and stress when deprived of these devices. This reinforces the notion that smartphones have become indispensable tools in modern life, and their absence can lead to substantial psychological distress.

Interestingly, the study reveals that while social usage does not significantly contribute to nomophobia, it should not be dismissed as irrelevant. The lack of a significant relationship may be due to the participants' lower motivation for social interaction via smartphones compared to their functional reliance. However, this does not imply that social connections are unimportant; rather, it suggests that functional dependencies may overshadow social ones in the context of nomophobia. Future research could further explore the nuanced differences between these types of usage and their psychological impacts.

The consistency of our findings with previous studies underscores the robustness of the relationship between functional usage and nomophobia. However, the divergence from earlier research regarding social usage and nomophobia suggests that cultural and contextual factors may play a critical role. It is possible that the social dynamics in Turkey differ from those in other contexts, leading to varying levels of dependency on smartphones for social purposes.

From a practical standpoint, these findings emphasize the urgent need for intervention strategies aimed at reducing smartphone dependency, particularly in

relation to functional usage. Digital detox programs, smartphone usage limitations, and educational initiatives targeting healthy digital habits are essential tools in combating nomophobia. As society continues to integrate digital technologies into every facet of life, it is crucial to develop and implement strategies that promote a balanced and healthy relationship with these devices. Moreover, the role of educational institutions and families in fostering awareness about the risks of excessive smartphone use cannot be overstated. By educating the younger generation about the potential dangers of nomophobia and encouraging healthier digital habits, we can mitigate the long-term psychological impacts of this modern dependency.

In conclusion, this study not only contributes to the growing body of literature on nomophobia but also provides actionable insights for both individuals and policymakers. The findings suggest that addressing the functional dependencies on smartphones is key to reducing nomophobia, while also recognizing the complex interplay of social factors. Moving forward, interdisciplinary approaches that consider cultural, psychological, and technological perspectives will be essential in developing effective interventions and promoting digital well-being in an increasingly connected world.

The limitations of this study include the reliance on self-reported data, which may introduce biases, and the cross-sectional design, which limits the ability to determine causal relationships. Additionally, the sample being confined to Istanbul restricts the generalizability of the findings to other regions or cultural contexts. Future research should employ longitudinal methods to explore the dynamics of these relationships over time and include more diverse geographic samples to enhance the generalizability of the results. Moreover, examining additional factors such as individual psychological traits and the specific contexts of smartphone usage could provide a deeper understanding of nomophobia. Given the rapidly evolving nature of digital technologies, there is also a need for research frameworks that are continually updated to reflect these changes.

7. CONFLICT OF INTEREST STATEMENT
There is no conflict of interest between the authors.

8. FINANCIAL SUPPORT
No funding or support was used in this study.

9. AUTHOR CONTRIBUTIONS
UO: The idea
UO: Design

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DC: Collection and / or processing of resources;
UO-DC: Empirical Analysis and / or interpretation
DC: Literature search
DC-UO: Writer.

10. ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS

Ethics committee principles were complied with in the study and necessary permissions were obtained in accordance with the intellectual property and copyright principles.

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