

# İSTANBUL BUSINESS RESEARCH

Cilt Volume 53 Sayı Number 1 E-ISSN 2630-5488



İSTANBUL  
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**ISTANBUL BUSINESS RESEARCH**

**Volume: 53 • Number: 1 • April 2024**

**E-ISSN: 2630-5488 • DOI: 10.26650/ibr**

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**PUBLISHER**

Istanbul University Press

Istanbul University Central Campus, 34452 Beyazıt, Fatih / Istanbul, Türkiye

Phone: +90 (212) 440 00 00

**Authors bear responsibility for the content of their published articles.**

**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: 53 • Number: 1 • April 2024

E-ISSN: 2630-5488 • DOI: 10.26650/ibr

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## RESEARCH ARTICLE

# Rethinking the Building Blocks of Employee Creativity: A Meta-Synthesis of Qualitative Research

Merve Gerçek<sup>1</sup>

### Abstract

Employee creativity refers to the generation of novel and useful ideas by either an individual or a group of individuals who are actively engaged in collaborative endeavors. Organizations can take advantage of new opportunities, maintain their competitive advantage, and adapt to dynamic situations with the help of novel ideas and decisions. Additionally, innovation is closely related to employee creativity, which has a significant impact on market expansion and profitability. Extensive research has been conducted on employee creativity, with a substantial number of studies using a quantitative methodology. The main goal of this study is to create a comprehensive framework that encompasses the factors that impact employee creativity at different levels, based on qualitative findings. An assessment was conducted on 32 qualitative studies through thematic synthesis using the meta-synthesis approach, a qualitative research method that systematically integrates and analyzes the findings of multiple qualitative studies. Through an iterative coding process, related categories and themes across studies were identified and synthesized to generate a detailed understanding of the factors that influence employee creativity. According to the findings, three primary themes, individual-level factors, group-level factors, and organizational-level factors, were identified. This study provides an alternative perspective on the multifaceted nature of employee creativity, providing insights for researchers and practitioners to promote innovation and enhance organizational success.

### Keywords

Employee creativity, Meta-synthesis, Qualitative research, Innovation

## Introduction

The significance of creativity in maintaining the innovation and competitiveness of organizations is widely acknowledged, particularly considering the fast-paced global economy that demands quicker creative output within narrow time limits (Epstein et al., 2013; Cirella, 2021). The different facets of creativity have been the subject of discussions within the academic and research communities for a long time (Kakko & Inkinen, 2009: 537). Creativity is essential for organizations to survive in today's competitive market since it serves as the foundation for new product development and market expansion (Houghton & DiLiello, 2010).

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**To cite this article:** Gerçek, M. (2024). Rethinking the building blocks of employee creativity: a meta-synthesis of qualitative research. *Istanbul Business Research*, 53(1), 1-22. <http://doi.org/10.26650/ibr.2024.53.1301642>



Employee creativity is “*the generation of original and practical ideas by a person or by a team of employees working together*” (Amabile & Pillemer, 2012: 4). A variety of individual, social, and environmental factors may affect individual creativity due to its complex and diverse nature (Politis, 2005). The creativity of employees is a crucial factor in enhancing innovation within organizations. According to Ullah et al. (2022), the creative abilities of employees are the catalysts for innovation and the determinants of innovation performance. Employee creativity has the potential to increase work engagement (Zhang & Bartol, 2010) and self-efficacy (Liu et al., 2016). Apart from enhancing innovative work behaviors and employee commitment (Chang et al., 2014), a positive correlation between employee creativity and organizational citizenship behavior exists (Deng & Guan, 2017). Employee creativity is considered a strategic element in achieving organizational success. Shalley and Gilson (2004) suggested that contextual factors could increase creativity by stimulating employees’ intrinsic motivation, which leads to cognitive flexibility, risk-taking, and persistence in the face of obstacles. Additionally, organizational culture, climate, resources, structure, and processes are factors that determine employee creativity (Andriopoulos, 2001).

Employee creativity was assessed using qualitative and quantitative research methods in the fields of business and management. To advance knowledge and arrive at comprehensive findings, researchers preferred “*meta*” approaches, which seek to go beyond individual studies and offer a more holistic view. For instance, meta-analytic studies on employee creativity have taken personality traits (Zare & Flinchbaugh, 2019), motivational variables (De Jesus et al., 2013), and innovation (Lee et al., 2020) into consideration. This led to the widespread usage of a meta-analytical approach which relied on quantitative studies that showed the favorability of this “*meta*” strategy toward employee creativity. Kruyen and van Genugten (2017) claimed that almost all studies on creativity used a deductive, quantitative approach, with few exceptions. According to them, the predominance of deductive research raised concerns about the limited practicality of study findings as well as a potential mismatch between academics’ and practitioners’ understanding of work-related creativity. The process of meta-synthesis involves a combination and incorporation of findings from multiple qualitative research studies on a particular topic (Walsh & Downe, 2005). Given its emphasis on discovery, qualitative research design offers a deeper comprehension of the elements influencing a certain phenomenon which allows for a comprehensive investigation of the factors that contribute to employee creativity by incorporating studies from diverse disciplinary perspectives and methodological approaches. Therefore, this study focused on qualitative studies of employee creativity to synthesize existing knowledge and help scholars and practitioners gain a deeper understanding of the multifaceted nature of employee creativity. These findings can help identify the common themes, factors, and conditions that emerge across different qualitative studies. By gaining an understanding of the factors that determine employee creativity, organizations can then use this knowledge to develop strategies, optimize the work environment, and improve leadership practices to foster employee innovation and creativity.



## Theoretical Background

### Definition of Employee Creativity

There is widespread recognition that employee creativity entails the generation of new and unique ideas. According to Oldham and Cummings (1996:608), “*a product, idea, or process is unique if it results from the recombination of materials that exist or the introduction of entirely new materials*”. Employee creativity is described as the development of novel and useful ideas by an individual or via the joint efforts of a group (Amabile & Pillemer, 2012: 4). Kruijen and van Genugten’s (2017: 826) approach to employee creativity focused on the capacity to produce novel and practical ideas that improved work-related processes. Kakko and Inkinen (2009) took the creativity debate further and put forward the idea of “*homo creativus*” in the context of organizational psychology. The authors stated that homo creativus “*connects ideas; sees similarities and differences; has flexibility; has aesthetic taste; is unorthodox; is motivated; is inquisitive; and questions societal norms.*”

The phenomenon of employee creativity is complex and multifaceted and is subject to the influence of individual, contextual, and environmental factors (Politis, 2005). Unsworth and Clegg (2010) conceptualized employee creativity as a process of behaviors intended to produce novel phenomena rather than an outcome. Creativity is typically viewed as a mixture of four critical components, known as the four Ps of creativity: *creative person/group, process, place/environment, and product/outcome* (Cirella et al., 2012; Cirella, 2021). Researchers offered various definitions of employee creativity, highlighting distinct aspects of the concept. The componential Model of Creativity involves five stages, which include identifying the problem, preparation, response generation, response validation, and outcome of the decision (Amabile, 1983). The Ecological Systems Model of Creativity Development Theory proposes a similar approach for the steps of creativity, including preparation, incubation, insight, and evaluation (Yeh, 2004). There is a discussion on whether creativity is domain-specific or domain-general which is illustrated in the first approach, the Model of Creativity, assuming a person can exhibit creativity in many domains, whereas the Ecological Systems Model assumes a person’s creativity does not necessarily cross over into other domains (Yeh, 2017). Also, it posits that creativity is determined by both personal and social factors (Plucker & Beghetto, 2004).

Employee creativity is crucial for organizations for several reasons. Creative ideas and solutions help organizations adapt to changing environments, seize new opportunities, and stay ahead of the competition. Although innovative behavior and employee creativity are closely associated, there is no clear distinction between the two concepts (Basadur, 2004). For instance, Dorenbosch et al. (2005) proposed that creativity-oriented work behavior was one of the sub-dimensions of innovative work behavior, so employee creativity is a determiner of

innovation, which in turn leads to innovation performance (Ullah et al., 2022). In addition to increasing innovative work behaviors and commitment (Chang et al., 2014), employee creativity is related to organizational citizenship behavior, which includes discretionary, voluntary, and proactive behaviors that workers engage in to enhance the overall welfare and efficiency of their organization (Deng & Guan, 2017). Employee creativity serves as a strategic factor for organizational success.

### **Antecedents of Employee Creativity**

Since creativity is not the sum of individuals' creative processes, distinct contexts, and conditions both promote and limit creativity (Gilson et al., 2019). Initial studies indicated that individuals possessing creative personalities are inclined to exhibit higher levels of creativity in their work settings (Oldham & Cummins, 1996). Kelloway and Barling (2000) suggested that workers possess a range of personality and professional traits, including confidence, perseverance, creativity, risk-taking attitudes, and the ability to synchronize their personal and professional development with the organization's vision. According to Kim et al. (2010), proactive individuals who were eager to take the initiative and make changes to the organizational environment were able to quickly adjust to the demand for creativity in the workplace and produce highly innovative work.

Employee creativity was also investigated on team level. Collective creativity is defined as "*a purposeful set of processes and activities established by a group of individuals working in a specific environment, through which a novel idea, product, service, or procedure is generated*" (Cirella et al., 2012: 289). The association between collective and individual creativity appears to stem from a phenomenon known as "*creative synthesis*," as described by Harvey (2014). People have the misconception that teamwork is always successful, but research demonstrated that this assumption was incorrect (Staw, 2009). According to Woodman et al. (1993), heterogeneity, diversity, and group composition influence the creative output of a team. The different aspects of team diversity were studied, including the psychological traits of team members (Bouncken et al., 2016), their competencies and experiences, and their functional role diversity (Bell et al., 2011; Lace et al., 2015).

Organizational elements, including the culture, resources, and systems of an organization, also influence employee creativity (Andriopoulos, 2001). Research suggests that more complex jobs with greater autonomy, routines, and challenges, require higher levels of creativity than simple ones (Tierney & Farmer, 2002), indicating that job characteristics are determiners of employee creativity. Mumford et al. (2007) listed the qualities creative leaders must have as identifying challenges, setting the context, developing solutions, expertise, creative thinking, social skills, and organizational knowledge. Similarly, performance evaluation and feedback were proven to be crucial for creativity (Oldham & Cummings, 1996), which resulted

in innovation (Anderson et al., 2014). Additionally, an employee's creativity was positively linked with their involvement in decision-making and manager support for creativity (Zubair et al., 2015).

### **Meta-Level Approaches to Employee Creativity**

Employee creativity was extensively examined, with a predominant utilization of quantitative research methods in most studies. Consequently, meta-analytical approaches relying on quantitative studies were employed to integrate and analyze the findings from multiple investigations. Meta-analysis studies including a combination of quantitative data, which often affected sizes or measurements of the outcome, were gathered from various investigations (Field & Gillet, 2010). In meta-analytical studies, employee creativity was considered alongside personality traits (Zare & Flinchbaugh, 2019), motivational variables (De Jesus et al., 2013), and innovation (Lee et al., 2020). A meta-analysis study by Byron et al. (2010) examined the links between stressors and creativity and emphasized the complex mechanisms between them. Sarooghi et al. (2015) examined the relationship between creativity and innovation according to organizational, cultural, and environmental factors which revealed a positive correlation between creativity and innovation, particularly at the individual level. Liu et al. (2016) focused on the motivational mechanisms that drive employee creativity. The authors concluded that motivation to engage in creative activities was dependent on certain contextual factors. Koh et al. (2019) performed a meta-analysis and developed an integrated model of transformational leadership and creativity. The meta-analytic study by Zare and Flinchbaugh (2019) showed how conscientiousness, openness, and extraversion predicted voice and creativity. In the study by Lee et al. (2020), a synthesis of research on leadership, creativity, and innovation revealed that the strongest links were observed between authentic, empowering, and entrepreneurial leadership styles and creative performance. Acar et al. (2023) conducted a meta-analysis study that showed links between creativity and happiness. Wei et al.'s (2023) meta-analysis discovered that effective relationship- and task-oriented leadership behaviors were positively associated with employee creativity. The prevalence of meta-analytic research based on quantitative studies demonstrates the popularity of the "meta" approach to employee creativity; however, a meta-approach focused on the qualitative findings of employee creativity has been overlooked and is much needed. While meta-analysis is a statistical approach that analyzes quantitative data to produce a statistical evaluation of the study results, meta-synthesis is a qualitative method that seeks to comprehend and explain the extensive textual material gathered from qualitative investigations. Both methods enhance evidence-based practice by offering a more thorough and nuanced comprehension of a certain research inquiry or issue. This present research employs a meta-synthesis methodology to offer a detailed perspective on the antecedents of employee creativity, drawing on previous qualitative studies.

## Method

The primary objective of qualitative research is to offer a thorough understanding of human behavior, emotions, attitudes, and experiences. In-depth meanings, experiences, and perspectives of participants in various contexts are obtained by synthesizing the results of qualitative studies (Tong et al., 2012). Meta-synthesis is a qualitative research methodology that is used to synthesize findings obtained from a wide variety of qualitative studies and has been extensively applied by scholars in the field of health sciences for over twenty-five years (Finfgeld-Connett, 2010). It involves synthesizing and integrating the findings of multiple qualitative research studies on a particular topic (Walsh & Downe, 2005). It is a systematic approach that provides a broader and deeper understanding of a research topic by bringing together insights and perspectives from different studies. According to Paterson (2011), there are multiple synthesis terms, such as aggregative method, meta-summary, and thematic synthesis. One commonly utilized method for analyzing data in primary qualitative research is thematic synthesis, which involves the systematic identification and development of themes (Thomas & Harden, 2008). In this study, thematic synthesis was used to capture the similarities between determinants of employee creativity and identify themes across prior qualitative studies.

Drawing on meta-synthesis methods proposed by Hoon (2013) and Walsh and Downe (2005) and using the ENTREQ (Enhancing Transparency in Reporting the Synthesis of Qualitative Research) Statement developed by Tong et al. (2012), the following steps were taken: Framing the meta-synthesis research question, identifying the search approach and locating relevant research, identifying inclusion and exclusion criteria, coding and appraisal of studies, analyzing different conceptualizations, and synthesizing the findings.

### **Step 1: Framing the Meta-Synthesis Research Question**

This study provides a comprehensive look at the determinants of employee creativity. To achieve that aim, the research question that directed the meta-synthesis was: “*Which factors determine employee creativity?*”. Drawing on a conceptual background of employee creativity as the meta-synthesis methodology, thematic synthesis was adopted to find relevant themes regarding the phenomenon.

### **Step 2: Identifying a Search Approach and Locating Relevant Research**

Search engines and databases such as Scopus, Web of Science, and EBSCOhost Business Source Complete, were utilized to locate scholarly articles on the topic of “*employee creativity*” using relevant keywords. Furthermore, the search query included a combination of terms such as “*qualitative,*” “*interview,*” “*case study,*” “*focus group,*” and “*ethnography*” within the title, abstract, and keywords of the research articles. An example of a search query used in this study is as follows:

*“(TI=(employee creat\*) AND AB=(interview\*)) AND (TI=(employee creat\*) AND (AK=(interview\*)) AND (TI=(creativity) AND AB=(interview\*)) AND (TI=(creativity) AND AK=(interview\*))”*

### Step 3: Identifying Inclusion and Exclusion Criteria

The original research articles with qualitative methods, which were written in English and Turkish, were included in the study. To check the appropriateness of the articles utilized for the analysis, we implemented the inclusion criteria outlined by Atkins et al. (2008), which provided a comprehensive framework for assessing qualitative data. The quality criteria used in this study were the qualitative approach of the studies (e.g., focus group, interview, etc.), the existence of an explicit research question, clarification of the researcher’s position, sampling procedures, and clear explanations of data analysis.

The search strategy followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol developed by Page et al. (2021), which included four main steps: identification, screening, eligibility, and inclusion. The initial search yielded 430 articles (WoS = 120; Scopus = 187; Ebscohost = 123). The first step included excluding duplicate records and gray literature records such as conference abstracts, book chapters, and reports. Then the titles and abstracts of 143 studies were screened, and 93 were excluded because they did not meet the inclusion criteria. Following the abstract screening, 50 full texts were obtained and comprehensively assessed. Eighteen of the studies failed to meet the quality standards, so a total of 32 studies were included in the synthesizing process.

Toye et al. (2014) discussed the challenges of synthesizing a large number of qualitative studies and recommended using a structured approach to manage the data. Meta-synthesis prioritizes the comprehensiveness and depth of the data rather than aiming for statistical significance. The objective was to incorporate an adequate quantity of qualitative studies that offered different perspectives and insights on the subject being examined. Some qualitative researchers emphasize achieving data saturation instead of selecting a certain number of samples as their goal. This entails including enough research until no additional themes emerge from the data, ensuring a comprehensive understanding of the phenomenon (e.g., Francis et al., 2010; Nye et al., 2016). Prior qualitative syntheses showed that the number of studies included in meta-synthesis ranges widely (e.g., Adams et al., 2023 (N = 26); Lazazzara et al., 2020 (N = 24); Rodrigues et al., 2023 (N = 40); Soral et al., 2022 (N = 39). Therefore, the study sample of 32 qualitative studies was concluded to be adequate for synthesizing.

### Step 4: Coding and Appraisal of the Studies

The appraisal of the studies began with setting up a coding sheet for drivers of employee creativity. The extracted data were coded on coding sheets. An expert was included in

the coding process for independent coding and determining the agreement rate. The coding procedure utilized an inductive and iterative approach, as described by Locke (2001). It was determined that the agreement rate was 81% in the calculation made based on the number of consensus and disagreements in the coding form used (Miles & Huberman, 1994). Also, descriptive validity was employed to ensure the accuracy of the data by providing meaningful and precise codes derived from each qualitative study utilized. Furthermore, theoretical validity was sought, relying on the theoretical background of employee creativity (Sandelowski & Barroso, 2007).

### **Step 5: Analyzing Different Conceptualizations**

Initially, a first-order analysis was conducted, wherein data were coded using codes that were based on prior qualitative research. The initial concepts presented were representative of the vocabulary and terminology used by the authors. The process of second-order analysis involved the examination of the initial first-order codes to identify similarities and distinctions, which were then utilized to establish more generalized second-order code groups. Subsequently, the data were integrated with theoretical frameworks, resulting in the formulation of third-order concepts that are employed in this manuscript.

### **Step 6: Synthesizing Findings**

The final stage of the study involved the synthesis of the emerging concepts to establish a systematic approach toward the specificities associated with qualitative research on employee creativity and uncover the factors that preceded employee creativity. The results are presented in the subsequent sections.

## **Results**

Table 1 shows the codes, authors, sample characteristics, and analytic approach of 32 synthesized studies. Five of the studies used the case study technique; four of the studies used the critical incident technique; and two of the studies used the focus group technique. Four of the research samples consisted of supervisors, whereas the remaining samples only collected data from employees. As seen in Table 1, different organizational contexts were taken into consideration in the overall studies.

Table 1  
*Codes, Authors, Sample Characteristics, and Analytic Approach of Synthesized Studies*

Study Code	Author	Sample Characteristics <sup>1</sup> Analytic Approach <sup>2</sup>
S1	De Alencar and De Bruno-Faria (1997)	<sup>1</sup> 25 employees from various organizations <sup>2</sup> Interviews
S2	Bukantaitė and Sederevičiūtė-Pačiauskienė (2021)	<sup>1</sup> 12 employees and managers from the fashion industry <sup>2</sup> Semi-structured interviews
S3	Cabra et al. (2007)	<sup>1</sup> 55 employees from various organizations <sup>2</sup> Critical incident technique, interviews
S4	Gupta and Singh (2012)	<sup>1</sup> 52 employees from Indian R&D labs <sup>2</sup> Interviews
S5	Hoff and Öberg (2015)	<sup>1</sup> 13 employees from the game and movie sectors <sup>2</sup> Interviews
S6	Jaiswal and Arun (2022)	<sup>1</sup> 24 employees from information technology companies <sup>2</sup> Interviews
S7	Laukkanen et al. (2017)	<sup>1</sup> 2 organizations from Finland and 2 organizations from the USA <sup>2</sup> Case study, interviews
S8	Lace et al. (2015)	<sup>1</sup> 50 employees from various organizations <sup>2</sup> Interviews
S9	Moultrie and Young (2009)	<sup>1</sup> 5 companies from the branding and product/industrial design sectors <sup>2</sup> Semi-structured interviews
S10	Nyawo and Schultz (2020)	<sup>1</sup> 23 managers from manufacturing companies in Zimbabwe <sup>2</sup> Interviews
S11	Olsson et al. (2019)	<sup>1</sup> 21 employees from retail companies in Sweden <sup>2</sup> Semi-structured interviews
S12	Paek et al. (2022)	<sup>1</sup> 12 sports employees from the USA <sup>2</sup> Semi-structured interviews
S13	Rampa and Agogue (2021)	<sup>1</sup> 70 employees from the energy sector in Canada <sup>2</sup> Semi-structured interviews
S14	Mangnion and Scicluna (2022)	<sup>1</sup> 12 nurses <sup>2</sup> Semi-structured interviews
S15	Sherief (2019)	<sup>1</sup> 13 public servants <sup>2</sup> In-depth interviews
S16	Tan et al. (2023)	<sup>1</sup> 2 groups of managers and employees from the public sector <sup>2</sup> Focus group study
S17	Unsworth and Clegg (2010)	<sup>1</sup> 65 engineers from two aerospace organizations <sup>2</sup> Interviews
S18	Yekanielibeglou et al. (2021)	<sup>1</sup> 50 employees from three companies in Sweden <sup>2</sup> Critical incident technique
S19	Han et al. (2017)	<sup>1</sup> 9 employees from virtual teams <sup>2</sup> Interviews
S20	Hemlin and Olsson (2011)	<sup>1</sup> 75 employees from universities and the biomedical industry in Sweden <sup>2</sup> Critical incident technique, interviews
S21	Kruyen and van Genugten (2017)	<sup>1</sup> 43 employees from municipalities in the Netherlands <sup>2</sup> Critical incident technique, interviews



Study Code	Author	Sample Characteristics <sup>1</sup> Analytic Approach <sup>2</sup>
S22	Lee et al. (2019)	<sup>1</sup> 18 restaurant operators in Australia <sup>2</sup> Interviews
S23	Chamakiotis et al. (2013)	<sup>1</sup> 49 participants in 6 virtual teams <sup>2</sup> Interviews
S24	Omilion-Hodges and Ackerman (2018)	<sup>1</sup> 30 employees from the video game industry <sup>2</sup> Semi-structured interviews
S25	Amabile et al. (2004)	<sup>1</sup> 238 employees from 26 project teams in 7 companies <sup>2</sup> Daily diary narratives
S26	Cirella (2021)	<sup>1</sup> 31 employees from two different organizations in Italy <sup>2</sup> Case study, interviews
S27	Raqshin and Nirjar (2012)	<sup>1</sup> Focus group interviews from 3 different organizations in India <sup>2</sup> Case study, semi-structured interviews
S28	Bunduchi (2009)	<sup>1</sup> 10 interviews with R&D team members <sup>2</sup> Case study, semi-structured interviews
S29	Hartmann et al. (2019)	<sup>1</sup> 10 interviews with R&D team members <sup>2</sup> Case study, interviews, field notes, and documents
S30	Bouncken et al. (2016)	<sup>1</sup> 70 interviews with five innovation teams <sup>2</sup> In-depth interviews
S31	Chuang (2007)	<sup>1</sup> 12 high-level managers from 6 organizations in Taiwan <sup>2</sup> In-depth interviews
S32	Ocker (2005)	<sup>1</sup> 10 virtual teams <sup>2</sup> In-depth interviews

After the coding process, three main themes emerged. These themes were individual-level factors, group-level factors, and organizational-level factors.

### Theme 1: Individual-Level Factors

Table 2 shows the codes and categories that make up individual-level factors that determine employee creativity. All codes were presented with study identifiers (e.g., S1) to demonstrate which study they were extracted from. Categories under the first theme include personality, attitudes, abilities, skills, and behaviors. All these categories represent individual-level characteristics that influence employee creativity.

The meta-synthesis analysis performed in this study sheds light on a wide range of individual-level drivers that have a significant impact on employee creativity. Among these drivers, openness to employee ideas (Laukkanen et al., 2017) indicates that employees who exhibit a willingness to consider and embrace novel concepts and perspectives are more likely to exhibit higher levels of creativity. Additionally, Mangnion and Scicluna (2022) identified specific dispositions that contribute to creativity, while Lace et al. (2015) noted that a particular mode of thinking can also facilitate creativity by promoting a constructive and open-minded approach. Employees who demonstrate proactive engagement in activities such as idea exploration, diverse perspective-seeking, and experimental approaches are more likely to produce innovative solutions.



Table 2  
Theme 1: Individual-Level Factors

Theme 1	Categories	Codes
<b>Individual-Level Factors</b>	Personality	openness to employee ideas (S7), dispositions (S8, S14), a particular style of thinking (S8), openness (S9), dynamism (S9), liveliness (S9), playfulness (S9), humor (S9), risk-taking (S11), mentality (S11), values (S13), problem-solving mindset (S14), emotional intelligence (S12), skepticism (S16), self-confidence (S16), creativity requirement (S17), honest (S19), frank (S19), open minded (S19), respectful (S19), responsible (S19), divergent thinking (S21), reflective capacity (S21), perseverance (S21, S27), awareness (S21), having guts (S21), need for structure and patterns (S21), behavioral skills (S21), self-efficacy (S27), optimism (S27), hope (S27), self-confidence (S27), resilience (S27), future mindedness (S27), risk orientation (S27), employee mindset (S31), cognition (S32), personality (S32)
	Attitudes, Abilities & Skills	Intellectual abilities (S8), skills (S8), staff expertise (S9), creative skills (S13), motivation to innovate (S13, S14), stress management skills (S12), general work motivation (S8, S17, S30), attitudes (S21), cognitive skills (S21), behavioral skills (S21), analytical skills (S21), intrinsic motivation (S21), high task engagement (S23), knowledge (S21), work experience (S21), attitudes toward being open to others' insights (S21), result-oriented attitude (S21), attitude to risk (S28), positive attitudes (S29)
	Behaviors	behaviors (S8), idea generation (S14), being creative (S16), initiate change (S16), challenge status quo (S16), demonstrate concern and enthusiasm (S20), direct conversation (S19), being in contact with others (S21), being proactive (S21), being communicative and persuasive (S21), individual experimentation (S27), taking responsibility (S29), making suggestions visible (S29), making fun of failures (S29)

### Theme 2: Group-Level Factors

Table 3 shows the codes and categories that make up group-level factors that determine employee creativity. Categories under the second theme include team composition and team dynamics. The team composition category includes characteristic factors such as team composition, team selection criteria, team member qualities, and team cohesion. The team dynamics category represents relational factors such as inter and intra-team communication, collaboration, team leader-member relations, team culture, and team climate.

Table 3  
Theme 2: Group-Level Factors

Theme 2	Categories	Codes
<b>Group-Level Factors</b>	Team Composition	team building (S4), group/team composition (S8, S32), team leaders' vision (S8), role distribution in the team (S8), skill-based team selection (S9), personality-based team selection (S9), team norms (S19), team guidelines (S19), team expertise (S19), team function (S19), team members' past experiences (S30), team members' openness (S30), team members' diversity in cognitive styles (S30), team members' diversity in knowledge (S30), team members' motivational factors (S30), team cohesion (S30, S32), team structure (S32)
	Team Dynamics	colleague support (S1), interpersonal relationships (S1, S16), friendly competition (S8), intra-team communication (S8), debates (S9), teamwork (S10), collaboration (S10, S21), sharing of ideas (S14), trust between leader and team members (S19), team culture (S19, S30), group dynamics (S19), group climate (S20), peer coaching (S24) team atmosphere (S32)

The composition of the group or team was found to be influential in facilitating employee creativity. Factors such as team members' skills (Lace et al., 2015), personality traits (Moultrie & Young, 2009), and diversity in cognitive styles and knowledge (Bouncken et al., 2016) were identified as group-level factors. Skill-based team selection and personality-based team selection played a significant role in assembling teams with complementary skills and different perspectives, enabling a more comprehensive approach to problem-solving and idea generation. Within the team dynamics category, intra-team communication, including debates and open discussions, facilitates the exchange of diverse perspectives and challenges conventional thinking, contributing to creative problem-solving. Team culture (Han et al., 2017), collaboration (Kruyen & van Genugten, 2017), and atmosphere were also elements of team dynamics that influenced employee creativity.

### **Theme 3: Organizational-Level Factors**

Table 4 shows the organizational-level factors that determine employee creativity. Categories under the third theme include organization structure, policies and practices, culture and climate, management and leadership, the physical environment, and external stakeholders.

Factors related to organizational structure highlight the importance of creating an environment that supports idea generation, collaboration, knowledge sharing, resource availability, and technological advancements to foster a creative workforce. Also, the policies and practices category involved recognition, reward policies, systems (Nyawo & Schultz, 2020), training, and development (Cabra et al., 2007), all of which have the potential to enhance employee creativity. Another element of organizational-level factors is culture and climate. In this category, freedom (De Alencar and De Bruno-Faria, 1997), autonomy (Laukkanen et al., 2017), and trust (Omilion-Hodges & Ackerman, 2018) were the factors that reoccurred the most in prior studies. The important drivers of employee creativity were supportive climate, communication, and a sense of belonging.

The meta-synthesis results highlighted key management and leadership-related factors that influenced employee creativity. Effective conflict management, enthusiasm, and structured management systems contributed to a creative environment (Moultrie & Young, 2009). Supervisory support, coaching, encouraging group member collaboration and input could potentially enhance employee creativity. Leadership practices such as actively encouraging employees, creating a safe environment, and promoting employee-generated ideas could stimulate creativity. As seen in Table 4, physical environment factors emphasize the significance of creating a conducive physical environment for promoting creativity. The arrangement of furniture, appropriate lighting, and availability of various spaces for collaboration and concentration played a key role in supporting creative thinking (Hoff & Öberg, 2015). Design elements, such as customized and creative spaces, along with intangible and tangible office

elements, contributed to a stimulating and inspiring workplace atmosphere. The last category is called external stakeholders which includes potential creativity drivers outside of organizations such as customers, competitors, and communities. A visualization of the study findings, first-order concepts, second-order themes, and aggregate dimensions affecting employee creativity are presented in Figure 1.

Table 4  
Theme 3: Organizational-Level Factors

Theme 3	Categories	Codes
<b>Organizational-Level Factors</b>	Organization Structure	organizational structure (S1, S8 S11, S31), flexibility (S1), decentralization (S1), social network (S2), knowledge sharing/transfer (S2, S13), access to information (S3), organization size (S8), network structure (S8), strategy (S8), organizational resources (S8, S11, S15, S31), challenging work (S8), expertise (S8), budget (S11), organizational vision (S15), meaningful work (S15), time resources (S3, S8, S14, S17), formal communication (S24), resource availability (S28), technology (S1, 19, S26), up-to-date technology (S19), mobile technology (S19), technology-mediated communication tools (S19), task-related characteristics (S32)
	Policies & Practices	recognition (S1, S3, S4, S25), salaries (S1), benefits (S1), reward policies/systems (S1, S8, S10, S20), training (S1, S3, S9, S10), opportunity to learn (S2), development (S3), knowledge management (S3), encouragement (S3), feedback (S3, S10), financial support (S3), self-confidence building (S3), employee empowerment (S7), functional support (S8), diversity and complexity of processes (S8), idea support (S9), problem solution (S8), benchmarking (S10), processes (S11), collective innovation tools (S13), brainstorming (S16), discussion (S19), career advise (S20), existing rules and regulations (S21), participation (S23), open communication (S28), frequent communication (S28)
	Culture & Climate	freedom (S1, S2, S8, S9, S20), autonomy (S1, S3, S7, S9, S15, S17, S21), organizational support (S1, S3), organizational culture (S8, S31), knowledge-sharing culture (S8), supportive climate (S8), trust (S9, S19, S24), sense of belonging (S10), engagement (S10, S23), entrepreneurship (S11), commitment (S11, S23), freedom to make mistakes (S11), constant improvement (S11), common language (S13), organizational willingness to take risks (S15), diversity (S15), freedom to think (S16), relationship building (S16), cultural support (S17), responsibility (S17), communication (S11, S23), open communication (S19), informal communication (S24), social norm (S19), collaboration (S26), synergy (S11, S26), atmosphere (S11), socialization of employees (S13), organizational climate (S21)
	Management & Leadership	leader support (S1, S4, S21), delegating (S4), consulting (S4), problem-solving (S4), leading by example (S4), inspiring (S4), informing (S4), handling conflict (S20), enthusiasm (S9), management systems (S9), supervisory support (S15), coaching (S16, S23), encourage group member external exchange (S20), provide freedom and responsibility (S20), inquire for group member opinion and expertise (S20), leadership (S11, S21), actively encouraging individual employees (S21), making employees feel safe (S21), asking employees to come up with creative ideas (S21), motivating (21), praising employees with creative ideas (S21), shared leadership (S23), emergent leadership (S23), fostering a spirit of commitment (S23), responsibility (S23), informal leadership (S24), mentoring (S24), positive leader behavior (S25), top management commitment (S28), change agent (S31)

Theme 3	Categories	Codes
	Physical Environment	physical environment (S1), ergonomic tools (S5), furniture (S5), lighting (S5), distraction-free space (S5), space (S5, S18), adjustable space (S5), psychosocial support (S5), private space (S5), customized space (S5), window view (S5), communication space (S5), informal spaces (S5), interior design (S5), spaces for brainstorming (S5), creative spaces (S7), intangible office elements (S18), tangible office elements (S18), spatial layout (S18), facilitating and inspiring physical layout of the workspace (S21)
	External Stakeholders	External stakeholder sources (S22), observing local competitors (S22), asking customer's ideas (S22), observing overseas competitors (S22), competitors (S31), customer focus (S2), customer feedback (S7, S22), customers (S31)

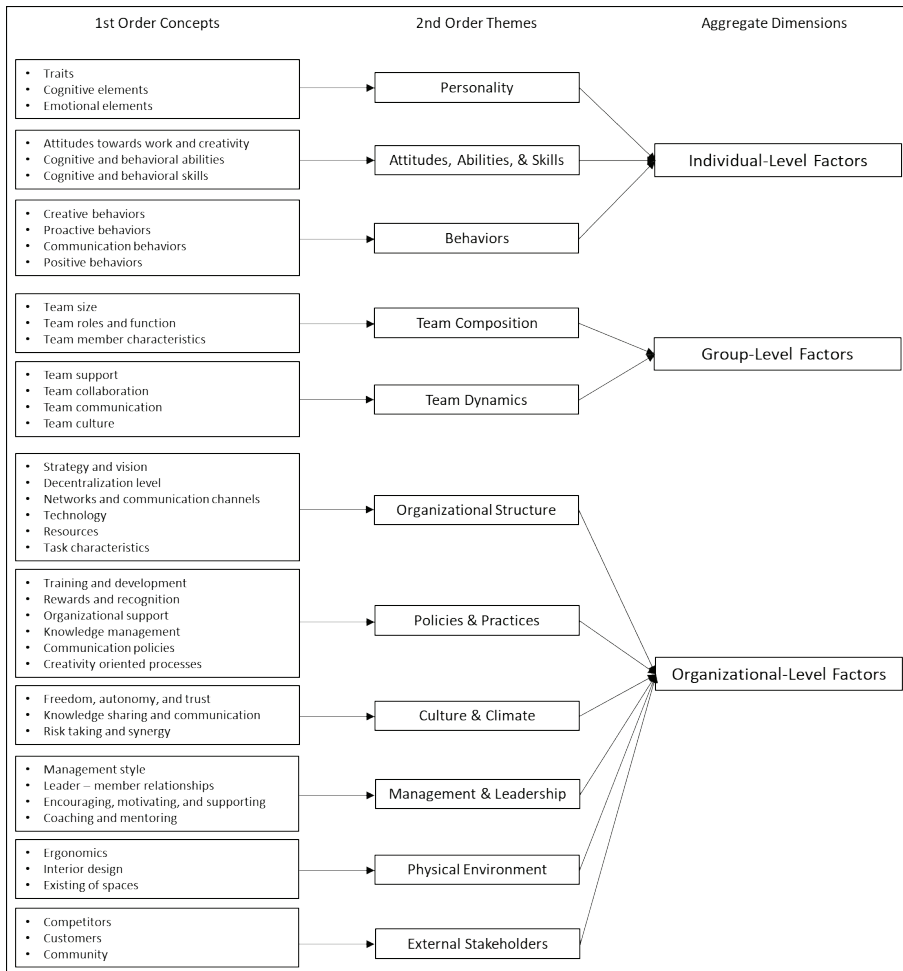


Figure 1. 1st Order Concepts, 2nd Order Themes, and Aggregate Dimensions Effecting Employee Creativity

As seen in Figure 1, first-order concepts are derived from initial codes extracted from thematic synthesis. The second-order themes correspond to the categories that emerged after

initial coding, and aggregate dimensions correspond to the main themes presented in Table 2, Table 3, and Table 4 previously.

## Discussion

The process of generating creative ideas and effectively executing them enables an organization to adjust to ever-changing market conditions, capitalize on favorable circumstances, and establish a competitive advantage to ensure its ongoing expansion (Houghton & DiLillo, 2010). This study aimed to combine current knowledge and provide academics and professionals with a greater understanding of the broad spectrum of employee creativity by synthesizing prior qualitative research findings. The study highlights directions for research and provides a comprehensive framework that combines the identified factors to guide future research on employee creativity. By employing the meta-synthesis methodology, a thorough assessment was conducted with 32 qualitative studies, which led to the discovery of the factors that determine employee creativity via thematic synthesis. The findings of the study uncovered three main themes: Individual-level factors, group-level factors, and organizational-level factors. While prior studies attempted to systematically examine data for employee creativity, this study makes several important contributions. One of them is combining exploratory findings to discover different perceptions of employee creativity across industries and work environments. For instance, contrary to the widely held belief of employee creativity, the study by Kruyen and van Genugten (2017) revealed that creativity refers to solving issues more effectively as opposed to producing new ones. This meta-synthesis study makes a theoretical contribution by providing a detailed presentation of factors at the individual, team, and organizational levels that were not addressed in quantitative studies.

Individual-level factors include personality factors, which include traits and cognitive and emotional elements of individuals. Employee attitudes, abilities, and skills involve work motivation, cognitive and behavioral abilities, and skills. The results indicated that the proactiveness and positive behaviors of employees influence creativity at work. According to Amabile and Kramer (2011), an organization must establish an environment that cultivates positive emotions, strong intrinsic motivation, and positive perceptions of colleagues and work to promote an effective inner work life. Organizations should consider utilizing personality tests focused on creativity-related factors to better understand their workers' characteristics and cognitive and emotional components. This could help identify employees' resources and areas for growth, allowing for targeted interventions and training programs to foster employee creativity. Subsequent investigations should concentrate on the formulation of practical models or instruments aimed at evaluating and enhancing personality traits that are associated with creativity. Furthermore, organizations should allocate resources toward training programs aimed at enhancing cognitive and behavioral competencies related to promoting

creativity. This could include initiatives to improve problem-solving abilities, foster critical thinking, promote effective communication, and facilitate collaborative efforts. The scope of these investigations is contingent upon the divergent interpretations of creativity among employees and managers across industries, as well as the multifaceted procedures that it entails.

The findings indicate that group-level factors comprise two categories called team composition and team dynamics. As stated in prior research, just being a team is not enough for individuals to be creative (Woodman et al., 1993). Nevertheless, employee creativity depends on team size, team roles, team member characteristics, support, collaboration, and communication processes within a team. It is believed that these findings will lead managers, especially project-based organizations, to consider what characteristics they need to build more creative teams.

The third and last theme is called organizational-level factors, which include organization structure, policies and practices, culture and climate, management and leadership, the physical environment, and external stakeholders. The findings of this study highlight organizational structure-related factors that contribute to employee creativity. The organizational structure plays a crucial role in facilitating creativity within an organization. Factors such as flexibility, decentralization, and networks positively influence employee creativity by providing an environment that encourages idea generation and collaboration. Technology is an important determinant of employee creativity since it provides the necessary tools for facilitating creative ideas and behaviors (Han et al., 2017). Policies and practices, including training, development, rewards, recognition, knowledge management, and organizational support, were found to be antecedents of employee creativity. In many studies, organizational culture and climate were mentioned (e.g., Lace et al., 2015). According to Moultrie and Young's (2009) findings, the most prominent characteristics that signified the necessity of an autonomous work setting for fostering creativity were freedom and support for ideas. The significance of organizational resources such as innovation time and training were also pointed out by them. Leadership practices such as encouraging, motivating, praising, and making employees feel safe contributed to a culture of creativity (Hemlin & Olsson, 2011). Leaders who encourage group members' external exchange, provide freedom and responsibility, and inquire about group member opinions and expertise create an inclusive and collaborative environment that stimulates creativity. Creating a work environment that promotes psychological safety among employees is crucial. This, in turn, facilitates a willingness to engage in open discussions regarding novel ideas and generate innovative and practical solutions (Han et al., 2017). Through the implementation of these practical recommendations and their further assessment via research, organizations can create an environment that cultivates the creativity of their employees, provides individuals with the ability to present innovative concepts, and promotes a climate of constant learning and growth.

The meta-synthesis methodology was contingent upon the quality and availability of prior research, which may engender biases and constraints that existed in the sample studies. The inclusion criteria and search techniques used to find relevant research may have an impact on the findings. The meta-synthesis procedure entailed the combination and clarification of information from various research contexts, thereby preventing the possibility of subjective evaluations and interpretations by different researchers. The potential for generalizability of the results was constrained due to the variability of contexts, industries, and participant characteristics among the studies included in the meta-synthesis. The inclusion of unpublished or non-English-language studies may be subject to potential publication bias. Due to these limitations, the results of this meta-synthesis should be interpreted with caution, and more research is needed to confirm and expand on them. Despite its limitations, this study provides information about creativity that may be used to develop effective employee engagement strategies. Organizations can adopt initiatives that meet employees' intrinsic motivations, developing a sense of purpose and enthusiasm for their jobs, which can have an advantageous impact on creativity. Moreover, comprehending the impact of team dynamics on creativity can assist team leaders in organizing teams and encouraging cooperation, particularly in project-based companies operating in dynamic environments (Gonzalez, 2022). The study's findings emphasize the significance of diverse teams, efficient communication, and a supportive team culture in promoting innovative concepts. Exploiting drivers of employee creativity could be advantageous for human resource practitioners in several areas, such as recruiting strategies, training and development programs, and the establishment of comprehensive performance assessment systems that recognize creative efforts.

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

**Conflict of Interest:** The author has no conflict of interest to declare.

**Grant Support:** The author declared that this study has received no financial support.

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## RESEARCH ARTICLE

# Social Capital and Entrepreneurship: Impact of Trust and Social Interaction on Entrepreneurship Trial

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### Abstract

Social capital is an important factor in entrepreneurship in emerging economies as it allows for the recognition and use of opportunities. Although previous literature emphasizes social capital, the role of various dimensions concerning it in entrepreneurship remains underexplored. Moreover, the impact of these dimensions on the early stages of entrepreneurship requires further consideration. Thus, this study investigates the impact of social capital on the trial stage of entrepreneurship. Specifically, it examines the effect of trust and social interaction on entrepreneurial trial in an emerging economy— Türkiye. Based on a sample of Turkish firms, the results of the empirical analyses reveal that trust and social interaction have positive impacts on entrepreneurship trial. However, the interaction between trust and social interaction has a negative impact on entrepreneurship trial. This study advances research on entrepreneurship by considering the associations between the various aspects of social capital and entrepreneurial activities.

### Keywords

Entrepreneurship trial, Social capital, Social interaction, Trust

## Introduction

Social capital refers to the patterns of social relations, which facilitate actors or individuals' action (Adler & Kwon, 2002). It has been investigated at the organizational, group, and individual levels (Payne, Moore, Griffis & Autry, 2011). It has a crucial role in entrepreneurial activities of individuals and organizations (Gedajlovic, Honig, Moore Payne & Wright, 2013). Entrepreneurs develop social capital by establishing networks with others to access resources and information (Cope, Jack & Rose, 2007). Previous studies have investigated its role in entrepreneurship in developed economies (Bauernschuster, Falck & Heblich, 2010; Kwon, Heflin & Ruef, 2013; McKeever, Anderson & Jack, 2014; Patel & Wolfe, 2023; Rodrigo-Alarcon, Garcia-Villaverde, Ruiz-Ortega & Parra-Requena, 2018) and have considered these relations across countries (Afandi, Kermani & Mammadov, 2017; Sahasranamam &

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**To cite this article:** Ozen, O. (2024). Social capital and entrepreneurship: impact of trust and social interaction on entrepreneurship trial. *Istanbul Business Research*, 53(1), 23-39. <http://doi.org/10.26650/ibr.2024.53.1110286>



Nandakumar, 2020), alongside emerging ones (Abane, Adamtey & Kpeglo, 2024; Correa, Queiroz & Shigaki, 2021).

Social capital theory, which is regarded as one of the theoretical perspectives to inform entrepreneurship, maintains that higher levels of social capital relate to greater knowledge access, resource exchange, entrepreneurship, and performance (Adler & Kwon, 2002; Bowey & Easton, 2007; Cope et al., 2007; Gedajlovic et al., 2013; Pillai, Hodgkinson, Kalyanaram & Nair, 2017; Wang, Wang, Ma & Wang, 2022). Specifically, social capital is crucial for emerging economies, where firms operate in an environment with weak institutional support (Peng & Luo, 2000). However, social capital theory maintains that social capital may have negative sides for the actors (Adler & Kwon, 2002; De Groot, Mihalache & Elfring, 2022; Granovetter, 1985; Uzzi, 1997). Excessive embeddedness within networks hinders the acquisition of new ideas and knowledge. Consequently, individuals cannot identify new ideas and opportunities for entrepreneurship (Pillai et al., 2017; Yates, Vardaman & Chrisman, 2023). However, whether individual level social capital influences entrepreneurial behavior positively or negatively in emerging economies is not fully known (Patel & Wolfe, 2023; Payne et al., 2011). That is, it has been argued that the role of social capital in entrepreneurship has not been sufficiently understood (Afandi et al., 2017; Rodrigo-Alarcon et al., 2018; Sahasranamam & Nandakumar, 2020). Furthermore, social capital may have different impacts at various phases of entrepreneurial activities (Gedajlovic et al., 2013), with, previous studies considering the earlier stages of entrepreneurship to a limited extent (Afandi et al., 2017).

This study aims to fill these gaps in the literature by exploring the relations between social capital and the trial phase of entrepreneurship within the framework of social capital theory. Accordingly, this study contributes to the relevant literature in two ways. First, by examining social capital and entrepreneurship relations at the individual level, this study responds to the call for further research on how individual networks influence the early stages of entrepreneurship (De Clercq, Dimov & Thongpapanl, 2013; Gedajlovic et al., 2013; Payne et al., 2011). Moreover, by investigating these relationships in an emerging economy, this study advances the existing research on developed economies (Bauernschuster et al., 2010; Khan, Breitenacker & Schwarz, 2014; Kwon et al., 2013; Percoco, 2012; Rodrigo-Alarcon et al., 2018). Considering that social capital is an important resource in emerging economies, this examination allows us to understand whether social capital has favorable or negative impacts on entrepreneurship. In relation, focusing on a single country may reduce the possible variations in different contexts across countries (Batjargal, 2007). Second, this study examines the effect of social capital on the trial stage of entrepreneurship, allowing us to understand how various aspects of social capital (e.g., trust and social interaction) influence the initial phases of entrepreneurial activity (Afandi et al., 2017; Gedajlovic et al., 2013).

In sum, this study concentrates on exploring the linkages between various dimensions of social capital and the trial phase of entrepreneurship. Since social capital is highly valued in

emerging economies, characterized by inefficient capital, labor, and product markets, this examination enhances our understanding of whether social capital facilitates or hinders entrepreneurship in such economies (Gedajlovic et al., 2013; Khanna & Palepu, 1997; Pillai et al. 2017).

Drawing on the social capital theory, this study proposes that the two aspects of social capital, such as trust and social interaction positively affect entrepreneurship. Additionally, trust and social interaction is expected to jointly influence entrepreneurship positively. The empirical results indicate that trust and social interaction have favorable effects on entrepreneurship trial. However, the findings reveal that the interaction between trust and social interaction has a negative impact on such trial. Accordingly, first, social capital and entrepreneurship relations are explained, and hypotheses are generated. Then, the research methodology is explained. Finally, empirical results are presented along with the discussion of the findings, limitations, and avenues for further research.

### **Theoretical Framework and Hypotheses**

Social capital theory is regarded as a theoretical foundation to enlighten entrepreneurship research (Gedajlovic et al., 2013; Lin, 1999). This theoretical approach allows the exploration of the individual and collective level outcomes of social interactions (Payne et al., 2011). In social capital theory, social relations are valuable resources for individuals that enable access to information and goals (Adler & Kwon, 2002; Nahapiet, 2008; Nahapiet & Ghoshal, 1998). Social capital, through various dimensions, helps with accessing information and networks (De Groot et al., 2022; Wulandhari, Golgeci, Mishra, Sivarajah & Gupta, 2022). Thus, individuals benefit from interactions within their networks to identify entrepreneurial opportunities (Lee, 2009). However, when actors are embedded within their networks, they cannot obtain novel information and knowledge (Adler & Kwon, 2002; Uzzi, 1997; Yates et al., 2023). Therefore, they may miss out on accessing new information required for entrepreneurial activities (Pillai et al., 2017). Accordingly, in this study, the relationships between social capital and entrepreneurship have been discussed within the theoretical framework of social capital.

Entrepreneurship can be expressed as the interaction among society, individuals, and social communities (McKeever et al., 2014). It is a process, which requires relations between key actors (Aldrich & Zimmer, 1986). Entrepreneurs are individuals who utilize the opportunities that others do not realize (Casson & Della-Giusta, 2007). Due to information asymmetries, some individuals get access to knowledge and information about opportunities before others; therefore, they exploit such opportunities in entrepreneurial activities. Individuals do not possess the same kind of information on entrepreneurial opportunities. The distribution of such information depends on individuals' conditions (Shane & Venkataraman, 2000).



Granovetter (1985) discusses that economic behavior has primarily been embedded in networks of relations between individuals. In this case, social capital is a vital element in entrepreneurship (Anderson, Park & Jack, 2007). Hidalgo, Monticelli, and Bortolaso (2021) propose that social entrepreneurs should build interpersonal relationships. Westlund and Gawell (2012) suggest that there is a strong relationship between entrepreneurial activities and social capital. Social capital is regarded as a resource, stemming from social relations (Adler & Kwon, 2000), based on social interactions, and formed through various relations between actors (McKeever et al., 2014). Westlund and Bolton (2003) note that social capital can act both as a preference and resource in entrepreneurship. Furthermore, entrepreneurship activities are embedded in a social context (McKeever et al., 2014).

Social capital encourages entrepreneurial activities because it facilitates access to the resources for establishing new businesses (Bahmani, Galindo & Mendez, 2012). As it involves reciprocity and trust, such capital allows for effective entrepreneurship (Light & Dana, 2013). Entrepreneurs build social capital by forming networks, providing them with knowledge, information, and other resources. Moreover, these networks affect entrepreneurs' opportunity utilization (Cope et al., 2007). For instance, Sahasranamam and Nandakumar (2020) point out that individual social capital may enhance social entrepreneurs' access to resources. Thus, social capital influences entrepreneur's perception of opportunities (McKeever et al., 2014).

Coleman (1988) suggests that individuals' actions are formed by social context. Interpersonal trust and social networks are crucial factors in an economy. Social relations deliver information for individuals' actions. In emerging economies, informal governance factors facilitate resource access for entrepreneurship, especially through social ties between individuals (Foo, Vissa & Wu, 2020). Foo et al. (2020) suggest that family relationships and community influence an individual's behavior in such economies. Furthermore, personal networks of relations are the means of doing business in transition economies (Batjargal, 2007).

Prior studies have highlighted the positive influence of social capital on entrepreneurship. Sahasranamam and Nandakumar (2020) depict that individual level social capital has a positive significant power on entry of social entrepreneurship. Percoco (2012) shows that social capital is an important antecedent of entrepreneurship in Italy. Estrin, Mickiewicz, and Stephan (2013), based on an individual level data from 47 countries, reveal that the prevalence of social entrepreneurs positively influences the probability to become a commercial entrepreneur. Abane et al. (2024) show that social capital contributes to the growth of new enterprises in Ghana. Shao and Sun (2021) find that entrepreneurs' structural and cognitive social capital facilitate venture capital financing. Chen and Wang (2008), based on research in entrepreneurial teams in Taiwan, find that external and internal social networks positively influence innovative capability. Thus, trust and social interaction, which are the important aspects of social capital, can facilitate entrepreneurs' activities.



## Trust, Social Interaction and Entrepreneurship

Trust is one of the characteristics of relational social capital (Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998), occurring between individuals, firms, or institutions (Welter, 2012). Zaheer, McEvily, and Perrone (1998) define interpersonal trust as the extent of trust between partners. Personal trust can be interpreted as a phenomenon emerging between two or more partners. Trustworthy partners have personal characteristics, such as sympathy, loyalty, honesty, and empathy (Welter, 2012). Welter (2012) suggests that future studies should consider the contexts in which trust occurs. In contexts, where institutions are inefficient, such as emerging economies, examining the role of trust in entrepreneurship becomes imperative.

To develop businesses, entrepreneurs should build trust-based ties (Welter, 2012). Specifically, the entrepreneurial process, which is characterized by interpersonal relations, includes high degrees of uncertainty and low degrees of predictability in the early stages. In this case, trust needs to emerge quickly (Goel & Karri, 2006). New businesses have risks that are associated with investment in resources and capital. Interpersonal trust facilitates the sharing of information by reducing the possibility of opportunistic behavior and the need for monitoring (Pathak & Muralidharan, 2016). Trust can take a primary role as an informal institution and reduce the transaction costs and risks of entrepreneurial actions, such as entering new businesses with others (Goel & Karri, 2006; Neergaard & Ulhoi, 2006; Welter, 2012). Deng, Liang, Fan, and Cui (2020) argue that trustworthy relations in social entrepreneurship decrease the transaction costs related to running a business.

Trust facilitates the access to various resources, which are difficult to acquire with arm's-length relations (Uzzi, 1997). Entrepreneurs also receive information on entrepreneurial opportunities (Goel & Karri, 2006; Pathak & Muralidharan, 2016). Trust becomes more important for the entrepreneurial process in transition economies (Manolova, Gyoshev & Manev, 2007). Particularly, in emerging economies, in the absence of well-developed markets, individuals rely on trust-based relations (Foo et al., 2020); personal trust compensates for the inadequacies associated with regulatory institutions and facilitates entrepreneurial exchange (Manolova et al., 2007).

Previous research on the relations between trust and entrepreneurship reveals mixed results. Pathak and Muralidharan (2016), based on individual level data from 27 countries, demonstrate that interpersonal trust increases the individual level social and commercial entrepreneurship. Rodrigo-Alarcon et al. (2018) reveal that relational social capital in the form of trust significantly influences the orientation of entrepreneurs in the Spanish agri-food industry. Turkina and Thai (2013) find that interpersonal trust positively affects entrepreneurship in 34 Organization for Economic Co-operation and Development (OECD) countries. Zeffane (2015) shows that trust affects entrepreneurial intentions in the United Arab Emirates. Manolova et al. (2007) suggest that entrepreneurs' interpersonal trust is associated with

economic exchange in Bulgarian small businesses. Chen and Wang (2008) reveal that trust of entrepreneurial teams moderates the relation between external social networks and innovative capability in Taiwan. Furthermore, based on a data from 44 entrepreneurial Austrian teams, Khan et al. (2014) show that affective trust is crucial in enhancing team effectiveness. However, Doh and Zolnik (2011), based on individual level survey data from 53 countries, reveal that although generalized trust has a reducing influence on entrepreneurship in the form of self-employment, institutional trust has a positive impact. Moreover, based on individual level survey data from 58 countries, Ayob (2018) reveals no moderating impact of generalized trust on the relationship between ethnic diversity and social entrepreneurship. Afandi et al. (2017) depict that interpersonal trust does not affect entrepreneurial process. However, while institutional trust (in government & civic bodies) negatively affects the prefer stage of entrepreneurial process, the effect of trust in government institutions on the success stage of entrepreneurship is positive. Further, the authors find no impact of interpersonal and institutional trust on the trial stage of entrepreneurship across 35 European and Central Asian countries. Based on these discussions, in emerging economies, entrepreneurs' trustworthy relations are expected to lead to establishing new businesses. Therefore,

Hypothesis 1: Trust has a positive impact on entrepreneurship trial.

Social interaction represents structural social capital and provides information and knowledge (Molina-Morales & Martinez-Fernandez, 2009, 2010; Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998; Wang et al., 2022). Since social capital includes social interaction, entrepreneurs use it to access to resources (Abane et al., 2024; Aidoo, Agyapong & Mensah, 2020; Cope et al., 2007). Furthermore, social interaction enhances knowledge sharing by boosting the depth and breadth of exchange (Yli-Renko, Autio & Sapienza, 2001). Entrepreneurs obtain information on resources and opportunities from their networks (Bowey & Easton, 2007). These networks may comprise individuals, such as other people, family, or clubs (Cope et al., 2007). Entrepreneurship through such networks can include communication and expectations (Aldrich & Zimmer, 1986). Individuals' networks are crucial in entrepreneurial activities in emerging economies (De Clercq, Danis & Dakhli, 2010). Chen and Wang (2008) suggest that an entrepreneurial team's networks of external social relations are sources of knowledge and information. De Clercq et al. (2010) propose that entrepreneurs' social ties, such as activities in voluntary organizations, political parties, or trade unions, offer them with various resources to establish new businesses in emerging economies.

Previous studies generally exhibit a favorable impact of social ties on entrepreneurial process. Rodrigo-Alarcon et al. (2018) find that structural social capital through network ties and density significantly impacts orientation of entrepreneurs in the Spanish agri-food industry. Doh and Zolnik (2011), based on individual level survey data from 53 countries, reveal that associational activities in the form of active membership positively impacts entrepreneurship

in the form of self-employment. Bauernschuster et al. (2010) show that social capital in the form of membership in associations and clubs is positively associated with an individual's entrepreneurship propensity in Germany. Kwon et al. (2013) show that membership with connected organizations is related to the greater level of self-employment in the U.S., meanwhile, membership with isolated organizations decreases the probability of self-employment. De Clercq et al. (2010) elicit that various associational activities in voluntary organizations have positive impact on establishing and running a new business. Danis, De Clercq, and Petricevic (2011) reveal that social relations have more impact on entrepreneurial activities in emerging economies than the observed impact in developed ones. Patel and Wolfe (2023) find a strong relation between regional economic connectedness and local entrepreneurship in the U.S. Moreover, while social capital in the form of regional network cohesiveness, which is based on social support, strengthens the positive association between regional economic connectedness and local entrepreneurship activity, regional network cohesiveness based on social clustering weakens the positive association between regional economic connectedness and local entrepreneurship activity. Afandi et al. (2017) show that individuals' network relations with relatives and friends enhance the likelihood to prefer self-employment. However, frequency of such meeting diminishes individuals' trial of establishing a business in 35 European and Central Asian countries. Professional organization membership positively affects prefer, trial, and success stages of entrepreneurship; whereas, labor union membership negatively affects them. Therefore,

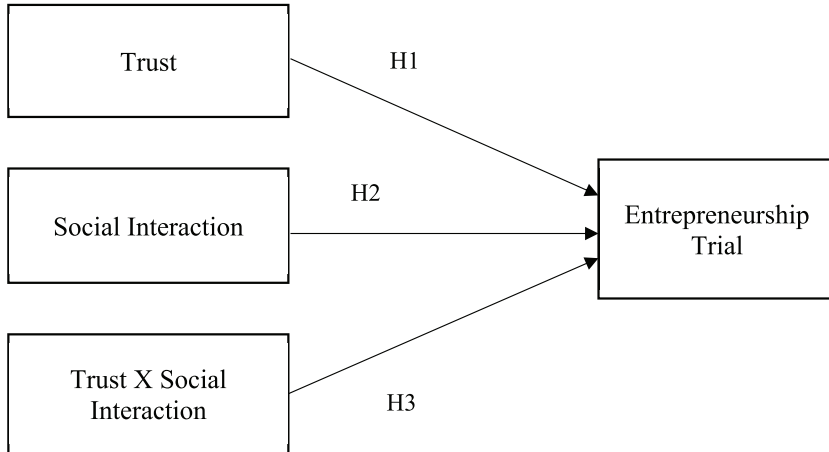
Hypothesis 2: Social interaction has a positive impact on entrepreneurship trial.

### **Joint Impact of Trust and Social Interaction on Entrepreneurship**

Nahapiet and Ghoshal (1998) argue that social capital dimensions are related, despite having different features. Social interaction may lead to trust between actors. As individuals interact, they trust each other more and share information (Tsai & Ghoshal, 1998; Yli-Renko et al., 2001). Individuals may intend to start a business when they build trustworthy relations and frequently interact with each other. However, as entrepreneurial process includes risks, an over-trust in the relationships may spur failures. Furthermore, trust involves risks in that individuals may confront unpredictable outcomes in their relationships (Goel & Karri, 2006). Additionally, frequent interactions among individuals may over-embed them in a network where such interaction does not allow for capturing new entrepreneurial opportunities (De Groot et al., 2022; Granovetter, 1985; Pillai et al., 2017; Uzzi, 1997; Yates et al., 2023). However, in emerging economies, in the absence of well-functioning labor, product, and capital markets, individuals rely on their personal relationships (Khanna & Palepu, 1997). Thus, the joint occurrence of social interaction and trust among individuals may enhance the intention and possibility of starting a business. Therefore,

Hypothesis 3: The interaction between trust and social interaction has a positive impact on entrepreneurship trial.

Figure 1 summarizes the proposed conceptual relations.



*Figure 1.* Proposed conceptual model.

## Methodology

### Data

The data for the present research comes from the third round of Life in Transition Survey (LiTS). The survey is conducted by the European Bank for Reconstruction and Development (EBRD) between 2015 and 2016. The survey collects individual level data about social, political, and economic topics in transition economies. The survey includes 1,500 observations for Türkiye. The data are collected by face-to-face interviews and are freely accessible to scholars (the approval of ethics committee is not required). The potential common method variance is alleviated by keeping respondents' names and identities anonymous and including various response formats, such as binary and Likert scales (Podsakoff, MacKenzie, Lee & Podsakoff, 2003).

### Variables

#### Dependent Variable

**Entrepreneurship:** Entrepreneurship can be a firm-level phenomenon (Barringer & Blue-dorn, 1999); however, research has also focused on individual entrepreneurs' activities. Ent-

repreneurship can be measured in several ways, such as self-employment, start-up activity, or the discovery of opportunities (Bjornskov & Foss, 2016; Gohman, 2012). Hsieh, Parker, and Van Praag (2017) measure entrepreneurship by occupational choice (self-employment vs. wage employment). Covin and Slevin (1991) suggest that individuals’ actions make them entrepreneur. Individual behavior affects firms’ actions. In this regard, in the present paper, entrepreneurship is measured by entrepreneurship trial following prior studies (Afandi et al., 2017). In the survey, respondents are asked whether they have ever tried to set up a business. The entrepreneurship trial variable is assigned the value 1 if the respondents have tried, and 0 otherwise.

**Independent Variables**

**Trust:** In the survey, all the respondents are asked “Generally speaking, would you say that most people can be trusted, or that you can’t be too careful in dealing with people?” The answers are indicated on a scale from 1 to 5, where 1 means that individuals have complete distrust and 5 means that individuals have complete trust.

**Social interaction:** Social interaction variable is operationalized by respondents’ indication of the frequency of meetings with friends or relatives. To measure the social interaction variable, the answers are coded from 1 (never) to 5 (on most days).

**Control Variables**

Respondents’ age, gender, and risk tendency are used as control variables. Risk taking is measured on a scale from 1 (not willing to take risks at all) to 10 (very much willing to take risks). Since the dependent variable is binary, logit regression is used to estimate the model (Hoetker, 2007). All the analyses are conducted by using Stata (V14.2).

**Results**

Table 1 presents the minimum, maximum values, standard deviations, means, and the correlations between the variables. The correlations are below 0.5, therefore, multicollinearity is not likely to be an issue (Hair, Black, Babin & Anderson, 2010).

Table 1  
*Correlations Between Variables*

Variable	1	2	3	4	5	6
1. Entrep. Trial	1					
2. Trust	.07*	1				
3. Social interaction	.01	.01	1			
4. Age	.05*	.01	-.02	1		
5. Gender	.11*	-.08*	.01	.09*	1	

Variable	1	2	3	4	5	6
6. Risk tendency	.07*	.29*	-.02	-.10*	-.03	1
Mean	.07	2.94	3.37	37.10	.51	5.42
Std. Dev.	.25	1.12	.81	12.24	.50	2.12
Min.	0	1	1	18	0	1
Max.	1	5	5	95	1	10

\*p < 0.05

Table 2 shows the results of the logit regression analysis regarding the effects of trust, social interaction, and the interaction between trust and social interaction on entrepreneurship trial. Model 1 includes the control variables, and trust variable. Model 2 has the social interaction variable. Model 3 includes all the variables and the interaction term between trust and social interaction.

In Table 2 (model 3), age, gender, and risk tendency have positive impacts on entrepreneurship trial. The results depict that trust has a favorable and significant influence on entrepreneurship trial, thus supporting Hypothesis 1 ( $\beta = 0.979$ ,  $p < 0.05$ ). In addition, the effect of social interaction on entrepreneurship trial is positive and significant; therefore, Hypothesis 2 is also supported ( $\beta = 0.769$ ,  $p < 0.1$ ). However, the results indicate a negative and significant impact of interaction between trust and social interaction on entrepreneurship trial; hence, Hypothesis 3 is not supported ( $\beta = -0.211$ ,  $p < 0.1$ ).

Table 2  
Logit Regression Results: Entrepreneurship Trial

Variable	Model 1	Model 2	Model 3
Age	0.017** (0.008) [0.045]	0.016** (0.008) [0.047]	0.017** (0.008) [0.040]
Gender	1.044*** (0.235) [0.000]	0.935*** (0.232) [0.000]	1.019*** (0.236) [0.000]
Risk tendency	0.132** (0.056) [0.018]	0.169*** (0.054) [0.002]	0.143** (0.057) [0.011]
Trust	0.236** (0.103) [0.022]		0.979** (0.451) [0.030]
Social interaction		0.086 (0.131) [0.510]	0.769* (0.418) [0.066]
Trust x Social interaction			-0.211* (0.123) [0.087]
Constant	-5.395***	-5.075***	-8.162***
Log likelihood	-346.725	-346.343	-338.164
Pseudo R <sup>2</sup>	.054	.043	.059
LR chi <sup>2</sup>	39.54***	31.28***	42.10***
N	1487	1460	1458

Standard errors in parentheses, p values in square brackets;

\* p<0.1, \*\* p<0.05, \*\*\* p<0.01.

## Discussion and Conclusion

This paper explores the influence of trust and social interaction between individuals on entrepreneurship trial within the framework of social capital theory. In addition, it investigates how trust and social interaction jointly affect entrepreneurship. Social capital theory maintains that higher levels of social capital relate to greater knowledge access, resource exchange, entrepreneurship, and performance (Adler & Kwon, 2002; Bowey & Easton, 2007; Gedajlovic et al., 2013; Pillai et al., 2017; Wang et al., 2022). According to the theory, social relations are valuable resources for individuals, enabling them to access information and achieve their aims (Nahapiet, 2008; Nahapiet & Ghoshal, 1998). Specifically, social capital is an important resource in emerging economies (Peng & Luo, 2000). The findings show that trust positively impacts entrepreneurship trial, complementing the theoretical framework of social capital and revealing the importance of trust in entrepreneurship. This finding is consistent with similar studies, where entrepreneurship has been found to be enhanced by trust between individuals. For instance, Pathak and Muralidharan (2016) find that interpersonal trust increases the individual level social and commercial entrepreneurship. Rodrigo-Alarcon et al. (2018) show that relational social capital in the form of trust has a significant impact on entrepreneurial orientation. Zeffane (2015) finds that trust affects entrepreneurial intentions in United Arab Emirates. Turkina and Thai (2013) reveal that interpersonal trust positively affects entrepreneurship in 34 OECD countries. Abane et al. (2024) reveal that structural, relational, and cognitive social capital support the growth of new enterprises in Ghana. Patel and Wolfe (2023) show that the relation between regional economic connectedness and local entrepreneurship is strong in the U.S. However, this finding partly contrasts with the results in other studies. For instance, Afandi et al. (2017) find no impact of interpersonal and institutional trust on trial stage of entrepreneurship. Doh and Zolnik (2011) show that while generalized trust has a reducing impact on entrepreneurship in the form of self-employment, institutional trust has a positive impact. Ayob (2018) finds no moderating impact of generalized trust on the relationship between ethnic diversity and social entrepreneurship.

Moreover, this study reveals a positive impact of social interaction on entrepreneurship trial. This positive effect of social interaction on entrepreneurship is consistent with the theoretical framework of social capital. This effect is in line with the findings in the prior studies. For instance, Bauernschuster et al. (2010) elicit that social capital via membership in associations and clubs is positively associated with an individual's entrepreneurship propensity. Doh and Zolnik (2011) show that associational activities in the form of active membership have a positive impact on entrepreneurship. Rodrigo-Alarcon et al. (2018) find that structural social capital via network ties and density has a significant influence on entrepreneurial orientation. However, contrary to the findings, Afandi et al. (2017) show that frequency of meeting friends and relatives reduces entrepreneurship trial.

The findings show a negative influence of interaction between trust and social interaction on entrepreneurship trial. Within the theoretical framework of social capital, it has also been argued that social capital may have dark sides (Adler & Kwon, 2002; De Groot et al., 2022). Excessive embeddedness within networks hinders acquisition of new ideas and knowledge. Consequently, individuals may be unable to identify new entrepreneurial ideas and opportunities (Pillai et al., 2017; Yates et al., 2023). In other words, although social capital contributes to entrepreneurship through providing individuals with resources, the joint utilization of its aspects may also have negative outcomes (Anderson et al., 2007; Gedajlovic et al., 2013; Light & Dana, 2013; Molina-Morales & Martinez-Fernandez, 2009; Payne et al., 2011). For instance, Uzzi (1997) emphasizes the over-embedded networks and states that embeddedness can harm economic performance of entrepreneurial firms by preventing them from getting information beyond such networks. Rodrigo-Alarcon et al. (2018) argue that structural social capital through network ties and density may prevent entrepreneurs from entrepreneurial orientation because dense ties may not provide them with new information and opportunities. Yates et al. (2023), based on the review of the literature, argue that while social relations among family members allow them to access knowledge and resources, excess relations prevent them from obtaining knowledge for entrepreneurial activities. Pyo, Tamrakar, Lee, and Choi (2023) show that social capital acts as a double-edged sword in new product diffusion process. Therefore, the joint impact of trust and social interaction on entrepreneurship can be the reflection of the embeddedness of individuals within their networks (Pillai et al., 2017). In summary, this study reveals the importance of various dimensions of social capital in the early stages of entrepreneurship. Trust and social interaction have positive impacts on individuals' intention to set up a business. Moreover, negative consequences of social capital exist in an emerging economy context. A negative result occurs when the two social capital dimensions are considered together.

The results of this study have implications for entrepreneurs in emerging economies. The findings suggest that entrepreneurs should consider networking relationships within their environments (Santoro, Bertoldi, Giachino & Canelo, 2020). They should enhance their social capital in the form of trustworthy relations and social interactions with individuals to create competitive advantage in the early phase of entrepreneurial activities in emerging economies. However, entrepreneurs should be cautious when forming relations. The excess use of social capital may inhibit entrepreneurial activities. They need to carefully use the different aspects of social capital because when trustworthy and social relations are considered together, they may have unfavorable impacts on such activities (Patel & Wolfe, 2023; Shao & Sun, 2021).

This study has several limitations, which can lead to further research. The operationalization of social capital is limited to trust and social relations based on the availability of the survey data. Further studies may consider other dimensions, such as norms, shared goals, or density of ties between individuals (Payne et al., 2011). Investigating these relations in a sing-



le country reflects the characteristics of institutional environment; however, other emerging economies may have different cultural and institutional contexts. Therefore, examining other emerging economies would be desirable (Aidoo et al., 2020; Batjargal, 2007; Wu, 2008). A possibility of reverse causality exists between concepts due to the cross-sectional data; therefore, further studies may use longitudinal data to overcome these problems (Patel & Wolfe, 2023; Sahasranamam & Nandakumar, 2020).

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

**Conflict of Interest:** The author has no conflict of interest to declare.

**Grant Support:** The author declared that this study has received no financial support.

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## RESEARCH ARTICLE

# Does Injudicious Kindness Caused by Power Distance Lead to Organizational Silence Behaviors of Research Assistants?

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### Abstract

Employee silence poses a significant challenge for organizations, hindering the use of innovative ideas and the establishment of democratic work environments. While previous research has predominantly focused on the cultural roots of silence within organizational culture, the influences of broader social-cultural factors have often been overlooked. In addition, investigations into the antecedents of silence have mainly relied on quantitative methodologies, leaving gaps in our understanding. To address these limitations, this study employs an exploratory qualitative case study methodology. Conducted through in-depth interviews with 12 research assistants from state universities, this study investigates the impact of power distance perceptions on academicians' silence behavior. The findings reveal that research assistants exhibit a heightened perception of power distance, leading to instances of inappropriate deference and a tendency to remain silent on critical issues, even when such silence is undesirable.

### Keywords

Organizational silence, Power distance, Academicians, State universities in Türkiye

## Introduction

Organizations are fundamentally aimed at improving their ability sustainability by using resources effectively and efficiently, with human resources being among the most valuable (Hagen et al., 2011). Developing new products, increasing service quality, making effective decisions, solving problems, and implementing creative ideas through human resources is possible. There are many ways to benefit from human resources. The most important of these is to obtain the ideas and opinions of employees about decisions, practices, and problems. Harnessing employees' creativity and insights is crucial for innovation, problem-solving, and

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**To cite this article:** Cohen, A., Ozsoy, E., Nart, S., & Nart, S. (2024). Does injudicious kindness caused by power distance lead to organizational silence behaviors of research assistants?. *Istanbul Business Research*, 53(1), 41-60. <http://doi.org/10.26650/ibr.2024.53.1284601>



decision-making within organizations (Castaneda & Cuellar, 2020). However, despite the importance of employee input, many organizations encounter a phenomenon known as organizational silence, in which employees withhold valuable knowledge and opinions that could contribute to organizational goals (Cullinane & Donaghey, 2014). Various factors contribute to organizational silence, including personal, organizational, and sociological dimensions (Dyne et al., 2003). Personality traits play a significant role in shaping employee behavior within organizational contexts (Cohen & Özsoy, 2021), with individuals exhibiting certain traits, such as schizoid or dependent tendencies, often refraining from expressing their views in social environments and business life (Millon et al., 2012; Özsoy & Ardiç, 2020). Moreover, employees may prefer silence for many reasons, such as protecting themselves, not being perceived as a bulge, and conforming to the normative social influence of the group (Morrison & Milliken, 2003; Vakola & Bouradas, 2005). Organizational factors also contribute to silence, particularly in environments characterized by repressive or autocratic management philosophies suitable for the age, and employees prefer to remain silent (Morrison & Milliken, 2000). The phenomenon of organizational silence in this context is defined as the conscious withholding of work, ideas, knowledge, and thoughts pertinent to organizational advancement by employees (Morrison & Milliken, 2000). Particularly in workplaces characterized by high power distance, employees refrain from expressing their viewpoints to their managers, opting instead to adapt to the organizational culture determined by hierarchy structures (Huang et al., 2005). Power distance denotes the extent to which unequal power distribution is accepted within societies (Hofstede, 1984). In societies exhibiting high power distance, both managers and subordinates perceive each other as unequal (Kiymalıoğlu et al., 2018). Courtesy norms, emanating from cultural heritage within organizations that foster a vertical hierarchical framework, can affect the attitudes and behaviors of employees, fostering one-way communication dynamics between subordinates and superiors (Blackman & Sadler-Smith, 2009). At this point, employees' silence can also occur within the framework of virtue elements such as modesty, respect, and kindness (Nakane, 2006).

Employees, in adhering to customary courtesy rules within the organization, often choose to remain silent out of fear of being misunderstood. Consequently, “national and cultural norms” emerge as primary factors prompting employees to collectively withhold their opinions and concerns within their professional undertakings (Morrison & Milliken, 2000). While this tendency toward silence may not immediately disturb employees in the short term, it gradually calcifies with the working environment over time, fostering a culture of silence within the organization. Such a climate stifles the generation and sharing of fresh, creative ideas, thereby impeding organizational evolution and development across various sectors. When universities and institutions are considered to ideally foster environments of accessible criticism and discourse, the deep-seated issues stemming from organizational silence become apparent (Cohen & Baruch, 2022; Sadeghi & Razavi, 2020). Although universities contribute



significantly to the production of scientific knowledge through research and publications, they also play a vital role in cultivating qualified, innovative, and creative graduates, thereby benefiting both the economy and society at large.

Amidst the fulfillment of these critical tasks, there is undeniably a need for work environments that foster mutual communication, idea sharing, and the cultivation of polyphony (Çaloğlu, 2014). Conversely, despite universities being the highest-level institutions in academic education and training, the entrenched perception of power distance within cultural frameworks can adversely affect employee relations within academic organizations (Cohen & Baruch, 2022). Cultural power distance thus emerges as a determinant of the inclination toward silence within the university environment. Considering this, it can be posited that the social-psychological processes stemming from the interaction of individual, organizational, and cultural factors significantly influence employees' proclivity toward silence. While numerous empirical studies explore the individual and organizational antecedents of silence, research investigating the effect of cultural factors on silence remains scant (Kwantes & Boglarsky, 2007). Although the effect of culture on silence has been explored within the realm of organizational culture (Parcham & Ghasemizad, 2017), from a sociological perspective, social culture also shapes the attitudes and behaviors of employees within organizations (Tutar, 2003). However, there is insufficient empirical evidence regarding whether cultural factors, particularly the perception of power distance, contribute to silence or cause excessive courtesy.

Building upon the above arguments, this study examines the role of power distance perception as a determinant of organizational silence tendencies among university employees. Particularly within universities, which serve as the primary source of free and critical sharing of thought, questioning, and research and foster innovative and entrepreneurial perspectives, understanding the reasons behind the tendency for silence becomes imperative. Thus, this study reveals the insights necessary for designing a more productive working environment within universities.

## **Literature Review and Conceptual Framework**

### **Definition of Concepts**

Organizational silence refers to the deliberate withholding of ideas, opinions, and concerns by employees regarding organizational issues and challenges (Morrison & Milliken, 2000). Those who choose silence abstain from addressing workplace problems and fail to provide valuable input and suggestions crucial for organizational growth and development (Henriksen & Dayton, 2006). Silence, generally perceived as an enigmatic attitude within organizations, significantly impacts both employees and organizational performance by impe-

ding progress and undermining organizational cohesion. Generally, the tendency for silence in organizations is attributed to organizational, managerial, and individual factors, with fears such as being labeled as the complainer, losing respect or trust, damaging relationships, facing termination, or encountering barriers to promotion being significant deterrents (Milliken et al., 2003). Fear of negative evaluation is particularly notable as a factor discouraging employees from speaking up or offering input in various situations (Milliken & Morrison, 2003). In addition, different motives prevent employees from sharing their ideas and information, leading to the emergence of different dimensions within the concept of silence (Dyne et al., 2003), such as acquiescence, self-defense, preserving relationships with colleagues, lack of confidence, and adherence to organizational regulations (Brinsfield, 2009).

Power distance involves the acceptance of unequal power distribution among individuals and organizations within society (Hofstede, 1984). This unequal power distribution determines the dynamics of social and interpersonal relations within organizational structures. Hofstede characterizes power distance as a cultural dimension, noting that societies exhibit varying degrees of power distance ranging from narrow to wide intervals. High power distance denotes a society in which inequality in power distribution is pronounced (Hofstede, 1984). In organizations characterized by high power distance, the culture endorses the centralization of power among employees, who often occupy positions within a structure dictated by their superiors and await instructions. An autocratic management style prevails in such organizations, augmenting employees' dependence on their superiors. Conversely, in organizations with low power distance, the inequality between managers and employees is minimal, with centralization and hierarchy at their lowest levels (Turan et al., 2005). Such organizations avoid the centralization of power, with employees asserting their beliefs while participating in decision-making processes (Rodrigues, 1998).

**The cultural effect of power distance** has been argued to be an effective lens for analyzing the sociocultural origins of organizations' silence (Hofstede, 1980). In societies characterized by high power distance levels, silence is deemed acceptable. A defining trait of such societies is the tendency for workers to obey orders without questioning or criticism. Hierarchical inequalities, differences in status, and power imbalances are commonly accepted norms. Particularly in these high power distance societies, where significant emphasis is placed on formal positions and hierarchies, employees often lack opportunities for participation in decision-making processes, and upward feedback mechanisms are absent within the organization structure (Morrison & Rothman, 2009).

Silence is commonly perceived as a positive politeness strategy aimed at regulating communication behaviors and ensuring harmony (Nakane, 2006). It is associated with various virtuous behaviors, including humility, respect for others, and common sense (Shojaie, et al., 2011). Conversely, tendencies such as polite and respectful behavior, coupled with extreme

humility, arise from the interaction of cultural and individual differences, influencing silence (Nakane, 2006). From a sociocultural perspective, silence can be viewed as a behavior encouraged by certain cultures, symbolizing respect. Hence, in cultures characterized by high power distance, it is often observed that subordinates remain silent in situations and environments where those in positions of power dictate courtesy rules (Aquino & Bommer 2003). Studies investigating the relationship between cultural power distance and silence behavior have shown that cultural power distance significantly influences employees' inclination to withhold their opinions. Employees in societies with lower power distance are typically more inclined to express their opinions (Huang et al., 2005).

### Research Setting

Türkiye is recognized as a country characterized by high power distance (Pasa et al., 2001; Hofstede, 1984). The prevailing perception is that the Turkish bureaucratic system exhibits a robust and centralized structure. Consequently, obedience to authority plays a crucial role in shaping individual behavior within Turkish society. From an organizational standpoint, the prevalence of organizational silence can be expected, given institutional arrangements combined with limited and inadequate communication channels (Aytaç, 2007). The degree of respect given to managers by their subordinates is widely regarded as a crucial indicator of managerial performance. This underscores the tendency of many Turkish employees to hesitate in expressing their opinions to their superiors (Wasti, 1998). This reluctance stems primarily from cultural factors that emphasize humility, respect, and kindness (Nakane, 2006). The implicit restrictive tendency arising from cultural factors between individuals in the position of authority and their subordinates within organizations may hinder individuals with lesser power from criticizing authority or expressing their opinions in decision-making processes. Consequently, high power distance may impede the creation of a participatory organizational culture and organizational development (Ghosh, 2011). Within the context of Turkish universities, previous research has suggested that power distance could be a potential factor contributing to employee silence (Çavuşoğlu & Köse, 2016; Sağlam et al., 2018; Solmaz & Serinkan, 2020). However, these findings remain predominantly descriptive, lacking in-depth exploration.

While universities in Türkiye may exhibit a more relaxed bureaucratic structure than other public institutions, they are not entirely free from communicative limitations imposed by bureaucratic frameworks. For example, Özgan and Külekçi (2012) found that the prevailing culture and norms within Turkish universities compel lecturers into silence, with the hierarchical structure inhibiting open sharing of ideas and opinions. Similarly, Alparslan's (2010) study supported this view, emphasizing the influence of organizational structuring and managerial attitudes as primary drivers of the climate of organizational silence, with institutional regulations cited as a significant factor contributing to academician reluctance. In this context, this study investigates the impact of extreme humility and courtesy on organizational silence within

Turkish universities. Being exploratory, this study refrains from developing specific hypotheses. However, several general expectations are presented: First, due to the deep traces of cultural norms, it is expected that Turkish academicians will generally exhibit a high power distance, notwithstanding their high level of education. Second, it is expected that this high power distance will engender an excess of unwarranted courtesy. Finally, it is expected that this unwarranted courtesy due to power distance will also hinder institutional progress within universities, despite their scholarly pursuits.

## Methodology

### Procedure and Data Collection

A qualitative case study research methodology grounded within the interpretivism paradigm was employed. The adoption of a multiple-case study design was deemed suitable for inductively exploring the silent behavior exhibited by the research assistants employed at the university. A semi-structured interview questionnaire was designed to facilitate the interviews. The initial iteration of the questionnaire was developed based on the pertinent literature. In addition to questions derived from the literature, new inquiries were incorporated into the questionnaire through focused group interviews. The formulation of the interview questions was guided by this collaborative process. Subsequently, to input from the co-authors and two pilot studies, question revisions were made to enhance their efficacy. This iterative process ensured the refinement of the interview questions. The final version of the open-ended questions presented to the participants is detailed in Table 1. These questions aimed to elucidate the role of power distance perception in influencing the tendency for silence among research assistants employed in universities.

Table 1  
*Interview questions*

- 
- 1- How can you define your relations with your colleagues whose academic title is higher than yours? Do you believe there is a power distance felt in your work environment?
  - 2- Can you easily share all your ideas and thoughts in your working environment? Can you, for example, express your thoughts or ideas for improving solutions to organizational problems?
  - 3- Do you believe that to continue to work in this institution, you ignore the negative situations related to work and remain silent from time to time?
  - 4- Do you believe you will not be taken seriously because of a lack of experience or your position when you report a work-related issue or problem?
  - 5- Do you believe that your manager or colleagues may have a critical attitude towards you when you speak openly?
  - 6- Does "the best-I-know attitude" of your high-level colleagues make your statements meaningless? In other words, do you believe that he doesn't listen to your ideas?
  - 7- Do you believe that people who report problems in the work environment are not welcome? Do your colleagues support you when you speak openly?
  - 8- In your opinion, do the courtesy rules in the working environment affect the sharing of healthy information?
-

Data were collected through face-to-face interviews with the participants. Each interview session with an average participant lasted approximately 45 minutes. Two researchers conducted the interviews, whereas other team members were responsible for the subsequent data analysis. Interviews were conducted with the participant's permission, adhering to ethical principles, and recorded using a voice recorder. Participants were assured that these recordings would only be used for the intended research purpose and would not be disclosed elsewhere. All participants consented to the voice recordings. In addition, important points were documented in writing by the researcher during the interviews. To ensure the reliability and accuracy of the interview results, questions were posed to the participants in a comfortable and conducted atmosphere.

## **Participants**

Ethical clearance for this study was obtained from the Sakarya University Ethics Committee (dated 02/09/2020, numbered 61923333/050.99/). Before the interview, informed consent was obtained from all participants who confirmed their voluntary participation in this study. The participant pool comprises 12 research assistants, comprising 4 females and 8 males, employed across two public universities.

## **Validity and Reliability Findings**

To ensure the validity of this study, methods such as long-term interaction, participant confirmation, and expert review were employed (Holloway & Wheeler, 1996). Researchers dedicated significant time to the interviews and conducted them in person, fostering an intimate understanding of the participants and enabling observation of consistency between verbal responses and body language. This approach contributed to mitigating researchers' biases and enhancing the study's objectivity (Lincoln & Guba, 1985). Additionally, to prevent misinterpreting of participants' responses, clarification questions were posed during the interview, the researchers asked them questions like "... do you mean like that?" The confirmation mechanism was thought to ensure that responses accurately reflected participants' intended meanings (Yıldırım & Şimşek, 2013). Expert opinions were obtained during the data coding process and theme development. Moreover, the inclusion of numerous direct quotations from participants enhanced internal reliability (Shenton, 2004; Yıldırım & Şimşek, 2013). Two pilot studies were conducted with two participants each during data collection to ensure clarity of expressions in the interview format. Reliability enhancement strategies included data source triangulation (interview data and secondary data), method triangulation (observation, focus group, and interview), and researcher triangulation during analysis (Denzin, 1978). The coding consistency among researchers was found to be 90%, with the remaining 10% reflecting minor discrepancies, which were resolved through discussions among the researchers.

## Data Analysis

To facilitate data analysis, sound recordings were transcribed into written texts, with each participant's data documented in separate text files. Participants were anonymized as "Participants 1,2,3...." Content analysis was employed to unveil themes and sub-themes from the interviews, aiming to elucidate participants' attitudes, thoughts, and values (Büyükoztürk et al., 2018). MAXQDA Analytics Pro 2018 was utilized for data analysis. Specialist input was sought in theme development, with consensus reached among experts and researchers regarding the three main themes and corresponding sub-themes. The study's framework delineating the relationship between reasons for silence and power distance perception was constructed based on these themes and the researchers' inputs. Furthermore, participants' perspectives were adhered to throughout the study to ensure its reliability and validity, with all stages meticulously detailed.

## Findings

### Themes and Sub-Themes

Data analysis conducted through content analysis revealed three main themes: (1) Communication, (2) Power Distance, and (3) Silence. Under the Communication theme, sub-themes recurrently highlighted by all participants ( $f = 12$ ) and perceived to contribute to communication challenges were identified as insufficient idea sharing and abstention. Additionally, most participants ( $f = 8$ ) emphasized "improper courtesy" as a significant barrier to effective communication. Regarding Power Distance, all participants ( $f = 12$ ) cited high levels of distance, an "I-know" attitude, and heavy workload as contributing factors, with the majority ( $f = 10$ ) noting perceptions of injustice. Furthermore, a significant number of participants ( $f = 11$ ) emphasized the necessity of maintaining a low power distance to uphold the institutional order.

Regarding the Silence theme, all participants ( $f = 12$ ) attributed their reluctance to speak out to insufficient support from colleagues and a lack of acknowledgment. Additionally, most participants expressed job insecurity anxiety ( $f = 10$ ), skepticism about reaching a solution ( $f = 8$ ), apprehension about being perceived as a complainant ( $f = 7$ ), and fear of facing criticism ( $f = 9$ ). Half of the participants ( $f = 6$ ) also expressed feelings of humiliation and distrust toward the management. The themes and sub-themes identified through content analysis are detailed in Table 2.

**Table 2**  
*Results of content analysis*

Themes	Sub-Themes	Frequency <sup>a</sup>
Communication	Lack of sharing ideas	12
	The difficulty of expressing	5
	Abstention	12
	Injudicious Kindness	8
	Prejudice	2
	Gossip	2
	Make suggestions	3
	Authoritarian power structure	2
	Title	12
	High distance	12
Power Distance	Self-righteousness attitude	12
	Injustice	10
	Favouritism	4
	Work load	12
	Maintain order	11
	Humiliation	6
	Insult	1
	Threat	5
	Distrust of management	6
	Lack of colleague support	12
Silence	Lack of organizational support	2
	Anxiety of being complainant	7
	Get short shrift	12
	The belief that a solution will not be reached.	8
	Target display	1
	Critical attitude	9
	Damage to relationships	4
	Job insecurity anxiety	10
	Mobbing	4

*Note.* The number of sub-themes repeated by the participants.

Based on the excerpts from the participants provided in Table 2, it is evident that research assistants perceive a prevalent presence of high power distance within their working environments. Participants assert that as one ascends the hierarchical ladder, the power distance intensifies, impacting the level of centralization. Conversely, participants argued that a lower power distance is imperative for maintaining order in the working environment.

For instance, Participant 1, a male, states “*I believe that there is absolutely a great power distance, and there is certainly a hierarchical structure in the working environment. I mean, there is a case where the one who has got a little bit of title speaks.*”

Participant 6, a female, expresses, “*I’m an advocate against an excessively high power range, yet a degree of power distance is essential. Otherwise, perceptions of duty vary among individuals, leading to potential injustice and favoritism. Such behaviors are evident at various levels. Even the Dean may not be taken seriously if there is no power distance. Therefore, a balanced power distance is crucial for upholding fair-*



*ness, preventing misunderstandings, and reducing prejudice. There is also favoritism at certain levels.”*

Participant 8, a male, shares, *“I Feel the power distance too much. This is clearly felt, especially with a research assistant. Even my friends in the faculty who were ahead of me and have recently become doctors, try to remind me of my profession and what I am required to do. I consider them malevolent. When we move down from seniority, the perception of power distance intensifies, suggesting an inverse correlation. It is intriguing, but precisely the case. The only explanation for this is the lack of experience and self-awareness among individuals. I believe that our senior managers have already solidified their positions and no longer require external validation. However, newer or mid-level managers may lean toward utilizing power distance as a way to express something or prove themselves, showcase their capabilities, and establish authority.”*

Participant 11, a female, reflects, *“I perceive male domination, evident in the effectiveness of their words and their tendency to employ harsh treatment. This gender-originated power distance is tangible.”*

According to the findings, research assistants tended to remain silent primarily because they believed their opinions would not be valued or taken seriously, and that any potential solutions would not be implemented due to the prevailing organizational culture and their perceived lower status within the hierarchy. These findings indicate that research assistants withhold their input due to their concerns about how it will be received in the workplace and their perception of lacking experience.

Participant 2, a female, shares, *“To maintain my position within this institution, I often find myself silently enduring unfavorable work conditions. Despite grievances to middle-level managers about unfair workload distribution or negative situations affecting my performance due to management oversight or indifference, I have sometimes been disregarded. In such instances, I prefer to remain silent and continue my work. The power distance I perceive in the environment means that I am not taken seriously until probably when I complete my doctorate.”*

Participant 6, a female, recounts, *“Our managers have used a disturbing phrase. A rector from another university ranked individuals, placing one professor first, followed by two associate professors, three doctoral lecturers, four lecturers, five students, six dogs, and seven research assistants. This ranking implies that we as research assistants, are deemed to be lower in status than dogs. Such a sentiment discourages open communication. When our managers echo this sentiment or similar ideas from other institutions, they indirectly remind us to ‘know our place’ and recognize our limit’.”*



Participant 7, a male, voice, *“Communication poses a significant challenge for us. Personally, I do not believe our opinions are truly heard by the higher-ups. Effective communication seems unattainable. It is evident that we are not taken seriously. In this environment, it feels as though being a research assistant is synonymous with being invisible unless you hold a doctorate. Furthermore, I perceive favoritism among the research assistants, which contributes to a pervasive sense of bias.”*

As evident from the findings, one solution to reduce organizational silence is to maintain open upward communication channels. Research indicates that when research assistants perceive that their higher-level colleagues can openly communicate with managers, their perceptions of organizational culture improve. This positive relationship underscores the importance of employees feeling psychologically safe to express themselves within the organization, with management being receptive to communication (Botero & Dyne, 2009). Morrison and Milliken (2000) state that sharing ideas and knowledge can lead to workplace improvement opportunities. Conversely, employees may become despondent and remain silent if they believe that their input will not make a difference. Additionally, Vakola and Bouradas (2005) discovered a significant relationship between top management attitudes toward silence and communication opportunities and employees’ tendency to remain silent. Research further indicates that healthy communication between managers and employees reduces perceived role uncertainty, leading to increased job performance and satisfaction (Johlke & Duhan, 2000).

Once again, due to their job title, research assistants abstain from sharing information and ideas out of anxiety about exhibiting a courtesy-based attitude. Any objection is considered disrespectful, especially in the academic environment, where increased power distance according to the title is perceived as normal. According to these results, employees in the research assistant position believe that they might encounter judgmental or critical attitudes when expressing their opinions clearly. In addition, they fear the negative reactions they may receive from their managers due to increased workloads. Participants in the study argued that various factors contribute to employee silence, including work-related fears, authoritarian executive characteristics, the prevalence of fear cultures within organizational structures, and the uneasiness of being socially isolated. These factors collectively reinforce the behavior of remaining silent among research assistants.

Participant 7, a male, remarks, *“A research assistant who knows how to behave, sit, and talk in the working environment typically adheres to courtesy rules. Personally, I have always respected these rules with all my managers, or at least I believe I have. However, adhering strictly to courtesy norms can sometimes hinder effective communication. I refrain from highlighting mistakes made by higher-level managers, particularly in collaborative projects, opting instead to correct them myself out of courtesy.”*

Participant 8, a male, suggests, *“The prevalence of courtesy rules may contribute to this silence, hindering healthy information sharing. While our profession may appear respectable from the outside, excessive adherence to improper courtesy norms exists within. Since childhood, we have been taught to respect our superiors, including managers. This mentality persists, creating barriers to open communication. I often feel that this improper courtesy culture is sufficient to prevent the sharing of business-related information. Furthermore, the significance placed on titles outweighs factors such as age or job role, intensifying the issue.”*

Participant 8, a female, expresses, *“At times, I refrain from sharing information due to courtesy rules. I choose silence to avoid reactions like ‘Do you know more than I do?’ I believe that some higher-level colleagues may react critically to open discussions on certain topics, which could hinder constructive outcomes.”*

Participant 11, a female, explains, *“When issues are raised, there is a fear of being targeted publicly, which silences me. Targets are indirectly identified rather than directly addressed. Additionally, hierarchical structures in meetings lead to one-sided information sharing. Due to infrequent meetings, we are not accustomed to expressing our thoughts freely.”*

As evident from the findings, there are notable challenges in downward communication within the chain of command. In this context, the quality of communication between department managers and employees outweighs the importance of communication tools or messages (Glaser, 1984). To address this, it is necessary to review attitudes toward role distribution. Regardless of one’s role, rank, or reputation, workplace norms should prioritize mutual respect. Managers must refrain from adopting a management style that fosters a culture of fear, leading employees to remain silent for self-protection, a key contribution to organizational silence. Such management approaches detrimentally impact organizational behavior, academic pursuits, career progression, organizational socialization, workplace well-being, self-confidence, and individuality (Yaman, et al., 2010).

Finally, it is apparent that research assistants exhibit a tendency toward silence due to job insecurity. Despite harboring thoughts and opinions, they hesitate to voice them, fearing insufficient support from colleagues and managers.

Participant 1, a male, remarks, *“Job insecurity is our primary concern, perhaps intensified by the political climate in the country. We refrain from discussing certain topics, fearing potential repercussions that could jeopardize our employment security.”*

Participant 8, a male, reflects, *“The power distance sometimes appears to be a vindictive sanction in our workplace. For example, one becomes more often controlled*

*by investigations, threats, and overtime obligations prevalent in our faculty. Naturally, job insecurity is a significant concern. Our profession ties us closely to the university, making it challenging to transition elsewhere without uprooting our lives. Private sector opportunities are not always readily available, especially considering my specialization in research over the past seven or eight years. This lack of practical knowledge outside academia intensifies anxieties about employability. Consequently, I have developed a defense mechanism, I withdraw and remain silent.”*

Participant 9, a female, laments, “*Regrettably, support is lacking when issues are reported. Despite receiving validation among ourselves after the meeting, those who agree during the meeting often fail to support each other afterward. This reluctance stems from a sense of unease, driven by anxieties about job insecurity.*”

In this section, participants share their personal experiences, highlighting employees’ sensitivity to organizational challenges. Despite their awareness and ability to evaluate the situation, they often feel a lack of support and trust from colleagues. Job insecurity and anxiety compel them to remain silent. It is believed that unity among employees at the same hierarchical level in expressing organizational issues and supporting each other will empower top management to take more constructive steps in addressing these issues.



Figure 1. Word cloud

It is evident from the interviews with research assistants that their tendency toward silence primarily stems from the organizational culture and their position within it (Cohen & Baruch,

2022). This behavior reflects a broader perception of how their institutions are managed. The prevalence of expressions such as power distance, the significance of the title, and being disregarded due to lack of experience suggests that organizational management styles align with their perception of silence and organizational culture. It is evident that employees with this title tend to remain silent due to anxiety about being targeted or facing criticism. This aligns with the concepts of *acquiescent silence* and *defensive silence* found in the literature, where silence serves as a form of self-protection and withdrawal (Vakola & Bouradas 2005). Mutual distrust within the organization further intensifies this reluctance to speak up, as employees fear repercussions for expressing their opinions on related issues (Detert & Edmondson, 2005). Defensive silence, rooted in the literature's notion of a fear culture, underscores fear as a primary motivator for organizational silence (Akan & Oran, 2017).

Once again, social factors emerge as a significant determinant of the constitute of silence, as revealed by participants' responses. The social factors cover the harmony among employees, the distribution of obligations, and the overall atmosphere of insecurity within the organization. Participants' responses indicate a reluctance to be perceived as troublemakers in the work, leading them to avoid conflicts and doubt their ability to garner sufficient support even when expressing their ideas. This finding aligns with *the prosocial silence dimension* highlighted in the literature. Moreover, the lack of communication in the workplace prevents employees from accessing maximum information about organizational issues and participating effectively in organizational processes (Ulker & Kanten, 2009). Consequently, the organization becomes enveloped in a "spiral of silence," wherein individuals refrain from expressing their views due to perceived social pressure and fear of negative consequences (Noelle-Neumann, 1991).

The responses indicating a keen sense of power distance also suggest the presence of a climate of silence stemming from *the institutional arrangements*, which is consistent with findings in the literature. Park and Keil (2009) assert that the climate of silence often arises from managerial practices. Rhee et al. (2017) examined the relationship between power distance and silence among workers in a heavy industry company in South Korea and found that power distance significantly influenced organizational silence. Similarly, Ayan (2015) discovered in their study on banking sector employees that transformative leadership style negatively affects organizational silence, whereas authoritarian leadership styles have a positive effect on organizational silence (see also Cohen & Baruch, 2022). In academic studies, Sağlam et al. (2018) identified a significant relationship between power distance and organizational silence. Likewise, Aydin et al. (2016) observed that research assistants tend to remain silent in cases characterized by power distance. In a qualitative study by Bayram (2010) on the organizational silence of academicians, significant variations in organizational silence scale scores were noted among academicians with different titles, depending on their duration of work, age, and administrative duties.

## Discussion and Conclusion

The findings of this study underscore institutional factors as the primary driving force behind the silent attitude observed among research assistants. Many participants expressed beliefs that the hierarchical structures within their institutions hinder the free sharing of ideas, opinions, and suggestions, fostering a culture of submission and increasing the tendency to remain silent. However, organizations benefit from employees who are willing to share their knowledge and ideas without reservation (Quinn & Spreitzer, 1997). By removing some organizational and administrative barriers, creating a positive organizational culture, and providing the necessary support, organizations can empower employees to comfortably and freely use these skills (Cohen & Baruch, 2022; Dimitris & Vakola, 2007; Boyukaslan & Aşıkoğlu, 2022).

Furthermore, the research revealed that research assistants often refrain from speaking up due to their perception that their ideas will not be valued. Consequently, they may abandon efforts to address organizational issues and withdraw from active participation. This behavior is characteristic of employees who feel that their contributions are disregarded and believe that their suggestions will not affect changes, leading to a sense of learned helplessness (Vakola & Bouradas, 2005). Drawing on Hofstede's cultural framework (1980), Turkish culture exhibits characteristics of high power distance, where authority is highly valued and respect is expected. In such cultures, adherence to courtesy rules often takes precedence, leading research assistants to opt for silence as a means of self-preservation, fearing the negative consequences of expressing dissenting opinions.

### Theoretical and Practical Implications

The present study contributes to the literature on employee silence by examining power distance as a key factor influencing silence within university settings. Through qualitative analysis, this study unveils specific patterns linking academics' silence behavior to power distance, particularly highlighting the impact of excessive courtesy stemming from power distance on organizational silence. These findings are particularly significant considering the crucial role that universities play in various developmental areas. It is crucial for universities, as centers of innovation and knowledge dissemination, to foster an environment where all employees, including research assistants, feel empowered to voice their ideas and opinions. Silence exhibited by research assistants can have negative effects on both individual well-being and organizational effectiveness. Over time, employees who adopt a silent attitude may become disengaged from their work, leading to difficulty in meeting performance expectations. Based on the research data, it is crucial for universities to implement reforms aimed at facilitating open communication and idea-sharing among all employees. This may entail revisiting central and hierarchical management structures and considering

alternative management approaches, such as lean and participative management. In addition, developing robust feedback mechanisms and establishing effective communication networks across different organizational units and hierarchies are crucial steps in fostering an inclusive organizational culture.

The perception among research assistants that their ideas and opinions are disregarded due to their titles, or that their expectations will not be fulfilled even if they openly express themselves, serves as a significant factor driving their silence. To alleviate this sense of learned helplessness, it is recommended that academicians with higher titles should reconsider their interactions with research assistants and actively encourage their participation in decision-making processes. This can be achieved through the implementation of practices that foster constructive conflict resolution, as suggested by Kirchmeyer and Cohen (1992).

### Limitations and Avenues for Future Research

One important limitation of this study is its focus on a small group of research subjects. Although the sample size does not allow for generalization to other professional groups, our findings provide theoretical insights into how power distance could shape organizational silence. Future studies further explore the role of personal-psychological variables in the development of a culture of silence (see, for example, Cohen & Baruch, 2022). Consequently, the study findings may not be readily generalizable to other cultures. Considering this limitation, researchers are encouraged to conduct studies in other countries to comprehensively analyze the relationships between the behavior of silence, academicians, and power distance.

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**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.C., E.Ö., S.N.; Data Acquisition: S.N., S.N.; Data Analysis/Interpretation: A.C., S.N.; Drafting Manuscript: A.C., S.N., S.N.; Critical Revision of Manuscript: A.C., E.Ö.; Final Approval and Accountability: A.C., E.Ö., S.N., S.N.

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# Istanbul Business Research

Submitted: 22.11.2022

Revision Requested: 10.07.2023

Last Revision Received: 11.07.2023

Accepted: 29.03.2023

## RESEARCH ARTICLE

# Where Should a New Graduate Start? A Multi-Source Evaluation of the Banking Sector Business Analyst Signals in an Emerging Economy

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### Abstract

Many of the existing studies focus on aligning occupations with higher education curriculum. However, it is known that with the ever-changing technology, skill requirements are constantly shifting. This discrepancy between education and employer demands can make it difficult for graduates to prepare themselves for the labor market. Accordingly, this study aims to assess the business analyst profession and recommend key skills for new graduates. We begin by analyzing the business analyst job ads within the Turkish banking sector. The research benefits from the professional qualifications of business analysts (n=15) in the National Occupational Standard (NOS) established by the Turkish Vocational Qualification Authority (VQA), including opinions of expert business analysts in the job analyst profession, to determine which skills are of critical importance. We interpret employer instrumental signals in job ads (n=323) from different sources with content analysis. Analytical thinking skills, knowledge of foreign languages, reporting, communication skills, and aptitude for teamwork and innovation are the most sought-after skills. Advertisements often request knowledge of SQL and Office programs and soft skills (SS). We have observed that the hard/technical skill requirements (such as Agile, Scrum, and Python) differ between employers. Our results emphasize that graduates should not be content with university courses, especially for developing SS.

### Keywords

Business Analyst, Job Advertisements, Content Analysis, Signal Theory, Instrumental Signals

## Introduction

Because the conditions of businesses are subject to constant and dynamic change, we believe that employers expect candidates to meet the current criteria and have skills that the position may require in the future before inviting them for an interview. Adapting study programs to labor market requirements based on changing conditions is one of the main challenges faced by higher education institutions. These institutions have understood the need to not only equip individuals with hard skills (a set of recognized qualifications, such as diplomas

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**To cite this article:** Çakmak, B. Y., & Yiğit, B. (2024). Where should a new graduate start? a multi-source evaluation of the banking sector business analyst signals in an emerging economy. *Istanbul Business Research*, 53(1), 61-80. <http://doi.org/10.26650/ibr.2024.53.1208513>



and certificates) but also to foster a type of education that encompasses soft skills (SS; a set of competencies specific to individuals: motivation, traits, aptitude, aspects of self-image, and social role) (Garcez et al., 2022). Hard skills are technical knowledge or training that you have gained through any life experience, including in your career or education, while soft skills are personal habits and traits that shape the manner in which you work on your own and with others (Birt, 2023).

Job opportunities increase when graduates are equipped with skills appropriate to the needs of businesses. The skill requirements of the jobs they apply for are unknown to many new graduates. Although on-the-job education can be seen as vital, new graduates are more likely to be recruited if they can signal competency for the position. At this point, the signal is defined as the information obtained from the CV or job interviews which indicate that a person is competent in the skills required for the job (Blickley et al., 2013). The existing literature focuses on two things: the education programs which impart skills to graduates and market expectations (Jaric & Deric, 2019; Rowe et al., 2020; Tyranska et al., 2021). In this study, we have interpreted employer signals by comparing them with the experts in the field and the Turkish national occupational standard data sources to identify the areas where graduates first need to improve themselves.

The signal theory is used to explain the behavior of individuals or businesses when they access different information. Typically, the sender has to choose how to transmit this information, while the other party, the receiver, has to decide how to interpret the signal. Thus, this theory is an essential component of management literature, including strategic management, entrepreneurship, and human resource (HR) management (Connelly et al., 2011).

Because the banking sector must take current (YuSheng & İbrahim, 2020) and innovative (Tajeddini et al., 2006) measures to adapt to the increasingly competitive environment, qualified personnel are needed. According to Agile Turkey's (2021) annual report on 415 companies, the adoption rate of agile applications in the banking and finance sector has the highest rate among the sectors, at 29%. Agile is a current business phenomena which focuses on how well organizations respond to change. Organizational agility refers to a firm's ability to cope with ever-changing market conditions, accelerate processes, and thrive by taking advantage of unforeseen and emerging business opportunities (Lu & Ramamurthy, 2011). The work of business analysts is critical in terms of adapting technology into the business world (Richards & Marrone, 2014), projecting the demands of internal and external customers in order to determine solution proposals (O'Loughlin, 2009). For this reason, the qualifications of business analysts are more important within the banking sector.

In this article, we aim to present an assessment of the business analyst profession in terms of which skills new graduates and early career job seekers can focus on, while obtaining information about the professions in which they are interested. The research thus contributes to the

current understanding of the business analyst profession within the banking sector in Türkiye, as well as factors which affect the employability of new graduates. It provided information about the resources that can benefit new graduates who will enter the labor market, besides the job ads. As far as we could determine, this is the first such study in Türkiye that brings together three skill definitions for the same profession. Whereas the existing literature focuses on the skills that education programs offer to graduates and the expectations of the job market (Tyranska et al., 2021), this study allows the interpretation of employer signals by pointing out the areas where graduates first need to improve themselves. We believe that graduates who realize how knowledge of the primary skills compares with the expectations of professionals and employers can more easily identify the education they need to achieve their goals.

We aimed to evaluate the business analyst profession in terms of which skills new graduates and early career job seekers should prioritize when seeking information about the professions in which they are interested. To achieve this goal, the article is structured as follows. In section 2, following this introductory section, we present the literature review in terms of studies related to the business analyst profession. In section 3, we describe the methodology steps that describe this study as qualitative research based on secondary empirical data (online job ads), in-depth interviews with professional business analysts, and an examination of the national occupational standard. In section 4, we present the findings and the discussion. In section 5, we conclude the discussion and make recommendations for future research. Following the conclusion, the limitations of the research are discussed.

## Literature Review

In today's technology-driven world, information technology (IT) plays a critical role in organizational functioning. Digital skills and the emergence of new information and communication technologies are regarded as essential tools that enable organizations to transform their operational processes, strategic vision of business models, and customer relationships (Ferreira et al., 2019). The ability of institutions to respond to these processes faster than their competitors has become crucial in gaining a competitive advantage (Shukor et al., 2020).

The banking sector has been at the forefront of the technological revolution, characterized by the revitalization of digital services, rapid delivery, and innovative advancements in banking applications (Krasonikolakis et al., 2020). Traditionally, the banking industry has been focused on cost reduction and streamlining operations to enhance efficiency. However, today, the digitalization of the banking sector is expected to not only improve operational efficiency and flexibility, but also meet the ever-expanding customer needs at a high level. Consequently, cost reduction and increased productivity enhance competitiveness, producing a value chain that fosters the utilization of knowledge to support innovation and decision-making processes (Rodrigues et al., 2022).

Due to its financial structure, utilization of advanced technology, and complexity of transactions and processes, the banking sector requires agility. According to a report by Agile Türkiye (2021), Agile practices are predominantly preferred in the banking sector, accounting for 29% of its application. Agile is one of the current business phenomena which focus on how well organizations respond to change. Organizational agility refers to a firm's ability to adapt to ever-changing market conditions, expedite processes, and thrive by leveraging unforeseen and emerging business opportunities (Lu & Ramamurthy, 2011). Agile business processes and IT systems safeguard and support model changes, allowing for immediate responses to opportunities and threats (Arsanjani, 2005). Although there are limited studies on Agile practices in the Turkish banking sector, those available emphasize the importance of flexibility, speed, trend monitoring, prompt decision-making, and customer orientation (Mızrak and Mızrak, 2020) while discussing their sub-dimensions (AI, 2022). AI (2022) found a statistically significant and positive relationship between the "knowledge production" sub-dimension of the knowledge management scale and the "responsiveness" sub-dimension of the organizational agility scale, highlighting the statistical associations between knowledge management and organizational agility.

Agile practices are significant in allowing business analysts to uncover the inherent value of their organization (Zajac-Woodie, 2013). As per the Turkish Vocational Qualifications Authority's definition (VQA, 2013), business analysts are skilled professionals responsible for preparing software development projects, designing projects, and conducting improvement studies. In this process, business analysts prioritize and analyze the perspectives of internal and external stakeholders, identify information technology solutions and solution dynamics (Kravchenko & Bruskin, 2017), and manage projects (Park & Jeong, 2016). These steps contribute to the production of robust, risk-free, and efficient solutions (Ten Vaanholt, 2008). They also enable continuous improvement that is aligned with project goals and requirements (Apine, 2013; Babok, 2015), which is a critical factor in determining the success or failure of a business (Bjarnason et al., 2011; Park & Jeong, 2016).

The role of a business analyst involves documenting user requests to ensure that developers and testers comprehend the expected outcomes, as well as facilitating effective communication within the team. Developing a contract for each request facilitates mediation among administrators, developers, and testers to establish agreement on the details of every issue. Additionally, business analysts assist in understanding, prioritizing, and elaborating the content of the Product Owner's backlog (Gregorio, 2012). Such a job description should highlight the fact that the business analyst role is not static, but rather adaptive to the context of specific projects. Business analysts aid in identifying business problems and guiding a team towards optimal solutions, recognizing that each problem and its corresponding solution are unique (Zajac-Woodie, 2013).

Studies have identified different skill sets for the business analyst profession. O’Loughlin (2009) has grouped the skill set required for a business analyst into four main categories: analytical, communication, technical, and business skills. Verma et al. (2019) defined the skill set of a business analyst as: decision making, organization, communication, content knowledge, and structured data management skills. Sonteya and Seymour (2012) incorporated Viitala’s (2005) competency pyramid into their study and produced a skill set for business analysts. This skill set consists of five dimensions: fundamental, interpersonal, organizational knowledge, business process management, and technical. Park et al. (2016) determined six competency dimensions consisting of 30 competencies, including: behavior, knowledge, analysis, thinking, communication, and interaction. Many studies have also emphasized that soft skills are as valuable as hard/technical skills (Apine, 2013; Crawford et al., 2011; O’Loughlin, 2009; Richards & Marrone, 2014).

Although there are international studies on the qualifications of business analysts (O’Loughlin, 2009; Verma et al., 2019), we have not come across any studies that deal with business analysts in the Turkish banking sector. Considering the popularity of Agile applications in banks and the diversity of business analysts’ projects, we believe that examining business analyst job postings in the banking sector will reflect the skills required by the profession in an up-to-date and comprehensive way. Job postings are frequently referenced sources on which qualifications are requested and applied (Robinson, 2021; Verma et al., 2019). Studies have utilized job postings in different ways, such as indicating change in qualifications with longitudinal data (Robinson, 2021) or revealing skill requirements of occupations (Verma et al., 2019). The skills which employers demand, can be seen as signals that provide insights about the job and business for candidates. Signal theory provides a useful argument for interpreting job postings. Studies have explained the views of candidates (Madan & Madan, 2013), the views of employees (Kim, 2019), employers’ views (Renfro et al., 2020), and job postings through signal theory to reveal clues which provide detailed information about jobs (Poba-Nzaou et al. others, 2020).

Spence’s (1973) signal theory is widely used in management studies. Signal theory (Spence, 1973) aims to inform job seekers about the details required for the post. Job seekers have limited knowledge of organizations and jobs, which means that they have to rely upon job postings to learn about opportunities and make their employment decisions. In this respect, the theory provides the rationale for why job postings are critical for employers and job seekers, as well as why job postings are appropriate resources to search for competencies required for recruitment (Poba-Nzaou et al., 2020).

Signal theory also has instrumental and symbolic implications (Highhouse et al., 2007). While instrumental inference is expressed by a job offer, job description, and characteristics, symbolic inferences express subjective and abstract qualities, such as corporate image, cul-



ture, prestige, competence, and robustness (Lievens & Highhouse, 2003; Van Hoye et al., 2013). Many researchers have examined the instrumental and symbolic signals found in job postings (Ganesan et al., 2018). This study offers suggestions for the interpretation of instrumental signals through different data sources and contributes to the discussions on where new graduates should start when preparing for their chosen profession.

The study is based on three research questions:

Q 1: What skills do employers look for when hiring business analysts?

Q 2: What are the critical skills for business analysts?

Q 3: Where should a new graduate who wants to become a business analyst start?

## **Methodology**

Previous studies have been built upon gathering a wide array of data from job ads (Kovacs & Zarandne, 2022; Lipovac & Babac, 2021; Verma et al., 2022; Walek & Pector, 2021; Wroblowska, 2019; Xiangdong, 2022; Zhou et al., 2022). This method reflects growing trends in the market and changing demand for the skills required in specific roles (Harper, 2012). This research employed data from three different data sources. Two of these are based on secondary empirical data (online job ads. and data of NOS), while the other concerns primary empirical data obtained from in-depth interviews with professional business analysts. We applied the qualitative analysis method and content analysis technique for the analysis and association of these data. Content analysis is the systematic reading of texts, images, and symbolic material, regardless of the author's or user's personal bias (Krippendorff, 2018). It is an effective reading method which emphasizes similarities and differences between the different data.

In the sub-headings of the methodology of the study, information will be given about the methods of obtaining the data used, their content, and the different stages of analysis.

### **Job Ads**

Job ads were obtained from Kariyer.net, one of Türkiye's most popular employment matching sites. We used common business analyst keywords (such as junior and senior) to test the keywords and filters of the site, we tested business analyst keywords (like junior, and senior), before summarizing the search results. We analyzed 741 business analyst job postings for the banking sector between March 15 and May 30, 2022 We chose job ads with keywords that directly matched the words "banking sector" and "business analyst" that required previous experience. Duplicate job ads were pruned from the results, which left us with 323 postings.



Job ads included the following: position title, level, department, general qualifications, and employer information. The various stages of the Content Analysis stages as they were carried out will be explained below.

The first step in content analysis is to understand and analyze the content of the job posting by carefully reading it. Two authors and a human resource specialist preflighted the job posting text to identify keywords and locate the requirements and expectations. This control phase refers to a content analysis that involved coding the demands of each of the examined job postings. This stage was key to determining the qualifications, experience requirements, and skill sets of the positions in question.

To establish the categories and to ensure the validity of the similarities between the demands, the authors sent the codes to two expert business analysts. We created two categories by the thoughts of experts:

- T-SQL, PL-SQL, and SQL were categorized under the word SQL
- Uipath, Rapidminer, Blue Prism, Orange, and Weka were categorized under the word RPA (Robotic Process Automation)

Based on the qualitative concept of data saturation (Corbin & Strauss, 2015), after analyzing a certain amount of job ads, the researchers found that no new concepts were emerging from the data, and thus concluded that the sample size was sufficient. Table 1 below illustrates the frequencies of codes (and the categorized codes).

Table 1  
*Frequency of Demands In Job Ads.*

<b>Demands</b>	<b>Count</b>	<b>Percentage</b>
Communication	323	100,00%
Foreign Language	323	100,00%
Analytical Thinking	323	100,00%
Teamwork	323	100,00%
Problem Solving	323	100,00%
Innovative	323	100,00%
Office Programs	323	100,00%
SQL	323	100,00%
Reporting	291	90,09%
Agile	241	74,61%
Scrum	234	72,45%
Flexible Working Adaptation	163	50,46%
Python	159	49,23%
Leadership	154	47,68%
Ethics	144	44,58%
Time management	144	44,58%
QlikView	99	30,65%

<b>Demands</b>	<b>Count</b>	<b>Percentage</b>
QlikSense	99	<b>30,65%</b>
Project planning	97	<b>30,03%</b>
Jira	81	<b>25,08%</b>
Visio	72	<b>22,29%</b>
RPA	45	<b>13,93%</b>
Draw.io	45	<b>13,93%</b>

## Interviews

LinkedIn profiles were scanned to identify professionals for interviews and reach business analysts in the banking sector. Questions were obtained from the opinions of the most senior business analysts in the industry and banking sector recruiters. All of the professionals involved in the study are in charge of a team of business analysts. For the first interview, we sent the interview questions to 37 professional business analysts with at least five years of experience. Questions were open-ended Google forms and were meant to reveal the general thoughts of the business analysts we contacted. We received 15 responses and conducted semi-structured second interviews with the same experts to further elaborate the answers they provided (**Table 2** includes the demographic data of the professionals). We also requested that the experts produce a skill pool that could be used to produce a road map of how new graduates would be able to step into the role of business analyst. It took an average of one hour for the participants to answer all of the open-ended questions. All participants answered the same questions on a standardized question form.

We left some sections of the Google form flexible to allow the respondents to make recommendations, in order for us to precisely identify the job requirements of the business analyst position. We interviewed each analyst twice to ensure there were no missing or misunderstood questions on the form.

Table 2  
*Demographics of Interviewees*

<b>Experts</b>	<b>Gender</b>	<b>Age</b>	<b>Experience at the Head of an Analyst Team</b>	<b>Industry</b>
M1	Male	30-34	0-2 years	Bank Sector
M2	Female	30-34	0-2 years	Bank Sector
M3	Female	25-29	2-4 years	Bank Sector
M4	Female	25-29	2-4 years	Bank Sector
M5	Female	25-29	0-2 years	Bank Sector
M6	Male	25-29	2-4 years	Bank Sector
M7	Male	35-39	10+ years	Bank Sector
M8	Female	25-29	4-6 years	Bank Sector
M9	Male	25-29	4-6 years	Bank Sector
M10	Female	25-29	4-6 years	Bank Sector
M11	Male	25-29	4-6 years	Bank Sector
M12	Female	30-34	6-8 years	Bank Sector

Experts	Gender	Age	Experience at the Head of an Analyst Team	Industry
M13	Female	25-29	2-4 years	Bank Sector
M14	Male	20-24	0-2 years	Bank Sector
M15	Female	35-39	10+ years	Bank Sector

### National Occupational Standard (NOS)

The third data source is the business analyst profession skill set in the national standard of professions created by the VQA. The National Occupational Standard (NOS) refers to the minimum norm that the VQA accepts as the necessary knowledge, skills, and attitudes for successful performance of a profession. The professions to be standardized are determined by the Board of Directors, considering the priority needs of the labor market and educational institutions and the recommendations of the sector committees (VQA, 2013). An I.T. business analyst is defined as a person who prepares a software development project, designs the project, coordinates the development studies, tests the compatibility and operability of the software within the application environment, completes the software documentation, makes the preparations for the implementation of the software, and coordinates software improvement studies. This position is a qualified professional who follows development throughout all stages (VQA, 2013).

## Findings and Discussion

The findings of all three stages should provide banking industry business analysts with instrumental information regarding new graduates. In this section, we provide the findings of the three data sources, discussing shared and separate skills.

### Findings of Job Ads

The list of skills obtained from the job ads is shown in Table 1 above. All ads include SQL, foreign language, analytical thinking, teamwork, problem-solving, and the ability to use office programs. Agile project management, Scrum methodology, and reporting skills are also frequently requested.

We followed the definition of Sisson and Adams (2013), which states that hard and soft skills include a combination of more task-oriented technical and/or cognitive knowledge, while soft skills on their own include personal behaviors, values, or skills, including ethics, communication, leadership skills, and teamwork. The study supports the findings of other authors (Brown & Hesketh, 2004; Calanca et al., 2019; Chamorro-Premuzic et al., 2010; Finch et al., 2013; Rivera, 2012; Szydło, 2021) that emphasize soft skills more frequently. The Agile Türkiye (2021) annual agility report observed that the Scrum methodology is pre-

ferred in 92% of Agile organizations. This information is also reflected in instrumental signals. Agile and Scrum demands reveal that teammates with experience in project design and management are sought as non-senior business analysts. Scrum is the framework of agile methodology as it focusses on the day-to-day project management and is the most widely adopted agile project management method (Hayat et al., 2019). In addition, foreign language knowledge, which is frequently requested in job advertisements (Genc, 2012), continues to be among the most demanded skills.

In addition to business analyst positions requiring a bachelor's degree, we have observed a requirement for graduated from the engineering and social science programs. All the degree sections mentioned in the advertisements are as follows: math, mathematical engineering, industrial engineering, computer engineering, management engineering, software engineering, electronic engineering, insurance, actuarial, statistics, economics, management information systems, information technologies, business, and physics.

## **Interview Findings**

We presented demographic data about the professional business analysts interviewed in Table 2. The common feature of all the individuals included in the study was that they worked in the banking sector and served as the leader or manager of an analyst team.

In the responses provided to the question regarding the definition of a business analyst, the analysts expressed that they possess qualities of: innovation, being able to devise solutions or projects to address specific or requested problems, diligently adhering to business processes, and assuming accountability. Participant responses include:

- “To generate the solution for any business need, after clarifying the requirements by asking the right questions, designing the optimum system, and preparing the documentation for the software of this system.” (M2)
- “Person in charge of the entire process, both business and technical, before, during, and after the development.” (M3)
- “It is the individual that examines the demands coming from the business unit and takes the necessary actions; they are a team player.” (M6)
- “It is the person who evaluates the business processes, determines the needs and the optimum solutions, then follows the actions to be taken for the solutions.” (M8)
- “People who carry out the processes of detailing the needs of the business units, projecting and commissioning the project. In addition, he/she is the person who thinks about solving problems and finds solutions.” (M9)

It is also noteworthy that the analyst's job is not directly related to software while carrying out this task. Participants described the job as:

- "The business analyst's job is not to transfer requests directly to the software." (M4)
- "It refers to all my friends who do not want to continue their professional life with coding, but still possess algorithmic logic." (M7)

It is seen that analysts are in a position not to produce software directly in banks but to plan the design and determine the framework. The survey questions about the duties and functions of the business analyst in the organization heavily emphasized process design and management, analysis, and planning projects. Participants stated:

- "Project management, process design, screen design, and testing." (M1)
- "Receiving the business units' requests, making a needs analysis, determining the project scope accordingly, defining the flow to the software teams, communicating at the integration points between the teams, performing the customer acceptance tests with the business units, and producing the analysis documents." (M5)
- "We undertake analysis, design, and testing tasks." (M11)
- "Process analysis, testing, and coordination." (M12)
- "Scope analysis, functional analysis, testing, user acceptance test organization, and reporting." (M13)

Business analysts are required to be part of a team. Analysts take responsibility for a project and try to design the least costly solution quickly and effectively. Analysts are good communicators who can analyze and organize critical information and direct team members (Arsanjani, 2005; Vongsavanh & Campbell, 2008). In the questions regarding the skills new business analysts need to develop, experts often express effective communication, problem-solving, reporting, time management, teamwork, analytical thinking, innovation, ethics, and adaptability to flexible working. Participants stated:

- "While doing my job, I think that apart from hard/technical skills, it is imperative to demonstrate qualities of curiosity, robust analytical capabilities, effective communication skills, and the ability to guide the team." (M3)
- "In order to excel as a proficient business analyst, it is necessary to be social, solution-oriented, innovative, and have communication, writing, and analytical thinking skills." (M4)
- "The first essential criterion for a business analyst is the ability to think analytically. This is shaped by good education and personal characteristics." (M5)

- “People who can think analytically, enjoy problem-solving, attach importance to ethical values, and use time well are suitable for this profession.” (M7)
- “In addition to hard/technical skills, it is necessary to have skills such as problem-solving, research, communication skills, coordination between business units, reporting, asking the right questions, concluding a subject by thinking analytically, organized, and innovative.” (M10)
- “The most important feature of a business analyst, besides hard/technical skills, is communication. Communication, understanding, and patience are important.” (M14)
- “I think detailed planning, a multidimensional perspective, analytical thinking, and a love to work are necessary to be a business analyst.” (M15)

In answers to the same question, participants stated that it would be helpful to know SQL, MS Office, and some specific programs from data query languages. Participants stated:

- “I think office programs, SQL, and MS Office should be known in order to be a business analyst.” (M3)
- “To be a business analyst, it is necessary to know SQL, MS Office, and Python programs.” (M5)
- “An analyst should make good use of SQL, Office Programs, Visio, and Jira.” (M6)

### **Findings of National Occupational Standard**

NOS is the minimum norm that the VQA accepts. It requires the necessary knowledge, skills, and attitudes for the successful performance of a profession in Türkiye (VQA, 2013). As in other data sources, the most common skills include: knowing a foreign language, analytical thinking, communication skills, teamwork, solution orientation, and knowing how to use office programs. Office programs were evaluated in the same code in all data, although Microsoft was not mentioned as a commercial enterprise when referring to Office programs.

As an exception, SQL was not specified in the same code, owing to the concern of being unable to point to the commercial or direct program name, even though the database information is mentioned in the NOS, and we sought a one-to-one word match. Database, system, and application software skills are included as general titles in the NOS. Still, the programs (SQL, Python, Jira, and Visio) that these skills correspond to in practice are specified separately in job ads and interviews.

Some other basic skills not covered in different data sources are listed in NOS. These include: basic first aid knowledge, international quality standards knowledge, occupational health and safety knowledge, firefighting knowledge, and labor legislation knowledge. This

information reflects the basic requirements common to all occupational groups.

### Comparison of Data Sources

The clusters in Figure 1 illustrate the skills and qualifications of business analysts listed in the NOS prepared by the VQA. In addition, they demonstrate the criteria sought in the job ads for business analysts and the skills and qualifications obtained as a result of interviews with business analysts who constituted the application area of the study. We used the Draw.io program to draw the figure.



Figure 1. Clusters of business analyst skills and knowledge

Studies highlight the importance of soft skills in business analysts (Loughlin, 2009; Richards & Marrone, 2014). All data sources also emphasize that soft skills are critical. Problem-solving, analytical thinking, teamwork disposition, reporting skills, openness to improvement, and foreign language knowledge were the most frequently encountered critical skills in all data sources. We think university education should address these skills through different courses. In addition, interviewees stated that graduates benefit from ethical sensitivity, planning skills, leadership, and time management. The ability to adapt to flexible working

adaptation is the only soft skill sought in job ads but not highlighted in interviews and by the NOS. Office program skills and knowledge of data query language (SQL) were the most critical hard/technical skills. Although there are data query language courses, especially in engineering departments, universities should devote time to the self-development of office programs by assigning proper homework. These demands apply to knowledge of Python, Jira, Visio, Qlik Sense, Qlik View, Agile, Scrum, Draw.io, and Robotic Process Automation (RPA) programs. These programs can be challenging to plan earlier in university education because they specifically relate to current job needs.

While flexible working hours were not mentioned in the interviews nor by NOS, employers frequently demand business analysts be open to such a schedule. Employers may want new graduates to be able to work under an intense pace and pressure when starting a job. The agile project management cycle and Scrum methodology are frequently mentioned in job ads. Although it is not mentioned in ads, it is thought that employers demand experienced teammates for projects.

### Critical Skills for Business Analysts

The most frequently requested skills for candidates entering the business analyst profession are presented in Table 3 below. Soft skills, such as problem-solving ability, teamwork predisposition, analytical thinking skills, openness to self-improvement (innovative), and communication skills, were identified as critical skills found across all data sets. Additionally, reporting skills, foreign language proficiency, using MS Office programs, and knowledge of the SQL programming language were the most important hard/technical skills. Adaptability to flexible working hours was the only soft skill mentioned in job postings. Furthermore, job postings highlighted the importance of knowledge in various programs beyond reporting, MS office programs, and SQL, as well as proficiency in the Agile and Scrum methodologies.

Table 3  
*Critical Skills for Business Analysts*

	Critical	Required
<b>Soft Skills</b>	Problem Solving, Teamwork, Analytical Thinking, Innovative Skills, Communication Skills	Flexible Working Adaptability
<b>Hard Skills</b>	Foreign Language, Reporting, SQL, MS Office Programs	QlikSense, QlikView, Python, Jira, Visio, Draw.io, Agile, Scrum
<b>General</b>	Basic First Aid, International Quality Standards Knowledge, Occupational Health and Safety Knowledge, Fire Fighting Knowledge, Labor Law Knowledge,	

Although Scrum was frequently mentioned in job postings, it did not appear in interviews nor the National Occupational Standards (NOS) data. By examining signals related to Agile and Scrum and consulting expert business analysts, it can be concluded that new business analysts are expected to work as part of a team in project design and management processes.



Experts suggest that the Agile and Scrum processes provide insights into employees' initiative, teamwork skills, interpersonal skills, motivation, flexibility, verbal and written communication skills, and stress resilience (M5). Additionally, while job postings do not provide a standardized skill set for the profession, the NOS offers a minimum set of norms for occupations.

## **Conclusion and Recommendations**

This study aimed to evaluate the business analyst profession and prioritize the skills that new graduates and job seekers should focus on when gathering information about their desired careers. To achieve this goal, we utilized interview data from job postings, the NOS as a professional standard, and interviews with expert business analysts, as these sources provide up-to-date information from the industry. Each dataset was manually coded using content analysis. The data were initially compared within themselves and then with each other to identify similarities and differences.

As job postings do not follow a standardized format, it is not always possible for employers to present the complete skill inventory, as they often focus on immediate demands. Therefore, we believed that evaluating employer signals in conjunction with other data sources (interviews and NOS) would yield more comprehensive results.

In the interviews conducted for this study, the participating business analysts described themselves as innovative individuals capable of devising solutions or projects to address specific problems, diligently adhering to business processes, and assuming accountability. They emphasized the importance of understanding the logic of algorithms rather than coding. Interviews and job postings emphasized the need for proficiency in certain data query languages that require algorithm mastery. It is worth noting that while Scrum and Agile are frequently mentioned in job postings, they were not mentioned in the interviews nor by the NOS information.

As stated in the literature, soft skills were consistently highlighted more than hard skills in all data sources (Apine, 2013; Crawford et al., 2011; O'Loughlin, 2009; Richards & Marrone, 2014). Critical soft skills identified included: problem-solving ability, teamwork predisposition, analytical thinking skills, openness to self-improvement, and communication skills. Additionally, foreign language proficiency, reporting skills, proficiency in using MS Office programs, and knowledge of the SQL programming language were identified as critical hard/technical skills. This finding addresses the research questions, emphasizing the predominance of soft skills while highlighting the importance of developing hard/technical skills, such as SQL and MS Office program knowledge, as initial steps. Furthermore, attention should be given to the development of soft skills throughout the educational journey.

The study makes several contributions. Firstly, it uncovers critical skills for the business analyst profession, particularly for recent graduates and early career job seekers. Furthermore, it presents a unique approach by comparing the profile of the analyst profession with job postings, the National Occupational Standards (NOS), and insights from expert business analysts working in the banking sector. This approach adds reliability to the data and offers valuable insights, especially in sectors like banking where agile applications are prevalent, continuously evolving, and rapidly translating customer demands into practice.

The study suggests that course curricula in higher education should place greater emphasis on soft skills to better align with current industry needs. For instance, incorporating more group work and student-led presentations into lessons can enhance students' communication and teamwork skills. Additionally, offering comprehensive courses and certificate programs can help individuals acquire the necessary hard and soft skills for the business analyst role. Lastly, the NOS can serve as a comprehensive and easily understandable reference for employers when posting job requirements. By providing minimum standards for professions, the NOS can guide newcomers to the sector.

Future research can be designed to cover various occupational groups, thereby equipping new graduates and early career professionals with the necessary skills for their chosen professions. Studies that promote the business analyst profession will contribute to its further development. Additionally, future studies can expand their scope by incorporating the ISCO 88 occupational classification system, which is the widely-accepted standard used throughout Europe.

### **Limitations**

The research has some limitations. The job ads are based solely on the advertisements that were obtained by web scraping weekly for ten weeks. Therefore, the acquired skills may not be final. The scope of the skills highlighted can be expanded with the wider job ads pool.

The research is also limited by the geography, only applying to the sample of Türkiye. A comparison of the results with another emerging country may contribute to different interpretations of instrumental signals.

The research targets a single sector and profession. Comparing the results with a similar methodology with different professions will benefit new graduates' career planning and choices. In addition, it can be thought that expanding the education curriculum and job ads, which are discussed with skill gaps or job adaptation, also to include sector employees, will allow for better observation of the transformation in industrial knowledge, skills, and demands.

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

**Conflict of Interest:** The author has no conflict of interest to declare.

**Grant Support:** The author declared that this study has received no financial support.

**Author Contributions:** Conception/Design of study: B.Y.Ç., B.Y.; Data Acquisition: B.Y.Ç., B.Y.; Data Analysis/Interpretation: B.Y.Ç., B.Y.; Drafting Manuscript: B.Y.Ç., B.Y.; Critical Revision of Manuscript: B.Y.Ç., B.Y.; Final Approval and Accountability: B.Y.Ç., B.Y.

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# Istanbul Business Research

Submitted: 02.02.2022

Revision Requested: 23.04.2023

Last Revision Received: 04.05.2023

Accepted: 09.04.2024

## RESEARCH ARTICLE

## Volatility Modeling and Spillover: The Turkish and Russian Stock Markets

Ahmet Galip Gençyürek<sup>1</sup>

### Abstract

This study investigates the internal and external (spillover) characteristics of the volatility of the Turkish and Russian stock market indices. To this end, generalized autoregressive conditional heteroskedasticity models that are classified as short memory (GARCH, EGARCH, GJR-GARCH, APARCH) and long memory (FIGARCH, FIEGARCH, FIAPARCH, HYGARCH) considering adaptive structure (Fourier series), and the rolling Hong causality methods are used. The analysis spans the years 2003–2020, revealing that the asymmetric power autoregressive conditional heteroskedasticity model is the most appropriate method in terms of both stock indices and leverage and long memory effects are evident in the volatility series. Bidirectional volatility spillovers between Turkish and Russian stock market indices are also evident in all time horizons. Investors can use volatility results for stock valuation, risk management, portfolio diversification, and hedging, and policymakers can consider the volatility results to evaluate the fragility of financial markets.

### Keywords

Stock Markets, Volatility, GARCH Models, Spillover, Time-Varying

## Introduction

Volatility modeling and forecasting are crucial because volatility is considered a risk measure (Yu, 2002; Terasvirta, 2009). Higher volatility indicates riskier assets and reveals instability (Bhowmik, 2013). In addition, volatility reflects the fundamentals of the market as well as critical information (Ross, 1989) and market expectations (Kalotychou & Staikouras, 2009). Therefore, volatility modeling is essential for asset allocation, risk management, stock valuation, derivative valuation, and hedging (Pindyck, 2004; Ewing & Malik, 2017; Wu & Wang, 2020; Zhang et al., 2020; Lyocsa et al., 2021).

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**To cite this article:** Gencyurek, A. G. (2024). Volatility modeling and spillover: the Turkish and Russian stock markets. *Istanbul Business Research*, 53(1), 81-101. <http://doi.org/10.26650/ibr.2024.53.162811>





The most frequently used models to measure volatility consider the conditional first moment. Returns on assets (first moment) have been assumed to be independent identically distributed (i.i.d.) random processes with zero mean and constant variance (Bollerslev et al., 1994; Xekalaki & Degiannakis, 2010); however, in the literature, variance has been reported as constant in the long-term, but changing during fluctuation periods (Kutlar & Torun, 2013). Studies by Engle (autoregressive conditional heteroskedasticity, ARCH) in 1982 and Bollerslev (generalized autoregressive conditional heteroskedasticity; GARCH) in 1986 considered these properties of time series and modeled the second moment (Chong et al., 1999). Since then, improvements have also been made to capture complex volatility dynamics (Brooks, 2007). Non-normal distribution, volatility clustering, the leverage effect, and long memory are the identified characteristics of the volatility of the financial time series (Carroll & Kearney, 2009). Volatility clustering indicates that “large changes tend to be followed by large changes —of either sign—and small changes tend to be followed by small changes” (Mandelbrot, 1963: 418), and indicates that volatility tends toward mean reversion (Bose, 2007). Volatility clustering and time series’ long memory properties are related. Long memory is a phenomenon observed in volatility clustering (Liu, 2000), which denotes a hyperbolic reduction in autocorrelations (Pong et al., 2008) and demonstrates that the market responds to the arrival of news slowly over time (Bentes, 2014). Therefore, researchers and investors can use past market movements to forecast future movement. Cognizance of the long memory property of time series helps to investigate the weak efficient market hypothesis, rejecting technical analysis. Heterogeneous information arrival and structural breaks may cause persistent behavior in volatility clustering (Andersen & Bollerslev, 1997). Liesenfeld (2001:173) noted that “short-run movements of volatility are driven by [the] news arrival process and the long-run movement of volatility by the sensitivity to news.” Empirical studies regarding volatility modeling show the volatility of asset prices to be considerably in persistent behavior. (e.g., Berger et al., 2009; Bentes et al., 2008; Baillie & Morana, 2009; Christensen et al., 2010; Chikli et al., 2012; Bentes, 2014; Nasr et al., 2016; Kuttu, 2018; Lahmiri & Bekiros, 2021). The leverage effect shows that “an unexpected drop in price (bad news) increases predictable volatility more than an unexpected increase in price (good news) of similar magnitude” (Engle & Ng, 1993: 1752). Christie (1982) indicated that financial leverage causes a leverage effect. A decrease in stock price elevates a firm’s leverage, and this circumstance enhances the risk borne by shareholders, and the expected stock return rises, along with the variance of stock return (French et al., 1987). A small number of researchers have explained the leverage phenomenon using volatility feedback. In cases of abundant positive news regarding the dividend policy, future volatility and expected return rises, and stock prices subsequently fall. In cases of abundant negative news regarding future dividend policy, stock price falls, as with the previous example and volatility and expected return increases, but this volatility deepens the negative effect of dividend policy and large negative stock returns are more prevalent, which can produce excess kurtosis (Campbell & Hentschel, 1992).



The features expressed (volatility clustering, leverage effect, and long memory) are obtained from analyses of the internal dynamics of volatility. This circumstance is referred to as a “heat wave” in the literature. According to this hypothesis, a shock in a market only affects the conditional volatility in that market (Engle et al., 1990). In addition, analyses of the external structure of volatility can also be conducted because volatility is affected by its own past fluctuations as well as fluctuations in other markets (Hong, 2001; Liu et al., 2017), which is referred to as a “meteor shower” (Engle et al., 1990). Two circumstances can cause meteor showers: trade and investment relationships and market psychology (Lin et al., 1994). The free flow of goods and capital and technological progress expedite the occurrence of meteor showers. Meteor shower (spillover) movement is consistent with the efficient market hypothesis (Koutmos & Booth, 1995). The research methods used to examine spillover include multivariate ARCH models (i.e., BEKK, VECH, CCC, DCC, cDCC, etc.), variance causality models (Cheung–Ng, Hong, Hafner–Herwartz), and spillover index models (Diebold Yilmaz, Barunik–Krehlik).

This study analyzes the properties of the univariate financial time series structure in Turkish and Russian stock market indices because both countries are considered emerging countries. From this perspective, the first aim is to determine the most relevant volatility structure of both countries’ leading stock market indices (BIST 100 and RTSI). Özden (2008), Kutlar & Torun (2012), Karabacak et al. (2014), Altuntas Taspunar & Colak (2015), Yildiz (2016), and Ay & Gün (2020) demonstrated that TGARCH is the most suitable ARCH model for stock market indices (e.g., BIST 100 - financial and industrial index-banking) in Türkiye; however, these studies did not consider long memory models in their studies. Koy & Ekim (2016) and Topaloğlu (2020) argued that GARCH or EGARCH are the most appropriate models for stock market indices according to the indices (e.g., industry, trade, services, banking, and financial) analyzed in Türkiye. Cevik (2012), Cevik & Topaloğlu (2014), Günay (2014), Gaye Gencer & Demiralay (2015), Büberkökü & Kizildere (2017), and Celik & Kaya (2018) revealed a long memory in conditional variance, asserting that and fractional integrated ARCH models are suitable for modeling volatility in stock indices. In addition, Kula & Baykut (2017) demonstrated that the GARCH model is the most appropriate model for BIST and RTSI among short memory models. Reviewing the results obtained in previous literature, it is apparent that the most suitable ARCH model depends on the methods used, the sample, and the time examined; however, volatility generally demonstrates long memory properties, which appears to reject the weak efficient market hypothesis.

The pairwise relationship between stock market index volatility in both countries has been also investigated because Türkiye and Russia are neighboring countries on the shores of the Black Sea and are highly interconnected, both politically and economically. In 2020, Türkiye’s exports to Russia amounted to 4.4 billion dollars, while Russia’s exports to Türkiye amounted to 17.8 billion dollars (Foreign Economic Relations Board, 2021). Yarovaya et al.

(2016), Dedi & Yavas (2016), Gökbulut (2017), Bayramoglu & Abasız (2017), Kocaarslan et al. (2017), Berberoglu (2020), and Kutlu & Karakaya (2020) analyzed volatility spillover between BIST 100 and RTSI with differing results. Yarovaya et al. (2016) and Gökbulut (2017) found a bidirectional interaction in volatility; however, Yarovaya et al. (2016) demonstrated that the Russian stock market index has a more dominant role in this interaction. Dedi & Yavas (2016) and Kocaarslan et al. (2017) revealed a volatility spillover effect from Türkiye to Russia. Berberoglu (2020) indicated ARCH and GARCH effects between the Turkish and Russian stock markets. Bayramoglu & Abasız (2017) and Kutlu & Karakaya (2020) did not find any volatility relationship between indices in the post-crisis period. Additional volatility spillover studies between stock market indices considering Türkiye or Russia have been conducted, including Saleem (2009), Beirne et al. (2010), Gürsoy & Eroglu (2016), Celik et al. (2018), McIaver & Kang (2020), and Mensi et al. (2020). Saleem (2009) found return and volatility linkages between Russia–US, Russia–European Union, Russia–Emerging Europe, and Russia–Asia, indicating that the relations are weak. Beirne et al. (2010) determined that there is a volatility spillover from global and local stock markets to Turkish and Russian stock indices. Gürsoy & Eroglu (2016) analyzed stock market transmissions among Türkiye, Brazil, India, Indonesia, and South Africa using VAR-EGARCH and did not find any relations from Brazil, India, Indonesia, and South Africa to Türkiye. Celik et al. (2018) examined return and volatility linkages among Islamic stock indices of the US, Indonesia, Malaysia, and Türkiye, demonstrating bidirectional volatility spillover between Indonesia and Türkiye, and a unidirectional volatility spillover from Türkiye to Malaysia.

In this study, univariate short and long memory ARCH models are first used. Considering the combined short and the long memory models in volatility modeling establishes a variation from similar previous studies. In addition, considering the Fourier series in volatility modeling (adaptive models) presents another a contribution to the literature. The findings indicate that the same ARCH model was the fittest method for both stock indices. The rolling Hong causality model is then used to capture the time-varying pairwise relationship (spillover, transmission) between the Turkish and Russian stock markets. Using the rolling Hong causality model allows us to clearly illustrate pre- and post-crisis effects. The analysis reveals a bidirectional volatility spillover between BIST 100 and RTSI throughout the analysis period.

These results are instructive for investors and policymakers because investors follow stock market volatility to optimize portfolio structure and avoid risk. Policymakers focus on volatility to avoid the spillover effects from significant changes in financial markets (Wang et al., 2020) because volatility is assumed to be an indicator of the vulnerability or stability of financial markets and the economy (Yu, 2002; Poon & Granger, 2003). This section has provided a brief summary of the theories and literature relating to volatility modeling. The next section describes the methodologies to determine the internal and external volatility structures.

## Methodology

Short and long memory ARCH models and the rolling Hong causality model are used in this study. For these reasons, the methodology section was examined under two subheadings.

### Autoregressive Conditional Heteroskedasticity Models

Bollerslev (1986) introduced the GARCH model as an extension of ARCH models similar to the AR portion of the autoregressive moving average (ARMA) model. The formulation of the GARCH model is as follows:

$$h_t = \alpha_0 + \sum_{i=1}^q \alpha_i \varepsilon_{t-1}^2 + \sum_{i=1}^p \beta_i h_{t-i} \quad (1)$$

$$p \geq q > 0$$

$$\alpha_0 > 0 \quad \alpha_i \geq 0 \quad i=1, \dots, q$$

$$\beta_i \geq 0 \quad i=1, \dots, p$$

In the GARCH model, conditional variance and lagged conditional variance are linear functions of a past sample. The effect of shocks on volatility and the persistence of volatility clustering are demonstrated by  $\alpha$  and  $\beta$ , respectively (Yildirim et al., 2020).

Nelson (1991) demonstrated that bad and good news exert different effects on volatility and can be captured by the EGARCH model. If bad news has a greater impact on volatility, the scenario is referred to as the leverage effect. The EGARCH model can be written as follows:

$$\ln(\sigma_t^2) = \alpha_t + \sum_{k=1}^{\infty} \beta_k g(Z_{t-k}) \quad (2)$$

$$g(Z_t) \equiv \theta Z_t + \gamma [|Z_t| - E |Z_t|] \quad (3)$$

where  $\gamma [|Z_t| - E |Z_t|]$  indicates the magnitude effect of GARCH. If the magnitude of  $Z_t$  is higher (lower) than the expected value,  $\ln(\sigma_{t+1}^2)$ , the process becomes positive (negative). If returns become negative (positive), the conditional variance is positive (negative) when  $\gamma = 0$  and  $\theta < 0$ .

Another asymmetric model demonstrating the effect of shocks on volatility is GJR-GARCH which was introduced by Glosten, Jagannathan, & Runkle (1993). The equation can be formulated as follows:

$$h_t = \alpha_0 + \sum_{j=1}^q \{\alpha_j + \delta_j I(\varepsilon_{t-j} > 0)\} \varepsilon_{t-j}^2 + \sum_{j=1}^p \beta_j h_{t-j} \tag{4}$$

When  $\varepsilon_{t-j} < 0$  and  $\varepsilon_{t-j} \geq 0$ , the dummy variable becomes 1 and 0, respectively (Poon, 2005). To detect the leverage effect,  $\delta_j$  should be higher than 0 (Brooks, 2008).

The APARCH model was suggested by Ding et al. (1993), which allows for capturing the leverage effect on volatility similar to EGARCH and GJR-GARCH. It can be written as follows:

$$S_t^\delta + \sum_{i=1}^p \alpha_i (|\varepsilon_{t-i}| - Y_i \varepsilon_{t-i})^\delta + \sum_{j=1}^q \beta_j S_{t-i}^\delta \tag{5}$$

$$\alpha_0 > 0 \quad \delta \geq 0$$

$$\alpha_i \geq 0 \quad i=1, \dots, p$$

$$-1 < Y_i < 1 \quad i=1, \dots, p$$

$$\beta_j \geq 0 \quad j=1, \dots, q$$

The APARCH model implements the Box–Cox power transformation of conditional standard deviation and asymmetric absolute residuals.

Baillie et al. (1996) introduced the fractional integrated GARCH (FIGARCH) model using GARCH and IGARCH models. The FIGARCH model indicates the long memory property of volatility. FIGARCH formulations are as follows:

$$[1 - \beta(L)]\sigma_t^2 = \omega + [1 - \beta(L) - \varphi(L)(1 - L)^d]\varepsilon_t^2 \tag{6}$$

$$\sigma^2 = w [1 - \beta(1)]^{-1} + \lambda(L)\varepsilon_t^2 \tag{7}$$

In Equation (6),  $d$  must be between 0 and 1. A hyperbolic (slow) decrease in volatility in the FIGARCH model is a more realistic approach than the exponential (fast) decrease in the GARCH model and the infinite persistence in the IGARCH model (Baillie et al., 1996).

The Baillie, Bollerslev, & Mikkelsen (BBM) and Chung approaches were used to estimate the parameters of the FIGARCH method. Chung asserted that the FIGARCH–BBM model had some specification and underscore problems, suggesting that the fractional differencing operator should be applied to the constant term in the mean equation (ARFIMA), but that no such approach is found in the variance equation (Chang et al., 2012; Al-Hajieh, 2017).

Bollerslev & Mikkelsen (1996) suggested a new method to capture the long memory and leverage effects of volatility simultaneously, which is referred to as the FIEGARCH model. The FIEGARCH equation can be written as follows:

$$\ln(\sigma_t^2) = \omega + \varphi(L)^{-1}(1-L)^{-d}[1 + \psi(L)]g(Z_{t-1}) \quad (8)$$

There is no nonnegativity constraint in the FIEGARCH model, as with EGARCH, and the  $d$  parameter must be between 0 and 1.

The FIAPARCH model was first introduced by Tse (1998) in an examination of the yen/dollar exchange rate, using the APARCH method using fractional integration. The equation processes for the relevant method are as follows:

$$\sigma_t^\delta = \omega + \lambda(L) (|\varepsilon_t| - \gamma\varepsilon_t)^\delta \quad (9)$$

$$\omega = \eta/(1 - \beta) \quad (10)$$

$$\lambda(L) = \sum_{i=1}^{\infty} \lambda_i L^i = 1 - (1 - \beta L)^{-1} (1 - \phi L)(1 - L)^d \quad (11)$$

where  $0 < d < 1$  determines that the effect of a shock on volatility is long memory. In equation (9), the expressions must be  $|\gamma| < 1$  and  $\delta > 0$ . When  $\gamma > 0$  ( $\gamma < 0$ ), this indicates that negative (positive) shocks increase volatility more than positive (negative) shocks.

Davidson (2004) introduced the HYGARCH model to investigate only the long memory properties of volatility, the formulations of which are as follows:

$$\theta(L) = 1 - \frac{\delta L}{\beta L} (1 + \alpha(1 - L)^d) - 1 \quad (12)$$

$$\alpha \geq 0 \quad d \geq 0$$

When  $\alpha = 1$  and  $\alpha = 0$ , the HYGARCH model becomes FIGARCH and stable GARCH, respectively.

### Rolling Hong Causality Model

This model was introduced to the literature by Hong (2001), and is calculated by considering a rolling correlation in the causality relationship method in mean and variance. To calculate the model, the standardized residuals and the squared standardized residuals obtained from the appropriate ARCH models must be determined. The equation processes of the rolling Hong model are as follows (Lu et al., 2014):

$$r_{12,t}(J, S) = \frac{C_{12,t}(J, S)}{\sqrt{C_{11,t}(0, S)C_{22,t}(0, S)}} \quad (13)$$

$$C_{12,t}(J, S) = \begin{cases} \frac{\sum_{i=0}^{S-j-1} u_{1,t-i}u_{2,t-i-j}}{S}, j = 0, 1, \dots, S - 1 \\ \frac{\sum_{i=0}^{S-j-1} u_{1,t-i}u_{2,t-i}}{S}, j = -1, -2, \dots, 1 - S \end{cases} \tag{14}$$

$$H_{1,t}^r(S) = \frac{S \sum_{j=1}^{S-1} k^2 \left(\frac{J}{M}\right) r_{12,t}^2(J, S) - C_{1S}(k)}{\sqrt{2D_{1S}(k)}} \tag{15}$$

Equation (13) reveals the rolling correlation value in lag  $j$ .  $C_{11,t}(0, S)$  and  $C_{22,t}(0, S)$  indicate the subsample variances of  $u_{1,t}$  and  $u_{2,t}$ , and  $C_{12,t}(J, S)$  identifies the cross-covariance between  $u_{1,t}$  and  $u_{2,t}$ .

### Dataset

Türkiye and Russia are considered emerging economies and share an intense pairwise political, commercial, and financial relationship. Therefore, the aim of this study is to analyze the financial time series structures of the countries’ stock markets. To do so, two research questions are posed. First, which volatility models are the most appropriate for the stock market indices of these countries? Second, what is the direction of the volatility transmission mechanism between the stock market indices? The BIST 100 and RTSI indices are considered the leading indicators for stock markets, and this study uses 4,564 pieces of daily data spanning the years 2003–2020 for the investigation. The datasets are obtained from the Bloomberg terminal database. The price series graphs of the BIST 100 and RTSI indices are presented in Figure 1.

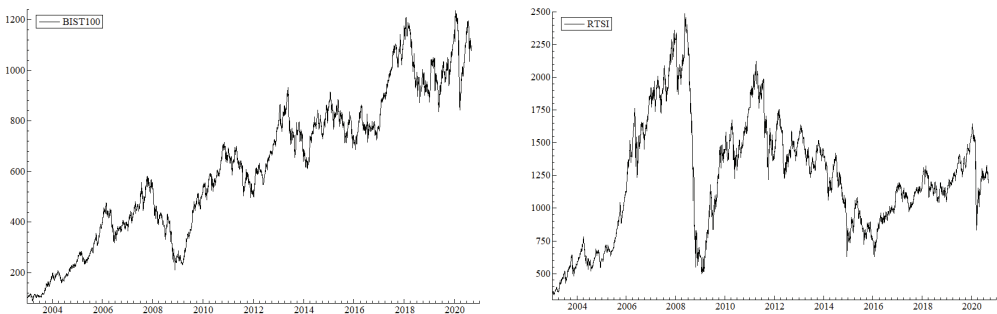


Figure 1. Price Series Graphs of BIST 100 and RTSI

Figure 1 indicates that the BIST 100 had an increasing trend in the 2003–2020 period, while the RTSI increased significantly from 2003 to 2008. In addition, the figure demonstrates that 2008 global financial crisis clearly had an extremely significant effect on the RTSI.

The graphics of the return series obtained from the formula  $\ln(P_t / P_{t-1}) * 100$  are presented in Figure 2.

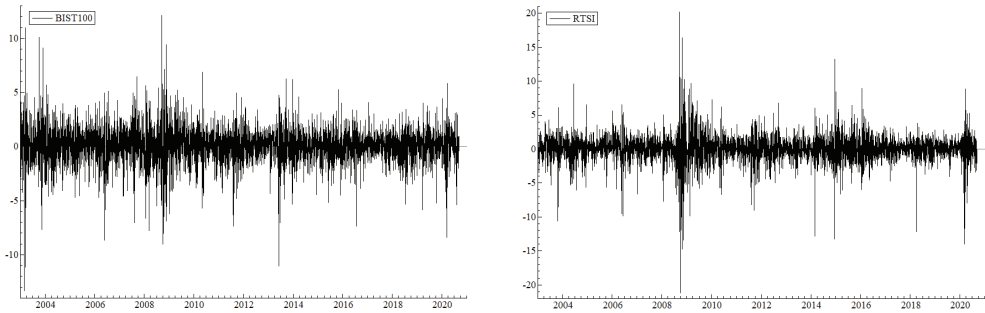


Figure 2. Return Series Graphs of BIST 100 and RTSI

According to Figure 2, the BIST 100 data demonstrate a more fluctuating structure compared to RTSI during the 2003–2020 period. The RTSI return series indicates that remarkable fluctuations were experienced in 2008, and the data are gathered around zero. This presents knowledge about the previous stationarity of the return series. Descriptive statistics for the return series are presented in Table I.

Table 1  
Descriptive Statistics

	BIST100	RTSI
Mean	0.051037	0.026035
Maximum	12.12810	20.20392
Minimum	-13.33586	-21.19942
Standard Deviation	1.671287	2.029094
Skewness	-0.354043	-0.572411
Kurtosis	8.142499	14.93373
JB	5180.500***	27631.02***
ADF (C+T)	-19.81860***	-11.14133***
PP (C+T)	-67.49698***	-62.12004***
KPSS (C+T)	0.046271***	0.082604***
BIST 100	1	0.417571
RTSI	0.417571	1
ARCH-LM 1-2	83.418***	200.95***
ARCH-LM 1-5	49.640***	120.25***
ARMA	(0,0)	(1,1)

Note: The expressions \*\*\*, \*\*, and \* indicate significance at 99%, 95%, and 90% confidence intervals, respectively.

Table I demonstrates that the mean value in both stock markets is positive; however, the value is higher in the BIST 100. The standard deviation values that indicate the deviation of a series from the mean (i.e., risk) are higher in the RTSI. The fact that the skewness values differ from 0 and are negative indicates that the series is skewed to the left, implying that the

probability of the occurrence of negative events is higher than that of positive events. A kurtosis value greater than three indicates that the datasets are leptokurtic, meaning that the dataset is distributed around zero. The Jarque–Bera (JB) values indicate that the dataset is normally distributed. The stationary structure of the series is tested using ADF, PP, and KPSS. ADF and PP tests examine the null hypothesis that the series has a unit root, and KPSS analyzes the null hypothesis that the series is stationary. According to the results in Table I, ADF and PP tests reject the null hypothesis, and the KPSS does not reject stationarity. In addition, Table I reveals a positive correlation of 0.41 between the BIST 100 and the RTSI. The ARCH–LM tests in Table I indicate a problem of heteroskedasticity in both datasets at the second and fifth lags.

### Empirical Results

Three different classifications (short memory, long memory, and asymmetric) are used to determine the most appropriate volatility structure for the BIST 100 and RTSI indices. The short memory models indicate that the correlation in the dataset exists at short lags and the shock in the dataset is mean reversion in the short-term. The long memory models imply that the dataset has autocorrelation at high lags and the shock presents mean reversion in the long run. Asymmetric models indicate that the effect of negative or positive shocks on volatility differ.

Tables II and III present the comparison of the volatility models in the form of short memory, long memory, and asymmetric structure.

Table 2  
BIST 100 Model Comparison Results

	<b>GARCH</b>	<b>EGARCH</b>	<b>GJR-GARCH</b>	<b>APARCH</b>	<b>FIGARCH-BBM</b>
<b>LL</b>	-8290.387	-8279.545	-8273.546	-8272.249	-8281.402
<b>AIC</b>	3.635139	3.631264	3.628197	3.628067	3.631640
<b>SIC</b>	3.642179	3.641120	3.636645	3.637923	3.640088
	<b>FIGARCH-CHUNG</b>	<b>FIEGARCH</b>	<b>FIAPARCH-BBM</b>	<b>FIAPARCH-CHUNG</b>	<b>HYGARCH</b>
<b>LL</b>	-8280.610	-8259.542	-8252.999	-8246.242	-8281.238
<b>AIC</b>	3.631293	3.622937	3.620070	3.617109	3.632006
<b>SIC</b>	3.639741	3.634201	3.631333	3.628372	3.641862

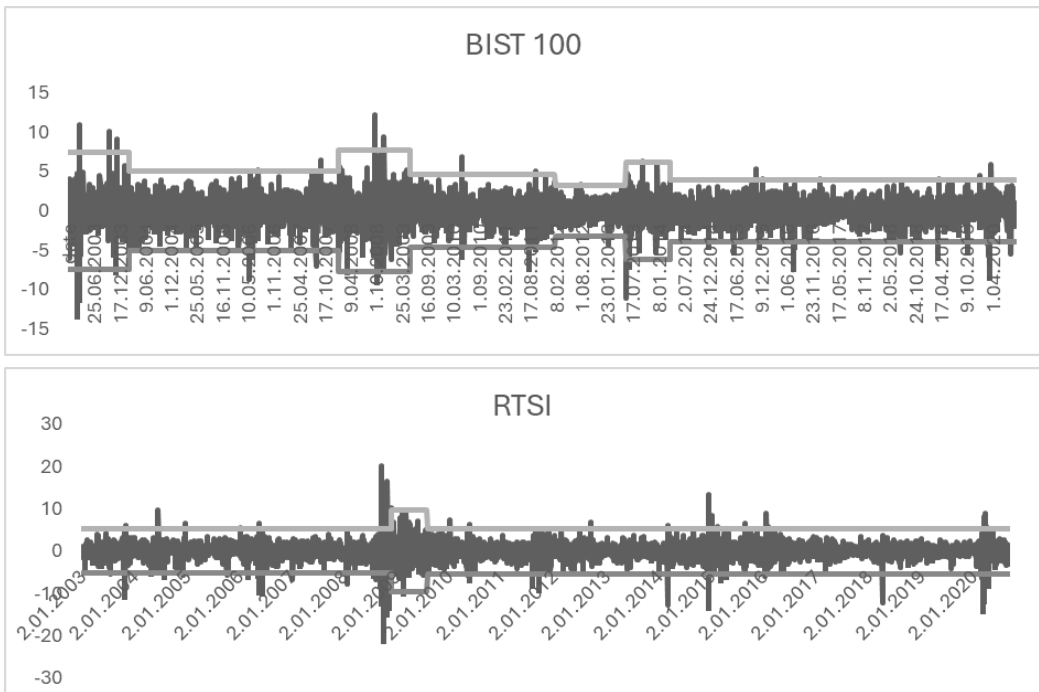
Table 3  
RTSI Model Comparison Results

	<b>GARCH</b>	<b>EGARCH</b>	<b>GJR-GARCH</b>	<b>APARCH</b>	<b>FIGARCH-BBM</b>
<b>LL</b>	-8613.640	-8606.623	-8600.742	-8598.400	-8608.359
<b>AIC</b>	3.777669	3.775470	3.772455	3.771867	3.775793
<b>SIC</b>	3.787524	3.788142	3.783718	3.784538	3.787056
	<b>FIGARCH-CHUNG</b>	<b>FIEGARCH</b>	<b>FIAPARCH-BBM</b>	<b>FIAPARCH-CHUNG</b>	<b>HYGARCH</b>
<b>LL</b>	-8608.680	-8601.955	-8589.664	-8589.710	-8608.287
<b>AIC</b>	3.775933	3.773863	3.768477	3.768497	3.776199
<b>SIC</b>	3.787197	3.787942	3.782556	3.782577	3.788871



The model with the largest LL value and the smallest AIC and SIC values is determined to be the most appropriate. Tables II and III indicate that the FIAPARCH–CHUNG and FIAPARCH–BBM models are suitable for BIST 100 and RTSI, respectively.

The next section of the study compares FIAPARCH, ICSS–FIAPARCH, and adaptive FIAPARCH models for both datasets. To construct the ICSS model, the breaks in variance are first determined using the KAPPA-2 method to capture variance breaking dates because of the consideration of non-mesokurtic structure and persistence in conditional variance (Çağlı et al., 2011). Graphs of variance breaks determined applying KAPPA-2 are presented in Figure 3.



*Figure 3.* Breaks in variance in return series

*Note:* Boundary lines are  $\pm 3$  standard errors

Figure 3 reveals six variance breaking points in the BIST 100 and two in the RTSI. The 2008 global financial crisis clearly affected variance breaking points in both datasets. These break dates are used to determine the ICSS–FIAPARCH model.

The Fourier series is added to construct the adaptive FIAPARCH model. The A-FIGARCH model proposed by Baillie and Morana (2009) analyzes the case of structural breaks or regime changes in the constant term; that is, in the unconditional variance. Hence, the authors applied Gallant's (1984) smooth flexible functional form. The Fourier formulation is as follows:

$$Y_i \sin(2\pi jt/T) + \delta_j \cos(2\pi jt/T) \tag{16}$$

The graphic form of the Fourier series is illustrated in Figure 4.

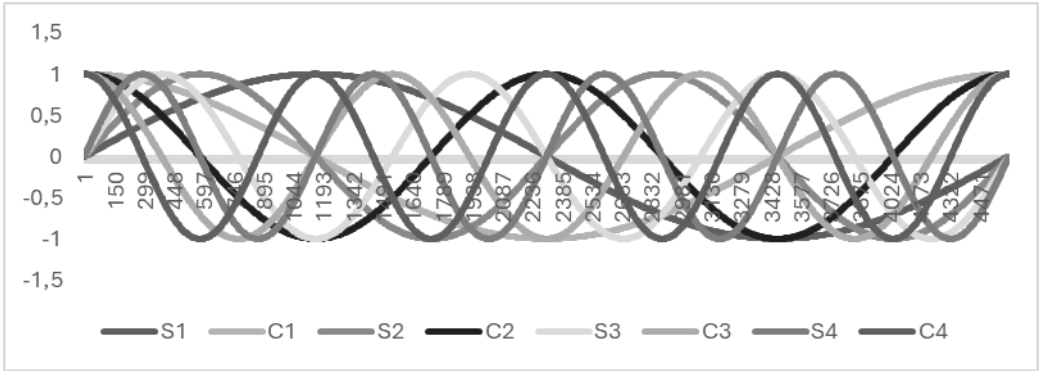


Figure 4. Fourier series

The most appropriate base model, the ICSS model, and the adaptive model results determined for BIST 100 and RTSI indices, are presented in Table IV.

Table 4  
BIST 100 vs. RTSI Models

	<i>BIST100</i>			<i>RTSI</i>		
	<i>MODEL 1</i>	<i>MODEL 2</i>	<i>MODEL 3</i>	<i>MODEL 1</i>	<i>MODEL 2</i>	<i>MODEL 3</i>
$\omega$	4.224421*** [5.690]	3.009763*** [6.451]	3.137936*** [6.083]	0.112029*** [2.989]	0.126142*** [3.405]	-
$d$	0.307122*** [8.852]	0.211608*** [5.340]	0.241885*** [6.776]	0.405672*** [5.967]	0.409641*** [5.663]	-
$\alpha$	0.186002** [2.319]	0.135733 [1.348]	0.174595** [1.989]	0.200333*** [4.080]	0.201357*** [4.106]	-
$\beta$	0.412952*** [4.638]	0.277832** [2.432]	0.343133*** [3.590]	0.533540*** [6.800]	0.536624*** [6.623]	-
$\gamma$	0.649391*** [4.112]	0.822210*** [3.671]	0.815943*** [3.800]	0.319848*** [4.545]	0.340128*** [4.564]	-
$\delta$	1.170064*** [7.192]	1.093716*** [5.577]	1.119134*** [6.627]	1.724808*** [14.84]	1.658537*** [13.29]	-
Student	5.945757*** [11.05]	6.084311*** [10.94]	6.077801*** [10.67]	5.381339*** [12.11]	5.345895*** [12.05]	-
Q(50)	60.3676	59.6867	57.5947	43.8765	43.5373	-
Q(50) <sup>2</sup>	52.7277	66.9537	61.4642	28.6420	28.9037	-
ARCH-1-5	0.21638	0.23296	0.33231	0.20671	0.18699	-
MSE	11.02	10.94	9.866	12.41	11.95	-
MAE	2.127	2.12	2.132	3.463	3.39	-
TIC	0.6484	0.6426	0.5692	0.5132	0.5098	-
LL	-8246.242	-8238.454	-8239.773	-8589.664	-8587.873	-
AIC	3.617109	3.615011	3.615150	3.768477	3.768130	-
SIC	3.628372	3.630498	3.629230	3.782556	3.783618	-

Note: The expressions \*\*\*, \*\*, \* show significance at 99%, 95%, and 90% confidence intervals, respectively

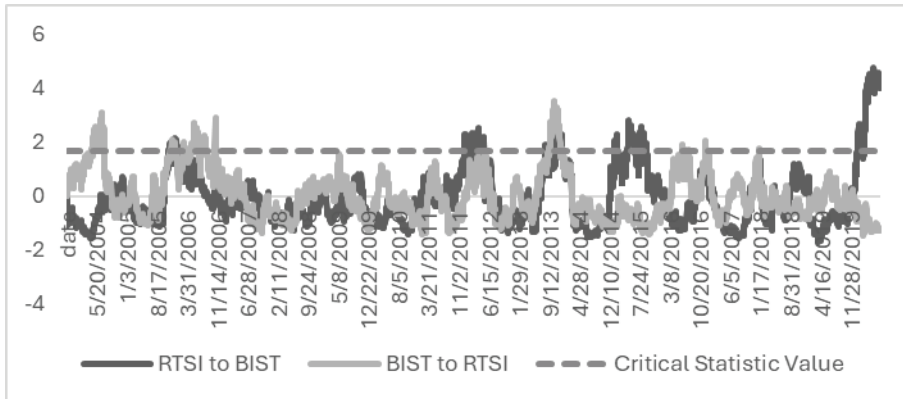
The Model 1 (FIAPARCH) results in Table IV indicate that the  $d$  (long memory) parameter has a value between 0 and 0.5 in the BIST 100 and RTSI indices. This result indicates that both datasets have long memory, in which volatility clustering (autocorrelation) is long-term, revealing a hyperbolic mean reversion.

The  $\gamma$  and  $\delta$  coefficients ( $-1 < \gamma < 1$  ve  $0 < \delta < 2$ ) in Model 1 demonstrate a leverage effect for both datasets; however, the power parameter ( $\delta$ ) of RTSI is larger. The leverage effect indicates that negative shocks have a stronger impact on volatility than positive shocks. The Model 2 (ICSS–FIAPARCH) results in Table IV indicate that parameter  $d$  decreases only in the BIST 100 compared with Model 1. This result implies that a variance break only causes spurious memory in the BIST 100. The Model 3 (adaptive FIAPARCH) results in Table IV show that the RTSI results are insignificant.

Two different methods are employed to determine which model better represents the dataset. The first of these is model comparison values, and the second is in the sample forecasting values. The model comparison values for the BIST 100 (LL, AIC, and SIC) show that the ICSS–FIAPARCH–CHUNG model is more appropriate; however, forecasting values (the small value is most suitable) show that the adaptive FIAPARCH–CHUNG method is more suitable. For the RTSI, both the model comparison and in-sample forecasting values indicate that the ICSS–FIAPARCH–BBM model is suitable.

Following the determination of appropriate volatility models for the BIST 100 and RTI indices, the interaction between the datasets is analyzed. Accordingly, the time-varying Granger causality test, which was introduced to the literature by Lu et al. (2014), is used for mean and variance.

The variance causality approach uses the standardized residual values obtained from the GARCH method; therefore, model specifications are crucial to the power of the test (Yildirim et al., 2020). In addition, Van Dijk et al. (2005) and Rodrigues & Rubia (2007) argued that severe size distortion will occur if variance breaks are not considered. Therefore, the standardized residual values obtained from the ICSS–FIAPARCH models and the square of these values are used for the causality analysis to avoid size distortion and due to the suggestion of model selection criteria. Figures 5 and 6 present the rolling Hong causality in mean and variance.



*Figure 5.* Rolling hong causality in mean

Figure 5 reveals return spillover effects between the BIST 100 to the RTSI before the pre-crisis (2008 global financial crisis) and post-crisis period; however, during the crisis period, no return spillover is evident. A lack of return spillover during the crisis period is expected, because throughout that period, US stock markets had a dominating role in spillover. The relationship between Türkiye and Russia indicates that two important events in the last 10 years may have induced shock effects between the stock markets. These events included the shooting down of a Russian warplane by the Turkish Armed Forces on November 24, 2015 due to a border violation, and the assassination of the Turkish Russian Ambassador Andrey Karlov on December 19, 2016. Figure 5 indicates that no shock transfer is detected between the markets on either date. The most striking finding in Figure 5 is a return spillover from the RTSI to the BIST 100 only occurred during the COVID-19 period. This result indicates a shock transmission from the RTSI to the BIST 100 that may be considered a “contagion effect.” Kutlu & Karakaya (2020) found return spillover from BIST to RTSI prior to the pre-crisis period and from RTSI to BIST in the crisis period, and they did not find any spillover in the post-crisis period.

The existence of strong causality in the return series may cause deceptive results in variance analysis; therefore, causality in the mean should be filtered out (Panatellidis & Pittis, 2004). To do so, lags of both stock market indices should be added to ARCH models to consider the direction of causality to obtain new squared standardized residuals (Yildirim et al., 2020).

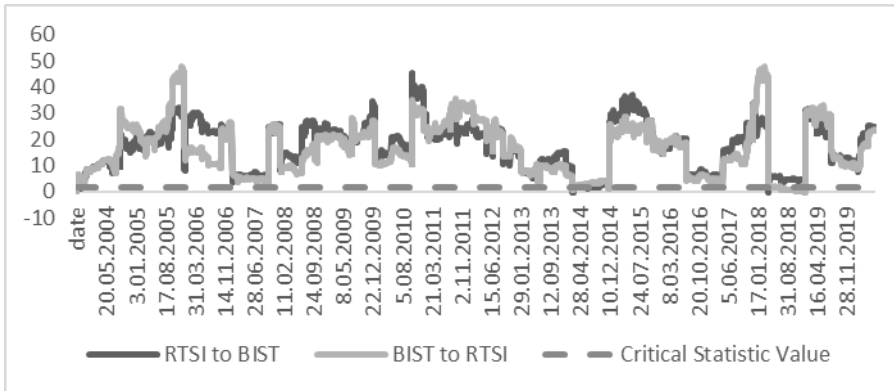


Figure 6. Rolling hong causality in variance

Figure 6 reveals a bidirectional trajectory and risk spillover in all time horizons between the RTSI and the BIST 100. This result corroborates Yarovaya et al. (2016), Gökbulut (2017), and Berberoglu (2020) therefore, both indices do not represent risk diversification instruments for one another.

## Conclusion and Discussion

Previous research has not thoroughly considered the internal and external characteristics of volatility at the same time. This study aims to fill this deficiency by considering the new methods of the adaptive volatility and rolling Hong causality models. To do this, BIST 100 and RTSI indices are selected as a sample.

ICSS–FIAPARCH–CHUNG and the adaptive FIAPARCH–CHUNG are determined to be the most appropriate models for the BIST 100 in terms of model selection criteria and in-sample forecasting values, respectively. For the RTSI, the ICSS–FIAPARCH–BBM model is suitable in terms of model selection criteria and in-sample forecasting values. These results demonstrate long memory and leverage effects in both indices. The long memory effect indicates that the volatility clustering (autocorrelation) is long-term, and this situation is a hyperbolic mean reversion. The long memory effect indicates a slow and long-term response to new information. This corroborates the rejection of the weak efficient market hypothesis because an efficient market instantly reacts to new information, implying that investors can use past price movements to estimate future price movements to obtain higher than average returns by applying technical analysis. The leverage effect indicates that negative news has a greater impact on volatility than positive news. It can be asserted that vulnerability is higher in the RTSI because the variance breaking dates only cause spurious memory in the BIST 100, and persistence and leverage effects were more dominant in the RTSI. The rationale for

these greater persistence and leverage effects could be more aggregated arrival of information and investors' higher sensitivity of the regarding the RTSI. The Granger causality in the mean reveals return spillovers in different directions at different times. For example, during the COVID-19 period, a return spillover only occurred from the RTSI to the BIST 100. This suggests that when predictions of the future return series of the BIST 100 during the COVID-19 period should include the past return series of the RTSI; however, the spillover effects are insufficient for investors and policymakers decision-making processes, as they also need access to the spillover relations in second moments called volatility (variance) spillover. In terms of variance causality, bidirectional risk and information spillover (transfer) are evident between both indices in all time horizons, indicating that both indices are not portfolio diversification instruments for one another at any time, and when examining the BIST 100 (RTSI), we should also consider RTSI (BIT100).

A general assessment of the study's findings indicates that stock markets have long memory and leverage effect properties; therefore, it is more beneficial to examine the causes of both features in volatility modeling. Other inferences revealed from the study include the more fragile nature of RTSI and the significance of regional proximity for risk management strategies. The fragile structure of the RTSI demonstrates that the RTSI is riskier than the BIST 10; therefore, investors and policymakers should consider this. Regional proximity, which is one of the reasons for risk and information transfer, should be considered by investors and policymakers to examine issues such as the detection of contagion effects and strategy formulation.

The results obtained from the study provide practical information for researchers, policymakers, and investors. Future studies should incorporate wavelet transformations, copula (tail dependence), and value-at-risk-based risk spillover methods to enhance the volatility modeling.

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

**Conflict of Interest:** The author has no conflict of interest to declare.

**Grant Support:** The author declared that this study has received no financial support.

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## RESEARCH ARTICLE

# The Impact of Financial Development on Income Inequality: Evidence from OECD Countries

Çiğdem Karış<sup>1</sup> , Dilek Çil<sup>2</sup> 

### Abstract

The financial system has an important component which adds to social welfare. Investment and consumption expenditures contribute to the increase in production by meeting the capital requirement. The study examines the impact of financial development on income inequality for 13 member nations of the OECD between 1993 and 2017 in light of the panel data method. In the study, income inequality is used as a proxy for the GINI coefficient, while the banks' domestic credit to the private sector is utilized to represent financial development. In addition, the model utilizes control variables, including per capita income, trade openness, inflation, and public spending. The panel data regression results reveal that financial development has a positive effect on income inequality. The results of the paper support the Income Inequality Widening Hypothesis, which suggests that the situation which favours individuals with high income levels who have access to financial resources continues when financial development increases, which in turn increases income inequality.

**Keywords:** Financial development, Income inequality, OECD countries, Panel data analysis

## Introduction

Financial development exhibits various impacts on the economy (such as economic growth, foreign trade, inflation, and foreign direct investments). The impact of financial development on economic growth has received considerable attention in the literature. However, the importance of the effect of financial development on income inequality has only recently been revealed, with studies soon following, as income inequality has continued to rise around the world since the 1980s, despite high economic growth. Financial development is considered a significant factor which affects income inequality because it impacts access to financial services. Academics, policymakers, and international organizations are all interested in the influence financial development has on income inequality. For instance, policymakers want to know how income distribution and economic growth are affected by the policies. Understanding this relationship can make it possible for policymakers to evaluate

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**To cite this article:** Karis, C., & Cil, D. (2024). The covid-19 pandemic's impact on the performance of firms on the BIST 100 index. *Istanbul Business Research*, 53(1), 103-118. <http://doi.org/10.26650/ibr.2024.53.1094981>



whether financial development could build up inequality and when it would be beneficial to do so (Law and Tan, 2009: 155).

Financial development may reduce income inequality by increasing individual productivity and welfare to the degree that it provides equitable and simple access to financial services which would benefit everyone equally. Thus, financial development can help reduce income inequality to the extent that it enables the majority of society to easily access financial markets and benefit from financial services. In the presence of financial market imperfections, information asymmetry, transaction, and contract enforcement costs can produce binding credit constraints for the poor, who have poor credit and collateral histories and are not well-connected. Therefore, easing credit constraints through financial development can diminish income inequality by making it easier for the poor to borrow loans for projects, increasing efficiency in capital allocation, and facilitating the provision of funds to the poor through profitable investments (Aghion and Bolton, 1997; Galor and Moav, 2004; Galor and Zeira, 1993). Hence, income inequality can be reduced through financial progress to the extent that it loosens the credit constraints that the poor experience more and affects the poor more negatively, and to the extent that it allows and facilitates more entrepreneurs' access to financial services by including more financial intermediaries in the system (Claessens and Perotti, 2007:49). Otherwise, financial progress can increase income inequality in cases where individuals face difficulties accessing financial services and do not have equal opportunities (Ang, 2009). Financial market imperfections in the form of asymmetric information and contract costs can be particularly binding for the poor, who have difficulty providing collateral, and lack a credit history. The poor are thus the most affected by these financial imperfections (Banerjee and Newman, 1993; Galor and Zeira, 1993). Due to these conditions, the poor can be subjected to constraints in obtaining credit for their viable projects, resulting in inefficiency in capital allocation. As a consequence of this situation, financial development can increase income inequality.

There are three hypotheses suggested in terms of financial development's impact on income inequality: The inequality-widening (IW) hypothesis, the inequality-narrowing (IN) hypothesis, and the Greenwood and Jovanovic (1990) (GJ) hypothesis. The IW hypothesis suggests that income inequality rises as a result of financial development (Behrman et al., 2001; Bourguignon and Verdier, 2000; Claessens, 2006; Claessens and Perotti, 2007; Dollar and Kraay, 2002). Especially in societies with poor institutional quality, financial development provides benefits to the wealthy and well-connected individuals. Accordingly, the rich benefit from financial services while the poor borrow from the informal sector under difficult conditions. This is because well-connected, wealthy individuals are more likely to provide collateral and repay their loans than the poor, with vested interests affecting access to financial resources (Acemoglu et al., 2005; Rajan and Zingales, 2003; Perotti and Volpin, 2007). Thus, the poor people who have difficulty providing collateral and repaying loans may still

continue to have difficulty taking out loans even if financial markets develop. In this situation, financial development may increase inequality of income.

On the other hand, the IN hypothesis suggests that financial development reduces income inequality (Ang, 2010; Beck et al., 2004; Beck et al., 2007; Bittencourt, 2006; Clarke et al., 2006; Liang, 2006). This hypothesis contends that credit opportunities and simple access to credit expand as a result of financial development, and as a result, this enables the poor the opportunity to make investments by taking advantage of these credit opportunities. The poor have the opportunity to invest in physical and human capital for themselves and their families and establish small businesses with the credit opportunities they obtain (Ahmed and Masih, 2017; Banerjee and Newman, 1993; Canavire-Bacarreza and Rioja, 2008). Thus, financial development decreases income inequality by providing disadvantaged people with access to financial resources and expanding their financial options.

According to the GJ hypothesis, financial development and income inequality have a non-linear, inverted U-shaped connection. According to this hypothesis, income inequality increases with financial development when the development in financial markets is low at the first stages of financial development. After financial development reaches a particular threshold, it decreases income inequality. Accordingly, access to financial services is costly at the first stages of development, where financial markets are not developed enough and only the rich can access and benefit from financial services. Especially in the presence of powerful interest groups, access to credit can be costly. At this stage, where there is no equal access to financial services, income inequality increases with financial development. After financial development reaches a certain threshold value, the costs of financial intermediation services decrease, and a wider part of society benefits from accessing these services. Income inequality decreases with financial development as a result of more people benefiting from financial services.

Recent studies have examined financial development as a factor which affects income inequality. Therefore, while the existence of a financial system where the majority of society can benefit from financial resources can decrease income inequality, weakly functioning financial markets may be a factor that increases income inequality by preventing those with low incomes from investing in profitable assets or investments. Thus, one of the major instruments used in the fight against income inequality can be developments in the financial sector. Therefore, OECD countries that exhibit high levels of financial development constitute the main focus of the present study. The idea that this high level of development in OECD countries may enable a better determination of the effects of financial development on income inequality is one of the reasons for considering this group of countries in the analysis. Another motivation for the study is the detection that the number of studies in the literature which cover OECD countries is quite low. This study, which examines the relationship between

financial development and income inequality for 13 OECD countries with a panel data analysis approach for the period between 1993 and 2017, aims to contribute to the development of this gap in the literature.

The paper is comprised of five sections. In the second part, after this introduction, studies related to the subject in the literature have been analysed. The analysis data, the econometric technique, and the econometric results are presented in the third and fourth sections. The conclusion and evaluations are given in the fifth and final section.

## Literature Review

As financial development has started to be seen as a factor affecting income inequality as well as a significant and effective instrument for reducing income inequality, researchers' interest in analysing the relationship between these two variables has increased in recent years. Consequently, the amount of research addressing the link between these two variables has also grown. The relationship between financial development and income inequality has been researched using the time series or panel data analysis approach for various time periods and countries.

The hypotheses explaining the link between financial development and income inequality are divided into two categories: linear and non-linear hypotheses. While the IW and IN hypotheses suggest that the relationship between these variables is linear, the GJ hypothesis suggests that the relationship in question is non-linear. The results of the studies investigating the impact of financial development on income inequality in the literature are contradictory in terms of the direction of this impact. The following studies have produced results that support the IW hypothesis: Adams and Klobodu, 2016; Altunbaş and Thornton, 2019; Argun, 2016; Arora, 2012; Balorinwa et al., 2020; Calderon and Servén, 2003; Chiu and Lee, 2019; Dabla-Norris et al., 2015; De Haan and Sturm, 2017; Demirgüç-Kunt and Levine, 2009; Denk and Cournede, 2015; Dollar and Kraay, 2002; Jaumotte et al., 2013; Kar and Kar, 2019; Li and Yu, 2014; Liu et al., 2017; Lopez, 2004; Motonishi, 2006; Rodriguez-Pose and Tselios, 2009; Sebastian and Sebastian, 2011; Sehrawat and Giri, 2015; Seven and Coşkun, 2016; Shahbaz et al., 2017; Topuz and Dağdemir, 2016; and Wahid et al., 2010, 2011). Conversely, the following studies have found results in favour of the IN hypothesis: Altunbaş ve Thornton, 2019; Ang, 2010; Barro, 2000; Batuo et al., 2010; Beck et al., 2007; Bittencourt, 2006, 2010; Bulir, 1998; Chiu and Lee, 2019; Clarke, Xu and Zuo, 2003; Hamori and Hashiguchi, 2012; Honohan, 2004; Jalil and Feridun, 2011; Kanberoğlu and Arvas, 2014; Kappel, 2010; Koçak and Uzay, 2019; Kunieda et al., 2014; Law and Tan, 2009; Li and Zou, 2002; Li Squire et al., 1998; Liang, 2006; Motonishi, 2006; Naceur and Zhang, 2016; Rashid and Intartaglia, 2017; Rehman et al., 2008; Shahbaz et al., 2015; Shahbaz and İslam, 2011; Thornton and Di Tommaso, 2019; Topuz and Dağdemir, 2016; and Westley, 2001, 2006. Some of the empirical



studies have concluded that the hypothesis of GJ is valid (Akıncı and Akıncı, 2016; Argun, 2016; Baiardi and Morana, 2016; Canavire-Bacarreza and Rioja, 2008; Chiu and Lee, 2019; Jalilian and Kirkpatrick, 2005; Kim and Lin, 2011; Koçak and Uzay, 2019; Law et al., 2014; Matsuyama, 2000; Nikoloski, 2012; Tan and Law, 2011; Tita and Aziakpono, 2016; Topuz, 2013; Topuz and Dağdemir, 2016; Zhang and Chen, 2015). The studies that use panel data analysis to examine financial development and the income inequality nexus have been examined following the methodology. The studies in question have been classified in a way to support three hypotheses in terms of their results and summarized to include author, period, and country information.

Table 1  
*Literature Review*

Author/Period	Country	Hypothesis	Country Group Results
Lopez (2002)/1960-2000	87 countries	Inequality-widening hypothesis	FD→I (+)
Jaumotte et al. (2008)/1981-2003	51 developed, developing, and emerging countries	Inequality-widening hypothesis	FD→I (+)
Rodriguez-Pose and Tselios (2009)/1995-2000	102 European Union regions	Inequality-widening hypothesis	FD→I (+)
Sebastian and Sebastian (2011)/1960-2008	138 developed and developing countries	Inequality-widening hypothesis	FD→I (+)
Gimet and Lagoarde Segot (2011)/1994-2002	49 countries	Inequality-widening hypothesis	FD→I (+)
Jauch and Watzka (2012)/1960-2008	138 developed and developing countries	Inequality-widening hypothesis	FD→I (+)
Li and Yu (2014)/1996-2005	18 Asian countries	Inequality-widening hypothesis	FD→I (+)
Dabla-Norris et al. (2015)/1980-2012	97 countries	Inequality-widening hypothesis	FD→I (+)
Denk and Cournede (2015)/1970-2011	33 OECD countries	Inequality-widening hypothesis	FD→I (+)
Adams and Klobodu (2016)/1985-2011	21 Sub-Saharan African countries	Inequality-widening hypothesis	FD→I (+)
Argun (2016)/1989-2013	10 Developing countries	Inequality-widening hypothesis	FD→I (+)
Jauch and Watzka (2016)/1960-2008	138 developed and developing countries	Inequality-widening hypothesis	FD→I (+)
Seven and Coşkun (2016)/1987-2011	45 emerging countries	Inequality-widening hypothesis	FD→I (+)
Topuz and Dağdemir (2016)/1995-2011	94 countries	Inequality-widening hypothesis	FD→I (+) (Low and lower-middle, higher-middle-income countries)
De Haan and Sturm (2017)/1975-2005	121 countries	Inequality-widening hypothesis	FD→I (+)
Altunbaş and Thornton (2019)/1980-2015	121 countries	Inequality-widening hypothesis	FD→I (+) (Low and high-income countries)
Baysal-Kar and Kar (2019)/1990-2014	BRICS (Brazil, China, India, Russia and South Africa) countries	Inequality-widening hypothesis	FD→I (+)

Author/Period	Country	Hypothesis	Country Group Results
Chiu and Lee (2019)/1985-2015	59 countries	Inequality-widening hypothesis	FD→I (+) (Low-income countries)
Li Squire et al. (1998)/1947-1994	49 developed and developing countries	Inequality-narrowing hypothesis	FD→(-)I
Clarke et al. (2003)/1960-1995	91 developed and developing countries	Inequality-narrowing hypothesis	FD→(-)I
Clarke et al. (2006)/1960-1995	83 countries	Inequality-narrowing hypothesis	FD→(-)I
Beck et al. (2007)/1960-2005	72 countries	Inequality-narrowing hypothesis	FD→(-)I
Batuo et al. (2010)/1990-2004	22 African countries	Inequality-narrowing hypothesis	FD→(-)I
Kappel (2010)/1960-2006	78 countries	Inequality-narrowing hypothesis	FD→(-)I
Hamori ve Hashiguchi (2012)/1963-2002	126 countries	Inequality-narrowing hypothesis	FD→(-)I
Kunieda et al. (2014)/1985-2009	120 countries	Inequality-narrowing hypothesis	FD→(-)I (Financially closed countries)
Naceur and Zhang (2016)/1961-2011	143 countries	Inequality-narrowing hypothesis	FD→(-)I
Topuz and Dağdemir (2016)/1995-2011	94 developed and developing countries	Inequality-narrowing hypothesis	FD→(-)I (High-income countries)
Rashid and Intartaglia (2017)/1985-2008	60 developing countries	Inequality-narrowing hypothesis	FD→(-)I
Altunbaş and Thornton (2019)/1980-2015	121 countries	Inequality-narrowing hypothesis	FD→(-)I (Upper-middle-income countries)
Chiu and Lee (2019)/1985-2015	59 countries	Inequality-narrowing hypothesis	FD→(-)I (High-income countries)
Jalilian and Kirkpatrick (2005)/1960-1995	42 countries	Greenwood and Jovanovic (1990) hypothesis	Only above threshold of FD decreases I
Canavire-Bacarreza and Rioja (2008)/1960-2005	21 Latin American and Caribbean countries	Greenwood and Jovanovic (1990) hypothesis	Only above threshold of FD decreases I
Kim and Lin (2011)/1960-2005	65 countries	Greenwood and Jovanovic (1990) hypothesis	Only above threshold of FD decreases I
Tan and Law (2011)/1980-2000	35 developing countries	Greenwood and Jovanovic (1990) hypothesis	Only above threshold of FD decreases I
Nikoloski (2012)/1962-2006	76 countries	Greenwood and Jovanovic (1990) hypothesis	Only above threshold of FD decreases I
Topuz (2013)/1995-2011	94 developed and developing countries	Greenwood and Jovanovic (1990) hypothesis	Only above threshold of FD decreases I
Argun (2016)/1989-2013	10 developing countries	Greenwood and Jovanovic (1990) hypothesis	Only above threshold of FD decreases I
Baiardi and Morana (2016)/1985-2013	19 Euro Area countries	Greenwood ve Jovanovic (1990) Hipotezi	Only above threshold of FD decreases I
Tita and Aziakpono (2016)/1985-2007	15 African countries	Greenwood and Jovanovic (1990) hypothesis	Only above threshold of FD decreases I
Topuz and Dağdemir (2016)/1995-2011	94 developed and developing countries	Greenwood and Jovanovic (1990) hypothesis	Only above threshold of FD decreases I

Author/Period	Country	Hypothesis	Country Group Results
Azam and Raza (2018)/1989-2013	5 ASEAN (Malaysia, Singapore, Thailand, Indonesia and Philippines) countries	Greenwood and Jovanovic (1990) hypothesis	Only above threshold of FD decreases I
Chiu and Lee (2019)/1985-2015	59 countries	Greenwood and Jovanovic (1990) hypothesis	Only above threshold of FD decreases I

Note: FD: financial development, I: income inequality, →(+): positive effect, →(-): negative effect.

The studies in the literature have provided mixed findings in terms of country groups. In this context, there have been findings obtained that support both the IW and IN hypotheses as well as the GJ hypothesis for varying country groups. For example, the results of Topuz and Dağdemir (2016) indicated that the IW hypothesis is valid in low, lower-middle, and upper-middle income countries, while the IN hypothesis is valid in high-income countries, and the GJ hypothesis is valid in all the countries. Another study by Chui and Lee (2019) found that the hypothesis of GJ is valid in a total of 59 countries, 32 of which are high-income and 27 of which are low-income countries; however, the inequality-narrowing hypothesis was valid only in the high-income countries which were included in the study. Topuz and Dağdemir (2016) and Chui and Lee (2019) classified the countries that they analysed in terms of their income levels. Similarly, the findings of these two studies also supported the GJ hypothesis for all the examined countries.

Furthermore, a comprehensive review of the literature indicates that the number of studies concentrating on the OECD country group is quite low. Therefore, this study aims to contribute to the development of the literature in terms of the country group examined.

### Data And Econometric Model

In this section, the effect of financial development on income inequality is investigated for 13 OECD countries,<sup>1</sup> including Türkiye, through the panel data method by implementing annual data from the period between 1993 and 2017 on Equation (1). In this regard, the study focused on OECD countries. One of the main characteristics of OECD countries is their high level of financial development. Therefore, the main reason for considering these countries in this study is that such an approach may enable a better definition of the effect of financial development on income inequality. However, the variables considered in the analysis were established by taking into account the criteria of both a balanced panel and the long-term availability of existing common data.

$$LGINI_{it} = \beta_0 + \beta_1 DCP_{it} + \beta_2 LPCGDP_{it} + \beta_3 LINI_{it} + \beta_4 GCE_{it} + \beta_5 LOP_{it} + \varepsilon_{it} \quad (1)$$

<sup>1</sup> United States, United Kingdom, Denmark, Sweden, Norway, Türkiye, Australia, Mexico, Czech Republic, Hungary, Chile, The Republic of Korea, Israel.

The *i* and *t* subindexes in the equations represent region and time, respectively. Variables and their definitions are given in Table 2 below.

Table 2  
*Definitions of the Variables*

<b>Variables</b>	<b>Definition</b>	<b>Source</b>
LGINI	Gini coefficient	
DCP	Domestic credit to private sector by banks (% of GDP)	
<b>Control Variables</b>		
LPCGDP	GDP per capita (constant 2010 US\$)	
LINF	Consumer price index (2010 = 100)	
GCE	General government final consumption expenditure (% of GDP)	
LOP	OP= Exports of goods and services (current \$)+ Imports of goods and services/GDP (current \$)	World Bank

In the study, LGINI indicates income inequality, DCP indicates financial development, LPCGDP indicates per capita income level, LINF indicates inflation, GCE indicates government expenditures, and LOP indicates foreign trade. The L at the beginning of variables indicates the logarithmic transformation. The analyses have been conducted through Stata 14.0 and the Eviews 10 package programme.

## **Econometric Method and Results**

In this section, tests and their results are provided using the panel data estimation method of Equation (1), which was set up to find out how economic growth affects income inequality. Tests were performed to notice whether the variables were cross-sectionally dependent. Then, the unit root test was used, which was chosen based on the cross-sectional dependency status. Finally, the method, selected according to the findings obtained, has been estimated, and the results have been presented.

### **Cross-Section Dependence Test**

The use of 2nd generation unit root tests is more suitable in cases where there is cross-section dependence between units. Cross-section dependency of the variables is investigated by the Breusch-Pagan (1980) Lagrange multiplier (LM), which can be used in the case of  $T > N$ . Table 3 below reports the results of the cross-section dependence test.

Table 3  
*Breusch-Pagan LM Test Results*

<b>Variables</b>	<b>t-statistic</b>
LGINI	962.4776 <sup>a</sup>
DCP	843.8948 <sup>a</sup>
LPCGDP	1739.578 <sup>a</sup>
LINF	1813.356 <sup>a</sup>
GCE	459.4832 <sup>a</sup>
LOP	1847.524 <sup>a</sup>

Note: a indicates the significance level of 1% statistically

As seen in Table 3, the basic hypothesis established as ‘ $H_0$ : No cross-section dependence’ for all the variables is rejected at the significance level of 1% statistically, and it is determined that there is cross-section dependence in the variables.

### Unit Root Test

The Multivariate Augmented Dickey-Fuller (MADF) Unit Root Test, pioneered by Taylor and Sarno (1998), was used to check the variables’ level of stationarity. It is a 2nd generation unit root test that is used when  $T > N$  and takes into account the correlation between units. The results are shown in Table 4 below. While the  $H_0$  hypothesis reveals that the series have a unit root, the alternative hypothesis indicates that they do not have a unit root. The rejection of the  $H_0$  hypothesis reveals that the variables are stationary at this level.

Table 4  
*MADF Unit Root Test Results*

<b>Variables</b>	<b>MADF (Level) test statistic</b>	<b>Critical value approximately 5%</b>
LGINI	350.572	
DCP	50.832	
LPCGDP	173.345	
LINF	2711.603	31.844
GCE	308.412	
LOP	140.472	

Note: The lag length is determined as 1.

As seen in Table 4, the MADF test statistic value calculated for all variables is greater than the 5% critical value. Therefore, the  $H_0$  hypothesis stating that the variables have a root has been rejected, and it has been determined that the variables do not have a unit root and are stationary at the level.

### Results

the results of the tests applied to determine the estimator of the panel model, which is established to determine the effect of financial development on income inequality, are provided in Table 5 below.

Table 5  
*Test Results on The Determination of Equation (1) Panel Regression Estimator*

Variables	POLS	FEM	REM	Resistant Estimator
c	4.376035 <sup>a</sup> (0.2169728)	3.386966 <sup>a</sup> (0.1426079)	3.470099 <sup>a</sup> (0.1490618)	3.47 <sup>a</sup> (0.594)
DCP	0.0003015 (0.0002326)	0.000677 <sup>a</sup> (0.0000794)	0.000691 <sup>a</sup> (0.0000797)	0.00069 <sup>a</sup> (2.0e-04)
LPCGDP	-0.0940783 <sup>a</sup> (0.0183769)	0.0064392 (0.0247572)	-0.0127511 (0.0238211)	-0.0128 (0.0728)
LINF	-0.0051086 (0.0145692)	-0.0171192 <sup>a</sup> (0.0039164)	-0.0169251 <sup>a</sup> (0.0039396)	-0.0169 <sup>a</sup> (0.0065)
GCE	-0.0261545 <sup>a</sup> (0.0023542)	-0.008023 <sup>a</sup> (0.0013944)	-0.0083004 <sup>a</sup> (0.0013978)	-0.0083 <sup>a</sup> (0.0035)
LOP	0.0202342 <sup>b</sup> (0.009887)	0.0070987 (0.0071203)	0.0115668 <sup>c</sup> (0.0069563)	0.0116 (0.0187)
R <sup>2</sup>		0.3328	0.3313	
F Test		639.98 <sup>a</sup>	1353.91 <sup>a</sup>	
LM Test			3207.88 <sup>a</sup>	
Hausman			6.75 REM	
Diagnostic Tests	Test Statistic		Decision	
Levene, Brown and Forsythe Heteroscedasticity Test	W0 = 5.3270380 <sup>a</sup> W50 = 4.5753401 <sup>a</sup> W10 = 5.1727929 <sup>a</sup>		H <sub>0</sub> is rejected. There is a heteroscedasticity problem.	
Baltagi-Wu LBI Autocorrelation Test	0.40538876		There is an autocorrelation problem.	
Breusch Pagan LM Test Cross-section Dependence Test	179 <sup>a</sup>		H <sub>0</sub> is rejected. There is a cross-section dependence problem.	

Note: The values between parentheses give the standard error. a, b, and c respectively indicate the significance level of 1%, 5%, and 10% statistically.

As seen in Table 5, firstly, the F test has been applied to choose between Pooled Ordinary Least Squares (POLS) and Fixed Effects Model (FEM) in the estimation of the established model, and then FEM has been chosen with the rejection of the H<sub>0</sub> hypothesis, which includes estimation by POLS, at the 1% significance level statistically. On the other hand, the Breusch-Pagan Lagrange Multiplier LM test has been applied to choose between the Random Effects Model (REM) and POLS, with REM being chosen with the rejection of the H<sub>0</sub> hypothesis, which includes estimation by POLS, at the significance level of 1% statistically. Finally, the fact that the H<sub>0</sub> hypothesis has not been rejected by the Hausman test applied to choose between FEM and REM has revealed the necessity of an estimate by REM. The regression model analyses the presence of unit and time effects. The F and LM test statistics for the existence of time effects are 0.46 and 0.01, respectively, and are statistically insignificant. Therefore, the null hypothesis H<sub>0</sub>, which states that time effects are equal to zero, cannot be rejected. As a result, the estimations are continued through the unidirectional unit effect panel regression model.

If the basic assumptions of panel data models, such as autocorrelation, heteroscedasticity, and horizontal cross-section dependence in error terms, are not met, the estimates obtained are inconsistent and biased. Therefore, effective results are obtained by making robust estimations for correcting standard errors without touching the parameter estimates (Yerdelen Tatoğlu, 2016: 251-252). The heteroscedasticity problem has been investigated by the Levene, Brown, and Forsythe test to evaluate the diagnostic test results of the panel regression estimated by the REM estimator. As can be seen in Table 4 above, there is a heteroscedasticity problem detected by the rejection of the  $H_0$  hypothesis. On the other hand, there is an autocorrelation problem determined by the Baltagi-Wu test. The Baltagi-Wu LBI test statistic has revealed the autocorrelation problem in the model. The results of the Breusch-Pagan LM test performed to determine whether there is a cross-section dependence problem in the estimated model have revealed the existence of cross-section dependence. The results of the Breusch-Pagan LM test performed to determine whether there is a cross-sectional dependence problem in the estimated model have revealed the existence of cross-sectional dependence. When cross-sectional dependency exists, disregarding it may result in estimates of regression coefficients that are biased, inconsistent, and ineffective. The obtained test statistics revealed the existence of autocorrelation and cross-sectional dependency problems, as well as heteroscedasticity problems in the model. In such a case where all three problems are present, the panel regression equation must be estimated with the robust estimator method, which allows adjusted standard errors to be yielded. Considering all these results, the REM estimation has been reestimated through the resistant estimator method, taking all three problems into account.

The results in Table 4 have revealed that DCP, used as indicator of financial development, affects LGINI positively at the significance level of 1% statistically. Accordingly, financial development affects income inequality positively. On the other hand, when the results of the control variables are examined, it has been determined that the LINF and GCE affect income inequality negatively, at a significance level of 1% statistically. According to this result, government expenditures and inflation reduce income inequality.

## Conclusion and Evaluation

Income inequality can cause poverty and worsen socioeconomic conditions in societies. These negative conditions naturally affect the investment level negatively, leading to low economic growth and a decrease in the living standards of societies. If income inequality is not tackled with appropriate policies, it can cause permanent harm to such societies, lasting for generations. Thus, it is important to establish policies to fight against the negative effects that income inequality creates on the economy. Inequality in access to resources and power distribution are important variables in the formation of income inequality. The functioning of financial markets affects income inequality in this setting. Therefore, the impact of financial

development on income inequality has been analysed through the panel data method for 13 OECD countries for the period between 1993 and 2017.

According to the panel regression results regarding 13 OECD countries, financial development affects income inequality positively by increasing the value of the GINI coefficient. The result in question reveals that financial development increases income inequality. This finding corroborates those found by Altunbaş and Thornton (2019), Denk and Cournede (2015), and Rodriguez-Pose and Tselios (2009). On the other hand, it has been determined that government expenditures and inflation, which have been used as control variables in the study, reduce income inequality. The finding, which determined that government expenditures decrease income inequality, supports the findings reached by Goni et al. (2011) and Kyriacou, MuineloGallo, and RocaSagalés (2016). Moreover, the finding which reveals that inflation decreases income inequality corroborates the results of Argun (2016), Topuz and Dağdemir (2016), and Emek and Tatoğlu (2020).

The panel regression analysis used to examine the influence of financial development on income distribution indicated that financial development increases income inequality. The rationale behind the outcome can be explained by the fact that loans are directed to capital-intensive sectors that use advanced technology and are more productive, rather than labour-intensive sectors that adopt simple technologies. Thus, the difference between the incomes of the workers in these sectors increases and produces income inequality. In other words, the increase in financial services may have increased income inequality by increasing the demand for skilled labour and thus increasing their wages. However, it can be said that transfers and the establishment of skilled labour, especially through public expenditures in the OECD countries, have contributed to the decrease in income inequality through public expenditures. The fact that increases in inflation reduce income inequality can be explained by this increase in inflation invigorates the economy and fosters economic growth. Accordingly, high-income groups are negatively affected by this increase compared to middle- and low-income groups. Another possible explanation is that inflation causes a change in income distribution from creditors to debtors through financial assets.

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**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: Ç.K., D.Ç.; Data Acquisition: Ç.K., D.Ç.; Data Analysis/Interpretation: Ç.K., D.Ç.; Drafting Manuscript: Ç.K., D.Ç.; Critical Revision of Manuscript: Ç.K., D.Ç.; Final Approval and Accountability: Ç.K., D.Ç.

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# Istanbul Business Research

Submitted: 02.02.2022

Revision Requested: 23.04.2023

Last Revision Received: 04.05.2023

Accepted: 09.04.2024

## RESEARCH ARTICLE

## The COVID-19 Pandemic's Impact on the Performance of Firms on the BIST 100 Index

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### Abstract

The coronavirus (COVID-19) pandemic that affected the world has caused a decline in most companies' financial performance. This study aims to analyze the effects of the COVID-19 pandemic on the financial performance of companies traded in Türkiye's Borsa Istanbul 100 (BIST 100) index for 2019-2021. Pooled ordinary least squares (OLS) regression was applied as the basic method to determine the effects of the COVID-19 pandemic on the financial performance of companies listed on the BIST 100 index. The study's findings show the COVID-19 pandemic to have had effects on the profitability of companies listed on the BIST 100 index. The results reveal net working capital, size (total assets), and financial autonomy ratios to be the ratios that affect return on assets (ROA), with the return on equity ratio (ROE) being affected only by size. These results show the BIST 100 index to have adapted to a certain extent to the uncertainties caused by the pandemic, so the shock has not been devastating. This study provides valuable insights that can assist investors, managers, creditors, and other stakeholders in making informed decisions that lead to positive outcomes.

### Keywords

COVID-19, firm performance, BIST 100, Türkiye

## Introduction

The COVID-19 pandemic devastated the global economy in early 2020. Even when compared to past events such as the Great Depression and the 1918-1920 flu pandemic, the market's reaction to the COVID-19 pandemic is regarded as exceptional (Baker et al., 2021). COVID-19's effects began as a regional crisis but quickly escalated into a global economic downturn due to the interconnectedness of financial systems. Alongside the pandemic, financial market instabilities occurred, as well as interruptions in supply chains, delays, restrictions, and interruptions in production. This led to a decrease in demand from both commercial customers and consumers, resulting in a decrease in companies' sales, earnings, and productivity (Cavlak, 2020). These micro-level disruptions also had an effect at the macro level, re-

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**To cite this article:** Altın, M., & Atalay, M. O. (2024). The covid-19 pandemic's impact on the performance of firms on the BIST 100 index. *Istanbul Business Research*, 53(1), 119-136. <http://doi.org/10.26650/ibr.2024.53.1138732>



sulting in a decrease in many countries' gross domestic product (GDP), as well as a decrease in exports, imports, and general economic activity.

COVID-19 may not have been equally damaging to all companies and industries. While most industries suffered and their stock prices plummeted, some may have benefitted from the pandemic and the ensuing lockdown (Mazur et al., 2021). Companies and governments have to consider which sectors will be affected by unusual events such as a pandemic, as well as how they will be affected. Furthermore, because such extreme circumstances have an impact on developing country markets (Topcu & Gulal, 2020), conducting these types of studies there is even more critical. Furthermore, a lack of research is found examining how the COVID-19 pandemic has changed companies' actions in terms of determining their degree of performance (Achim et al., 2022). Accordingly, the study primarily focuses on firm performance in the face of the COVID-19 pandemic by assessing several key changes in the activities of various organizations. The sample of this study includes 86 of the 100 companies listed on the Borsa Istanbul (BIST 100) index traded under the ticker symbol XU100, which can be considered an emerging market. These companies can also be considered representative of Türkiye's largest companies.

The remaining sections of this work are structured as follows. Following the Introduction is a literature review on the issue. The third section describes the paper's data and methods. The fourth section contains the results and discussion, and the fifth section provides the conclusions.

## Literature Review

A number of studies have emerged over a short time examining the COVID-19 pandemic's effects on stock market returns and volatility (Ali et al., 2020; Salisu et al., 2020; Mazura et al., 2020; Papadamou et al., 2020; Zhang et al., 2020), exchange rate (Iyke, 2020), and companies' performances (Achim et al., 2022) by country groups or by countries. Mazura et al.'s (2020) study found stocks in the health, food, natural gas, and software sectors to have provided high returns during the March 2020 stock market crash, while stocks in the crude oil, real estate, entertainment, and accommodation sectors dropped significantly, losing more than 70% of their market value. COVID-19 increased the vulnerability of all sectors to the crisis with the exception of information technology, pharmaceuticals, and basic food sectors (Allianz, 2020; Euler Hermes, 2020). In a poll performed in Türkiye, the majority of sector representatives stated the pandemic to have had a significant impact on their sector (KPMG, 2020). According to United Nations Conference on Trade and Development (UNCTAD, 2020) data, a 37.3% drop has occurred in the world's general commodity prices, 55% in the energy sector, 18% in industrial metals, 7% in agriculture, 15% in animal husbandry, and 5% in metal prices. Furthermore, metal products, machinery, sports, insurance, and banking were among the hardest-hit industries.



Despite the significant economic downturn, the food and beverage, wholesale and retail trade, and real estate investment sectors were the least affected by the outbreak (Öztürk et al., 2020). For instance, although the manufacturing sector experienced significant declines, other industries such as information technology, software, and social services saw increases in their respective market shares (Gu et al., 2020). The most interesting consequences of the pandemic are observed in the service industry sector. In some service areas such as the airline industry, a sudden drop occurred in demand and capacity was not at full use, while in other service areas such health services, a sudden rise in demand occurred that made meeting the demand impossible (Kabadayı et al., 2020).

The COVID-19 outbreak, which had numerous severe economic repercussions, was discovered to have a negative impact on the average returns of the BIST sector index. Goker et al.'s (2020) study investigated the impact of the COVID-19 pandemic on the BIST sector index's returns and found sports, tourism, and transportation to have been negatively affected while food, chemical, and banking were positively affected. Kılıç (2020) used the event study research approach to examine the returns on the BIST sector indices in order to determine the impact of the COVID-19 outbreak on Turkish financial markets. Despite the fact that the textile and tourist industries were said to have been the most negatively affected, the trade sector was positively affected by the pandemic. Goker et al. (2020) analyzed 26 sector indices of the BIST 100. By analyzing the cumulative average abnormal returns (CAAR) of the sectors using the event study approach, the study aimed to determine on which sectors the pandemic was having the greatest impact. The conclusion of their research determined the industries that were being most negatively affected by the pandemic process to be the sports, tourism, and textile industries, although this changed over time. In contrast, positive CAAR values were recorded in the food, chemical, and banking sectors, which are the largest consumer sectors. According to Xiong et al. (2020), at this exceptional moment, individuals were responding instinctively to satisfy their most fundamental needs, and companies with a strong financial position were also less affected by the COVID-19 outbreak's negative consequences. They found those companies to be more profitable and to have high growth potential, more short-term assets, and higher share values.

Demirhan's (2020) study concluded the pandemic to have caused volatility and this volatility in the stock market and CDS premiums to be closely related to the increase in the number of patients, which sheds light on individuals' investment decisions. Peker and Demirhan (2020) examined on a sectorial basis the returns of stocks traded on the BIST index and the effects of these returns on volatility. They concluded the effects of the global pandemic to vary according to sector. Bayraktar (2020) examined the impact of the COVID-19 pandemic on BIST 100 index's manufacturing sector stocks, with the results showing the manufacturing sector stocks that were traded on the BIST 100 to have generated more returns than in the period before the pandemic, thus the sector had eliminated the pandemic's negative

effects. Zhang et al. (2020) observed a never-before-seen traumatic downward movement to have occurred in the financial markets alongside the COVID-19 pandemic. Evidence from their research showed that systematic risks in the market had increased with the pandemic and found the reactions of China's stock markets to the pandemic to have been significant.

Baskan et al. (2022) compared the financial data of small- and medium-sized construction companies from 2019 to when the pandemic affected the world. A decrease in current assets was determined in 2020 for the companies they subjected to the study. On the other hand, when they analyzed the account class of fixed assets, no major change could be detected. They determined short-term liabilities to have decreased by approximately 24% on average, long-term liabilities to have increased by approximately 9% on average, and shareholder equity to have increased by approximately 14%. They found on average that companies' debt ratios went down, even if only by a small amount; at the same time the percentage of total liabilities went up for short-term liabilities and down for long-term liabilities.

Laing (2020) evaluated the economic effects of the COVID-19 outbreak on the mining sector alongside the economic effects that were expected to occur in the mining sector and stated that prices and production would be affected in the short term and that the sector's profitability would decrease, with the medium- to long-term effects being completely uncertain. Kızıllı & Aslan's (2019) study used the ratio method to examine the financial performances of airline companies traded on BIST 100 (i.e., THY and Pegasus). According to the results from their analysis, Pegasus was concluded to be in a better position than THY in terms of liquidity ratios, both companies to be operating effectively, and their profitability fluctuations to closely resemble one another. The dynamic panel data analysis results from Demirhan & Sakin's (2021) study showed the COVID-19 pandemic to have both negative and positive effects on the profitability ratios of companies listed in Türkiye.

## **Research Model and Data**

### **Data**

The sample of this study includes 86 of the 100 companies listed on the BIST 100 index (ticker symbol XU100). These companies can be seen as the representatives of the largest companies in Türkiye. Of the remaining 14 companies, they were either bank, which were excluded from the research due to their unique balance sheet arrangements, or companies that did not publish financial statements in 2019, 2020, or 2021.

The companies in the study's sample are grouped into their respective industries, six in real estate, 10 in chemicals, 12 in holdings, 27 in manufacturing, six in retail, seven in energy and gas, four in technology (including IT and R&D), and 14 in "other services". Again, the



companies not included in any of the sectors mentioned above were grouped under the category of “other services” for being relatively few in number (e.g., only one company operating in the financial institutions sector, only two companies operating in the transportation sector).

## Variables

Table 1 lists the variables used in this study and their descriptions. The dependent variables (i.e., companies’ return on equity [ROE] and return on assets [ROA] rates) are widely used indicators of firm performance. Working capital ratios, capital structure ratios, and size proxies are the study’s independent variables affecting the ROE and ROA indicators. Size proxy is comprised of the indicator total asset; working capital is comprised of net working capital, quick ratio, and cash ratio assets; and capital structure is comprised of financial autonomy rate and debt equity rate (Vätavu, 2015; Afrifa, 2016; Chaudhuri, 2016; Nizam et al., 2019; Ramzan et al., 2021; Nasrallah & El Khoury, 2022).

Table 1  
*Variable of the Models*

Variables	Expression	Description	Measurement
<b>Dependent Variables</b>			
Performance Measures (PM)	Return of Assets (ROA)	Shows whether the company is using its assets profitably.	Net Income/Total Shareholder’s Equity
	Return of Equity (ROE)	Shows profit earned on equity. Express whether the resources are used efficiently or not.	Net Income/Total Assets
<b>Independent Variables</b>			
Size (SIZE)	Total Assets (TA)	Represents the sum of a company’s current economic resources.	Logarithm of Total Assets
	Net Working Capital (NWC)	The difference between a company’s current assets and short-term liabilities. Essential indicator of company’s credibility.	Net Working Capital/Total Assets (%)
Working Capital (WC)	Quick Ratio (QR)	Excluding inventories from a company’s current assets and dividing them by short-term liabilities. Represents the companies’ ability to pay its short-term debts.	(Cash+Marketable Securities+Account Receivables)/ Current Liabilities (%)
	Cash Ratio (CR)	Representing how much of the company’s short-term debts can be paid through its liquid assets.	(Cash+Marketable Securities)/ Current Liabilities (%)
Capital Structure (CS)	Financial Autonomy Rate (FAR)	Indicating the degree to which a company’s economic resources are covered by its sources.	Shareholder’s Equity/Total Assets (%)
	Debt Equity Ratio (DER)	Whether and to what extent a company financing its operations with its own funds or debt.	Total Depts / Total Assets (%)

All financial data have been obtained from the 2019–2021 yearly financial statements published on Türkiye’s Public Disclosure Platform (KAP; [www.kap.org](http://www.kap.org)). Before examining

the market- and sector-based evaluations, Türkiye's current situation must be addressed. The manufacturing sector of Turkish companies has an import-dependent structure. The value of the Turkish lira has decreased dramatically against foreign currencies over the last five years. This decrease has gained momentum in the USD/TRY currency pair since 2019. Table 2 shows the relative changes in sales revenue during the 2019–2021 period.

Table 2  
*Relative changes (%) in the sales revenue during 2019-2021 period*

Sectors	Sales (2019, USD)	Sales (2020, USD)	Sales (2021, USD)	Changes in Sales (%) 2019-2020	Changes in Sales (%) 2020-2021
Real Estate	1.757.641.365	1.653.087.642	1.721.872.405	-5,94%	4,16%
Chemistry	16.861.696.155	13.950.949.352	25.312.295.926	-17,26%	81,43%
Holdings	36.113.413.331	36.271.069.903	48.390.399.109	0,01%	33,41%
Manufacturing	36.477.580.618	43.594.212.213	57.223.480.711	19,50%	31,26%
Retail	16.393.317.469	21.019.660.180	21.090.180.358	25,78%	0,01%
Energy	4.361.511.951	4.806.886.852	5.271.030.326	9,17%	9,65%
Technology	2.674.355.296	3.846.250.341	3.840.328.539	43,81%	0,00%
Other Services	59.055.079.008	36.387.803.715	43.506.763.129	-38,38%	19,56%
Total	173.494.595.193	161.529.920.198	204.732.423.626	-7,00%	26,74%

In studies dealing with companies' performances, sector-based analyses have yielded detailed and consistent results. Table 2 demonstrates how the COVID-19 pandemic affected companies' sales revenues in the relevant sectors during the 2019–2021 period. In comparison to 2019, total market sales had decreased by 7% by the end of 2020. Companies in the real estate, chemical, and other services sectors had had average respective decreases in sales of 5.94%, 17.26%, and 38.38% in the 2019-2021 period. These sectors can safely be assumed to have been the sectors most negatively affected by the COVID-19 pandemic. In particular, the transportation sector, which has been included in "other services", had a dramatic decrease in sales of 40.50% during the analyzed period. Due to the pandemic, travel restrictions on intercity travel and curfews had been introduced at certain times in Türkiye. These restrictions had a negative impact on the transportation sector. Despite the COVID-19 pandemic, the manufacturing, retail, energy, and technology sectors respectively increased their sales by 19.50%, 25.78%, 9.17%, and 43.81%. Due to the COVID-19 pandemic, many new entertainment programs were started on digital platforms. In addition, many face-to-face activities started taking place on digital platforms. These changes have led to a growth in the technology sector.

COVID-19 started to lose its effect in Türkiye after the second half of 2020 in particular (Topcu & Gulal, 2020). Economic activity that had slowed down due to the coronavirus started an upward trend with the decrease of the pandemic's effect. This upward trend started to show itself in the economy as well. The companies listed on the BIST 100 index grew by 26.74% from 2020 to 2021. As COVID-19 cases declined, curfews and travel bans/restrict-

tions were abandoned or reduced. Lifting restrictions had a positive impact on the transportation sector (included in the “other services” sector). As a result of all these developments, the transportation sector, which had shrunk by 40.50% between 2019-2020, grew by 65.98% compared to the previous period. The considerable degree of fear, worry, and concern the pandemic had induced in the population decreased as the numbers of cases and daily deaths decreased, thus increasing the demand for products and services, which in turn caused the chemical, holdings, manufacturing, and energy sectors to grow by 81.43%, 33.41%, 31.26%, and 9.65%, respectively. No growing market was encountered in the technology sector. The reasons for this being factors such as online and digital environments no longer being as needed due to restrictions being lifted, as well as the preference for face-to-face activities over digital processes and applications. While the technology market did not grow in 2021, it did however retain its value, indicating that applications and processes for digital and online platforms were still being widely used in the Turkish market.

Table 3

*Relative changes (%) in the current and fixed assets during 2019-2020 period*

Sectors	Current Assets 2019	Current Assets 2020	Fixed Assets 2019	Fixed Assets 2020	Changes in Current Assets (%)	Changes in Fixed Assets (%)
Real Estate	4.451.570	3.835.882	4.159.820	3.669.180	-13,83	-11,79
Chemistry	8.212.062	8.331.669	7.615.631	7.548.357	1,46	-0,88
Holdings	56.945.964	90.896.415	60.391.325	84.034.142	59,62	39,15
Manufacturing	28.037.945	30.990.264	24.611.181	34.649.526	10,53	40,79
Retail	3.950.861	4.865.709	4.132.801	3.846.092	23,16	-6,94
Energy	1.923.853	1.690.439	8.005.902	7.291.413	-12,13	-8,92
Technology	2.808.973	3.250.386	2.049.598	2.056.877	15,71	0,08
Other Services	18.867.161	18.209.499	39.692.389	39.810.549	-3,49	0,3
Total	152.757.892	172.701.166	122.011.328	158.843.205	13,05	30,18

\* The amounts indicates a thousand USD.

The 2019-2020 period for the sectors in Table 3 showed an increase in current assets of 13.05% in total, and an increase of 30.18% in fixed assets. An increase in current assets was observed in all sectors except the real estate, energy, and “other services” sectors. The sectors with the highest increase in current assets appeared as the holdings, retail, technology, and manufacturing sectors, in that order. When looking at fixed assets, increases occurred in all sectors’ fixed assets except for the real estate, energy, retail, and chemical sectors.

Table 4 shows the total value of current assets between 2020-2021 to have declined by 12.91% and the value of fixed assets to have declined by 3.82%. Decreases occurred in fixed assets in all sectors except the retail and energy sectors. In addition, the ratio of current assets, which had increased significantly in the previous period when COVID-19 had been more common, now decreased in all but the chemical, energy, and “other services” sectors.

Table 4  
*Relative changes (%) in the current and fixed assets during 2020-2021 period*

Sectors	Current Assets 2020	Current Assets 2021	Fixed Assets 2020	Fixed Assets 2021	Changes in Current Assets (%)	Changes in Fixed Assets (%)
Real Estate	3.835.882	2.443.926	3.669.180	2.772.943	-37,59	-24,42
Chemistry	8.331.669	9.217.351	7.548.357	5.719.565	11,27	-24,23
Holdings	90.896.415	86.695.894	84.034.142	70.886.926	-4,62	-15,64
Manufacturing	30.990.264	27.924.629	34.649.526	25.486.942	-9,89	-26,44
Retail	4.865.709	3.505.362	3.846.092	2.697.683	-27,95	29,85
Energy	1.690.439	1.838.039	7.291.413	4.734.408	8,03	35,06
Technology	3.250.386	2.321.369	2.056.877	1.837.559	-28,58	-10,66
Other Services	18.209.499	19.397.841	39.810.549	36.889.185	6,52	-7,33
Total	172.701.166	150.391.055	158.843.205	152.764.885	-12,91	-3,82

\* The amounts indicates a thousand USD.

Table 5 presents the 2019–2021 summary statistics of all variables for the entire 86 Turkish companies sampled from the BIST 100 index. The purpose of this study is to examine these summary statistics that form the short panel's time dimension in order to assess the impact COVID-19 had on Turkish companies' climate and comprehend how companies adapted annually. The results indicate an increase in the average ROA and ROE values of the sampled companies between 2019-2021. These results imply the sampled companies to have used their assets and resources efficiently during the COVID-19 pandemic. In addition, a slight decrease as found in the proportion of debt equity rate, as well as a slight increase in the financial autonomy rate. Furthermore, the proportion of net working capital increased by 23.14%, with companies having increased their ability to pay short-term debts during the crisis. Finally, as mentioned before, companies had increased their total assets to become more adaptable to the COVID-19 pandemic.

Table 5  
*Summary Statistics of Selected Variables*

Variable	Mean	Std. Dev.	Min	Max	Observations
ROA	99.856	111.689	-142.630	544.600	258
ROA (2019)	76.296	953.511	-142.630	365.219	86
ROA (2020)	89.605	104.691	-106.427	468.108	86
ROA (2021)	133.669	125.857	-123.800	544.600	86
ROE	209.799	405.003	-2.558.142	2.425.642	258
ROE (2019)	120.176	420.140	-2.558.142	800.725	86
ROE (2020)	198.337	452.061	-2.101.261	2.425.642	86
ROE (2021)	310.884	310.592	-1.290.400	1.265.600	86
Debt Equity Ratio	550.823	238.466	0.9385	1.004.707	258
Debt Equity Ratio (2019)	557.339	239.796	11.933	1.004.707	86
Debt Equity Ratio (2020)	551.350	237.108	0.9385	997.824	86
Debt Equity Ratio (2021)	543.780	244.449	11.400	970.400	86
Net Working Capital	139.462	233.662	-425.709	734.203	258
Net Working Capital (2019)	121.667	246.351	-425.709	713.939	86

Variable	Mean	Std. Dev.	Min	Max	Observations
Net Working Capital (2020)	144.618	234.795	-404.465	734.203	86
Net Working Capital (2021)	149.829	222.322	-276.900	701.100	86
Financial Autonomy Rate	411.079	231.910	-0.4965	990.614	258
Financial Autonomy Rate (2019)	405.341	229.796	-0.4965	9.880.665	86
Financial Autonomy Rate (2020)	412.214	230.726	0.2019	990.614	86
Financial Autonomy Rate (2011)	415.689	237.724	29.600	988.600	86
Total Assets	3.16 x 10 <sup>10</sup>	1.03 x 10 <sup>11</sup>	8.64 x 10 <sup>7</sup>	1.02 x 10 <sup>12</sup>	258
Total Assets (2019)	1.9 x 10 <sup>10</sup>	4.93 x 10 <sup>10</sup>	8.64 x 10 <sup>7</sup>	4.06 x 10 <sup>11</sup>	86
Total Assets (2020)	2.86 x 10 <sup>10</sup>	8.76 x 10 <sup>10</sup>	1.94 x 10 <sup>8</sup>	6.30 x 10 <sup>11</sup>	86
Total Assets (2021)	4.73 x 10 <sup>10</sup>	1.44 x 10 <sup>11</sup>	3.61 x 10 <sup>8</sup>	1.02 x 10 <sup>12</sup>	86
Quick Ratio	23.565	60.306	0.1152	594.017	258
Quick Ratio (2019)	25.338	69.152	0.1220	578.405	86
Quick Ratio (2020)	25.569	70.274	0.1152	594.017	86
Quick Ratio (2021)	19.784	35.420	0.1800	220.300	86
Cash Ratio	1.740.127	579.122	0.0914	5.707.779	258
Cash Ratio (2019)	1.907.434	6.642.834	0.0914	5.453.889	86
Cash Ratio (2020)	1.941.881	6.847.824	0.1828	5.707.779	86
Cash Ratio (2021)	1.371.067	3.190.065	13.200	2.048.910	86

Table 5 shows the correlation matrix between the study's chosen variables. Most variables are computed as percentages in order to perform regression modeling on the variables with the same units, the exception here being the size variable, which is the natural logarithm of the total assets. The direct and indirect relations the dependent variables ROE and ROA have with the independent variables are shown by the signs of their correlation coefficients.

Table 6  
*Correlation matrix of Selected Variables*

Variables	ROE	ROA	TA	DER	FAR	NWC	QR	CR
ROE	1							
ROA	0.5749	1						
TA	-0.1135	-0.3943	1					
DER	-0.1807	-0.5369	0.3408	1				
FAR	0.1727	0.5750	-0.3981	-0.9067	1			
NWC	0.3338	0.5597	-0.2618	-0.6663	0.5348	1		
QR	0.0582	0.2745	-0.1854	-0.4852	0.4178	0.3914	1	
CR	0.0394	0.2209	-0.1556	-0.4634	0.3875	0.3635	0.9953	1

## Statistical Techniques

The study models the balanced panel data using simple regression analysis utilizing the pooled ordinary least squares (OLS) method in order to evaluate the influence of the BIST 100 companies' key measures on their performance. To establish which of these measures has the biggest influence on the tested companies, the following equations serve as the foundation for the more intricate models that were created:

$$ROE_{i,t} = \beta_0 + \beta_1 NWC_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 DER_{i,t} + \beta_4 SD_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$ROA_{i,t} = \beta_0 + \beta_1 NWC_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 FAR_{i,t} + \beta_4 SD_{i,t} + \varepsilon_{i,t} \quad (2)$$

As shown in Equations 1 and 2, a company's financial success is based on the independent variables given in Table 1, where  $SD_{i,t}$  is the dummy variable that accounts for variations between industries and  $\varepsilon_{i,t}$  is the residual. Creating dummies is vital for the activity fields in order to assess the effects of the pandemic on the sampled organizations.

The fixed effects and random effects methods were also applied alongside the pooled OLS method for panel data. Fixed effects can eliminate the effect of time-invariant variations among companies, allowing for an analysis of the predictors' net effects on the outcome variable. Meanwhile, random effects models assume that variations among companies are both random and uncorrelated with the model's independent variables.

## Results and Discussion

### Regression Results

Table 7 shows the first main findings of the investigation. The influence of the COVID-19 pandemic on the performance of 86 Turkish companies from a variety of activity sectors was examined for the 2019-2021 period. The dependent variables are the ROA indicators (Models 1-4") and the ROE indicators (Models 5-8").

Model 1 estimates the influence of net working capital on company ROA, which is expected to be positive based on the correlation matrix of these variables (Table 6). The difference between a company's current assets and short-term liabilities is its net working capital. The less companies operate their activities with debt, the higher their performance in terms of ROA. As a result, a positive net working capital indicates that a company can pay its short-term liabilities and show good performance. A one-unit increase in a company's net working capital increases its ROA by 0.27 on average, while everything else remains constant. The net working capital explains 31.33% of the variance in ROA. Model 2 adds a variable with a direct relationship to company performance. As a result of the OLS regression in Table 7, an increase in company size decreases the company's performance. Companies' performances declined as their sizes increased mainly because larger companies were unable to manage their assets well during this period. They were unable to act flexibly or quickly during the pandemic due to their complex organizational structures and thus could not adapt to market changes. On the other hand, small companies performed better because their organizational structures are simpler, they could behave more flexibly during the pandemic, and they were able to adapt to changing conditions.

Table 7

The performances of companies, full sample, with ROA (models (1)-(3'')) and ROE as dependent variables (models (4)-(6''))

ROA						
Performance	Model 1 OLS	Model 2 OLS	Model 3 OLS	Model 4 OLS	Model 4' FEM	Model 4'' REM
Constant	6,25***	48,34***	29,40***	15,18	-108,66***	-3,46
NetWorkingCapital	0,27***	0,23***	0,16***	0,15***	0,13***	0,16***
Size		-4,21***	-2,84***	-1,71**	10,50***	0,28
FinancialAutonomyRate			0,16***	0,18***	0,32***	0,22***
D_REAL				0,64		-2,41
D_CHEM				4,61		2,59
D_HOLD				-1,79		-5,11
D_MANU				2,38		-0,02
D_RETA				6,88		5,03
D_ENRG				-0,93		-2,55
D_TECH				8,49		6,64
D_OTHR				0,61		-2,26
R <sup>2</sup>	0,3133	0,3792	0,4469	0,5027	within R <sup>2</sup> =0,29	within R <sup>2</sup> =0,17
Adjusted R <sup>2</sup>	0,3106	0,3743	0,4404	0,4804	between R <sup>2</sup> =0,08	between R <sup>2</sup> =0,53
Obs	258	258	258	258	overall R <sup>2</sup> =0,11	overall R <sup>2</sup> =0,43
Hausmann Test					Prob > chi2 = 0.0000 H1: FEM is optimal.	
ROE						
Performance	Model 5 OLS	Model 6 OLS	Model 7 OLS	Model 8 OLS	Model 8' FEM	Model 8'' REM
Constant	12,91***	29,01	28,38	6,96	-244,43*	-2,41
NetWorkingCapital	0,58***	0,57***	0,66***	0,64***	0,53	0,63***
Size		-1,61	-2,52	-0,27	29,03**	0,96
DebtEquityRatio			0,15	0,08	-0,52	0,05
D_REAL				3,21		1,63
D_CHEM				10,07		9,41
D_HOLD				-3,55		-5,29
D_MANU				2,15		1,21
D_RETA				11,27		10,8
D_ENRG				0,98		0,47
D_TECH				15,12		14,47
D_OTHR				0,78		-0,62
R <sup>2</sup>	0,1114	0,1122	0,1163	0,1296	within R <sup>2</sup> =0,07	within R <sup>2</sup> =0,04
Adjusted R <sup>2</sup>	0,108	0,1052	0,1058	0,0907	between R <sup>2</sup> =0,02	between R <sup>2</sup> =0,25

Performance	ROE					
	Model 5 OLS	Model 6 OLS	Model 7 OLS	Model 8 OLS	Model 8' FEM	Model 8'' REM
Obs	258	258	258	258	overall R <sup>2</sup> =0,03	overall R <sup>2</sup> =0,13
Hausmann Test					Prob > chi2 = 0.0012 H1: FEM is optimal.	

\*\*\* represents the 1%, \*\* represents the 5%, and \* represents the 10% significant coefficients.

Model 3 adds the independent variable of financial autonomy rate, which has a direct correlation with firm performance due to its estimated coefficient being positive and significant. Model 4 contains sectoral dummies that provide a minor estimation basis for their relationship to the performance of Turkish companies during the COVID-19 pandemic. As shown in Model 4, no industries were negatively or positively affected by the COVID-19 pandemic. This result indicates industrial dynamics to have had no impact on companies' performances. The fixed effects models (FEM Model 4') and random effects models (REM Model 4'') are the primary alternatives to the default estimate method of OLS estimation. As expected, the independent variables apart from size kept their signs and significances, with their coefficients in Model 4' being extremely similar. In Model 4'', the influence of the size variable on ROA was insignificant. These results indicate size to have had a varying effect on ROA under different contexts. The Hausman test confirmed the FEM model to be the optimal one.

The effect of net working capital on ROE for the sampled companies was modeled and estimated using Model 5. As predicted by the correlation matrix in Table 6, a positive connection can be observed, with the net working capital's impact on ROE. A one-unit increase in net working capital rates increased companies' ROE ratios by an average of 0.58 units. Thus, the less debt a company uses to finance its operations, the greater its success in terms of its return on shareholders' equity. Models 6 and 7 show surprising results when adding size and debt equity ratio to the independent variables, as these variables showed no significant positive or negative effect on ROE. Model 8 adds sectoral dummies to the formation of Eq. 2; however, industrial dynamics showed no significant effect on ROE. The fixed effects model (FEM Model 8') and the random effects model (REM Model 8'') have also been applied. The effect of the variable of size on ROE is significant and positive in Model 8'; however, it had no significant effect on ROE in Model 8''. As previously indicated, this result demonstrates the impact of company size on ROE to vary depending on context. Net working capital has a significant and positive effect on ROE in Model 8''. The Hausman test indicates the optimal estimation technique to be the fixed effects model.

## Robustness Checks

This section examines whether the overall finding still holds when re-estimating the model in light of potential endogeneity issues and alternative conditions. As a result, the study



utilizes regression modeling of cross-sectional variations from 2019-2021 to estimate Equations 1 and 2 using the variations in the size, debt equity ratio, net working capital, financial autonomy rate, and sectorial dummy variables as factors explaining the variance in ROA and ROE. Table 8 largely reemphasizes the main results from Table 7.

Table 8

*Robustness checks. The performances of companies, full sample, with ROA (models (1)-(4)) and ROE as dependent variables (models (5)-(8))*

Performance	ROA			
	Model 1 OLS	Model 2 OLS	Model 3 OLS	Model 4 OLS
Constant	6,16***	27,59**	7,22	-3,46
NetWorkingCapital	0,27***	0,26***	0,17***	0,16***
Size		-2,15***	-0,75**	0,28
FinancialAutonomyRate			0,19***	0,22***
D_REAL				-2,41
D_CHEM				2,59
D_HOLD				-5,11*
D_MANU				-0,02
D_RETA				5,03*
D_ENRG				-2,55
D_TECH				6,64
D_OTHR				-2,26
Within R <sup>2</sup>	0,13	0,08	0,17	0,19
Between R <sup>2</sup>	0,38	0,47	0,53	0,6
Overall R <sup>2</sup>	0,31	0,36	0,43	0,49
Obs	258	258	258	258
Performance	ROE			
	Model 5 OLS	Model 6 OLS	Model 7 OLS	Model 8 OLS
Constant	12,81***	21,39	21,07	-2,41
NetWorkingCapital	0,59***	0,58***	0,66***	0,63***
Size		-0,86	-1,66	0,96
DebtEquityRatio			0,13	0,05
D_REAL				1,63
D_CHEM				9,41
D_HOLD				-5,29
D_MANU				1,21
D_RETA				10,8
D_ENRG				0,48
D_TECH				14,47
D_OTHR				-0,62
Within R <sup>2</sup>	0,03	0,03	0,03	0,04
Between R <sup>2</sup>	0,21	0,21	0,23	0,25
Overall R <sup>2</sup>	0,11	0,11	0,12	0,13
Obs	258	258	258	258

\*\*\* represents the 1%, \*\* represents the 5%, and \* represents the 10% significant coefficients.

Equations 1 and 2 have been re-estimated utilizing the recomputed independent variables. As anticipated, the results confirm the study's main findings. Between 2019-2021, variations in net working capital showed a positive effect on financial performance as measured by the variations in ROA (Models 1-4) and ROE (Models 5-8) of the 86 companies, whereas the variations in size showed a negative effect on ROA (Models 2 and 3) and no significant effect on ROE (Models 6-8). The rate of financial autonomy showed a positive effect on ROA (Models 3-4). However, variations in the debt equity ratio showed no significant effect on ROE. Model 4 demonstrates the negative effects of variations in ROA of the holdings sector and the positive effects of variations in ROA on the retail sector (significant at the 10% level). Supported by the robustness tests, the study's main findings validate the applicability of Equations 1 and 2 in explaining the variations in ROE and ROA for Turkish companies between 2019-2021.

### **Conclusions**

The rapid spread of COVID-19 seriously affected the global economy with disruptions in companies' activities and fluctuations in asset prices and exchange rates. As in the past, the negative financial effects of such events are severe and global. Consequently, and similar to other national economies, the COVID-19 outbreak has had a significant impact on the Turkish economy and its companies and industries. Profitability is one of the most important indicators in evaluating a firm's performance. Identifying the variables that are the determinants of profitability and revealing their relations with profitability have the potential to benefit companies and the economy in general at the macro level, as well as contributing to the literature. In order to investigate the factors affecting companies' profitability during the COVID period, this study has intended to evaluate the level of firm performance in reaction to the COVID-19 pandemic by analyzing numerous major changes in companies' activities. The sample of this study includes 86 of the 100 companies listed on the Borsa Istanbul (BIST) 100 index (ticker symbol XU100), which can be considered an emerging market. This research has also tried to fill the gap in the existing literature regarding studies examining key changes in company activities to assess companies' performance levels in response to global pandemics.

The COVID-19 pandemic affected companies' sales revenue in the related sectors during the 2019–2021 period. In comparison to 2019, total market sales had decreased by 7% by the end of 2020. When considering total company sales, the manufacturing, retail, energy, and technology sectors can be safely assumed to have been positively affected by the COVID-19 pandemic and the real estate, chemical, and "other service" sectors to have been negatively affected. In particular, the transportation sector (included in "other services") experienced a dramatic decrease in sales of 40.50% during the analyzed period. Due to COVID-19 pandemic, travel restrictions on intercity travel and curfews were introduced at certain times in

Türkiye. These restrictions had a negative impact on the transportation sector. A number of monetary policies such as providing liquidity support to the market, low-interest loan options, and changes in policy interest rates were put into effect in 2020 in order to combat the pandemic and reduce its negative economic effects for the real estate sector. An increase in real estate sales occurred between 2020-2021.

The short-balanced panel data results from this paper show the COVID-19 pandemic to have impacted the profitability ratios of listed companies in Türkiye. The percentages for net working capital, size, and financial autonomy rate appear to have affected their ROA values. However, only size appears to have had an effect on their ROE ratio, whereas the net working capital and debt equity ratios did not. The robustness test did not alter the study's main findings. In addition, the findings from the robustness test revealed the holdings sector to have been negatively affected by the global pandemic, while the retail sector performed well during this this period.

These results show the companies on the BIST 100 index to have adapted to a certain extent to the uncertainties the pandemic had caused, resulting in the shock not being so devastating. This study reveals results from which investors, managers, creditors, and all other stakeholders can benefit with regard to their decisions for helping them make the right decisions. The worst-affected industries and companies needed help from governments in the form of financial support, such as rescheduling or delaying loans, subsidies, and possible tax breaks to help them get back on their feet. In addition, companies should enhance their financial planning and concentrate on policies to be implemented in the aftermath of the pandemic. Investors must also avoid speculative investments and make well-informed decisions regarding their portfolios. As a result of speculation, the value of financial instruments may decline even further in the market.

Evidently, governments, banks, regulators, and central banks must work together to tackle the financial and economic repercussions of the COVID-19 crisis. They should also produce thorough plans to deal with the consequences of future crises. A number of steps may be taken to help the worst-affected industries, such as providing loans or restructuring current debts.

This paper has some limitations. First, it focused on the sectors included in the BIST 100 index (ticker symbol XU100). Future studies can include other sectors. Secondly, the effects on sector performance can be explained more comprehensively by adding the effects of different financial ratios to the independent variables. In addition, different performance measures can be used as dependent variables.

**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: M.A., M.Ö.A.; Data Acquisition: M.A., M.Ö.A.; Data Analysis/Interpretation: M.A., M.Ö.A.; Drafting Manuscript: M.A., M.Ö.A.; Critical Revision of Manuscript: M.A., M.Ö.A.; Final Approval and Accountability: M.A., M.Ö.A.

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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>

#### c) Journal Article from Web, without DOI

Sidani, S. (2003). Enhancing the evaluation of nursing care effectiveness. *Canadian Journal of Nursing Research*, 35(3), 26–38. Retrieved from <http://cjr.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>

#### f) Article in a Magazine

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)

#### b) Dissertation/Thesis from an Institutional Database

Yaylalı-Yıldız, B. (2014). *University campuses as places of potential publicness: Exploring the political, social and cultural practices in Ege University* (Doctoral dissertation). Retrieved from <http://library.iyte.edu.tr/tr/hizli-erisim/iyte-tez-portali>

**c) Dissertation/Thesis from Web**

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>

**d) Dissertation/Thesis abstracted in Dissertations Abstracts International**

Appelbaum, L. G. (2005). Three studies of human information processing: Texture amplification, motion representation, and figure-ground segregation. *Dissertation Abstracts International: Section B. Sciences and Engineering*, 65(10), 5428.

**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.

**f) Conference Paper Abstract Retrieved Online**

Liu, S. (2005, May). *Defending against business crises with the help of intelligent agent based early warning solutions*. Paper presented at the Seventh International Conference on Enterprise Information Systems, Miami, FL. Abstract retrieved from [http://www.iceis.org/iceis2005/abstracts\\_2005.htm](http://www.iceis.org/iceis2005/abstracts_2005.htm)

**g) Conference Paper - In Regularly Published Proceedings and Retrieved Online**

Herculano-Houzel, S., Collins, C. E., Wong, P., Kaas, J. H., & Lent, R. (2008). The basic nonuniformity of the cerebral cortex. *Proceedings of the National Academy of Sciences*, 105, 12593–12598. <http://dx.doi.org/10.1073/pnas.0805417105>

**h) Proceeding in Book Form**

Parsons, O. A., Pryzwansky, W. B., Weinstein, D. J., & Wiens, A. N. (1995). Taxonomy for psychology. In J. N. Reich, H. Sands, & A. N. Wiens (Eds.), *Education and training beyond the doctoral degree: Proceedings of the American Psychological Association National Conference on Postdoctoral Education and Training in Psychology* (pp. 45–50). Washington, DC: American Psychological Association.

**i) Paper Presentation**

Nguyen, C. A. (2012, August). *Humor and deception in advertising: When laughter may not be the best medicine*. Paper presented at the meeting of the American Psychological Association, Orlando, FL.

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