# ISTANBUL BUSINESS RESEARCH

**Cilt** Volume **52** **Sayı** Number **1** E-ISSN **2630-5488**

İSTANBUL ÜNİVERSİTESİ YAYINEVİ

**Indexing and Abstracting**

Emerging Sources Citation Index (ESCI) - Web of Science
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**ISTANBUL BUSINESS RESEARCH**
**Volume:** 52 • **Number:** 1 • **April 2023**
**E-ISSN:** 2630-5488 • **DOI:** 10.26650/ibr

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http://dergipark.org.tr/ibr

http://ibr.istanbul.edu.tr/

**PUBLISHER**

Istanbul University Press

Istanbul University Central Campus, 34452 Beyazit, Fatih / Istanbul, Turkiye

Phone: +90 (212) 440 00 00



**The publication language of the journal is English.**

**This is a scholarly, international, peer-reviewed and open-access journal published triannually in April, August and December.**

**Publication Type**
Periodical

**ISTANBUL BUSINESS RESEARCH**
**Volume:** 52 • **Number:** 1 • **April 2023**
**E-ISSN:** 2630-5488 • **DOI:** 10.26650/ibr

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İSTANBUL UNIVERSITY PRESS

*Istanbul Business Research, 52*(1), 1-30
**DOI:** 10.26650/ibr.2023.52.804819
http://ibr.istanbul.edu.tr/
http://dergipark.org.tr/ibr

# Istanbul Business Research

**Submitted:** 03.10.2020
**Revision Requested:** 21.06.2021
**Last Revision Received:** 20.01.2022
**Accepted:** 20.01.2022
**Published Online:** 29.09.2022

RESEARCH ARTICLE

# Investigation of the Mediating Effect of Strategic Posture on the Relationship between Environmental Conditions and Firm Performance on the Logistics Sector

**Saniye Yıldırım Ozmutlu[1], Esin Can[2]**

**Abstract**
The effects of environmental conditions on firm performance are investigated in this study. Within the scope of the research, the relationships between the strategic posture and the performance of logistics companies in varying environmental conditions were examined. During this study, the interaction between variables was also investigated by predicting the presence of the mediating effect of strategic posture. In this context, a research model and related research hypotheses were developed. The created research model was comprised of the three-dimension of environmental conditions developed by Dess and Beard (1984), six dimensions of strategic stance developed by Venkatraman (1989), and firm performance variables. A survey related to the research was conducted with 264 people working in managerial positions in 218 logistics companies operating within the scope of the research to test the hypotheses in the research model. The analysis of the obtained data was performed by the Structural Equation Modeling (SEM) method utilizing the SPSS and AMOS software program. According to the analysis results, it was determined that the strategic posture variable has a full mediating effect between environmental conditions and firm performance. As a result, by enabling logistics companies to realize their strategic posture features, information was provided to guide them on how to improve their performance in changing environmental conditions.

**Keywords**

Environmental Conditions, Strategic Posture, Firm Performance, Logistics Companies

## Introduction

In the competitive world market, it is very important for organizations to gain an advantage and maintain this advantage by being environmentally sensitive. Recently, having a strategic posture is considered as one of the main elements that will allow organizations to retain their advantage and affect their success. Also, since environment and economic conditions are changeable, organizations should refer to points that will raise awareness, such as making technological transformation in work to increase their performance, mastering the corporate

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**To cite this article:** Yildirim Ozmutlu, S., & Can, E. (2023). Investigation of the mediating effect of strategic posture on the relationship between environmental conditions and firm performance on the logistics sector. *Istanbul Business Research, 52*(1), 1-30.
http://doi.org/10.26650/ibr.2023.52.804819

mindset, ensuring diversity of the senior management team, and identifying competitors in the intensity of competition. The studies carried out show that the most effective way to raise awareness is for an organization to have a strategic posture. Another issue to focus on is to have managers who will take the necessary measures and make an effort in order for organizations to increase their performances. For organizations to meet the expectations of their target audiences and to continue their process in a globally competitive environment, it is expected of the managers and stakeholders to strive to improve the performance of the company and be in a holistic consensus. Ensuring integrity in organizations is related to the functioning of management. In this context, it is thought that managers who work in organizations in "variable-uncertain-risky" environmental conditions such as the logistics sector will have a great impact and role in the strategic posture of the company.

In business environments where change is rapid, such as in the logistics sector, organizations are required to renew themselves in line with the changing conditions due to fundamental changes such as dynamic changes in the product and service demands of the customers, technological developments, dramatic change in the product life cycle, etc. The variable environmental conditions, the disappearance of market borders, the increase in the levels of the competitive market day by day, and the steady rise of expectations of customers from the product and services require the organizations to have a global vision. All of these changes are closely related to the logistics sector with an ever-dizzying pace of change.

For organizations to be responsive to environmental changes, they must have a more flexible structure in an environment of increasing uncertainty and intense competition (Elbanna et al., 2015). A flexible structure refers to organizations which are sensitive to the conditions of their environment. In the study conducted by Dess and Beard (1984), the environmental uncertainties, which are defined as environmental conditions, are expressed with the dimensions of "environmental munificence," "environmental dynamism," and "environmental complexity" that aims at being sensitive to changing environmental conditions. These three dimensions were also determined as independent variables in this study.

The environmental conditions constitute the independent variable of this research. However, for organizations to improve their performances, it is not enough just to be sensitive to and adapt to the changing environment, but they are also required to have a strategic posture. With the effects of hyper-competition and rapid transformation, organizations recognize the need to make strategic choices and adapt their strategic posture according to the effects of the environment. The sensitivity of an organization to its environment and its adaptability to environmental conditions are indications of the presence of a strategy followed by the organization. Developed and named by Venkatraman (1989), six dimensions, "proactiveness," "aggressiveness," "defensiveness," "futurity," "riskiness," and "analysis" define the strategic posture. These six dimensions were determined as mediating variables in this study. Strategic posture is important to provide in allocating firms specific resources and calibrating activi-

ties to fit these resources to accomplish superior performance (Guo et al., 2020; Yuan et al., 2021). For this reason, the strategy typology determined by Venkatraman (1989) was found useful for the study.

There are findings which indicate that the conditions of the environment in which organizations continue their activities or intend to continue their activities, the narrowness or extent of the market fields, the strategy(s) they have implemented to compete with their competitors and gain lasting advantages, and the strategic posture(s) they have will affect the operational, logistic, financial, and market performance of organizations. When the studies conducted on this subject are examined, the scales we come across are the organizational performance scale developed by Watkins and Marsick (1993-1997), the operational performance scale proposed by Hayes and Wheelwright (1984) and developed by González-Benito (2005), and the logistics performance scale proposed by Stank et al. and developed by Ellinger et al. (2000). These performance scales were determined as the dependent variables of the study. Even though there are a large number of performance measures for organizations, overall performance measurement has financial, environmental, and operational dimensions (Srinivasan et al., 2020). Financial indicators are related to the achievement of an organization's economic goals, the growth, profit margin, and profitability of its sales (Jamali, 2020). Operational indicators are product and process-related practices and explain what and how things go on in organizations (Wong et al., 2011; Liu et al., 2021). Logistic indicators are related to the efficiency, effectiveness, and degree of differentiation for fulfilling the logistic activities of an organization (Ballou, 2004; Nakano, 2015).

The main aim of the study is to establish the relationship between environmental conditions and firm performance, which was studied conceptually and empirically in the business and strategic management literature, as well as, to investigate the possible mediating effect of the strategic posture variable in this relationship, and to determine the effect of strategic posture on the tendencies of firms to improve their performance. In line with this aim, in this study, the kind of strategic posture organizations of the logistics sector should have in the face of open, dynamic, and complex environmental conditions as a result of intense competition in the global world market was investigated. Furthermore, it was tried to determine what the strategic posture of organizations was in response to competition, the results of the adopted strategic posture, and to what extent the conditions of the environment in which the organizations operate their activities and the strategic posture they hold affect the performance of the company.

## Literature Review

**Environmental conditions :** As a result of the literature review, it was observed that environmental uncertainty is an important issue that shapes the lives of organizations. The

environment is not fixed (Child, 1972; Dess and Beard, 1984) nor is it a homogenous entity but is composed of multifaceted combinations (Bocken and Geradts, 2020). Therefore, the changeability of the environment causes some uncertainties, and the resulting uncertainties can have unexpected consequences for organizations (Pfeffer and Salancik, 1978; Cannella et al. 2008; Freudenreich et al., 2020). Thus, the environment can be considered as a corporate ecosystem in which new organizations emerge, develop, compete, and end their lives. For this reason, organizations should be able to improve their strategic flexibility to take advantage of opportunities in changing environments (Jiang et al., 2020). Thus, with the development of strategic flexibility, performance changes depending on environmental conditions (Miles and Covin, 2000; Miles et al. 2000; Desarbo et al. 2005; Hettich and Kreutzer, 2021). Dess and Beard (1984) indicated that the environment has various effects on different organizational characteristics.

In our study, the dimensions of environmental uncertainty of "munificence, dynamism, and complexity," as defined by Dess and Beard (1984), are addressed. Munificence is defined as the abundance or scarcity of resources and market potential in the environment (Elbanna and Child, 2007; García-Sánchez et al., 2020). Dynamism is defined as change that is difficult to predict and can result from market changes or technology (Goll and Rasheed, 2004; Yuan et al., 2021). Complexity is defined as the heterogeneity of and range of an organization's activities and is measured by geographical dispersion and market structure (Sharfman and Dean, 1991; Bradley et al., 2011; Seo et al., 2021; Du and Kim, 2021). These dimensions are focused on investigating the relationship between the environment's variable structure and the organization's development and performance. In terms of strategy, these dimensions, as determined by Dess and Beard (1984), are considered to be the most critical dimensions of the environment (Keats and Hitt, 1988).

**Strategic posture :** The theoretical literature contains many different definitions and conceptualizations of strategy. The concept of strategy is defined as activities that will harmonize the internal resources and capabilities of institutions with the opportunities and threats of the external environment (Hofer and Schendel, 1978; Bolland, 2020). Researchers also stated that the appropriateness of the strategy of a firm can be defined in terms of its compliance with the environmental or organizational conditions they face (Bolland, 2020; Bunger et al., 2021). A strategy is expressed as the process of adapting to changes in the environment of an organization (Chakravarthy 1982; Yang and Gan, 2020) and the state of reacting to environmental change (Snow and Hambrick, 1980; Yu et al. 2016; Yuan et al., 2020). The requirement of reacting to environmental change evokes the necessity for organizations to make strategic choices. Strategic choice typically includes not only the creation of structural forms but also the manipulation of environmental characteristics and the selection of relevant performance standards (Child, 1972; Hanelt et al., 2020). Any organization choosing to adopt a strategy(s) is an indication that the organization has a strategic posture. As can be seen, many

researchers in the area of strategic management have stressed the importance of values and attitudes in the strategy formulation process (Glueck, 1980; Tumidei et al. 2020). Strategic posture is defined as the general competitive orientation of a firm (Covin and Slevin, 1989; Kaufmann et al., 2020). Strategic posture refers to the combination of competitive options that the organization uses in their industry (Dess and Davis, 1984; Bunger et al., 2021). The term strategic posture is a fundamental principle that permeates the disciplinary orientations of both strategic management and organizational theories and also constitutes the critical point of the coupling between the environmental context and organizational capabilities and resources (Scott, 1987). Strategic posture describes the mode of response of an organization's key decision makers towards social demands (Waddock and Graves, 1997; Haessler, 2020). Strategic posture refers to managers' attitudes towards environmental conditions (Shwairef et al., 2021). Ullmann (1985) categorized strategic posture into active and passive postures. Where there is an active strategic posture, the manager and manager team have a progressive attitude, actively searching to satisfy stakeholders' claims, and consequently pursue both a competitive advantage and business opportunism. In other words, the managers' attitudes demonstrate a proactive pattern of behavior. On another hand, when a manager team adopts a passive strategic posture, a conservative attitude gives rise to greater risk aversion, a tendency to maintain the status quo, and a general reactive pattern of behavior (Crant, 2000; Miller and Friesen, 1983; Du and Kim, 2021). Thus, it is expected that those companies with an active strategic posture are more likely to disclose more social and environmental information (Ullmann 1985; Du and Kim, 2021).

When determining their strategic posture, organizations should have a good understanding of the relationships between resources, capabilities, competitive advantage and performance, and, specifically, the mechanisms of how competitive advantage can travel and sustain over time (Grant, 1991; Mintzberg et al., 2020). The types of strategy, which are determined by strategy management researchers, largely depend on the aims of the organization (Galbraith and Schendel, 1983; Tan, 2002; Tan and Tan, 2005; Lundgren et al., 2021). The number of different identified strategy types tends to vary widely. The strategy types differ radically in their scope, and the dimensions were chosen to define these strategies. In our study, the use of six strategic postures determined by Venkatraman (1989) was found useful. Proactive strategy is about seeking new opportunities and experimentation of responses to changing environments (Venkatraman, 1989; Araujo and Gava, 2012). Aggressive strategy focuses on resource allocation to improve an organization's market position compared to its competitors. Defensive strategy focuses on maintaining the current market position rather than increasing market share (Legionosuko et al., 2019). Future strategy is about long versus short-term decisions (Venkatraman, 1989; Sabherwal et al. 2019). Risky strategy focuses on entering new unknown markets with intensive resources (Lumpking and Dess, 2001). Analysis strategy focuses on basic problem solving to understand the internal and external environments of the

organization (Lumpking and Dess, 2001). These strategic dimensions, defined by Venkatraman (1989), contribute to determining the strategic posture of the service sector (Zuckerman, 2016; Wright, 2020).

**Firm performance** : Organizations want to carry out performance evaluations to assess their current conditions and to predict their future situations. Measuring firm performance is not an easy construct. It can be even more difficult, especially when what needs to be measured continues to change (Hubbard, 2009). Strategies have firm-specific requirements and must be properly managed by organizations to adapt to changing contextual aspects and achieve higher performance (Kelly and Flores, 2002; Perez-Franco and Phadnis, 2018). On the other hand, the lack of clear strategic positioning negatively impacts organizational performance (Nakano, 2015). In other words, strategic management informs the relationship between the environment and the performance. Therefore, organizations should be able to improve their strategic flexibility to take advantage of opportunities in changing environments (Mason-Jones et al., 2000). As a result, parallel to the literature (Adner et al., 2014; Xie et al., 2018; Arun and Yıldırım Özmutlu, 2021), effective strategy can increase overall organizational performance. In our research, the firm performance is handled in the form of three components : financial and market, logistic and operational performances. The performance of companies in the Marmara Region in Turkey were measured in this study.

Today, firms want to improve their performance results every day. This study focused on answering the question of what can be the “important complements” that are effective in the high performance of companies while considering the changeability of economic and environmental conditions. As important complements, “environmental conditions and strategic posture” were discussed here. It was aimed to reveal to the firms included in our research that it was possible for them to improve their performance levels by making them realize the importance of strategic choices that fit their environmental impacts and capabilities. Within the framework of information provided by the researchers, the environmental conditions and dimensions by Dess and Beard (1984), which are still widely used in studies today, the structure and dimensions that Venkatraman (1989) conceptualized as strategic posture, and the components of firm performance are given in Table 1.

## Research Method

The mediating role of strategic posture in the impact of environmental conditions on firm performance was examined through the correlational research design, which is a quantitative research method. According to this method, a study is conducted on the whole of the universe or a group, sample, or sample taken from it in order to make a general judgment about the universe (Fink, 2016). Correlational studies aim to reveal the existence of a relationship between the variables subject to examination (Gliner et al., 2017). In addition, a variance-based

Table 1
*The Dimensions of Concepts Related to the Topic and the Academic Contributors*

| Dimensions | | Definition | Academic Contributors |
|---|---|---|---|
| **Environmental Conditions** | ***Munificence*** | It refers to the environment's capacity to support organizational growth based on the availability of critical resources. | Aldrich (1979), Castrogiovanni (1991), Child (1972), Cyert and March (1963), Dess and Beard (1984), Goll and Rasheed (1997, 2004), Starbuck (1976-1983), Yasai-Ardekani (1989) |
| | ***Dynamism*** | It expresses the speed, severity, and unpredictability of environmental change. | Aldrich (1979), Child (1972), D'Aveni (1994), Dess and Beard (1984), Emery and Trist (1965), Goll and Rasheed (1997-2004), Jurkovich (1974), Miles et al. (1974), Starbuck (1983) |
| | ***Complexity*** | It expresses the number, diversity, and degree of dependence among environmental factors. | Aldrich (1979), Castrogiovanni (1991-2002), Child (1972), Dess and Beard (1984), Duncan (1972), Huber and Daft (1987), Miller and Friesen (1983), Starbuck (1976), Tung (1979) |
| **Strategic Posture** | ***Aggressive*** | It is the posture an organization adopts in allocating resources to improve its market position compared to its competitors. | Buzzell et al. (1975), Hofer and Schendel (1978), Venkatraman, (1989), Lumpkin and Dess (2001) |
| | ***Analysis*** | It is the basic problem-solving approach to understanding both the internal and external environments of an organization. | Miles and Snow (1978), Miller and Friesen (1984), Grant and King, (1982), Venkatraman (1989) |
| | ***Defensive*** | It is the posture which aims to maintain the organization's current market position instead of improving its market position or increasing its market share. | Morgan and Strong (1998), Venkatraman (1989), Kelly and Storey (2000) |
| | ***Proactive*** | It is an organization's behavior as a result of experiences gained with its involvement in emerging industries, constant search for market opportunities, and responses to changing environmental conditions. | Miles and Snow (1978), Miller and Friesen (1984), Venkatraman (1989), Lumking and Dess (1996), Slater and Narver (1993), Lumking and Dess (2001) |
| | ***Future*** | It is the posture of an organization that aims to be prepared for future environmental conditions and to turn the opportunities that may arise to their advantage. | Venkatraman (1989), Narver and Slater (1990), Piercy and Morgan (1994), Ganesan (1994), Jaworski and Kohli (1996) |
| | ***Riskiness*** | It is the posture of an organization being inclined to take bold steps, such as entering new unknown markets, committing a large portion of resources to initiatives with uncertain results. | Miller and Friesen (1984), Dickson and GigLerano (1986), March and Shapira (1987), Venkatraman (1989), Covin and Slevin (1989), Morgan and Strong (1998), Lumpking and Dess (2001) |

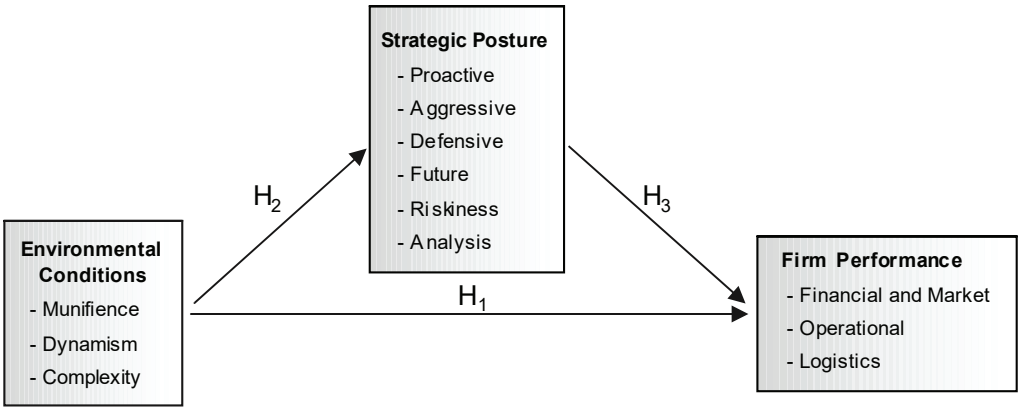
Table 1
*The Dimensions of Concepts Related to the Topic and the Academic Contributors*

| Dimensions | | Definition | Academic Contributors |
|---|---|---|---|
| **Firm Performance** | ***Financial and Market*** | It is the fulfillment of an organization's economic goals, the growth of its sales, and its profitability. | Drucker (1954), Hofer (1983), Wolff and Pett (2006), Venkatraman and Ramanujam (1987), Dess and Robinson (1984), Robinson (1995), Murphy et al. (1996) |
| | ***Operational*** | It expresses how an organization performs on non-financial matters. | Dess and Robinson (1984), Kaplan (1984), Venkatraman and Ramanujam (1986), Hayes and Wheelwright (1984), González-Benito and González-Benito (2005), Sodhi (2015) |
| | ***Logistics*** | It indicates an organization's degree of efficiency, effectiveness, and differentiation associated with the fulfillment of its logistics activities. | Perreault and Russ (1976), Stock and Lambert (1992), Cooper et al. (1997), Mentzer and Firman (1994), Bowersox and Closs (1996), Stank et al. (1999); Ellinger et al. (2000), Bowersox et al. (2002), Ballou (2004) |

Structural Equation Modelling (SEM) method was used as the basic statistical method to test the hypotheses in the research. In this method, which requires the use of a number of statistical techniques, the effect of independent variables on dependent variables can be calculated simultaneously (Hair et al., 2019). In the study, this feature of the SEM method was used in order to investigate the relationships between the variables.

## The Research Model and Hypotheses

In this study, it was aimed to establish a model that will measure how environmental conditions affect firm performance and the presence of the mediating effect of strategic posture. In this regard, hypotheses were developed based on the conceptual structure and subdimensions of the study. Hence, a "research model" which shows the relationship between the developed hypotheses was created. In the model, there are four hypotheses and a series of sub-hypotheses that will be attempted to be verified. The relations between the main structures and also the relations between the dimensions were measured in the research. The research model and hypothesis are shown in Figure 1.




**Mediator Effect;** $H_4$: Environmental Conditions → Strategic Posture → Firm Performance

***Figure 1.*** The research model

**$H_1$:** There is a significant relationship between environmental conditions and firm performance.

**$H_{1a\text{-}c}$:** Environmental condition dimensions (munificence, dynamism and complexity) have a significant impact on firm performance.

**$H_2$:** There is a significant relationship between environmental conditions and strategic posture.

**$H_{2a-c}$:** Environmental condition dimensions (munificence, dynamism and complexity) have a significant impact on strategic posture dimensions (proactiveness, aggressiveness, defensiveness, futurity, riskiness and analysis).

**$H_3$:** There is a significant relationship between strategic posture and firm performance.

**$H_{3a-f}$:** Strategic posture dimensions (proactiveness, aggressiveness, defensiveness, futurity, riskiness and analysis) have a significant impact on firm performance.

**$H_4$:** The strategic posture mediator has a variable effect on the relationship between environmental conditions and firm performance.

**$H_{4a-c}$:** Strategic posture dimensions mediates the relationship between environmental conditions and firm performance.

## Sample and Data Collection

The research population was comprised of 462 people working in managerial positions in logistics organizations who are registered either with the International Transporters Association (ITA) or with the International Transport and Logistics Service Providers Association (ITLSPA) in the Marmara Region of Turkey. The reason for choosing the Marmara Region is that the region constitutes the heart of Turkey's logistics industry. It is possible to see the Marmara region as Turkey's logistics base. Looking at the regional developments in Turkey, the Marmara Region is not only an industrial region but also a region where the importance of logistics services gains value. The sample of the study consisted of 264 managers selected among these individuals by random sampling method. In the study, the sampling table and calculations created by Israel (Israel, 2013) were used to determine the sample size. According to the calculation tool related to the sample size at the 95% confidence interval and ±5% margin of error, it was calculated that the normal size assumption was supported if our required sample size was more than 217 (Israel, 2013). Thus, out of 750 questionnaires distributed, 279 were returned; the sample size was supported for normal distribution with a response rate of 37.2%, and 264 data containing complete information were found suitable for analysis.

This study is a quantitative one, and data was collected from logistics firm managers through face-to-face interviews between September 2018 and January 2019. Each firm within the scope of the research was visited with two surveys. Although the logistics companies in Istanbul were visited with two surveys, one manager from each company filled in the survey due to the intensity of the workload. In the provinces other than Istanbul, as many as two possible surveys forms were filled by people working in managerial positions. In the first part of the research questionnaire, 13 questions are asked about the information of the participant and the firm. In the second part of the questionnaire, 60 questions were about the items of the variables. All constructs were measured using 5-point Likert scales ranging from "Strongly Disagree" (1) to "Strongly Agree" (5) and were used to evaluate environmental conditions,

strategic posture, and firm performance. All scale items used within the scope of the study were adapted by taking into account the terminology suitable for the logistics sector.

In the analysis of the data collected in the study, SSPS and AMOS software programs were utilized. Firstly, the analyses containing the information of the firm and the firm managers, secondly, the analyses for the structural validity of scales for each variable with Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) methods, and thirdly, the analyses displaying the relationships between structures were performed using the SEM method.

## Scale

The environmental uncertainty scale (α) .81 developed by Dess and Beard (1984) consists of munificence (6 items), dynamism (5 items), and complexity (6 items) dimensions. The following statements are measured in the scale of environmental uncertainty variable. The environmental munificence dimension is about the availability of investment and marketing opportunities, abundant (scarce) resources, and increasing investments. The environmental dynamism dimension is about rapid change of the actions of rival companies, radical technological changes, the change of demand, and the change of consumer preferences. The environmental complexity dimension is about diversity of the number of competitors, the number of customers, supplies, and the amount of equipment.

The strategic posture scale (α) .86 developed by Venkatraman (1989) consists of proactive (5 items), aggressive (4 items), defense (5 items), future (5 items), riskiness (4 items), and analysis (5 items) dimensions. The following statements are measured in the scale of strategic posture variable. The aggressive strategy dimension is about regulating the competitive price, and making price reductions. The defense strategy dimension is about improving the quality of existing services. The future strategy dimension is about being future-oriented rather than for today and providing information about future customer needs. The analysis strategy dimension includes information that focuses on innovating and making the necessary decisions in order to be successful. The risk strategy dimension is about acting with caution and supporting only service activities that are considered to be successful. The proactive strategy dimension is about being a pioneer in developing new services.

The operational performance scale (α) .80 developed by Hayes and Wheelwright (1984) and later contributed by González-Benito and González-Benito (2005) consists of (6 items). The questions in the operational performance scale include statements to measure situations such as providing timely delivery, acting with a high service quality understanding, developing new services, and providing reliability.

The logistics performance scale (α) .79 developed by Stank et al. (1999) and later contributed by Ellinger et al. (2000) consists of (5 items). The questions in the logistics performan-

ce scale include statements to measure situations such as adopting the reliability of delivery dates, informing customers about delivery times, and maintaining speed.

The financial and market performance scale (α) .92 developed by Ellinger et al. (2002) consists of (12 items). In the financial and market performance scale, statements include questions to measure situations such as return on investments, customer satisfaction level, market share increase, net profitability, net income, expenditures on technology and information processing, the average productivity per employee, and the number of qualified employees.

## Analyses and Results

### The Demographic Findings of Businesses and Managers in the Research

First, the basic information of the firms and firm managers participating in the research was examined. Descriptive statistical analyses of the 218 firms included in the study and a total of 264 participants working as managers in these firms were compiled. According to the analysis results, it was observed that most of the logistics firms participating in the study and registered with ITA and ITLSPA in the Marmara Region operate in Istanbul (77%). Since there are no firms registered with ITA and ITLSPA in Bilecik and Balıkesir provinces, no findings could be obtained. According to these results, it was observed that the establishment of logistics firms participating in the research in the Marmara Region increased steadily, especially after the 1980s (38%) and the establishment of such firms continued after 2000 (40%). According to the findings obtained, when the number of people working in the logistics firm within the research was examined, it was observed that approximately half of the logistics firms (49%) are large-scale companies. When the educational fields of the managers working in these firms were examined, it was observed that people working as managers in the logistics firms participating in the study within the Marmara Region had largely received logistics education and specializations (46%). When the status of the managers working in the logistics companies participating in the study was examined, it was observed that in these logistics firms in the Marmara Region, communication was established with middle-level managers (44%) and then top-level managers (32%) rather than managers.

Considering the age range distribution of the managers, it was found that the proportion of those between the ages of 26-35 was 50%, and the proportion of those between the ages of 36-45 was 34.5%. As a result of the findings obtained, it was determined that the managers working in the logistics companies within the aim of the research in the Marmara Region adopted a dynamic age range as well as having certain experience. Considering the gender distribution of the managers, it was determined that the proportion of men was 84.5% and that of women was 15.5%. Because of the findings, it is thought that heavy workload and heavy work practices may be among the reasons for preferring male managers in logistics companies within

the scope of the research in the Marmara Region. As can be seen, it is thought that the young, experienced, and dynamic people working in managerial positions in logistics companies in the Marmara Region within the scope of the research are considered to be the primary choice.

## Validity, Reliability and Correlation Analysis Results Regarding the Research Variables

First, the validity and dimensionality analyses of all scales were applied by the use of the SPSS software program to examine the skewness and kurtosis values of the variables, the descriptive analysis findings, the correlation between the variables, sampling adequacy, and the base values of the variables. Then, a factor analysis was applied to examine the EFA results. For each scale, the factorization matrix was created, and as in theory, it was determined that it had a factoring structure. Reliability tests were conducted to determine the reliability of the scales. In terms of measuring the value and significance of the scales used, the Cronbach's alpha values, as well as "Average Variance Extracted (AVE)" values and "Composite Reliability (CR)" values were calculated. In Table 2, the results of the reliability analysis of all scales are given. As seen in Table-2, the Cronbach-Alpha (α) (CR) and AVE values were calculated for each factor in the measurement model. A distribution is observed between the obtained (α) coefficient values (0.72 - 0.92). These values are above the acceptable limit (α = 0.70 - 0.80 and above) (Hair et al., 2019). (CR) coefficient values of 0.80 and above (Fornell and Larker, 1981) indicate that structural validity and reliability of the related variables were obtained. The facts that (AVE) value results obtained were 0.50 and above (Fornell and Larcker, 1981; Hair et al., 2019) reveal that the scales show convergent and divergent validity.

The correlation coefficients were evaluated by taking the mean of each variable of the scale among its own items to determine the structural validity with the sample data obtained. In Table 3, a correlation analysis was made by considering the basic sub-dimensions of the variables "Environmental Conditions" and "Strategic Posture" and the scales of the variables of the "Firm Performance" components to determine the structural validity of the scales. As seen in Table 3, at the [$P < 0.01$] significance level, it was observed that the interaction values between the variables are strong, and there is a statistically significant relationship.

## The Confirmatory Factor Analysis Results Regarding the Research Variables

In this part of the study, to verify each scale used in the context of the data obtained, CFA was conducted using the AMOS statistical software program. In Table 4, the results of the CFA analysis for all scales are given. As seen in Table 4 below, analyses were conducted to determine the validity of the measurement model and the acceptable levels of compliance for the measurement model. As it can be observed from this, the CFA fit indices values for all scales show the compatibility of the model with the data. This shows that the variables in all scales describe the scale they belong to and that the factors in the scale are suitable for SEM.

Table 2
*The Reliability Analysis of All Scales*

| *Scales* | *Number of Items* | Cronbach-Alpha *(α)* | CR | AVE | *Contributors to the Development of the Scale* |
|---|---|---|---|---|---|
| **Environmental Conditions** | **14** | **0,807** | **-** | **-** | |
| *Dynamism* | 4 | 0.75 | 0.84 | 0.57 | Dess and Beard (1984) |
| *Munificence* | 4 | 0.76 | 0.84 | 0.58 | |
| *Complexity* | 6 | 0.81 | 0.86 | 0.51 | |
| ***Strategic Posture*** | **24** | **0.86** | **-** | **-** | |
| *Aggressive* | 3 | 0.85 | 0.89 | 0.75 | |
| *Defensive* | 4 | 0.72 | 0.82 | 0.55 | |
| *Future* | 4 | 0.73 | 0.83 | 0.55 | Venkatraman (1989) |
| *Analysis* | 5 | 0.83 | 0.88 | 0.59 | |
| *Riskiness* | 3 | 0.76 | 0.86 | 0.68 | |
| *Proactive* | 5 | 0.89 | 0.92 | 0.71 | |
| ***Firm Performance*** | **22** | **0.92** | **-** | **-** | |
| *Operational* | 5 | 0.80 | 0.86 | 0.56 | Hayes and Wheelwright (1984); González-Benito (2005) |
| *Logistics* | 5 | 0.79 | 0.86 | 0.55 | Stank et al. (1999); Ellinger et al (2000) |
| *Financial-Market* | 12 | 0.90 | 0.91 | 0.50 | Watkins and Marsick (1993-1997); Ellinger et al. (2002) |

Table 3
*The Average, Standard Deviation and Correlation Coefficients of the Variables*

| **Variables** | **M** | **SD** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *1.Dynamism* | 3.29 | 0.82 | 1 | | | | | | | | | | | |
| *2.Munificence* | 4.23 | 0.60 | 0.18** | 1 | | | | | | | | | | |
| *3.Complexity* | 4.18 | 0.57 | 0.19** | 0.47** | 1 | | | | | | | | | |
| *4.Aggressive* | 2.99 | 1.06 | | | | 1 | | | | | | | | |
| *5.Defensive* | 4.29 | 0.55 | | | | 0.02 | 1 | | | | | | | |
| *6.Future* | 4.19 | 0.61 | | | | 0.18** | 0.40** | 1 | | | | | | |
| *7.Analysis* | 4.33 | 0.49 | | | | 0.04 | 0.43** | 0.49** | 1 | | | | | |
| *8.Riskiness* | 3.81 | 0.68 | | | | 0.17** | 0.06 | 0.02 | -0.04 | 1 | | | | |
| *9.Proactive* | 4.24 | 0.63 | | | | 0.10 | 0.38** | 0.52** | 0.64** | 0.01 | 1 | | | |
| *10.Operational* | 4.25 | 0.55 | | | | | | | | | | 1 | | |
| *11.Logistics* | 4.50 | 0.47 | | | | | | | | | | 0.54** | 1 | |
| *12.Financial* | 4.09 | 0.52 | | | | | | | | | | 0.61** | 0.54** | 1 |

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed). Values without asterisk, p > 0.05 M: Mean SD: Standard Deviation

The CFA results of all scales used in our research were found to be suitable for using the structural equation modelling method.

## The Structural Model

The models, which were tested with the CFA applied to environmental conditions, strategic posture, and firm performance scales to test the hypotheses and were found suitable,

Table 4
*The Confirmatory Factor Analysis Results for All Scales*

| ***The Model Fit Criterion*** | ***Definition*** | ***Good Fit (GF)*** | ***Acceptable Compliance (AC)*** | ***Environmental Conditions Scale CFA*** | | ***Strategic Posture Scale CFA*** | | ***Firm Performance Scale CFA*** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Measured Value/Fit* | | *Measured Value/Fit* | | *Operational Performance* | | *Logistics Performance* | | *Financial and Market Performance* | |
| | | | | | | | | *Measured Value/Fit* | | *Measured Value/Fit* | | | |
| | | | | *MV* | *F* | *MV* | *F* | *MV* | *F* | *MV* | *F* | *MV* | *F* |
| ***χ2*** | Chi-Square | 0≤χ2≤ 2df | 2df<χ2≤3df | 109.229 | GF | 376.076 | GF | 6.743 | GF | 4.245 | GF | 80.106 | GF |
| ***CMIN/DF*** | ***Chi-square/SD*** | ***0≤CMIN/DF≤2*** | ***2<CMIN/DF≤ 5*** | ***1.517*** | ***GF*** | ***1.628*** | ***GF*** | ***1.349*** | ***GF*** | ***1.415*** | ***GF*** | ***1.780*** | ***GF*** |
| ***CFI*** | Comparative fit index | 0.97≤CFI≤1.00 | 0.95≤CFI<0.97 | 0.965 | AC | 0.951 | AC | 0.995 | GF | 0.997 | GF | 0.974 | GF |
| ***NFI*** | Normed fit index | 0.97≤NFI≤1.00 | 0.95≤NFI<0.97 | 0.906 | AC | 0.878 | AC | 0.982 | GF | 0.989 | GF | 0.954 | AC |
| ***GFI*** | Goodness of fit index | 0.95≤GFI≤1.00 | 0.90≤GFI<0.95 | 0.946 | AC | 0.904 | AC | 0.990 | GF | 0.994 | GF | 0.953 | GF |
| ***AGFI*** | Adjusted goodness of fit index | 0.90≤AGFI≤1.00 | 0.85≤AGFI<0.90 | 0.921 | GF | 0.863 | AC | 0.969 | GF | 0.969 | GF | 0.918 | GF |
| ***RMR*** | Mean squared error Square root | 0≤RMR≤0.05 | 0.05<SRMR≤0.10 | 0.031 | GF | 0.048 | GF | 0.012 | GF | 0.007 | GF | 0.025 | GF |
| ***RMSEA*** | The root mean square error of approximation | 0≤RMSEA≤0.05 | 0.05<RMSEA≤0.08 | 0.044 | GF | 0.049 | GF | 0.036 | GF | 0.040 | GF | 0.054 | GF |

were gradually added to the measurement model using the SEM method. The relationships between variables were investigated separately in four models with the SEM method. The purpose of investigating in this way is to find the answers to the questions below gradually.

- In the first stage, do the independent variable environmental conditions affect the dependent variable firm performances?

- In the second stage, do the independent variable environmental conditions affect the mediating variable strategic posture?

- In the third stage, does the mediating variable strategic posture affect the dependent variable firm performance?

- In the fourth stage, by including the mediating variable strategic posture in the regression analysis together with the independent variable environmental conditions, what effect will the independent variable have on the dependent variable firm performance, and also, will the mediating variable have a significant effect on the dependent variable?

The SEM enables the modeling of the relationships between a large number of dependent and independent variables. This method is based entirely on theory and acknowledges the existence of a causality structure among the set of implicit variables (Hair et al., 2019). By utilizing the SEM method, the research hypotheses were tested with the analysis. In this way, the research model fit was investigated. In Figure 2, the path diagram shows the SEM model, which displays the mediating role of strategic posture in the relationship between the environmental conditions and firm performance. The results, which reveal that the measurement model is statistically significant and the model is fit, are given in Figure 2.

## The Hypothesis Test Results

The final SEM model results displaying the relationships between variables within the context of the research model are shown in the final research model in Figure 3 and Table 5.

According to the SEM analysis results, in SEM Model-1, the direct effect of the independent variable environmental conditions on the dependent variable firm performance was examined. According to the analysis results, it was observed that the environmental conditions significantly affect firm performance ($\beta$; 0.762, $P < 0.01$). In SEM Model-2, the effect of the independent variable environmental conditions on the mediating variable strategic posture was examined. According to the results, it was observed that the environmental conditions significantly affect the strategic posture. ($\beta$; 0.761, $P < 0.01$). In SEM Model-3, the effect of the mediating variable strategic posture on the dependent variable firm performance was examined. According to the analysis results, it was observed that the strategic posture significantly affects firm performance ($\beta$; 0.915, $P < 0.001$).

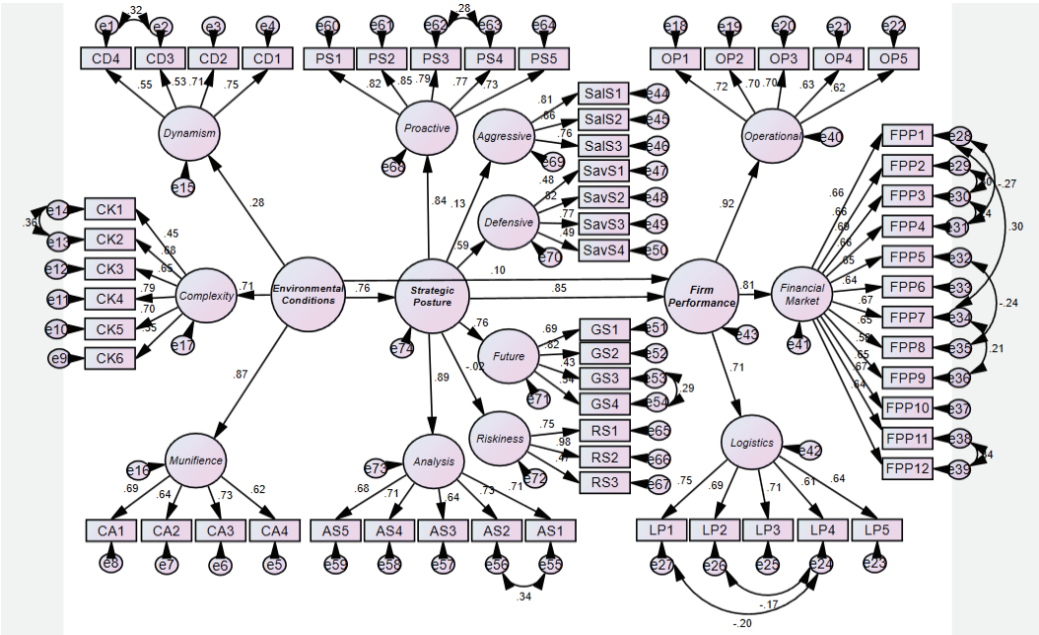



***Figure 2.*** The mediating role of strategic posture in the relationship between the environmental conditions and firm performance SEM model.

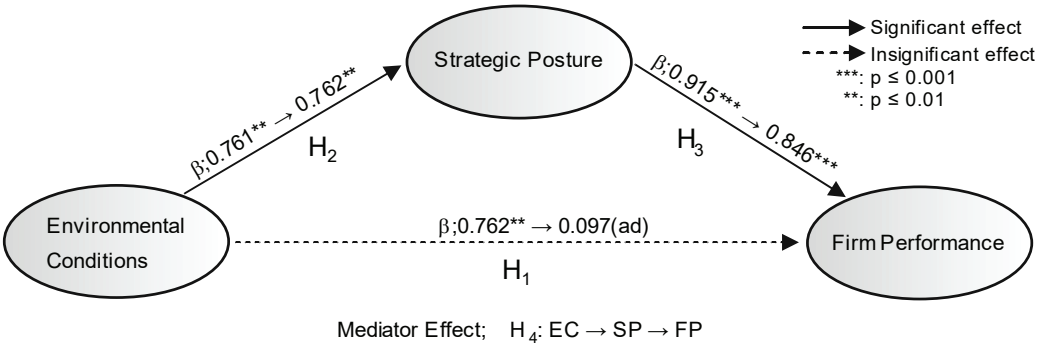



***Figure 3.*** The final research model results

*Additionally, in SEM Model-4,* the relationship between the environmental conditions and firm performance which constitutes the $H_4$ assertion hypothesis was examined by including the mediating variable strategic posture. According to the direct effects from the analysis results, it was observed that the environmental conditions significantly affected the mediating variable strategic posture (β; 0.762, $P < 0.01$) and that the mediating variable strategic posture significantly affected the firm performance (β; 0.846, $P < 0.001$). According to the indirect effects from the SEM Model 4 analysis results, it was observed that the impact of the environmental conditions on firm performance (β; 0.097, $P > 0.05$) has disappeared as a result of the inclusion of the mediating variable strategic posture in the model. Analysis findings show

that the value of β decreased from 0.761 to 0.097 and the P value changed from significant to insignificant in the relationship between the environmental conditions and firm performance. To summarize, while the results of the SEM Model-1 analysis show that environmental conditions have a significant effect on firm performance, this effect disappears by including the mediating variable strategic posture in the SEM Model-4. It leads to the conclusion that due to the disappearance of the effect and the presence of an indirect effect, the strategic posture has a full mediating effect between the environmental conditions and firm performance.

According to the indirect analysis results of Table 5, environmental conditions have an impact on firm performance through the mediating effects of the strategic posture (β; 0.645, $P < 0.01$). Hence, the $H_4$ assertion hypothesis was supported by confirming the existence of the full mediating effect of the strategic posture variable. It has been determined that the impact of environmental conditions on firm performance is not direct but through the mediating effects of the strategic posture variable. The findings obtained show that the firms [1]within the scope of the research do not evaluate the environmental conditions separately during the strategic planning process; they evaluate the effects of the external environment very well and can transfer the effects of the environment to their strategy. The findings show that the firms evaluate the effects of the external environment very well during the strategic process, and by transferring this situation to strategy during the strategic direction phase and that adopting an environmentally friendly strategic posture has positive effects on the firm performance.

1 According to Bryson (2011-2018) strategic planning is the analysis of the duties and values of the firm, the analysis of the internal and external environment of the firm and the determination of strategic issues based on these analyzes and the creation of strategies, aims and plans for the issues. According to Schendel and Hofer (1979); Wolf and Floyd (2017), strategic planning is a series of logical steps which involves long-term aims, environmental analysis, strategic formulation, implementation and control. Eisenhardt and Sull (2001) stated that strategy planning processes, complex adaptive system models, and non-hierarchical systems are highly effective in predicting and guiding the adaptation to changing environmental conditions and embody the concept of simple rules.
As stated by the researchers, it was observed that the firms within the scope of the study evaluate their environmental effects during the strategic planning process. The findings of the study show that the environmental conditions were not excluded or disabled. As Grant (2003) stated in his study, the environmental analysis is a part of strategic planning. It is considered that environmental effects are included in the strategic planning process in a way that will adapt the firm.

Table 5
*The Hypothesis Results*

| ***Relationships*** | | | ***Path Value*** | | | | ***Conclusion*** |
|---|---|---|---|---|---|---|---|
| | | | ***Standardized ß*** | | | | |
| ***Hypothesis*** | **Independent Variable** | **Dependent Variable** | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Supported/ Unsupported** |
| | ***Environmental Conditions*** | ***Firm Performance*** | ***0.762***** | | | | |
| $H_1$ | Environmental Conditions | Financial and Market | 0.663** | | | | ***Supported*** |
| | | Operational | 0.629** | | | | |
| | | Logistics | 0.566** | | | | |
| ***$H_{1a}$*** | Munificence | Financial and Market | 1.327*** | | | | ***Supported*** |
| | | Operational | 1.263*** | | | | |
| | | Logistics | 1.285*** | | | | |
| ***$H_{1b}$*** | Dynamism | Financial and Market | -0.169 (ad) | | | | ***Unsupported*** |
| | | Operational | -0.059 (ad) | | | | |
| | | Logistics | -0.146 (ad) | | | | |
| ***$H_{1c}$*** | Complexity | Financial and Market | -0.544** | | | | ***Supported*** |
| | | Operational | -0.601** | | | | |
| | | Logistics | -0.721*** | | | | |
| | ***Environmental Conditions*** | ***Strategic Posture*** | | ***0.761***** | | | |
| $H_2$ | Environmental Conditions | Proactive | | 0.635** | | | ***Supported*** |
| | | Aggressive | | 0.077(ad) | | | |
| | | Defensive | | 0.451* | | | |
| | | Future | | 0.567** | | | |
| | | Risk | | -0.008(ad) | | | |
| | | Analysis | | 0.694* | | | |
| ***$H_{2a}$*** | Munificence | Proactive | | 1.124*** | | | ***Partially Supported*** |
| | | Aggressive | | -0.046(ad) | | | |
| | | Defensive | | 0.907*** | | | |
| | | Future | | 1.183*** | | | |
| | | Risk | | -0.113(ad) | | | |
| | | Analysis | | 1.306*** | | | |
| ***$H_{2b}$*** | Dynamism | Proactive | | -0.130(ad) | | | ***Unsupported*** |
| | | Aggressive | | 0.062(ad) | | | |
| | | Defensive | | -0.031(ad) | | | |
| | | Future | | -0.101(ad) | | | |
| | | Risk | | 0.109(ad) | | | |
| | | Analysis | | -0.166(ad) | | | |

| *Relationships* | | | *Path Value* *Standardized* ß | | | | *Conclusion* |
|---|---|---|---|---|---|---|---|
| ***Hypothesis*** | **Independent Variable** | **Dependent Variable** | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Supported/ Unsupported** |
| ***H2c*** | Complexity | Proactive | | -0.385* | | | ***Partially Supported*** |
| | | Aggressive | | 0.210(ad) | | | |
| | | Defensive | | -0.440** | | | |
| | | Future | | -0.606** | | | |
| | | Risk | | 0.106(ad) | | | |
| | | Analysis | | -0.508** | | | |
| | ***Strategic Posture*** | ***Firm Performance*** | | | ***0.915****** | | ***Supported*** |
| **H3** | Strategic Posture | Financial and Market | | | 0.716** | | ***Partially Supported*** |
| | | Operational | | | 0.881** | | |
| | | Logistics | | | 0.690** | | |
| ***H3a*** | Proactive | Financial and Market | | | -0.049(ad) | | ***Partially Supported*** |
| | | Operational | | | 0.264* | | |
| | | Logistics | | | -0.367* | | |
| ***H3b*** | Aggressive | Financial and Market | | | 0.117* | | ***Unsupported*** |
| | | Operational | | | 0.0145** | | |
| | | Logistics | | | 0.030(ad) | | |
| ***H3c*** | Defensive | Financial and Market | | | -0.084(ad) | | ***Unsupported*** |
| | | Operational | | | 0.020(ad) | | |
| | | Logistics | | | -0.125(ad) | | |
| ***H3d*** | Future | Financial and Market | | | 0.060(ad) | | ***Unsupported*** |
| | | Operational | | | 0.121(ad) | | |
| | | Logistics | | | 0.174(ad) | | |
| ***H3e*** | Risk | Financial and Market | | | -0.064(ad) | | ***Supported*** |
| | | Operational | | | -0.037(ad) | | |
| | | Logistics Performance | | | 0.020(ad) | | |
| ***H3f*** | Analysis | Financial and Market | | | 0.789*** | | ***Partially Supported*** |
| | | Operational | | | 0.537*** | | |
| | | Logistics | | | 0.989*** | | |

| *Relationships* | | | *Path Value* — *Standardized* ß | | | | *Conclusion* |
|---|---|---|---|---|---|---|---|
| ***Hypothesis*** | **Independent Variable** | **Dependent Variable** | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Supported/ Unsupported** |
| **$H_4$ DIRECT EFFECTS** | | | | | | | |
| | ***Environmental Conditions*** | ***Firm Performance*** | | | ***0.097 (ad)*** | | ***The coefficient decreased and became insignificant.*** |
| | **Environmental Conditions** | **Strategic Posture** | | | **0.762**** | | |
| **$H_4$** | Environmental Conditions | Proactive | | | 0.642** | | |
| | | Aggressive | | | 0.099 (ad) | | |
| | | Defensive | | | 0.448* | | |
| | | Future | | | 0.576* | | |
| | | Risk | | | -0.018 (ad) | | |
| | | Analysis | | | 0.681* | | |
| | **Strategic Posture** | **Firm Performance** | | | **0.846***** | | |
| | Strategic Posture | Financial and Market | | | 0.688** | | |
| | | Operational | | | 0.774** | | |
| | | Logistics | | | 0.603* | | |

**$H_4$ INDIRECT EFFECTS**

| ***Hypothesis*** | **Independent Variable** | **Mediator Variable** | **Dependent Variable** | **Model 1-2-3** | **Model 4** | **Supported/Unsupported** |
|---|---|---|---|---|---|---|
| **$H_4$** | **Environmental Conditions** | **Strategic Posture** | **Firm Performance** | | **0.645**** | **Supported-Full Mediator** |
| **$H_{4a}$** | Munificence | Strategic Posture Dimensions | Financial and Market | | 3.096** | **Supported-Full Mediator** |
| | | | Operational | | 3.827** | |
| | | | Logistics | | 4.701** | |
| **$H_{4b}$** | Dynamism | Strategic Posture Dimensions | Financial and Market | | -0.360 (ad) | **Unsupported-No Mediation** |
| | | | Operational | | -0.419 (ad) | |
| | | | Logistics | | -0.539 (ad) | |
| **$H_{4c}$** | Complexity | Strategic Posture Dimensions | Financial and Market | | -1.447* | **Supported-Full Mediator** |
| | | | Operational | | -1.752 * | |
| | | | Logistics | | -2.238* | |

$\chi 2 = 2659.192$, df = 1679 $\chi 2/df = 1.584$, CFI = 0.866, NFI = 0.707, GFI = 0.761, AGFI = 0.740, RMR = 0.043, RMSEA = 0.047, AIC = Suitable. $R^2 = 0.851$.

Path coefficients are standardized. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, ad; $p > 0.05$.

## Conclusion and Recommendations

In their studies, Miller (1988), Dollinger, and Golden (1992) attribute the good performance of firms to the match between environment and strategy, which they call "important complements," and giving effective strategic responses. In this study, "environmental conditions and strategic posture" were discussed as important complements. With this study, the aim

is to help the logistics firms in the Marmara Region participating in this research to determine the environmental conditions, to emphasize the importance of strategic choices, and to contribute to the determination of the strategic posture of the firms according to their environment. Hence, within the scope of this research, it was emphasized that in environments with the high-speed change, the logistics firms should have a strategic posture to improve their performance indicators.

*The results* show that the direct impact of environmental conditions on firm performance disappears due to the indirect effect of the strategic posture (full mediator) and that the strategic posture has a strong effect on firm performance. This reveals that within the scope of the research, the logistics firms have successfully transferred their environmental effects to strategy and have a significant impact on performance by adopting the strategic posture that suits the environmental effects. This shows that firms can obtain higher performance indicators, especially *by choosing "analysis, proactive, and aggressive"* strategies and that having a strategic posture is important in raising their performance criteria. It was observed that risk-taking, defensive, and future strategies tend to have a negative effect due to the fact that their effects on firm performance, statistically, significant findings could not be obtained. If the managers in the logistics service sector choose these strategies, there may be poor performance, downsizing, loss of customers, or loss of market, so they should avoid choosing these strategies (Sabherwal et al., 2019).

The results of this study show that the firms within the scope of the research do not evaluate the environmental conditions separately and evaluate the effects of the external environment during the strategic planning process. It displays that firms create positive effects on performance by successfully transferring the effects of the environment to strategy and adopting an appropriate strategic posture that is sensitive to the environment. The presence of the full mediating relationship of the strategic posture does not mean that it eliminates environmental conditions. On the contrary, it shows that the firms within the context of the research can evaluate the environmental conditions during the strategic planning process and determine the strategic posture suitable for environmental effects and reflect their effects on the performance.

*To summarize,* from the hypotheses developed by verifying the research model empirically, only the hypotheses that belong to environmental dynamism and $H_{3b\text{-}c\text{-}d}$ were not supported, and all other hypotheses were partially or fully supported. It is concluded that environmental dynamism, which is one of the dimensions of the environmental condition, does not significantly affect the strategic posture or the firm performance in a statistically significant way. The literature supports these findings. The literature shows that while the performance of some of the firms operating in the medium of environmental dynamism is positively affected, the performance of some of the firms is negatively affected and that there are

no effects on the performance indicators of some of the firms. It shows that the environmental dynamism conditions have a positive effect, especially on the performance of the production firms and small-scale firms. It is among the literature findings that the effects of environmental dynamism conditions have less impact on performance in environments with a lot of strategic diversity. As a result, it was observed that the strategic posture has significant effects on firm performance criteria. Strategic posture is a significant determinant of performance.

In the strategic management literature, an organization's strategy must be compatible with its internal and external environments to achieve the best outcomes (Lee, 2002; Zimmermann et al., 2020). Therefore, especially under uncertain environmental conditions, alternative scenarios should be prepared and strategic choices should be made in accordance with environmental effects. Therefore, managers of logistics firms should focus on selective narration of the environment. In addition, managers should know the environment of their companies and be sensitive to it. Obviously, managers are recommended to consider the effects of all environmental conditions and make strategic choices appropriate to these effects. The ability of the firm's strategy to create a bond of belonging between employees, sub-units, and environmental conditions is effective on the performance of firms.

Looking to the future, the environment is a heterogeneous entity and composed of versatile combinations. Our findings show that more research is needed on the different environmental aspects and the best possible balance between strategy and adaptation to the external environment. These results are somewhat of a new perspective for the logistics industry, environmental compliance, and strategic choice (Ghemawat, 2016). Our common recommendation to both managers and researchers is that they should be more visionary rather than adopting a traditional approach. The following future lines of research may be derived from this paper. First, although this research focused on logistics companies in the Marmara region, it would be interesting to expand this research to different organizations to open a new window on the strategic posture of managers in this sector. Second, we encourage other researchers to expand our research to include developing and emerging countries.

**Peer-review:** Externally peer-reviewed.
**Conflict of Interest:** The authors have no conflict of interest to declare.
**Grant Support:** The authors declared that this study has received no financial support.
**Author Contributions:** Conception/Design of study: S.Y.Ö., E.C.; Data Acquisition: S.Y.Ö., E.C.; Data Analysis/Interpretation: S.Y.Ö., E.C.; Drafting Manuscript: S.Y.Ö., E.C.; Critical Revision of Manuscript: S.Y.Ö., E.C.; Final Approval and Accountability: S.Y.Ö., E.C.

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*Istanbul Business Research, 52*(1), 31-45
**DOI:** 10.26650/ibr.2023.52.870245
http://ibr.istanbul.edu.tr/
http://dergipark.org.tr/ibr

# Istanbul Business Research

**Submitted:** 30.01.2021
**Revision Requested:** 09.02.2022
**Last Revision Received:** 09.02.2022
**Accepted:** 10.02.2022
**Published Online:** 04.11.2022

RESEARCH ARTICLE

# Scale Adaptation of Innovation-Outsourcing in Companies*

**Öncü Yanmaz Arpacı[1], Ferda Esin Gülel[2]**

**Abstract**

In line with the strategic management approach which was developed in the light of changes in production and markets, there is an emphasis in the literature of this field that companies need to be well managed in order to survive, to benefit from strategic management, and to have a sustainable competitive advantage. This study aimed to adapt and apply a scale of innovation and outsourcing. While adapting the scale, in addition to the data from the qualitative research, three different scales were used in the selection. We arranged a questionnaire and created new questions. The questionnaire consists of eight chapters: the characteristics of companies, outsourcing, supplier relations, suppliers' satisfaction level, innovation process, innovations in the last five years, and outsourcing-innovation. We collected the data from companies in Turkey, which are on the Fortune 500 list. We analyzed the data with SPSS 23 and AMOS 20. As a result of exploratory and confirmatory factor analyses, the outsourcing scale was composed of 3 dimensions and 20 items. While the innovation scale consisted of 12 items in one dimension. The reliability coefficient of the outsourcing scale is 0.912, and the innovation scale is 0.911. The low number of items facilitates its applicability.

**Keywords**

Outsourcing, Innovation, Scale Adaptation, Validity, Reliability

## Introduction

The term 'resource' was first used in connection with natural resources, which throughout the history of the world have always been distributed in various types and amounts to different geographical locations. With the development of industry after the industrial revolution and the creation of new means of production along with the invention of new products, other types of resources such as electricity, oil, and natural gas were brought to the agenda of countries and businesses (Orhan, Genç Yılmaz and Karadeniz, 2018 p. 3). As service and industry sectors continue to evolve, so the need for different types of resources remains a high priority. While the differentiation of resource types has emerged as a result of changing production

* The scale adapted in this paper can be requested from the authors. This study was derived from the doctoral study titled "The Relationship Between Outsourcing and Innovation in Businesses" conducted at Pamukkale University Social Sciences Institute under the supervision of Prof. Dr. Ayşe İRMİŞ.

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**To cite this article:** Yanmaz Arpaci, O., & Gulel, F. E. (2022). Scale adaptation of innovation-outsourcing in companies. *Istanbul Business Research, 52*(1), 31-45. http://doi.org/10.26650/ibr.2023.52.870245

patterns, it has also led to the emergence of new production processes. Differentiation of resources and interaction between resources has created the process of outsourcing, where many business needs can be supplied. Within the framework of the strategic management approach, the fact that companies have a sustainable competitive advantage is the most crucial factor in their survival. In this context, outsourcing is seen as an essential method in providing a competitive advantage.

Another area in which it is important for businesses to achieve sustainable competitive advantage is that of innovation. The successful practice of innovation in the world of commerce has given rise to many benefits such as an increase in profitability, a decrease in costs, and an increase in market share. Moreover, this has provided a competitive advantage and an increase in productivity while also creating new markets. When considered in terms of innovation and outsourcing, it is clear that businesses can achieve innovation in different ways. Businesses can innovate by focusing on their core competencies and by supplying standard outsourcing, or they can transform these sources into innovation by choosing innovative suppliers. Another option is to provide innovation directly from an outsource. Accordingly, the purpose of this research is to present how to measure the innovation and outsourcing relationship in terms of businesses on the Fortune 500 list. For this purpose, we tried to adapt a scale that measures the outsourcing and innovative activities of companies.

This study considers research already conducted in this field, including data, method, and findings. In conclusion, we summarize the research and include suggestions.

## Literature

As far as literature in this field is concerned, no research has yet been found in which all types of outsourcing and innovative activities of a company are discussed together. A small number of studies have focused on the impact of outsourcing on the innovation of the enterprise, but only in certain areas. In previous studies the outsourcing principles and innovations of companies have generally been discussed separately. However, in our study we examine the relationship between outsourcing and innovation. In other studies, outsourcing was evaluated within the scope of satisfaction with outsourced services, relations with suppliers, written agreements, and collaborations with suppliers. Some previous studies attempted to assess innovation within the scope of the openness of the enterprises, market-oriented activities, openness to learning, competitive view, and innovation systems.

Calantone et al. (2002) analyzed the learning orientation, firm innovation capability, and firm performance in large-scale businesses operating in the technology field in the United States. In order to create the items of the scale used within the scope of the study, 25 people working as assistant general managers responsible for R&D were interviewed, and sub-

dimensions were determined. The items under each sub-dimension were prepared using different scales. Reliability coefficients of the sub-dimensions were measured as 0.80, 0.79, 0.72, 0.75, 0.89 and 0.85. The deputy general managers responsible for R&D of 187 companies from the production and service sectors were asked to participate in the survey. The result of the study showed that the learning tendency has critical importance in terms of innovation ability and performance of companies.

Arikan (2008) examined the dynamics of the innovation of businesses operating in Turkey and determined the dynamics of innovation together with quantitative and qualitative research methods. The questionnaire used in the study was created using various scales in addition to qualitative findings. The survey participants were selected from a wide range of sectors including banking/finance, e-commerce, electronics, IT, telecommunications, the automotive industry, food, textile, chemistry, construction, the pharmaceutical sector, health, energy, management and consulting, airlines, tourism, fuel, and industrial products. The survey was completed by middle and senior managers with a good command of the organizational culture. Reliability coefficients of the survey sub-dimensions were measured as 0.93, 0.95, 0.38 (non-factor), 0.88, 0.89, 0.94 and 0.92. In line with the findings obtained from the study, it was stated that the fact that businesses focus on market, learning, and entrepreneurship were the factors that determine their innovation culture.

Bengtsson, von Haartman and Dabhilkar (2009, p. 35-47) aimed to compare the outsourcing and integration strategies of companies operating in Switzerland in terms of low cost and innovation. In their study, a questionnaire consisting of 51 questions was used as a data collection tool. The data of 267 companies with more than 50 employees and producing metal goods, machinery, office equipment and computers, electronics, equipment for telecommunications, and vehicles were obtained. The data were analyzed using descriptive statistics and reliability analysis methods. The reliability coefficient of the scale, which consisted of two sub-dimensions, was 0.84 and 0.87. As a result of the study, it was revealed that, for businesses, the choice of a low-cost and innovative supplier is just as crucial as that of outsourcing.

Çetinkaya (2009) used a structured questionnaire technique for the determination of bilateral governance and the dynamics between companies in the context of outsourcing in enterprises operating in Istanbul which were taken from the Istanbul Chamber of Industry (ISO) list. The survey was created based on the scales used in different studies, and questions about organizational quality were added. The reliability values of the sub-dimensions of the survey applied to 128 enterprises were 0.83, 0.86, 0.88, 0.67 (low), 0.88 and 0.76. Validity analysis, reliability analysis, factor analysis, and descriptive statistics were used in the research. The results showed that the level of cost and mutual satisfaction are important factors in the relations with suppliers.

İraz, Çakıcı and Tekin (2014, p. 51-68) evaluated the outsourcing of SMEs operating in Konya in terms of innovation management. A survey was applied to 42 companies, the aim of which was to measure the outsourcing levels of SMEs in terms of innovation manage-

ment. The scale used in the study had previously been employed by Gül (2005) and Murat and Kulualp (2010, p. 49-65). The reliability coefficients of the scale consisting of five sub-dimensions were found as 0.94, 0.93, 0.86, 0.98, and 0.97. In line with the findings obtained in the study, it was determined that the priority of benefiting from external sources on innovation management was 40%.

Özçifçi and Sarıçay (2014, p. 387-404) discussed the innovation activities of 105 medium and large-scale companies operating in the Kayseri Organized Industrial Zone with more than 50 employees. The scale employed in the study was developed by considering the scales used in previous studies. The equivalent scale method, which is one of the internal consistency methods, was used to determine the reliability of the scale. Reliability coefficients of the dimensions in the scale were found as 0.76, 0.65, 0.66, and 0.82. The correlation analysis method was used to determine the relationship between business size and innovation activities. The results obtained in the research showed that the majority of companies are highly innovative, and that there is a relationship between company size and innovation.

Haartman and Bengtsson (2015, p. 1295-1311) evaluated the impact of global outsourcing and supplier integration on product innovation in manufacturing businesses. In their study, the data was obtained from an International Purchasing Survey conducted in 679 manufacturing companies operating in Europe, the United States, and Canada in 2009. The reliability coefficients of the two sub-dimensions were found as 0.85 and 0.78. As a result of the study, it was revealed that global outsourcing has no direct effect on product innovation.

Bardakçı (2018) used a questionnaire to determine the importance of innovation as a core competence strategy in 282 of the 500 companies of Borsa Istanbul (BIST). The scale developed by Günay (2007) was used in the preparation of the survey questions. As a result of the research, it was determined that the organizational and process innovations applied in the companies differed according to their legal status.

Bui, Leo and Adelakun (2019, p. 1-10) aimed to determine the level of strategic innovation by examining external resources used by large-scale companies in the information technology sector. In the study, a cross-sectional survey method consisting of two sub-dimensions was used as a data collection tool. Questions were developed from Ragin (2000; 2008), Schneider and Wagemann (2012) scales and checked by an outsourcing specialist. The results obtained from 41 companies, which are included in the International Association of Outsourcing Professionals and which mostly operate in the United States, showed that a multiple outsourcing strategy could lead to strategic innovations.

Yıldız and Çiğdem (2019, pp. 1761-1777) analyzed the intermediary role of innovative supply on the innovation performance of the innovation strategy within the sample of Turkey's 1,000 largest exporting companies. In the survey, the supplier innovation scale based on the

research of Kim and Chai (2017, p. 42-52), the firm innovation strategy scale of Jajja, Kannan, Brah and Hassan (2017, p. 1054-1075) and the product innovation performance scale of Prajogo and Sohal (2006, p. 296-312) were used in order to conduct the study. Data was collected from 115 businesses operating in the food, textile, plastic/chemical, construction, machinery and electronics industries. The reliability coefficients of the scale variables were found to be 0.78, 0.90, and 0.85. As a result of the study, it was determined that the company innovation strategy significantly affected innovation performance and supplier innovation.

Zafar (2019) evaluated the contradictions of the top executives of innovative companies in terms of outsourcing and innovation. Within the scope of the study, which used a questionnaire as a data collection tool, questions were sent to 260 randomly selected people from 20 countries (Finland, Sweden, Denmark, Germany, Spain, Netherlands, Switzerland, Cyprus, USA, Canada, England, Singapore, Malaysia, Taiwan, India, Pakistan, United Arab Emirates, Saudi Arabia, Oman, and Egypt). The data set consisted of responses from 112 participants from about 60 different businesses. In the study, it was seen that the product development department managers wanted to innovate with external cooperation.

Table 1 contains a detailed summary of the studies on outsourcing and innovation scales:

Table 1

*Empirical Literature Summary*

| Author | Research Topic | Dataset | Method | Findings |
|---|---|---|---|---|
| **Calantone et al. (2002)** | Learning orientation, firm innovation capability, and firm performance | 187 large-scale technology enterprises (USA) | Survey (validity analysis, confirmatory factor analysis, structural equation model) | Learning disposition is critical to the firm's innovation capability and performance. |
| **Arıkan (2008)** | Evaluating the dynamics of innovation in Turkey | 122 companies (Turkey) | Interview, Questionnaire (reliability analysis, factor analysis, hierarchical regression method) | The fact that businesses are market and entrepreneurial oriented are the factors that determine how businesses have an innovation culture. |
| **Bengtsson et al. (2009)** | Low cost versus innovation: contrasting outsourcing and integration Strategies in manufacturing | 267 companies with more than 50 employees (Switzerland) | Survey (descriptive statistics, reliability analysis) | In outsourcing, the selection of an innovative supplier is as important as the cost. |
| **Çetinkaya (2009)** | Bilateral governance in outsourced services: inter-organizational dynamics and consequences | 128 companies (Istanbul) | Survey (validity analysis, reliability analysis, factor analysis, descriptive statistics) | Cost and mutual satisfaction levels in relationships with suppliers are essential factors in outsourced companies. |
| **İraz et al. (2014)** | A study on outsourcing by SMEs in terms of management innovation | 42 companies (Konya) | Survey (reliability analysis, two-way ANOVA, variance analysis) | The effect of priority in the utilization of external resources on innovation management is 40%. |

| Author | Research Topic | Dataset | Method | Findings |
|---|---|---|---|---|
| **Özçifçi and Sarıçay (2014)** | Examining innovation activities of companies | 105 companies (Kayseri) | Survey (reliability analysis, correlation) | The vast majority of businesses are innovating at a high level; there is a relationship between business size and innovation. |
| **Haartman and Bengtsson (2015)** | The impact of global purchasing and supplier integration on product innovation | 679 production businesses (Europe, USA, Canada) | Survey (t-test, factor analysis, regression analysis) | Global outsourcing has no direct impact on product innovation. |
| **Bardakçı (2018)** | The importance of innovation as a core competency strategy | 282 companies Borsa İstanbul (BIST) 500 companies | Survey (descriptive statistics) | Organizational innovations and process innovations applied in businesses differ according to the legal status of the companies. |
| **Bui et al. (2019)** | Achieving strategic innovation through information technology outsourcing | 41 large scale businesses (US) | Cross-sectional survey (fuzzy cluster analysis) | Multiple outsourcing strategies can lead to strategic innovations. |
| **Yıldız and Çiğdem (2019)** | The role of supplier innovativeness in the effect of innovation strategy on innovation performance | 115 enterprises of Turkey's 1000 largest exporters | Survey (structural equation model, Sobel test) | Company innovation strategy significantly affects innovation performance and supplier innovation. |
| **Zafar (2019)** | The outsourcing innovation paradox | 60 innovative businesses (20 countries) | Survey (Pearson correlation, reliability analysis, validity analysis) | Product development department managers want to innovate with outsourcing alliances. |

The tables were created by the authors.

## Data

In this study, Turkey's Fortune 500 list is determined as the population. This list of manufacturing, trade, services and construction companies covering all areas comprise Turkey's largest 500 companies and is considered as a reference in both business and academia (www.fortuneturkey.com, 2019). The list is prepared in July of each year based on the balance sheets of the previous year. Large enterprises leading the list are ranked according to Turkey's sales volumes combined with determined and key financial indicators. Being ranked in the list of Fortune Magazine, which is the most reputable business magazine in the world and published in the USA, is seen as an indicator of respectability for businesses.

## Method

Within the scope of this study, we adapted the outsourcing and innovation scale in the companies. We used qualitative research methods primarily to form a basis for the questions to be asked and the dimensions to be examined. This is because the survey method, which is one of the quantitative research techniques, would not be sufficient by itself in revealing the

correct results. Within the scope of qualitative research, we tried to get information about the outsourcing of companies, outsourcing processes, innovation structures, and innovation processes. We used the data from previous interviews as a source in selecting the questionnaire questions to be applied within the scope of quantitative research, organizing these questions, and creating new ones.

The data set obtained from the questionnaire sent to 251 companies constitutes the sample group of the research. In the research, the scales used for the relationship between innovation and outsourcing were the scales used in Çetinkaya's (2009) and Arıkan's (2008) scales, and the scale used in the article published by Calantone et al. (2002). Although there are questions in the scales investigated which contain items that are defining factors for innovation and outsourcing, there is no single questionnaire that considers all these factors together and reveals the relationship. A list was created with expressions that were understandable and plain, which could explain the relationship between innovation and outsourcing among the measurement tools examined, and which did not contain more than one thought/judgment. For the suitability of the statements, expert opinions of ten business owners and/or senior executives, seven academicians from management-organization and statistics departments, and one Turkish Language and Literature teacher were consulted. As a result of the evaluation, 52 question statements were found appropriate and determined to be used on the scale.

The adapted scale includes seven questions about outsourcing, seven questions about supplier relationships, seven questions about collaborations with suppliers, eight questions about suppliers' satisfaction, eight questions about the innovation process, and eight questions about innovations in the past five years. The 45-phrase questions in the questionnaire are rated as 5-point Likert type (1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree, and 1 = Very Unsatisfied, 2 = Unsatisfied 3 = Neutral, 4 = Satisfied, 5 = Very satisfied).

The research company contacted all companies in the research population via telephone and sent online prepared questionnaires to those who agreed to participate in the research. 251 suitable pieces of data were obtained for the analysis. The resolution of the information collected from the scale application was made in SPSS 23 and AMOS 20 package programs. Cronbach alpha coefficient was used for reliability. Frequency and ratios were used to summarize descriptive statistics.

We adapted questions from the scales developed by certain previous studies. From Çetinkaya's (2009) study (*Bilateral Governance in Outsourced Services: Interorganizational Dynamics and Consequences)* which tested the validity and reliability of outsourcing in 128 companies operating in Istanbul, we adapted question numbers 3, 6, 9, 10, 11, 12, 15, 16, 17, 18, 24, 40, 44, 46, 47, 48, 49, 50, 51, 52, 53, 57, 59, 60, 65, 66. From Arikan's (2008) study entitled *Evaluating the Dynamics of Innovation in Turkey: The Impact of Innovation*

*on Business Performance* carried out in 122 companies from different sectors in Turkey, we used question numbers 3, 9, 13, 51, 52, 53, 54, 55, 56 from the scale which tested validity and reliability. From Calantone et al.'s (2002) article under the title *Learning Orientation, Firm Innovation Capability, and Firm Performance*, question numbers 1, 3, 4, 5, 6 from the scale developed by the study applied to 187 senior R&D managers in the US industry were adapted to the scale in this study. Validity is a concept related to how accurately a measurement tool measures the variable it attempts to measure. Along with the newly added questions, 52 statements regarding the relationship of outsourcing and innovation were found by eight experts to be appropriate.

In the adapted scale, there are a total of 45 items, of which 39 are positive, and six are negative. Questions 5, 6, 7, 8, 9, 12, 13, 15, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48 and 49 have positive points, while items 10, 11, 14, 16, 17 and 38 have negative points. The positive items are scored as 1, 2, 3, 4, 5, and the negative items are scored as 5, 4, 3, 2, and 1. The total score is calculated as a result of the degrees given to each item. The lowest score which could be obtained from the scales is 45, and the highest score is 225.

In this study, exploratory factor analysis, confirmatory factor analysis, and correlations were used to examine the relationship between factors.

## Findings

In the research, we carried out exploratory factor analysis to determine the related variables and to examine the order of the answers given to the scale. In the eligibility determination stage, the Bartlett Sphericity Test (which is suitable for innovation and outsourcing with a significance (sig.) Value of 0,000) and the Kaiser-Meyer-Olkin Test (outsourcing Test value for 0.896; Test value for innovation 0.9005 - very good) were applied. Eight of the 52 expressions in the questionnaire, according to the eigenvalue in the factor determination stage, were thought to disrupt the intra-factor fit and factor reliability. These statements were excluded from the scale. Five expressions on two separate factors were canceled because they do not have a sufficient number of questions that would create a dimension. Expressions removed from the scale are given in Table 2.

Table 2

*Expressions Extracted from the Scale as a Result of Factor Analysis*

| |
|---|
| 10. We think that our business has lost control of outsourced services. |
| 11. In outsourcing, costs arise that we could not estimate. |
| 14. It is challenging to obtain data from suppliers on their performance and costs. |
| 16. Our business spends a lot of time and effort on checking its suppliers' products/services and processes. |
| 17. We do not have specific standards to measure suppliers' performance. |

Table 2

*Expressions Extracted from the Scale as a Result of Factor Analysis*

| |
|---|
| 18. It will be difficult/costly for our business to switch suppliers in terms of time and resources. |
| 19. Our costs have decreased. |
| 20. We were able to focus on our core business. |
| 33. We are able to entrust company privacy |
| 34. Our business often tries new ideas. |
| 35. Our business looks for new methods to operate. |
| 36. Our business is creative in operational methods. |
| 38. In our business, innovation is perceived to be risky and exposed to resistance. |

After the statements in Table 2 were removed, we performed factor analysis. Three factors for outsourcing and one factor for innovation were determined. Factor dimensions of innovation and outsourcing are given in Table 3. As a result of the rotation made on the scale of innovation and outsourcing, the factors are explained by 52.3% and 60.3% of the total variability, respectively. After that, the distribution of the variables according to these factors was determined. In this study, we used the varimax rotation method. As a result of the reliability analysis, we calculated the scale of innovation and outsourcing to be highly reliable according to the criterion of $0.80 \leq \alpha < 1.00$ ($\alpha\ (innovation) = 0.911\ and\ \alpha\ (outsource) = 0.912$).

Table 3

*Factor Dimensions According to Factor Analysis Results*

| **Factors** | **Questions** |
|---|---|
| Outsourcing Factor 1 | 5, 6, 7, 8, 9, 12 |
| Outsourcing Factor 2 | 13, 21, 22, 23, 24, 25, 30 |
| Outsourcing Factor 3 | 15, 26, 27, 28, 29, 31, 32 |
| Innovation Factor 1 | 37, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49 |

Table 4 shows the factor loads of the innovation scale:

Table 4

*Exploratory Factor Analysis of Innovation Scale Results of Single Factor Structure: Factor Loadings According to Varimax Rotation*

| | **Component** |
|---|---|
| | 1 |
| It has successfully implemented many new products/services. | 0.827 |
| It has developed many new product/service ideas. | 0.812 |
| It has implemented many new planned strategies. | 0.809 |
| It has created many new business systems. | 0.798 |
| It has planned many new strategies. | 0.758 |
| With its products/services, it has accessed many new markets that had not been entered before. | 0.753 |
| | **Component** |
| | 1 |
| In its new products and service offers, our business uses the latest technology on the market. | 0.698 |
| Our business is usually among the first to enter the market in new products and services. | 0.695 |
| Our new product promotions have increased in the last five years. | 0.689 |
| Our company has obtained many new patents. | 0.628 |

| | |
|---|---|
| Our company has used open innovation. (It made the innovation in collaboration with other businesses.) | 0.622 |
| | **Component** |
| | 1 |
| Our business carries out innovative activities in partnership with other businesses. | 0.524 |
| Eigenvalues | 6.275 |
| Explained Variance Ratio | 52.3% |

As seen in Table 4, the innovation scale is explained with a single factor. The loading values of the items in this factor range between 0.827 and 0.524. All of the 12 items in the scale explain 52.3% of the total variance.

Table 5 shows the factor loads of the outsourcing scale:

Table 5

*Outsourcing Scale Exploratory Factor Analysis 3 Factor Structure: Factor Loadings Results According to Varimax Rotation*

| | **Component** | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Sufficiency of supplier resources | 0.800 | | |
| Overall performance | 0.782 | | |
| The experience and knowledge of the supplier in the sector | 0.780 | | |
| Knowledge transfer | 0.748 | | |
| Communication | 0.726 | | |
| Providing flexibility in conditions | 0.713 | | |
| The parties adapt easily when an unexpected situation arises. | 0.480 | | |
| We achieved differentiation in our market compared to competitors. | | 0.818 | |
| We gained effectiveness in innovative products and processes. | | 0.818 | |
| We achieved competencies and technologies that require specialization. | | 0.807 | |
| Our experience and knowledge in the sector have increased. | | 0.776 | |
| Our performance has generally improved. | | 0.714 | |
| We are producing innovative products | | 0.538 | |
| Suppliers meet our innovation expectations. | | 0.438 | |
| Outsourcing is strategic for our business. | | | 0.837 |
| Outsourcing is integrated into our business. | | | 0.787 |
| Outsourcing has a high impact on the total profitability of our business. | | | 0.648 |
| With outsourcing, we were able to adapt to our customers' demands more easily. | | | 0.606 |
| Emerging situations are regarded as a shared responsibility by both partners. | | | 0.564 |
| Outsourcing has made our customers see us in a more favorable light over our competitors. | | | 0.550 |
| Eigenvalues | 7.635 | 2.718 | 1.586 |
| Explained Variance Ratio | 38.8% | 13.6% | 7.9% |

In Table 5, the loading values of items in the first factor range from 0.80 to 0.48, in the second factor they range from 0.818 to 0.438, and in the third factor the range is from 0.837 to 0.550. The first factor explains 38.8% of the variance; the second explains 13.6%, and the third explains 7.9%. All items of the scale explain 60.3% of the total variance. In line with the factor analysis conducted, the questions about outsourcing are divided into three dimensions, and the questions about innovation are accumulated into one dimension. Outsourcing

dimensions are the importance of outsourcing, results of outsourcing and satisfaction in outsourcing.

In the study, we obtained the reliability coefficient of the innovation and outsourcing scale as 0.911 and 0.912 respectively, and defined this as highly reliable.

We applied the Confirmatory Factor Analysis to determine the measurement model indicating the relationship between hidden variables observed in the innovation scale. We used the Maximum Likelihood Method in the estimation. The distribution of the items by dimensions is given below:

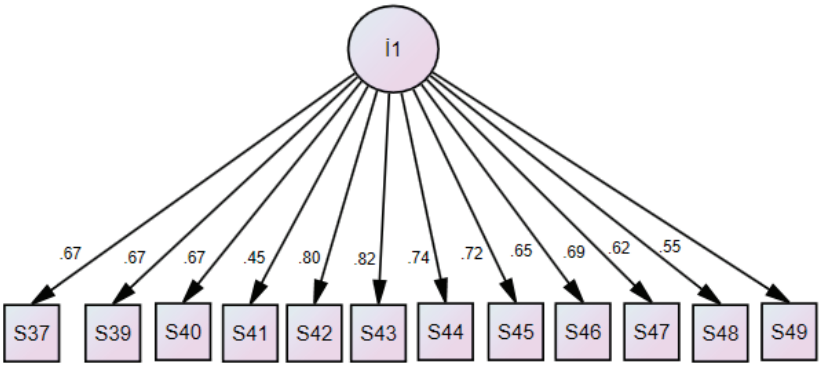


***Figure. 1*** Distribution of the Innovation Scale by Item Dimensions

In Figure 1, it can be seen that the coefficients between I1 and the items of this dimension vary between 0.45 and 0.82. The variability of I1 dimension is explained by S43 (81.8%) and S41 (45.1%). The coefficients in the model are all significant (p = 0.000). The fit values obtained as a result of the analysis are given in Table 6. According to Table 6, it can be said that the fit of the one-dimensional model is confirmed with the data.

Table 6

*Innovation Fit Index Results*

| Fit Indices | Good Fit | Acceptable Fit | Calculated Value |
|---|---|---|---|
| RMSEA | $0 \leq RMSEA \leq 0.05$ | $0.05 \leq RMSEA \leq 0.1$ | 0.082 |
| CFI | $0.95 \leq CFI \leq 1$ | $0.90 \leq CFI \leq 0.95$ | 0.955 |
| $\chi^2/df$ | $< 2$ | $< 3$ | 2.698 |
| IFI | $0.95 \leq IFI \leq 1$ | $0.90 \leq IFI \leq 0.95$ | 0.956 |

Fit indices limit values (Schermelleh-Engel and Moosbrugger, 2003)

We applied the Confirmatory Factor Analysis to determine the measurement model, which also shows the relationship between hidden variables observed in the outsourcing scale. We

used the Maximum Likelihood method in the estimation. The distribution of the items by dimensions is given below:

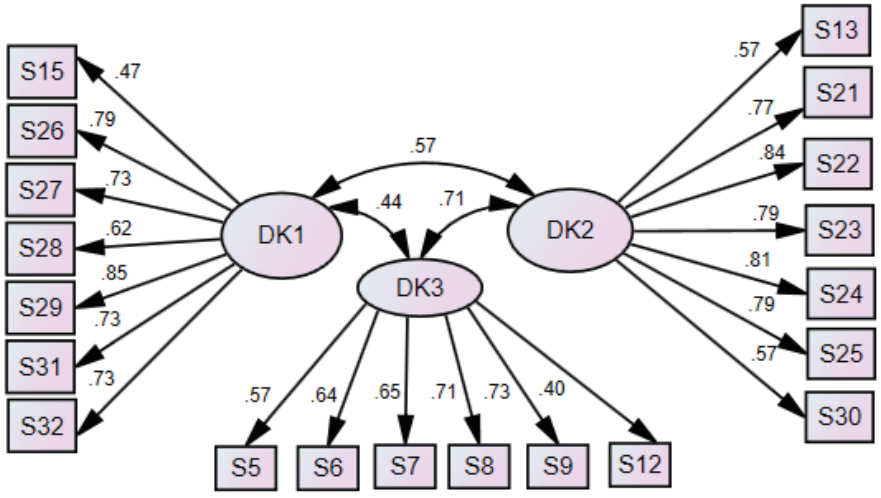


***Figure. 2*** Distribution of Outsourcing (DK) Scale by Item Dimensions

In Figure 2, the coefficients between DK1 and the items of this dimension are in the range of 0.47-0.85, the coefficients between DK2 and the items of this dimension are in the range of 0.57-0.84, the coefficients between DK3 and the items of this dimension are in the range of 0.40-0.73.The variability of DK1 dimension is at most S29 (85.3%), and at least S15 (47.2%); the variability of DK2 size is explained by S22 (83.7%), at least S13 and S30 (57%) and the variability of DK3 size is at most S9 (73.3%), and at least S12 (40.5%). We found all the coefficients in the model ($p = 0.000 p = 0.000$) to be significant. When we examined the correlations between sub-dimensions, we determined the relationship between DK1, DK2, and DK3 as a statistically significant (p = 0.000). These results are shown in Table 7:

Table 7

*Correlations between sub-dimensions*

| | DK1 | DK2 | DK3 |
|---|---|---|---|
| DK1 | 1 | | |
| DK2 | 0.571 | 1 | |
| DK3 | 0.436 | 0.706 | 1 |

$p < 0.05$

There is a similar relationship between all sub-dimensions. The correlation between the importance of outsourcing (DK1) and the results of outsourcing (DK2) is 0.57, the correlation between the importance of outsourcing (DK1) and satisfaction in outsourcing (DK3) is

0.44, the correlation between the results of outsourcing (DK2) and satisfaction in outsourcing (DK3) is 0.71. In this case, the emphasis on outsourcing is related to the outcomes of outsourcing and satisfaction in outsourcing. It is also understood that the results of outsourcing are highly correlated with satisfaction in outsourcing. The fit values obtained as a result of the analysis are given in Table 8. According to Table 8, it can be said that the compatibility of the three-dimensional model with the data is confirmed.

Table 8

*Outsourcing Fit Index Results*

| Fit Indices | Good Fit | Acceptable Fit | Calculated Value |
|---|---|---|---|
| RMSEA | $0 \leq RMSEA \leq 0.05$ | $0.05 \leq RMSEA \leq 0.1$ | 0.078 |
| CFI | $0.95 \leq CFI \leq 1$ | $0.90 \leq CFI \leq 0.95$ | 0.904 |
| $\chi^2/df$ | $< 2$ | $< 3$ | 2.535 |
| IFI | $0.95 \leq IFI \leq 1$ | $0.90 \leq IFI \leq 0.95$ | 0.905 |

Fit indices limit values (Schermelleh-Engel and Moosbrugger, 2003)

## Results and Discussion

In this study, we carried out an adaptation of a questionnaire to measure the relationship between innovation and outsourcing. We chose companies ranked on the Fortune 500 list in Turkey for analysis of the validity and reliability of the questionnaire. Exploratory and confirmatory factor analysis was performed on the data obtained from the 251 companies on this list. As a result of the exploratory factor analysis, the outsourcing scale was obtained in three dimensions. The first dimension consisted of six items, the second dimension consisted of seven items, and the third dimension consisted of seven items. The innovation scale consisted of 12 items and one dimension.

Following the exploratory factor analysis, we performed the confirmatory factor analysis to confirm the scale. As a result of the confirmatory factor analysis, it can be said that all the items in the scale represent the dimension they are related to in a meaningful way. The model fit values obtained for innovation and outsourcing are among the acceptable values. The 12-item one-dimensional innovation scale and 20-item and three-dimensional outsourcing scale can be used to measure the innovation and outsourcing of businesses and to examine the relationship between them. The low number of items in the scale facilitates applicability. We think that our study will be useful in further research related to this subject.

The scale, adapted to measure the relationship between innovation and outsourcing, can be applied in different sector groups, industrial zones, industrial chambers, and exporter unions by experts who want to research sectoral, regional, and local contexts. Since the study was carried out with the data obtained from companies operating in both the production and service sectors, it is essential in terms of its contribution to literature. We predict that the Inno-

vation-Outsourcing scale will contribute to strategic management, supply chain management, and innovation management studies with different sample groups in the future.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Conception/Design of study: Ö.Y.A., F.E.G.; Data Acquisition: Ö.Y.A., F.E.G.; Data Analysis/Interpretation: Ö.Y.A., F.E.G.; Drafting Manuscript: Ö.Y.A., F.E.G; Critical Revision of Manuscript: Ö.Y.A., F.E.G.; Final Approval and Accountability: Ö.Y.A., F.E.G.

**Conflict of Interest:** The authors have no conflict of interest to declare.

**Grant Support:** This study was supported by Pamukkale University Scientific Research Projects Unit with the PhD thesis project number 2018SOBE23.

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İSTANBUL UNIVERSITY PRESS

*Istanbul Business Research, 52*(1), 47-65
**DOI:** 10.26650/ibr.2023.52.955732
http://ibr.istanbul.edu.tr/
http://dergipark.org.tr/ibr

# Istanbul Business Research

**Submitted:** 27.07.2021
**Revision Requested:** 17.01.2022
**Last Revision Received:** 29.01.2022
**Accepted:** 14.02.2022
**Published Online:** 29.09.2022

RESEARCH ARTICLE

# The Relationship between Behavioral Tendencies and Stock Market Participation: A Study for Accounting and Finance Academics*

**Abdulvahid Çavuşoğlu[1], İbrahim Halil Ekşi[2], Ahmet Şit[3]**

**Abstract**
The purpose of this study is to identify the behavioral tendencies of accounting and finance academics in participating in the stock market and to examine the impact of these behavioral tendencies on their participation in the stock market. Behavioral finance recognizes that investors do not act rationally. Investors are influenced by behavioral trends and socioeconomic factors in addition to risk and return factors. Although there are many behavioral tendencies, the most basic behavioral tendencies recognized in the literature are risk tolerance, self-confidence, herd behavior, and anchoring tendencies. Along with the above factors, the socioeconomic factors of the participants and their participation in the stock market were also examined. The surveys, which were conducted among a total of 403 academics in the field of accounting and finance, were analyzed using logistic regression and chi-square test. As a result of the analyzes conducted in this study, it was found that there is a relationship between behavioral tendencies and 8 socioeconomic factors and participation in the stock market. Moreover, it was found that demographic variables such as age, marital status, amount of savings and years of academic experience have a significant relationship with participation in the stock market.

**Keywords**

Behavioral Tendencies, Stock Market Participation, Principal Component Analysis, Chi-Square Test, Logistic Regression Analysis

## Introduction

Traditional financial theories assume that investors act rationally in their investment decisions, that they invest while taking into account the risk/reward ratio, and that they do not consider emotional attitudes. Behavioral finance, however, assumes that investors can be influenced in their investment decisions by the environment in which they find themselves, as well as by their own feelings and thoughts, in addition to the risk-return combination. The

* This article was derived from the doctoral thesis titled "The relation between behavioral tendency and exchange participation: A research for academicians of accounting-financing science", which was prepared by Abdulvahid Çavuşoğlu under the supervision of Prof. Dr. İbrahim Halil Ekşi and Ahmet Şit at Gaziantep University Social Sciences Institute.

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**To cite this article:** Cavusoglu, A., Eksi, I. H., & Sit, A. (2023). The relationship between behavioral tendencies and stock market participation: a study for accounting and finance academics. *Istanbul Business Research, 52*(1), 47-65. http://doi.org/10.26650/ibr.2023.52.955732

awarding of the Nobel Prize in Economics to Gary Becker in 1992, to Daniel Kahneman and Vernon Lomax Smith in 2002, and to Richard Thaler in 2017 shows that behavioral finance has reached an acceptable level worldwide.

Knowledge of investor behavior in financial markets is particularly important in countries where the number of investors is insufficient. It is well known that the development of capital markets, which are an important pillar of financial markets, is directly proportional to the number of stock market participants. This fact is also reflected in the development plans of countries (Presidency of the Republic of Türkiye - Strategy and Budget Office, 2019).

Although it is well known in the literature that there are many different factors that influence the decisions of individual investors, it is accepted that the level of financial knowledge is an important determinant (Lodhi, 2014 and Gutsche et al., 2020). With this in mind, academics in the fields of accounting and finance whose financial knowledge is considered to be the highest were selected for this study.

There are several reasons why the study sample was from Türkiye. The fact that the number of individual stock market participants is small compared to the country's population, its location in a developing country, and the interest of foreign investors are the most important. The high development opportunities of the Turkish Stock Exchange - Borsa İstanbul (BIST) compared to the stock exchanges of developed countries are another source of motivation. For example, looking at the ratio of market capitalization to GDP, this ratio is 126% for the New York Stock Exchange, 92% for the Nasdaq Stock Exchange, 136% for TMX Group, 131% for Euronext (Europe) Stock Exchange, and 33% for Türkiye. This figure puts Türkiye in 32nd place in the country rankings. Additionally, the afore-mentioned development potential of BIST, Türkiye's geographical location, the dynamics of economic and foreign trade development among developing countries, large domestic and regional markets, liberal investment environment, incentives for foreign investors, and the presence of institutions such as Capital Markets Board of Türkiye (CMB) and Borsa İstanbul (BIST), which protect investors, are important. (The Investment Office of the Presidency of the Republic of Türkiye, 2021).

This study investigates whether risk tolerance, self-confidence, herding behavior, and anchoring tendency have an impact on individuals' investments in the stock market. The study also examines whether there is a relationship between individuals' socioeconomic characteristics and their participation in the stock market. To this end, a questionnaire was sent to accounting and finance academics working at public or foundation universities in different regions of the country.

The study examined the effect of behavioral tendencies on stock market participation using logistic regression analysis among 403 academics who participated in the survey. The relationship between socioeconomic variables and stock market participation was analyzed

using the chi-square test. It is expected that the results of the analysis will serve as a stimulus for regulators in Türkiye and similar developing countries. Knowing the personal and demographic characteristics of investors that influence their behavior is important for developing capital markets and increasing the number of investors.

After this introductory section , the study continues with the explanation of the scale of behavioral tendencies.

## Behavioral Tendencies

Behavioral finance theory states that irrational decisions can be effective in the investment decisions of investors. This is because people cannot be expected to always act rationally in their decisions since there are both psychological and economic characteristics (Akyıldız, 2008, p.39). For this reason, this study investigated how investors' behavioral tendencies affect their participation in the stock market. Although there are many behavioral tendency scales in the literature, the behavioral tendencies that were used as independent variables in this study and the reasons for these tendencies are listed below.

Risk tolerance is the amount of risk that the investor can directly accept within a certain or indefinite period of time, without considering whether he needs to take any precautions for the investment he prefers. In other words, it is a situation that shows how much of the potential dangers he can tolerate and how willing he is to take the necessary risk to achieve the positive part of the opportunities (Grable et al., 2008, p.7). Risk tolerance is a situation that may be preferred especially by investors who do not want to take high risk, because investors prefer to take the risks they can foresee rather than the risks they cannot foresee when making investment decisions (Boyle, Uppal & Wang, 2003; Çetiner, Gökçek & Gölbaşı, 2019). No investment has zero risk, and the investor must bear a small amount of risk compared to the investment instrument. For this reason, this scale was used to measure investors' attitude toward risk.

The fact that people believe that their predictions about the future are much higher than the actual ones and act in this sense shows that people are overconfident. In this context, individuals cannot prevent their tendency to make decisions and act without knowing that they are making irrational decisions. Even when individuals know that new information is extremely safe in some cases, they continue to make decisions by putting new information in the background because they are overconfident (Kavurmacı & Altıntaş, 2017, p. 97). In particular, when this decision-making process is continuous, investors prevent difficulties that may arise from their important and strategic steps from even being perceived, and they may make mistakes in their decisions because of their self-confidence (Lovallo & Sibony, 2006, p. 21). In this study, the self-confidence scale was chosen to investigate the selection of accounting

and finance academics as the sample and the fact that these individuals have stock market knowledge and have an impact on academics' investment behavior in their investments.

In social psychology, herd behavior occurs when investors put their own decisions and orientations in the background and follow the orientations and desires of the group to which they belong. The definition of herd behavior in the stock markets is the situation of individuals who are influenced by the market reactions and movements and make buying and selling transactions in the stock market by putting their own thoughts and feelings into the background (Ergün & Doğukanlı, 2015, p. 690). As another definition, Baddaley stated in his 2010 study that individuals follow in the footsteps of communities in situations of uncertainty and imitate them (Baddaley, 2010, p. 283). The tendency to herd behavior is divided into rational herd behavior and irrational herd behavior. In rational herd behavior, individuals consider the events and situations that have occurred in the past and act accordingly, whereas in non-rational herd behavior, individuals make the same decisions and behaviors by considering the person in front of them (Scharfstein & Stein, 1990, p. 465). While there are studies in which herd behavior is effective in investing in stocks in the countries' stock markets, this scale was included in the study to investigate whether this tendency also applies to the participants who make up the study's sample and who are knowledgeable in this area.

Humans have the need to create a point of reference when solving a problem or facing a complex situation. Based on this reference point, various estimates are made. In the last case, the initial value is established by anchoring it with the additional information. This reference point, usually determined by previous experience, is a small formulation of the problem. All these situations define the tendency of anchoring (Şenkesen, 2009, p. 237). The purpose of this scale is to test whether accounting and finance academics always prefer the same investment instruments in their investments or whether portfolio diversification is undertaken. Since the academics in the sample are aware of various investment instruments, the anchoring tendency was used to examine whether these investment instruments are preferred or not.

## Literature Review

In the literature, there are studies that analyze the relationship between the demographic characteristics of individual investors such as age, gender, marital status and their investments, such as the studies by Saraç and Kahyaoğlu (2011), Öztopçu (2016), Kesbiç and Yiğit (2016), Tekin and Cengiz (2020). Studies that analyze socioeconomic variables such as religious structures, income, investment amounts, region of residence of individuals and their participation in the stock market are the works of Ayvalı (2014), Rajamohan (2010), Lodhi (2014), Gutsche et al. (2020). Studies that examine behavioral tendencies such as risk tolerance, self-confidence, herd behavior, anchoring, and participation in the stock market are Chandra and Kumar (2011), Menike et al. (2015), Dizdarlar and Şener (2016), Dervishaj

and Xhaferi (2020), Adielyani and Mawardi (2020), Cherotich and Shiundu (2020), Akal and Kılıç (2020). Some studies from the literature are summarized below.

Duqi and Al-Tamimi (2019), Ayvalı (2014), Yeşildağ and Özen (2015), Öztopçu (2016), Dizdarlar and Şener (2016), Şamandar and Çömlekçi (2019) studied the behavior of individual investors. In this context, individual investors were preferred as samples in the studies, and a questionnaire was administered to the participants. In general, the studies in which factor analysis and chi-square test were applied concluded that individuals cannot act rationally, that they are influenced by their social environment, and that their demographic characteristics are crucial for their investment decisions.

Chandra and Kumar (2011), Shafiee Sardasht, Moradi and Rahmani (2014), Menike, Dunisinghe, and Ranasinghe (2015), Aydın and Ağan (2016), Lai (2019), Dervishaj and Xhaferi (2020), Özçelik (2018), Adielyani and Mawardi (2020), Cherotich and Shiundu (2020) distributed questionnaires to individual investors as well as to the employees of brokers and financial institutions in order to measure the behavioral factors that affect individuals' participation in the stock market, they. They concluded that herd behavior, risk tolerance, confidence in the stock market, and anchoring tendencies affect individuals' participation in the stock market.

Al-Tamimi and Kalli (2009), Rajamohan (2010), Hossain and Nasrin (2012), Yüksel (2009), Kesbic and Yiğit (2016), Cihangir, Sak, and Bilgin (2016), and Tekin and Cengiz (2020) conducted studies to identify the behavioral and socioeconomic factors that influence investors' participation in the stock market and analyzed the questionnaires they sent to individual investors and households using regression analysis and T-tests in general. They concluded that having a high level of financial education, being close to finance, having a high income, and being married all influence trading in the stock market.

Saraç and Kahyaoğlu (2011), Lodhi (2014), Farooq and Sajid (2015), Gao, Meng, and Zhao (2019), Gutsche, Wetzel, and Ziegler (2020), Akal and Kılıç (2020) conducted studies on environmental and behavioral factors and stock market participation. A survey of individual investors was conducted to test the relationship between the correlation and the least squares method, and the authors concluded that individuals who are risk takers, have a high degree of conservatism, have good social relationships, and have a high level of education have a higher propensity to participate in the stock market.

## Model and Hypotheses of the Study

The model of the study is shown in Figure-1 below.

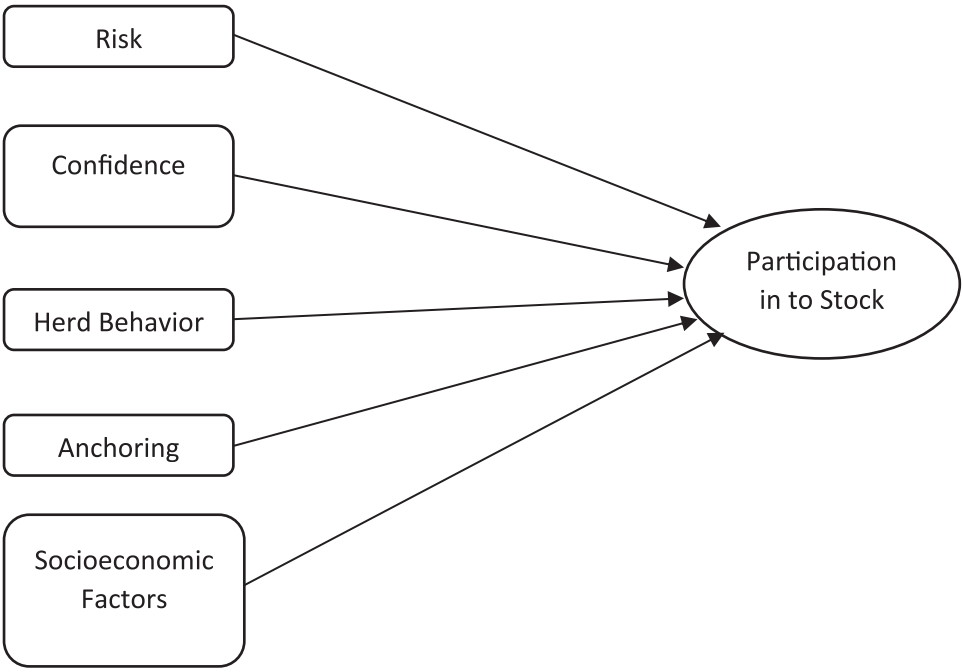


***Figure 1.*** Model of the Research

In the study, there are two types of variables: the dependent variable and the independent variable. The dependent variable is the participants' participation status in the stock market and the independent variables are the participants' risk tolerance, their self-confidence, their herding behavior, the values composed of the averages of the anchoring tendencies, and the socioeconomic variables of the individuals.

The hypotheses of the study, based on the literature, are listed below.

**H**$_1$: Risk tolerance has a statistically significant effect on stock market participation.

**H**$_2$: Self-confidence has a statistically significant influence on participation in the stock market.

**H**$_3$: Herding behavior has a statistically significant influence on participation in the stock market.

**$H_4$**: Anchoring tendency has a statistically significant influence on participation in the stock market.

**$H_5$**: There is a statistically significant relationship between gender and participation in the stock market.

**$H_6$**: There is a statistically significant relationship between age and participation in the stock market.

**$H_7$**: There is a statistically significant relationship between marital status and participation in the stock market.

**$H_8$**: There is a statistically significant relationship between the amount of savings and participation in the stock market.

**$H_9$**: There is a statistically significant relationship between years of academic experience and participation in the stock market.

## Research Population and Sample

The population of this study consists of accounting and finance academics working at YOKSIS in February 2021. YOKSIS is a publicly accessible academic information infrastructure system that stores information about students and transmits the data of graduates and active students of all universities. The accessibility of the sample is important for the applicability of the study. For the survey, academics were contacted through their email addresses registered in YOKSIS, and those who did not have registered email addresses were reached through their universities' official websites. The online surveys were conducted among 2372 accounting academics and 2160 finance academics, and 403 responses were received. In this context, the population of the survey is 4532 people. The sample is the entire population. The reason why the survey was conducted among academics is that their income level is high, since investments depend on savings and savings depend on income. The reason why the survey was conducted among academics in accounting and finance is that they have mastered the theoretical part of the subject through academic studies and lectures/seminars on the stock market. As for the level of financial literacy, the group most likely to participate in the stock market is the sample of the survey. The survey questions were sent online to the academic or personal email addresses of the academics in the study population.

The scale for the study was created by combining 4 factors under the headings of risk tolerance, self-confidence, herd behavior, and anchoring that had previously been tested for reliability and validity in measuring behavioral tendencies related to individuals' decisions not to invest. Both the 3-item and 5-item risk tolerance questions in the scale are from Salem's (2019) risk tolerance scale, , the 4-item herding behavior questions are from Adielyani and Mawardi's (2020) herding behavior scale, and the 6-item anchoring questions are from Elrabeey's (2018) anchoring scale.

## Methodology

The answers given by academics of the Department of Accounting and Finance to the questions asked in the questionnaire were analyzed by principal component analysis, reliability test, logistic regression analysis and finally chi-square test.

The study used principal component analysis to reduce each scale, which consisted of 18 questions to participants, to a single value. The rotation method used was the Varimax method, one of the vertical rotation methods. The Varimax method is not only the most commonly used rotation method, but also the only method that can be used to determine factor coefficients (Nakip, 2003, p. 413). Kaiser-Meyer-Olkin (KMO) and Barlett tests were applied to test the suitability of the data for factor analysis. The technique is widely used in the literature against the dependence structure between variables (Joliffe, 2002, p. 167) and the multicollinearity problem (Ersungur, Kızıltan, & Polat, 2007, p.57).

Chi-square test is a test based on whether the difference between observed frequencies (OF) and expected frequencies (EF) is statistically significant (Last, 2001, p.29).

Logistic regression is the method of analysis used when there is at least one independent variable and the dependent variable is categorical. In the study, logistic regression analysis was considered appropriate to code the status of participation in the stock market as 0 and 1, that is, the dependent variable had a categorical structure. In this way, the effect of four independent variables, which are behavioral tendencies, on participation in the stock market is analyzed.

Logistics Regression is written as below (Bircan, 2004, p. 189):

$$= \pi(x)\left[\frac{exp(\beta_{0+}\,\beta_1\,X}{1+exp(\beta_{0+}\,\beta_1\,X}\right]$$

This equation can also be expressed as:

$$\pi(x) = [1 + exp\,(-\beta_0 - \beta_1\,X]^{-1}$$

Transforming the conditional mean is for linearization with the parameters included in the model (βo+β1).

$$L = ln\left[\frac{P_i}{1-P_i}\right] = \beta_{1+}\beta_2\,X_i + u_i$$

Logistic regression occupies an important place in the analysis of categorical data because it is more effective when other types of regression are considered. The greatest common denominator of logistic regression, which has many similar structures to multiple regression and discriminant analysis, with discriminant analysis is that its dependent variables have a categorical structure (Çokluk, 2010, p. 1360).

## Findings

In this part of the study, the results related to the analysis of the survey responses are presented. The frequency values indicate the percentage of descriptive, i.e. demographic, characteristics of the academics participating in the survey. The frequency values of the survey responses are presented in Figure 1.

Table 1
*Frequency and Percentage Distribution of Participant Demographics*

| **Variables** | **Groups** | **F** | **%** |
|---|---|---|---|
| Gender | Female | 159 | 39.5 |
| | Male | 244 | 60.5 |
| Age | 24 and below | 39 | 9.7 |
| | 25-34 | 77 | 19.1 |
| | 35-44 | 170 | 42.2 |
| | 45-54 | 71 | 17.6 |
| | 55 and above | 46 | 11.4 |
| Maritial Stuation | Single | 129 | 32 |
| | Married | 274 | 68 |
| Amount of Monthly Savings | 0 TL | 20 | 5 |
| | 500 TL and less | 70 | 17.4 |
| | 501-2000 TL | 123 | 30.5 |
| | 2001-5000 TL | 97 | 24.1 |
| | 5001 TL and more | 93 | 23 |
| Academical Experience | 0-5 years | 102 | 25.3 |
| | 6-10 years | 97 | 24.1 |
| | 11-20 years | 109 | 27 |
| | 21 years and above | 95 | 23.6 |
| Stock Exchange Participation | Yes | 181 | 44.9 |
| | No | 222 | 55.1 |

When we examine the frequency distributions of the demographic variables in the study, we find that the responses are generally evenly distributed. In this context, we find that the number of those who invest in the stock market and those who do not are close, that the socioeconomic status of the respondents is balanced, and that both the analysis of the study and the results of the logistic regression analysis can provide healthier results.

## Test and Results Of Principal Component Analysis

In the study, the questions on risk tolerance, self-confidence, herd behavior, and anchoring tendencies were reduced to one factor for each independent variable, and a score was created for each independent variable.

A rotated component matrix was created to determine which factor the questions were strongly correlated with. As a result of the principal component analysis, the 4th and 5th questions of the self-confidence factor and the 2nd, 4th, and 5th questions of the anchoring factor were excluded from the analysis because they loaded on more than one factor and the factor loadings were low. In the last case, 4 factors were found to be consistent with the model.

The factor analyzing process results of Behavioral Tendencies are as below:

Table 2

*KMO and Barlett's Tests*

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Sample Efficiency Scale | | .746 |
| Barlett's Spherical Test | Chi-Square | 1433.074 |
| | SD | 78 |
| | P | .000* |

** It refers to the relationship at the 1% significance level.*

Since Bartlett's test was significant at the 0.01 level and the KMO test was greater than 0.6, it was decided that the data were suitable for factor analysis (Kulcsár, 2010, p.153).

According to the factor analysis of the behavioral tendency scale, the first factor explained 18.92% of the total variance, the second factor explained 16.33% of the total variance, the third factor explained 14.67% of the total variance, and the fourth factor explained 13.29% of the total variance. It was found that all factors explained 63.22% of the total variance.

In this part, reliability analyzes of the factors created for the survey questions were conducted.

Table 3

*Reliability Analysis*

| **Factors** | **Question (N)** | **Cronbach's Alpha** |
|---|---|---|
| Herd Behavior | 4 | .788 |
| Self Confidence | 3 | .776 |
| Risk Tolerance | 3 | .678 |
| Anchoring | 3 | .601 |

As shown in Figure 3, the herd behavior factor in the scale is about 79%, the self-confidence factor is about 78%, the risk tolerance factor is about 68%, and the anchoring factor is about 60% reliability. These values are considered quite sufficient in terms of reliability in the social science field (Hair et al., 1998, p.118).

## Logistics Regression Tests and Findings

After determining that the assumptions of the logistic regression analysis were met, the analysis was started. Participation in the stock market, which is the dependent variable, was

coded as "yes=1" and "no=0". The first step of the logistic regression analysis results is the comparison of the classification tables. The classification results of steps 0 and 1 are shown in Figure 4.

Table 4

*The Classification Results of the 0th and 1st Phases*

| **Observed** | | | **Prediction Participating in the Stock** | | |
|---|---|---|---|---|---|
| | | | **Yes** | **No** | **True %** |
| Step 0 | Participating in the Stock | Yes | 181 | 0 | 100.0 |
| | | No | 222 | 0 | 0 |
| | | Total | | | **44.9** |
| **Observed** | | | **Prediction Participating in the Stock** | | |
| | | | **Yes** | **No** | **True %** |
| Step 1 | Participating in the Stock | Yes | 119 | 62 | 65.7 |
| | | No | 41 | 181 | 81.5 |
| | | Total | | | **74.3** |

Step 0 in Figure 4 shows the precision of this estimate assuming that all participants answered yes in the original model without the added independent variables. Step 1 shows the rate at which the independent variables correctly predict the values of the dependent variable. While the estimate in Step 0 was 44.9%, the estimation rate of the independent variables was 74.3%. This situation is an indicator of the fit of the model because the independent variables increase the predictive power of the original model by 29.4%.

Figure 5 shows the values of the initial model of the study.

Table 5

*Values of Starting Model*

| | **β** | **S.H.** | **Wald** | **SD** | **Sig.** | **Exp (β)** | **-2 Log The independent likelihood** |
|---|---|---|---|---|---|---|---|
| Stable | .204 | .100 | 4.157 | 1 | .041** | 1.227 | 424.916[a] |

-2 LogLikelihood Value of Step 1:554.498[a]

In Figure 5, the independent variables were not included in the analysis. Before proceeding with the logistic regression analysis, one can see the improvement that occurs when the independent variables are added to the model by looking at the -2 log likelihood (LL) value in the initial model and the -2 LL value in the final state using the following method (Field, 2013, p. 324).

$$X^2 = 2\left[Log\ Likelihood_{(NEW)} - Log\ Likelihood_{(BEGINING)}\right]$$

$$sd = K_{(NEW)} - K_{(BEGINING)}$$

As can be seen in Figure 5, the value -2 LL decreased from 554,498 to 424,916 in the first case, which is an indicator of the goodness-of-fit of the model (Arıkan, 2015, p. 7).

Goodness-of-fit tests are also used to evaluate the fit of the model. The results of the score test, the omnibus test, and finally the results of the Hosmer & Lemeshow test from the goodness-of-fit tests are shown in Figure 6 below.

Table 6
*Adaptation Benefit Test Results*

| Test | $x^2$ | Sd | P |
|---|---|---|---|
| Score Test | 111.597 | 4 | .000 *** |
| Omnibus Test | 129.582 | 4 | .000 *** |
| Hosmer & Lemeshow Test | 10.438 | 8 | .236 |

The critical values at the *** 1% levels of significance.

If the score test yields a significant result ($p < 0.01$), it means that the predictive power of the model increases when the independent variables that were not included in the model are then added (Çokluk, 2010, p. 1384). In this context, it can be interpreted that the inclusion of independent variables in the model strengthens the model.

The significant result of the omnibus test indicates that the model with the independent variables is stronger than the original model and that there is a statistically significant relationship between the dependent variable and the independent variables (Çokluk, 2010, p. 1386).

If the result of the omnibus test is less than 0.01, it means that the model with the independent variables is stronger than the model in the first case and that there is a statistically significant relationship between the dependent variable and the independent variables.

When the Hosmer & Lemeshow test, which examines logistic regression analysis as a whole, is meaningless, it is interpreted to mean that there is a good fit between the model and the data. Accordingly, the Hosmer & Lemeshow test is greater than 0.05, which means that it is considered meaningless. In general, it can be concluded that the predictive power of the model is increased by the independent variables, that there is a significant statistical relationship between the dependent variable and the independent variables, and finally that the data and the model have a good fit.

In the final stage of the logistic regression analysis, the regression coefficients and the significance levels of the coefficients are examined to make evaluations. Figure 7 shows the values of β, standard error and Wald statistics. β; When the regression coefficients of the independent variables are reported, the negative sign of the coefficient means that the probability of participating in the exchange is coded as 0, and the positive sign means that the probability of not participating in the exchange, which is coded as 1, has an effect on the probability of realization. The Wald statistic is used to test the significance of the regression coefficients of the independent variables. It is obtained by dividing the β-coefficients of the independent variables by the standard error and squaring ( $(\frac{\beta}{S.H})^2$). Another value in the figure is the Exp (β)-value. The Exp (β)-value indicates the odds ratio calculated for each independent variable. In other words, it measures the change in odds ratio when the independent variable changes by

one unit. It is interpreted that in cases where the Exp (β) value is greater than 1, it increases the probability that the predicted situation will occur, and in cases where it is less than 1, it increases the probability that the predicted situation will not occur (Field, 2013, p.337).

Table 7
*The Coefficient Predictions of Logistics Regression Model*

| **Exp (β) %95 Confidence Interval** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Variables** | **B** | **S.H.** | **Wald** | **SD** | **p** | **Exp(β)** | **Lower Limit** | **Upper limit** |
| Herd Behavior | -.944 | .155 | 37.227 | 1 | .000* | 2.569 | 1.897 | 3.479 |
| Self Confidence | .573 | .151 | 14.496 | 1 | .000* | .564 | .420 | .757 |
| Risk Tolarance | .845 | .144 | 34.596 | 1 | .000* | .430 | .324 | .569 |
| Anchoring | .584 | .210 | 7.712 | 1 | .000* | .558 | .369 | .842 |
| Stable | 3.778 | .962 | 15.415 | 1 | .000* | 43.720 | | |

**Indicates the level %1 of significant relation.*

According to Figure 7; since the herding behavior, self-confidence, risk tolerance, and anchoring factors, i.e., the β-values of the independent variables, were significant at the 0.01 level, they were found to have an effect on the dependent variable of whether or not to participate in the stock market. According to this result, hypotheses H1, H2, H3 and H4 are accepted.

Looking at the coefficient values of the variables, we find that a 1-unit increase in the "herd behavior" factor has a 0.94 impact on the non-participation status; a 1-unit increase in the "self-confidence" factor has a 0.57 impact on the participation status in the stock market; a 1-unit increase in the "risk tolerance" factor has a 0.84 impact on the participation status in the stock market.

Looking at the Exp (β)-values in Figure 7, a 1-unit increase in herding behavior increases the probability of not participating in the stock market by 156.9% ((2.569-1)*100) compared to the probability of participating in the stock market. A 1 unit increase in self-confidence increases the probability of participating in the stock market by 43.6% compared to the probability of not participating. A 1-unit increase in risk tolerance increases the probability of participating in the stock market by 57% compared to the probability of not participating. A 1 unit increase in anchoring tendency increases the probability of participating in the stock market by 44.2% compared to the probability of not participating.

Table 8
*R2 Values of the Model*

| | |
|---|---|
| Cox&Snell $R^2$ | .275 |
| Nagelkerke $R^2$ | .368 |

The Cox & Snell R2 and Nagelkerke R2 values indicate how much of the variance in the dependent variable in the model is explained by the independent variables. An R2 value of 1 means that the fit is perfect and the explanatory power is high. The interpretation of Hair et al. (2014) should be based on the Nagelkerke R2 value. Because the Nagelkerke R2 value is $0<R2<1$. According to Figure 8, the Cox & Snell R2 value of the model was 0.275 and the

Nagelkerke R2 value was 0.368. It is recommended to interpret the Nagelkerke value (Hair et al., 2014, p.164). Accordingly, the explanatory power of the independent variables was reported to be 36.8%.

In this section, the socioeconomic questions asked of survey participants and their participation in the stock market were analyzed using the chi-square test, and the results of the analysis are presented below.

Table 9

*Chi-Square Test Findings*

| Variables | Yes | | No | | $x^2$ | p | F Value |
|---|---|---|---|---|---|---|---|
| | n | % | n | % | | | |
| **Gender** | | | | | | | |
| Female | 69 | 38.1 | 90 | 40.5 | 0.244 | 0.621 | 71.41 |
| Male | 112 | 61.9 | 132 | 59.5 | | | |
| **Age** | | | | | | | |
| 24 and below | 37 | 20.4 | 2 | 0.9 | 48.689 | 0.000 *** | 17.52 |
| 25-34 | 29 | 16 | 48 | 21.6 | | | |
| 35-44 | 59 | 32.6 | 111 | 50 | | | |
| 45-54 | 33 | 18.2 | 38 | 17.1 | | | |
| 55 and above | 23 | 12.7 | 23 | 10.4 | | | |
| **Maritial Stuation** | | | | | | | |
| Single | 69 | 38.1 | 60 | 27 | 5.639 | 0.018** | 57.94 |
| Married | 112 | 61.9 | 162 | 73 | | | |
| **Amount of Monthly Saving** | | | | | | | |
| 0 TL | 1 | 0.6 | 19 | 8.6 | 19.938 | 0.001*** | 8.98 |
| 500 TL and less | 42 | 23.2 | 28 | 12.6 | | | |
| 501-2000 TL | 51 | 28.2 | 72 | 32.4 | | | |
| 2001-5000 TL | 44 | 24.3 | 53 | 23.9 | | | |
| 5000 TL and more | 43 | 23.8 | 50 | 22.5 | | | |
| **Experience Years** | | | | | | | |
| 0-5 years | 56 | 30.9 | 46 | 20.7 | 10.924 | 0.012** | 42.67 |
| 6-10 years | 31 | 17.1 | 66 | 29.7 | | | |
| 11-20 years | 49 | 27.1 | 60 | 27 | | | |
| 21 years and above | 45 | 24.9 | 50 | 22.5 | | | |

The critical values at the *** 1% and ** 5% levels of significance.

To evaluate the results of the chi-square analysis, the number of cells with an expected value below 5 should not exceed 20% of the total number of cells in the crosstab. In other words, the expected value should be 5 or more in 80% of the cells. In this analysis, the number of cells with an expected value of less than 5 is zero.

Examination of the table shows that there is no statistical relationship between gender and participation in the stock market. In this case, hypothesis H5 was rejected. There is a statistical relationship between age and participation in the stock market at the 1% level of significance ($p < 0.05$). In this case, hypothesis H6 was accepted. While participation in the stock market

tends to decrease in the age group from 24 to 34, participation in the stock market increases in the age group from 35 to 44, and thereafter participation in the stock market tends to decrease in the different age groups. There is a statistical relationship at the 5% level of significance between marital status and participation in the stock market. In this case, hypothesis H7 was accepted. It can be concluded that the marital status of the participants has an impact on spending/saving, which in turn has an impact on investing. There is a statistical relationship at the 1% level of significance between monthly savings and participation in the stock market ($p < 0.05$). In this case, hypothesis H8 was accepted. There is a statistical relationship at the 5% level of significance between years of academic experience and participation in the stock market ($p < 0.05$). In this case, hypothesis H9 was accepted. It can be seen that the experience in the professional life of the survey participants has an impact on participation in the stock market. From these results, it can be concluded that the participants can earn higher income if they work longer and they can participate in the stock market with higher income. Based on these results, hypothesis H5 was rejected and all other hypotheses were accepted.

## Conclusion

Behavioral finance assumes that people do not act rationally in their investment decisions and that both personality traits and behavioral tendencies play a role in decision making. Although there are many behavioral tendencies in the literature, the behavioral tendencies that most influence people are risk tolerance, self-confidence, herd behavior, and anchoring tendencies. In addition, people's socioeconomic characteristics are also known to influence their participation in the stock market. In this context, the study examined the relationship between behavioral tendencies and participation in the stock market. Saving for investment and income for saving must be at a certain level. For this study, academics were selected as the sample based on their income status. Academics from accounting and finance were chosen based on their proximity to the stock market. Accordingly, this study examined the effects of four behavioral tendencies and socioeconomic factors on stock market participation among those who participated and those who did not. The behavioral tendencies and participation in the stock market were analyzed using logistic regression analysis, and the socioeconomic factors were analyzed using the chi-square test.

The results of the study show that all four behavioral tendencies have an impact on stock market participation. Looking at the coefficient values of the variables, we find that a 1-unit increase in the "herd behavior" factor leads to a 0.94 increase in non-participation in the stock market. Again, we find that a 1-unit increase in herd behavior increases the probability of not participating in the stock market by 156.9% relative to the probability of participating. Accordingly, we would expect participants who do participate in the stock market to discard their herd behavior tendencies and benefit from technical analysis and methods in areas where they are deficient in the stock market. This will increase the participation of individuals in the stock market and contribute to the further development of the capital markets.

It turns out that a 1-unit increase in the self-confidence factor increases the status of participation in the stock market by 0.57, while a 1-unit increase in the self-confidence level increases the probability of participation in the stock market by 43.6%, compared to the probability of non-participation in the stock market. Despite the fact that individuals are experts in their field, due to the low level of participation in the stock market, it will be beneficial to increase the number of stock market participants by conducting various studies and attending training about the stock market so that people who are not part of the research universe will gain confidence. More information will increase investor confidence. This will also have an impact on participation in the stock market.

It is observed that a one-unit increase in the risk tolerance factor increases participation in the stock market by 0.84, while a one-unit increase in risk tolerance increases the probability of participating in the stock market by 57%, compared to the probability of not participating in the stock market. This suggests that individuals with high risk tolerance tend to participate more in the stock market. Therefore, to increase the number of retail investors, investors should build a portfolio and minimize their potential losses.

It can be seen that a 1-unit increase in the anchoring factor increases the status of participation in the stock market by 0.58, while a 1 unit increase in the anchoring tendency increases the probability of participation in the stock market by 44.2% compared to the probability of non-participation in the stock market. In this regard, investors will find it easier to achieve the expected return on their investment in the stock market if they do not keep their investment analysis static, but constantly review it, are open to other ideas on the subject, and apply various analysis techniques. In this way, it is expected that investors' participation in the stock market will be higher.

In examining the relationships between socioeconomic factors and participation in the stock market, it was found that there was a statistically significant relationship between individuals' age, marital status, monthly savings, and academic experience and participation in the stock market. In addition, no statistically significant relationship was found between gender and participation in the stock market. In accordance with the studies in the literature, an increase in participation in the stock market was observed as the age of the individuals increased. In addition, the relationship between the monthly savings amount and participation in the stock market showed a result consistent with the notion that investment depends on savings and savings depends on income. There was also a relationship between participants' theoretical knowledge of the stock market based on their professional status and the increase in their experience and participation in the stock market.

In this regard, according to the analyzes in the study Öztopçu (2016), Gutsche et al. (2020), in conjunction with the work of Cherotich and Shiundu (2020), Rajamohan (2010), Farrell (2011), Cihangir et al. (2016), partly similar to the studies of Adielyani and Mawardi (2020),

Shafiee Sardasht et al. (2014), Ayvali (2014), Farooq and Sajid (2015) have obtained opposite results. To improve the study, new results could be obtained by finding out people's opinions about participation in the stock market and their reasons for not participating in the stock market. These future studies could be conducted through personal interviews instead of surveys.

**Peer-review:** Externally peer-reviewed.
**Conflict of Interest:** The authors have no conflict of interest to declare.
**Grant Support:** The authors declared that this study has received no financial support.
**Author Contributions:** Conception/Design of study: A.Ç., İ.H.E., A.Ş.; Data Acquisition: A.Ç., A.Ş.; Data Analysis/Interpretation: İ.H.E., A.Ç.; Drafting Manuscript: İ.H.E., A.Ş.; Critical Revision of Manuscript: İ.H.E., A.Ş.; Final Approval and Accountability: A.Ç., İ.H.E., A.Ş.

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*Istanbul Business Research, 52*(1), 67-85
**DOI:** 10.26650/ibr.2023.52.806695
http://ibr.istanbul.edu.tr/
http://dergipark.org.tr/ibr

# Istanbul Business Research

**Submitted:** 06.10.2020
**Revision Requested:** 22.02.2022
**Last Revision Received:** 07.03.2022
**Accepted:** 17.03.2022
**Published Online:** 29.11.2022

RESEARCH ARTICLE

# Retaining Employees through Organizational Social Climate, Sense of Belonging and Workplace Friendship: A Research in the Financial Sector

**Elif Bilginoğlu[1], Uğur Yozgat[2]**

**Abstract**

This paper examined the impact of organizational social climate on employees' sense of belonging, its impact on employees' intention to leave as well as the moderating effect of workplace friendships on this relationship. Using a convenient sampling method on financial sector employees working in Istanbul, Turkey, a survey was conducted. A total of 403 employees were surveyed. The findings of this study revealed that organizational social climate is positively associated with sense of belonging, while organizational social climate, sense of belonging and workplace friendship are negatively associated with intention to leave the organization. According to the findings, the workplace friendship moderates the relationship between sense of belonging and intention to leave. This paper demonstrated that social interactions in the workplace play a vitally important role in employees' intentions to leave the organization. This contributes to conceptual understanding of the job embeddedness theory, which suggests that the relationships are one of the key factors that keep individuals in organizations. This paper highlighted the potential for employee turnover to directly / indirectly arise from the employees' sense of belonging, social climate and workplace friendships acquired in the organization.

**Keywords**

Organizational Social Climate, Sense of Belonging, Workplace Friendship, Intention to Leave, Turnover Intention

## Introduction

In today's world, work has a central and a very important role in the life of an individual. The social dimension of work involves individuals in interaction with one another. It is hard to imagine a job that does not require interaction with people. Considering that most adults spend more than one-third of their waking lives there, except the members of one's family, few individuals are more a part of one's everyday life than those with whom one works (Bryson and MacKerron, 2015; Chiaburu and Harrison, 2008). A place becomes meaningful regarding the individual's relations with other people there, and the sense of community created by these social relations (Gustafson, 2001). Many organizations are taking concrete steps

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**To cite this article:** Bilginoglu, E., & Yozgat, U. (2023). Retaining employees through organizational social climate, sense of belonging and workplace friendship: a research in the financial sector. *Istanbul Business Research, 52*(1), 67-85. http://doi.org/10.26650/ibr.2023.52.806695

to develop a social work climate and foster workplace friendships where their importance is obvious. Pfeffer (2006) suggests that longer-term employment is characterized by more community-like companies where workplace friendships were highly valued. If the social climate of the organization leads the employees to feel a psychological connection to the organization and a sense of belonging, these interactions may improve as the employees form more workplace friendships, thus reinforcing their organizational sense of belonging. Employees who prefer to be a part of an organization in which they have friends and to which they feel a sense of belonging, may be less likely have an intention to leave.

The finance sector plays a vital role for the achievement of continuous economic growth in any country. The employees in this sector tend to be more qualified and the sector relies heavily on highly skilled labor. The experts working in the finance sector are professionals whose work keeps the organizations competitive in a global economy marked not only by recession and global crisis, but also by disruptive technology and emerging markets. Hence, in today's business world, a competent finance professional is an invaluable asset to the organization. Regarding the increasing global need for finance professionals around the world in times of recession and global crisis, the demand for their services is increasing daily (D'Abate and Eddy, 2007). Hence financial organizations are aware of the importance of human resource departments. Although the key skills of recruiting and hiring used to be the only business skills of human resources, today's human resources department involves more than that. They now know that soft skills can be as important as technical skills in an employee recruitment and hiring process. They also look after the well-being of all employees. Research reveals that employees want to see a greater focus on emotional as well as physical well-being in their organizations (Global Talent Trends Study, 2018).

The focus of organizational psychology is on social interactions and how they affect the individual and the functioning of the organization (Cascio, 2015). Social identity theory suggests that individuals define their own identities regarding the social groups in which they act (Tajfel, 1982). Job embeddedness theory suggests that relationships have a key role in keeping individuals in organizations (Mitchell et al., 2001). Applying the social identity theory (Tajfel, 1982), employees who feel a belongingness to their organizations are more likely to make workplace friendships. Whilst highly embedded individuals who have a high sense of group identity have many links not only to their organizations, but also to the organizational community, previous research revealed, with the help of job embeddedness theory, that social networks influence turnover (Mossholder et al., 2005). Therefore, this study attempts to explore the importance of the social side of the organization with the help of a survey that examines the impact of organizational social climate on the sense of the employees' belonging. Furthermore, the impact of the sense of belonging on intention to leave and moreover the moderating effect of workplace friendships on this relationship are analyzed in the findings.

There is only a small amount of research in human resource management which addresses the social and human side of financial organizations. This paper, which mainly considers organizations as social structures, has highlighted the potential for employee turnover to directly / indirectly arise from the employees' sense of belonging, social climate and the workplace friendships acquired in the organization.

## Literature Review

### Social Climate

Halpin and Croft (as cited in Anderson, 1982: 369) emphasizes "*Personality is to the individual what climate is to the organization".* The set of characteristics describing an organization that distinguishes it from others, referred to as organizational climate, are relatively enduring over time and influence the behavior of people in the organization (Forehand and von Haller Gilmer, 1964). Climate, which is a variable that is both in the heads of organizational members and an attribute of the setting (Schneider et al., 2000), is seen as organizations and individual's joint property (Ashforth, 1985).

Another definition for social climate is *"the collective set of norms, values and beliefs that express employees' views of how they interact with one another while carrying out tasks for their firm"* (Collins and Smith, 2006: 547). Wilkinson (1973) uses social climate and social atmosphere synonymously, where Bennett (2004: 906-907) uses social climate synonymously with *"psychological climate"* and *"social context".*

According to the theoretical specification of Murray's suggestion, social environments being significant determinants of behavior is seen as the origin of the social climate concept (Moos, 1997; Moos and Holahan, 2004; Wright, 1993). Since the beginning, with Lewin et al. discussion of *"social climates"* has been used for prediction of many important individual and organizational outcome variables (as cited in Parker et al., 2003). This resulted in numerous applications of the climate concept towards business and industry (Schneider et al., 1996).

Work environments exist as social and psychological structures, as well as tangible and physical structures (Allen et al., 2004; Rugulies, 2019). These social environments, which have important consequences for individual and group behavior (as cited in Wright, 1993), encompass many elements of a social system. Climates of work environments must be described within this context (Flarey, 1993).

### Sense of Belonging

In both Maslow's (1954) hierarchy and in McClelland's (1987) important motive systems, belonging is identified as a basic human need. An individual needs to belong to a community

in which he knows people, in which he is known by them, and in which his own relationship is anchored (Drucker, 2007). Hence, belonging is essential for an individual's well-being (Lambert et al., 2013; Libbey, 2004).

Videbeck's (2011: 123) sense of belonging definition is *"the feeling of connectedness with or involvement in a social system or environment of which a person feels an integral part."* It is a personal experience which evolves in response to feeling secure, accepted, included, and valued by a group and thus, the individual feels connected with them and reflects a professional or harmonious personal relationship between oneself and them (Levett-Jones and Lathlean, 2008: 104).

The sense of belonging, which is an awareness that others care, and that the individual, in turn, has a responsibility to care for others, is affected by collectively negotiated understandings of who we are, what we stand for and who gets excluded as the other (May, 2013).

For humans, who are highly social creatures, a sense of belonging is comforting because it conveys an understanding of completeness and at the same time, it increases security and decreases anxiety. To meet this need, a healthy community or set of other possibilities must exist and be accessible to individuals (Leiter, 2013). The preconditions for belonging are friendship, open communication, and mutual respect (Giacalone and Jurkiewicz, 2010). Personal acceptance, respect, feeling as being a part and others' support in the workplace creates the feeling of workplace belongingness (Cockshaw and Shochet, 2010: 284).

The strength of the workplace relationships referring to an employee's experience of the organization community, which includes the organizational setting and the interactions that take place therein (Booker, 2016: 218) affect the sense of belonging of the individuals in an environment (Winter-Collins and McDaniel, 2000).

The workplace serves as a kind of community within which many individuals experience *"a real sense of belonging"* (Estlund, 2003: 28) which can develop into an organization's competitive advantage (Onurlubaş et al., 2015). In a similar vein, Jaitli and Hua (2013) claim that as companies grow in size and become more globally dispersed, they continue to be a crucial concern for organizations, while Pembroke (2004) mentions it's a fundamental importance for each and every employee.

The sense of belonging is often referred to as the perceived social climate (Juvonen, 2006). Since the organizational social climate is a contributing factor to the sense of belonging of the employees. This study proposes the following hypothesis:

$H_1$*: Organizational social climate is positively associated with the sense of belonging.*

## Intention to Leave the Organization

Tett and Meyer (1993: 262) defined intention to leave as *"a conscious and deliberate willfulness to leave the organization"* and Werbel and Bedeian (1989: 275) as *"perceived probability to continue or terminate employment."*

Turnover intention has a potential to imply a major and permanent change in one's working life (George and Jones, 1996). Therefore, employees go through a precise evaluation process before their withdrawal decision (Mobley, 1977).

According to the behavioral intentions focused theory (Fishbein and Ajzen, 1975), intention to perform is the best predictor of an individual's behavior. As Ajzen (1991: 181) states *"the stronger the intention to engage in a behavior, the more likely should be its performance"* is a general rule. The intention to leave has been acknowledged by many studies as an important antecedent of actual turnover (Lane et al., 1990; Lee and Mowday, 1987; Mobley et al., 1978; Michaels and Spector, 1982; Prestholdt et al., 1987; Steel and Ovalle, 1984, Vandenberg and Nelson, 1999). Furthermore, the intention to leave is based more on individuality being controllable compared to turnover (Shore and Martin, 1989). For these reasons, the intention to leave an organization is chosen as the dependent variable of this study.

As Çitlioğlu (2008: 13) claims, *"Isolating people from their sense of belonging means cutting the roots, which are the arteries connecting them to life."* Since employees having an organizational sense of belonging may be less likely to change their jobs, fostering this commitment may therefore present a way to improve employee retention and reduce their intention to leave. Therefore, the following hypothesis is proposed.

*$H_2$: There is a negative relationship between the sense of belonging and intention to leave the organization.*

## Workplace Friendship

In the Fundamental Interpersonal Relations Orientation Theory introduced by Schutz (1958), he asserts that people need people, and besides this , man is a social being who requires the support and companionship of others throughout life (Bruhn, 2009).

Work settings provide coworkers with not only frequent dyadic contact together, but also travelling, commuting, lunches, as well as work breaks with each other (Marks, 1994); these make them share common occupational interests and experiences which extend beyond the professional boundary line. Thus, it is regarded as a natural incubator for personal relationships (Sias and Gallagher, 2009). Work settings are increasingly becoming our main crucibles for making friends, as neighborhood and community ties weaken (Shellenbarger, 2000). The immediate family context is followed by the social group formed by colleagues at work (Stewart as cited in Chadsey and Beyer, 2001) as the most important social network among the adults (Björkqvist et al., 1994; Gruneberg, 1979).

Today, we spend more time with our coworkers compared to our friends and consequently, the development of non-work friendships opportunity is reduced (Riordan and Griffeth, 1995). *"So why not make friends at work?"* (Forck, 2011: 71). Workplace friendships constitute the most ubiquitous and powerful informal relationships in an organization (Sias and Gallagher, 2009). Workplace friendships, which go beyond normal, work-related interactions (Ofoegbu et al., 2012) are defined as *"non-romantic, voluntary, and informal relationships between current coworkers that are characterized by communal norms and socioemotional goals"* (Pillemer and Rothbard, 2018: 637).

Workplace friendships differ from non-work relationships with the option to converse about work-related issues (Fritz, 1997), and from other non-work relationships in primary ways in which the leading one is voluntariness. Although almost no employees have the opportunity and/or the right to choose their coworkers, they do have the right to decide with which friends to be surrounded by (Boyd and Taylor, 1998; Sias and Gallagher, 2009).

As the findings of previous research reveal, those with an orientation to the need of belonging tend to establish more close relationships (Pillow et al., 2015) and findings of various studies reveal that many people stay because of their workplace friendships (e.g., Asgharian et al., 2013; Morrison, 2004) and attachments they have to their community (Mitchell et al., 2001). In this respect, the following hypothesis is proposed.

*$H_3$: Workplace friendship moderates the relationship between sense of belonging and intention to leave.*

## Research Method

### Proposed Model

The conceptual model based on the literature review and theoretical and logical grounds was developed indicating the hypothesized relationship between organizational social climate and sense of belonging, sense of belonging and intention to leave, and the moderating role of workplace friendship. Intention to leave is depicted as the dependent variable, sense of belonging is the independent variable, and workplace friendship is shown as the moderating variable. The conceptual model is demonstrated in Figure 1.

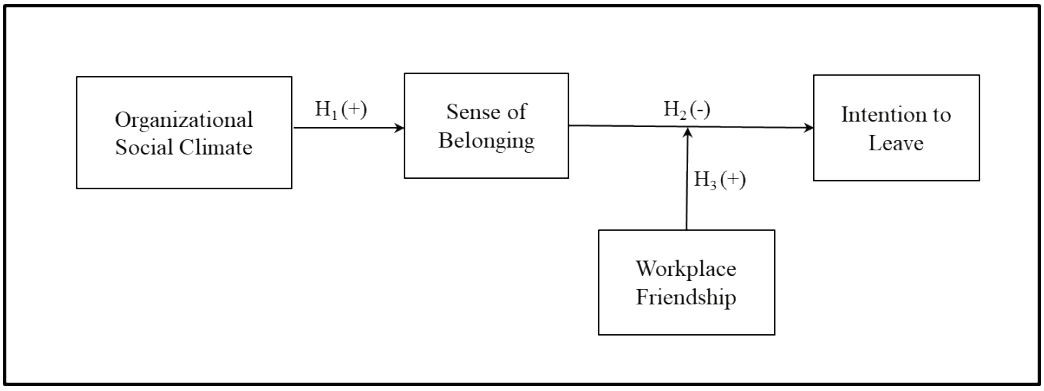


***Figure 1.*** Conceptual model and hypotheses.

## Sample Design

The study was conducted in Istanbul, Turkey using a convenient sampling method on employees in the financial sector. The participants of the financial sector worked for organizations that provide banking, insurance, and investment services and their involvement was voluntary. The first pretest of the questionnaires was done by 45 employees; however, there was a need for some wording changes. The second pretest was completed by 30 employees and there was no need to change the questionnaires that had been distributed to 500 employees in envelopes. The final count was 403 (80.6 %) questionnaires were completed and returned in closed envelopes. Of these, semi-filled questionnaires were deleted and 387 (77.4 %) remained for analysis. Ethics committee permission was granted for this study by Nişantaşı University Ethics Committee with the decision dated 30.12.2021 and numbered 2021/20. The obtained data were analyzed with SPSS and LISREL statistical package programs.

The sample consisted of 235 (60.7 %) women and 152 (39.3 %) men. The respondents' mean age was 31.67 (SD: 6.25) with an average tenure of 9.68 years (SD: 6.28) in the current position or sector. The education background of the participants varied from elementary school to doctorate level, in addition, 341 (88.2 %) held an undergraduate or higher degree.

## Measures

Organizational social climate was measured using the 9-item questionnaire adapted by Çetin (2009) from the measure developed by Litwin and Stringer (1968) which includes the separate dimensions of conflict, identity, responsibility, reward, risk, standards, support, and warmth. All items for each dimension were measured with a six- point scale ranging from 1 (totally disagree) to 6 (totally agree). A sample item is *"A friendly atmosphere prevails in this organization."* Cronbach's alpha value of the organizational climate measure is .920, with a 4.14 mean and 1.03 standard deviation.

Sense of belonging is measured using the 3-item questionnaire developed by Hurtado and Carter (1997). *"I see myself as a part of the organization community"* is one of the items. Cronbach's alpha value of the sense of belonging measure is .980, with a 4.26 mean and standard 1.53 deviation.

Nielsen et al.'s (2000) 6-item questionnaire was used to measure the workplace friendship as the original scale consisted of 2 dimensions and 12 items. The measure contains 6 items measuring the friendship opportunity dimension whereas the other 6 items measure the friendship prevalence dimension. In line with the aim of this study, only the friendship prevalence items were used, one example being *"I have formed strong friendships at work."* Cronbach's alpha value of the workplace friendship measure is .909, with a 4.48 mean and 1.25 standard deviation.

Blau's (1989) 3-item questionnaire was used to measure the employees' intention to leave, with one of the items listed being *"I am thinking of quitting this job."* Cronbach's alpha value of the intention to leave measure is .949, with a 2.48 mean and 1.37 standard deviation.

## Results

To control for common-method bias, all the items of all variables were entered in an exploratory factor analysis (EFA) to test the original-single-factor. Where eigenvalues of four factors varied between 2.69 and 5.12 (all > 1.00), 74.44 % of the total variance was explained and no single factor emerged, it was concluded that no threat could be posed by common - method bias (Podsakoff et al., 2003).

For determination of the reliability of the scales, Cronbach's alpha values (varies between .909 and .980, Table 1) and validity of the exploratory factor analysis was used. The factor analysis placed organizational social climate (OSC), sense of belonging (SoB), workplace friendship (WpF), and intention to leave (ItL) under one factor. Two items of organizational social climate and one item of sense of belonging were removed due to low communalities.

The discriminant validity of our four variables was examined using Lisrel. The hypothesized model demonstrated a reasonably good fit to the data: $\chi 2$ (129) = 493.68, $\chi 2/df$ = 1.28, RMSEA = .08, GFI = .90, CFI = .95, NFI = .93, SRMR = .047. After examination of several alternative measurement models, the best fitting one was chosen. All the factor loadings for the indicators on the latent variables were significant at 0.001 level.

According to the answers of the respondents, workplace friendship had the highest mean value (4.48), followed by sense of belonging (4.26) and organizational social climate (4.14). Where six-point-Likert type scales were used, the results showed that workplace friendship and sense of belonging were high, also organizational social climate was perceived as being good. Moreover, the mean value of intention to leave (2.48) was low, which could be seen as a good sign for their organizations (Table 1).

Table 1

*Means, Standard Deviations, Cronbach's Alpha Coefficients, And Correlations*

| Variables | *M* | *SD* | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| **1 Organizational Social Climate (OSC)** | 4.14 | 1.03 | (.920) | | | |
| **2 Sense of Belonging (SoB)** | 4.26 | 1.53 | .358*** | (.980) | | |
| **3 Workplace Friendship (WpF)** | 4.48 | 1.25 | .371*** | .032 | (.909) | |
| **4 Intention to Leave (ItL)** | 2.48 | 1.37 | -.403*** | -.478*** | -.298*** | (.949) |

Note: Values on the diagonal represent Cronbach's alpha coefficients.

*** p <0.001 (two-tailed tests); N=387.

Organizational social climate had a significant positive bivariate correlation with sense of belonging (r = .358***) and workplace friendship (r = .371***), where organizational social climate, sense of belonging and workplace friendship had negative bivariate correlations with intention to leave (r = -.403***; r = -.478***; r = -.298***). Bivariate correlation is reported in Table 1.

Multi-collinearity was tested using the variance inflation factor (VIF) values. Where values ranged from 1.28 to 1.52, multi-collinearity threat was avoided (Hair et al., 1995; O'Brien, 2007).

To test Hypotheses 1 and 2, regression analyses were applied. Model 1 takes only control variables into consideration; the main effect variable was added in Model 2. A positive relationship between organizational social climate and sense of belonging (β = .358***) was found. Thus, Hypothesis 1 was supported.

Table 2

*Hierarchical Regression Analysis Results*

| Variables | Sense of Belonging | | Intention to Leave | |
|---|---|---|---|---|
| | Model 1 β | Model 2 β | Model 3 β | Model 4 β |
| **Control variables** | | | | |
| Age | -.024 | .053 | .020 | .023 |
| Gender | -.103* | -.103* | .057 | .010 |
| Education | -.067 | -.046 | .042 | .009 |
| Tenure | -.021 | .057 | .055 | .045 |
| **Main effect variable** | | | | |
| Organizational Social Climate (OSC) | | .358*** | | |
| Sense of Belonging (SoB) | | | | -.478*** |
| $R^2$ | .011 | .139 | .012 | .228 |
| $\Delta R^2$ | .011* | .128*** | .012 | .216*** |

Notes: *p<0.05, ** p <0.01, *** p <0.001

Model 3 had only control variables whereas Model 4 included the main effect variable sense of belonging. It was found that the sense of belonging and intention to leave (β = -.478***) relationship was negative which supported the second Hypothesis ($H_2$).

The hypothesized moderation effect of the workplace friendship on the relationship between sense of belonging and intention to leave was analyzed based on the methodology of Cohen et al. (2003): the main effects were added stepwise in Models 5 - 7, and the interaction term multiplication of the two main effects sense of belonging and workplace friendship were added in Model 8. The control variables were excluded where no significant effect was found in Model 3 (Table 3).

Table 3

*Summary of Hierarchical Regression Analysis of Variables Predicting Intention to Leave*

| Variables | Model 5 β | Model 6 β | Model 7 β | Model 8 β |
|---|---|---|---|---|
| **Main effect variables** | | | | |
| Organizational Social Climate (OSC) | -.403 | -.266*** | -.176*** | -.167** |
| Sense of Belonging (SoB) | | -.383*** | -.408*** | -.153* |
| Workplace Friendship (WpF) | | | -.219*** | -.009 |
| **Interaction variables** | | | | |
| SoB*WpF | | | | -.356*** |
| $R^2$ | .160 | .286 | .326 | .332 |
| $\Delta R^2$ | .160*** | .126*** | .040*** | .006** |

Notes: *p<0.05, ** p <0.01, *** p <0.001

In Model 8 *R*-squared, change was analyzed in order to demonstrate moderation effect; while controlling main effect variables, the interaction variable was added to the model. Where change in *R*-squared was statistically significant ($\Delta R^2 = .006^{**}$), it proved the significance of the interaction variable (Cohen et al., 2003). The moderating effect of workplace friendship on the relationship between sense of belonging and intention to leave was also significant ($\beta = -.356^{***}$) which supported the third Hypothesis ($H_3$).

The presentation of the moderating effect of workplace friendship is shown graphically (Figure 2). It shows that the sense of belonging with intention to leave relationship is negatively independent from the level of workplace friendship, whether that be high or low.

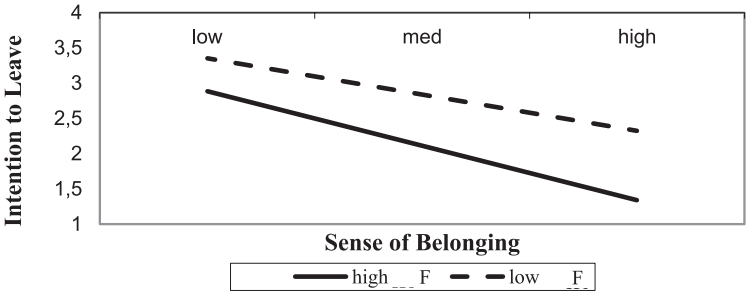


***Figure 2.*** The moderating effect of workplace friendship on the relationship between sense of belonging and intention to leave.

Employees having a higher level of workplace friendship had a lower level of intention to leave at all the levels of sense of belonging. Moreover, the decrease of the level of intention to leave was higher for employees who had a higher level of workplace friendship compared to a lower level (Figure 2).

## Conclusion

Throughout the study it was evident that the organizational social climate had a significant positive relationship with sense of belonging and workplace friendship, whilst organizational social climate, sense of belonging and workplace friendships had negative relationships with intention to leave the organization.

Pfeffer (2005) states that how employees of an organization work remains as a crucial, differentiating factor of competitive success where other factors lose their importance. Considering the negative impacts that turnover has on an organization (Mowday et al., 1982), it is important for organizations to understand the elements that have an impact on the employee's intention to leave the organization. Organizations that are seeking to decrease turnover rates should implement effective human resource management policies in order to retain their employees. When the variables that affect the employees' intentions to leave the organization are determined, the organizations may retain the talented potential to the competitive advantage of the employees contributing to the organization.

The findings which show a positive relationship between organizational social climate and sense of belonging are consistent with the claim of Juvonen (2006) that the sense of belonging often refers to the social climate of organizations. These findings also support the results of the study of Lampinen et al. (2018) which revealed that social relationships including openness, mutual trust, respect and appreciation foster a sense of belonging among colleagues in an organization.

The findings which show a positive relationship between organizational social climate and workplace friendships are consistent with the claims of Mao et al. (2012: 249) that workplace friendship relationships have to be encountered in a social environment within work organizations.

The findings also reveal a negative relationship between sense of belonging and intention to leave. The major force for the intention to stay in the organization may be an affective attachment to the organization so that employees who have a great sense of belonging to the organization are less likely to leave. These findings are consistent with the arguments of Meyer and Allen (1991) who claim that affectively committed employees continue to work in an organization because they want to do so.

The findings also suggest that workplace friendship has a moderating effect on the relationship between sense of belonging and intention to leave. It is consistent with the findings of the study of Morrison (2004), who theorized that workplace friendship has a negative relationship with turnover, and also with the findings of the studies of Ozbek (2018) which reveal that workplace friendships decrease turnover intention, Riordan and Griffeth (1995) which indicate that employees' perceptions of friendship opportunities in the workplace have direct effects on intention to turnover and Asgharian et al.'s (2013) study findings where respondents indicated that they would consider leaving the organization if they no longer had friendships in the workplace and added that they have stayed at their jobs longer than anticipated due to the friendships they have made with the other employees.

Furthermore, the findings suggest that the employees who have a higher level of workplace friendship have a lower level of intention to leave at all the levels of sense of belonging. Also, the decrease in the level of intention to leave is higher for employees who have a higher level of workplace friendship compared to a lower level.

These findings give organizations an idea on what to require in recruiting. The findings suggest that the social side of the organization constituted an important consideration for employers when recruiting and hiring new employee,s so by recruiting and hiring, they should be aware of the importance of social skills as well as the core business skills, work experience and knowledge.

According to this study's findings, it appears that an individual's perception of the overall organizational social climate is a good predictor of his/her sense of belonging. The findings also reveal that workplace friendships, which play a significant part in many people's lives, also play a significant part in their organizational lives. These findings suggest that organizations should do their best to promote a social organizational climate. This is critical because human resources work today involves more than the recruiting, hiring and compensation of employees because employees are now demanding that organizations should pay attention to social problems and look after their well-being.

This study involves conceptual, empirical and practical arguments on why organizations need to focus on their social dimensions, in order to further improve organizational excellence in today's competitive business environment. The researchers suggest that the organizations focus more on practical issues, which can directly contribute to improving the quality of the relationships in a working context. In an organization, when a social climate is fostered and the feelings of friendship and a sense of belonging are improved, the reduced turnover intentions become a byproduct.

Although, it appears clear from this study that the social climate of the organization, the sense of belonging of the employees and the workplace friendships predicts the employees'

intention to leave the organization, there is still a poor understanding of the consequences of these behaviors. There appears to be several additional consequences of the social climate of the organizations that have yet to receive research attention.

## Limitations and Future Research

This study focused on the role of organizational social climate, sense of belonging and workplace friendship among the employees of one industry in one city only, that is, the financial sector in Istanbul, Turkey (Limitation 1). Therefore, extreme caution should be exercised in claiming generalizability of the results. Replication studies in other regions of Turkey and other countries among financial sector employees as well as other industries would broaden the database for further generalizations. Data was obtained from respondents using self-reports (Limitation 2). To overcome this potential problem issue in following research, supervisory and peer ratings should be assessed.

Since feeling a sense of belonging is the essence of organizational commitment (Meyer and Allen, 1991; Mowday et al., 1982; van Dyne and Pierce, 2004), it is suggested by the researchers that any future research should be directed at the proposed linkage between organizational social climate, organizational commitment and workplace friendship relationship or the organizational social climate, organizational identification and workplace friendship relationship.

However, it is important to recognize that the sense of belonging of employees is not only related to the general social environment. Rather, there are also other components in the organizational social climate of an organization. These components may be both individual and organizational. These components should also be regarded in future research.

**Acknowledgements:** We would like to thank Rebecca Ogun, the Director of the Arkin University of Creative Arts and Design English Preparatory School, for proofreading our paper.
**Peer-review:** Externally peer-reviewed.
**Conflict of Interest:** The authors have no conflict of interest to declare.
**Grant Support:** The authors declared that this study has received no financial support.
**Author Contributions:** Conception/Design of study: E.B.; Data Acquisition: E.B.; Data Analysis/Interpretation: U.Y.; Drafting Manuscript: E.B.; Critical Revision of Manuscript: U.Y.; Final Approval and Accountability: E.B., U.Y.

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## Questionnaire

**Socio-demographical aspects**

1. Please indicate your gender.
2. Please indicate your age.
3. Please indicate your tenure.
4. Please indicate your educational attainment.

**Organizational Social Climate** (developed by Litwin and Stringer, 1968 and adapted by Çetin, 2009)

1. A friendly atmosphere prevails in this organization.
2. It is very difficult to understand people in this organization.
3. People in this organization are cold and distant to each other.
4. In this organization people do not trust each other.
5. In this organization the relationship between superiors and subordinates is quite sincere.
6. Everyone in this organization criticizes each other.
7. Interpersonal relations in this organization are warm and sincere.
8. There is a significant sense of unity among employees in this organization.
9. Cooperation, sharing and cooperation play an important role in the relations between the employees in this organization.

**Sense of Belonging** (developed by Hurtado and Carter, 1997)

1. I see myself as a part of the organization community.
2. I feel that I am a member of the organization community.
3. I feel a sense of belonging to the organization community

**Workplace Friendship** (developed by Nielsen, Jex and Adams, 2000)

1. I have formed strong friendships at work.
2. I have social activities with coworkers outside of work.
3. I can share my secrets with my coworkers.
4. I feel I can trust many of my coworkers.
5. Being able to see my coworkers is one reason why I look forward to my job.
6. I do not feel that anyone I work with is a true friend. (reverse question)

**Intention to Leave** (developed by Blau, 1989)

1. I am thinking of quitting this job.
2. I intend to search for a different job.
3. I intend to quit this job.

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*Istanbul Business Research, 52*(1), 87-106
**DOI:** 10.26650/ibr.2023.52.955629
http://ibr.istanbul.edu.tr/
http://dergipark.org.tr/ibr

# Istanbul Business Research

**Submitted:** 23.06.2021
**Revision Requested:** 22.12.2021
**Last Revision Received:** 17.03.2022
**Accepted:** 21.03.2022
**Published Online:** 23.10.2022

RESEARCH ARTICLE

# The Mediation Role of Supply Chain Practices and Logistics Integration on the Effect of Lean Supply Chain Strategy on Operational Performance

**Elif Gilanlı[1], Onur Çetin[2]**

**Abstract**

Supply chain strategy is the determinant of supply chain management (SCM) and product flow efficiency in the market. Lean supply chain strategy (LSCS), which is based on lean practices in production and supply chain, is a strategy that aims to prevent waste and increase efficiency. Although some studies in the literature examine the relationship of many elements of supply chain management with supply chain performance (SCP), and others examine the correlation of many lean manufacturing elements with performance, studies examining the LSCS-SCP relationship is limited. In addition, the number of studies examining the relationship of LSCS with supply chain practices and logistics integration (LI), as well as the number of studies examining LSCS, supply chain practices, LI, and SCP is much more limited.

The research aims to examine the effect of LSCS on the supply chain practices which consists of customer relations (CR) and strategic supplier relations (SSR) and the LI as well as, based on these variables, the effect of LSCS on SCP. Data were obtained from 294 companies in the manufacturing sector through questionnaires. A structural equation model, including LSCS, supply chain practices, LI, and SCP, was tested for the first time. In conclusion, the mediating effects of CR, SSR and LI was emphasized to be important in the impact of LSCS on SCP.

**Keywords**

Supply chain management, Structural eguation modeling, Supply chain strategy, Confirmatory factor analysis

## Introduction

SCM which includes all businesses and flows from the first raw material manufacturer to the final consumer, has become a significant competition issue in recent years. Therefore, manufacturing companies have effectively included the SCM concept in the operations to reduce costs and improve service qualities for many years (Stank et al., 2001). It is a fact that competition is not between businesses but between supply chains (Lambert & Cooper, 2000). The supply chain has started to attract attention in academic fields and industry since the 1980s. SCM has become strategic for businesses and handled with a strategic perspective.

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**To cite this article:** Gilanli, E., & Cetin, O. (2023). The mediation role of supply chain practices and logistics integration on the effect of lean supply chain strategy on operational performance. *Istanbul Business Research, 52*(1), 87-106. http://doi.org/10.26650/ibr.2023.52.955629

Depending on this strategic perspective, supply chain strategy (SCS) deals with decisions, such as purchasing the raw material, transporting them to the company, providing the product manufacturing or service operation, ensuring products' distribution and follow-up to the customer, and in or out-sourcing the process of these transactions. These decisions are generally long-term decisions about supply chain design (Chopra & Meindl, 2007:20). There are some classifications related to supply chains that can also be examined in terms of SCS. Supply chains can be categorized as efficient and reactive (Chopra & Meindl, 2007). Another classification is performed as the lean strategy that focuses on waste reduction, the agile approach that focuses on quick response, and the lean-agile method, a mixture of both (Sharma & Kulkarni, 2016). It can be said that effective supply chains and lean supply chains include similar strategies. LSCS is defined as reducing the customer order and product delivery times, eliminating or reducing the factors causing production waste (Bhasin & Burcher, 2006). Agile supply chain strategy focuses on customer satisfaction and quickly responding to changing customer demands (Waters, 2003: 34).

The Lean-Agile supply chain is a system that combines the advantages of simplicity and agility (Ambe, 2014). The aim is to increase product diversity and efficiency together (Ramana et al., 2016).

There is extensive literature on the relationship between SCS and several dimensions of performance. Direct effects of SCS on SCP (Agarwal et al., 2006; Qi et al., 2009, Çiçekdağı, 2019) on firm performance (Çalışkan et al., 2016) are reported in the literature. Besides, indirect effects of SCS on SCP (Sun et al., 2009; Othman et al., 2012; Sukwadi et al., 2013; Ambe, 2014; Qrunfleh & Tarafdar, 2014; Rahimnia et al., 2014), on firm performance (Qi et al., 2011; Akçi, 2012; Qrunfleh & Tarafdar, 2014) on organizational performance (Jajja et al., 2013), on operational performance (Zhang & Qi, 2013), on financial performance (Qi, Huo et al.; 2017) are stated in the literature.

There are variables such as supply chain practices (Othman et al., 2012) and supply chain integration (SCI) (Qi, Huo, et al., 2017) in the indirect effect of SCS on performance. While supply chain practices include concepts such as CR and SSR, SCI coordinates the flows by ensuring their integrations within the chain (Krajewski, Ritzman, & Malhotra, 2013:356).

SCS focuses on business process integration along the value chain to provide optimum value to the end customer (Qrunfleh & Tarafdar, 2013). While SCI is classified as internal integration, supplier integration, customer integration (Ellinger et al., 2015; Kim, 2009), another classification type is information integration and logistics integration. One of the SCI-related elements is logistics integration (LI). The LI stands for specific logistics practices and operational activities that control the outward flow of value and material from supplier to customers (Prajogo & Olhager, 2012).

SCS includes taking strategic decisions about supply chain practices and SCI (Qrunfleh & Tarafdar, 2013). There are limited numbers of studies in the literature on the relationships between SCS, supply chain practices, and performance (Othman et al., 2012; Qrunfleh, 2010; Qrunfleh & Tarafdar, 2013). There are studies in the literature on the effects of SCS on supply chain practices and supply chain integration, the effect of supply chain practices on Supply chain performance (SCP) (Sundram et al., 2011), and the effect of LI on SCP (Prajogo & Olhager, 2012).

However, the number of studies examining the relationships between supply chain practices, SCI, and performance is limited (Ahmad & Saifudin, 2014; Kim, 2009; Kim, 2006). Studies examining the relationships between LSCS, supply chain practices (SSR and CR), LI, and SCP as a whole have not been found in the literature. Therefore, the research questions were formed as follows:

- Does LSCS affect SCI?
- Does LSCS affect SSR and CR?
- Does LSCS directly affect operational performance?
- Have SCI and supply chain practices mediation role on the effect of LSCS on performance?

This research examines the relationships between SSR, CR, LI and LSCS and the effects of these variables on performance. The data was collected using survey method. Convenience sampling method is applied. The obtained data were analysed with exploratory factor analysis, Confirmatory factor analysis, and Structural equation modelling (SEM) methods.

## Definition of Concepts

### LSCS

With the competitive conditions getting harder, companies today adopt a cost-oriented management approach to gain market advantage, preferring to reduce their costs in production for goods offered to the market. Customers don't want to pay for non-value-adding things and evaluate these operations as an extravagance. The lean manufacturing philosophy is based on excluding the activities that do not create value for the customer (Turan &Turan, 2019). Lean manufacturing is characterized as reducing the customer-order-time and product-delivery time by eliminating wasteful resources in the production flow (Bhasin & Burcher, 2006).

SCS means a set of approaches that integrate suppliers, manufacturers, warehouses, and stores to produce and distribute products at the right time, at the right place, at the right qu-

ality, to minimize the cost and increase the level of satisfaction (Qrunfleh & Tarafdar, 2013). The lean supply chain has resulted from the relationship between quality and cost factors that affect competitiveness (Konecka, 2010). LSCS focuses on quality improvement in the supply chain to eliminate waste, aims to create cost-effectiveness in the supply chain with effective inventory management (Qrunfleh & Tarafdar, 2013).

### SCI

SCI is divided into two as information integration and LI. LI means special logistics applications and operational activities that control the material flow from the supplier to the customer with the outward value flow (Prajogo & Olhager, 2012).

## Supply Chain Practices

### SSR

Supply chain practices are composed of SSR, CR, information sharing, information quality, lean applications and postponement (Li, Rao, et al., 2005; Qrunfleh, 2010). This research focuses on two of these applications; SSR and CR.

SSR is the long-term relationship between the suppliers of the organization. This relationship is designed to leverage participant organizations' strategic and operational capabilities to help them achieve significant benefits (Li, Rao, et al., 2005). SSR not only purchases goods and services from suppliers but also affects suppliers' systems and operational capabilities, adds value to goods and services, and improves the performance of the entire supply chain (Qrunfleh, 2010: 33).

### CR

CR includes the activities carried out by employees to provide customer acquisition, increase customer satisfaction, establish long-term relationships with customers, ensure customer loyalty and develop different products than competitors (Li, Rao, et al., 2005). CR activities include the relationship not only with customers but also with suppliers and service providers (Alshurideh et al., 2019)

### SCP

Today, with the effect of globalization, the perception of competition of enterprises is changing. Businesses try to gain a competitive advantage by managing performance well (Acar, 2010; Onay & Kara, 2009). Gunasekaran et al. (2001) defined SCP as overall efficiency and effectiveness of the supply chain. Gunasekaran et al. (2001) analysed SCP in three

dimensions; strategic, tactical and operational. Operational dimensions of SCP should contain are customer service and ability to responding change (Van Hoek, 1998; Beamon, 1999). Flynn et. al. (2010) measured SCP as operational performance and business performance.

## Research Method

### Research Purpose

In the literature, the relationships between SCS, supply chain practices, and performance (Othman et al., 2012; Qrunfleh, 2010; Qrunfleh & Tarafdar, 2013), between SCS, integration, and performance (Qi, Huo et al., 2017), between supply chain practices, integration, and performance (Ahmad & Saifudin, 2014; Kim, 2009; Kim, 2006) were examined. However, no study was found that investigated the relationships between LSCS, SSR and CR, LI, and SCP as a whole. This study aims to analyse the effects of LSCS, SSR, CR, and LI on SCP.

The research model created by conducting domestic and foreign literature research comprises valid and reliable scales suitable for the research purpose. According to the research model, the dependent variables are SSR, CR, LI, and SCP, and the independent variable is LSCS. The research model of this study can be seen in Figure 1.

The models and hypotheses developed for the research are as follows:

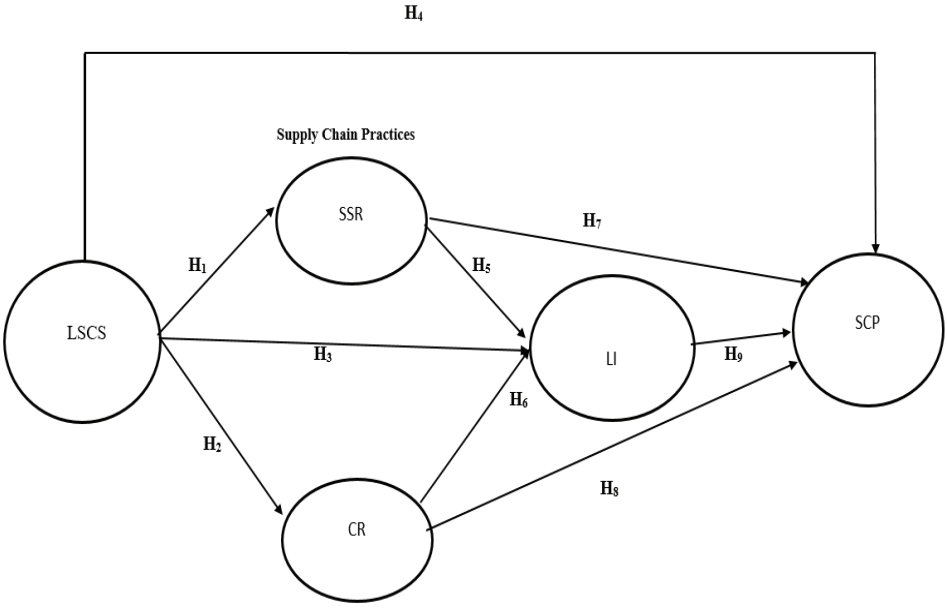


***Figure 1.*** Research model

Qrunfleh (2010) states that LSCS has a significant relationship with SSR. Accordingly, the following hypotheses were suggested:

$H_1$: LSCS affects SSR.

$H_2$: LSCS affects CR.

In their study, Qrunfleh, Tarafdar & Nathan (2012) stated no direct effect between supply chain strategies and LI. However, Parast & Spillan (2014) found a positive relationship between logistics/supply chain strategy and LI/SCI in their study. Accordingly, the following hypothesis was proposed:

$H_3$: LSCS affects LI.

It is stated that supply chain strategies increase SCP and firm performance in the Qrunfleh study (2010), and LSCS does not have a significant positive effect on SCP in the Sukwadi, Wee and Yang study (2013). Othman et al. (2012) reported a significant impact between the SCP responsiveness of the LSCS and the SC responsiveness of the LSCS. Although there is no direct relationship between the SCS and performance, they stated that the effect increases with the mediation relationship of the supply chain practices. Accordingly, the following hypothesis was introduced:

$H_4$: LSCS affects SCP.

Kim (2009) has declared a positive relationship between supply chain practices and SCI in his work. Furthermore, Kim (2006) states a positive relationship between supply chain practices and SCI in small-scale enterprises and a negative relationship in large-scale enterprises. Accordingly, the following hypotheses were suggested:

$H_5$: SSR affects LI.

$H_6$: CR affects LI.

Sukwadi and Saifudin (2014) have found that SSR does not have a direct effect on SCP. Ahmad and Saifudin (2014) have found that supply chain practices do not directly impact SCP, but there is a relationship between supply chain practices and SCP through the mediating effect of LI. Qrunfleh (2010) has discovered a positive, significant relationship between SSR and SCP and that the harmony of supply chain practices improves SCP and firm performance. Sundram et al. (2011) have found that supply chain practices significantly impacts SCP. Othman et al. (2012) have found that there is a relationship between supply chain strategies and SCP when supply chain practices are the mediator variables. Gharakhani et al. (2012) have stated that supply chain practices positively affect innovation and corporate performance. Li, Nathan et al. (2006) have found that high levels of supply chain practices increase organizational performance. Accordingly, the following two hypotheses were proposed:

$H_7$: SSR affects SCP.

$H_8$: CR affects SCP.

Li, Yang et al. (2009) have stated that SCI positively impacts SCP through to the mediating effect of information technology. Moshkdanian & Author (2013) have found a forceful and positive relationship between LI and SCP, while Prajogo and Olhager (2012) have found a positive relationship between LI and performance. Osei (2017) has stated that a positive, significant relationship between internal and external integration also positively significantly affects business performance. Accordingly, the following hypothesis was suggested:

$H_9$: LI affects SCP.

## The Sample

The population consists of enterprises with ten or more employees operating in the manufacturing sector in Edirne, Tekirdağ, and Kırklareli. Manufacturing sector is selected as lean manufacturing practices are more common in manufacturing sector. The survey method was utilized in the study. Since it was impossible to achieve the entire universe, a sample collection method from the main population was preferred. A total of 294 businesses were reached. The respondents were firm owners, general managers, plant managers and department managers as they have sufficient knowledge to answer the questions. 280 of the obtained questionnaires could be used. There are different approaches for determining the number of samples. According to Child (2006), the sample size should be five times the number of statements. According to Kline (1994), sample size should be at least twice and preferably ten times the number of items. In this study, since the number of statements was 24, the 280 samples were sufficient as it exceeds ten times the statement number. Participants in the study were selected with the non-random convenience sampling method.

## Measurement

The questionnaires are developed in light of previous literature studies. A five-part questionnaire is prepared through the literature examination. A pilot study is conducted before starting the actual survey. The pilot questionnaire ensured us to make some corrections and changes to increase the consistency and comprehensibility between the statements. The data is collected by face-to-face surveys between June 2017 and May 2018.

The scales used in this study were obtained from the literature. The LSCS scale developed by Qi, Boyer & Zhao (2009), including seven statements, is used to measure the LSCS. Five LI statements are obtained from Prajogo & Olhager (2012). The scale developed by Tarafdar & Qrunfleh (2017) is used to measure the SSR and CR variables. SCP statements are obtained from Flynn, Huo & Zhao's (2010) research. They measure SCP as operational performance and business performance. In this research operational performance items of Flynn, Huo & Zhao's (2010) is used to measure SCP. Although the operational performance scale comprised six statements, one was excluded from the study because it was not intelligible for the

participants in the pilot study, and the current SCP scale consists of five statements. Each statement is tested with a 5-point Likert scale. Some statements used for measurement are "The products offered to our customers are standard and impossible to personalize", "The distribution of incoming and outgoing products is in integration with suppliers", "We measure and evaluate customer satisfaction" and "Order delivery time is short in our supply chain". The last part covered the statements about determining the demographic characteristics of the companies. Ethics committee approval of this study was received from Trakya University Social and Human Sciences Research Ethics Committee under the permission number 2017.05.03 dated 10.05.2017.

## Findings

According to the findings of the research; while 31.1% of the enterprises taking part in the research were in the food sector, 25% are in the textile sector, and the rest are in other sectors. 68.2% of the enterprises are 21 years old or more, 11.1% are between 16 and 20 years, 6.4% are between 11 and 15 years, 6.4% are between 6 and 10 years, and 7.9% are between 1 and 5 years. In terms of the number of employees, 38.2% are medium-sized enterprises (50-249 employees), 33.2% are large-scale enterprises (250 or more employees), 28.6% are small-scale enterprises (10-49 employees). Classification according to number of employees are conducted using KOSGEB classification (https://www.kosgeb.gov.tr). 85% of the enterprises participating in the research are full-national capital enterprises, 8.2% are full-foreign capital enterprises, 2.9% are national-capital-dominated enterprises, 2.5% are foreign capital-dominated enterprises, and 1.4% are half-domestic half-foreign capital enterprises. Of the business managers participating in the research, 45.7% are department managers, 22.5% are business managers, 16.4% are business owners/partners, and 15.4% are other managers.

## Exploratory Factor Analysis and Reliability Analysis

Exploratory factor analysis, Confirmatory factor analysis, and SEM methods are used in the research. First, the dataset is checked for normal distribution. In this study, the LI2, CR1, SCP3, SCP5 kurtosis values in the scale are above 2, however skewness and kurtosis values of the other variables are between +2 and -2. If the values are within this range, the data are considered normally distributed (George & Mallery, 2016:114). Therefore, the data could be said normally distributed.

The result of the Kaiser-Meyer-Olkin (KMO) test used to evaluate the suitability of the data set for factor analysis was 0.811. As a result of the factor analysis, the statements are grouped under five factors.

Some items on the scale were excluded because of cross-loading on other factors. Particularly, LSCS2, LSCS3, LSCS5 items were removed from the LSCS scale. In previous studies,

items related to this scale were also removed for these reasons (Qi, Boyer & Zhao, 2009). The result of exploratory factor analysis is seen on Table 1 which demonstrates Cronbach's α and Average Variance Explained (AVE) as well. While factor loadings in the scale were generally between 0.515 and 0.722 in the LSCS, the lowest was 0.704, and the highest was 0.881 in other scales. According to Table 1 Cronbach's α values are between 0,528 and 0,805. Cronbach's α value more than 0.6 can be regarded as a satisfactory reliability (Malhotra & Birks, 2000: 307). The only factor with a Cronbach's α value under 0.6 is LSCS (0,528) which is very close to 0,6.

Tablo 1

*Rotation Sums of Squared Loadings*

| | Items | LSCS | LI | Supply Chain Practices | | SCP | Initial Eigenvalues | Variance Explained (%) |
|---|---|---|---|---|---|---|---|---|
| | | | | SSR | CR | | | |
| LSCS1 | Our supply chain supplies predictable products. | 0.717 | | | | | | |
| LSCS4 | Our supply chain provides customer with standardized products | 0,612 | | | | | | |
| LSCS6 | Our supply chain selects the suppliers based on their performance on cost and quality | 0.515 | | | | | 1.491 | 9.896 |
| LSCS7 | Our supply chain structure seldom changes | 0.722 | | | | | | |
| LI1 | Inter-organizational logistic activities are closely coordinated. | | 0.704 | | | | | |
| LI2 | Our logistics activities are well integrated with suppliers' logistics activities | | 0.802 | | | | | |
| LI3 | We have a seamless integration of logistics activities with our key suppliers | | 0.855 | | | | 5.642 | 18.965 |
| LI4 | Our logistics integration is characterized by excellent distribution, transportation, and/or warehousing facilities | | 0.774 | | | | | |
| LI5 | The inbound and outbound distribution of goods with our suppliers is well integrated | | 0.740 | | | | | |
| SSR2 | We solve problems jointly with our suppliers | | | 0.855 | | | 1.122 | 8.531 |
| SSR3 | We introduce our key suppliers in our planning and goal-setting activities | | | 0.791 | | | | |
| CR2 | Measure and evaluate customer satisfaction | | | | 0.854 | | | |
| CR3 | Determine future customer expectations | | | | 0.881 | | 1.667 | 13.504 |
| CR4 | Facilitate customers' ability to seek assistance from us | | | | 0.775 | | | |

| | Items | LSCS | LI | Supply Chain Practices | | SCP | Initial Eigenvalues | Variance Explained (%) |
|---|---|---|---|---|---|---|---|---|
| | | | | SSR | CR | | | |
| SCP1 | Our company can quickly respond to changes in market demand. | | | | | 0.776 | | |
| SCP2 | Our company can quickly modify products to meet our major customer's requirements. | | | | | 0.828 | | |
| SCP3 | Our company can quickly introduce new products into the market. | | | | | 0.757 | 1.895 | 14.755 |
| SCP4 | The lead time for fulfilling customers' orders (the time which elapses between the receipt of customer's order and the delivery of the goods) is short. | | | | | 0.724 | | |
| **Cronbach's Alpha** | | 0.528 | 0.877 | 0.698 | 0.873 | 0.805 | | |
| | | | | 0.752 | | | | |

These values showed that all of the scales were reliable enough for this study.

## Confirmatory Factor Analysis

In testing the structural equation models, goodness-of-fit evaluation criteria are taken into account. The factors are found to be statistically significant because the p values of the factors were $p<0.05$. Confirmatory factor analysis criteria taken into account and the criteria values obtained after Confirmatory factor analysis are shown on Table 2.

Table 2

*Generally Accepted Goodness of Fit Criteria*

| Goodness-of-Fit Criteria | LSCS | LI | Supply Chain Practices | SCP | All Variables | Measures of Good Fit | Measures of Acceptable Fit |
|---|---|---|---|---|---|---|---|
| **CMIN/Df** | 2.433 | 1.388 | 3.150 | 1.886 | 2.428 | $0 \leq \chi 2/df \leq 2$ | $2 \leq \chi 2/df \leq 5$ |
| **GFI** | 0.991 | 0.994 | 0.982 | 0.997 | 0.900 | 0.95≤ NFI≤ 1.00 | 0.90 ≤ NFI < 0.95 |
| **CFI** | 0.966 | 0.998 | 0.985 | 0.998 | 0.917 | 0.95≤ NFI≤ 1.00 | 0.90 ≤ NFI < 0.95 |
| **RMSEA** | 0.072 | 0.037 | 0.080 | 0.056 | 0.072 | 0≤RMSEA≤0.05 | 0.05≤RMSEA≤0.08 |
| **NFI** | 0.946 | 0.99 | 0.97 | 0.995 | 0.868 | 0.95≤ NFI≤ 1.00 | 0.90 ≤ NFI <0.95 |

**Reference:** Hooper et al., 2008

## Discriminant and Convergent Validity

Discriminant validity and convergent validity are tested and results can be seen on Table 3. The bold values on the diagonal are root square of AVE values. The values in the cells are correlation coefficients on the top and square of correlation coefficients in brackets.

Table 3
*Discriminant Validity of the Measurement Model*

| Variables | Lean Supply Chain Strategy | Logistics Integration | Strategic Supplier Relationship | Customer Relationship | Supply Chain Performance |
|---|---|---|---|---|---|
| **Lean Supply Chain Strategy (LSCS)** | **0.502** | | | | |
| **Logistics Integration (LI)** | 0.301 (0.090) | **0.757** | | | |
| **Strategic Supplier Relationship (SSR)** | 0.097 (0.009) | 0.521 (0.271) | **0.755** | | |
| **Customer Relationship (CR)** | 0.269 (0.072) | 0.495 (0.245) | 0.333 (0.110) | **0.841** | |
| **Supply Chain Performance (SCP)** | 0.185 (0.034) | 0.416 (0.173) | 0.314 (0.098) | 0.367 (0.134) | **0.737** |
| **Composite Reliability** | 0.570 | 0.870 | 0.721 | 0.879 | 0.827 |

In order for Convergent Validity to be acceptable, Composite Reliability values should be at least 0.6 (Hair, Hult et al., 2014:102). Here, the Composite Reliability values are within the acceptable range for the variables other than LSCS. Since the LSCS value are very close to the limit of 0.60, the Composite Reliability values could be suggested to be appropriate. In addition, it is acceptable when factor loads are not below 0.40 (Hair, Hult et al., 2014: 104). In this case, the model could generally be said to have Convergent Validity.

For the test of discriminant validity, correlations between factor loads obtained as a result of Confirmatory factor analysis should be less than 0.90 (Kline, 2011: 116). In the current study, the model is discriminately valid.

## Structural Equation Modelling Test

In order to test the hypotheses, the research model created was tested with the AMOS 23 package program. The results are demonstrated in Table 4.

Table 4
*Model Parameter Estimates*

| Structural Equations | Standard Coefficients (β) | Non-Standard Coefficients | Standard Error | Critical Rate | P |
|---|---|---|---|---|---|
| **(H1)LSCS →SSR** | 0.212 | 0.14 | 0.066 | 2.158 | * |
| **(H2)LSCS →CR** | 0.335 | 0.27 | 0.081 | 3.357 | *** |
| **(H3)LSCS→LI** | 0.17 | 0.15 | 0.078 | 0.196 | 0.057 |
| **(H4)LSCS→SCP** | 0.04 | 0.04 | 0.093 | 0.452 | 0.651 |
| **(H5)SSR →LI** | 0.341 | 0.44 | 0.089 | 4.919 | *** |
| **(H6)CR → LI** | 0.35 | 0.37 | 0.076 | 4.900 | *** |
| **H7)SSR → SCP** | 0.070 | 0.10 | 0.098 | 1.071 | 0.284 |
| **(H8)CR → SCP** | 0.199 | 0.25 | 0.095 | 2.577 | ** |
| **(H9)LI → SCP** | 0.271 | 0.31 | 0.102 | 3.079 | *** |

*p≤0.05 ** p≤0.01 ***p≤0.001

The fit indices of the model (CMIN=312.717, df=123, $\chi 2/df=2.542$, p=0.000, GFI=0.894, CFI=0.909, RMSEA=0.074 and NFI=0.861) met the fit criteria. However, when the regression weights and significance values of the paths in the model were examined, some paths are seen to be insignificant (p>0,05). These paths represent the hypothesis $H_3$, $H_4$ and $H_7$ which are not accepted. These insignificant paths are excluded from the model, and the model is reanalysed, and the modification indices are applied. Figure 2 shows the resulting new structural equation model.

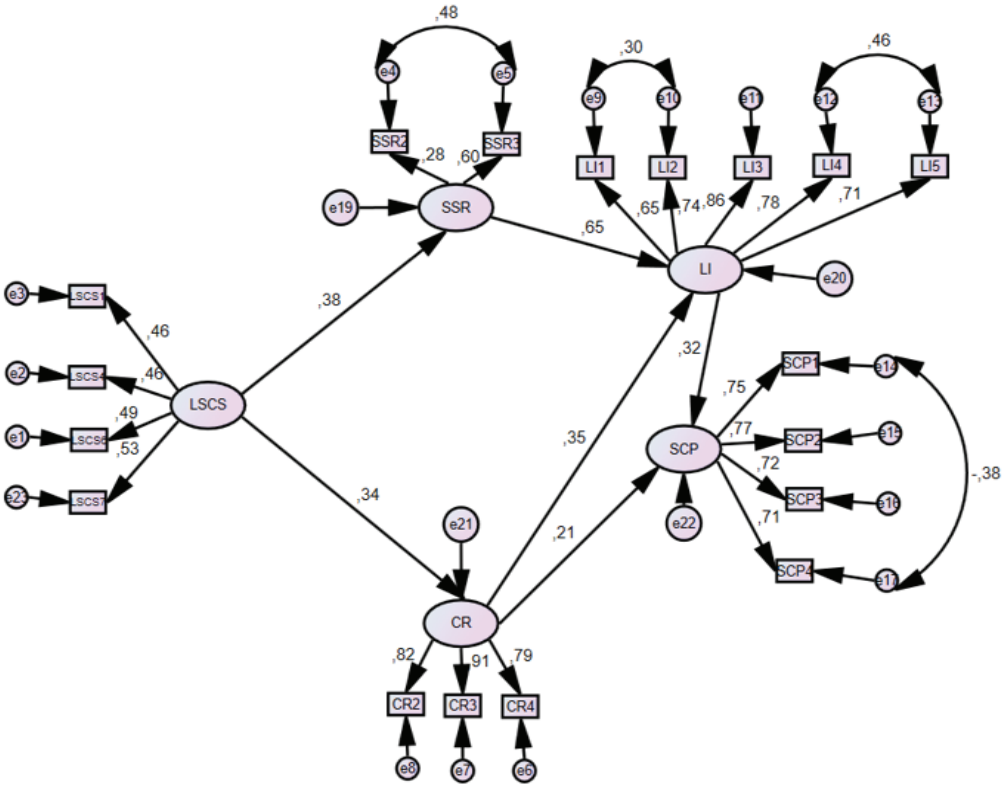


***Figure 2.*** modified structural equation model.

All paths are found significant according to the regression weights (estimates) and significance values of the final model obtained in the analysis result. The fit indices of the model (CMIN=314.041, df=125, $\chi 2/df=2.512$, p=0.000, GFI=0.893, CFI=0.910, RMSEA=0.074, NFI=0.860) met the fit criteria.

Table 5
*Model Parameter Estimates*

| Structural Equations | Standard Coefficients (β) | Non-Standard Coefficients | Standard Error | Critical Rate | P |
|---|---|---|---|---|---|
| **(H1)LSCS → SSR** | 0.376 | 0.14 | 0.065 | 2.126 | * |
| **(H2)LSCS → CR** | 0.336 | 0.27 | 0.081 | 3.366 | *** |
| **(H5)SSR→LI** | 0.652 | 1.55 | 0.760 | 2.044 | * |
| **(H6)CR → LI** | 0.353 | 0.38 | 0.076 | 4.936 | *** |
| **(H8)CR → SCP** | 0.206 | 0.26 | 0.090 | 2.821 | ** |
| **(H9)LI → SCP** | 0.320 | 0.37 | 0.091 | 4.062 | *** |

*p≤0.05 ** p≤0.01 ***p≤0.001

## Mediation Variable Testing in Structural Equation Modelling

In the structural equation model, the sum of the direct and indirect relationships shows the total effect. Depending on these indirect effects, the significance of the mediating effect was also measured with the Sobel Test.

### • Mediating Role of SSR in the Effect of LSCS on LI

There is no direct effect between LSCS and LI. However, the total impact with the SSR variable was 0.364. Therefore, SSR has a mediating effect between LSCS and LI. It is statistically significant since p=0.034 between LSCS and SSR and p≤0.001 between SSR and LI. This mediation is not significant according to the Sobel Test (p=0.138).

### • Mediating Role of CR in the Effect of LSCS on LI

There is no direct effect between LSCS and LI. However, the total effect with the CR variable is 0.364. Therefore, CR had a full mediator effect between LSCS and LI. It is statistically significant because p≤0.001 between LSCS and CR and p≤0.001 between CR and LI. According to the results of the Sobel test, the LSCS variable indirectly significantly affects LI through CR (p=0.005).

### • Mediating Role of CR in the Effect of LSCS on SCP

There is no direct effect between LSCS and SCP. However, since the total effect with the CR variable was 0.186, CR has a full mediator effect between LSCS and SCP. It is statistically significant since p≤0.001 between LSCS and CR, p=0.005 between CR and SCP. According to the results of the Sobel test, the LSCS variable affected SCP indirectly significantly through CR (p=0.0290).

### • Mediating Role of LI in The Effect of SSR on SCP

There is no direct interaction between SSR and SCP. However, since the total effect with

the LI variable is 0.208, the LI variable has a full mediation effect between SSR and SCP. It is statistically significant because p=0.041 between SSR and LI and p≤0.001 between LI and SCP. This mediation is not significant according to the Sobel Test (p=0.068).

- **Mediating Role of LI in The Effect of CR on SCP**

While the CR variable directly affected the SCP variable at a value of 0.206, the total effect with the LI variable is 0.319. In this case, the LI variable has a partial and significant mediation effect of 0.113 between CR and SCP. It is statistically significant because p≤0.001 between CR and LI, p≤0.001 between LI and SCP, and p=0.005 between CR and SCP. According to the results of the Sobel test, the CR variable directly and significantly affected the SCP through LI (p=0.0016). The strong customer relations of the companies will increase the supply chain performance indirectly and directly through logistics integrations.

## Discussion

This study investigates the effect of the Lean supply chain strategy on SCP. In this context, it also examined the impact of the lean supply chain strategy on SSR and CR, the supply chain applications. The research findings are related with the literature from several following dimensions:

- LSCS is determined to have a significant direct effect on SSR which is consistent with the literature as Qrunfleh (2010) stated that lean supplier practices have a direct effect on SSR.

- A significant direct effect of LSCS on CR is determined which is consistent with Othman et al. (2012) whom stated that supply chain applications (customer relations, strategic supplier relations) have a mediating effect between supply chain strategies and supply chain performance.

- No significant direct effect of LSCS on LI is determined. Qrunfleh, Tarafdar & Nathan (2012) have stated that LSCS does not affect LI directly, however LSCS affects LI through the moderation role of the information system.

- No significant direct effect of the LSCS on the SCP is detected. Sukwadi et al. (2013) have stated that LSCS do not have a significant positive effect on SCI, while Çiçekdağı (2019) has found that LSCS has a significant and positive relationship with SCP in their research on food logistics in hotel businesses. Besides, Othman et al. (2012) have stated a significant effect between LSCS's SCP responsiveness and LSCS's supply chain responsiveness. Çalıskan et al. (2016) have also declared that there is a direct effect between SCS and performance. However, although there is no direct relationship between SCS and performance, it is stated that the effect increases with

the mediating relationship of supply chain practices between SCS and performance.

- A statistically significant positive effect of SSR on LI is detected. A statistically significant positive effect of CR on LI is detected. Kim (2009) stated a positive relationship between Supply chain practices and SCI.
- No statistically significant direct effect of the SSR on the SCP is detected. However, this effect is insignificant. While Ahmad & Saifudin (2014) have suggested no direct effect but a relationship through LI, Qrunfleh (2010) and Sundram et al. (2011) have argued that there is a direct effect. In this case, generally, an impact can be said to exist.
- There is a significant positive effect of CR on SCP. It is revealed that CR was substantial to increase SCP. Qrunfleh (2010) has stated that there is a significant positive relationship between CR and SCP. Sundram et al. (2011) have stated that supply chain practices (SSR, CR, information sharing, information quality, product delay, vision and purpose acceptance, risk and reward sharing) has a significant impact on SCP.
- A statistically positive effect of LI on SCP is detected. Prajogo & Olhager (2012) have stated that there is a positive relationship between LI and performance. Toker&Pınar (2020) determined that customer and supplier integration has a positive and significant effect on business performance, and internal integration insignificantly affects business performance. In particular, they emphasized the high positive impact of customer integration on business performance.
- SSR has a mediating effect on the effect of LSCS on LI. However, this effect is insignificant.
- The CR has a full mediator effect on the effect of LSCS on LI.
- CR has a significant full mediation effect between LSCS and SCP. Similarly, Othman et al. (2012) reported that supply chain practices mediate the relationship between chain strategies and SCP
- LI has a full mediation effect on the effect of SSR on SCP. In the study of Ahmad & Saifudin (2014), supply chain practices (SSR, CR, information sharing) has no direct effect on SCP. However, when LI is the mediating variable, its effect becomes significant.
- While the CR directly affects the SCP, the total effect of the CR on the SCP increases with the LI variable. In this case, partial mediation effect of LI variable is seen between CR variable and SCP.

- LI's effect on the SCP is significant. In addition, the mediating effect between CR and SCP is also significant. Therefore, LI studies should be given importance.

## Conclusions

According to the findings LSCS effects both SSR and CR which shows that these supply chain practices are influenced by supply chain strategy at least LSCS. Practices such as supplier selection and evaluation or customer relationship management are tied to LSCS and the managers should focus on their supply chain strategy to improve their supply chain practices. It is recommended to develop lean practices in order to improve SSR and CR. The managers need to realize that quality and cost factors alone are not enough in the SCP development, and LI is also substantial. LSCS is related to SSR, but neither LSCS nor SSR alone affects SCP. SSR shows its effect on SCP via LI. That's why LI is crucial. For these reasons, the companies need to develop strategies to increase supply chain performance, review supply chain practices and integration, and use effective information technologies to provide efficient customer satisfaction and LI. Using a system providing a rapid information flow to the production facility as soon as a product reaches the customer is recommended. In order to develop long-term relationships with few suppliers, it is suggested to make virtual cooperation or face-to-face meetings depending on the company's conditions.

Since it is a new research area in Turkey, no study has addressed all the LSCS, SSR, CR, LI, and SCP factors. The research is limited to small-scale, medium-sized, and large-scale manufacturing companies in Edirne, Tekirdağ, Kırklareli. Most companies in the region are in the food and textile sectors. Therefore, it is difficult to determine other sectors' specific relations. Company officials can hardly allocate time to respond to the survey. The non-random convenience sampling method was applied in this study. Therefore, it could not be generalized as a limitation.

This research is significant because it was carried out in a new field in our country. The value of the study is academically high. This study will contribute to the deficiency in the national literature, and the findings will be a valuable resource for similar studies in the future. Researchers who will work on this subject can work sectoral in other regions, especially on large-scale companies. They can compare their studies (conducted with the same or different scales) with this study. In addition, they can include other variables such as agile supply chain strategy and supply chain orientation, which can affect supply chain performance, into the model.

It is recommended that the manufacturing enterprises operating in our country consider these factors, and the effective use of these factors will contribute to their businesses. This study may be a pioneer for others to be carried out in our country, both manufacturing and

service enterprises.

**Peer-review:** Externally peer-reviewed.
**Conflict of Interest:** The authors have no conflict of interest to declare.
**Grant Support:** The authors declared that this study has received no financial support.
**Author Contributions:** Conception/Design of study: E.G., O.Ç.; Data Acquisition: E.G., O.Ç.; Data Analysis/Interpretation: E.G., O.Ç.; Drafting Manuscript: E.G., O.Ç.; Critical Revision of Manuscript: E.G., O.Ç.; Final Approval and Accountability: E.G., O.Ç.

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İSTANBUL UNIVERSITY PRESS

*Istanbul Business Research, 52*(1), 107-132
**DOI:** 10.26650/ibr.2023.52.947907
http://ibr.istanbul.edu.tr/
http://dergipark.org.tr/ibr

# Istanbul Business Research

**Submitted:** 04.06.2021
**Revision Requested:** 31.05.2022
**Last Revision Received:** 15.06.2022
**Accepted:** 22.07.2022
**Published Online:** 30.11.2022

RESEARCH ARTICLE

# A Research on the Relationship of Social Intelligence and Cultural Intelligence with Leadership Styles*

**Serap Yalçınyigit[1], Hakki Aktas[2]**

**Abstract**
Technological and social changes have made the organizational nature more open and accessible than ever. In recent years, modern leadership styles are used to efficiently manage these radical changes, and social intelligence and cultural intelligence concepts are used to get an edge over these changes correctly. In this study, based on the interaction of different intelligence types with the leadership styles exhibited, the factors affecting the leadership style were examined. The concept of leadership was carefully considered by associating the sub-dimensions of social intelligence and cultural intelligence, and assessing them in terms of demographics. The research sample is selected as Technopark employees in Istanbul. The sample reflects one of the increasingly widespread Technology Development Zones in Turkey, and welcomes technological developments as well as foreign cultural companies within. By analyzing the obtained data from 354 participants with descriptive and explanatory statistical methods, the relationships between leadership styles in the Multi-Factor Leadership Questionnaire, a comprehensive leadership tendency measurement tool, and social intelligence and cultural intelligence have been revealed. In addition, the effects of social intelligence's and cultural intelligence's sub-dimensions on four different leadership styles, and demographic differentiations are detected. The research provides guiding outputs for future research and business reflections.

**Keywords**

Social intelligence, Cultural intelligence, Transformational leadership, Transactional leadership, Leadership styles

## Introduction

With the emergence of the phenomenon of globalization, it did not take long to realize that more importance should be attached to human differences. Attaining high efficiency from employees who have different personality traits, abilities, origins, beliefs and values within the same organization has become one of the main responsibilities of the leader (Fettahlıoğlu, 2018). The leadership approach, which has evolved from early management approaches to the present and continues to evolve, has started to turn the light more on *"people"* and *"relations"*.

* This article is an improved version of the master's thesis titled "A research on the relationship between social intelligence and cultural intelligence with transformational and transactional leadership" written by the first author under the supervision of the second author at Istanbul University Institute of Social Sciences in 2019.

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**To cite this article:** Yalcinyigit, S., & Aktas, H. (2023). A research on the relationship of social intelligence and cultural intelligence with leadership styles. *Istanbul Business Research, 52*(1), 107-132. http://doi.org/10.26650/ibr.2023.52.947907

Leadership and intelligence are deep-rooted concepts that have been associated with each other for centuries. In traditional leadership studies, it is stated that leadership depends on the personal characteristics of the individual and that one of these characteristics should be intelligence (Stodgill, 1948). In intelligence research, while the leading ability is considered as a determining variable in intelligence tests (Hollingworth, 2015), the Marland Report (1972), which compiles the areas where high intelligence can manifest itself, stated intellectual and academic ability and creative thinking, as well as the ability to lead as a criterion of high intelligence (Harrington, Harrington & Karns, 1991).

In modern organizations, the leader is expected to have social skills such as having effective communication skills, being successful in interpersonal relationships, and perceiving and meeting the needs of the followers. At this point, the concept of social intelligence has a supportive role in managerial areas by enabling people to understand and act intelligently in human relations (Thorndike, 1920a). In addition to social needs, the ability to lead in a global context has become invaluable for many organizations. Hereby, the guiding influences of the leader are expected to vary according to their ability to distinguish the cultural characteristics of followers. Social and cultural intelligence is important not only for organizations operating on a global scale, but also for local organizations that incorporate diversity such as ethnic differences or social expectations (Sharma & Hussain, 2020).

Within the scope of this research, it aimed to explain the relationship between the social and cultural intelligence of employees and their leadership styles in a Technopark sample, where the reverberations of the new business world order can be frankly observed.

## Literature Review

This section includes a conceptual review and discussion of empirical findings on research variables to construct hypotheses.

### Leadership Styles

#### Transformational Leadership

Transformational leadership became the center of attention after Burns' approached political leadership in 1977 with transformational and transactional leadership sub-dimensions. This leadership style is among the neo-charismatic approaches and it enables the leader to transform the beliefs, values and needs of followers (Luthans, 2011). According to this style, the leader has a moral duty that aims to bring all the followers in the leadership process to a high level of human development (Bass & Avolio, 1989).

With a radical and modernist approach, the leadership phenomenon, which has been at the top of the hierarchical pyramid for years, has been taken to the horizontal plane, thereby the

need for transformational leaders has arisen. With this breakthrough, leaders began to be able to comprehensively analyze the environment of the organization and create strategic goals that attract followers' attention and provide efficiency. Thus, transformational leaders have the ability to express their goals effectively and spread them faster (Berson & Avolio, 2004). In this context, it is inevitable for a transformational leader in an organization to provide a suitable field for understanding and adopting strategic visions, missions, and organizational goals.

Transformational leadership consists of four dimensions of leadership style according to the Multi-Factor Leadership Questionnaire. These are called Charisma, Inspirational Motivation, Intellectual Stimulation, and Individualized Consideration (Bass & Avolio, 1990). In order to increase work efficiency during transformation process, leaders must first create a strong bond with their followers (Çakar & Arbak, 2003). At this point, each leadership characteristic given below forms the basis of transformational leadership (Bass & Avolio, 1990).

- Charisma is effective in setting a vision, creating mission awareness and instilling self-confidence.
- Inspirational motivation is giving followers a meaning to the work done in order to achieve predetermined goals and motivating followers in line with this meaning.
- Intellectual stimulation pushes followers to think, gives new perspectives on old problems, ensures realism, and allows creative intelligence to shine.
- Individualized consideration allows leaders to recognize their followers and train them appropriately by establishing special but equal relationships with each follower.

**Transactional Leadership**

Transactional leadership is a traditional and retrospective leadership style conceptualized by Burns, is based on the mutual interaction between the leader and the follower (Luthans, 2011). The effectiveness of transactional leadership is closely related to how much the needs of followers are fulfilled (Eraslan, 2006). In this style, while the followers are directed to act to reach a reward or avoid a punishment, the behavior of the leader is shaped depending on whether the followers accomplished the predetermined tasks or not (Bass & Avolio, 1989). There is a clear agreement between the leader and the followers on the completion of the task (Buluç, 2009).

Transactional leadership, when applied with a laissez-faire leadership approach, allows the followers to exhibit risk taking and initiative behaviors. In addition, transactional leadership contributes positively to the increase of the performance of the followers (Changar & Atan, 2021) by increasing social-based activities in organizations (Achmad & Ftriansyah, 2021).

Dimensions of transactional leadership are mentioned as Management by Exception, Contingent Reward, and Laissez-Faire (Bass, Avolio & Atwater, 1996):

- Management by exception allows leaders to observe their followers and give directions for performance increase when deemed necessary.
- In contingent reward, leaders reward or deliberately fail to reward followers when they achieve their desired performance or goals after giving them full instructions on the task.
- Laissez-faire is the leader's giving their followers unlimited freedom to do their job or the disregard of the leadership.

## Types of Intelligence and Relationships with Leadership Styles

When research studies on intelligence are examined, it is seen that there are various studies on many types of intelligence. The treatment of intelligence as a plural capacity dates back to ancient times. Plato (427-347 BC) argued that the natural tendencies of individuals should be discovered and they should be educated on the basis of this, and in the relatively recent past, J. J. Rousseau (18th century) argued that intelligence is fed not only from books but also from real life experiences (Türkuzan, 2004).

In more recent past; Terman (1916) argued that it was wrong to accept intelligence as a single and irrefutable fact. A few years later, Thorndike proved that when verbal and numerical tests based on speed are compared, the results do not give the same success scores for individuals (Thorndike, 1920b). For this reason, he mentioned that three types of intelligence should be examined separately for human beings: mechanical intelligence, social intelligence, and abstract intelligence. With this study, studies on the types of intelligence gained momentum. Spearman's (1927) Two-Factor Theory and Thurstone's (1943) Group Factor Theory revealed the necessity of re-evaluation of intelligence tests applied.

In 1983, Howard Gardner explained the Theory of Multiple Intelligences in his book *Frames of Mind*. In this book, it is suggested that intelligence is affected by cultural factors as well as biological factors. The type of intelligence accepted in a culture is expected to be open to development in that specific culture. For this reason, it is argued that intelligence is an improvable potential that is not limited to inherited traits. According to Gardner, intelligence has eight distinct components: linguistic, logical/mathematical, spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal, and naturalist (Gardner, 2011).

This masterpiece and its likes have pushed researchers to research different types of intelligence for years and caused the popularization of social and cultural intelligence, which has also determined the subject of this paper.

### Social Intelligence (SQ)

Beyond the traditional understanding of intelligence, social intelligence was first used in 1920 by Thorndike to measure an individual's social competence and success in dealing with interpersonal relationships (Albrecht, 2006). Social intelligence is not only the ability to understand and manage people, but also the ability to understand and manage oneself (Salovey & Mayer, 1990). It is cited as the reason why some people can communicate more easily and overcome relational problems (Goleman, 2010).

Empathy, the abilities promoted by social intelligence, positively affects the social interaction between the leader and followers (Jones, 1983). Another encouraged ability, emotional analysis allows the leader to organize in-group and out-group followers (Densereau, Graen & Haga, 1975). Establishing relationships and effective communicating skills, prepare the ground for the leader to show sensitivity to the needs of followers (Papa & Tracy, 1988), it also enables the followers to emerge feelings such as happiness, life satisfaction and optimism (Doğan & Eryılmaz, 2014).

Based on previous studies, the first hypothesis is developed to examine the relationship between social intelligence and leadership through the lens of particular leadership styles.

*$H_{1a}$: There is a positive relationship between social intelligence and "transformational leadership".*

*$H_{1b}$: There is a positive relationship between social intelligence and "transformational and transactional leadership".*

*$H_{1c}$: There is a positive relationship between social intelligence and "management by exceptions and laissez-faire leadership".*

*$H_{1d}$: There is a positive relationship between social intelligence and "charisma and inspirational leadership".*

### Cultural Intelligence (CQ)

The concept of cultural intelligence was first introduced by Earley and Ang (2003), and defined as the ability of the individual to adapt effectively to new cultural contexts. Cultural intelligence enables individuals to interpret behaviors that do not belong to their own culture (Earley & Mosakowski, 2004) and act in accordance with the requirements of the culture they just met (Ang, Van Dyne & Koh, 2006). Although cultural intelligence studies are on the increase, it is recommended by many researchers to carry out studies from different perspectives on this type of intelligence. (Afsar, Al-Ghazali, Cheema & Javed, 2020; Doğan & Uysal, 2020).

Cultural intelligence interacts with variables closely related to leadership such as being able to make effective decisions (Ang, et al., 2007), effective communication (Bücker, 2014), improving team performance (Şahin & Gürbüz, 2012), and coping with confusion (Plum, 2009), international leader development (Ng, Van Dyne & Ang, 2009) and diversity management (Ersoy & Ehtiyar, 2015). In addition, cultural intelligence has a share in the achievement of effective leadership behaviors expected from leaders in different cultures by supporting the skills of managing differences, being innovative and looking from different perspectives (Dilek & Topaloğlu, 2017).

According to the literature review, it was envisioned that the cultural intelligence has a strong influence on the leadership phenomenon in the current dynamic business world and therefore it was taken as the second hypothesis of the study.

*$H_{2a}$: There is a positive relationship between cultural intelligence and "transformational leadership".*

*$H_{2b}$: There is a positive relationship between cultural intelligence and "transformational and transactional leadership".*

*$H_{2c}$: There is a positive relationship between cultural intelligence and "management by exceptions and laissez-faire leadership".*

*$H_{2d}$: There is a positive relationship between cultural intelligence and "charisma and inspirational leadership".*

In addition to the given research hypotheses, the third and final hypothesis was developed to test whether the dependent and independent variables differ in terms of demographics.

*$H_3$: Social intelligence, cultural intelligence and four leadership styles of the participants differ according to demographics.*

## Research Method

### Purpose and Importance of the Research

The aim of this research is to examine the relationship between social intelligence and cultural intelligence with transformational and transactional leadership styles. It has been revealed that the exhibited leadership styles have a relationship with which sub-dimensions of social intelligence and cultural intelligence, and how these variables differ in the context of demographics. Intelligence, which is often associated with leadership, was studied in the light of modern approaches. Spotlighting social intelligence and cultural intelligence, which are in the shadow of emotional intelligence in Turkey, points to the importance of the research.

## Research Model

The research model as the basis of the research is shown in the figure below.

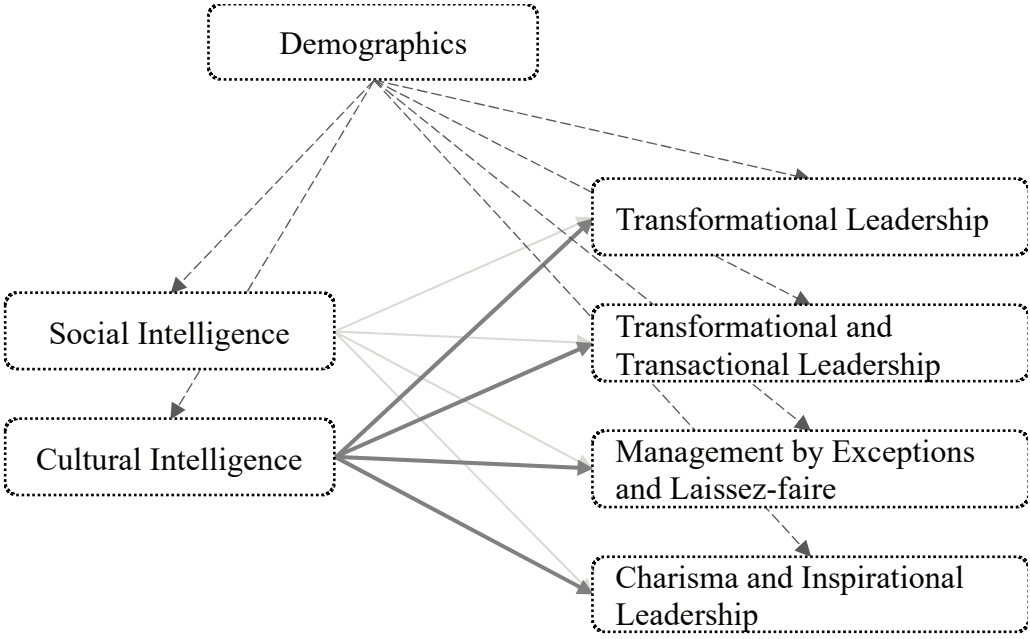


***Figure 1.*** Research model

## Research Population and Sample

Technoparks is one of the increasingly common Technology Development Zones in Turkey and establish a bridge between universities and industrial cooperation. With the support of research and development activities, these zones are closely related to technological developments. Companies operating in foreign cultures located in this region, provide the opportunity to observe change and transformation in detail. For this reason, the employees of a Technopark within the body of a state university in Istanbul with a large number of employees was determined as the population of the research.

The online questionnaire form prepared was sent to Technopark employees in collaboration with the Corporate Communication Department, and 374 employees participated in the questionnaire. After the missing data were identified, extreme value analysis was performed and extreme values were excluded in order not to prevent obtaining normal results (Kalaycı, 2018). In this case, the data gathered from 20 participants were excluded and the analysis proceeded with the data submitted by 354 participants.

## Scales

The questionnaire form consists of four parts. In the first part, the demographics of the participants (gender, age, education level, position level, organizational tenure and professional tenure) are included. In the second part, a Turkish adapted version of the Tromso Social Intelligence Scale (TSIS) by Doğan and Çetin (2009) was placed. TSIS, consists of social information processes, social skills and social awareness sub-dimensions and 21 items in total. In the third part, the version of the Cultural Intelligence Scale (CIS) adapted to Turkish by İlhan and Çetin (2014), which is a 20-item scale, was used, with its structure consisting of metacognitive, cognitive, behavioral and motivational sub-dimensions. In the last part, the Turkish translation of the Multi-Factor Leadership Scale (MLQ) developed by Bass and Avolio (1992) taken from the study of Tarım (2010), was included in the questionnaire form. The MLQ is a 21-item scale and includes idealized influence, inspirational motivation, intellectual stimulation, individual attention, contingent rewarding, management by exceptions, and laisez-faire leadership sub-dimensions that determine transformational and transactional leadership characteristics. The statement sets in the questionnaire form consist of three different scales and 62 statements in total. The scales were prepared in five-point likert scale and ranked as "1: Strongly Disagree", "2: Disagree", "3: Neutral", "4: Agree", "5: Strongly Agree".

## Research Methodology

The research was conducted on the employees of a Technopark in Istanbul. The convenience sampling method was used as it facilitates access to employees in terms of time and cost. Following the process, which was managed jointly with the Technopark's Corporate Communication Department, an online questionnaire form was sent to the employees' contact addresses. Also, after face to face interviews, some of the participants filled out the questionnaire form by hand. The collected data was subjected to descriptive and explanatory analysis with the SPSS 25.0 program.

# Findings

## Demographics

Participants were asked to share their *age* [20-24 age range (11,3%), 25-29 age range (38,7%), 30-34 age range (20,6%), 35-39 age range (12,4%), 40 age and older (13,8%), not specified (3,1%)], *gender* [female (39%), male (61%)], *education level* [high school and associate degree (6,5%), bachelor's degree (54,8%), postgraduate (38,7%)], *level of position* [manager (37%), employee (62,4%), not specified (0,6%)], *organizational tenure* [less than 1 year (23,2%), 1-5 years (54,8%), 6-10 years (12,1%), 16 years and more (9,3%), not specified (0,6%)], and *professional tenure* [less than 1 year (12,4%), 1-5 years (37,6%), 6-10 years (20,1%), 11-15 years (13,8%), 16 years and more (15,5%), not specified (0,6%)].

### Tests of Normality and Homogeneity of Variances

In Table 1, since the n>50, Kolmogorov-Smirnov values are given to test the normal distribution. When we look at Kolmogorov-Smirnov values, intelligence types indicate normal distribution, while leadership styles do not. In large samples, the results of one test or both may be significant, even if there is only a small deviation from the normal distribution. Therefore, normality should be evaluated together with the values of skewness and kurtosis (İslamoğlu & Alnıaçık, 2014). Table 2 presents descriptive statistics prepared to provide a more comprehensive perspective.

Table 1

*Test of Normality*

| | Kolmogorov-Smirnov[a] | | |
|---|---|---|---|
| | **Statistic** | **df** | **Sig.** |
| Social Intelligence | .027 | 354 | .200* |
| Cultural Intelligence | .040 | 354 | .200* |
| Transform. L. | .154 | 354 | <.001 |
| Transform. and Transact. L. | .094 | 354 | <.001 |
| Charisma and Inspirational L. | .170 | 354 | <.001 |
| Manage.by Except. Laissez-faire L. | .110 | 354 | <.001 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 2

*Test of Normality -Descriptive Statistics*

| | | **Statistic** | **Std. Error** |
|---|---|---|---|
| Social Intelligence | Skewness | -.244 | .130 |
| | Kurtosis | .415 | .259 |
| Cultural Intelligence | Skewness | .004 | .130 |
| | Kurtosis | -.021 | .259 |
| Transform. L. | Skewness | -.677 | .130 |
| | Kurtosis | .424 | .259 |
| Transform. and Transact. L. | Skewness | -.836 | .130 |
| | Kurtosis | 1.309 | .259 |
| Charisma and Inspirational L. | Skewness | -.360 | .130 |
| | Kurtosis | -.060 | .259 |
| Manage.by Except. Laissez-faire L. | Skewness | -.364 | .130 |
| | Kurtosis | .112 | .259 |

According to the George and Mallery's (2003) classification, skewness and kourtosis values between +2 and -2 indicate compliance with normal distribution. While the leadership styles variables were not normally distributed according to the Kolmogorov-Smirnov value, it is considered to be normally distributed based on the skewness and kourtosis values and the homogeneity of the variances test results. Table 3 shows the Test of Homogeneity of Variances.

Table 3
*Test of Homogeneity of Variances*

| | | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|---|
| Social Intelligence | Based on Mean | .458 | 10 | 1045 | .917 |
| Cultural Intelligence | Based on Mean | .599 | 3 | 350 | .616 |
| Transform. L. | Based on Mean | 1.822 | 4 | 347 | .124 |
| Transform. and Transact. L. | Based on Mean | 2.196 | 9 | 825 | .120 |
| Charisma and Inspirational L. | Based on Mean | 1.137 | 4 | 347 | .339 |
| Manage.by Except. Laissez-faire L. | Based on Mean | 1.418 | 8 | 771 | .185 |

## Validity and Reliability Analysis of the Scales

The Multi-Factor Leadership Scale is distributed under four dimensions in this study. Five statements were not included in the analysis due to their low factor loadings. These four dimensions are as follows: "*transformational and transactional leadership*", "*transformational leadership*", "*management by exceptions and laissez-faire leadership*" and "*charisma and inspirational leadership*". In addition, according to the factor analysis results, four statements in the Tromso Social Intelligence Scale were excluded from the analysis due to their low factor loadings.

Table 4
*Validity and Reliability Analysis*

| Scale | Kaiser-Meyer-Olkin (KMO) | Barlett Test of Sphericity | p | Cronbach's Alpha |
|---|---|---|---|---|
| MLQ | 0,845 | 1417,321 | 0,000 | 0,794 |
| SQ | 0,837 | 2081,263 | 0,000 | 0,817 |
| CQ | 0,890 | 3228,996 | 0,000 | 0,901 |

**Notes:** Factor loadings are between 0,561-0,867 for TSIS (SQ), 0,567-0,824 for CIS (CQ), and ,0546-0,786 for MLQ.

## Hypotheses Testing

### Correlation Analysis: The Levels of Intelligence and Leadership

In correlation analysis, the relationships between the main variables and their sub-dimensions and the direction of these relationships were examined.

The correlation matrix above demonstrates that there is a statistically significant relationships between social intelligence, cultural intelligence and all leadership styles except management by exceptions and laissez-faire leadership. Results of previous studies support these positive relationships between social intelligence and leadership styles. (see: Cavins, 2021; Goleman & Boyatzis, 2008; Zaccaro, Gilbert, Thor & Mumford, 1991). Furthermore, the statistically significant positive relationship between cultural intelligence and leadership styles has also obtained similarity with different comprehensive studies in the literature (see: Solomon & Steyn, 2017; Deng & Gibson, 2008).

Table 5

*Correlation Analysis*

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Social Info. Processing. | 1 | | | | | | | | | | | | |
| 2. Social Skills | .211** | 1 | | | | | | | | | | | |
| 3. Social Awareness | .202** | .323** | 1 | | | | | | | | | | |
| 4. Metacognitive | .322** | .182** | -.014 | 1 | | | | | | | | | |
| 5. Cognitive | .190** | .054 | -.136* | .427** | 1 | | | | | | | | |
| 6. Motivational | .184** | .402** | .145** | .412** | .376** | 1 | | | | | | | |
| 7. Behavioral | .203** | .240** | .068 | .467** | .465** | .502** | 1 | | | | | | |
| 8. Transform. L. | .169** | .244** | .010 | .281** | .203** | .241** | .272** | 1 | | | | | |
| 9. Transform. and Transact. L. | .130* | .170** | -.053 | .219** | .195** | .195** | .239** | .469** | 1 | | | | |
| 10. Charisma and Inspirational L. | .183** | .245** | .138** | .144** | .136* | .186** | .193** | .291** | .393** | 1 | | | |
| 11. Manage.by Except. Laissez-faire L. | .061 | -.137** | -.134* | .144** | .137** | -.035 | .066 | .112* | .124* | .086 | 1 | | |
| 12. Social Intelligence | .583** | .772** | .747** | .209** | .031 | .355** | .237** | .198** | .112* | .268** | -.117* | 1 | |
| 13. Cultural Intelligence | .288** | .291** | .025 | .724** | .746** | .760** | .815** | .324** | .277** | .218** | .097 | .274** | 1 |

* Correlation is significant at the 0,01 level (2-tailed).

** Correlation is significant at the 0,05 level (2-tailed).

The table indicates that the sub-dimensions of social intelligence have statistically significant both positive and negative relationships with leadership styles exhibited while the sub-dimensions of cultural intelligence have only positive relationships. These findings confirm the $H_1$ and $H_2$ hypotheses of the research. However, in order to examine the interaction between variables in detail, regression analysis was conducted.

## Regression Analysis

In line with the hypotheses of the research, the interaction between social intelligence and cultural intelligence and leadership styles exhibited was examined through enter regression analysis. The results of the regression analysis and the effects between dependent and independent variables are given in Table 6.

Table 6
*Regression Analysis of Independent Variables and Leadership Styles*

| Model | Dependent Variable | Adjusted $R^2$ | Independent Variable | β | t | p | F |
|---|---|---|---|---|---|---|---|
| *Model 1* | *Transform. L.* | 0,118 | Social Intelligence<br>Cultural Intelligence | ,128<br>,280 | 2,258<br>5,606 | ,025<br>,000 | 23,491 |
| *Model 2* | *Transform. and Transact. L.* | 0,078 | Social Intelligence<br>Cultural Intelligence | ,049<br>,294 | ,729<br>5,006 | ,467<br>,000 | 14,913 |
| *Model 3* | *Charisma and Inspirational L.* | 0,094 | Social Intelligence<br>Cultural Intelligence | ,288<br>,177 | 4,254<br>2,963 | ,000<br>,003 | 18,254 |
| *Model 4* | *Manage.by Except. Laissez-faire L.* | 0,032 | Social Intelligence<br>Cultural Intelligence | -,263<br>,208 | -2,845<br>2,553 | ,005<br>,011 | 5,749 |

**Notes:** The table contains four regression models for each dependent leadership style. For four models p<0,001.

At the statistical level, the proposed models are significant (p<0,001). According to the results of the regression analysis seen on Table 6, it is revealed that social intelligence and cultural intelligence have significant positive effects on leadership styles.

In the following regression analysis, the sub-dimensions of independent variables were analyzed for each leadership style separately. The results are shown in Table 7.

Table 7

*Regression Analysis of Sub-Dimensions of Variables*

| Model | Dependent Variable | Adjusted $R^2$ | Independent Variable | β | t | p | F |
|---|---|---|---|---|---|---|---|
| *Model 1* | *Transform. L.* | 0,125 | Social Info. Processing | ,061 | 1,112 | ,267 | 8,208 |
| | | | Social Skills | ,184 | 3,199 | ,002 | |
| | | | Social Awareness | -,066 | -1,202 | ,230 | |
| | | | Metacognitive | ,139 | 2,260 | ,024 | |
| | | | Cognitive | ,047 | ,769 | ,442 | |
| | | | Motivational | ,031 | ,492 | ,623 | |
| | | | Behavioral | ,117 | 1,845 | ,066 | |
| *Model 2* | *Transform. and Transact. L.* | 0,082 | Social Info. Processing | ,056 | 1,008 | ,314 | 8,208 |
| | | | Social Skills | ,135 | 2,292 | ,023 | |
| | | | Social Awareness | -,111 | -1,992 | ,047 | |
| | | | Metacognitive | ,079 | 1,259 | ,209 | |
| | | | Cognitive | ,059 | ,956 | ,340 | |
| | | | Motivational | ,030 | ,461 | ,645 | |
| | | | Behavioral | ,123 | 1,882 | ,061 | |
| *Model 3* | *Charisma and Inspirational L.* | 0,081 | Social Info. Processing | ,099 | 1,767 | ,078 | 5,504 |
| | | | Social Skills | ,171 | 2,900 | ,004 | |
| | | | Social Awareness | ,064 | 1,146 | ,253 | |
| | | | Metacognitive | ,006 | ,091 | ,927 | |
| | | | Cognitive | ,068 | 1,092 | ,276 | |
| | | | Motivational | ,020 | ,307 | ,759 | |
| | | | Behavioral | ,084 | 1,282 | ,201 | |
| *Model 4* | *Manage.by Except. Laissez-faire L.* | 0,048 | Social Info. Processing | ,054 | ,954 | ,340 | 5,420 |
| | | | Social Skills | -,124 | -2,069 | ,039 | |
| | | | Social Awareness | -,081 | -1,425 | ,155 | |
| | | | Metacognitive | ,132 | 2,063 | ,040 | |
| | | | Cognitive | ,083 | 1,306 | ,192 | |
| | | | Motivational | -,086 | -1,294 | ,197 | |
| | | | Behavioral | ,033 | ,504 | ,614 | |

**Notes**: The table contains four regression models for each dependent leadership style. For four models p<0,001.

In accordance with Table 7, the models are significant (p<0,001). There is an effect between the sub-dimensions of social intelligence and cultural intelligence and leadership styles exhibited which theoretically supported by the literature (see: Beheshtifar & Roasaei, 2012; Keung & Rockinson-Szapkiw, 2013).

When overall findings are summarized, the effects of

- cultural intelligence on each leadership style positively,
- social intelligence on "*transformational leadership"*, and "*charisma and inspirational*

*leadership"* positively and on "*management by exceptions and laissez-faire leadership"* negatively,

- social skills on each leadership style positively,
- metacognitive cultural intelligence on "*transformational leadership"* and "*management by exceptions and laissez-faire leadership"* positively,
- social awareness on "*transformational and transactional leadership"* positively

were determined to be statistically significant.

## Analysis of Intelligence and Leadership Depending on Demographics

Comparison of the participants according to their demographics in the direction of variables was also examined within the scope of the research hypotheses. Demographics with two groups (gender and position level) were analyzed by t-test analysis, and those with more than two groups (age, education level, organizational tenure, and occupational tenure) were analyzed by Analysis of Variance. In cases where differences are detected, the differences were determined by t-test group statistics and multiple comparison analysis (Scheffe and Tamhane). Only statistically significant variables are included in Table 8 and Table 9.

Table 8

*T-Test Results of Gender and Position Level*

| Demographics | Variables | | N | Mean | SS | t | p |
|---|---|---|---|---|---|---|---|
| *Gender* | Metacognitive | Female | 138 | 3,95 | 0,55 | -2,251 | ,025 |
| | | Male | 216 | 4,08 | 0,58 | | |
| | Cognitive | Female | 138 | 3,11 | 0,62 | -3,181 | ,002 |
| | | Male | 216 | 3,35 | 0,72 | | |
| | Cultural Intelligence | Female | 138 | 3,64 | 0,48 | -2,305 | ,022 |
| | | Male | 216 | 3,78 | 0,54 | | |
| | Transform. L. | Female | 138 | 4,27 | 0,54 | -3,195 | ,002 |
| | | Male | 216 | 4,44 | 0,46 | | |
| | Transform. and Transact. L. | Female | 138 | 4,05 | 0,62 | -2,168 | 0,31 |
| | | Male | 216 | 4,18 | 0,54 | | |
| *Position Level* | Manage. by Except. and Laissez-faire L. | Manager | 131 | 3,32 | 0,80 | -3,352 | ,001 |
| | | Employee | 221 | 3,60 | 0,74 | | |
| | Transform. and Transact. L. | Manager | 131 | 4,31 | 0,49 | 4,679 | ,000 |
| | | Employee | 221 | 4,02 | 0,60 | | |

Table 9
*ANOVA Test Results of Age, Organizational Tenure and Professional Tenure*

| Demographics | Variables | | Sum of Squares | df | Mean Square | F | p |
|---|---|---|---|---|---|---|---|
| *Age* | Social Info. Processing | Between Groups | 3,620 | 5 | ,724 | 2,880 | ,015 |
| | | Within Groups | 87,473 | 348 | ,251 | | |
| | | Total | 91,093 | 353 | | | |
| | Metacognitive | Between Groups | 3,722 | 5 | ,744 | 2,339 | ,041 |
| | | Within Groups | 110,744 | 348 | ,318 | | |
| | | Total | 114,467 | 353 | | | |
| | Behavioral | Between Groups | 8,202 | 5 | 1,640 | 2,965 | ,012 |
| | | Within Groups | 192,525 | 348 | ,553 | | |
| | | Total | 200,727 | 353 | | | |
| | Cultural Intelligence | Between Groups | 4,869 | 5 | ,974 | 3,720 | ,003 |
| | | Within Groups | 91,087 | 348 | ,262 | | |
| | | Total | 95,956 | 353 | | | |
| | Transform. Transact. L. | Between Groups | 5,968 | 5 | 1,194 | 3,745 | ,003 |
| | | Within Groups | 110,911 | 348 | ,319 | | |
| | | Total | 116,880 | 353 | | | |
| *Education Level* | Social Skills | Between Groups | 6,817 | 4 | 1,704 | 3,256 | ,012 |
| | | Within Groups | 182,697 | 349 | ,523 | | |
| | | Total | 189,514 | 353 | | | |
| *Org. Tenure* | Transform. Transact. L. | Between Groups | 4,678 | 6 | ,780 | 2,411 | ,027 |
| | | Within Groups | 112,202 | 347 | ,323 | | |
| | | Total | 116,880 | 353 | | | |
| *Profession. Tenure* | Social Info. Processing | Between Groups | 4,285 | 6 | ,714 | 2,855 | ,010 |
| | | Within Groups | 86,808 | 347 | ,250 | | |
| | | Total | 91,093 | 353 | | | |
| | Transform. Transact. L | Between Groups | 6,904 | 6 | 1,151 | 3,631 | ,002 |
| | | Within Groups | 109,976 | 347 | ,317 | | |
| | | Total | 116,880 | 353 | | | |

According to Table 8 and Table 9, the main variables of the study differ according to age, gender, education level, level of position, organizational tenure and professional tenure. Statistical test and analysis of variance allow us to accept the $H_3$.

## Results and Discussion

The relationship between the leader and follower is considered as the key pair for organizational success (Kim, et al., 2020). As the leadership process interplay of many factors, the effective use of the style in this process is closely related to the intelligence of the leader.

Leaders' social intelligence and cultural intelligence levels can give clues about what kind of leader they will be.

In this study, the relationship between social intelligence and cultural intelligence levels of a Technopark employees and their exhibited leadership styles were examined and the effect of demographics was determined. Based on the percentages of demographics, Generation Y constitutes the majority of the research sample. Currently, this generation, which has the ability to obtain information from different sources and to use it effectively in problem solving, lean towards the leader's transformational principles (Davutoğlu, Muğaloğlu & Arslan, 2020). The reason behind this is shown as the young workforce's demand to being aware of their individual differences and to being guided by each and every individual expectations and skills (Yeşil & Fırat, 2020).

When the findings of the study are examined, it is seen that social intelligence and cultural intelligence are in relationships with leadership styles. Today, the understanding that the leader should be intelligent, which has been maintained since the traditional leadership approaches; diversifies towards the need of the leader to have intellectual knowledge and skills and to be aware of cultural values, norms and expectations (Aycan, Kanungo & Mendonca 2016; Harrington, et al., 1991; Stogdill, 1948). These needs of modern day support the hypotheses of the research by revealing the expectations from today's leaders.

Considering the studies in the literature in line with the research hypotheses, the relationship between cultural intelligence and transformational and transactional leadership styles eliminates many conflicts in various cultural and social contexts (Ansari, Reza & Mehdi, 2012). In addition, social intelligence and emotional intelligence, which is accepted as a direction of social intelligence by many researchers, positively affects transactional leadership by causing the leader to exhibit more sensitive and supportive behaviors (Cavins, 2005). In this context, social intelligence and cultural intelligence can be seen as the two main predictors of a leader's success.

In the literature, besides the main variables of the research, closely related concepts are also discussed. It is known that cultural intelligence has a supportive relationship with effective decision-making, enhancing task performance, conflict management and diversity management. Social intelligence, on the other hand, affects leadership characteristics positively such as effective communication and solution generation. In all, the effect of these types of intelligence on leadership processes is undeniable.

According to the results of the research, the social skills is statistically related to all leadership styles in the study. It is possible for leaders with high social skills to be responsive to the needs of their followers and to perform a management process that reduces conflict within the organization (Papa & Tracy, 1988). Social skills is negatively related to mana-

gement by exceptions and laissez-faire leadership within the scope of this study. In these leadership styles with minimum communication processes with followers, the leader does not participate in the business process of the followers or is ignored as a guide (Çakınberk & Demirel, 2010; Demir & Okan, 2008), which prevent the active use of social skills. The ability of socially conscious leaders to see the norms, characteristics, or expectations of a context as a whole parallels transformational and transactional leadership characteristic. The ability of transactional leaders to work without losing control over their followers but also without straining them is an important social balance skill (Cıranoğlu, 2020). In other respects, transformational leaders are seen as a highly effective role model in determining future goals with their environmental analysis capabilities and drawing the road map to these goals (Şimşek, 2020). When considered in alignment with the characteristics of leadership styles, it is possible to say that social awareness will be a useful equipment for both styles.

Metacognitive cultural intelligence positively affects transformational leadership and management by exceptions and laissez-faire leadership. Metacognitive cultural intelligence brings along compromise behavior (Kenar & Bektaş, 2020). This feature of metacognitive intelligence reinforces the principle of transactional leadership to enable followers to participate in the decision-making process, while supporting transformational leadership's ability to deal with confusion, uncertainty, and conflict (Luthans, 2011).

As a result of this research, it was revealed that cultural intelligence has a positive relationship with all leadership styles discussed in the study. Social intelligence was found to be in a positive relationship with transformational leadership and charisma and inspirational leadership, and negatively with management by exceptions and laissez-faire leadership. The practical implications for the business world compiled from the results of the research are summarized below.

- While social intelligence increases the positive emotional state of individuals in the organization, it enables to prevent negative emotions, thoughts and behaviors. Identifying the emotional states of followers that cause negative behaviors helps to eliminate devastating problems such as intention to quit. Therefore, qualified and trained workforce continues to be valuable resources of the organization (Diktaş & Özgeldi, 2020).

- In cases where working remotely, such as the Covid-19 pandemic, or where remote working is adopted as an organization strategy, the cultural intelligence of individuals who form virtual teams should be seen as a resource that increases interpersonal synergy (Presbitero, 2021). High cultural intelligence will increase the effectiveness of team members by promoting the establishment and participation of diverse work teams (Alexandra, Ehrhart, & Randel, 2021).

- The training and development of leaders with high social and cultural intelligence has become indispensable for the long-term success of organizations (Cavins, 2021). Being aware of the culturally differentiating social and emotional needs of individuals in

uncertain times and directing them is only possible with the leadership process of the mentioned types of intelligence.

- The business world is constantly changing with the effect of Industry 4.0. Values such as knowledge, learning and innovation, which are the sources of Industry 4.0, at an organizational level, is only possible with the ability of the transformational leader to create a vision. In order to benefit from transformational leadership in this dynamic order, it is necessary to have a learning organization mindset in order to reveal the potential of the young workforce that is open to differences and free from prejudices. (Davutoğlu, et al., 2020).

- Organizations determine their strategies according to environmental conditions. When aggressive and opportunistic innovation strategies are implemented, transformational leaders can provide local and global competitive advantage for organizations with the ability to analyze the external environment (Shibu & Uysal, 2020). However, when defensive and traditional innovation strategies are adopted with the desire to avoid uncertainty, task-oriented transactional leadership will guide organizations to mimic and survive.

- It should not be forgotten that today's global business world is not satisfied with a single leadership style in practice. Depending on the nature of the problem encountered, it may be necessary to borrow from the components of different leadership styles or to change the leadership style completely (Helmold, 2021). If it is desired to ensure the effectiveness of leaders in organizations, it is recommended to choose leaders with high social intelligence and cultural intelligence. Considering these preferences in the selection of leaders, analyzing the social needs in the globalizing business world, identifying feelings and thoughts, being aware of cultural differences and being successful in managing diversity will bring organizations one step ahead of their rivals.

As a result of this research, it has been revealed that leadership styles are in relation and affected by social intelligence and cultural intelligence. Within the scope of research limitations, it should not be overlooked that this research was conducted in solely a Technopark within the body of a state university in Istanbul. The implementation of the research in organizations that support and incorporate technological and social change, and globalization, such as Technology Development Zones in different cities, should be considered as a new research proposal. In addition, the fact that the demographic characteristics discussed in the study differ according to the variables of intelligence and leadership indicates that interesting results will be obtained when the study is redesigned with different samples. Finally, detecting the negative relationships between social intelligence, social skills and social awareness with management by exceptions and laissez-faire leadership, it presents valuable suggestions for future research.

**Peer-review:** Externally peer-reviewed.
**Conflict of Interest:** The authors have no conflict of interest to declare.
**Grant Support:** The authors declared that this study has received no financial support.
**Author Contributions:** Conception/Design of study: S.Y., H.A.; Data Acquisition: S.Y.; Data Analysis/Interpretation: S.Y.; Drafting Manuscript: S.Y.; Critical Revision of Manuscript: S.Y., H.A.; Final Approval and Accountability: S.Y.

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# Appendix – Scales

**A. Multi-Factor Leadership Questionnaire (MLQ)**

| (Bass & Avolio, 1992) | (Tarım, 2010) |
|---|---|
| I make others feel good to be around me. | Çalışanlarımın kendilerini iyi hissetmelerini sağlarım. |
| I express with a few simple words what we could and should do. | Birkaç basit kelimeyle ne yapabileceğimizi ve ne yapmamız gerektiğini anlatırım. |
| I enable others to think about old problems in new ways. | Çalışanlarımın problem çözümünde farklı bakış açıları geliştirmelerini sağlarım. |
| I help others develop themselves. | Çalışanlarımın kendilerini geliştirmelerine yardım ederim. |
| I tell others what to do if they wan t to be rewarded for their work. | Çalışanlarıma ödüllendirilmek istiyorlarsa neler yapmaları gerektiğini anlatırım. |
| I am satisfied when others meet agreed-upon standards. | Çalışanlarımın önceden belirlenen standartlara ulaşması beni mutlu eder. |
| I am content to let others continue working in the same ways always. | Çalışanlarımın her zamanki gibi çalışmalarına devam etmeleri beni memnun eder. |
| Others have complete faith in me. | Çalışanlarım bana tam anlamıyla güvenir. |
| I provide appealing images about what we can do. | Yapabileceğimiz işlerle ilgili örnek davranışlar sergilerim. |
| I provide others with new ways of looking at puzzling things. | Karmaşık şeyleri ele almaları için çalışanlarıma yeni yollar sunarım. |
| I let others know how I think they are doing. | Çalışanlarımın performansları konusunda ne düşündüğümü bilmelerini sağlarım. |
| I provide recognition/rewards when others reach their goals. | Hedeflerine ulaştıklarında çalışanlarımın ödüllendirilmelerini sağlarım. |
| As long as things are working, I do not try to change anything. | İşler yolunda gittiği sürece değişiklik yapmaya çalışmam. |
| Whatever others want to do is OK with me. | Çalışanlarımın yapmak istediği her şey benim için uygundur. |
| Others are proud to be associated with me. | Çalışanlarım benimle çalıştıkları için gurur duyarlar. |
| I help others find meaning in their work. | Çalışanlarımın yaptıkları işlerin anlamını kavramalarına yardım ederim. |
| I get others to rethink ideas that they had never questioned before. | Çalışanlarımı daha önce hiç sorgulanmamış fikirleri düşünmeye sevk ederim |
| I give personal attention to others who seem rejected. | Dışlanmış görünenlere özel ilgi gösteririm. |
| I call attention to what others can get for what they accomplish. | Çalışanlarımın başarıları sonucunda neler elde edebileceklerine dikkat çekerim. |
| I tell others the standards they have to know to carry out their work. | Çalışanlarıma işlerini yapabilmeleri için gereken standartları anlatırım. |
| I ask no more of others than what is absolutely essential. | Çalışanlarımdan gerekenden daha fazlasını beklemem. |

**B. Tromso Social Intelligence Scale (TSIS)**

| **(Silvera, Martinussen & Dahl, 2001)** | **(Doğan & Çetin, 2009)** |
|---|---|
| I can predict other people's behavior. | Diğer insanların davranışlarını önceden tahmin edebilirim. |
| I know how my actions will make others feel. | Davranışlarımın diğer insanlara ne hissettirdiğini bilirim. |
| I understand other people's feelings. | Diğer insanların duygularını anlayabilirim. |
| I understand other's wishes. | Başkalarının isteklerini anlarım. |
| I can often understand what others are trying to accomplish without the need for them to say anything. | Bir açıklama yapmalarına gerek duymadan insanların ne yapmaya çalıştıklarını çoğunlukla anlarım. |
| I can predict how others will react to my behavior. | Diğer insanların davranışlarıma nasıl tepki göstereceklerini bilirim. |
| I can often understand what others really mean through their expression, body language, etc. | Diğer insanların yüz ifadelerinden, beden dillerinden vs. gerçekte ne demek istediklerini çoğunlukla anlarım. |
| I often feel uncertain around new people who I don't know. | Tanımadığım yeni insanları olduğu bir ortamda genellikle tedirginlik hissederim. |
| I fit in easily in social situations. | Sosyal ortamlara kolaylıkla uyum sağlarım. |
| I am good at entering new situations and meeting people for the first time. | İnsanlarla ilk tanışmada ve yeni ortamlara girme konusunda iyiyimdir. |
| I have a hard time getting along with other people. | Başka insanlarla geçinebilmekte zorlanırım. |
| I takes a long time for me to get to know others well. | Başkalarını iyice tanımam uzun zaman alır. |
| I am good at getting on good terms with new people. | Yeni tanıştığım insanlarla iyi ilişkiler kurmada başarılıyımdır. |
| I frequently have problems finding good conversation topics. | Başkalarıyla konuşacak güzel sohbet konuları bulmakta çoğunlukla sıkıntı çekerim. |
| I often feel that it is difficult to understand other's choices. | Çoğunlukla başkalarının seçimlerini anlamanın zor olduğunu hissederim. |
| People often surprise me with the things they do. | İnsanlar yaptıkları şeylerle beni sık sık şaşırtırlar. |
| Other people become angry with me without me being able to explain why. | İnsanlar açıklama yapmama fırsat vermeden bana kızarlar. |
| It seems as though people are often angry or irritated with me when I say what I think. | Ne düşündüğümü söylediğimde insanlar genellikle benden rahatsız olmuş veya bana kızmış gibi görünürler. |
| I find people unpredictable. | İnsanları tahmin edilemez bulurum. |
| I have often hurt others without realizing it. | Farkına varmadan çoğu kez başkalarını incitirim. |
| I am often surprised by other's reactions to what I do. | Diğer insanların yaptıklarıma verdiği tepkiler beni çoğunlukla şaşırtır. |

**C. Cultural Intelligence Scale (CQS)**

| (Ang et al., 2007) | (İlhan & Çetin, 2014) |
|---|---|
| I am conscious of the cultural knowledge I use when interacting with people with different cultural backgrounds. | Farklı kültürel geçmişe sahip insanlarla etkileşim kurarken kullandığım kültürel bilgilerin farkındayım. |
| I adjust my cultural knowledge as I interact with people from a culture that is unfamiliar to me. | Bana yabancı bir kültürden gelen insanlarla etkileşim kurarken kültürel bilgimi ayarlarım. |
| I am conscious of the cultural knowledge I apply to cross-cultural interactions. | Kültürlerarası etkileşimlerde kullandığım kültürel bilgimin farkındayım. |
| I check the accuracy of my cultural knowledge as I interact with people from different cultures. | Farklı kültürlere sahip insanlarla etkileşim halindeyken, kültürel bilgilerimin doğruluğunu kontrol ederim. |
| I know the legal and economic systems of other cultures. | Diğer kültürlerin yasal ve ekonomik sistemlerini bilirim. |
| I know the rules (e.g., vocabulary, grammar) of other languages. | Diğer dillerin kurallarını (örneğin; kelime bilgisi, dil bilgisi) bilirim. |
| I know the cultural values and religious beliefs of other cultures. | Diğer kültürlerin dini inançlarını ve kültürel değerlerini bilirim. |
| I know the marriage systems of other cultures. | Diğer kültürlerin evlilik yapılarını bilirim. |
| I know the arts and crafts of other cultures. | Diğer kültürlerin sanat ve zanaatlarını bilirim. |
| I know the rules for expressing nonverbal behaviors in other cultures. | Diğer kültürlerin sözel olmayan davranışlarını (jest ve mimik) ifade etme şekillerini bilirim. |
| I enjoy interacting with people from different cultures. | Farklı kültürlerden insanlarla etkileşim kurmaktan zevk alırım. |
| I am confident that I can socialize with locals in a culture that is unfamiliar to me. | Bana yabancı bir kültürün halkı ile karşılaştığımda onlarla kaynaşabilme konusunda kendime güvenirim. |
| I am sure I can deal with the stresses of adjusting to a culture that is new to me. | Yeni bir kültüre uyum sağlama sürecinde yaşayacağım stres ile başa çıkabilme konusunda kendime güvenirim. |
| I enjoy living in cultures that are unfamiliar to me. | Yabancısı olduğum bir kültürde yaşamaktan hoşlanırım. |
| I am confident that I can get accustomed to the shopping conditions in a different culture. | Farklı bir kültürdeki alışveriş koşullarına alışabilme konusunda kendime güvenirim. |
| I change my verbal behavior (e.g., accent, tone) when a cross-cultural interaction requires it. | Konuşma davranışlarımı (örneğin; ses tonu, aksan) kültürlerarası etkileşimin gereklerine göre ayarlarım. |
| I use pause and silence differently to suit different cross-cultural situations. | Farklı kültürlerarası durumlara uyum sağlamak için duruma göre duraksar ya da sessiz kalırım. |
| I vary the rate of my speaking when a cross-cultural situation requires it. | Konuşma hızını kültürlerarası etkileşimin gereklerine göre değiştirebilirim. |
| I change my nonverbal behavior when a cross-cultural situation requires it. | Sözel olmayan davranışlarımı kültürlerarası etkileşimin gereklerine göre değiştirebilirim. |
| I alter my facial expressions when a cross-cultural interaction requires it. | Yüz ifadelerimi kültürlerarası etkileşimin gereklerine göre değiştirebilirim. |
| I am conscious of the cultural knowledge I use when interacting with people with different cultural backgrounds. | Farklı kültürel geçmişe sahip insanlarla etkileşim kurarken kullandığım kültürel bilgilerin farkındayım. |

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*Istanbul Business Research, 52*(1), 133-160
**DOI:** 10.26650/ibr.2023.52.961368
http://ibr.istanbul.edu.tr/
http://dergipark.org.tr/ibr

# Istanbul Business Research

**Submitted:** 02.07.2021
**Revision Requested:** 24.10.2021
**Last Revision Received:** 30.11.2021
**Accepted:** 31.05.2022
**Published Online:** 23.02.2023

RESEARCH ARTICLE

# Evaluation and Classification of Behavioral Biases According to Thinking Styles, Risky Investment Intention, and Subjective Financial Literacy

**Selim Aren**[1], **Hatice Nayman Hamamcı**[2]

**Abstract**
The main purpose of this study is to classify the 20 biases into different groups (factors) and estimate each of them according to the variables of rational, experiential-affective, risky investment intention, and financial literacy. Behavioral finance, which combines the concepts and approaches of psychology with the theory of finance, evaluates individuals' deviations from rational choices in their financial decisions with the concept of biases. In this context, the data were collected from 1188 subjects in Turkey through online surveys using a convenience sampling method between 14 May - 28 June 2020. Participants were gender-balanced, young, single, and highly educated. An exploratory factor analysis, ANOVA, an independent sample T-test, and a correlation analysis were performed using SPSS. In addition, a confirmatory factor analysis was performed using structural equation modeling. According to the results, these 20 biases were grouped into four groups according to the variables of thinking style, risky investment intention, and subjective financial literacy level. It was determined how both these four groups and individual biases differ according to thinking styles, risky investment intention and their levels of subjective financial literacy. In addition, it was also investigated whether both bias groups and other variables differed according to four demographic variables.

**Keywords**

Behavioral Biases, Thinking Styles, Risky Investment Intention, Subjective Financial Literacy

## Introduction

People make decisions in their daily lives. Some of these are based on preferences that do not require knowledge and awareness, such as what to eat for lunch or to drink tea or coffee, and whose accuracy and wrongness are not questioned much. In addition to these, sometimes it is in selections that require information and may be correct or incorrect, such as whether to accept a job offer which has a high salary in a different city or to choose between one of two positions offered in the same workplace. People tend to seek information about such

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**To cite this article:** Aren, S., & Nayman Hamamci, H. (2023). Evaluation and classification of behavioral biases according to thinking styles, risky investment intention and, subjective financial literacy. *Istanbul Business Research, 52*(1), 133-160. http://doi.org/10.26650/ibr.2023.52.961368

decision problems (Baker, 2019). Nowadays, the problem is not the scarcity of information but its abundance. There are also information-searching distractions that we call noise. In such a decision making problem, when people are exposed to too much information or noise, they filter most of them and choose what they believe to be the most useful (Peon, Antelo, & Calvo-Siilvaso, 2017; Baker, 2019). However, from where that information is obtained and how it is analyzed is an important issue. At this point, individuals try to simplify information processing by using mental shortcuts called heuristics (Peon et al., 2017; Baker, 2019) in order to find a satisfactory solution instead of an optimal solution (Simon, 1972).

The difference between what should be done and what has been done regarding that information, and where to get it and how to use it points to behavioral biases. Behavioral biases affect investors and experts' judgments (Baker & Ricciardi, 2014). Bias is defined as a tendency to make mistakes and, heuristics as a rule of thumb (Shefrin, 2008; Baker & Ricciardi, 2014). Since individuals' preferences are influenced by their beliefs (Baker & Ricciardi, 2014), they exhibit many biases (Chira, Adams, & Thornton, 2008; Baker, 2019). However, it is not very easy to identify them (Goetzmann & Massa, 2008), and these biases cause errors in decision-making processes (Shefrin, 2008; Baker & Ricciardi, 2014; Blumenthal-Barby, 2016; Peon et al., 2017; Baker, 2019). Both psychology and behavioral finance studies state that people think using shortcuts and make decisions under the influence of various biases (Peon et al., 2017). Studies show that there are individual differences under heuristics and biases (Ceschia, Constantinia, & Sartoria, 2019).

Peon et al. (2017) refer to two different views on heuristics. According to the first, it is effective short-cuts developed through basic psychological mechanisms. In the second view, according to the dual-process theory, heuristics are the second of the two existing cognitive systems (reason and intuition). The intuitive system is an affect-driven and effortless cognitive system. Tversky & Kahneman (1974) also evaluated intuitions as mental shortcuts, biases, and heuristics. Heuristics are formed by affect evaluation, are automatic and accessible, and are highly functional in evaluations such as good-bad, positive-negative (Peon et al., 2017). Affect provides faster intuition than recall from memory (Peon et al., 2017). Loewenstein, Weber, Hsee, & Welch (2001)'s risk model also refers to the effect of affect. Investors make decisions based on past events, beliefs and preferences (Baker & Ricciardi, 2014). Loewenstein et al. (2001)'s risk model also refers to the effect of affect. Investors make decisions based on past events, beliefs and preferences (Baker & Ricciardi, 2014). For this reason, investment decisions have both qualitative and quantitative features.

The uncertainty inherent in an investment requires an intuitive solution (Pretz & Totz, 2007). Intuitive people use stereotypes instead of concrete facts to predict probabilities. As Kahneman (2013) states in his book "Thinking, Fast and Slow", there are two thinking styles according to dual-process theory, analytic and intuitive. Analytic thinking is slow and rule-

based. However, the intuitive thinking style is fast and automatic. The intuitive style is associated with emotions and refers to its three properties: the affective, heuristic, and holistic (Pretz & Totz, 2007). An experiential/intuitive style is also based on emotions and affect (Pretz & Totz, 2007). Affect is not intuitive but related to it (Pretz & Totz, 2007). Similarly, Thaller & Sunstein (2008) mentioned two different thinking styles and labeled them automatic and reflective systems. The automatic system is fast and feels instinctive, and is not usually associated with word thinking. The reflective system, on the other hand, is expressed as understanding situations by thinking and logic (rational). The differences between these systems are listed in Table 1.

Table 1
*Thinking Styles*

| **Automatic (Intuitive) System** | **Reflective (Analytic) System** |
|---|---|
| 1. Uncontrolled | 1. Controlled |
| 2. Effortless | 2. Effortful |
| 3. Associative | 3. Deductive |
| 4. Fast | 4. Slow |
| 5. Unconscious | 5. Self-aware |
| 6. Skilled | 6. Rule-following |

Pretz & Totz (2007) state that individuals' thinking styles are a personality structure and that similar scales are used to measure this even though there are differences in their names. In this framework, different dual structures were used such as intuitive/sensate, thinking/feeling or rational/experiential (Pretz & Totz, 2007). Although people cannot escape from all cognitive and emotional responses, they need to be aware of them in order to overcome these biases, because it is difficult to change behavior without awareness (Baker, 2019).

The main purpose of this study is to classify biases, which is defined as the tendency of individuals to make mistakes, and to categorize them according to thinking styles, risky investment intention and subjective financial literacy. As discussed in detail in the literature review section, there is no consensus on the number of biases in the literature, and there is also not enough research regarding its classification. The general acceptance is that some biases are cognitive-based and some biases are affective-based. However, this distinction is based on conceptual knowledge rather than on any analysis. In this study, we aimed to make this classification using 1188 subjects based on the analyses. Categorization was done not only according to the cognitive and affective distinctions, but also according to the variables of risky investment intention and subjective financial literacy. Risk perception is important in the formation of biases. People's risk-taking or risk avoidance attitudes cause various tendencies. Also, financial literacy is important in preferences. Although there are significant relationships between objective financial literacy and subjective financial literacy, the two are different. Subjective financial literacy refers to the level of financial literacy individuals themselves have and is expected to have a stronger effect on biases.

In the second part, which is called the literature review, behavioral biases and risk aversion were explained in detail. The third part is the methodology, and in this section the purpose of the research, the data and scales used were mentioned. In the fourth part, the analyses conducted within the scope of the study and the findings obtained were reported. In the last part the conclusion, the research findings were evaluated, implications were made about the results and suggestions were made for future research.

## Literature Review

### Behavioral Biases

Behavioral finance research has defined many behavioral biases (Baker, 2019). However, there is no consensus on the number of biases and even their names (Peon et al., 2017; Ceschia et al., 2019). Blumenthal-Barby (2016) examined 214 studies on behavioral biases and found that there were 19 different biases and heuristics. Since there are very strong relationships between biases, almost none of them are found alone (Baker, 2019). While some of these biases completely overlap, some of them are completely opposite to each other (Baker & Ricciardi, 2014; Baker, 2019). However, there are very few studies that examined and classified biases in relation to each other (Ceschia et al., 2019). There is no consensus on these classifications (Peon et al., 2017; Ceschia et al., 2019; Baker, 2019).

Pompian (2006; 2008) first divided biases into two categaries, cognitive and emotional, based on his own experiences. Cognitive error is a definition or limitation of how people think (Baker, 2019). Cognitive biases are errors that occur when people collect, process and interpret information (Baker, 2019). Emotion is a mental state that arises spontaneously instead of conscious effort (Pompian, 2012). Emotional biases are decision-making behaviors based on emotions (Baker & Ricciardi, 2014). Emotional biases arise from impulses or intuitions rather than conscious calculations (Pompian, 2012). For this reason, a judgment is reached by how the information feels rather than by evaluating and analyzing it. Pompian (2006; 2008) lists cognitive biases as follows: ambiguity aversion, hindsight, framing, cognitive dissonance, recency (risk taking middle low); conservatism, availability, confirmation, representativeness, self-attribution (risk taking middle high). Emotional biases were also listed as follows: endowment, loss aversion, status quo, anchoring, mental accounting, regret aversion (risk taking low); overconfidence, self-control, optimism, illusion of control (risk taking middle high).

Aren & Canikli (2018a) followed Pompain (2008) and studied 19 biases with 100 subjects. However, rather than grouping biases, the authors examined changes according to active and passive investor characteristics and gender. Al-Dahana, Hasan, & Jadah (2019), referring to the study of Pompain (2006), evaluated biases in two groups. They evaluated cognitive bia-

ses as overconfidence, representativeness, availability, illusion of control, confirmation and hindsight bias, and they accepted emotional biases as loss aversion, endowment, self-control, regret aversion and status quo.

In the following years, Pompian (2012) divided cognitive biases into two groups: belief perseverance biases (conservatism, confirmation, representativeness, illusion of control, hindsight, cognitive dissonance) and information processing biases (anchoring and adjustment bias, mental accounting, framing, availability, self-attribution, recency). While belief perseverance biases indicate that individuals stay irrationally or illogically connected to their beliefs, information processing biases indicate that they process information illogically or irrationally (Pompian, 2012). Pompain (2012) accepts loss aversion, overconfidence, self-control, status quo, endowment, regret aversion as emotional biases. Similarly, Baker (2019) also divided biases into two: cognitive and emotional. While the author listed cognitive biases as confirmation, illusion of control, hindsight, framing, mental accounting and familiarity, listed emotional biases were overconfidence, optimism, loss aversion, regret aversion. Teovanović, Knezevic, & Stankov (2015) grouped seven cognitive biases under two factors with data consisting of 243 undergraduate students. Sahi, Arora, & Dhameja (2013), gathered the biases in the three groups, based on interviews with 30 people. In addition to these, Peon et al. (2017) divided biases into three groups. While the first group includes representativeness, anchoring, familiarity, hindsight, cognitive dissonance, aversion to ambiguity, overconfidence, self-attribution, confirmation and illusion of control, the second group included framing, loss aversion, mental accounting, conservatism, anchoring and self-control. Confirmation, familiarity and status quo occurred in the third group. However, this classification is not based on any analysis, and it is seen that some biases are in more than one group. Ceschia et al. (2019) also classified 17 heuristics and biases under three factors with 289 subjects, and the classification process was based only on internal correlation.

In this study, the biases in the studies of Pompian (2006; 2008), who used the widest bias list, were based. Accordingly, it was attempted to classify twenty biases analytically. The biases in the study are listed in Table 4.

*1. Overconfidence:* It is the overvaluation of an individual's knowledge and ability (Aren & Canikli, 2018a). It is accepted to be positively related to risk-taking (Lambert, Bessiere, & N'Goala, 2012; Broihanne, Merli, & Roger, 2014; Mota, Moreira, & Cossa, 2015) Findings regarding the amount of knowledge possessed and the relationship with financial literacy are complex. Menkhoff, Schmeling, & Schmidt (2013) and Mota et al. (2015) stated that there is a positive relationship with the amount of knowledge. While Anwar, Khan, & Rehman (2017) did not find a significant relationship with financial literacy, Rasool & Ullah (2020) stated that there was a negative relationship between them.

*2. Illusion of control:* It is the belief that people can control or at least affect the consequences of events (Aren & Canikli, 2018a). There is evidence that there is a negative relati-

onship with risk taking (Rasool & Ullah, 2020). In addition, Martinez, Le Floch, Gaffie, & Villejoubert (2011) determined that the illusion of control and risk-taking behaviors of the individuals may increase or not change according to the past event information given to the subjects. Hooks, Schuitema, & McDermott (2019) also state that individuals with the illusion of control tend to underestimate risks. Lam & Ozorio (2015), who studied Chinese subjects, could not find a significant relationship with risk taking Ateş, Coşkun, Şahin, & Demircan (2016) stated that it is positively related to financial literacy, and Smith & Giroux (2019), who evaluated the illusion of control in the context of gambling, also found that this bias would be more in well-educated people with more knowledge of probability and statistics.

*3. Optimism:* It is investors' positive opinions about the future, their own investments and financial decisions that are not based on a valid reason (Aren & Canikli, 2018a). It was reported to be positively associated with risk taking (Wang, Sheng, & Yang, 2013) and financial literacy (Ateş et al., 2016).

*4. Self-Attribution:* It is defined as individuals attributing their success to their personal abilities and their failures to bad luck (De Bondt, Muradoglu, Shefrin, & Staikouras, 2008). There are findings that there is a positive relationship with risk-taking (Jain & Kesari, 2019). Baker, Kumar, Goyal, & Gaur (2019) stated that there is a very strong relationship between self-attribution and overconfidence and that self-attribution leads to overconfidence, but they could not find a significant relationship with financial literacy. Czaja & Röder (2020) evaluated self-attribution and overconfidence together, considering self-attribution highly correlated with overconfidence (similar to Baker et al. (2019)), and both studies pointed out the positive relationship between self-attribution and risk taking.

*5. Conservatism:* It is to give more weight and trust to old information than new information (Ramiah, Xu, & Moosa, 2015). There are studies that found that conservative traders underestimate risks (Rahim, Shah, & Aamir, 2019) or avoid risk (Luo, 2013). It is accepted that there is also a positive relationship between financial literacy and conservatism (Kılınç & Kılıç, 2014).

*6. Representativeness*: It is the evaluation of an event or example according to its similarity to the main population in terms of its basic and salient characteristics (Kahneman & Tversky, 1972). It is thought that there is a positive relationship between risk-taking (Salman, Khan, & Javed, 2020) and a negative relationship with financial literacy (Rasool & Ullah, 2020). However, Baker et al. (2019) could not detect a significant relationship with financial literacy.

*7. Regret Aversion:* It is the desire to avoid negative emotion when individuals realize that it would be better if they had made a different choice (Zeelenberg, Beattie, Pligt, & Vries, 1996; Zeelenberg & Beattie, 1997; Humphrey, 2004; Reb, 2008; Van de Ven and Zeelenberg,

2011; Wong, 2014). Aren (2019b) states that there are both positive and negative relationships between regret aversion and risk taking. Hala, Abdullah, Andayani, Ilyas, & Akab (2020) could not find a relationship with financial literacy.

*8. Framing:* It is the decision maker making different choices according to presenting the same problem as gain or loss (Huangfu, 2014). There are findings that individuals want risk in case of loss and avoid risk in case of gain (Mishra, Gregson, & Lalumiere, 2011; Huangfu, 2014). It was found to be negatively related to financial literacy (Adamkovic, Martoncik, & Ropovik, 2020).

*9. Cognitive dissonance:* It is the tendency to eliminate the discomfort caused by inconsistent behavior by changing the behavior, preferences or changing the evaluation of the behavior that causes the arousal (Mannberg, 2012). It is accepted that this bias is positively associated with risk taking (Mannberg, 2012) but negatively associated with financial literacy (Ateş et al., 2016). However, while Beasley (2016) emphasizes that the cognitive dissonance theory is not a risk-taking theory, Meertens & Lion (2011) also point out that it will increase both risk aversion attitude of risk-averse individuals and the risk-taking attitudes of risk seeking people.

*10. Recency:* It is defined as believing that new information is more important than old information without rational justifications, and weighting the new information more in the decision phase (Aren, 2019a). Findings regarding its relationship with risk are complex (Aren, 2019a). Some researchers state that it increases risk-taking (Plonsky & Erev, 2017) and some researchers state it decreases it (Barron & Yechiam, 2009). It was reported to be negatively related to financial literacy (Avşar & Özdemir, 2020).

*11. Hindsight:* It is an individual's erroneous belief regarding that s/he predicted the outcome of an event (actually did not) (Aren, 2019a). It was predicted to be positively associated with risk taking (Cristina, 2009; Merkle, 2017) and negatively related to financial literacy (Rasool & Ullah, 2020).

*12. Endowment:* It is the positive difference between the price that those who own the asset wants to sell the asset and the amount that those who do not have the asset are willing to pay to buy (Aren, 2019a). It has been stated that it is positively associated with risk aversion indirectly (Aren, 2019a) and indirectly and negatively associated with financial literacy (List, 2003).

*13. Status Quo:* It has been defined as individuals prefer their current situation by high weight without any basis (Samuelson & Zeckhauser, 1988). It was reported to be positively associated with risk aversion (Maner, Gailliot, Butz, & Peruche, 2007) and financial literacy (Josef & Vera, 2017).

*14. Loss Aversion:* The fact that individuals are more sensitive to losses than gains are defined as loss aversion (Maggi, 2006). It was predicted to be positively associated with risk avoidance (Maggi, 2006) and negatively related to financial literacy (Ateş et al., 2016; Rasool & Ullah, 2020; Mrkva, Johnson, Gaechter, & Herrmann, 2020).

*15. Anchoring:* This bias, first expressed by Tversky and Kahneman (1974), expresses the commitment of individuals to a certain value without any basis while making a decision (Aren, 2019b). It was stated that it was positively associated with risk taking (Ayadi, Paraschiv, & Vernette, 2017; Jetter & Walker, 2017) and negatively related to financial literacy (Smith, Windschitl, & Bruchmann, 2013).

*16. Mental Accounting:* It is defined as categorization by dividing the expenses and income of individuals into different classes (Shefrin & Thaler, 1988). Muehlbacher & Kirchler (2019) found a positive relationship between mental accounting and financial literacy and emphasized that it could increase risk-taking.

17. *Ambiguity aversion*; It is defined as people's preference for risky situations over uncertain situations (Borghans, Golsteyn, Heckmann, & Meijers, 2009). Foltice & Rogers (2020) state that ambiguity aversion is associated with lower participation in stock markets and more conservative investment strategies, therefore, it is expected to be positively associated with risk avoidance. Dimmock, Kouwenberg, Mitchell, & Peijnenburg (2016) found a significant positive relationship between ambiguity aversion and financial literacy, albeit very low (0.04).

*18. Self-control:* It is deficiency in the ability to overcome impulses (Baumeister, 2002). It was found to be positively associated with risk-taking (Dickason & Ferreira, 2018; Ritika, 2020) and negatively related to financial literacy (Mehmood, Bashir, & Khan, 2019). However, Trehan & Sinha (2020) state that as financial literacy increases within the framework of retirement planning, self-control bias will decrease indirectly.

*19. Availability:* It is the prediction of the probability of an event occurring according to the ease of remembering (Tversky & Kahneman, 1973; Tversky & Kahneman, 1974; Shams, 2002; Kliger & Kudryavtsev, 2010; Javed, Bagh, & Razzaq, 2017; Chen, Cheng, Lin, & Chihwei, 2017; Kudryavtsev, 2018). It was found to be positively associated with risk-taking (Mouna & Jarboui, 2015) and negatively related to financial literacy (Mouna & Jarboui, 2015; Rasool & Ullah, 2020).

*20. Confirmation:* It is the tendency to seek and overweigh information that overlaps with individuals' beliefs and predictions, and to underweight or ignore non-overlapping information (Nickerson, 1998; Cipriano & Gruca, 2014; Nelson, 2014; Costa, Carvalho, Bruno, & Prado, 2017; Charness & Dave, 2017). It is accepted that there is a positive relationship between risk taking (Aren, 2019b) and financial literacy (Ateş et al. 2016).

## Risk Aversion

Risk aversion refers to the level of risk that individuals do not want to accept or undertake (Aren & Hamamcı, 2020, 2021). Traditional finance states that homo economicus is generally risk-averse, whereas behavioral economists states that risk aversion is dynamic, that is, it changes according to loss or gain situations (Czerwonka, 2019). Unlike behavioral finance, Breuer, Riesener & Salzmann (2014) stated that risk aversion is generally accepted as a stable personal trait.

Risk aversion increases in negative situations, following, a decrease in financial decisions such as savings and investment is experienced (Sakha, 2019). Similarly, as individuals' risk-averse attitudes increase, their demand for risky assets also decreases (Gollier, 2002). In this context, risk aversion also significantly affects people's decisions to participate in risky markets (Dimmock & Kouwenberg (2010). In terms of financial crises, it has been seen that market shocks caused by crises increase risk aversion (Guiso, Sapienza & Zingales, 2018). Sakha (2019) determined that risk aversion was high during the 2008 crisis, but there was a decrease in risk aversion with the improvement that came two years after the crisis. He stated that these changes occurred as a result of micro and macro-shocks. He also mentioned that if individuals expect to live in worse conditions in the future, their risk aversion attitudes will increase. Likewise, Guiso, Sapienza & Zingales (2018) found that there was an increase in the risk aversion attitudes of financial investors after the 2008 crisis. Byder, Agudela & Arango (2019) also investigated the risk attitudes of mutual fund investors in Colombia, and as a result, they observed that after the crisis, women and self-employed individuals withdrew their money from risky assets faster than others.

In the literature review, it was observed that there is a relationship between demographic variables and risk aversion. In terms of gender, women were found to be more risk-averse than men (Charness & Gneezy, 2012; Halko, Kaustia & Alanko, 2012; Meziani & Noma, 2018). Cole, Sampson & Zia (2008) stated that the reason for the low level of financial literacy of women may be due to their low demand for financial instruments. There are different findings in the literature regarding the relationship between risk aversion and age. While Bucciol & Miniaci (2011) and Boyle et al. (2012) found that risk aversion increases with age, on the contrary, Bommier & Rochet, (2006) and Brooks et al. (2018) found an inverse relationship between age and risk aversion.

## Methodology

The aim of this study was to classify biases commonly used in behavioral finance. As discussed in the literature review section, there is no consensus on the number of biases and there is not enough work on their classification. In this study, biases were classified in the context of both rational/experiential – affective and risky investment intentions and subjective financial literacy. The variables and scales used in this framework are listed in Table 2.

Table 2
*Variables and Scales Used in Research*

| Variables | Items | Scales |
|---|---|---|
| Rational/Experiential –Affective | 20 | Pacini & Epstein (1999) |
| Risky Investment Intention | 4 | Aydemir & Selim (2017) |
| Subjective Financial Literacy | 1 | Aren & Canikli (2018b) |
| Biases | 20 | Developed by this article |

Our undergraduate and graduate students, who voluntarily supported the collection of data, shared an online survey link on their social networks. Within the scope of this study, individuals over the age of 18 with the potential to invest were reached. In this way, 1188 subjects participated in the study between May 14 2020 – June 28 2020. Four demographic questions were asked, namely sex, age, education level and marital status. Against this, since the questions about the economic situation of the individuals reduced the notifications given to the other questions, a separate question was not asked about their economic situation. Two participants did not answer the four demographic questions. However, all subjects, including these two subjects, completely answered all other questions in the study. Five hundred and sixty seven (47.7%) of the subjects were male and 619 (52.1%) were female. Nine hundred and twenty seven (78%) were 20-30 age group, 164 (13.8%) 31-40, 53 (4.5%) 41-50 and 42 were 51 and over. Twenty (1.7%) subjects had a degree of primary school, 292 (24.6%) subjects had a degree of high school, 741 (62.4%) degree of undergraduate and 133 (11.2%) degree of master/doctorate graduates. Two hundred and thirty seven (19.9%) of the subjects were married and 949 (79.9%) were single. Accordingly, our participants were gender-balanced, young, single and highly educated.

## Analyses

Confirmatory factor analysis aims to verify previously developed or determined structures (Yaşlıoğlu, 2017). In this context, since the rational/experiential-emotional (two-dimensional) and risky investment intention (one-dimensional) scales used in the study were previously developed structures, confirmatory factor analysis was performed on these variables using SEM. The AMOS program was used for analyses. The analysis results are presented in Table 3.

Table 3
*Confirmatory Factor Analysis*

| CMIN/DF | RMSEA | GFI | IFI | CFI | TLI | NFI | RFI |
|---|---|---|---|---|---|---|---|
| 4,364 | 0,053 | 0,929 | 0,950 | 0,950 | 0,943 | 0,936 | 0,927 |

CMIN/DF shows the ratio of chi-square to degrees of freedom (Kes, Şahin & Sevencan, 2021). While RMSEA, one of the fit values listed in Table 2, is a statistic that provides information about whether the population is compatible with the covariance matrix (Byrne, 2011), NFI compares the $\chi 2$ value of the statistical model with the $\chi 2$ value of the zero model

(Yaşlıoğlu, 2017). In addition, while GFI shows the extent to which the model measures the covariance matrix in the sample (Waltz et al., 2010), CFI is a model that predicts that there is no relationship between variables. TLI value was put forth to eliminate the effect of sample size (Yaşlıoğlu, 2017). CMIN / DF value was less than 5 and RMSEA value was approximately 0.05. Other indicator values were higher than 0.90, which is accepted as the threshold value. In this context, according to Table 3, the goodness of fit indicator values regarding the confirmatory factor analysis conducted for the three variables used in our study is quite good.

In addition to this, exploratory factor analysis was made since we developed the items regarding biases. The varimax rotation results obtained by exploratory factor analysis regarding the biases used in the study are reported in Table 4.

Table 4
*Varimax Rotated Component Matrix*

| **Biases and Items** | **Components** | | | |
|---|---|---|---|---|
| | **Factor 1** | **Factor 2** | **Factor 3** | **Factor 4** |
| **Overconfidence:** *"If I have a month to research, I can choose the most profitable investment instrument for the next month."* | ,706 | | | |
| **Illusion of Control:** *"I believe that I can protect my investment from negative developments in the market when I analyze as necessary."* | ,755 | | | |
| **Optimism:** *"When making an investment decision, I always have a positive opinion about the return on investment."* | ,587 | | | |
| **Self-attribution:** *"If an investment instrument I bought yields a return above expectations, I take a credit for my own investment ability from this."* | ,614 | | | |
| **Conservatism:** *"After I make an investment decision, I stand behind my decision, even if the developments are negative."* | ,560 | | | |
| **Representativeness:** *"When I come across an investment instrument that I am foreign to, I evaluate it according to other investment instruments that I find similar."* | ,397 | | | |
| **Regret Aversion:** *"If everyone around me buys an investment tool whose price is not high for me and I do not believe that it will earn much and they say that it will have a big return, I also buy it at the expense of some loss to avoid regret."* | | ,661 | | |
| **Framing:** *"To be honest, when it is said that an investment instrument has a 70% chance of earning, I look more positively compared to saying that you can lose 30%."* | | ,486 | | |
| **Cognitive Dissonance:** *"Even if an investment I made does not provide the return I expected, I think it is worth to make an investment."* | | ,702 | | |
| **Recency:** *"When making an investment decision, I pay more importance to the latest information."* | | ,437 | | |
| **Hindsight:** *"I think, "I knew" beforehand some opportunities that provide high returns in the financial markets."* | | ,367 | | |
| **Endowment:** *"I do not accept market price offers to buy the stock or house inherited from my family; a higher offer must be made for me to sell."* | | | ,586 | |

| Biases and Items | Components | | | |
|---|---|---|---|---|
| | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
| **Status Quo:** *"If there are financial preferences I have made since the past, I will not change them easily."* | | | ,585 | |
| **Loss Aversion:** *"For me, the pain of losing $100 is more than the happiness of winning $100."* | | | ,640 | |
| **Anchoring:** *"I do not sell an investment instrument I bought below my purchase price, regardless of market conditions."* | | | ,534 | |
| **Mental Accounting:** *"If I were to direct my savings to investment, I would make separate investments for my expenses (holiday money, education money, automobile money, etc.) and the risk of each investment would be different."* | | | ,432 | |
| **Ambiguity Aversion:** *"I prefer certain investments with low return, rather than high-return or lossy investments with high uncertainty."* | | | ,355 | |
| **Self–Control:** *"I would rather spend less today than save and spend more in the future"* | | | | ,351 |
| **Availability:** *"I think that the most reported and mentioned investment instruments are more profitable."* | | | | ,718 |
| **Confirmation:** *"I care more about the information that shows that the investment decision I made is correct rather than the information that shows that it is erroneous"* | | | | ,633 |
| % of Variance | 15,470 | 9,999 | 9,560 | 9,405 |
| Reliability Analysis | 0,766 | 0,622 | 0,594 | 0,529 |
| KMO | | 0,898 | | |
| Bartlett's Test of Sphericity | | $4732,721^{0,000}$ | | |

According to Table 4, the KMO value, which indicates the adequacy of the data and its suitability for factor analysis, is above the threshold value, and Bartlett's Test of Sphericity is significant at a 0,000 error level. As a result of the factor analysis, four factors were obtained and which biases were collected under which factors are shown in Table 4. Reliability analysis results for factors are not very high but at an acceptable level (Aren, Nayman, & Özcan, 2021). The four factors formed according to the results of factor analysis and the biases in these factors are as follows:

*Factor 1* (Overconfidence, Illusion of Control, Optimism, Self-Attribution, Conservatism, Representativeness)

*Factor 2* (Regret Aversion, Framing, Cognitive Dissonance, Recency, Hindsight)

*Factor 3* (Endowment, Status Quo, Loss Aversion, Anchoring, Mental Accounting, Ambiguity Aversion)

*Factor 4* (Self–Control, Availability, Confirmation).

Following the factor and reliability analyses, a discriminant analysis was performed for each factor. Discriminant analysis enables the prediction of dependent categorical variables

by using independent variables in continuously variable property. Since the dependent variable was categorical, the success of the analysis was measured with the correct classification.

The main purpose of the study is to separate the biases into different groups (factors) and estimate each of them according to the variables of rational, experiential-affective, risky investment intention and financial literacy. For this reason, dependent variables were categorized as low or high. Thus, it was possible to determine the main determinants of the factors consisting of relevant biases for each subject.

The discriminant analysis results obtained within this framework are reported in Table 5.

Table 5

*Discriminant Analyses for Factor 1, Factor 2, Factor 3 and Factor 4*

| **Factor 1** | | **Structure Matrix** | | **Canonical Discriminant Function Coefficients** | | |
|---|---|---|---|---|---|---|
| Rational | | 0,520 | | 0,379 | | |
| Experiential – Affective | | 0,623 | | 0,695 | | |
| Risky Investment Intention | | 0,647 | | 0,383 | | |
| Subjective Financial Literacy | | 0,600 | | 0,416 | | |
| Constant | | | | –6,054 | | |
| Function | Eigenvalue | Canonical Correlation | Wilks' Lambda | Chi-square | Sig. | Correct classification |
| 1 | 0,139 | 0,349 | 0,878 | 153,721 | 0,000 | %65,9 |
| **Factor 2** | | **Structure Matrix** | | **Canonical Discriminant Function Coefficients** | | |
| Rational | | 0,357 | | 0,146 | | |
| Experiential –Affective | | 0,764 | | 0,955 | | |
| Risky Investment Intention | | 0,638 | | 0,429 | | |
| Subjective Financial Literacy | | 0,475 | | 0,293 | | |
| Constant | | | | –5,917 | | |
| Function | Eigenvalue | Canonical Correlation | Wilks' Lambda | Chi-square | Sig. | Correct classification |
| 1 | 0,156 | 0,367 | 0,865 | 171,272 | 0,000 | %66,4 |
| **Factor 3** | | **Structure Matrix** | | **Canonical Discriminant Function Coefficients** | | |
| Rational | | 0,123 | | 0,013 | | |
| Experiential – Affective | | 0,966 | | 1,390 | | |
| Risky Investment Intention | | –0,078 | | –0,235 | | |
| Subjective Financial Literacy | | 0,008 | | –0,019 | | |
| Constant | | | | –4,248 | | |
| Function | Eigenvalue | Canonical Correlation | Wilks' Lambda | Chi-square | Sig. | Correct classification |
| 1 | 0,051 | 0,221 | 0,951 | 59,066 | 0,000 | %62 |

| Factor 4 | | Structure Matrix | | Canonical Discriminant Function Coefficients | | |
|---|---|---|---|---|---|---|
| Rational | | –0,021 | | –0,349 | | |
| Experiential – Affective | | 0,882 | | 1,238 | | |
| Risky Investment Intention | | 0,408 | | 0,257 | | |
| Subjective Financial Literacy | | 0,369 | | 0,268 | | |
| Constant | | | | –4,588 | | |
| Function | Eigenvalue | Canonical Correlation | Wilks' Lambda | Chi-square | Sig. | Correct classification |
| 1 | 0,126 | 0,335 | 0,888 | 140,779 | 0,000 | %64,6 |

In Table 5, in the four discriminant analyses performed for each factor, the models were significant at 0,000 margins of error, and the correct classification success was respectively 65.9%, 66.4%, 62.0%, and 64.6%. These classification values are quite high. The structure matrices were evaluated according to the threshold value of 0.30. For Factor 1 and Factor 2, all values are higher than the threshold value, indicating that these variables have discriminant characteristics. The variable with discriminant characteristic for Factor 3 is experiential-affective. For Factor 4, three variables except rational have discriminant characteristics.

Equations describing each factor can be written with the help of the values in the canonical discriminant function coefficient column. According to this;

$$\text{Factor 1} = -6{,}054 + 0{,}379\ X_1\ (\text{Rational}) + 0{,}695\ X_2\ (\text{Experiential} - \text{Affective}) + 0{,}383\ X_3\ (\text{Risky Investment Intention}) + 0{,}416\ X_4\ (\text{Subjective Financial Literacy})$$

$$\text{Factor 2} = -5{,}917 + 0{,}146\ X_1\ (\text{Rational}) + 0{,}955\ X_2\ (\text{Experiential} - \text{Affective}) + 0{,}429\ X_3\ (\text{Risky Investment Intention}) + 0{,}293\ X_4\ (\text{Subjective Financial Literacy})$$

$$\text{Factor 3} = -4{,}248 + 0{,}013\ X_1\ (\text{Rational}) + 1{,}390\ X_2\ (\text{Experiential} - \text{Affective}) - 0{,}235\ X_3\ (\text{Risky Investment Intention}) - 0{,}019\ X_4\ (\text{Subjective Financial Literacy})$$

$$\text{Factor 4} = -4{,}588 - 0{,}349\ X_1\ (\text{Rational}) + 1{,}238\ X_2\ (\text{Experiential} - \text{Affective}) + 0{,}257\ X_3\ (\text{Risky Investment Intention}) + 0{,}2689\ X_4\ (\text{Subjective Financial Literacy})$$

Following the discriminant analysis, mean values of four factors for each variable were calculated and reported in Table 6.

Table 6

*Mean for Factor 1, Factor 2, Factor 3 and Factor 4*

| | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Mean |
|---|---|---|---|---|---|
| Rational | 3,6972 | 3,6895 | 3,6032 | 3,5810 | 3,5880 |
| Experiential – Affective | 3,6466 | 3,7171 | 3,6346 | 3,7802 | 3,5324 |
| Risky Investment Intention | 2,9665 | 3,0219 | 2,7803 | 2,9675 | 2,7927 |
| Subjective Financial Literacy | 2,9700 | 2,9800 | 2,8100 | 2,9600 | 2,8100 |

When Table 6 above is examined, it is seen that each factor has different mean values for each variable. For each factor, some of these variables were high and some were low. However, in order to say that these differences are statistically significant, analyses of ANOVA and Duncan tests should be performed. For this purpose, we investigated how each factor has a characteristic structure according to rational, experiential, risky investment intention and subjective financial literacy values. ANOVA and Duncan tests were performed for each variable using SPSS and the results were reported in Tables 7, 8, 9 and 10. Then Table 11 is then prepared as a summary of these.

Table 7

*ANOVA Analysis and Duncan Test for Rational*

| **Factor** | **Mean** | **Mean** |
|---|---|---|
| Factor 4 | 3,5831 | |
| Factor 3 | 3,6053 | |
| Factor 2 | | 3,6917 |
| Factor 1 | | 3,6993 |
| Sig. | ,617 | ,864 |
| ANOVA Score: F value | 3,494* (significant at the 0.05 level) | |

According to the ANOVA analysis for the "rational" variable, Factor 1 and Factor 2 have a higher rational mean. Factors 3 and 4 have lower means. While Factor 1 and Factor 2 became a subgroup, Factors 3 and 4 took part in the second subgroup. Since the significant values of both subgroups are well above 0.05, it is possible to say that both subgroups are quite stable.

Table 8

*ANOVA Analysis and Duncan Test for Experiential*

| **Factor** | **Mean** | **Mean** |
|---|---|---|
| Factor 3 | 3,6346 | |
| Factor 1 | 3,6466 | |
| Factor 2 | | 3,7171 |
| Factor 4 | | 3,7802 |
| Sig. | ,754 | ,098 |
| ANOVA Score: F value | 5,861** (significant at the 0.01 level) | |

Similar analyses were made for the variable of "experiential" and reported in Table 8. While Factors 2 and 4 formed a subgroup with higher mean values, Factors 3 and 1 took part in the second subgroup with lower mean values.

Table 9

*ANOVA Analysis and Duncan Test for Risky Investment Intention*

| **Factor** | **Mean** | **Mean** |
|---|---|---|
| Factor 3 | 2,7803 | |
| Factor 1 | | 2,9665 |
| Factor 4 | | 2,9675 |
| Factor 2 | | 3,0219 |
| Sig. | 1,000 | ,384 |
| ANOVA Score: F value | 7,150*** (significant at the 0.000 level) | |

For risky investment intention, factors were grouped into two sub-groups. However, while this time Factors 1, 4 and 2 were gathered in the same subgroup with higher values, Factor 3 took part in the other subgroup with a lower mean value.

Table 10

*ANOVA Analysis and Duncan Test for Subjective Financial Literacy*

| Factor | Mean | Mean |
|---|---|---|
| Factor 3 | 2,8109 | |
| Factor 4 | | 2,9623 |
| Factor 1 | | 2,9656 |
| Factor 2 | | 2,9766 |
| Sig. | 1,000 | ,809 |
| ANOVA Score: F value | 4,691** (significant at the 0.01 level) | |

In this framework, the subjective financial literacy variable, in which individuals evaluate their own financial literacy levels, was used in the last ANOVA and Duncan analysis. While Factor 3 took part in a subgroup alone with a lower mean value, the other three factors have formed the other subgroup with higher mean values. As a result, according to these four ANOVA and Duncan tests results, factors show the features summarized in Table 11.

Table 11

*Summary of ANOVA Analyzes and Duncan Tests*

| Factor | Biases | Rational | Experiential | Risky Investment Intention | Subjective Financial Literacy |
|---|---|---|---|---|---|
| Factor 1 | Overconfidence, Illusion of Control, Optimism, Self-attribution, Conservatism, Representativeness | High | Low | High | High |
| Factor 2 | Regret Aversion, Framing, Cognitive Dissonance, Recency, Hindsight | High | High | High | High |
| Factor 3 | Endowment, Status Quo, Loss Aversion, Anchoring, Mental Accounting, Ambiguity Aversion | Low | Low | Low | Low |
| Factor 4 | Self–Control, Availability, Confirmation | Low | High | High | High |

According to Table 11, individuals who have biases gathered under Factor 1 have high rational tendencies but their experiential tendencies are low. In addition, their risky investment intentions and subjective financial literacy levels were also high. In spite of this, all dependent variable values of individuals with biases gathered under Factor 2 were high. Conversely, all dependent variable values of individuals with biases gathered under Factor 3 were low. While individuals who have biases gathered under Factor 4 have low rational tendencies, their tendencies regarding other variables are high. When the four factors are evaluated together, it can be seen that there is a clear distinction between the dependent variable values of individuals with these biases.

In addition, ANOVA and Duncan tests were conducted for each of the demographic variables of sex, age, education and marital status in terms of Factors 1, 2, 3, and 4, rational, experiential, risky investment intention and subjective financial literacy level. In none of the thirty-two (4 demographics x 8 dependents) analyses performed, no difference was detected between the groups at a significance level of 0.05. In other words, factors formed within the scope of the study (Factor 1–2–3–4) and dependent variables (rational, experiential, risky investment intention and subjective financial literacy) do not differ according to demographic variables.

In this context, the correlation analysis results for dependent variables are also reported in Table 12.

Table 12

*Correlation Analysis Results*

| | **Rational** | **Experiential** | **Risky Investment Intention** | **Subjective Financial Literacy** |
|---|---|---|---|---|
| Rational | 1 | 0,176*** | 0,236*** | 0,157*** |
| Experiential | 0,176*** | 1 | 0,173*** | 0,100*** |
| Risky Investment Intention | 0,236*** | 0,173*** | 1 | 0,299*** |
| Subjective Financial Literacy | 0,157*** | 0,100*** | 0,299*** | 1 |

**Note:** significant at the 0.000 level

The results shown in Table 12 are interesting. A negative correlation is generally expected between rational and experiential. However, according to these results, it was found that positive and significant (at 0,000 level) relationship between all variables. This shows us that individuals do not have to have either rational or experiential tendencies, they can have both at the same time. In fact, this finding supports the statement that System 1 and System 2 can be activated simultaneously, emphasized by Kahneman (2013) in the dual thinking system. Systems 1 and 2 are effective structures in the decision-making processes of individuals. While System 1 is fast, automatic, experiential and intuitive, System 2 relies on slow, cognitive, analytical and conscious choices. According to Kahneman (2013), System 1 generates the feelings, impressions and intentions that System 2 needs. While System 2, on the other hand, transforms the intuitions and impressions provided by System 1 into beliefs, it transforms impulses into conscious actions. The division of labour between systems is efficient, reduces effort and increases performance.

To the best of our knowledge, our study is the research conducted with the largest data on the topology of biases. For this reason, in addition to analyses made, separate analyses were performed for each of the bias. In this context, it was investigated whether each bias differs for four dependent variables (rational, experiential, risky investment intention and subjective financial literacy) and four demographic variables. Accordingly, the independent sample T-test was applied to variables using the SPSS program and the results are reported in Table 13.

Table 13

*Independent Sample T-tests for Biases*

| | | Rational | | Experiential | | Risky Investment Intention | | Subjective Financial Literacy | |
|---|---|---|---|---|---|---|---|---|---|
| Overconfidence | Low | 3,24 | *** | 3,16 | *** | 3,30 | *** | 3,34 | *** |
| | High | 3,50 | | 3,52 | | 3,68 | | 3,71 | |
| Illusion of Control | Low | 3,09 | *** | 3,16 | *** | 3,23 | *** | 3,27 | *** |
| | High | 3,47 | | 3,44 | | 3,62 | | 3,65 | |
| Optimism | Low | 3,19 | ** | 2,94 | *** | 3,13 | *** | 3,25 | *** |
| | High | 3,38 | | 3,46 | | 3,70 | | 3,57 | |
| Self-attribution | Low | 3,20 | *** | 3,19 | *** | 3,34 | *** | 3,35 | *** |
| | High | 3,54 | | 3,54 | | 3,67 | | 3,76 | |
| Conservatism | Low | 3,08 | *** | 3,01 | *** | 3,16 | *** | 3,22 | *** |
| | High | 3,37 | | 3,38 | | 3,55 | | 3,52 | |
| Representativeness | Low | 3,31 | *** | 3,26 | *** | 3,41 | *** | 3,45 | ** |
| | High | 3,58 | | 3,59 | | 3,69 | | 3,67 | |
| Regret Aversion | Low | 2,92 | * | 2,78 | *** | 2,90 | *** | 3,01 | |
| | High | 3,09 | | 3,13 | | 3,33 | | 3,15 | |
| Framing | Low | 3,41 | ** | 3,19 | *** | 3,48 | ** | 3,49 | ** |
| | High | 3,60 | | 3,67 | | 3,68 | | 3,71 | |
| Cognitive Dissonance | Low | 2,82 | *** | 2,75 | *** | 2,80 | *** | 2,93 | *** |
| | High | 3,09 | | 3,10 | | 3,42 | | 3,27 | |
| Recency | Low | 3,29 | ** | 3,28 | *** | 3,37 | *** | 3,39 | *** |
| | High | 3,51 | | 3,51 | | 3,61 | | 3,63 | |
| Hindsight | Low | 2,80 | *** | 2,78 | *** | 2,84 | *** | 2,97 | *** |
| | High | 3,15 | | 3,14 | | 3,46 | | 3,31 | |
| Endowment Bias | Low | 3,43 | *** | 3,34 | *** | 3,57 | ** | 3,62 | |
| | High | 3,72 | | 3,73 | | 3,76 | | 3,68 | |
| Status Quo | Low | 3,28 | | 3,02 | *** | 3,38 | | 3,38 | |
| | High | 3,40 | | 3,48 | | 3,34 | | 3,33 | |
| Loss Aversion | Low | 3,31 | | 3,15 | * | 3,33 | | 3,30 | |
| | High | 3,28 | | 3,33 | | 3,21 | | 3,24 | |
| Anchoring | Low | 3,31 | | 3,20 | ** | 3,29 | ** | 3,36 | |
| | High | 3,36 | | 3,40 | | 3,46 | | 3,31 | |
| Mental Accounting | Low | 3,28 | *** | 3,34 | * | 3,38 | *** | 3,37 | *** |
| | High | 3,54 | | 3,51 | | 3,65 | | 3,77 | |
| Ambiguity Aversion | Low | 3,29 | | 3,21 | ** | 3,38 | | 3,38 | |
| | High | 3,41 | | 3,43 | | 3,37 | | 3,37 | |
| Self–Control | Low | 3,25 | | 3,09 | *** | 3,28 | * | 3,29 | ** |
| | High | 3,36 | | 3,41 | | 3,43 | | 3,47 | |
| Availability | Low | 3,08 | | 2,64 | *** | 2,95 | *** | 2,97 | |
| | High | 2,98 | | 3,13 | | 3,11 | | 3,11 | |
| Confirmation | Low | 3,02 | | 2,55 | *** | 2,93 | *** | 3,01 | ** |
| | High | 3,08 | | 3,23 | | 3,32 | | 3,24 | |

*** 0,000 error level

** 0,01 error level

* 0,05 error level

In Table 13 above, all the dependent variables (rational, experiential, risky investment intention and subjective financial literacy) were grouped as low and high. Then, an independent sample T-test was conducted for each variable and each bias. The results of 80 (20 biases x 4 variables) independent sample T-tests performed in this way were reported. As an example, to understand Table 12 more easily; the overconfidence value of individuals with low level of rationality is 3.24, and the overconfidence value of individuals with a high level of rationality is 3.50. In other words, individuals with a high level of rational have a higher tendency to be overconfident, and this situation is significant at a 0,000 error level. Individuals' tendency towards status quo, loss aversion, anchoring, ambiguity aversion, self-control, availability and confirmation biases is not related to the rational level. In other biases, the higher the rational level, the higher the tendency towards the relevant bias. On the other hand, as the experiential level increases, the tendency towards all biases increases. Status quo, loss aversion and ambiguity aversion are not associated with risky investment intention levels. The tendency towards other biases increases as risky investment intentions increase. Regret aversion, endowment, status quo, loss aversion, anchoring, ambiguity aversion and availability biases are also not associated with subjective financial literacy. The tendency towards other biases increases as the subjective financial literacy increases.

When looking at the change according to demographic variables, ANOVA analyses and an independent sample T-test was performed for four demographic variables (sex, marital status, age and education) for each bias. A total of 40 independent sample tests (20 biases and 2 demographic variables) were conducted for sex and marital status, and 40 ANOVA analyses (20 biases and 2 demographic variables) for age and education. It was observed that the tendency towards any bias does not change according to age, and only overconfidence and optimism biases differ according to education level. Remarkably, it was seen that individuals with the lowest education level (primary school) had a higher tendency towards overconfidence and optimism biases. However, the fact that there were only 20 people at this education level in the participant group may have been effective in this result. On the other hand, it was determined that the tendency to bias did not change according to sex (0.05 error level). According to marital status, there was only differentiation in ambiguity aversion (0.05 error level). Married people tend to more ambiguity aversion than single people.

## Conclusion

### General Review

As a result of the analyses, 20 biases subject to the research were grouped into four groups. Accordingly, overconfidence, illusion of control, optimism, self-attribution, conservatism, and representativeness were put in a group. While the second group included regret

aversion, framing, cognitive dissonance, recency, hindsight, the third group included endowment, status quo, loss aversion, anchoring, mental accounting and ambiguity aversion. In the last group, self-control, availability, and confirmation biases were included.

According to this classification, while the rationally, risky investment intention and subjective financial literacy level of the individuals with bias in the first group are high, the experiential feature is low. On the other hand, individuals with biases in the second group were at high levels for all four characteristics. Individuals with biases in the third group are the opposite of those in the second group, and they are at a low level in all characteristics. Individuals with biases in the last group are similar to those in the first group, but while their experiential levels, which is is one of the thinking styles, are high, their rational levels are low. Since relatively high data can be reached in the study, additional analyses regarding biases were also made. In this context, interesting findings were obtained. As the experiential level, one of the thinking styles, increases, the tendency towards all biases increases. On the other hand, as the rational level rises, the tendency to be overconfident, an illusion of control, optimism, self-attribution, conservatism, representativeness, regret aversion, framing, cognitive dissonance, recency, hindsight, endowment and mental accounting biases also increase. However the tendency towards status quo, loss aversion, anchoring, ambiguity aversion, self-control, availability and confirmation biases are not related to the rational level. In addition, status quo, loss aversion and ambiguity aversion biases are not associated with the level of risky investment intention. However, the tendency towards other biases increases as risky investment intentions increase. Regret aversion, endowment, status quo, loss aversion, anchoring, ambiguity aversion and availability biases are also not associated with subjective financial literacy. In spite of this, the tendency towards overconfidence, an illusion of control, self-attribution, conservatism, representativeness, framing, cognitive dissonance, recency, hindsight, mental accounting, self-control and confirmation biases increase as subjective financial literacy increases.

Finally, serious relationships between biases and demographic variables could not be determined either, grouped or individually.

## Implications

Our study provides important findings for academic people and financial advisors. As far as we know in the literature, no other study classified biases based on a number of variables on this number of subjects. This study will provide an important basis for subsequent academic studies. In addition, the approach to classifying biases both empirically and theoretically is based on a cognitive and affective basis. Interestingly, as Kahneman (2013), who won a Nobel prize for his work in behavioral finance, emphasized in his dual thinking system that these two systems can be active at the same time. However, as far as we know, no study has

empirically emphasized that the tendency towards bias can be triggered by both thinking styles. This study is important in terms of revealing this. In addition, we showed that a classification based on thinking styles, risky investment intention and subjective financial literacy would be more accurate rather than demographic variables. Finally, empirical findings regarding the change according to the four variables expressed for each bias are provided. As highlighted in the literature review section, the findings regarding the relationship of biases to relevant variables are complex. With its data and inferences, this study has the potential to clarify a little bit about this complex situation.

As Pompian (2008) stated, it is easy to find customers in financial markets, but it is difficult to retain them and ensure that they stick to their portfolio for the planned period. The way to do this is to understand the customers and know their tendencies. Each investor has a tendency towards various biases. It is not very easy to detect them one by one. However, many financial fund management companies try to measure their risk appetite by applying different risk-seeking surveys to investors. Similarly, subjective financial literacy levels can be easily learned. With the help of our approach, it becomes possible to predict the biases that investors, whose thinking styles are measured, may have. This finding may make a significant contribution to the happy advisor-happy investor relationships. In addition, we reveal that demographic variables such as age, sex, marital status and education level, which are frequently used in the formation of investor profiles, are not really important in the tendency to bias.

## Future Research

Although our study was conducted with a relatively large number of subjects, it does not have the feature of generalization and it does not have such a claim. However, thanks to 1186 participants, it points to a number of trends. When combined with future studies and findings from different countries, it is possible to provide generalizable findings. On the other hand, adding various psychological variables such as emotional and emotional intelligence will also be beneficial for investor taxonomy. Consequently, this work has the potential to provide a basis for further research. It can provide guidance in terms of the findings obtained for future studies to be done in the behavioral finance area.

**Peer-review:** Externally peer-reviewed.
**Author Contributions:** Conception/Design of study: S.A.; Data Acquisition: S.A., H.N.H.; Data Analysis/Interpretation: S.A., H.N.H.; Drafting Manuscript: S.A., H.N.H.; Critical Revision of Manuscript: S.A.; Final Approval and Accountability: S.A., H.N.H.
**Conflict of Interest:** The authors have no conflict of interest to declare.
**Grant Support:** This study was funded by the Yildiz Technical University Scientific Research Projects Coordination Unit (SBA-2022-5039).

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*Istanbul Business Research, 52*(1), 161-183
**DOI:** 10.26650/ibr.2023.52.828912
http://ibr.istanbul.edu.tr/
http://dergipark.org.tr/ibr

# Istanbul Business Research

**Submitted:** 20.11.2020
**Revision Requested:** 29.01.2021
**Last Revision Received:** 07.06.2022
**Accepted:** 29.06.2022
**Published Online:** 06.12.2022

RESEARCH ARTICLE

# Leader Behavior, Job Performance, and Service Quality: Ethical Perspective From Banking Sector*

**Gaye Onan[1], Ömür N.Özmen[2], Esin Firuzan[3]**

**Abstract**

This study aimed to examine the relationships between ethical leadership behavior, ethical work climate, employee job performance, and customer service quality. The impact of ethical leadership on three types of ethical climates—egoist, benevolent, and principled—, employee job performance, and customer service quality were analyzed, as were the relationships between all of these variables as well. Data were gathered from 379 bank branch employees and 406 bank customers in Izmir, Turkiye. Results of the PLS-SEM analysis revealed that ethical leadership behavior affects benevolent and principled ethical climates, but contrary to the hypothesis suggested, it also has a positive effect on an egoistic climate. However, the results indicate that the egoist and benevolent climates do not have a significant influence on job performance, but the principled climate positively affects the job performance of employees. In addition, ethical leadership affects job performance positively. However, ethical leadership and service quality, as well as job performance and service quality, are not significantly related. These findings further suggest that ethical leadership behaviors affect an ethical working climate and have a positive effect on employee job performance and quality of service.

**Keywords**

ethical leadership, ethical climate, job performance, service quality, SEM-PL

## Introduction

Trying to operate in an intensely competitive environment can cause businesses and employees to display unethical behaviors. Scandals around the world (such as Lehman Brothers in 2008 and Volkswagen in 2015) have highlighted the concept of "ethics" in the business world (Guğerçin, U.,& Ay, Ü (2017), and brought the importance of ethics in leadership to the agenda. With Facebook's data scandal in 2018, this concept has started to be reconsidered and examined in leadership studies. Most of the research on organizational ethics has focused on ethical leadership and ethical climate as critical antecedents of organizational outputs (Demirtaş and Akdoğan, 2015:59). The ethical climate in the organization is an important mechanism that ethical leadership relies on to promote ethical behavior (Elçi and Alpkan, 2009).

* This article was derived from the doctoral thesis titled "Ethical leadership, ethical climate, employee performance and service quality relations: Banking sector example", which was prepared by Gaye Onan under the supervision of Prof. Dr. Ömür N. Timurcanday Özme at Dokuz Eylul University Social Sciences Institute.

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**To cite this article:** Onan, G., Ozmen, O. N., & Firuzan, E. (2023). Leader behaviour, job performance, and service quality: ethical perspective from banking sector. *Istanbul Business Research, 52*(1), 161-183. http://doi.org/10.26650/ibr.2023.52.828912

Studies show that ethical working climates have important effects on employees' behaviors, attitudes, and organizational outputs. One of these outputs is job performance. Leaders can have a very important role in creating a work environment that increases job performance. In addition, job performance is expressed by researchers as one of the most important factors affecting customers' perception of service quality (Berry et. al., 1988; Tsaur et al., 2004; Gould-Williams, 1999; Bitner, 1990), which is one way of providing competitive advantage and superiority in the market.

Many researchers in the field of organizational behavior have examined the relationship between leadership styles and outcomes, but there is limited research on ethical leadership and behavioral consequences in Turkey (Demirtaş and Akdoğan, 2015:59). This study aims to examine the effect of the ethical leadership behavior of branch managers in the banking sector on the ethical climate of the branch, the work performance of the employees, and the quality of the service. The banking sector is one of the most important building blocks of the financial system in a country, and competition is more intense than in many sectors. Accordingly, it is important to analyze in detail the behavioral outputs of managers and employees in this sector, as well as the effects of these behaviors on customers. When previous research on the issue is examined, studies analyzing the relationships between some of the concepts investigated in this research could be found (Berry et al.,1988; Jaramillo et al.,2006; Mayer et al., 2010; Bouckenooghe et al.,2015). However, there has not been any study that reveals the relationship between all of these concepts at the same time, and also in the banking sector. Therefore, this study is based on data collected from bank employees and customers. In addition, unlike prior studies analyzing the relationship between ethical leadership and ethical climate, the effect of ethical leadership on three different ethical climate types (egoistic, benevolent, and principled) was investigated within the scope of the research. The lack of a corresponding study in the banking sector is the study's most encouraging feature. Therefore, the study is expected to be an important resource in this regard.

## Literature Review and Hypotheses Development

### Ethical Leadership and Ethical Climate

Brown et al. (2005) defined ethical leadership as displaying normatively appropriate behaviors through personal actions and interpersonal relationships and ensuring that such behaviors are widespread among employees through communication and support. The main components of ethical leadership, according to Trevino et al. (2000; 2003), are "moral person" and "moral manager." The "moral person" is the core of ethical leadership and refers to the leader who is ethically exemplary and treats all employees fairly. A moral manager, on the other hand, efficiently supervises his subordinates' ethical behavior, either by encouraging ethical behavior or by communicating with them about the consequences of unethical

activity. Previous studies indicate that the leader's behavior has a substantial influence on employees (Brown and Trevino, 2006; DeConinck, 2010; Kalshooven et al., 2011). Although different researchers explain the effects of ethical approaches such as being a role model, reward system, and informing about ethics with different processes, they agree that the leader has a major influence on the creation and maintenance of the ethical climate (Trevino et al., 1998; Grojean et al., 2004; Schminke et al., 2005; Mulki et al.,2009; Neubert et al.,2009). An ethical climate is defined by Victor and Cullen (1987) as "shared perceptions about what ethically appropriate behavior should be and how ethical issues are handled." Many researchers consider ethical climate to be a multi-dimensional structure (Shin,2012:300). Victor and Cullen's (1988) typology is the most well-known classification of ethical climate. Victor and Cullen (1987, 1988) suggested an ethical climate typology based on three main moral judgment bases: egoism, benevolent, and principled.

Based on Kohlberg's (1969) pre-conventional stage, the egoism criterion reflects egoistic ethical theory. In an egoistic ethical climate, individuals react to ethical issues with a self-centered perspective, judge ethical situations in terms of their consequences, and the basic response is to "maximize benefit" at the individual, company, or cosmopolitan level (Schimnke et.al.,,2005:136, Akdoğan and Demirtaş,2014:109). In organizations where an egoist ethical climate prevails, employees act only by considering themselves and their interests when confronted with an ethical problem, and they don't even take into account laws and rules, as well as how their colleagues may be affected by their actions. As a result, it might be concluded that the leader does not display ethical leadership conduct in an egoistic climate. Thus, the following hypothesis is suggested:

H1: Ethical leadership affects egoistic ethical climate negatively.

A benevolent ethical climate is concerned with satisfying as many people's interests as possible (Elci and Alpkan,2009:298). This ethical climate creates general well-being by improving friendships, interpersonal relationships, and loyalty within the group and society (Akkoç, 2012). This ethical climate improves group and societal well-being by enhancing friendship, interpersonal relationships, and loyalty (Akkoç, 2012). Priorities are defined as the interests and benefits of all employees in the company, and decisions are made to maximize them (Saygan and Bedük, 2013). Employees that consider the leader as a role model develop ethical behaviors (Mayer et al., 2009; Bello, 2012), and they will also act in the interests of their colleagues rather than their own interests when evaluating the outcome of their actions. From this point of view, the following hypothesis is put forward:

H2: Ethical leadership affects a benevolent ethical climate positively.

A principled climate reflects the internalization of universal codes, standards, and beliefs by members of an organization (Appelbaum et al., 2005: 44; Cullen et al., 2003:129). In cont-

rast to the two previous human-based climates (Akkoç, 2012), morally acceptable behaviors are determined with respect to the principles of universal morality and justice (Schimnke et al., 2005). This approach does not consider the happiness and satisfaction of the individual or group; rather, it focuses on rules and procedures, as well as laws and codes (Akkoç, 2012). Ethical leaders set codes of conduct (rules and procedures) for the ethical behavior of employees and base them on laws and regulations. In addition, as a role model, the leader forms the perceptions of employees about what ethical conduct should be with his/her law and rules-based behaviors. As a result of this, organizations, where ethical leadership occurs, would be regarded as having a principled ethical climate. Therefore, it is hypothesized that:

H3: Ethical leadership affects principled ethical climate positively.

## Ethical Leadership and Employee Job Performance

Job performance refers to measurable actions, attitudes, behaviors, and outcomes that are linked to and contribute to organizational goals set and are demonstrated by employees (Viswesvaran and Ones, 2000). Although job performance may seem related to the person himself at first glance, it actually emerges as a result of the interaction of different variables such as work, employee, and environmental factors (Milkovich and Wigdor, 1991). Leadership style is one of the organizational factors that can affect individual performance at various levels (Özmutaf, 2007). Ethical leaders are "moral people" who act as role models by displaying ethical behavior, while at the same time they are "moral managers" who encourage ethical conduct (Brown and Trevino, 2006). In this context, ethical leaders shape employees' behaviors and work-related outcomes as a result in two ways: as role models (directly) and through interaction (indirectly). Social exchange theory (Blau, 1964), followed by another important theory, social learning theory (Bandura, 1977, 1986), has been suggested by Brown and Trevino (2006) to explain the theoretical basis of the relationship between employee behavior and ethical leadership. According to the social exchange theory, if the quality of the social interaction between two parties is high, both parties will demonstrate beneficial behaviors towards each other. In the opposite case, harmful conduct is unavoidable. In other words, if employees get support and trust from their leaders, as well as material and moral benefits from the organization and other employees, they will feel responsible for repaying these benefits and positive behaviors (Brown and Trevino, 2006; Kalshoven et al., 2011; Mayer et al., 2012). Employees respond to this conduct by enhancing their performance when they believe their leader cares about them and is looking out for their best interests (Walumbwa et.al., 2011). In social learning theory, according to Bandura and Walters (1977), the impact of ethical leadership on the behavior of employees is due to the fact that the leader is a role model. Employees learn what behaviors are expected of them, and they must perform well at work in this way (Bouckenooghe et al., 2015). Ethical leaders act in a manner aligned with ethics; they treat their employees fairly, are concerned for them, and they are significant gu-

ides in these matters. For this reason, employees take an example of the behavior of ethical leaders and thus adopt values and attitudes. Employees who observe such values and attitudes and learn acceptable behaviors are more likely to achieve high levels of job performance by doing their duties sincerely. Based on this relationship between ethical leadership and job performance, the following hypothesis has been proposed;

H4: Ethical leadership affects job performance positively.

## Ethical Climate and Employee Job Performance

In organizations, creating an appropriate ethical climate leads to ethical conduct and attitudes. These behaviors and attitudes turn into results, such as increasing individual performance, and these results provide many contributions to both employees and organizations. However, there may be different types of ethical climates in organizations, and these have different levels of impact on the employees and job-related outputs. Previous studies revealed that there is a negative relationship between the egoistic climate (locus of analysis: self-interest, company profit, efficiency) and the positive work outcomes of employees (e.g. job satisfaction, organizational commitment, job performance) (Desphande, 1996; Cullen et al., 2003; Martin and Cullen, 2006; Tsai and Huang, 2008; Elci and Alpkan, 2009; Wang and Hsieh, 2012), and a positive relationship between individual and organizational negative behaviors and intentions, such as turnover intentions and counterproductive behaviors (DeConinck, 2011; Mulki et al., 2009; Kish-Gephart et al., 2010). Work climates with high ethical standards, trust, and accountability that are adopted by employees will increase employee productivity and efficiency (Weeks, et al., 2004). In egoist climates, employees will consider that organizational activities exceed the acceptable ethical limits and that these activities do not fulfill social ethical expectations (Cullen et al., 2003). In a climate where the code of ethics is not applicable, job-related outputs such as job loyalty and job satisfaction will be negative, and this will lead to inefficient work efforts. On this basis, the following hypothesis is proposed:

H5: Egoistic ethical climate affects job performance negatively.

Martin and Cullen (2006) claimed that the most preferred work climate by employees is a benevolent ethical climate. Studies have revealed a positive relationship between job outputs and this climate type, such as job satisfaction and organizational commitment (Schwepker, 2001; Cullen et al., 2003; Martin and Cullen, 2006; Akbaş, 2010; Elci and Alpkan, 2009). In addition, this climate reduces unethical behaviors (Kish-Gephart et al., 2010). Employees in benevolent climates base their decisions and behaviors on the well-being of others, and they tend to act in the most favorable way possible. Koopmans et al. (2011) stated that performance involves positive employee behaviors, such as guiding, helping, and cooperating with colleagues, taking into account the work's social structure. In a benevolent ethical climate, it can

be said that the employees will work most effectively and efficiently, taking into account the team members' and team's well-being, and at the same time, based on teamwork and helping each other. Hence, the following hypothesis is formulated:

H6: Benevolent ethical climate affects job performance positively.

According to Kish-Gephart et al. (2010), there is a negative relationship between unethical behaviors, intentions, and the principled climate. This climate type affects turnover intentions (DeConinck, 2011; Mulki et al., 2009), organizational commitment (Cullen et al., 2003, Akbas, 2010), and job satisfaction (Elci and Alpkan, 2009; Koh and Boo, 2001). In a principled ethical climate, employees act on the basis of codes of ethical behavior, professional rules, and laws. Employees in organizations with clearly defined and implemented ethical codes of conduct will know what is expected of them and will act accordingly. From this point of view, the main priority of the employees in a principled ethical climate is endeavoring to do their job in the best way as written in the job descriptions. Therefore, the following hypothesis can be suggested:

H7: Principled ethical climate affects job performance positively.

## Ethical Leadership and Service Quality

Parasuraman. et. al. (1986) defined service quality as an emotional response, an affective judgment similar to an attitude or inference about the superiority of a product or service based on a rational assessment of its features or attributes. Employee behavior is one of the most critical aspects affecting customers' perceptions of service quality. Parasuraman et al. (1985) also determined the dimensions of service quality as competence, responsiveness, tangibles, access, security, courtesy, credibility, communication, understanding/knowing, and reliability. As can be seen, all these dimensions depend on the attitudes and behaviors of employees.

The leader is the most essential factor that shapes these attitudes and behaviors in the organization. Ethical leaders, according to Brown and Trevino (2006), behave in accordance with ethics, treat others fairly, and value their subordinates. They serve as key role models and constitute an environment in which doing the right thing is valued. Thus, as role models, ethical leaders inspire their employees on how to provide the best service possible. In Schaubroeck et al.'s study (2016), the ethical leadership behavior of peer leaders is an important variable that positively affects employee service quality commitment and service performance. According to a study by Hui et al. (2007), if the perceived service climate is weak, the manager does not display effective leadership behavior, and service quality decreases. According to Schaubroeck et al. (2016), employees regard colleagues and managers as role models to demonstrate specific sorts of service conduct. In other words, employees adopt ethical leaders' principles and attitudes by imitating their behavior. Employees who observe such

values and attitudes and learn acceptable behaviors are more likely to provide quality service by doing their jobs sincerely. Therefore, it is hypothesized that:

H8: Ethical leadership affects service quality positively.

## Employee Job Performance and Service Quality

Service quality is the general perception of the customer after many purchases (Parasuraman, 1988). The customer's perception of service quality is almost entirely dependent on the behavior of employees because the service is the result of interaction between customers and the employees who provide it. Berry et al. (1988), Tsaur et al. (2004), Gould-Williams (1999), and Bitner (1990) suggested that employee performance was one of the most important factors affecting customer perceptions of service quality. Berry et al. (1988) also concluded that the most important dimension determining the quality of service provided to the customer is reliability. As can be understood from these studies, it is obvious that the attitudes and behaviors of the employee providing service to the customer will have a significant impact on the customer's perception of service quality. Customers expect employees to provide the fastest service, act by empathizing, and most of all, be reliable in doing everything they are committed to doing. In addition to this, behaving in accordance with the organization's service quality standards is also a determining factor in employee performance. All in all, the following hypothesis has been established with the belief that the relationship between performance and service quality may be positive:

H9: Employee job performance affects service quality positively.

## Methodology

The survival of a company by working efficiently in an intensely competitive environment depends on the interconnected and coordinated interaction of multiple variables. Studies conducted so far display the importance of variables such as ethical leadership, ethical climate, job performance, and service quality for the organization. This research aims to reveal the results of the ethical leadership of managers in the banking sector by analyzing the mutual relationship between all variables. In this way, it aims to provide a guide for banks to make the necessary regulations to increase employee performance and service quality, which are important tools of competition in the sector. From this point of view, the model of the study was determined as seen in Figure 1.

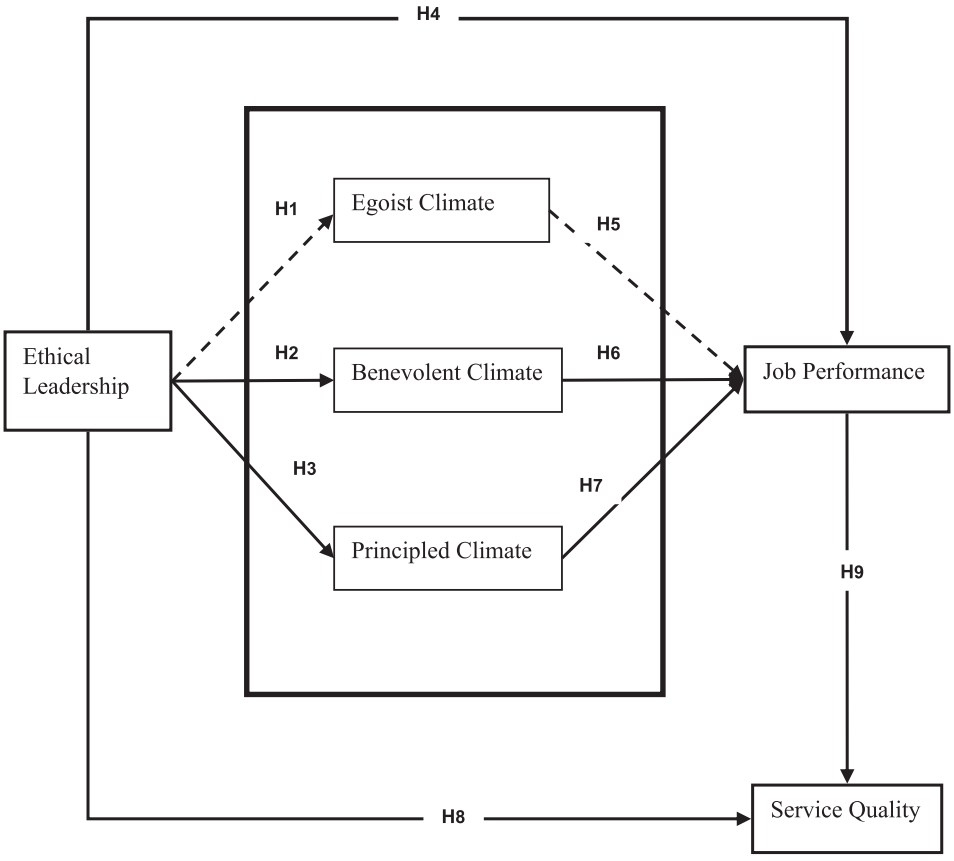


***Figure 1***. Research model

## Sample

The samples consist of all employees of public and private bank branches operating in the city center of Izmir, the third-largest in Turkey, and the customers of these branches. Data were obtained by two distinct questionnaires: one for the bank branch employees and the other for the bank branch customers, using the "convenience sampling" method. A total of 379 bank employees and 406 bank customers responded to the survey.

## Measures

The questionnaire developed for bank branch employees consists of three parts: the "Ethical Leadership Scale", which includes statements about the ethical leadership behavior of the branch manager; the "Ethical Climate Scale" which includes statements about the ethical climate perceived by employees at the bank; and the "Employee Job Performance" scale, where

questions are asked to measure the job performance of bank branch employees. The Ethical Leadership at Work (ELW) scale (Kalshoven et al., 2011) was used to measure ethical leadership behavior. The "Ethical Climate Questionnaire-ECQ", which was developed by Victor and Cullen in 1988 and revised by Cullen, Victor, and Bronson in 1993, was used to measure the prevailing ethical climate at work. The 36-item English scale was translated into Turkish by Elçi (2005) and transformed into a 38-item scale where cultural adaptation and reliability were tested. In order to measure the job performance of the employees, the scales developed by Kirkman and Rosen (1999), Fuentes et al. (2004), and Rahman and Bullock (2005) were used (Erdogan, 2011). The five-point Likert-type response scale was adopted, ranging from 1 = strongly disagree to 5 = strongly agree. The service quality scale, SERVPERF, was used in the survey for bank customers. The scale was developed by Cronin and Taylor (1992) and consists of five dimensions: tangibles, reliability, responsiveness, assurance, and empathy. The seven-point Likert measurement scale was adopted, ranging from 1 (strongly disagree) to 7 (strongly agree). The analyses revealed that all the scales used in the post-study had a reliability coefficient of 0.97 and 0.96. This indicates a high degree of reliability. Regarding demographics, 51.7% of bank employees are women. Eighty-one percent of those taking part work for a private-sector bank. The respondents were working in the following departments: (70.2%) marketing; (28.5%) operation; and (1.3%) counter. The sample included Master's/PhD (10%), university (84,4%), and high school (5,5%) graduates. 51.2% of customer participants are male. In terms of education, (23.2%) high school, (59.4%) university, and (9.9%) Master's/PhD graduates. 36.7% of the participants have worked with banks for more than 7 years, 22.9% have worked with these banks for 0 to 3 years, and 26.4% have worked with these banks for 3 to 5 years, while 14% said they have worked between 5 and 7 years.

## Data Analysis

The data were analyzed using Partial Least Squares to Structural Equation Modeling (PLS-SEM), also known as PLS Path Modeling, in the context of Structural Equation Modeling from multivariate statistical methods.PLS is a very variable modeling technique used to reveal cause-and-effect relationships and increase the explained variance of the endogenous variable (dependent variable) (Hair et al., 2011). It is widely applied in many social science disciplines, including management (Ali et al., 2018; Hair et al., 2011, 2019; Kaufmann and Gaeckler, 2015; Peng and Lai, 2012; Sosik et al., 2009).

Hair et al. (2019) suggest choosing PLS-SEM when the model is complex with many structures, indicators, or model relationships. PLS-SEM can be applied for exploratory research (exploratory factor analysis) when the primary focus of the research is to predict and explain the key target constructs and/or identify the key driver constructs (Hair et al., 2017). Additionally, when formative constructs are part of a model (Hair et al., 2014), PLS-SEM would be the preferable choice. Hence, for models with formative constructs, or a combinati-

on of both reflective and formative constructs, PLS-SEM has the edge. An exploratory factor analysis (EFA) was performed to determine the factors that constitute the basis of the research model. The "Ethical Leadership at Work Scale" was divided into two dimensions as a result of EFA. The ethical leader has two main factors: "moral person" and "moral manager". This conclusion overlaps with Trevino's (2000) study. Apart from the two factors explaining the ethical leadership dimension, the other factors explain the ethical climate scale. This scale has three factors: egoistic climate, benevolent climate, and principled climate. This factorization is consistent with Schimnke et al. (2005). In the meantime, the perceived customer service quality scale (SERVPERF) is represented by four factors: Tangibility, reliability/assurance, responsiveness, and empathy.

The PLS-SEM method has been performed after obtaining the new latent variables. Analyzing and interpreting the theoretical model created by the PLS-SEM method requires two stages: evaluation of the measurement model and construction of the structural model (Hair et al., 2011). The measurement model reveals the relationship between observed variables and latent variables. Relations between latent variables are determined by the structural model. After evaluating the capability of the measurement model and structural model, bootstrapping has been implemented to facilitate the significance of PLS-SEM parameters.

## Results

### Measurement Model Assessment

Measurement model evaluation analysis the reliability and validity of the constructs with their corresponding items. As recommended by Hair et.al. (2011), evaluating the measurement model involves determining factor loadings [>0.5], internal consistency reliability (CR [>0.7] and CA [>0.6]), discriminant validity, and convergent validity (AVE [>0.5]). Values in brackets are considered acceptable (Memon and Rahman,2014) and (Hair et al., 2011) respectively. Cronbach's α and Composite reliability (CR) is the more traditional method for measuring internal consistency reliability in PLS-SEM data analysis and tends to be more accurate. Values in brackets are considered acceptable (Litwin,1995, Hair et al.,2011). The internal consistency reliability (CR) values of this study are between 0.820 and 0.949, and Cronbach's Alpha values are 0.787 and above. In the current study, the AVE is evaluated to check for convergent validity, and AVE values are calculated between 0.788 and 0.866, The suggested AVE values of more than 0.5 indicate that at least 50% of the variance of the items under each construct can be explained.

After performing the measurement model, it is realized that the model does not fit the measure within acceptable limits. To make the fit better, the latent variables that have both less than 0.50 factor loadings and 0.85 AVE values are removed from the measurement model.

As shown in Table 1, factor loadings, convergent validity, and discriminant validity are all suitable in this study.

Table 1
*Results Summary for Structural Model Evaluation*

| | Loadings | AVE | CR | Cronbach's Alpha |
|---|---|---|---|---|
| **Moral Manager** | | **0.788** | **0.949** | **0.933** |
| EL23.Clearly explains integrity-related.. | 0.882 | | | |
| EL26. Ensures that employees follow codes of integrity.. | 0.896 | | | |
| EL27. Clarifies the likely consequences…. | 0.900 | | | |
| EL28.Stimulates the discussion of integrity issues.. | 0.882 | | | |
| EL29.Compliments employees who behave according to ethics | 0.878 | | | |
| **Moral Person** | | **0.862** | **0.949** | **0.920** |
| EL3. Pays attention to my personal needs. | 0.920 | | | |
| EL6. Sympathizes with me when I have a problem. | 0.933 | | | |
| EL7.Cares about his/her followers. | 0.932 | | | |
| **Egoistic Climate** | | **1.000** | **1.000** | **1.000** |
| EİK10.Efficient solutions to always sought. | 1.000 | | | |
| **Benevolent Climate** | | **0.810** | **0.927** | **0.882** |
| EİK17.Look out for each other's good | 0.900 | | | |
| EİK18.Team spirit is important | 0.895 | | | |
| EİK19.Concerned about what is generally best | 0.905 | | | |
| **Principled Climate** | | **0.827** | **0.927** | **0.882** |
| EİK33. Whether a decision violates any law | 0.897 | | | |
| EİK35. Strictly follow legal or professional standards | 0.901 | | | |
| EİK37. Law or ethical code is the major consideration | 0.930 | | | |
| **Job Performance** | | **0.822** | **0.902** | **0.787** |
| CP4. Completes tasks in time that is expected | 0.885 | | | |
| CP5. Meets formal performance requirements | 0.929 | | | |
| **Tangibility** | | **1.000** | **1.000** | **1.000** |
| SP3R.Employees are dressed well and look elegant. | 1.000 | | | |
| **Reliability/Assurance** | | **1.000** | **1.000** | **1.000** |
| SP14.You can trust employees. | 1.000 | | | |
| **Responsiveness** | | **0.851** | **0.820** | **0.828** |
| SP12.Employees are not always willing to help customers. | 0.903 | | | |
| SP13.Employees are too busy to reply demands of customers. | 0.941 | | | |
| **Empathy** | | **0.789** | **0.918** | **0.866** |
| SP19.Employees do not show special interest to you. | 0.862 | | | |
| SP20.Employees do not know your needs. | 0.922 | | | |
| SP21.Employees does not look after your interest. | 0.879 | | | |

Finally, cross-loads and the Fornell-Larcker criterion are used for discriminant validity. The square root of each construct's AVE should be greater than its highest correlation with

other constructs (Hair et al., 2017). As seen in Table 2, squared correlations for each construct are smaller than the AVE by the indicators calculating that construct. Therefore, there is discriminant validity in this study.

Table 2

*Discriminant Validity*

| | JP | EC | EMP | MM | MP | TAN | R/A | RES | PC | BC |
|---|---|---|---|---|---|---|---|---|---|---|
| **Job Performance (JP)** | **0,91** | | | | | | | | | |
| **Egoist Climate (EC)** | 0,21 | **1,00** | | | | | | | | |
| **Empathy (EMP)** | -0,16 | -0,12 | **0,89** | | | | | | | |
| **Moral Manager (MM)** | 0,33 | 0,25 | -0,09 | **0,88** | | | | | | |
| **Moral Person (MP)** | 0,20 | 0,12 | -0,05 | 0,68 | **0,93** | | | | | |
| **Tangibility (TAN)** | -0,05 | -0,06 | 0,26 | 0,12 | 0,04 | **1,00** | | | | |
| **Reliability/Assurance(R/A)** | 0,01 | -0,09 | 0,28 | 0,11 | 0,15 | 0,36 | **1,00** | | | |
| **Responsiveness (RES)** | -0,11 | -0,06 | 0,63 | 0,00 | 0,02 | 0,25 | 0,38 | **0,92** | | |
| **Principled Climate (PC)** | 0,34 | 0,18 | -0,05 | 0,54 | 0,36 | -0,02 | 0,03 | 0,01 | **0,91** | |
| **Benevolent Climate (BC)** | 0,28 | 0,24 | -0,14 | 0,52 | 0,49 | -0,02 | 0,04 | -0,07 | 0,43 | **0,90** |

## Structural Model Assessment

After the construct measures are confirmed to be reliable and valid, the next step is to evaluate the structural model. The key criteria for evaluating the structural model are the measurement of $R^2$ as well as the significance level of the path coefficients that define the variance of the endogenous latent variables (Hair et al., 2011). The $R^2$ result in PLS reveals the overall amount of variance in the constructs that the model enunciates. According to Cohen's (1988) suggestion, the value of the $R^2$ range is between 0.02 and 0.12, which means weak; between 0.13 and 0.25 means moderate, and 0.26 and above means important (Memon and Rahman, 2014). The path coefficient shows the hypothetical link between the structures in the model (Hair et al., 2013). When the path coefficient is close to +1, it indicates a strong positive relationship, and when it is close to -1, it indicates a strong negative relationship (Hair et al., 2013). In addition, the $R^2$ value and path coefficients (β) indicate how strongly the data support the assumed model (Chin, 1998). The explanatory power of the present study is estimated from the $R^2$ values.

As can be seen from Figure 2, the moral manager's $R^2$ value (0.468) indicates that the moral person explains 0.468% of the variance in the moral manager variable. Similarly, egoistic climate, principled climate, and benevolent climate are explained by 0.066%, 0.287%, and 0.308% of the independent variables, respectively, in this study. The $R^2$ value of employee performance is 0.164. Of the service quality variables, empathy is explained by 0.027% of the independent variables, tangibility by 0.025%, reliability-assurance by 0.024%, and responsiveness by 0.014%. However, in order to evaluate the structural model, the statistical significance of the path coefficients was evaluated by bootstrapping (5000 resamples), as suggested by Hair et al. (2016). In the structural model, the path coefficients (β) are measured by the

significance level of the t-value. Hair et al. (2011) state that acceptable t-values are 1.65 for 10% significance level, 1.96 for 5% significance level, and 2.58 for 1% significance level.

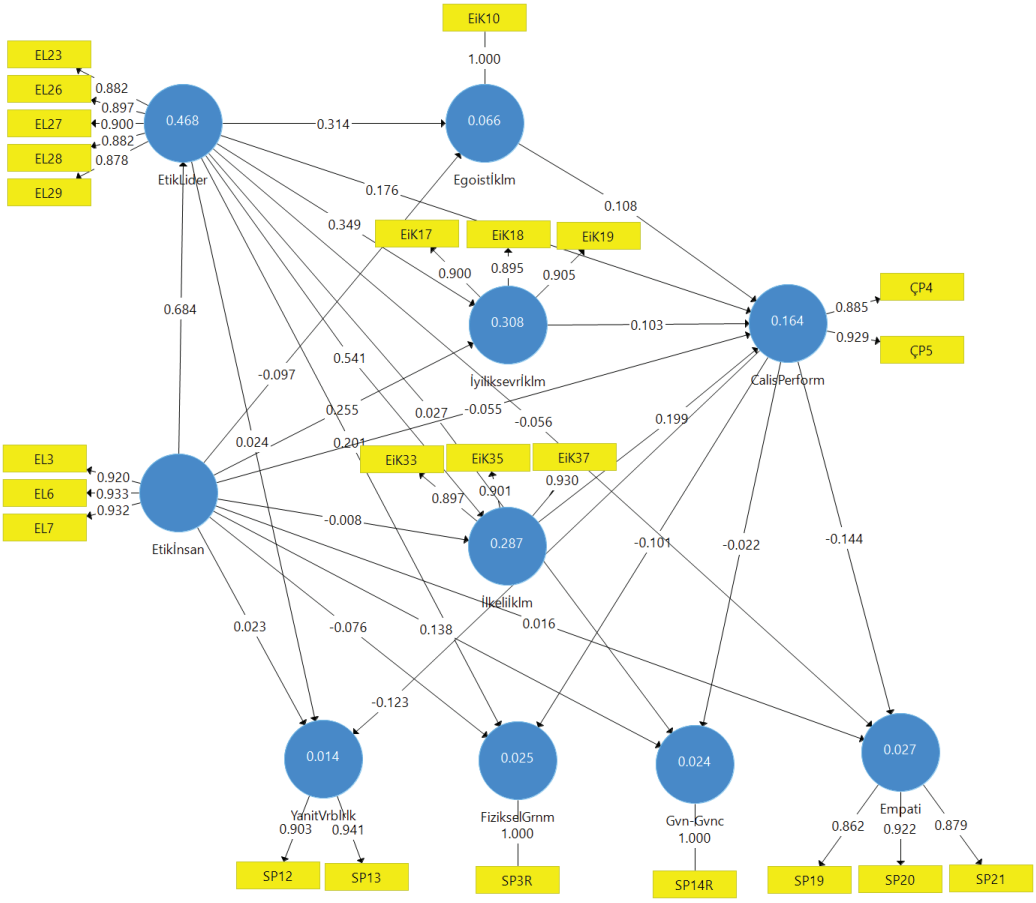


***Figure 2.*** Structural Model with loading factor, path coefficients, and r square

As seen in Table 3, there is a strong relationship (β=0.684, t=19.129, p=0.000) between the two components of ethical leadership, the moral manager and the moral person. Together, they constitute ethical leadership behavior (Trevino et.al., 2000;2003). The moral manager variable has a significant effect on the egoistic climate (β=0.314, t=4.096, p=0.000). However, the moral person has no effect on the egoistic climate (β=-0.097, t=1.283, p >0.000). Therefore, H1 was rejected. H2 was accepted because of the positive effects of moral manager and moral person on a benevolent climate ( respectively β=-0.349, t=5.866, p=0.000 and β=-0.255, t=4.498, p=0.000). Moral manager has a significant effect on principled climate (β=0.541, t=7.986,p=0.000), but moral person has no meaningful effect on principled climate (β=-0.008, t=0.117, p=0.907). Therefore, H3 hypothesis was accepted. Job performance is

positively affected by the moral manager (β=0.176, t=2.504, p=0.012). The relationship between the moral person and job performance (β=-0.055, t=0.827, p=0.408) is not statistically significant. Thus, the H4 hypothesis was accepted. Hypotheses H5 and H6 were rejected because of the relationship between job performance and egoistic climate (β=0.108, t=1.880, p=0.060) and benevolent climate (β=0.103, t=1.753, p=0.080) was not statistically significant. However, the principled climate affects job performance (β=0.199, t=3.167, p=0.002). Therefore, the H7 hypothesis was accepted. When the customer service quality dimensions are examined, it is seen that the moral manager variable has no effect on empathy (β = -0.056, t=0.807, p=0.420), reliability-assurance (β=0.027, t=0.361, p=0.718) and responsiveness (β=0.024). , t=0.330, p=0.742). Only the relationship between tangibility and moral manager is statistically significant (β=0.201, t=2.435, p=0.015). On the other hand, moral person has no effect on empathy (β=0.016, t=0.222, p=0.824), responsiveness (β=0.023, t=0.331, p=0.741) and tangibility (β= -0.076, t=1.016, p). =0.310). Only the relationship between reliability-assurance (β=0.138, t=2.076, p=0.038) is statistically significant. For these reasons, H8 is rejected. Job performance has no effect on service quality dimensions, respectively, reliability-assurance (β=-0.022, t=0.398, p=0.690), responsiveness (β=-0.123, t=2.218, p=0.027), and tangibility (β=-0.101, t=1.849, p=0.064). However, the relationship between job performance and empathy (β=-0.141, t=2.676, p=0.007) was statistically significant. Therefore, H9 is rejected.

Table 3

*Structural Model: Hypothesis Testing*

| Hypotheses | | Path Relations | Path coefficient | t statistics | p value | |
|---|---|---|---|---|---|---|
| **H1** | **EL-EC** | MM-EC | 0.314 | 4.096 | 0.000 | **Not Supported** |
| | | MP-EC | -0.097 | 1.283 | 0.200 | |
| **H2** | **EL-PC** | MM-PC | 0.541 | 7.986 | 0.000 | **Supported** |
| | | MP-PC | -0.008 | 0.117 | 0.907 | |
| **H3** | **EL-BC** | MM-BC | 0.349 | 5.866 | 0.000 | **Supported** |
| | | MP-BC | 0.255 | 4.498 | 0.000 | |
| **H4** | **EL-JP** | MM-JP | 0.176 | 2.504 | 0.012 | **Supported** |
| | | MP-JP | -0.055 | 0.827 | 0.408 | |
| **H5** | | **JP-EC** | 0.108 | 1.880 | 0.060 | **Not Supported** |
| **H6** | | **JP-PC** | 0.199 | 3.167 | 0.002 | **Not Supported** |
| **H7** | | **JP-BC** | 0.103 | 1.753 | 0.080 | **Supported** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **H8** | **EL-SQ** | MM-EMP | -0.056 | 0.807 | 0.420 | |
| | | MM-R/A | 0.027 | 0.361 | 0.718 | |
| | | MM-RES | 0.024 | 0.330 | 0.742 | |
| | | MM-TAN | 0.201 | 2.435 | 0.015 | **Not** |
| | | MP-EMP | 0.016 | 0.222 | 0.824 | **Supported** |
| | | MP-RES | 0.023 | 0.331 | 0.741 | |
| | | MP-TAN | -0.076 | 1.016 | 0.310 | |
| | | MP-R/A | 0.138 | 2.076 | 0.038 | |
| **H9** | **JP-SQ** | JP-EMP | -0.144 | 2.676 | 0.007 | |
| | | JP-R/A | -0.022 | 0.398 | 0.690 | **Not** |
| | | JP-RES | -0.123 | 2.218 | 0.027 | **Supported** |
| | | JP-TAN | -0.101 | 1.849 | 0.064 | |

MM: Moral manager, MP: Moral person, EC: Egoist climate, PC: Principled climate, BC: Benevolent climate, JP: Job performance, SQ: Service quality, R/A: Reliability –assurance, TAN: Tangibility, RES: Responsiveness, EMP: Empathy.

According to Hu and Bentler (1998, 1999), Standardized Root Mean Square Residual (SRMR) is an adequate goodness-of-fit criterion for SEM-PLS. Since SRMR is an absolute measure of fit, a value of zero indicates a perfect fit. However, a value of less than 0.10 or 0.08 is considered an indicator of acceptable fit (Hu and Bentler, 1999). In this study, the SRMR value was calculated as 0.039, and it can be said that the model suggests a good fit.

## Discussion

The findings of the study have several theoretical implications. First, this study is one of very few attempts to simultaneously analyze the relationships between ethical leadership, ethical climate, job performance, and service quality. Secondly, a study conducted in a different culture supports Trevino et al.'s (2000; 2003) research, which explains the moral manager and moral person as components of ethical leadership. Third, considering the ethical climate dimensions as egoistic, benevolent, and principled, it is important in terms of revealing the relationship between these dimensions and ethical leadership and job performance. Another implication is the direct effect of ethical leadership on service quality dimensions. Finally, it examines in detail the relationship between job performance and service quality. The analysis of the relations between all these variables in the banking sector differentiates this study from other studies.

Studies on leadership have revealed that leader behaviors have important effects on the conduct and attitudes of employees and, therefore, on shaping the ethical climate in the organization. Neubert et al. (2009) stated that the ethical behavior of the leader is the critical determinant of the ethical climate. Studies examining the relationship between ethical leadership and ethical climate have found a positive relationship between the two of them (Pel-

letier and Bligh, 2008; Mayer et al., 2010, Shin, 2012). However, it can be said that the number of studies analyzing the effect of ethical leadership on ethical climate dimensions is not sufficient. Similar to this study, Akdoğan and Demirtas' (2014) research examined the effect of ethical leadership behavior on five theoretical ethical climates determined by Victor and Cullen (1988). According to the results, ethical leadership behavior has a positive relationship between laws and codes (principled climate), caring (benevolent climate), independence (principled climate), and efficiency (egoistic climate) dimensions, and a negative relationship between instrumental (egoistic climate) dimensions. Similarly, in this study, it was found that there is a positive and significant relationship between ethical leadership behavior and benevolent, and principled ethical climate. Unlike Akdoğan and Demirtas' (2014) study, however, it was not found a negative relationship between ethical leadership behavior and egoistic ethical climate. Studies examining the effect of ethical leadership on an employee's job performance initially revealed a relationship between the employee's work-related efforts and ethical leadership. According to these studies, there is a positive relationship between ethical leadership and employees' extra job effort (Brown et al., 2005; Brown and Trevino, 2006; Toor and Ofori, 2009). Later studies analyzed the direct relationship between ethical leadership and job performance and suggested that there is a positive relationship between the two (Piccolo et al., 2010; Resick et al., 2011; Walumbwa et al., 2011; Zehir and Erdogan, 2011; Ayan, 2015). In addition, Kia et al.'s (2019) study with bank employees revealed that ethical climate mediates the relationship between ethical leadership and employee performance. In this study, similar to previous studies, it was concluded that ethical leadership behavior has a positive effect on employee performance. The result is important in terms of supporting the literature.

Although there are many studies examining the relationships between ethical climate and work-related outcomes, they mostly focus on employee behaviors, and organizational outcomes, such as job satisfaction (Elci and Alpkan, 2009; Schwepker, 2001; Schwepker and Hartline, 2005), organizational commitment (Eren and Hayatoğlu, 2011; Mulki, et al., 2009; Büte, 2011), and turnover intentions (Mulki et al. 2009; Schwepker, 2001). There are, however, few studies that examine the relationship between ethical climate and job performance (DeConinck,2010; Eren and Hayatoğlu, 2011; Büte,2011; Aksoy,2013; Karatepe,2013; Jaramillo et al.,2006). These studies focused on the ethical climate in general and did not take into account the dimensions. In previous studies, no study was found that investigated the effect of ethical climate sub-dimensions on job performance. This study stands out in this regard since it reveals the effects of perceived ethical climate dimensions on job performance. According to the findings of the analysis, while egoistic climate and benevolent climate do not have any effect on job performance, principled climate positively affects it.

In service companies, employee behavior is one of the most important factors affecting consumer perceptions of service quality. And, the leader is the most significant factor in

shaping the attitudes and behaviors of employees in an organization. Despite the well-known correlation between the two, any studies examining the impact of ethical leadership on service quality have not been found. Only Schaubroeck et al. (2016) revealed that there is a relationship between the high level of ethical leadership behavior by peer leaders and the increase in employees' normative beliefs, and this has a significant indirect effect on employees' commitment to service quality. This study proposed that the ethical leadership behavior of the manager is one of the important and direct determinants of service quality. The findings were not completely insignificant, as they indicated a positive relationship between ethical leadership behavior and tangibility, as well as reliability-assurance, two dimensions of service quality. When examining the studies that investigate the relationship between job performance and service quality, Berry et al. (1988), Tsaur et al. (2004), Gould-Williams (1999), and Bitner (1990) revealed that job performance is one of the most important factors affecting customers' perception of service quality. In research on hotel/motel customer-contact employees, Schwepker Jr. and Dimitriou (2021) revealed that the perception of ethical leadership behavior has a positive impact on employee performance quality. This study revealed that job performance does not affect service quality. However, in this study, unlike similar studies, the relationship between job performance and service quality dimensions was examined in detail. However, unlike similar studies, the relationship between job performance and service quality dimensions was investigated in detail in this study. It has been revealed that there is a significant relationship between job performance and the empathy dimension of service quality.

## Implications for practice

This study aims to determine how the bank branch manager's ethical leadership behavior affects the ethical climate and job performance in the branch, as well as how all of this impacts service quality. In this context, the branch manager's ethical leadership behavior was analyzed based on employee perceptions, and the relationship between this behavior and the branch's ethical work climate was determined. Furthermore, the impact of ethical leadership on job performance was revealed. In addition, the effects of the bank branch manager's ethical leadership behavior and the job performance of bank branch employees on the quality of service were analyzed. According to the findings, the perception of the employees, in general, is that it is more important for the branch manager to be a moral manager than to be a moral person. In other words, the branch manager's ethical management features have a greater impact on the employees than his ethical personality characteristics. The manager's overall ethical leadership behavior has an impact on the branch's ethical work climate. According to this, there is a positive relationship between the ethical leadership behavior of the bank branch manager and the egoistic, benevolent, and principled climate. The branch manager who wants to build an egoistic or principled climate in the branch should emphasize moral manager characteristics. However, in order to constitute a benevolent climate in the branch, the manager should guide his employees by using both moral manager and moral person traits at the same

time. Job performance is positively affected when the ethical work climate in the branch is principled. When bank employees consider that they are performing their tasks in accordance with professional principles, rules, and laws, their performance will increase. As a result, bank branch managers should strive to build a principled ethical climate in the branch in order to enhance employee job performance. The study also revealed that ethical leadership behavior has an impact on job performance. In other words, the more the branch manager's ethical leadership behaviors, the higher the job performance. The important point here is that the moral personality traits of the branch manager do not affect employee performance. As a result, emphasizing the moral manager qualification of the branch manager will be able to improve the performance of the branch employees. It has been determined that the branch manager's ethical leadership behavior has no impact on the bank branch customers' perceptions of service quality. However, there is an important point to be made here. The tangibility dimension of the service quality is positively affected by the branch manager's moral manager behavior. Trust, on the other hand, is one of the most critical factors influencing customers' perceptions of service quality. According to the findings, the branch manager's ethical behavior creates the impression that the service offered to the consumer is reliable, and customers also believe that employees are dependable. The empathy dimension of perceived service quality is positively affected by branch employee job performance. Customers' perceptions of the service will be positively affected by behaviors such as displaying sincere interest and delivering services by considering their needs and demands. As a result, ethical leadership behavior has a number of consequences within the organization. The ethical leadership behavior of bank branch managers will affect the ethical working climate of the branch, with beneficial outcomes such as increased job performance and improved service quality.

## Limitations and Future Research Directions

The results of the study should be evaluated within the framework of some limitations. First and foremost, the variables within the scope of the study are measured by employee and customer perceptions. For the purpose of the research, data was gathered from volunteers from bank branches and clients of the same branches. Therefore, this factor should be taken into account when evaluating the results. This study is expected to be a guide for future studies. In the theoretical framework, some suggestions can be made in this context. The impact of ethical leadership behavior on headquarter departments may be studied, or the study can be applied to only one bank overall. It can be carried out by assessing employee performance against specific parameters. Thus, the effect of ethical leadership behavior on the objective work outputs of employees can be measured.

**Peer-review:** Externally peer-reviewed.
**Conflict of Interest:** The authors have no conflict of interest to declare.
**Grant Support:** The authors declared that this study has received no financial support.
**Author Contributions:** Conception/Design of study: G.O., Ö.N.Ö., E.F..; Data Acquisition: G.O., Ö.N.Ö., E.F.; Data Analysis/Interpretation: G.O., Ö.N.Ö., E.F.; Drafting Manuscript: G.O., Ö.N.Ö., E.F.; Critical Revision of Manuscript: G.O., Ö.N.Ö., E.F.; Final Approval and Accountability: G.O., Ö.N.Ö., E.F.

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*Istanbul Business Research, 52*(1), 185-197
**DOI:** 10.26650/ibr.2023.52.890137
http://ibr.istanbul.edu.tr/
http://dergipark.org.tr/ibr

# Istanbul Business Research

**Submitted:** 05.03.2021
**Revision Requested:** 07.03.2022
**Last Revision Received:** 06.05.2022
**Accepted:** 18.09.2022

RESEARCH ARTICLE

# Assessing Covid-19 Threat Perceptions of Employees: A Generation Oriented Research in Turkiye

**Osman Yalap[1], Mustafa Canbek[2]**

**Abstract**
Coronavirus threatens the physical and mental health of human beings throughout the world. Besides that, extraordinary measures, which are taken in order to protect the public health, have devastating effects on the global economy. In this context, it can be said that understanding the perceptions of employees who are surrounded by health and economic risks is crucial for the field of management. In the current study, it was investigated how Covid-19 threat perceptions of employees differ according to generation. With this purpose, data was collected from 535 public and private sector employees working in various provinces of Turkey. In order to analyze the collected data Independent sample t-test and one-way analysis of variance (ANOVA) were conducted. Findings indicated that Generation Z individuals are significantly different from other generations regarding Covid-19 threat perceptions. Generation Z perceives threats less than generation X and Y. The results of this research can be interpreted as that Generation Z employees feel more confident against the risks accompanying the coronavirus. In addition, statistically significant differences were found between some of the demographic characteristics of the participants and their perceptions of COVID-19 threats.

**Keywords**

Threat Perception of Covid-19, Generations, Employees

## Introduction

COVID-19 first appeared in Wuhan, China at the end of 2019 and soon became a global epidemic, causing many people to die. As of January 2021, the virus had claimed more than 1.87 million lives across the world and more than 86 million people were reported to have been infected (Worldometers, 2020). Although some infected people do not show any symptoms, many of them need a difficult treatment process before returning to normal life. Since the known treatment methods are inadequate against this virus, governments are asking

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**To cite this article:** Yalap, O., & Canbek, M. (2022). Assessing Covid-19 Threat Perceptions of Employees: A Generation Oriented Research in Turkiye. *Istanbul Business Research, 52*(1), 185-197. http://doi.org/10.26650/ibr.2023.52.890137

people to stay home and not go out unless there is a reasonable excuse. Therefore, as in the epidemics of SARS (Severe Acute Respiratory Syndrome) and MERS (Middle East Respiratory Syndrome), COVID-19 also has great economic impacts as a result of the measures taken in addition to being a threat to human life. Global supply chain disruptions, job cuts and job losses, and more employees starting to work from home show that the virus has devastating social and economic impacts (Evans, 2020, p. 6-8; Ratten, 2020). The rapid spread of coronavirus, which was believed to have emerged from an animal source, caused a slowdown in the global economy and temporarily shut down sectors such as the automotive, tourism, and education sectors (Ayittey et al., 2020, p. 1-2; Pérez-Fuentes et al., 2020, p. 2).

Currently, a very high level of daily cases and deaths are reported in the USA, Brazil, India, and Russia, and the new variant identified in the UK seems to spread faster (Gallagher, 2020). Although some of the vaccines developed appeared to be highly reliable, the COVID-19 pandemic seems set to incur difficulties globally for a while due to the uncertainties that lie ahead concerning the roll-out of COVID-19 vaccines and their distribution (Robert, 2020, Zimmer et al., 2020, World Health Organization, 2020).

As the coronavirus threatens all humanity, it is perceived as a threat at different levels by individuals with different characteristics (Doğan & Düzel, 2020, p. 750). It is quite natural that individuals with different mentalities, experiences and competencies react differently to events and situations. Researchers emphasize that individuals' perceptions of disease or disasters are far more important than objective assessments of the current threat (Kim, 2020, p. 109). Accordingly, it is necessary to observe how the COVID-19 virus is perceived by individuals to understand the reflections of this virus threat in the business world. Thus, the necessary measures to ensure that individuals are less affected by the panic of COVID-19 can be discussed more realistically.

## Threat Perception of Covid-19

The rapid increase in the number of coronavirus deaths and the serious measures taken due to the unknown nature of the virus cause various mental disorders such as anxiety, depression, fear, and stress in humans (Bozkurt et al., 2020, p. 307-308). COVID-19 has become a very important threat to physical and mental health and its devastating effects are already being felt in economic and social domains. The quick spread of the virus across the world in just a few weeks caused the shut-down of many sectors such as tourism, education, manufacturing as well as significant job losses. Despite COVID-19, efforts are made to carry out the necessary activities in a lifestyle called "*the new normal*" and thus social and economic life is less affected (Bonacini et al., 2020, p. 330). However, it is very difficult to make absolute predictions about the future due to uncertainties about coronavirus (Ratten, 2020, p. 504).

Extensive measures that seriously affect economic life and social habits also significantly affect individuals' perceptions of COVID-19 (Pérez-Fuentes et al., 2020, p. 2). It can be said that as a result of the dramatic changes in the business world, employees' feelings and thoughts were significantly affected by COVID-19. The pandemic seriously threatens not only the health of employees but also their income. It has been reported that the rate of those who are temporarily or permanently laid off due to COVID-19 in the USA is 11%, furthermore, in addition to those who try to overcome economic difficulties by savings accounts or short-term debt, 21% are trying to reduce their expenses by skipping meals and eating less (Norc, 2020).

In this chaotic environment of COVID-19, it was considered that employees' perceptions and attitudes towards their organizations and jobs might change significantly due to the serious change in the way of doing business in many sectors (Fernandez & Shaw, 2020, 40). In this regard, it can be argued that employees will experience huge pressure, their attitudes towards their jobs and their work-related beliefs will change significantly and thus they are likely to experience anxiety by constantly feeling the risk of losing their health or job. The uncertainty about how long the pandemic could last and the vaccine required for the treatment of patients raise concerns (Gica et al., 2020, 9).

Studies conducted over a short period of time are guiding in understanding the emotional reactions of individuals to COVID-19. Paredes et. al (2020, p. 4-5) found that perceptions of the threat of COVID-19 increase individuals' future anxiety and decrease mental well-being. Similarly, the results of another study revealed that the COVID-19 threat perception causes an increase in anxiety, depression, and anger-hostility levels in individuals (Pérez-Fuentes et al., 2020, p. 5-6). Accordingly, it can be stated that the perceptions of the threat of COVID-19 might cause various problems at the individual, organizational and community levels. While there may be differences among nations perceiving COVID-19 as a threat, significant differences can also be observed between people of the same society with different characteristics. It can be argued that the perceptions of the threat of COVID-19 might be different, especially across generations.

## Generations X, Y, and Z

The differences between generations in business life have been examined in numerous empirical studies. The results obtained in those studies in general revealed that the conditions of the period in which individuals were born and grew up are likely to have an impact on their perceptions, attitudes, and behaviors (Arklina et al., 2020, p. 13; Kızıldağ, 2019, p. 33; 92). Situations such as important events, social and economic developments, popular culture and media that take place within a certain period affect individuals who experience these developments and naturally, value judgments and preferences of those individuals could vary when

compared to other generations (Twenge et al., 2010, p. 1120). Among the generations that exist in business life today, the generation called *Baby Boomers* (due to the post–World War II baby boom) can be discussed. Although different dates are stated in the literature, individuals born between the mid-1940s and the first half of the 1960s can be considered as this generation (Beytekin & Doğan, 2019, p. 384; Ball & Gotsill, 2011, p. 18; Appelbaum et al., 2005, p. 1-2). On the other hand, generations X, Y, and Z are the generations after the Baby Boomers, respectively, with different characteristics (Waligóra & Austen, 2019, p. 244). A comparative examination of the definitions of these generations can provide a deeper insight into the differences between the generations and the reflections of these differences in business life.

Although there are no certain agreed dates regarding the birth years for each generation, it is mostly accepted that generation X covers people born between the first half of the 1960s and 1980s, generation Y between the early 1980s and the first half of the 1980s, and finally, generation Z covers people born from the mid-1990s through to today (Cilliers, 2017, p. 190; Lissitsa & Kol, 2016, p. 305; Ball & Gotsill, 2011, p. 26). Regarding the studies conducted in this field, it can be said that the most problematic generation for determining the age group is generation Z (Dolot, 2018, p. 44). Currently, it can be argued that Gen-Xers are in leadership roles or approaching their retirement, Generation-Yers are climbing the career ladder, and Gen-Zers have just entered the working life (Gaidhani et al., 2019, p. 2804; Kızıldağ, 2019, p. 33).

According to previous studies; since both parents of Gen-Xers are usually working, it can be argued that they have become used to being lonely since their childhood. Therefore, these individuals enjoy working alone and try to be self-sufficient, in other words, they have individualistic characteristics. Moreover, Gen-Xers have strong technical skills and are successful in developing alternative solutions for problems. These individuals often tend to display skeptical behaviors towards events and individuals. It can be stated that their authority dependence is less than that of previous generations. Moreover, Gen-Xers are extremely careful when maintaining the balance between work and family (Kanbur & Şen, 2017, p. 121; Bejtkovský, 2016, p. 108; Lissitsa & Kol, 2016, p. 305; Abrams & Von Frank, 2013, p. 9-10; Twenge et al., 2010, p. 1120).

Gen-Yers, also referred to as *Millenial, Net-Generation, GenMe, nGen, iGen, or civic generation,* witnessed the emergence of the internet at an early age and they have grown accustomed to accessing information easily thanks to the internet. Although Gen-Yers are similar to Gen-Xers regarding characteristics such as technology addiction, antipathy towards formality, accepting differences, and balancing work-family life, they distinguish in terms of predisposition toward teamwork and attaching importance to social relations. They can tolerate differences in culture, ethnicity, religion and gender, and have no difficulty working with people who have different values. Gen-Yers can adapt quickly to changes due to their flexibi-

lity. Furthermore, they can complete multiple tasks simultaneously without having difficulty (Kolnhofer-Derecskei, 2017, p. 108; Clarke, 2015, p. 566; Krahn & Galambos, 2014, p. 95; Sa'aban et al., 2013, p. 549-550; Twenge et al., 2010, p. 1120).

Since Gen-Zers grew up with technologies such as the internet, laptop computers, and mobile phones at a very early age, it can be argued that the keyword in their lives is *digitization*. Generation Z can exist in both the real and virtual worlds and easily make transitions between these two worlds. One of their basic characteristics is that they can easily access information they need and share it with others. Furthermore, it can be also claimed that they communicate constantly with people through various communication tools and social media. They often tend to solve problems they face using the internet. Generation Z behave relatively impatiently and are agile compared to other generations and they wish to work on different things. It can be argued that they are not afraid of constant change. Furthermore, since they lack sufficient work experience, they may have unrealistic expectations about the company or their managers which do not coincide with the realities of the business world such as flexibility in working hours (Schroth, 2019, p. 7; Dolot, 2018, p. 45; Andrea et al., 2016, p. 93). Since Gen Zers are new in business life, there is relatively little information about the characteristics of this generation, their expectations of business life, their attitudes and their working styles (Gaidhani et al., 2019, p. 2804-2805).

## Methods

### Research Design

In the current study, the descriptive method was chosen in terms of methodological research. As a research technique, the deductive assumptions and quantitative research techniques were discussed. The measurement tool used in the survey was a 5-point Likert-type scale. The survey form also includes several open-ended items which were employed to determine the demographic characteristics of the participants (such as age, marital status, education). On the other hand, all procedures performed in this current research involving human participants were in accordance with the ethical standards of the Artvin Coruh University in 2020 and with the decision no: 18457941-050.01.04-.

Although the periods of the generations differ in the literature, certain amount of studies define specific characteristics of each generation in depth. Therefore, the mentioned studies which have minor differences regarding periods of the generations were referred to. In this regard, generations were defined as Gen X, born between 1965 and 1979, Gen Y, born between 1980 and 1999 and Gen Z, born after 2000 (Bejtkovský, 2016, p. 108; Lissitsa & Kol, 2016, p. 305; Abrams & Von Frank, 2013, p. 10).

## Sample

Our sample consisted of 535 full and part-time school teachers from public and private sector organizations in Turkey. Of 535 participants, 46.3% were female and 53.7% were male. While 14.4% of the participants were from Generation X, 55.4% were from Generation Y. The rate of Generation Z was 30.2%. The mean age of the sample was 31.97 years (SD= 9.03). Most participants were private-sector employees (71.8%). Alongside this, 68.8% of the participants were married and 30.2% were single. Finally, 39.4% of the participants were college graduates, 41.4% were primary school graduates and 19.2% were MSc graduates.

## Measures

The scale developed by Gica, Kavakli, Durduran and Ak (2020) was used to measure the COVID-19 threat perceptions of participants. The form consists of seven items in a 5-point Likert-type format ranging from strongly disagree (1) to strongly agree (5). The researchers reported the Cronbach's Alpha reliability score of the scale as 0.75. Also, we controlled for the demographic variables such as age (continuous variable) of generation X, Y and Z; gender (1= male; 2= female); marital status (1= married; 2= single); employment sector (1= public, 2= private) and; education level (primary school, high school, undergraduate, and Master's degree).

## Data Analytic Approach

We used SPSS and LISREL statistical programs for data analysis. Confirmatory factor analysis (CFA), correlation analysis, independent samples t-test and one-way ANOVA were applied to the data. CFA was performed on the measurement tool. According to the results, the single factor structure of the scale was validated and the required goodness-of-fit values were achieved ($X^2$/df= 55.14/13; RMSEA= 0.78; GFI= 0.97; CFI= 0.98; NFI= 0.97; NNFI= 0.96; IFI= 0.98). Also, the Cronbach's Alpha reliability score of the scale was calculated as 0.82.

# Results

The COVID-19 pandemic is constantly worsening all over the world and also in Turkey. The descriptive statistics that summarize the responses of the participants to the statements about the perceived threat of COVID-19 are presented in Table 1.

Table 1

*Descriptive Statistics of Perceived Threat of COVID-19 Form (n= 535)*

| Items | Mean | Std. Er. | Median | Mode | Std. Dev. | Var. | Sw. | Kur. |
|---|---|---|---|---|---|---|---|---|
| The possibility of contamination (IT1) | 3.37 | 0.056 | 4.00 | 4.0 | 1.31 | 1.72 | -0.45 | -0.99 |
| The possibility of killing (IT2) | 3.30 | 0.053 | 3.00 | 3.0 | 1.24 | 1.54 | -0.14 | -1.05 |
| Economic reasons (IT3) | 3.47 | 0.052 | 4.00 | 4.0 | 1.21 | 1.47 | -0.39 | -0.91 |
| Social media, news and content (IT4) | 3.43 | 0.051 | 4.00 | 4.0 | 1.18 | 1.39 | -0.35 | -0.84 |
| The purpose of biological attack (IT5) | 3.53 | 0.052 | 4.00 | 4.0 | 1.21 | 1.47 | -0.49 | -0.71 |
| Unhappiness (IT6) | 2.77 | 0.049 | 2.00 | 2.0 | 1.14 | 1.31 | 0.17 | -0.80 |
| Despair (IT7) | 2.63 | 0.051 | 2.00 | 2.0 | 1.19 | 1.43 | 0.36 | -0.70 |
| Perceived COVID-19 Threat | 3.21 | 0.036 | 3.28 | 3.7 | 0.84 | 0.71 | -0.19 | -0.43 |

*IT= Consisting of seven items and one structural dimension, each statement in the Perceived Threat of COVID1-19 Form refers to the related content.*

According to the results, shown in Table 1, the item that the participants mainly agreed on concerning the perceived threat of COVID-19 was that the virus was produced for a biological attack ($\bar{x}$= 3.53; SS= 1.21). The least agreed item was that they do not lose hope during the pandemic period ($\bar{x}$= 2.63; SS= 1.21).

The results of Pearson correlation between independent variables (gender, age, employment sector, marital status and education level) and the dependent variable (perceived threat of COVID-19) presented in Table 2 show a significant positive correlation between the COVID-19 threat perception and gender ($r= 0.119$, $p<0.01$). The relationship between the COVID-19 threat perception and age is positive and significant ($r= 0.116$, $p<0.01$). However, the relationship between the COVID-19 threat perception and the employment sector is negative and significant. Finally, a significant and positive correlation was found between the COVID-19 threat perception and marital status ($r= 0.123$, $p<0.01$). On the other hand, no significant relationship between the participants' level of education and the perceived threat of COVID-19 was found.

Table 2

*Correlation Matrix*

| | Variables | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| **1** | Perceived COVID-19 threat | - | | | | |
| **2** | Gender | 0.119** | - | | | |
| **3** | Age | 0.116** | 0.023 | - | | |
| **4** | Employment Sector | -0.105* | -0.142** | -0.299** | - | |
| **5** | Marital Status | 0.123** | 0.057 | 0.411** | -0.088* | - |
| **6** | Education | 0.024 | 0.050 | 0.343** | -0.379** | 0.060 |

*N= 535; **p<0.01; *p<0.05.*

In this study we used the independent samples t-test and one-way analysis of variance (ANOVA). The results obtained from the t-test are as follows (Table 3):

Table 3

*Independent Sample t-Test Results*

| Variables | N | Mean | Std. Dev. | df | t | Sig. | Levene's test | |
|---|---|---|---|---|---|---|---|---|
| **Gender** | | | | | | | F | p |
| Female | 248 | 2.67 | 0.84 | 533 | -2.774 | 0.006 | 0.319 | 0.573 |
| Male | 287 | 2.87 | 0.83 | | | | | |
| **Marital Status** | | | | | | | F | p |
| Single | 166 | 2.62 | 0.83 | 541 | -2.852 | 0.005 | 0.612 | 0.435 |
| Married | 369 | 2.85 | 0.84 | | | | | |
| **Employment Sector** | | | | | | | F | p |
| Public | 151 | 2.92 | 0.82 | 534 | 2.471 | 0.014 | 0.272 | 0.602 |
| Private | 385 | 2.72 | 0.84 | | | | | |

Table 3 reveals that a significant difference exists in the perceived threat of COVID-19 between female and male participants (t (533) = -2.774, p<0.05). The finding indicates that male participants ($\bar{x}$= 2.87; SS= 0.83) are perceive higher levels of COVID-19 threat than female participants ($\bar{x}$= 2.67; SS= 0.84). Furthermore, there is a significant difference between single and married respondents in terms of the perceived threat of COVID-19 (t (541) = -2.852, p<0.05). The result shows that married employees ($\bar{x}$= 2.85; SS= 0.84) perceive higher levels of COVID-19 threat than single employees ($\bar{x}$= 2.62; SS= 0.83). Finally, it was determined that the perceived threat of COVID-19 among public sector employees was higher than private-sector employees (t (534) = 2.471, p<0.05).

Table 4

*Results of One-way analysis of variance (ANOVA) regarding the perceived threat of COVID-19 between Generations X, Y, and Z*

| Variables | | N | Mean | Std. Dev. | | Sum of Squares | df | F | Sig. |
|---|---|---|---|---|---|---|---|---|---|
| **Generations** | X | 77 | 2.90 | 0.88 | BG | 5.681 | 3 | 4.023 | 0.018 |
| | Y | 297 | 2.83 | 0.84 | WG | 375.616 | 532 | | |
| | Z | 161 | 2.63 | 0.80 | Total | 381.298 | | | |
| | Total | 535 | 2.78 | 0.84 | | | | | |

*N= 535; BG= Between Groups; WG= Within Groups; *p<0.05.*

Table 4 summarizes whether there is a significant difference in the threat perceptions of COVID-19 among Generations X, Y, and Z. The age groups of the employees were classified as being Generation X, Y, or Z, and a statistically significant difference was found in the COVID-19 threat perception levels of the employees of Generations X, Y, and Z ($F= 4.203$; $p<0.05$). The Tukey-HSD method, one of the multiple comparison analyzes, was used to determine if particular generations were responsible for the significant difference. The results obtained are shown in Table 5.

Table 5

*Results of the Multiple Comparisons (Tukey-HSD)*

| Generation | Generations | Mean Difference | Std. Error | Sig. | %95 Confidence Interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound |
| X | Y | 0.07 | 0.10 | 0.782 | -0.180 | 0.324 |
| | Z | 0.27* | 0.11 | 0.048 | -0.001 | 0.549 |
| Y | X | -0.07 | 0.10 | 0.782 | -0.324 | 0.180 |
| | Z | 0.20* | 0.08 | 0.036 | -0.010 | 0.396 |
| Z | Y | -0.20* | 0.08 | 0.036 | -0.396 | -0.10 |
| | X | -0.27* | 0.11 | 0.048 | -0.549 | -0.01 |

*N= 535; Dependent Variable: Perceived COVID-19 Threat; *p<0.05.*

According to the results presented in Table 5, a significant difference exists in the perceptions of the threat of COVID-19 only between Generation Z and other generations. The results of Tukey-HSD showed that there was a statistically significant difference in COVID-19 threat perception between participants from Generation Z and Generation X in favor of Gen Z (MD = -0.27; SE= 0.11). Similarly, our analysis showed that the threat perception was statistically significant between participants from Generation Z and Generation Y in favor of Gen Z (MD = -0.20; SE= 0.08).

## Conclusion

Researchers have drawn attention to the various discussions about generation studies. First of all, the term *generation* cannot be accepted strictly identical for all members who are born on a particular date and grow up in the same environment. Culture, personality and other related characteristics can also create important differences in individuals' choices and decisions based on the generation to which he/she belongs. Another discussion related to generation-oriented investigations highlights the age differences among the members of the sample groups. While expecting objective assessments by the participants, younger individuals can react with more excitement than the older ones. It can be assumed that the older participants were more excited at the beginning of their careers (Kolnhofer-Derecskei et al., 2017, p. 109; Twenge et al., 2010, p. 1118). Nevertheless, generation studies in the literature present a deep insight into the job market and human capital. Since the term *generation* defines particular groups of human being with similar attitudes, habits and behaviors, it can be accepted that significant results might be acquired from generation studies.

The current study was conducted to analyze how public and private sector employees in Turkey have been affected by the COVID-19 pandemic period and whether there is a statistically significant difference in COVID-19 threat perception levels between generations. According to the results, generation Z employees were found to perceive fewer threats from the virus during the COVID-19 pandemic compared to Generation X and Generation Y employees. Accordingly, our finding indicating that Gen Z exhibits less anxiety regarding the threat of COVID-19 compared to other generations can be considered congruous to the statements of Andrea et al. (2016, p. 93) suggesting Gen Z is not afraid of continuous change.

In this regard, it is assumed that younger people would be less affected by the COVID-19 pandemic. However, the argument that the "younger generation are not afraid of change" needs to be argued when it comes to the coronavirus. Although, older people who are suffering from medical difficulties such as asthma and patients with weakened immune systems are more vulnerable, in fact, people of all ages are similarly affected by the virus (World Health Organization, n.d.).

Analysis of the demographic variables indicates that there are statistically significant differences in COVID-19 threat perceptions based on participants' gender, marital status and employment sector (public or private). Male employees experience more threat perceptions of the virus than female employees and married employees experience more threat perceptions than single ones. Therefore, it can be assumed that male employees are concerned more about being obliged to tackle the effects of the pandemic more than female employees. This finding is not congruous to the study of Morioka (2014, p. 110) who investigates the risk perceptions among Japanese workers about the explosion of the Fukushima power plant. The findings related to the marital status of the employees can be interpreted as married employees have to care for family members' economic and psychological well-being against the effects of the pandemic, besides their own well-being.

Furthermore, we found that public sector employees have higher perceptions of virus threats than private-sector employees. Obviously, it can be said that the public sector employees work and live in a certain routine, while private-sector employees live in a more dynamic business environment. Therefore, it can be stated that private sector employees feel more confident regarding coping with unsteady work conditions and they can feel psychologically prepared for changes or fluctuations in the business environment. It can be assumed that public sector workers are more apprehensive about dealing with major changes. All these results coincide with the results of another study of Bostan et al. (2020, p. 6) who conducted extensive research in Turkey.

Economic, psychological, and sociological dimensions of the COVID-19 pandemic have great importance for individuals, organizations, and communities, although it is generally discussed in the field of health sciences. In the field of business management, there is a limited

number of studies measuring employees' levels of the COVID-19 threat perception and addressing their relationships with various variables (Aguinis et al., 2020; Manuel and Herron, 2020; Vaziri et al., 2020; Verma & Gustafsson, 2020). In the current study, to contribute to the literature, we investigated whether there is a significant difference in the perceived threat of COVID-19 according to certain demographic characteristics of public and private sector employees in Turkey. As a suggestion for future studies, investigating the enhancive and assuasive factors or the consequences of the threat perception of COVID-19 might provide a broader perspective on the global risks.

Since it is thought that employees' perceptions of COVID-19-related threats will have negative repercussions at both the organizational and social levels, it can be suggested that organizations need to make sure employees feel safe, at least in terms of their impact at the economic and organizational level. In addition, although it is thought that the effect of the virus may vary depending on age, the World Health Organization states that individuals of all ages can be affected in the same way. For this reason, we recommend providing various development activities such as training and seminars for employees at the organizational level so that employees may make realistic assessments about the pandemic period.

**Ethical Approval:** All procedures performed in this current research involving human participants were in accordance with the ethical standards of the Artvin Coruh University in 2020 and with the decision no: 18457941-050.01.04-.
**Peer-review:** Externally peer-reviewed.
**Author Contributions:** Conception/Design of study: O.Y.; Data Acquisition: O.Y.; Data Analysis/Interpretation: O.Y.; Drafting Manuscript: M.C.; Critical Revision of Manuscript: O.Y.; Final Approval and Accountability: M.C.
**Conflict of Interest:** The authors have no conflict of interest to declare.
**Grant Support:** The authors declared that this study has received no financial support.

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İSTANBUL UNIVERSITY PRESS

*Istanbul Business Research, 52*(1), 199-232
**DOI:** 10.26650/ibr.2023.52.994729
http://ibr.istanbul.edu.tr/
http://dergipark.org.tr/ibr

# Istanbul Business Research

**Submitted:** 13.09.2021
**Revision Requested:** 01.11.2021
**Last Revision Received:** 27.02.2022
**Accepted:** 17.03.2022
**Published Online:** 10.01.2022

RESEARCH ARTICLE

# A Financial Performance Evaluation via Hybrid MCDM methods: A case of Amazon.com Inc.

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**Abstract**

This study aims to make inferences about company performance by analyzing the financial performance of Amazon.com, Inc. over a period of fifteen years (2005-2019) using selected evaluation criteria in accordance with Multi-Criteria Decision-Making (MCDM) methods. For this purpose, CRiteria Importance Through Intercriteria Correlation (CRITIC) was used for weighting the evaluation criteria, and COmplex PRoportional ASsessment (COPRAS), Additive Ratio ASsessment (ARAS), Simple Additive Weighting (SAW), and BORDA Count and Copeland methods were used to rank financial performance by years. From the results obtained through the CRITIC method, it was found that the most crucial evaluation criterion was the debt-to-equity (DER) ratio, and the least important was the return-on-assets (ROA) ratio. The BORDA Count and Copeland methods were used to obtain an integrative and single ranking series due to varying results of the COPRAS, ARAS, SAW methods by years. According to the scores obtained using BORDA and Copeland methods 2005 was the best year and 2014 was the least successful year in terms of financial performance. During these years, developments experienced in the company were discussed, and an attempt was made to examine the reasons behind the financial performance.

**Keywords**

MCDM methods, Financial Performance, CRITIC, COPRAS, ARAS

## Introduction

With technology-based innovations, many changes have occurred in human life, and every innovation has become a pioneer of new technologies. Remarkably, with the advent of internet technology, access to information has become easy and fast, and transactions have started to be transferred to the electronic environment, bringing many new business models to the agenda (Mahadevan, 2000). In line with these developments, companies have started to see the internet as a tool to create competitive advantage and increase their revenues (Chan & Al-Hawamdeh, 2000). With the proliferation of new technology products such as smart-

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**To cite this article:** Akdemir, D. M., & Simsek, O. (2023). A financial performance evaluation via hybrid MCDM methods: a case of Amazon. *Istanbul Business Research, 52*(1), 199-232. http://doi.org/10.26650/ibr.2023.52.994729

phones, tablets, and the internet, the chance to appeal to larger audiences has been achieved. Businesses that succeeded in integrating this technology into their business at an early stage have gained great advantages in the international competitive environment (Laudon & Traver, 2017).

As e-commerce is increasingly adopted by consumers every year, its use has risen, especially in the retail industry. When looking at global data for retail e-commerce, B2C (Business-to-Consumer) retail e-commerce sales were realized as 1.33 trillion dollars in 2014 increasing to 4.93 trillion dollars in 2021. This increase is gradually continuing and is expected to reach $7.39 trillion in 2025 (Statista, 2022a). Moreover, while retail e-commerce volume in 2015 constituted only 7.4% of the total e-commerce globally, the total share of retail e-commerce reached 17.8% in 2020, and this ratio is estimated to reach 24.5% in 2025 (Statista, 2022b). Considering B2C retail e-commerce sales in the USA, it is possible to say that e-commerce draws a parallel image to the development in the world. While e-commerce sales amounted to almost 441.5 billion dollars in 2017, it is estimated that in 2021, sales increased almost two-fold and reached approximately 870.8 billion dollars (U.S Census Bureau, 2022). Within the framework of these figures, the company with the largest market share is Amazon.com, Inc., which started off as a book selling business in 1994. It is now an e-commerce giant that offers services in many product categories such as music, consumer electronics, clothing, games, as well as media, advertising, web hosting, payment methods, etc. Amazon has an e-commerce market share of 41% in the US as of October 2021, and its closest competitor Walmart.com is in second place after Amazon.com with 6.6% (Statista, 2021). Amazon has also achieved the success of being the most valuable brand in the world, according to the BrandZ report (Kantar BrandZ, 2021).

In order to effectively understand the performance chart drawn by companies, their financial statements can give strong clues about the financial performance of the company. In one study, it was stated that one of the determinants of e-commerce performance is the financial performance of the company according to the data collected from 70 retail companies operating in China (Huang, et al., 2009). Considering that the general purpose of businesses is profitability, financial ratios are one of the basic indicators that provide information about financial performance. Utilizing financial ratios to evaluate the performance of companies is an old but frequently used and quite effective tool for decision-makers, business analysts, and investors (Delen, et al., 2013). In line with the aforementioned information, in order to understand the success status of Amazon.com, Inc. and the factors affecting this success , an examination of the financial statements of Amazon.com, Inc. and an evaluation of their financial ratios might be considered as the first criteria in the evaluation process. In this direction, to obtain a general valuation measure, the preference of this study was to use MCDM methods, in which many financial ratios can be used together. In the literature there are studies in which financial performance evaluations are made for many sectors using MCDM

methods (Kung & Wen, 2007; Tung & Lee, 2010; Lee, et al., 2012; Moghimi & Anwari, 2014; Doumpos, et al., 2018; Shaverdi, et al., 2016; Inani & Gupta, 2017; Gudiel Pineda, et al., 2018; Heidary Dahooie, et al., 2019; Ayçin & Güçlü, 2020). Although various methods are used to prioritize the factors that affect companies' overall success in order to improve their way of doing business (Lin & Fu, 2012; Chiu, et al., 2004; Titiyal, et al., 2019; Kaushik, et al., 2020; Agrawal, et al., 2020) and to measure the performance of the firm with different variables in the studies conducted under the title of e-commerce (Torres, et al., 2014; Yang, et al., 2015; Dhir & Dhir, 2018), there are few studies (Juliá-Igual, et al., 2016; Urbonavičiūtė & Maknickienė, 2019) that measure the financial performance of the firms with MCDM methods based on e-commerce. Obviously, more studies need to be conducted in the context of e-commerce to address this gap in the literature. Examining the financial performance of a large-scale company such as Amazon in the e-commerce sector with various multi-criteria decision-making techniques is momentous, but it is a necessary way of obtaining more empirical results about the company's past financial performance. At the same time, in the light of the results obtained, it is thought that discussing the possible effects of new investments and managerial decisions taken in the future will guide other companies in the growing and competitive e-commerce sector. For this reason, this study was conducted to fill this gap in the literature.

In this study, the financial performance of Amazon.com, Inc. between the years 2005 and 2019 was analyzed using MCDM-related methods such as CRITIC, COPRAS, ARAS, SAW, BORDA Count, and Copeland methods. CRITIC weighting method was preferred because financial ratios related to each other are used, and the data set is processed without seeking expert opinion. Accordingly, CRITIC method was used to calculate the weight of the criteria. COPRAS, ARAS, and SAW methods were then used to obtain the rankings in terms of performance by years. Finally, the Borda Count and Copeland methods, which are methods that integrate the ranking results, were used in order to do the combined ranking. According to the hybrid analysis results, the most successful and unsuccessful years of the company in terms of financial performance were found, and the reasons behind the performance were examined. It is thought that this study will be a pioneering study in the literature as it is the first study that examines and makes inferences about an e-commerce based company in terms of financial performance with hybrid MCDM methods.

## Literature Review

Both nationally and internationally there are many comprehensive studies in the literature that empirically investigate the financial performance of firms or sectors with MCDM methods. For example, Wu et al. (2009) analyzed 3 banks with the SAW, Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), VIekriterijumsko KOmpromisno

Rangiranje (VIKOR) and Fuzzy Analytical Hierarchy Process (FAHP) methods. Tung & Lee (2010) analyzed the financial performance of seven Biotechnology Companies operating in the Taiwan Stock Exchange within the scope of the Gray Factor Analysis (GRA) method. Dinçer & Görener (2011) used Analytical Hierarchy Process (AHP) and VIKOR methods to measure three different bank groups' financial performance success. Marjanović & Popović (2020) investigated the performance of 25 banks in Serbia using CRITIC weighting and TOPSIS decision making methods. Ignatius et al. (2012) made the financial performance evaluation for the automotive sector using Preference Ranking Organization Method for Enrichment Evaluation II (PROMETHEE II) as the MCDM method. In another study conducted for the automotive industry, Ömürbek et al. (2016) used an integrated approach with Entropy, Multi-attribute Utility Theory (MAUT), and SAW methods. Their study, which measured the financial performance of 6 companies registered in Borsa Istanbul, concluded that the most important performance criterion is sales revenues. Yalcin et al. (2012) proposed a new model including FAHP, VIKOR, and TOPSIS for the evaluation of the financial performance of manufacturing companies in different sectors in Turkey. Similarly, Esbouei et al. (2014) examined 143 manufacturing companies registered in the Tehran Stock Exchange and made evaluations by obtaining various financial performance measurements for different industries using Fuzzy Analytic Network Process (FANP) and Fuzzy VIKOR methods.

In a study conducted by Lee et al. (2012), the financial performance evaluation of four shipping companies operating in Taiwan and Korea was measured with Entropy and GRA methods, and evaluations were made about the performance in different years. Moghimi & Anvari (2014) discussed the financial performance of eight cement companies in Iran using a combined Fuzzy AHP-TOPSIS method. Rezaie et al. (2014) analyzed the financial performance of companies operating in the cement industry in Iran using Fuzzy AHP and VIKOR methods. Shaverdi et al. (2016) applied Fuzzy AHP and FUZZY TOPSIS methods to measure seven companies' financial performance in the Iranian Petrochemical industry. Gudiel Pineda et al. (2018) made inferences about both the financial and operational efficiency of 12 US-based airline companies in their studies using data mining and MCDM methods together. Dong et al. (2018) proposed a cosine similarity-based QUALItative FLEXible multiple criteria method (QUALIFLEX) approach to measure financial performance and accordingly examined three airline companies and tested the model. Urbonavičiūtė & Maknickienė (2019) analyzed the top four digital retail companies using the SAW and TOPSIS methods. Ayçin & Çakın (2019) used Measuring Attractiveness by a Categorical Based Evaluation Technique (MACBETH) and COPRAS methods in their study, and they used the enterprises included in the BIST SME index. Heidary Dahooie et al. (2019) presented a new model that evaluates manufacturing companies' financial performance applying for a loan from the federal bank using data-based (Correlation Coefficient and Standard Deviation) CCSD and integrated Fuzzy C-means (FCM)-ARAS methods. Isik (2019) analyzed deposit banks operating

in the Turkish banking sector using ARAS and Entropy methods. Abdel-Basset et al. (2020) conducted financial performance research for companies in the steel industry using AHP, VIKOR, and TOPSIS methods by proposing an integrated model. The afore-mentioned studies have been scrutinized and summarized in chronological order in Table 1.

Table 1

*Literature Review*

| **Authors (Year)** | **Sample/Time Range** | **Applied Method(s)** | **Findings** |
|---|---|---|---|
| Wu et al. (2009) | 3 banks operating in Taiwan / unspecified | SAW, TOPSIS, VIKOR, and Fuzzy AHP | In the study, it was reported that the bank performance ranking obtained by all three methods was similar. |
| Tung & Lee (2010) | 7 biotechnology firms operating in Taiwan / 2001-2008 | GRA | Apex Biotechnology Corp, Yung Shin Pharmaceutical Industrial Co. and Standard Chem. & Pharm. Co., Ltd. are reported to be the best in terms of financial performance. |
| Dinçer & Görener (2011) | 3 bank groups (public, privately and foreign-owned) in Turkey / 2002-2008 | AHP, VIKOR | While public banks had a more successful financial outlook between 2004 and 2007, foreign-owned banks stood out in other years. |
| Ignatius et al. (2012) | 8 largest Iranian automotive companies / 2009-2010 | PROMETHEE II | Zamyad Co. is the best, and SAIPA Diesel Co. is the worst in regard to financial performance in the automotive sector. |
| Yalcin et al. (2012) | 94 companies in the Turkish manufacturing industry / 2007 | FAHP, TOPSIS, and VIKOR | As a result of the study, top-ranking manufacturing companies were determined for food, paper, chemistry, basic metal, metal and machine, non-metallic minerals, and textile sectors. |
| Lee et al. (2012) | 4 shipping companies operating in Taiwan and Korea / 1999-2009 | Entropy and GRA | The results of the Entropy method show that cash flow to net income and cash flow adequacy are the most important ratios. As stated by the GRA method, Taiwan-based Evergreen Corp. and Yang Ming Corp. generally outperformed financially Korea-based Hyundai Merchant Marine Co., Ltd. and Hanjin Co., Ltd. between 1999 and 2009, except 2008. |
| Esbouei et al. (2014) | 143 manufacturing companies listed in Tehran Stock Exchange / 2002-2011 | Fuzzy ANP and Fuzzy VIKOR | Applying the Fuzzy ANP method, it was found that Market Value, Refined Economic Value Added, and Cash Value Added are the sub-criteria with the highest weight; Return On Assets (ROA), Return On Equity (ROE) and the ratio of market price and earnings (P/E) are the sub-criteria with the lowest weight. According to Fuzzy VIKOR, the most financially successful companies were identified for each of the related industries. |
| Moghimi & Anvari (2014) | 8 cement companies registered in Tehran Stock Exchange | Fuzzy AHP and TOPSIS | Using the Fuzzy AHP method, it was reported that the most important criterion is the liquidity ratio, and according to the financial success scores obtained by the TOPSIS method, Sabhan is the most successful company among the 8 cement companies. |

| Authors (Year) | Sample/Time Range | Applied Method(s) | Findings |
|---|---|---|---|
| Rezaie et al. (2014) | 27 companies operating in the Iranian cement industry / 2008-2009 | Fuzzy AHP and VIKOR | On the basis of the fuzzy AHP method, the most effective evaluation criteria are profitability ratios. Also, according to findings from the VIKOR method, the order of succession of the companies varies according to years. |
| Ömürbek et al. (2016) | 6 companies operating in the automotive industry registered in Borsa Istanbul / 2014 | Entropy, MAUT, and SAW | The Entropy method highlights that the most important criterion is sales revenues. The financial success scores obtained from MAUT and SAW methods demonstrated that the most successful firm regarding financial performance is the firm with the C code. |
| Shaverdi et al. (2016) | 7 companies operating in the Iranian Petrochemical Industry / 2003-2013 | Fuzzy AHP and Fuzzy TOPSIS | The most important criterion is receivable accounting turnover ratio as revealed by the Fuzzy AHP method, and the most successful company in 2003-2013 was Arak Petrochemical according to TOPSIS output. |
| Beheshtinia ve Omidi (2017) | 4 banks in Iran | AHP, Modified Digital Logic, Fuzzy TOPSIS, Fuzzy VIKOR, Copeland | While evaluating the performance of the banks, it was concluded that the most important criteria were return on investment, lower energy consumption, and debt ratio. Finally, banks were ranked by performance. |
| Gudiel Pineda et al. (2018) | 12 US Airlines / 2005-2014 | DRSA, DEMATEL, DANP, and VIKOR | In the model developed to improve airline companies' operational and financial performance, the stock price has the highest weight according to DANP, and Delta Airlines was identified as the most successful airline company in this context as a result of the VIKOR method. |
| Dong et al. (2018) | 3 China-based firms operating in air transport industry | QUALIFLEX | According to the proposed approach for MCDM with HFLTSs to measure financial performance, Air China Ltd. is the most financially successful company. In the article, along with the case study and comparative analysis, the approach's applicability and effectiveness were also confirmed. |
| Urbonavičiūtė &Maknickienė (2019) | The top four digital retail companies in the world | SAW and TOPSIS | Sales turnover is the prime criteria to evaluate financial performance. According to the TOPSIS method, Alibaba Inc. is the most successful company, and according to Saw method eBay Inc. is the most successful company. |
| Ayçin & Çakın (2019) | Enterprises included in the BIST SME Index | MACBETH and COPRAS | According to the results, the most important criteria is return on asset (ROA), and the best performing enterprise is RTA Inc. |
| Heidary Dahooie et al. (2019) | 58 manufacturing corporations applying to get a loan from a federal bank in Iran / 2016-2018 | CCSD, Fuzzy c-means, ARAS | Based on the CCSD, the data-based objective method, the main financial performance metrics are Debt ratio, Return on Assets, and equity-to-asset ratio. Thanks to the hybrid FCM-ARAS method, top companies with the best financial performance were determined, and it was evaluated that these banks would have high priority in getting loans. |

| Authors (Year) | Sample/Time Range | Applied Method(s) | Findings |
|---|---|---|---|
| Isik (2019) | Turkish deposit banking sector / 2008-2017 | ARAS and Entropy | According to the analysis, the most important criteria for the period in question are the short-term debt to assets ratio. Also, the year 2010 was identified as the best financial performance of the sector. |
| Marjanovic & Popovic (2020) | 25 banks running in Serbia / 2012-2017 | CRITIC and TOPSIS | Based on the CRITIC method, liquidity and financial soundness indicators have gained more importance over the years in evaluating bank performance. Raiffeisen Bank was ranked first with the highest aggregate value according to TOPSIS, although it is not a specific bank that has always demonstrated superior financial performance for these years. |
| Abdel-Basset et al. (2020) | 10 steel companies operating in Egypt | AHP, VIKOR, and TOPSIS | AHP Method results show that the best indicator that evaluates companies' financial performance is their profitability ratio. The results obtained using VIKOR and TOPSIS methods prove that Misr National Steel is the only company in the top 3 in terms of financial success in both methods. |

In the literature, in addition to the use of MCDM methods, various other approaches are also used to measure financial performance. When the literature is examined, some studies show that companies can also be evaluated from a financial perspective with the CAMELS approach consisting of six different components (Capital adequacy, Asset quality, Management efficiency, Earnings, Liquidity, and Sensitivity to the market risk) (Singh & Milan, 2020; Ledhem & Mekidiche, 2020), with panel data analysis (Shabbir & Wisdom, 2020; Mishra, et. Al., 2021), and with balanced scorecard (Malagueño, et. al., 2018). In financial performance evaluations, different approaches such as the ones mentioned can also be used.

## Methodology

In this section, detailed information about CRITIC weighting, COPRAS, ARAS and, SAW financial performance measurement techniques and Borda Count and Copeland methods used to measure the financial indicators of Amazon.com, Inc. for the years 2005-2019 will be given. Financial indicators for Amazon.com, Inc. were taken from the macrotrends.net platform (Macrotrends 2020).

### CRITIC Method

The criteria weights can be determined by various methods, including subjective, objective, and both subjective and objective. The weights of the criteria can be affected by the characteristics of the determined criteria as well as by the subjective judgments of the decision-making mechanisms. Since the mentioned subjective judgments may lead to biased results, some methods that provide objective evaluation have been introduced into the

literature (Kazan & Ozdemir, 2014; Akyüz & Aka, 2017). The CRITIC method is one of the objective weighting methods introduced into the literature by Diakoulaki et al. (1995). The method is based on weighting each criterion objectively based on correlation and standard deviation (Ren, et al., 2020). The process of determining the weight coefficients consists of the following steps (Diakoulaki, et al., 1995; Aytaç Adalı & Tuş Işık, 2017; Wu, et al., 2020; Akbulut, 2020a; Marjanović & Popović, 2020):

**Step 1**: The decision matrix consisting of n evaluation criteria and m alternatives is formed as shown in Eq. (1).

$$X = \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix}; i = 1, \dots \dots m \text{ ve } j = 1, \dots n \quad (1)$$

**Step 2**: Each evaluation criterion in the decision matrix is normalized according to its beneficial and non-beneficial or cost properties. Criteria are normalized using Eq. (2) if they have beneficial properties and Eq.(3) if they have non-beneficial or cost properties. $x_j^{max}$ and $x_j^{min}$ values in the equations represent the highest and lowest value of the j criterion, respectively.

$$r_{ij} = \frac{x_{ij} - x_j^{min}}{x_j^{max} - x_j^{min}} \quad (2)$$

$$r_{ij} = \frac{x_j^{max} - x_{ij}}{x_j^{max} - x_j^{min}} \quad (3)$$

**Step 3**: Correlation coefficients are calculated using Eq. (4) in order to measure the degree of the linear relationship between the criteria pairs.

$$p_{jk} = \frac{\sum_{i=1}^{m}(r_{ij} - \bar{r}_j) \times (r_{ik} - \bar{r}_k)}{\sqrt{\sum_{i=1}^{m}(x_{ij} - \bar{x}_j)^2 \times \sum_{i=1}^{m}(x_{ik} - \bar{x}_k)^2}}; j, k = 1, \dots, n \quad (4)$$

**Step 4**: $C_j$ value, representing the quantity of information for each evaluation criterion, is obtained using Eq. (5).

$$c_j = \sigma_j \sum_{k=1}^{n}(1 - p_{jk}); \; j = 1, \dots, n \quad (5)$$

The value of $\sigma_j$ in Eq. (5) represents each evaluation criterion's standard deviation and is obtained by Eq. (6).

$$\sigma_j = \sqrt{\frac{1}{n-1}\sum_{j=1}^{n}(x_{ij} - \bar{x}_j)^2}; i = 1, \dots, m \quad (6)$$

**Step 5**: The criteria weights are calculated by Eq. (7). The weight of the jth criterion ($w_j$) is obtained as:

$$w_j = \frac{c_j}{\sum_{j=1}^{n} c_j} ; \; j = 1, \dots, n \tag{7}$$

In this case, the criterion with the highest value is accepted as the best relative significant criterion.

## COPRAS Method

COPRAS method is a MCDM method developed by Zavadskas and Kaklauskas (1996) which can evaluate qualitative and quantitative criteria with accuracy and which is used by many scientists today to improve decision-making processes in a wide range of fields from management to engineering (Beheshti, et al., 2016; Amoozad Mahdiraji, et al., 2018). According to this method, the effect of the values to be maximized and minimized is considered separately in the evaluation (Podvezko, 2011). In addition to the afore-mentioned advantages of the method, the COPRAS method differs from other MCDM methods with certain features such as its short and easy calculation period, its use in estimating the utility degrees of alternatives, its ability to calculate how much better or worse alternatives are compared to each other in percentage terms, and its ability to be used in different disciplines such as planning and sustainability (Mulliner, et al., 2013). The COPRAS method consists of 7 stages and these stages are formulated as follows (Kaklauskas, et al., 2007; Chatterjee, et al., 2011; Podvezko, 2011):

**Step 1**: The decision matrix is created with m alternatives and n criteria and is shown as in Eq. (1).

**Step 2**: Using Eq. (8) the decision matrix is normalized.

$$x_{ij}^{*} = \frac{x_{ij}}{\sum_{i=1}^{m} x_{ij}}; \forall j = 1,2,3 \dots, n \tag{8}$$

**Step 3**: The criterion weights obtained using the CRITIC method are included in the COPRAS method, and a weighted normalized decision matrix is formed by Eq. (9).

$$x_{ij}^{*} = \frac{x_{ij}}{\sum_{i=1}^{m} x_{ij}}; \forall j = 1,2,3 \dots, n \tag{9}$$

**Step 4**: Beneficial and non-beneficial or cost criteria in the decision matrix are grouped among themselves, and it is ensured that the benefit criteria reach the maximum level and the non-beneficial or cost criteria reach the minimum level. For this purpose, benefit criteria are grouped among themselves using Eq. (10) and non-beneficial or cost criteria using Eq. (11).

$$S_i^{+} = \sum_{j=1}^{k} d_{ij} \; ; \; j = 1,2,3, \dots, k \tag{10}$$

$$S_i^{-} = \sum_{j=k+1}^{n} d_{ij} \; ; \; j = k+1, k+2, \dots, n \tag{11}$$

**Step 5**: The value expressed as the $Q_i$ value is the relative significance value for each al-

ternative included in the study and is obtained through Eq. (12). As a result of the calculation, the alternative with the highest relative significance value is determined as the best decision alternative.

$$Q_i = S_i^+ + \frac{\sum_{i=1}^{m} S_i^-}{S_i^- \times \sum_{i=1}^{m} \frac{1}{S_i^-}} \quad (12)$$

**Step 6**: Using the $Q_i$ values calculated in the previous step, the alternative with the highest relative significance value is obtained through Eq. (13).

$$Q_{max} = \text{maksimum}\,(Q_i); \forall_i = 1,2,3 \ldots, m \quad (13)$$

**Step 7**: The performance value index ($P_i$) for each alternative included in the study is obtained using Eq. (14). According to the calculated values, the alternative with a $P_i$ score of 100 is determined as the best decision alternative, and the performance ranking of each alternative is obtained by ranking the other values in descending order.

$$P_i = \frac{Q_i}{Q_{max}} \times \%100 \quad (14)$$

## ARAS Method

In this method, which was introduced to the literature by Zavadskas and Turskis (2010), the utility values of the alternatives are compared with an optimal value determined by the decision-maker (Akbulut, 2020b). The ARAS method consists of the following steps (Zavadskas, et al., 2010; Isik, 2019):

**Step 1**: As in other MCDM methods, the decision matrix consisting of m evaluations and n alternative criteria is presented in Eq. (15).

$$X = \left[x_{ij}\right]_{mxn} = \begin{bmatrix} x_{01} & x_{02} & \cdots & x_{0n} \\ x_{11} & x_{12} & \cdots & x_{1n} \\ \cdots & \cdots & \cdots & \cdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix} \quad (15)$$

According to the initial matrix, $x_{ij}$ expresses the performance value of *i* alternative in terms of *j* criterion, and $x_{0i}$ is the optimal value for the j criterion. If the value of $x_{0j}$ is not known for the decision makers, the optimal values of the criteria according to the benefit (maximizing) and cost (minimizing) status are obtained with the help of Eq. (16) and Eq. (17), respectively.

For benefit type criteria; $x_{oj} = \max_i x_{ij}; i = 0,1, \ldots, m \text{ ve } j = 1, \ldots, n$ (16)

For cost type criteria; $x_{oj} = \min_i x_{ij}; i = 0,1, \ldots, m \text{ ve } j = 1, \ldots, n$ (17)

**Step 2**: Primary inputs are normalized to take values in the range [0-1]. If the criterion is benefit type, normalization is performed using Eq. (18); if it is cost type, using Eq. (19).

$$\overline{x}_{ij} = \frac{x_{ij}}{\sum_{i=0}^{m} x_{ij}} \quad (18)$$

$$\overline{x}_{ij} = \frac{1/x_{ij}}{\sum_{i=0}^{m} 1/x_{ij}} \quad (19)$$

**Step 3**: The weighting coefficients of the evaluation criteria obtained using the CRITIC method are covered in the ARAS method, and a weighted normalized decision matrix is obtained following Eq. (20).

$$x_{ij} = \overline{x}_{ij} \times w_j \quad (20)$$

**Step 4**: After obtaining the weighted normalized matrix, optimality values for decision alternatives are calculated using Eq. (21).

$$S_i = \sum_{j=1}^{n} x_{ij} \quad (21)$$

$S_i$ value in the equation explains the optimality value of the i alternative. The alternative with the highest $S_i$ value is defined as the best alternative and the alternative with the lowest $S_i$ value as the worst alternative.

**Step 5**: Using the optimal values for the alternatives, the utility degree for each alternative is calculated using the formula in Eq. (22).

$$K_i = \frac{S_i}{S_0} \quad (22)$$

In the equation, $S_0$ means the optimality function value of the best alternative. The $K_i$ value of each alternative is ranked in descending order. The alternative with the highest $K_i$ value is the most effective.

## SAW Method

SAW (Simple Additive Weighting) is a MCDM method which is simple and easy to apply. It is also known as scoring technique and weighted linear combination in the literature. This method was first used by Churchman and Ackoff (1954). According to this method, which is based on the weighted average, the normalized value of each criterion is multiplied by the importance coefficients of the criteria, and evaluation scores are formed. The calculated evaluation scores are then listed, and the decision alternative with the highest score is evaluated as the most effective alternative. The application steps of the SAW method are shown below (Jaberidoost, et al., 2015; Rezaei, et al., 2015; Wang, et al., 2016):

**Step 1**: The decision matrix, which includes the criteria and alternatives, is formed as in Eq (1).

**Step 2**: All values in the decision matrix are normalized using Eq. (23) and Eq. (24), taking into account the benefit and cost properties, respectively.

For benefit type criteria; $r_{ij} = \frac{x_{ij}}{\max x_{ij}}$ (23)

For cost type criteria; $r_{ij} = \frac{\min x_{ij}}{x_{ij}}$ (24)

**Step 3**: The weight coefficients obtained from the CRITIC method are used in applying the SAW method, and the decision matrix weighted by Eq. (25) is obtained.

$$W_j \times r_{ij} \quad (25)$$

**Step 4**: The decision alternatives' values in the weighted matrix are summed among themselves, and the total ranking scores for the alternatives ($S_i$) are obtained using Eq. (26).

$$S_i = \sum_{j=1}^{n} W_j \times r_{ij} \quad (26)$$

The decision alternative with a higher $S_i$ value is the best, while the lowest alternative with the $S_i$ value is considered the worst decision alternative.

## BORDA Count and Copeland Method

BORDA Count method, proposed by Jean - Charles de Borda in the 18th century, is a method used to assign ranks to decision alternatives in line with the preferences of decision-makers (Gorsevski, et al., 2013). Although the method was first introduced to solve voting problems (Costa 2017), it is applied today to facilitate decision-making processes in different areas. Thanks to the BORDA Count method, it is possible to combine at least two ranked lists into one and to choose the most appropriate decision alternative (Lumini & Nanni, 2006). In the literature, the BORDA Count method is used in many studies involving the integrated MCDM method to obtain a combined ranking list (Görçün, 2020; Ecer, 2021; Poongavanam, et. al., 2021).

In the Borda rank aggregation method, the Borda values are calculated by giving 0 points to the decision alternative with the lowest evaluation score, 1 point to the next alternative, and n-1 point (n = number of alternatives) to the best decision alternative (Wu, 2011). As a result of the process, the total Borda score for each decision alternative is calculated by adding up all the values given to the alternatives. As a result of the obtained scores, the final success scores are obtained by ranking each alternative in descending order (Ludwin, 1978; Lansdowne & Woodward, 1996).

The Copeland method, which was introduced to the literature by Saari and Merlin (1996), is the modified version of the Borda Count Method and is another method used in combining the rankings obtained from different methods in studies which use the MCDM method. In the Copeland method, the scoring of alternatives is based on how many times an alternative is dominant in terms of ranking compared to the others. Accordingly, this method considers not only the wins but also the losses for each alternative. The ranking is determined by the difference between the win and the loss (Dortaj et. al, 2020; Şahin, 2021).

In the first step of the Copeland method, the ranking results of the COPRAS, ARAS, and SAW methods are compared in pairs. In the comparison process, each decision alternative is examined in pairs and handled separately. "1" point is given for the case where the alternative is dominant to the other alternatives, while "0" points are given for the case where it is weak. With this scoring, the winning score of each alternative is calculated. Secondly, the loss score is calculated. The losses score of the alternatives is obtained by subtracting the wins score received for each option from the majority wins score. Lastly, the final scores and ranking are determined. The difference between the wins score and the losses score gives the final result of each alternative, and according to this result, the best option is the one with the highest total score (Bączkiewicz et. al, 2021).

## Application and Results

This section begins by outlining the evaluation criteria and their explanations as discussed within the scope of the study. Then the results of the methods used are given in tables, and the year ranking is created by considering the financial performance success. Finally, Spearman's Correlation Coefficient results are shared in order to check the validity of the applicability of the methods.

### Evaluation Criteria Used in the Study

This study aims to examine the financial performance of Amazon for the period 2005-2019. Data on financial indicators were obtained from the financial statements that the company regularly publishes. The financial ratios, which are the evaluation criteria used in the study, the calculation methods for these ratios, and the codes and qualitative information regarding the criteria, are presented in Table 2.

Table 2
*Evaluation Criteria*

| Evaluation Criteria (Code) | Calculation Method (%) | Criteria Type | Studies Using the Criterion |
|---|---|---|---|
| Current Ratio (CR) | Current Assets / Current Liabilities | Max | Baležentis, et al., 2012; Moghimi & Anwari, 2014; Farrokh, et al., 2016; Abdel-Basset, et al., 2020 |
| Return on Investment (ROI) | Net Return on Investment / Cost of Investment | Max | Chen, et al., 2011; Baležentis, et al., 2012; Beheshtinia & Omidi, 2017 |
| Return on Assets (ROA) | Net Income / Average Total Assets | Max | Yalcin, et al., 2012; Safaei Ghadikolaei, et al., 2014; Shaverdi, et al., 2014; Bilbao-Terol, et al., 2018 |
| Return on Equity (ROE) | Net Income / Total Equity | Max | Lee, et al., 2012; Dong, et al., 2018; Abdel-Basset, et al., 2020 |
| Accounts Receivables Turnover Rate (ART) | Net Sales / Average Account Receivables | Max | Wang, 2008; Ertuğrul & Karakaşoğlu, 2009; Moghimi & Anvari, 2014; Kazan & Ozdemir, 2014 |

| Evaluation Criteria (Code) | Calculation Method (%) | Criteria Type | Studies Using the Criterion |
|---|---|---|---|
| Inventory Turnover Ratio (ITR) | Cost of Goods Sold / Average Inventory | Max | Moghimi & Anvari, 2014; Visalakshmi, et al., 2015; Aytekin, 2019 |
| Net Profit Margin Ratio (NPM) | Net Profit / Net Sales | Max | Önder, et al., 2014; Abdel-Basset, et al., 2020; Gupta, et al., 2020 |
| Debt-to-equity Ratio (DER) | Total Debt / Total Equity | Min | Rahmani & Keshavarz, 2015; Karimi & Barati, 2018; Tey, et al., 2019; Erdoğan, et al., 2020 |
| Debt Ratio (DR) | Total Debt / Total Assets | Min | Deng, et al., 2020; Rezaie, et al., 2014; Tavana, et al., 2014; Beheshtinia & Omidi, 2017 |

The evaluation criteria used in the study are variables that are frequently used in the literature to determine the financial performance of companies. Criteria used in the study are listed as follows: "*Current Ratio*" which expresses the ability of the company to pay its short-term debts (Baležentis, et al., 2012; Moghimi & Anwari, 2014; Farrokh, et al., 2016; Abdel-Basset, et al., 2020); "*Return on Investment*" which measures the efficiency of the investments made by companies (Chen, et al., 2011; Baležentis, et al., 2012; Beheshtinia & Omidi, 2017); "*Return on Assets*" showing how effectively the company uses its assets to generate income (Yalcin, et al., 2012; Safaei Ghadikolaei, et al., 2014; Shaverdi, et al., 2014; Bilbao-Terol, et al., 2018); "*Return on Equity*" which describes how much of the equity owned by the company can be converted into profit (Lee, et al., 2012; Dong, et al., 2018; Abdel-Basset, et al., 2020); "*Accounts Receivables Turnover Ratio*" which measures how effective the business is in collecting its receivables (Wang, 2008; Ertuğrul & Karakaşoğlu, 2009; Moghimi & Anvari, 2014; Kazan & Ozdemir, 2014); "*Inventory Turnover Ratio*" which measures how many days the company turns its stocks into sales in a year (Moghimi & Anvari, 2014; Visalakshmi, et al., 2015; Aytekin, 2019); "*Net Profit Margin Ratio*" which measures the level of control of the expenses of the company (Önder, et al., 2014; Abdel-Basset, et al., 2020; Gupta, et al., 2020); "*Debt-to-equity Ratio*" showing how much equity and debt the company uses to finance its assets (Rahmani & Keshavarz, 2015; Karimi & Barati, 2018; Tey, et al., 2019; Erdoğan, et al., 2020); "*Debt Ratio*" expressing how much of the assets of the company is obtained through debt (Deng, et al., 2020; Rezaie, et al., 2014; Tavana, et al., 2014; Beheshtinia & Omidi, 2017).

In order to analyze the financial performance of Amazon.com, Inc. with different MCDM methods, the required data of Amazon.com, Inc. were examined. First, the importance weights of the evaluation criteria were determined using the CRITIC method. Then, the weight coefficients obtained from the CRITIC method were included with the COPRAS, ARAS and SAW methods respectively and the financial performance rankings for each method were identified. Finally, an overall assessment was made by combining all methods with the Borda Count and Copeland methods.

## CRITIC Method Findings

In this part of the study, the weight coefficients (significance weights) of the evaluation criteria were determined using the CRITIC method. Created in line with Step (1), the decision matrix that includes firm-level data of Amazon.com, Inc. for the years 2005-2019 is included in Table 3.

Table 3

*Decision Matrix*

| | Max | Max | Max | Max | Max | Max | Max | Min | Min |
|---|---|---|---|---|---|---|---|---|---|
| | **CR** | **ROI** | **ROA** | **ROE** | **ART** | **ITR** | **NPM** | **DER** | **DR** |
| **2019** | 1.097 | 13.557 | 5.145 | 18.672 | 1.245 | 8.076 | 4.131 | 0.377 | 0.724 |
| **2018** | 1.098 | 15.025 | 6.193 | 23.130 | 1.432 | 8.103 | 4.325 | 0.540 | 0.732 |
| **2017** | 1.040 | 5.782 | 2.310 | 10.946 | 1.355 | 6.975 | 1.705 | 0.893 | 0.789 |
| **2016** | 1.045 | 8.788 | 2.843 | 12.295 | 1.631 | 7.701 | 1.744 | 0.399 | 0.769 |
| **2015** | 1.054 | 2.758 | 0.921 | 4.453 | 1.653 | 6.995 | 0.557 | 0.615 | 0.793 |
| **2014** | 1.115 | -1.268 | -0.442 | -2.244 | 1.633 | 7.561 | -0.271 | 0.770 | 0.803 |
| **2013** | 1.072 | 2.118 | 0.682 | 2.811 | 1.854 | 7.311 | 0.368 | 0.327 | 0.757 |
| **2012** | 1.121 | -0.346 | -0.120 | -0.476 | 1.877 | 7.623 | -0.064 | 0.377 | 0.748 |
| **2011** | 1.174 | 7.876 | 2.496 | 8.135 | 1.902 | 7.470 | 1.313 | 0.033 | 0.693 |
| **2010** | 1.325 | 13.674 | 6.129 | 16.783 | 1.820 | 8.295 | 3.368 | 0.227 | 0.635 |
| **2009** | 1.330 | 17.158 | 6.530 | 17.158 | 1.774 | 8.742 | 3.680 | 0.533 | 0.619 |
| **2008** | 1.297 | 20.935 | 7.758 | 24.139 | 2.305 | 10.648 | 3.365 | 0.153 | 0.656 |
| **2007** | 1.390 | 19.201 | 7.340 | 39.766 | 2.288 | 9.568 | 3.209 | 1.085 | 0.815 |
| **2006** | 1.332 | 11.323 | 4.355 | 44.084 | 2.455 | 9.413 | 1.774 | 2.893 | 0.901 |
| **2005** | 1.542 | 19.293 | 9.010 | 135.366 | 2.297 | 11.398 | 4.229 | 6.016 | 0.933 |

The initial decision matrix was normalized by considering the benefits as well as the non-beneficial or cost properties of each criterion. To put it more clearly, Eq. (2) was used for the utility criteria, Eq. (3) was used for the cost criteria, and the normalized decision matrix was created as shown in Table 4.

Table 4

*Normalized Decision Matrix*

| | **CR** | **ROI** | **ROA** | **ROE** | **ART** | **ITR** | **NPM** | **DER** | **DR** |
|---|---|---|---|---|---|---|---|---|---|
| **2019** | 0.113 | 0.668 | 0.591 | 0.152 | 0.000 | 0.249 | 0.958 | 0.942 | 0.666 |
| **2018** | 0.116 | 0.734 | 0.702 | 0.184 | 0.154 | 0.255 | 1.000 | 0.915 | 0.640 |
| **2017** | 0.000 | 0.318 | 0.291 | 0.096 | 0.090 | 0.000 | 0.430 | 0.856 | 0.459 |
| **2016** | 0.010 | 0.453 | 0.348 | 0.106 | 0.318 | 0.164 | 0.438 | 0.939 | 0.522 |
| **2015** | 0.027 | 0.181 | 0.144 | 0.049 | 0.337 | 0.004 | 0.180 | 0.903 | 0.446 |
| **2014** | 0.150 | 0.000 | 0.000 | 0.000 | 0.320 | 0.133 | 0.000 | 0.877 | 0.414 |
| **2013** | 0.063 | 0.153 | 0.119 | 0.037 | 0.503 | 0.076 | 0.139 | 0.951 | 0.561 |
| **2012** | 0.161 | 0.042 | 0.034 | 0.013 | 0.522 | 0.146 | 0.045 | 0.943 | 0.589 |
| **2011** | 0.267 | 0.412 | 0.311 | 0.075 | 0.543 | 0.112 | 0.344 | 1.000 | 0.764 |
| **2010** | 0.568 | 0.673 | 0.695 | 0.138 | 0.475 | 0.298 | 0.792 | 0.967 | 0.949 |
| **2009** | 0.578 | 0.830 | 0.738 | 0.141 | 0.437 | 0.399 | 0.860 | 0.916 | 1.000 |
| **2008** | 0.512 | 1.000 | 0.868 | 0.192 | 0.876 | 0.830 | 0.791 | 0.980 | 0.882 |
| **2007** | 0.697 | 0.922 | 0.823 | 0.305 | 0.862 | 0.586 | 0.757 | 0.824 | 0.376 |

| | CR | ROI | ROA | ROE | ART | ITR | NPM | DER | DR |
|---|---|---|---|---|---|---|---|---|---|
| **2006** | 0.581 | 0.567 | 0.508 | 0.337 | 1.000 | 0.551 | 0.445 | 0.522 | 0.102 |
| **2005** | 1.000 | 0.926 | 1.000 | 1.000 | 0.869 | 1.000 | 0.979 | 0.000 | 0.000 |

In Table 5, correlation coefficients calculated with the help of Eq. (4) are presented to determine the relationships between the evaluation criteria used in the study.

Table 5
*Correlation Coefficients Between Evaluation Criteria*

| | CR | ROI | ROA | ROE | ART | ITR | NPM | DER | DR |
|---|---|---|---|---|---|---|---|---|---|
| **CR** | 1 | 0.714 | 0.766 | 0.777 | 0.764 | 0.882 | 0.540 | -0.659 | -0.205 |
| **ROI** | 0.714 | 1 | 0.986 | 0.595 | 0.393 | 0.795 | 0.920 | -0.315 | 0.123 |
| **ROA** | 0.766 | 0.986 | 1 | 0.683 | 0.396 | 0.825 | 0.933 | -0.419 | 0.054 |
| **ROE** | 0.777 | 0.595 | 0.683 | 1 | 0.521 | 0.811 | 0.548 | -0.933 | -0.580 |
| **ART** | 0.764 | 0.393 | 0.396 | 0.521 | 1 | 0.737 | 0.062 | -0.494 | -0.331 |
| **ITR** | 0.882 | 0.795 | 0.825 | 0.811 | 0.737 | 1 | 0.615 | -0.659 | -0.257 |
| **NPM** | 0.540 | 0.920 | 0.933 | 0.548 | 0.062 | 0.615 | 1 | -0.277 | 0.171 |
| **DER** | -0.659 | -0.315 | -0.419 | -0.933 | -0.494 | -0.659 | -0.277 | 1 | 0.769 |
| **DR** | -0.205 | 0.123 | 0.054 | -0.580 | -0.331 | -0.257 | 0.171 | 0.769 | 1 |

At this stage of the method, ($C_j$) values representing the amount of information contained in each evaluation criterion regarding the years within the scope of the study were calculated with Eq. (5). Also, the standard deviation values of the evaluation criteria were calculated with Eq. (6), and finally, the weighting values of the evaluation criteria for all years ($W_j$) were calculated using Eq. (7). The findings obtained are presented in Table 6.

Table 6
*Calculated $C_j$ and $W_j$ Values*

| | CR | ROI | ROA | ROE | ART | ITR | NPM | DER | DR |
|---|---|---|---|---|---|---|---|---|---|
| $C_j$ | 1.363 | 1.262 | 1.222 | 1.364 | 1.808 | 1.274 | 1.587 | 2.829 | 2.327 |
| $W_j$ | 0.091 | 0.084 | **0.081** | 0.090 | 0.120 | 0.085 | 0.106 | **0.188** | 0.155 |

According to the findings in Table 6, it is seen that the importance weights of the financial performance criteria of Amazon.com, Inc. vary between 0.081 and 0.188. In other words, the most important performance criterion for Amazon.com, Inc. is the debt-to-equity ratio (DER). The findings also show that the return on assets (ROA) criterion is the lowest performance criterion.

The significance levels of the performance criteria of the variables included in the study for the years 2005-2019 are debt-to-equity ratio (DER), debt ratio (DR), accounts receivables turnover rate (ART), net profit margin ratio (NPM), current ratio (CR), return on equity ratio (ROE), inventory turnover rate (IRT), return on investments ratio (ROI), and return on assets ratio (ROA), respectively.

## COPRAS Method Findings

In the first stage of the COPRAS Method, the decision matrix was created according to Eq. (1) and presented in Table 3. Then, in the second stage, with the help of Eq. (8), each value in the decision matrix presented in Table 3 was normalized by dividing it by the total column in which it was found. The decision matrix that was normalized is presented in Table 7.

Table 7

*Normalized Decision Matrix*

| | CR | ROI | ROA | ROE | ART | ITR | NPM | DER | DR |
|---|---|---|---|---|---|---|---|---|---|
| **2019** | 0.061 | 0.087 | 0.084 | 0.053 | 0.045 | 0.064 | 0.124 | 0.025 | 0.064 |
| **2018** | 0.061 | 0.096 | 0.101 | 0.065 | 0.052 | 0.064 | 0.129 | 0.035 | 0.064 |
| **2017** | 0.058 | 0.037 | 0.038 | 0.031 | 0.049 | 0.055 | 0.051 | 0.059 | 0.069 |
| **2016** | 0.058 | 0.056 | 0.046 | 0.035 | 0.059 | 0.061 | 0.052 | 0.026 | 0.068 |
| **2015** | 0.058 | 0.018 | 0.015 | 0.013 | 0.060 | 0.056 | 0.017 | 0.040 | 0.070 |
| **2014** | 0.062 | -0.008 | -0.007 | -0.006 | 0.059 | 0.060 | -0.008 | 0.050 | 0.071 |
| **2013** | 0.059 | 0.014 | 0.011 | 0.008 | 0.067 | 0.058 | 0.011 | 0.021 | 0.067 |
| **2012** | 0.062 | -0.002 | -0.002 | -0.001 | 0.068 | 0.061 | -0.002 | 0.025 | 0.066 |
| **2011** | 0.065 | 0.051 | 0.041 | 0.023 | 0.069 | 0.059 | 0.039 | 0.002 | 0.061 |
| **2010** | 0.073 | 0.088 | 0.100 | 0.047 | 0.066 | 0.066 | 0.101 | 0.015 | 0.056 |
| **2009** | 0.074 | 0.110 | 0.107 | 0.048 | 0.064 | 0.069 | 0.110 | 0.035 | 0.054 |
| **2008** | 0.072 | 0.134 | 0.127 | 0.068 | 0.084 | 0.085 | 0.101 | 0.010 | 0.058 |
| **2007** | 0.077 | 0.123 | 0.120 | 0.112 | 0.083 | 0.076 | 0.096 | 0.071 | 0.072 |
| **2006** | 0.074 | 0.073 | 0.071 | 0.124 | 0.089 | 0.075 | 0.053 | 0.190 | 0.079 |
| **2005** | 0.086 | 0.124 | 0.147 | 0.381 | 0.083 | 0.091 | 0.126 | 0.395 | 0.082 |

In the third stage of the method, the importance coefficients of the evaluation criteria obtained from the CRITIC method were included in the COPRAS method and a weighted normalized matrix was created within the scope of Eq. (9). The results are presented in Table 8.

Table 8

*Weighted Normalized Decision Matrix*

| | CR | ROI | ROA | ROE | ART | ITR | NPM | DER | DR |
|---|---|---|---|---|---|---|---|---|---|
| **2019** | 0.006 | 0.007 | 0.007 | 0.005 | 0.005 | 0.005 | 0.013 | 0.005 | 0.010 |
| **2018** | 0.006 | 0.008 | 0.008 | 0.006 | 0.006 | 0.005 | 0.014 | 0.007 | 0.010 |
| **2017** | 0.005 | 0.003 | 0.003 | 0.003 | 0.006 | 0.005 | 0.005 | 0.011 | 0.011 |
| **2016** | 0.005 | 0.005 | 0.004 | 0.003 | 0.007 | 0.005 | 0.006 | 0.005 | 0.010 |
| **2015** | 0.005 | 0.001 | 0.001 | 0.001 | 0.007 | 0.005 | 0.002 | 0.008 | 0.011 |
| **2014** | 0.006 | -0.001 | -0.001 | -0.001 | 0.007 | 0.005 | -0.001 | 0.010 | 0.011 |
| **2013** | 0.005 | 0.001 | 0.001 | 0.001 | 0.008 | 0.005 | 0.001 | 0.004 | 0.010 |
| **2012** | 0.006 | 0.000 | 0.000 | 0.000 | 0.008 | 0.005 | 0.000 | 0.005 | 0.010 |
| **2011** | 0.006 | 0.004 | 0.003 | 0.002 | 0.008 | 0.005 | 0.004 | 0.000 | 0.009 |
| **2010** | 0.007 | 0.007 | 0.008 | 0.004 | 0.008 | 0.006 | 0.011 | 0.003 | 0.009 |
| **2009** | 0.007 | 0.009 | 0.009 | 0.004 | 0.008 | 0.006 | 0.012 | 0.007 | 0.008 |
| **2008** | 0.007 | 0.011 | 0.010 | 0.006 | 0.010 | 0.007 | 0.011 | 0.002 | 0.009 |
| **2007** | 0.007 | 0.010 | 0.010 | 0.010 | 0.010 | 0.006 | 0.010 | 0.013 | 0.011 |
| **2006** | 0.007 | 0.006 | 0.006 | 0.011 | 0.011 | 0.006 | 0.006 | 0.036 | 0.012 |
| **2005** | 0.086 | 0.124 | 0.147 | 0.381 | 0.083 | 0.091 | 0.126 | 0.395 | 0.082 |

Beneficial and non-beneficial or cost criteria were determined with the help of Eq. (10) and Eq. (11) and reported in table 9.

Table 9

*Beneficial ($S_i^+$) and non-beneficial or cost ($S_i^-$) Criterion Values*

| | $S_i^+$ | $S_i^-$ | $1/S_i^-$ |
|---|---|---|---|
| **2019** | 0.048 | 0.015 | 68.894 |
| **2018** | 0.053 | 0.017 | 60.144 |
| **2017** | 0.030 | 0.022 | 45.940 |
| **2016** | 0.035 | 0.015 | 64.954 |
| **2015** | 0.023 | 0.018 | 54.390 |
| **2014** | 0.015 | 0.020 | 48.940 |
| **2013** | 0.022 | 0.014 | 69.695 |
| **2012** | 0.018 | 0.015 | 67.422 |
| **2011** | 0.033 | 0.010 | 101.619 |
| **2010** | 0.051 | 0.011 | 87.317 |
| **2009** | 0.054 | 0.015 | 66.624 |
| **2008** | 0.062 | 0.011 | 92.412 |
| **2007** | 0.064 | 0.024 | 40.826 |
| **2006** | 0.053 | 0.048 | 20.838 |
| **2005** | 0.096 | 0.087 | 11.496 |
| **Sum (∑)** | | 0.343 | 901.511 |

At this stage, the $Q_i$ values expressed as relative importance value for each decision alternative were calculated using Eq. (12), and then the $Q_{max}$ value with the highest $Q_i$ value was calculated using Eq. (13). In the last part, the values for each alternative included in the study, expressed as $P_i$ and representing the performance index value, were calculated with the help of Eq. (14), and all the findings obtained are presented in Table 10.

Table 10

*Relative Importance Value ($Q_i$), Performance Index ($P_i$), and Rankings by Years*

| | $Q_i$ | c | Ranking by COPRAS |
|---|---|---|---|
| **2019** | 0.075 | 74.440 | 7 |
| **2018** | 0.076 | 75.885 | 6 |
| **2017** | 0.048 | 47.611 | 12 |
| **2016** | 0.059 | 59.337 | 10 |
| **2015** | 0.044 | 43.456 | 14 |
| **2014** | 0.034 | 33.697 | **15** |
| **2013** | 0.049 | 48.775 | 11 |
| **2012** | 0.044 | 43.877 | 13 |
| **2011** | 0.072 | 71.569 | 8 |
| **2010** | 0.084 | 83.719 | 3 |
| **2009** | 0.080 | 79.473 | 4 |
| **2008** | 0.097 | 97.149 | 2 |
| **2007** | 0.079 | 79.227 | 5 |
| **2006** | 0.060 | 60.350 | 9 |
| **2005** | 0.100 | 100.000 | **1** |
| | **$Q_{imax=0.100}$** | | |

According to the findings obtained from the COPRAS method, it was concluded that the year 2005 was the most successful financially for Amazon.com, Inc. between the years 2005 and 2019, and that 2014 was the year in which the company was financially the most unsuccessful in the same period.

## ARAS Method Findings

In the first stage of the ARAS method, the decision matrix was created according to Eq. (15). Then, the optimal values (OPT) for the evaluation criteria were calculated using Eq. (16) and Eq. (17) according to the benefit and cost characteristics. The findings are presented in Table 11.

Table 11

*Decision Matrix*

| | CR | ROI | ROA | ROE | ART | ITR | NPM | DER | DR |
|---|---|---|---|---|---|---|---|---|---|
| **OPT** | 1.542 | 20.935 | 9.010 | 135.366 | 2.455 | 11.398 | 4.325 | 0.033 | 0.619 |
| **2019** | 1.097 | 13.557 | 5.145 | 18.672 | 1.245 | 8.076 | 4.131 | 0.377 | 0.724 |
| **2018** | 1.098 | 15.025 | 6.193 | 23.130 | 1.432 | 8.103 | 4.325 | 0.540 | 0.732 |
| **2017** | 1.040 | 5.782 | 2.310 | 10.946 | 1.355 | 6.975 | 1.705 | 0.893 | 0.789 |
| **2016** | 1.045 | 8.788 | 2.843 | 12.295 | 1.631 | 7.701 | 1.744 | 0.399 | 0.769 |
| **2015** | 1.054 | 2.758 | 0.921 | 4.453 | 1.653 | 6.995 | 0.557 | 0.615 | 0.793 |
| **2014** | 1.115 | -1.268 | -0.442 | -2.244 | 1.633 | 7.561 | -0.271 | 0.770 | 0.803 |
| **2013** | 1.072 | 2.118 | 0.682 | 2.811 | 1.854 | 7.311 | 0.368 | 0.327 | 0.757 |
| **2012** | 1.121 | -0.346 | -0.120 | -0.476 | 1.877 | 7.623 | -0.064 | 0.377 | 0.748 |
| **2011** | 1.174 | 7.876 | 2.496 | 8.135 | 1.902 | 7.470 | 1.313 | 0.033 | 0.693 |
| **2010** | 1.325 | 13.674 | 6.129 | 16.783 | 1.820 | 8.295 | 3.368 | 0.227 | 0.635 |
| **2009** | 1.330 | 17.158 | 6.530 | 17.158 | 1.774 | 8.742 | 3.680 | 0.533 | 0.619 |
| **2008** | 1.297 | 20.935 | 7.758 | 24.139 | 2.305 | 10.648 | 3.365 | 0.153 | 0.656 |
| **2007** | 1.390 | 19.201 | 7.340 | 39.766 | 2.288 | 9.568 | 3.209 | 1.085 | 0.815 |
| **2006** | 1.332 | 11.323 | 4.355 | 44.084 | 2.455 | 9.413 | 1.774 | 2.893 | 0.901 |
| **2005** | 1.542 | 19.293 | 9.010 | 135.366 | 2.297 | 11.398 | 4.229 | 6.016 | 0.933 |

Considering the cost and benefit types of the criteria, each value in the decision matrix in line with Eq. (18) and Eq. (19) is normalized and presented in Table 12.

Table 12

*Normalized Decision Matrix*

| | CR | ROI | ROA | ROE | ART | ITR | NPM | DER | DR |
|---|---|---|---|---|---|---|---|---|---|
| **OPT.** | 0.086 | 0.134 | 0.147 | 0.381 | 0.089 | 0.091 | 0.129 | 0.331 | 0.075 |
| **2019** | 0.061 | 0.087 | 0.084 | 0.053 | 0.045 | 0.064 | 0.124 | 0.029 | 0.064 |
| **2018** | 0.061 | 0.096 | 0.101 | 0.065 | 0.052 | 0.064 | 0.129 | 0.020 | 0.063 |
| **2017** | 0.058 | 0.037 | 0.038 | 0.031 | 0.049 | 0.055 | 0.051 | 0.012 | 0.059 |
| **2016** | 0.058 | 0.056 | 0.046 | 0.035 | 0.059 | 0.061 | 0.052 | 0.027 | 0.060 |
| **2015** | 0.058 | 0.018 | 0.015 | 0.013 | 0.060 | 0.056 | 0.017 | 0.018 | 0.058 |
| **2014** | 0.062 | -0.008 | -0.007 | -0.006 | 0.059 | 0.060 | -0.008 | 0.014 | 0.057 |
| **2013** | 0.059 | 0.014 | 0.011 | 0.008 | 0.067 | 0.058 | 0.011 | 0.033 | 0.061 |

| | CR | ROI | ROA | ROE | ART | ITR | NPM | DER | DR |
|---|---|---|---|---|---|---|---|---|---|
| **2012** | 0.062 | -0.002 | -0.002 | -0.001 | 0.068 | 0.061 | -0.002 | 0.029 | 0.062 |
| **2011** | 0.065 | 0.051 | 0.041 | 0.023 | 0.069 | 0.059 | 0.039 | 0.331 | 0.067 |
| **2010** | 0.073 | 0.088 | 0.100 | 0.047 | 0.066 | 0.066 | 0.101 | 0.048 | 0.073 |
| **2009** | 0.074 | 0.110 | 0.107 | 0.048 | 0.064 | 0.069 | 0.110 | 0.020 | 0.075 |
| **2008** | 0.072 | 0.134 | 0.127 | 0.068 | 0.084 | 0.085 | 0.101 | 0.071 | 0.070 |
| **2007** | 0.077 | 0.123 | 0.120 | 0.112 | 0.083 | 0.076 | 0.096 | 0.010 | 0.057 |
| **2006** | 0.074 | 0.073 | 0.071 | 0.124 | 0.089 | 0.075 | 0.053 | 0.004 | 0.051 |
| **2005** | 0.086 | 0.124 | 0.147 | 0.381 | 0.083 | 0.091 | 0.126 | 0.002 | 0.049 |

The importance weights of the evaluation criteria obtained using the CRITIC method are included in the ARAS method and the decision matrix weighted in line with Eq. (20) is obtained and presented in Table 13.

Table 13

*Weighted Normalized Decision Matrix*

| | CR | ROI | ROA | ROE | ART | ITR | NPM | DER | DR |
|---|---|---|---|---|---|---|---|---|---|
| **OPT.** | 0.008 | 0.011 | 0.012 | 0.035 | 0.011 | 0.008 | 0.014 | 0.062 | 0.012 |
| **2019** | 0.006 | 0.007 | 0.007 | 0.005 | 0.005 | 0.005 | 0.013 | 0.005 | 0.010 |
| **2018** | 0.006 | 0.008 | 0.008 | 0.006 | 0.006 | 0.005 | 0.014 | 0.004 | 0.010 |
| **2017** | 0.005 | 0.003 | 0.003 | 0.003 | 0.006 | 0.005 | 0.005 | 0.002 | 0.009 |
| **2016** | 0.005 | 0.005 | 0.004 | 0.003 | 0.007 | 0.005 | 0.006 | 0.005 | 0.009 |
| **2015** | 0.005 | 0.001 | 0.001 | 0.001 | 0.007 | 0.005 | 0.002 | 0.003 | 0.009 |
| **2014** | 0.006 | -0.001 | -0.001 | -0.001 | 0.007 | 0.005 | -0.001 | 0.003 | 0.009 |
| **2013** | 0.005 | 0.001 | 0.001 | 0.001 | 0.008 | 0.005 | 0.001 | 0.006 | 0.009 |
| **2012** | 0.006 | 0 | 0 | 0 | 0.008 | 0.005 | 0 | 0.005 | 0.010 |
| **2011** | 0.006 | 0.004 | 0.003 | 0.002 | 0.008 | 0.005 | 0.004 | 0.062 | 0.010 |
| **2010** | 0.007 | 0.007 | 0.008 | 0.004 | 0.008 | 0.006 | 0.011 | 0.009 | 0.011 |
| **2009** | 0.007 | 0.009 | 0.009 | 0.004 | 0.008 | 0.006 | 0.012 | 0.004 | 0.012 |
| **2008** | 0.007 | 0.011 | 0.010 | 0.006 | 0.010 | 0.007 | 0.011 | 0.013 | 0.011 |
| **2007** | 0.007 | 0.010 | 0.010 | 0.010 | 0.010 | 0.006 | 0.01 | 0.002 | 0.009 |
| **2006** | 0.007 | 0.006 | 0.006 | 0.011 | 0.011 | 0.006 | 0.006 | 0.001 | 0.008 |
| **2005** | 0.008 | 0.010 | 0.012 | 0.035 | 0.010 | 0.008 | 0.013 | 0 | 0.008 |

After weighting the values in the normalized decision matrix, the $S_i$ value expressing the optimality function value for each decision alternative and the $K_i$ values expressing the utility degree of each decision alternative were determined using Eq. (21) and Eq. (22) respectively. The results obtained are reported in Table 14.

Table 14

*Optimal Values and Performance Ranking of ARAS Method*

| | $S_i$ | $K_i$ | Rank |
|---|---|---|---|
| **OPT.** | 0.171 | | |
| **2019** | 0.064 | 0.371 | 8 |
| **2018** | 0.067 | 0.389 | 7 |
| **2017** | 0.042 | 0.242 | 11 |
| **2016** | 0.049 | 0.287 | 10 |

| | $S_i$ | $K_i$ | Rank |
|---|---|---|---|
| **2015** | 0.035 | 0.205 | 13 |
| **2014** | 0.027 | 0.156 | **15** |
| **2013** | 0.038 | 0.222 | 12 |
| **2012** | 0.033 | 0.194 | 14 |
| **2011** | 0.106 | 0.616 | **1** |
| **2010** | 0.071 | 0.413 | 5 |
| **2009** | 0.070 | 0.406 | 6 |
| **2008** | 0.086 | 0.504 | 3 |
| **2007** | 0.074 | 0.434 | 4 |
| **2006** | 0.061 | 0.357 | 9 |
| **2005** | 0.104 | 0.605 | 2 |

Considering the values of $S_i$, which expresses the optimality function for each decision alternative, and $K_i$ values expressing the utility degrees in Table 14, a financial performance ranking was made according to the ARAS method for each year included in the study and is presented in the last column of Table 14. According to the results reported in the table, it was concluded that between the years 2005 and 2019 the financial performance of Amazon.com, Inc. was the highest in 2011 according to the ARAS method. However, the year in which the firm in question was the worst in terms of financial performance within the same period was 2014, as in the COPRAS method.

## SAW Method Findings

In the first stage of the SAW method, the decision matrix was created in line with Eq. (1) and presented in Table 3. Then, in the second stage, the benefit and cost types of each value in the decision matrix were normalized within the scope of Eq. (23) and Eq. (24), and the results reached are given in Table 15.

Table 15

*Normalized Decision Matrix*

| | CR | ROI | ROA | ROE | ART | ITR | NPM | DER | DR |
|---|---|---|---|---|---|---|---|---|---|
| **2019** | 0.711 | 0.648 | 0.571 | 0.138 | 0.507 | 0.709 | 0.955 | 0.087 | 0.855 |
| **2018** | 0.712 | 0.718 | 0.687 | 0.171 | 0.583 | 0.711 | 1.000 | 0.061 | 0.846 |
| **2017** | 0.674 | 0.276 | 0.256 | 0.081 | 0.552 | 0.612 | 0.394 | 0.037 | 0.785 |
| **2016** | 0.677 | 0.420 | 0.316 | 0.091 | 0.664 | 0.676 | 0.403 | 0.082 | 0.805 |
| **2015** | 0.683 | 0.132 | 0.102 | 0.033 | 0.673 | 0.614 | 0.129 | 0.054 | 0.781 |
| **2014** | 0.723 | -0.061 | -0.049 | -0.017 | 0.665 | 0.663 | -0.063 | 0.043 | 0.771 |
| **2013** | 0.695 | 0.101 | 0.076 | 0.021 | 0.755 | 0.641 | 0.085 | 0.100 | 0.818 |
| **2012** | 0.727 | -0.017 | -0.013 | -0.004 | 0.764 | 0.669 | -0.015 | 0.087 | 0.828 |
| **2011** | 0.761 | 0.376 | 0.277 | 0.060 | 0.775 | 0.655 | 0.303 | 1.000 | 0.893 |
| **2010** | 0.859 | 0.653 | 0.680 | 0.124 | 0.741 | 0.728 | 0.779 | 0.145 | 0.975 |
| **2009** | 0.863 | 0.820 | 0.725 | 0.127 | 0.723 | 0.767 | 0.851 | 0.062 | 1.000 |
| **2008** | 0.841 | 1.000 | 0.861 | 0.178 | 0.939 | 0.934 | 0.778 | 0.215 | 0.944 |
| **2007** | 0.901 | 0.917 | 0.815 | 0.294 | 0.932 | 0.840 | 0.742 | 0.030 | 0.760 |
| **2006** | 0.864 | 0.541 | 0.483 | 0.326 | 1.000 | 0.826 | 0.410 | 0.011 | 0.687 |
| **2005** | 1.000 | 0.922 | 1.000 | 1.000 | 0.936 | 1.000 | 0.978 | 0.005 | 0.663 |

At this stage of the method, criteria weights obtained from the CRITIC method were included in the SAW method and the criteria were weighted with the help of Eq. (25). Then, using Eq. (26), the preference score, called $S_i$ value, was determined for each decision alternative, and success ranking was made for each alternative. All findings achieved are reported in Table 16.

Table 16

*Weighted Normalized Decision Matrix and SAW Method Rankings*

| | CR | ROI | ROA | ROE | ART | ITR | NPM | DER | DR | $S_i$ | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **2019** | 0.064 | 0.054 | 0.046 | 0.013 | 0.061 | 0.060 | 0.101 | 0.016 | 0.132 | 0.548 | 8 |
| **2018** | 0.065 | 0.060 | 0.056 | 0.016 | 0.070 | 0.060 | 0.106 | 0.011 | 0.131 | 0.574 | 7 |
| **2017** | 0.061 | 0.023 | 0.021 | 0.007 | 0.066 | 0.052 | 0.042 | 0.007 | 0.121 | 0.401 | 11 |
| **2016** | 0.061 | 0.035 | 0.026 | 0.008 | 0.080 | 0.057 | 0.043 | 0.016 | 0.125 | 0.450 | 10 |
| **2015** | 0.062 | 0.011 | 0.008 | 0.003 | 0.081 | 0.052 | 0.014 | 0.010 | 0.121 | 0.362 | 13 |
| **2014** | 0.066 | -0.005 | -0.004 | -0.002 | 0.080 | 0.056 | -0.007 | 0.008 | 0.119 | 0.312 | **15** |
| **2013** | 0.063 | 0.008 | 0.006 | 0.002 | 0.091 | 0.054 | 0.009 | 0.019 | 0.127 | 0.379 | 12 |
| **2012** | 0.066 | -0.001 | -0.001 | 0.000 | 0.092 | 0.057 | -0.002 | 0.016 | 0.128 | 0.355 | 14 |
| **2011** | 0.069 | 0.032 | 0.023 | 0.005 | 0.093 | 0.056 | 0.032 | 0.188 | 0.138 | 0.636 | 4 |
| **2010** | 0.078 | 0.055 | 0.055 | 0.011 | 0.089 | 0.062 | 0.082 | 0.027 | 0.151 | 0.610 | 6 |
| **2009** | 0.078 | 0.069 | 0.059 | 0.012 | 0.087 | 0.065 | 0.090 | 0.012 | 0.155 | 0.625 | 5 |
| **2008** | 0.076 | 0.084 | 0.070 | 0.016 | 0.113 | 0.079 | 0.082 | 0.040 | 0.146 | 0.707 | 2 |
| **2007** | 0.082 | 0.077 | 0.066 | 0.027 | 0.112 | 0.071 | 0.078 | 0.006 | 0.118 | 0.636 | 3 |
| **2006** | 0.078 | 0.045 | 0.039 | 0.030 | 0.120 | 0.070 | 0.043 | 0.002 | 0.106 | 0.534 | 9 |
| **2005** | 0.091 | 0.077 | 0.081 | 0.091 | 0.113 | 0.085 | 0.103 | 0.001 | 0.103 | 0.744 | **1** |

According to the findings in Table 16 which were obtained from the SAW method, it was found that, in terms of finance, the most successful year of Amazon.com, Inc. within the 2005-2019 time period was 2005, just like the COPRAS method. In addition, it was concluded that the firm in question was the most financially unsuccessful in the year 2014, as also seen in the COPRAS and ARAS methods within the same period.

In order to see the results obtained from the study more clearly, the financial performance success rankings obtained from the COPRAS, ARAS and SAW methods used in the study are presented collectively in Table 17.

Table 17

*Rankings Comparison of COPRAS, ARAS, and SAW Methods*

| Years | Ranking by COPRAS Method | Ranking by ARAS Method | Ranking by SAW Method |
|---|---|---|---|
| **2019** | 7 | 8 | 8 |
| **2018** | 6 | 7 | 7 |
| **2017** | 12 | 11 | 11 |
| **2016** | 10 | 10 | 10 |
| **2015** | 14 | 13 | 13 |
| **2014** | **15** | **15** | **15** |
| **2013** | 11 | 12 | 12 |

| Years | Ranking by COPRAS Method | Ranking by ARAS Method | Ranking by SAW Method |
|---|---|---|---|
| **2012** | 13 | 14 | 14 |
| **2011** | 8 | **1** | 4 |
| **2010** | 3 | 5 | 6 |
| **2009** | 4 | 6 | 5 |
| **2008** | 2 | 3 | 2 |
| **2007** | 5 | 4 | 3 |
| **2006** | 9 | 9 | 9 |
| **2005** | **1** | 2 | **1** |

## BORDA Count and Copeland Method Findings

Due to the difference of some values obtained within the same time period from the three MCDM methods, Borda Count and Copeland Method were included in the study so that a single financial performance ranking could be obtained by combining the sequence series.

In the Borda Count Method, values between 0 and 15 were given to sequence series previously created with COPRAS, ARAS, and SAW methods. Scoring was made for each alternative and the Borda values were calculated by assigning a value of 0 to the decision alternative that ranked last in the series, and a value of 15 to the first decision alternative. Borda score for each alternative was created by summing the Borda values obtained by the alternatives according to all three methods, and the alternatives were reordered as a result of the scores. The decision alternative with the highest Borda score was evaluated as the most successful alternative financially. The Borda values obtained by Amazon.com, Inc. from the COPRAS, ARAS, and SAW methods, the Borda scores calculated based on these values, and the success rankings are shown in Table 18.

In the Copeland Method, which is a modified version of the Borda Count method and another ranking method used in the study, the ranking results obtained from the COPRAS, ARAS, and SAW methods were compared with each other and then the wins and losses of alternatives were determined. In the final step of the Copeland method, the final ranking was formed by taking the difference between the wins and losses score of alternatives.

Table 18

*Ranking of the COPRAS, ARAS, and SAW Methods Rankings with Borda and Copeland Scores*

| | COPRAS Rank | Borda Rank | ARAS Rank | Borda Rank | SAW Rank | Borda Rank | Overall Borda Rank | Borda Integrated Rank | Copeland Integrated Rank |
|---|---|---|---|---|---|---|---|---|---|
| **2019** | 7 | 8 | 8 | 7 | 8 | 7 | 22 | 8 | 8 |
| **2018** | 6 | 9 | 7 | 8 | 7 | 8 | 25 | 7 | 7 |
| **2017** | 12 | 3 | 11 | 4 | 11 | 4 | 11 | 11 | 11 |
| **2016** | 10 | 5 | 10 | 5 | 10 | 5 | 15 | 10 | 10 |
| **2015** | 14 | 1 | 13 | 2 | 13 | 2 | 5 | 13 | 13 |
| **2014** | 15 | 0 | 15 | 0 | 15 | 0 | 0 | **15** | **15** |

| | COPRAS Rank | Borda Rank | ARAS Rank | Borda Rank | SAW Rank | Borda Rank | Overall Borda Rank | Borda Integrated Rank | Copeland Integrated Rank |
|---|---|---|---|---|---|---|---|---|---|
| **2013** | 11 | 4 | 12 | 3 | 12 | 3 | 10 | 12 | 12 |
| **2012** | 13 | 2 | 14 | 1 | 14 | 1 | 4 | 14 | 14 |
| **2011** | 8 | 7 | 1 | 14 | 4 | 11 | 32 | 4 | 4 |
| **2010** | 3 | 12 | 5 | 10 | 6 | 9 | 31 | 5 | 5 |
| **2009** | 4 | 11 | 6 | 9 | 5 | 10 | 30 | 6 | 6 |
| **2008** | 2 | 13 | 3 | 12 | 2 | 13 | 38 | 2 | 2 |
| **2007** | 5 | 10 | 4 | 11 | 3 | 12 | 33 | 3 | 3 |
| **2006** | 9 | 6 | 9 | 6 | 9 | 6 | 18 | 9 | 9 |
| **2005** | 1 | 14 | 2 | 13 | 1 | 14 | 41 | **1** | **1** |

The success scores obtained as a result of Borda Count scores and Copeland Method scores are included in the last column of Table 18. According to the results obtained from the Borda Count method and Copeland method, it was determined that 2005 was the most successful year for Amazon in terms of financial performance as in the COPRAS and SAW method, and the most unsuccessful year was 2014 as in the COPRAS, ARAS and SAW methods. In line with these outcomes, it can be stated that the results obtained from combined ranking methods are consistent with each other.

## Spearman's Correlation Coefficient

Spearman's Correlation Coefficient was used to check the similarities in the rankings obtained from the methods. The correlation values between the methods are given in Table 19.

Table 19

*Correlation values between applied MCDM methods*

| | COPRAS | ARAS | SAW |
|---|---|---|---|
| COPRAS | 1.000 | 0.882 | 0.936 |
| ARAS | 0.882 | 1.000 | 0.975 |
| SAW | 0.936 | 0.975 | 1.000 |

As seen in Table 19, it can be said that there is a strong correlation between the COPRAS-ARAS, COPRAS-SAW, and ARAS-SAW methods, with a high correlation of 0.882, 0.936, and 0.975, respectively. Accordingly, it can be stated that the results of the method approaches are stable.

## Conclusion and Discussion

With globalization, new technologies, and ease of access to the internet, many businesses have started to carry out their activities more frequently over the internet. As the scope and quality of service provided over the Internet has increased in recent years, e-commerce has reached new heights as one of the fastest-growing channels. Worldwide e-commerce sales

increased from $23.8 trillion in 2017 to $25.6 trillion in 2018, an 8% increase led by B2C sales, which corresponds to roughly 30% of the global GDP (UNCTAD, 2020). With the continuation of the upward trend of e-commerce, companies that want to survive in an increasingly competitive environment should quickly adapt to the dynamic structure experienced on a national and international scale. Additionally, in response to various performance evaluations and sector analyses, companies should take all necessary action without wasting time in order to get ahead of their competitors. In this direction, it is vital that companies operating in the e-commerce sector, which has started to take an essential place in the economy , are evaluated regularly in accordance with the results obtained by measuring their performance.

The purpose of this study was to examine the financial performance of the biggest e-commerce retailer Amazon.com, Inc. for the period 2005-2019. For this purpose, nine evaluation criteria and five MCDM methods were used in the study. In the first stage of the analysis, the importance weights of the evaluation criteria included in the study were determined within the scope of the CRITIC method. According to the findings obtained from the CRITIC method, it was concluded that the most important evaluation criterion affecting the performance of Amazon.com, Inc. in the 2005-2019 period was the debt-to-equity (DER) ratio. However, the most ineffective evaluation criterion on performance was the return on assets (ROA) ratio. In the second stage of the analysis, the weight values obtained from the CRITIC method which expressed the importance level of the evaluation criteria were included in the COPRAS, ARAS, and SAW methods respectively, and the performance scores were determined within the scope of each method. According to the performance scores obtained, the year in which Amazon.com, Inc. was most financially successful varied depending on the periods, while 2014 was determined to be the most financially unsuccessful year for the company according to all methods. In the last stage of the study, a single success score was obtained by combining different performance rankings obtained from COPRAS, ARAS and SAW methods with Borda Count and Copeland methods. According to the financial performance rankings made as a result of the scores obtained from Borda and Copeland methods, it was determined that the company was the most financially successful in 2005 and that 2014 was the worst year between the years 2005 and 2019.

There are several reasons why Amazon.com, Inc. had its most successful year in terms of financial performance in 2005. These reasons can be explained by the company's high market value in the international arena, the global spread of internet access in the 2000s, and the company's technological and customer-value based investments. Examples of these investments include Amazon Prime and Amazon Mechanical Turk (MTurk), which were established in 2005. Amazon Prime, which gives customers a variety of special privileges for a certain annual fee, has more than 150 million subscribers today. Amazon Prime nowadays offers its subscribers a variety of benefits in various areas such as shopping, games, and TV series. It offers special discounts, early shopping, and fast shipping (Euromonitor, 2020; Ke-

yes, 2020). MTurk, on the other hand, is the platform "online labor marketplace", which is presented by bringing together what machines find difficult to do, what is easier to be done by humans, and what can be done digitally (Paolacci, et al., 2010). New business models such as Amazon Prime membership and MTurk provided data about customers to improve their services to Amazon, contributing to its growth rate and leading to the development of new services suitable for its customers. In addition, the success in 2005 can be explained by the company's responsible investments in human resources fields, increasing process efficiency, reducing costs, and increasing product variety. Finally, it can be explained by the firm's steady increase in active assets compared to previous years (About Amazon, 2020).

There are several factors that contribute to Amazon.com, Inc.'s worst financial year in 2014. During this period called "Investment Mode," the company invested $100 million in online video programming and $970 million for the acquisition of the game related live-streaming company Twitch. It then launched its new products (Mac, 2014). The most notable driver of the failure in 2014 can be assumed to be the "Amazon Fire Phone" product. The Fire Phone, announced on June 18, 2014, was manufactured by Foxconn, and had various technological features. Fire Phone, which attracted people's attention especially with its X-ray feature and Dynamic Perspective feature, also received serious criticism and this investment did not achieve the desired result. The sales of the Fire Phone, which was discontinued in August 2015, were stopped shortly after, and Amazon.com, Inc. lost 170 million dollars from this investment (Kokalitcheva, 2015). During 2014, these heavy investments of Amazon may have concluded with long-term success, but they harmed the financial performance of the company in that year. At the same time , Amazon had a dispute with Hachette due to Amazon's desire to maintain price control over electronic books, and Hachette, one of the major book publishers, did not allow this pricing control. The reaction of many authors and publishers to this conflict affected Amazon badly (Ellis-Petersen, 2014). In addition, Amazon.com, Inc. experienced a serious decrease in its revenues despite increasing the amount of sales made in 2014 and they had to pay high principal and interest as a result of the increase in long-term debt structure compared to previous years. These factors can be considered together as being instrumental in the poor financial performance of the company (About Amazon, 2020).

Although different MCDM methods can give different results alone, this study uses more than one method together and is evaluated in a broader perspective thus having a better analysis power. Moreover, it is believed that decision-makers can make more accurate managerial and operational decisions by examining the results in line with financial performance evaluation with integrated methods. In this way, the investments made and the developments occurring on a global scale will be understood better.

This study also has some limitations. The first limitation of this study is to evaluate the company included in the analysis around only nine evaluation criteria. Another limitation of

the study is the short period (2005-2019) that the data selected for analysis were used. In addition, the use of COPRAS, ARAS, SAW, Borda Count, and Copeland methods based on the CRITIC method can be considered as a limitation for performance comparison. Different results could be obtained using more evaluation criteria and different MCDM methods in future studies on the financial performance of companies. Moreover, methods such as the CAMELS approach, balanced scorecard, and panel data analysis could also be used in financial performance evaluations. Another limitation is that the study is limited to only the Amazon firm. Therefore, it is impossible to compare companies operating in the e-commerce sector and other sectors with Amazon.com Inc. in terms of financial performance. Lastly, since there were extraordinary changes in e-commerce due to the pandemic in 2020, the year 2020 was not included in the analysis in order for an objective evaluation to be made. In future studies, comparisons can be made by analyzing companies' financial data in both the same and different sectors' firms. In company reviews for Amazon.com, not only relying on financial data but also analyzing data obtained from different areas such as supply chain, marketing, sales, customer service, research and development, and determining and analyzing other criteria that affect company performance may also be the subject of future studies.

**Peer-review:** Externally peer-reviewed.
**Author Contributions:** Conception/Design of study: D.M.A., O.Ş.; Data Acquisition: D.M.A., O.Ş.; Data Analysis/Interpretation: D.M.A., O.Ş.; Drafting Manuscript: D.M.A., O.Ş.; Critical Revision of Manuscript: D.M.A., O.Ş.; Final Approval and Accountability: D.M.A., O.Ş.
**Conflict of Interest:** The authors have no conflict of interest to declare.
**Grant Support:** The authors declared that this study has received no financial support.

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***b) Journal Article with DOI and More Than Seven Authors***

Lal, H., Cunningham, A. L., Godeaux, O., Chlibek, R., Diez-Domingo, J., Hwang, S.-J. ... Heineman, T. C. (2015). Efficacy of an adjuvanted herpes zoster subunit vaccine in older adults. *New England Journal of Medicine, 372,* 2087–2096. http://dx.doi.org/10.1056/NEJMoa1501184

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Sidani, S. (2003). Enhancing the evaluation of nursing care effectiveness. *Canadian Journal of Nursing Research, 35*(3), 26–38. Retrieved from http://cjnr.mcgill.ca

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Turner, S. J. (2010). Website statistics 2.0: Using Google Analytics to measure library website effectiveness. *Technical Services Quarterly, 27,* 261–278. http://dx.doi.org/10.1080/07317131003765910

***e) Advance Online Publication***

Smith, J. A. (2010). Citing advance online publication: A review. *Journal of Psychology.* Advance online publication. http://dx.doi.org/10.1037/a45d7867

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Henry, W. A., III. (1990, April 9). Making the grade in today's schools. *Time, 135,* 28–31.

**Doctoral Dissertation, Master's Thesis, Presentation, Proceeding**

***a) Dissertation/Thesis from a Commercial Database***

Van Brunt, D. (1997). *Networked consumer health information systems* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 9943436)

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Yaylalı-Yıldız, B. (2014). *University campuses as places of potential publicness: Exploring the politicals, social and cultural practices in Ege University* (Doctoral dissertation). Retrieved from Retrieved from: http://library.iyte.edu.tr/tr/hizli-erisim/iyte-tez-portali

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Tonta, Y. A. (1992). *An analysis of search failures in online library catalogs* (Doctoral dissertation, University of California, Berkeley). Retrieved from http://yunus.hacettepe.edu.tr/~tonta/yayinlar /phd/ickapak.html

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***e) Symposium Contribution***

Krinsky-McHale, S. J., Zigman, W. B., & Silverman, W. (2012, August). Are neuropsychiatric symptoms markers of prodromal Alzheimer's disease in adults with Down syndrome? In W. B. Zigman (Chair), *Predictors of mild cognitive impairment, dementia, and mortality in adults with Down syndrome.* Symposium conducted at the meeting of the American Psychological Association, Orlando, FL.

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