



# The role of flexibility, digitalization, and crisis response strategy for SMEs: Case of COVID-19

Eyup Kahveci <sup>a</sup>, Zehra Binnur Avunduk <sup>b</sup>, Tuğrul Daim <sup>c,d</sup>, and Selim Zaim <sup>e</sup>

<sup>a</sup>SBS Swiss Business School, University of Applied Sciences Institute, Switzerland; <sup>b</sup>Vocational School of Social Sciences, Istanbul University-Cerrahpaşa, Türkiye; <sup>c</sup>Portland State University, USA; <sup>d</sup>Chaoyang University of Technology, Taiwan; <sup>e</sup>School of Business, Department of Management, IBN Haldun University, Türkiye

## ABSTRACT

We explore the impact of COVID-19 on small- and medium-sized enterprises (SMEs) and examine how crisis management strategies, particularly related to flexibility and digitalization, have influenced their responses during and after the pandemic. In this regard, we investigate the relationships between strategic flexibility, digitalization, digital technology adoption, COVID-19 perception, and firm strategy after the pandemic by specifically incorporating the mediating role of the crisis response strategy. Based on a survey of 206 Turkish SMEs in manufacturing and service industries, our research employs structural equation modeling using Smart PLS. Our findings indicate that crisis response strategies play a significant role in shaping the firm strategy after COVID-19, mediating the impact of strategic flexibility, digitalization, digital technology adoption, and COVID-19 perception. The findings highlight the importance of crisis response strategies—including optimizing business models, developing marketing channels, investing in technological innovation, diversifying into new business areas, and integrating the supply chain—during the COVID-19 period. These strategies are crucial influencers in shaping the firm strategies of SMEs beyond the pandemic. In particular, SMEs demonstrate adaptation by reassessing and restructuring their product portfolios, expanding their presence in regional markets, and establishing strategic collaborations to thrive in the evolving business landscape.

## KEYWORDS

COVID-19; crisis response strategy; digital technology adoption; firm strategy; flexibility; SMEs; digitalization

## Introduction

Small- and medium-sized enterprises (SMEs)<sup>1</sup> play a significant role in various economies. In advanced economies, such enterprises account for over 90 percent of business establishments, approximately 70 percent of jobs, and 55 percent of GDP (World Trade Organization [WTO], 2016). Similarly, in developing economies, SMEs contribute up to 40 percent of GDP and provide

**CONTACT** Tuğrul Daim  [tugrul.u.daim@pdx.edu](mailto:tugrul.u.daim@pdx.edu)  Portland State University, PO Box 751, Portland, OR 97207

<sup>1</sup>IFC defines SMEs as enterprises that have two of the following three characteristics: 10–300 employees; \$100,000–\$15 million in assets; and \$100,000 – \$15 million in annual sales. <https://www.ifc.org/content/dam/ifc/doc/mgrt/2022-gsmef-progress-report.pdf>.

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70 percent of occupational opportunities.<sup>2</sup> In the EU-28, SMEs represent more than 99 percent of all enterprises and contribute over 50 percent of total jobs (Kahveci & Wolfs, 2019; World Bank Group, 2017).

SMEs have the potential to expand and establish connections with medium and large businesses, fostering forward linkages. They also play a crucial role in promoting equitable regional growth (Saáry et al., 2022), income redistribution, the creation of jobs (Ciurea et al., 2021; Saáry et al., 2022), poverty reduction, and innovation (Saáry et al., 2022).

Numerous developed countries have implemented supportive programs to provide financial assistance to domestic SMEs in their digitalization endeavors. The significance of these policies stems from two key factors. Firstly, SMEs often serve as the backbone of many economies, making it economically crucial to enhance their competitiveness and promote domestic economic growth. Secondly, large companies, which have a significant impact on the economy, rely on numerous SMEs within their supply chain structures. Therefore, even if a large company has embraced digitalization, it will face substantial disadvantages in the medium to long term if its supply chain remains nondigitalized while competing with similarly large companies benefiting from a fully digitalized supply chain. Consequently, the cost-effective digitalization of domestic SMEs has become a key priority for both public authorities and the private sector (Bokša et al., 2020).

Small firms, with their inherent flexibility, lack internal bureaucracy and often have owners/directors who can make quick decisions and adapt easily to agile environments and internal or external crises. Additionally, they tend to cultivate strong customer networks (Matalamäki & Joensuu-Salo, 2022). However, to fully embrace digital transformation, SMEs need to be convinced of the benefits that come with adopting digital technologies throughout their processes.

The significance of digital transformation in products, services, and value chains is emphasized as a crucial approach to achieving sustainable development and gaining competitive advantages (Gomez-Trujillo & Gonzalez-Perez, 2022; Meier, 2021; Radicic & Petković, 2023; Rossato & Castellani, 2020; Sousa-Zomer et al., 2020). However, there is a need to deepen understanding regarding the potential transformative pathways for SMEs, including strategies for embracing digitalization and adapting organizational structures and processes (Kahveci & Tambunan, 2023).

The COVID-19 pandemic has profoundly impacted businesses, particularly SMEs, forcing them to adapt rapidly to the changing

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<sup>2</sup>According to UNCTAD, the developing economies broadly comprise Africa, Latin America and the Caribbean, Asia without Israel, Japan, and the Republic of Korea, and Oceania without Australia and New Zealand. The developed economies broadly comprise Northern America and Europe, Israel, Japan, the Republic of Korea, Australia, and New Zealand. <https://unctadstat.unctad.org/EN/Classifications.html#:~:text=The%20developing%20economies%20broadly%20comprise,%2C%20Australia%2C%20and%20New%20Zealand.>

circumstances. In response to the pandemic, crisis management has become a priority for survival. SMEs have had to employ various strategies from optimizing business models, developing marketing channels and investing in technological innovation to diversify into new business areas and integrate the supply chain in order to navigate through the uncertainty and safeguard their operations. The effectiveness of these strategies in influencing firm strategy and the path to recovery is of paramount importance to the survival and long-term sustainability of SMEs.

In this area, literature has extensively examined the impacts of crises on businesses and the adoption of various strategies for survival and recovery. This study aims to fill this gap by investigating the effect of crisis response strategies on the relationship between key factors, such as SMEs' flexibility, perception of COVID-19, digitalization, and digital technology adoption, and the formulation of firm strategies.

Therefore, we aim to explore what main drivers during COVID-19 impacted firm strategies in the aftermath of the pandemic. By focusing on the SMEs' flexibility to adapt to changing environments and COVID-19 perception with the help of digitalization, we seek to shed light on how SMEs have managed to survive and maintain resilience, adaptability, and innovation during these challenging times. This study encompasses six key variables that represent strategic, digitalization, digital technology adoption, crisis response strategy flexibility, COVID-19 perception, and firm strategy after the pandemic. Survey questions concerning flexibility were sourced and adapted from Gorondutse et al. (2020) and F. Thomas (2014). Questions regarding digitalization, digital technology adoption, and crisis response strategy were adapted from Guo et al. (2020). Finally, items related to COVID-19 perception and post-pandemic firm strategy were adapted from Kahveci (2022a).

The originality and value of this research lie in its focused examination of understanding how SMEs can strategically respond to crises with the help of their flexibility and digitalization efforts and can leverage crisis response strategies to shape their firm strategies in the aftermath of the COVID-19 pandemic. By addressing the research gap and emphasizing the importance of studying crisis response strategies and digitalization undertakings of SMEs, this study aims to provide actionable insights to support SMEs in building robust and agile strategies for post-pandemic recovery and future resilience in an increasingly uncertain world. The study's findings will contribute to the existing body of knowledge in strategic decision-making, strategic flexibility, organizational adaptation, and digitalization, offering practical implications for SMEs navigating uncertain times.

## Literature review

### *Strategic flexibility*

The term *strategic flexibility* is used in strategic management literature to define a firm's ability to adapt to the changing environment. *Strategic flexibility* refers to a firm's capacity to modify its strategy in response to external opportunities, threats, and environmental variations by utilizing its available resources (Guo & Cao, 2014). On the other hand, dynamic capability is the main source of sustainable competitive advantage and refers to a firm's ability to integrate, develop, and reconfigure internal and external competences to address rapidly changing environments (Teece et al., 1997). Muneeb et al.'s (2023) findings show that dynamic capabilities support strategic flexibility and play a vital role in promoting organizational responsiveness during periods of turbulence. Strategic flexibility is the pivotal factor enabling adaptation in the face of crises and plays a significant role in enhancing a company's competitive edge, particularly during times of crisis (Guo & Cao, 2014; Klein & Todesco, 2021; Zahra et al., 2008). According to Teece's (2007) explanation, strategic flexibility can be seen as a "translator" or "convertor" that converts business information into a firm's resource management efforts.

Strategic flexibility depends on organizational culture and structure (Kuusisto, 2017). Strategic flexibility also entails the ability to proactively and swiftly respond to changing competitive conditions by effectively mobilizing resources to seize opportunities, thereby, establishing and maintaining a competitive advantage. Strategic flexibility and agility are closely related to digital capability, indicating that digitalization fosters agility (Matalamäki & Joensuu-Salo, 2022).

Gorondutse et al. (2020) found that strategic flexibility positively influences SMEs' performance with a moderating role of sustainability strategy based on a survey of 486 SMEs in Nigeria analyzed by structural equation modeling. Specifically, SMEs that exhibit higher levels of strategic flexibility, which is defined as the capability of the firm to react to changing environments to reach and sustain competitive advantage, are more likely to sustain their efforts and achieve better performance (Gorondutse et al., 2020).

According to Karman (2020), flexibility is a characteristic of systems that enables them to change within predetermined parameters, while resilience refers to an organization's ability to withstand environmental changes and continue functioning. Coping capacity, on the other hand, describes purposeful organizational behavior that involves timely and adaptive responses to challenges. Coping capacity is crucial for firms to be able to quickly and flexibly respond to their environment and effectively address emerging challenges, ultimately, leading to a competitive advantage. Flexibility and coping capacity contribute to resilience, which in turn enhances an organization's ability to select the most appropriate response strategy at any given moment.

Resilience also supports the organization's efforts to implement, reconfigure, integrate, or release resources to achieve the desired configuration. Even in turbulent conditions, firms can cultivate competitiveness by being agile and resilient (Karman, 2020; Klein & Todesco, 2021). The organization's ability to adapt to changes is contingent on its flexibility (Karman, 2020).

Guo and Cao's (2014) findings indicate that strategic flexibility is more effective in improving performance in highly competitive and less resource abundant environments. Additionally, the impact of strategic flexibility on firm performance is strengthened by resource combination activities and weakened by managerial ties (Guo & Cao, 2014).

According to Alcalde Heras et al. (2019), SMEs demonstrate greater capability in developing ambidextrous innovation strategies during economic recessions compared to larger firms. Their flexible organizational structure allows them to effectively identify new market opportunities. Moreover, SMEs' senior management exhibits strong risk anticipation skills and proactive preparation to overcome challenges, while their networking capabilities enable resource acquisition through cooperation (Klein & Todesco, 2021; Sousa-Zomer et al., 2020). These factors drive SMEs to adopt more-ambidextrous innovation strategies (Alcalde Heras et al., 2019; Klein & Todesco, 2021). This can be attributed to the need for dynamic environments to deploy such capabilities and the tendency for companies to become complacent during good financial times when demand is high and improvements may not be perceived as necessary (Alonso-Almeida et al., 2015).

Zhang et al. (2023) show that digital technology usage positively affects business model innovation with the mediating role of strategic flexibility.

The integration of novel digital technologies prompts companies to either revise their existing business model or formulate a new one. Importantly, managers gain insight into factors that exert a constructive or adverse influence on the interplay between digital technologies (DTs) and business model innovation (BMI) processes and their outcomes. This understanding empowers managers to take targeted action to mitigate unfavorable effects while enhancing the impact of beneficial factors. Flexibility emerges as a key approach, allowing managers to adapt to emerging opportunities and uncertainties (Ancillai et al., 2023).

Resilience is facilitated by resourcefulness, adaptability, and flexibility. Coping capacity involves effectively managing unexpected events and absorbing disturbances while assimilating deviations. Additionally, resilience greatly contributes to a firm's long-term ability to withstand shocks and select the most suitable response strategy in turbulent conditions (Karman, 2020; Klein & Todesco, 2021). Sensing capabilities plays a vital role in identifying technological and market trends while seizing capabilities is essential for integrating knowledge and data related to customers, markets, and technologies.

Reconfiguration capability is critical for transforming the current system and business model into a new one (Rachinger et al., 2019).

To enhance firm performance, managers should strive to align strategic flexibility with external and internal environments by using managerial ties (Rossato & Castellani, 2020).

The research conducted on Spanish SMEs in the machinery and tools industry by North et al. (2019) indicates that these companies face challenges in proactively identifying digitally enabled growth opportunities, indicating a weakness in “sensing.” Additionally, they struggle to fully capitalize on these opportunities to enhance their presence in digital markets and engage with customers, indicating a limitation in “seizing.” However, it is noteworthy that these SMEs demonstrate relatively better performance in identifying digital growth opportunities, “sensing,” compared to their ability to effectively profit from them, “seizing” (North et al., 2019).

Therefore, understanding the significant role played by strategic flexibility and the crisis response strategies during the COVID-19 in determining firm strategy after the pandemic is crucial. Based on the literature, the questionnaire focused on responses to changes in aggregate demand and new product launches by competitors, the introduction of new pricing schedules, expansion into new regional or international markets, the adoption of new technologies, and changes in the cost structure. The hypothesis of this research is as follows:

**Hypothesis 1:** *The crisis response strategy mediates the relationship between strategic flexibility and firm strategy after the pandemic.*

### **Digitalization and digital technology adoption**

Digital Technology (DT) has been a significant shift in our society even prior to the pandemic, with organizations transitioning from analog-based production processes to digital-based value creation processes that integrate a combination of computerized information and communication technologies into business processes, products, and services (Klein & Todesco, 2021).

DT can be categorized according to seven distinct types: social media, mobile technologies, big data, cloud computing, Internet of things (IoT) (communication and interaction between physical objects and their environment), platform development, and artificial intelligence-related (AI-related) technologies (allowing the analysis and interpretation of huge amounts of data in real time and enabling powerful automation solutions) (Guo et al., 2020; Khin & Ho, 2019). The key components of DT include the effective management of knowledge to fully leverage digital technologies, strong leadership and business expertise to develop innovative business models and foster a digital culture, and the acquisition of customer insights to adapt to evolving demands

(Klein & Todesco, 2021; Quinton et al., 2018). The characteristics of digitalization enable SMEs to swiftly respond to market changes and the successful utilization of digitalization can lead to a competitive advantage for companies. To achieve this advantage, companies need to possess digital capabilities, which involves leveraging digital technology for innovative product/service development; effective management of digital technology; adapting to digital changes; identifying new digital opportunities; and adopting relevant digital technologies. Digitalization has been incorporated into growth strategies such as market penetration, product development, and diversification through market expansion (Matalamäki & Joensuu-Salo, 2022).

The adoption and implementation of new technologies and digitalization is crucial for the survival and growth (Matalamäki & Joensuu-Salo, 2022) of SMEs (Bindra, 2013; Ciurea et al., 2021; Costa & Castro, 2021; Kahveci & Tambunan, 2023; Khin & Ho, 2019; Lányi et al., 2021) since this significantly impacts products and services, workflows, organizational structure, industrial facilities, and business models and brings about a complete paradigm shift in production and innovation processes (Hoerlsberger, 2019). The commitment to embracing digital technologies and improving the ability to effectively manage digital technology adoption, not only plays a vital role in SMEs' survival and contributes to sustainable development (Gomez-Trujillo & Gonzalez-Perez, 2022; Mancuso et al., 2023), but also offers opportunities to access new markets (Matalamäki & Joensuu-Salo, 2022) and develop long-term business strategies (Costa & Castro, 2021; Lányi et al., 2021; Neumeyer et al., 2021; Rossato & Castellani, 2020; Vide et al., 2022). This leads to improved performance, growth (Matalamäki & Joensuu-Salo, 2022), and a competitive advantage for SMEs (Ciurea et al., 2021; Costa & Castro, 2021; Neumeyer et al., 2021; Radicic & Petković, 2023; Rossato & Castellani, 2020; Sousa-Zomer et al., 2020). Additionally, such new technologies can help SMEs personalize their products and services, automate routine tasks, streamline business processes, and improve data management, which can lead to significant operational and financial efficiency (Amankwah-Amoah et al., 2021; Fauzi & Sheng, 2022; Kahveci & Tambunan, 2023; Khin & Ho, 2019; Saáry et al., 2022; Vide et al., 2022) as well as to better overall customer experience (Kalidas et al., 2020; Rossato & Castellani, 2020). They achieve this by reducing costs (Amankwah-Amoah et al., 2021; Kahveci & Tambunan, 2023; Lányi et al., 2021; Saáry et al., 2022; Vide et al., 2022) improving productivity, enhancing integration and interaction, sharing knowledge, stimulating innovation (Fauzi & Sheng, 2022; Khin & Ho, 2019; Neumeyer et al., 2021; Quinton et al., 2018; Radicic & Petković, 2023; Santos & Neumeyer, 2023), improving access to financial services, and supporting internationalization (Kutlu & Özturan, 2008; Vide et al., 2022). This is particularly beneficial for resource-constrained SMEs because it helps them to overcome scale inefficiencies. Moreover, digital transformation can encompass the development of fresh

skills, capabilities, and expertise that can encourage enterprises to innovate by introducing novel products and processes (Radicic & Petković, 2023).

The emergence of web technologies has further expanded the possibilities for firms, enabling them to expand their customer base and receive direct and immediate feedback from the market (Lányi et al., 2021; Matalamäki & Joensuu-Salo, 2022). Furthermore, web technologies contribute to the quality and speed of transactions and communication, facilitating both internal and external communication for SMEs (Lányi et al., 2021).

Garzoni et al. (2020) proposed a four-level approach for SMEs for adopting DTs. The approach includes four stages: digital awareness, digital requirement, digital collaboration, and digital transformation.

Rachinger et al.'s (2019) findings highlight the significant impact of digitalization on value creation within a business model. Digitalization positively influences the value proposition and value capture aspects of a business model, resulting in increased and additional revenue (Mancuso et al., 2023; Rachinger et al., 2019). Mancuso et al. (2023) observed that digital business model innovation functions not only as an immediate crisis response but also as a catalyst for long-term business opportunities. The study further reveals how the interplay of value mechanisms, cultivated or enhanced during times of crisis, is facilitated by digital technologies, ultimately, enabling the capture of new business opportunities beyond the crisis. This form of innovation not only facilitates short-term transformative changes but also strengthens and reshapes the competitive landscape over the long run (Mancuso et al., 2023).

Forliano et al.'s (2023) study reveals that digital BMI serves as both a short-term crisis response and a catalyst for long-term business opportunities. These authors also suggest that under the influence of crisis pressures and the increasing adoption of DTs, the traditional distinct phases of short-term crisis response, long-term innovation, and business expansion tend to merge and accelerate the innovation path (Forliano et al., 2023).

North et al.'s (2019) results indicate that although company leaders made efforts to promote digitalization and implement digital initiatives, processes, and technologies, they lacked clear strategies for future digitally driven growth and digital transformation (North et al., 2019; Radicic & Petković, 2023). According to these authors, the overall digital maturity level of the analyzed companies is moderate (North et al., 2019).

Despite the benefits, SMEs face challenges in their digitalization journey, which may include a lack of critical digital infrastructure (Amankwah-Amoah et al., 2021; Kahveci & Tambunan, 2023; Neumeyer et al., 2021) such as a fast internet connection, a lack of digital transformation strategy, reluctance to implement digital transformation (Radicic & Petković, 2023), and a lack of the necessary mindset (Solberg et al., 2020) and digital skills and expertise (Moeuf et al., 2018) needed to invest in and implement digital technologies. There may also be a lack of financial resources (Amankwah-Amoah et al., 2021; Costa &

Castro, 2021; Moeuf et al., 2018; Neumeyer et al., 2021; Teltz, 2020) and a lack of awareness and knowledge about the availability and effective integration of digital technologies into business models and processes (Amankwah-Amoah et al., 2021; Matalamäki & Joensuu-Salo, 2022; Radicic & Petković, 2023; Vide et al., 2022). SME managers may be uncertain about the benefits and risks associated with digitalization and may mistrust these technologies (Sousa-Zomer et al., 2020; Vide et al., 2022). Dependency on online platforms can expose SMEs to lock-in effects and operational risks, and limited access to customer data can hinder their understanding of the customer base. Additionally, different online platform fees may impact SMEs' profitability and competitiveness. As SMEs become more digital, they also face an increased risk of online attacks, cybersecurity threats, and data breaches, which can be a particular concern for SMEs and can have disproportionate costs and affect their supply chains deeply (Vide et al., 2022). These challenges might cause resistance to change and a hesitation to adopt DTs, which can make it difficult to fully embrace digitalization. Neumeyer et al. (2021) suggest that enhancing digital literacy improves technology absorption capacity and positively influences technology adoption. This, in turn, facilitates company efficiency, value creation, and innovation activities.

The Visa survey conducted in 2021 revealed that small business owners are actively adopting new technologies to adapt to evolving consumer behaviors. The survey indicated a significant increase in the adoption of contactless and digital payment methods by SMEs, with 39 percent reporting that they have started accepting these forms of payment. To effectively embrace these technological advancements, it is crucial for SMEs to invest in various tools and technologies, such as security and fraud management software, contactless or mobile payment systems, mobile device payment capabilities, installment payment options for online transactions, and digitization of back-end payment operations. However, the transition to new technology is not always smooth, as only 12 percent of SMEs consider themselves "experts," and 29 percent consider themselves to be "proficient" in technology, leaving a majority (59 percent) who feel less than proficient. Security and fraud management software is identified as a critical area of investment by 47 percent of small businesses to protect consumer data (VISA, 2021).

Globally, SMEs have been actively increasing their efforts to digitally adapt to meet consumer demands and gain a competitive edge. Digital adjustments include selling products and services online, accepting contactless payments, targeted advertising on social media, and digitizing various business functions such as back-end payment operations (VISA, 2021).

According to the VISA survey conducted in 2022, it is crucial for SMEs to embrace new forms of payment. A significant majority of surveyed SMEs (82 percent) expressed their intention to accept digital payment options in 2022, and 73 percent acknowledged the importance

of accepting new forms of payments. Notably, 24 percent of respondents indicated their plans to accept digital currencies such as Bitcoin (VISA, 2022).

Non-knowledge-based businesses derive greater benefits from practices associated with digitization and IT; whereas, knowledge-intensive businesses gain more from management practices that focus on enhancing customer relationships. Businesses should introduce IT practices that deliver greater value to customers through technology (Horváth & Szerb, 2018).

FinTechs provides significant advantages, particularly for SMEs. Firstly, the flat, agile, and flexible organizational structure of SMEs empowers it to proactively address and mitigate potential threats and to seize opportunities as they emerge (Kuusisto, 2017). This characteristic grants SMEs a competitive advantage over larger enterprises that tend to have more hierarchical structures and encounter difficulties in implementing organizational changes (Becker & Schmid, 2020; Teltz, 2020). Secondly, their smaller size allows for a higher degree of service customization, particularly in niche markets, catering to the specific demands of their customers. However, there are significant disadvantages associated with the size of FinTechs. It often has limited resources, including capital, experience, and information. Additionally, its smaller equity ratio results in a lower capacity to bear risks. Moreover, finding qualified employees can be more challenging for FinTechs compared to larger enterprises (Teltz, 2020). According to the results of Teltz (2020), low levels of digitalization and internalization lead to lower business success, while moderate levels of digitalization correspond to moderate to high levels of business success. The results of Becker and Schmid's (2020) study indicate that both SMEs and large enterprises (LSEs) primarily finance their digitalization efforts through cash flows generated from sales or predetermined budgets, with minimal dependence on alternative funding sources. Additionally, the study highlights that SMEs benefit from new software solutions, which allow for selective improvements without requiring a companywide IT infrastructure; whereas, LSEs typically face the need for such infrastructure (Becker & Schmid, 2020).

Therefore, despite the challenges of digitalization and digital technology adoption, they enable SMEs to swiftly respond to changing market conditions during a crisis. The successful utilization of these technologies can lead to efficient resource use, operational and financial efficiency, and developing long-term business strategies that provide a competitive advantage. Therefore, digitalization and digital technology adoption must be part of crisis response strategy. Consequently, other hypotheses of this research are as follows:

**Hypothesis 2:** *The crisis response strategy mediates the relationship between digitalization and firm strategy after the pandemic.*

**Hypothesis 3:** *The crisis response strategy mediates the relationship between digital technology adoption and the firm strategy after the pandemic.*

### **COVID-19 perception and crisis response strategy**

The COVID-19 pandemic not only has had a significant negative impact on public health but has also caused substantial adverse effects on the business environment, particularly affecting SMEs. SMEs face greater challenges due to their limited specialized knowledge, skills, and financial resources (Kahveci, 2022b; Klein & Todesco, 2021). To overcome disruptions in supply chains and remain operational, SMEs have accelerated their digitalization efforts by moving operations online and implementing digital tools (Klein & Todesco, 2021; Vide et al., 2022). This shift toward digital transformation has not only provided SMEs with resilience but also better prepared them for future disruptions (Vide et al., 2022).

To adapt to crises, firms have the option to employ short-term strategies, which help them navigate the immediate challenges presented by a volatile crisis environment (Kahveci, 2021, 2022b). These strategies aim to ensure their survival during a crisis. Additionally, firms can adopt long-term strategies that allow them to shift their focus toward future developments. Organizations can identify and seize opportunities that emerge from the crisis, enabling them to thrive in the long run. Therefore, the combination of short-term and long-term strategies allows firms to effectively respond to crises and maintain their competitiveness (Guo et al., 2020; Kahveci, 2022b).

Proactive strategies and strong market orientation have been identified as the most effective approaches for crisis management for several reasons. Firstly, these strategies contribute to cost reduction by optimizing or eliminating operational expenses. Additionally, proactive strategies reinforce marketing processes and the exploration of new, crisis-resistant markets. It is important to tap into new market segments, retain loyal clients, and maintain a flexible structure supported by IT investments for quick decision-making and responsiveness to customer demands. These actions are crucial for maintaining or improving market position during challenging times. Huang et al. (2023) corroborate the notion that proactive employee behavior plays a pivotal role in driving knowledge acquisition, ultimately, fostering innovation in a highly dynamic environment.

Reactive strategies, on the other hand, primarily focus on cost reduction and have immediate effects on cutting expenses. However, they may result in the elimination of services, depreciation of service quality, and profit loss. It is

important to note that cost-cutting measures alone do not drive competitive advantage since the main reason for cost-reduction measures is survival. Previous research has indicated that companies prioritizing reactive strategies during crises often struggle to remain in the market and face increased debt due to reduced bank credit. Reactive strategies create a cycle in which companies reduce costs but customers perceive lower quality, leading to decreased income and the need for further cost-cutting. Alonso-Almeida et al.'s (2015) work reveals that cost-cutting effects, whether resulting from proactive or reactive strategies, do not have a statistically significant impact on competitive advantage (Alonso-Almeida et al., 2015). Crespo et al.'s (2023) study reveals that digital strategy implementation allows international new ventures to save costs, allows direct access to information, facilitates knowledge transfer, and enables efficient collaboration in their internationalization efforts.

During the pandemic, digital payments and online sales emerged as vital survival strategies for SMEs to maintain their revenue streams. Tools such as email, chatbots, and social media enabled SMEs to stay connected to their customers and stakeholders, preserving their reputation even in challenging times. Microsoft's CEO Satya Nadella highlighted that the pandemic accelerated their digital transformation efforts by accomplishing what would typically take 2 years in just 2 months. Furthermore, a recent poll conducted by McKinsey revealed that C-suite executives perceive COVID-19 as having been a catalyst for a decade's worth of digitalization (Tung, 2020). Antonopoulou et al. (2023) and Amankwah-Amoah et al. (2021) also empirically found that the uncertainty caused by the pandemic acted as a catalyst for digital transformation. Huang et al.'s (2023) results also indicate that during turbulent times, such as COVID-19, effective training for employees and knowledge acquisition in manufacturing SMEs becomes crucial. Results show that as the degree of environmental dynamism intensifies, there is a greater tendency for employees with higher creative self-efficacy to engage in knowledge-acquisition activities, ultimately, driving innovative behaviors (Huang et al., 2023). According to a survey by VISA (2022), 90 percent of participants agreed that their ability to sell through e-commerce platforms, even when physical stores and offices were closed, played a significant role in their survival (VISA, 2022). It was also found that a majority of SMEs expect their businesses to eventually rely exclusively on digital payments, with 64 percent anticipating this shift within the next 10 years, 41 percent within the next 2 years, and 18 percent already operating cashless businesses (VISA, 2022).

Digital and new technologies played a central role in the response strategies to combat COVID-19 (Klein & Todesco, 2021; Sigala, 2020). These technologies included mobility tracing apps, touchless service, and material delivery through robots, digital health passports, and identity controls that allowed businesses to ensure guest satisfaction by offering personalized services (Le & Phi, 2021). Digital technologies such as cloud computing, video conferencing,

and project management tools have facilitated remote work, enabling SMEs to maintain business continuity. Additionally, analytics and business intelligence tools have helped SMEs analyze customer behavior and market trends in real time allowing them to adapt their products and services more quickly to meet changing demands during crisis periods. Moreover, digitalization has spurred innovation among SMEs, as some have pivoted to producing medical equipment or other essential supplies during the COVID-19 pandemic, demonstrating the agility and flexibility (Brodeur et al., 2023) that digitalization can provide (Kahveci, 2021). Crespo et al. (2023) also empirically showed a positive relationship between digitalization strategy and innovation performance during a crisis. Overall, embracing digital technologies and platforms can empower SMEs to cope with crises and ensure long-term resilience (Klein & Todesco, 2021; Santos et al., 2023). By adapting to changing circumstances more quickly, maintaining revenue streams, and continuing to serve customers during challenging times, SMEs can leverage digitalization as a powerful tool for their survival and success. In addition, knowledge management also provided SMEs with the needed knowledge to understand customer behavior during and after the pandemic (Klein & Todesco, 2021).

Digital transformation has a significant impact on sustainable development (Rossato & Castellani, 2020). The COVID-19 pandemic highlighted how digitization enabled a seamless transition to remote work, reducing the need for commuting, and subsequently decreasing carbon dioxide emissions (Amankwah-Amoah et al., 2021; Isensee et al., 2020). Moreover, in the business context, digitization reduces reliance on paper (Amankwah-Amoah et al., 2021) and the chemicals associated with document printing. These changes have raised awareness of environmental sustainability and the importance of adopting digital practices to minimize environmental impact (Isensee et al., 2020).

Guo et al. (2020) examined the digitalization and public crisis responses of SMEs during the COVID-19 pandemic based on a survey of 518 SMEs in China. The authors found that SMEs with higher levels of digitalization and dynamic capabilities were able to adopt both short-term responses, enabling them to survive and quickly mobilize internal and external resources and long-term strategies, allowing them to focus on strategic transformation and change over the long-term (Guo et al., 2020; Klein & Todesco, 2021). The findings suggest that big data, mobile, and cloud computing technologies exhibit notable effectiveness in assisting SMEs in coping with the crisis. Overall, higher levels of digitalization resulted in performance improvement for SMEs in implementing both short- and long-term strategies in response to the pandemic (Guo et al., 2020).

Bokša et al. (2020) argue that during a recession, SMEs face intensified pressure to seek greater efficiency, which particularly benefits those SMEs with better access to advanced digitalization programs. Conversely, during

economic expansion, there is less significant pressure on SMEs to enhance efficiency and optimize their operations through digitalization (Bokša et al., 2020). An empirical study conducted by Guo and Cao (2014) on Chinese SMEs revealed that in environments with less favorable conditions, the strategic flexibility of a firm becomes more effective. Therefore, recessionary periods or economic crises present opportunities for SMEs to effectively apply their flexibility, leveraging the digitalization process to improve their performance, sustainability, and competitive advantage. This idea finds support in Antonopoulou et al.'s (2023), Amankwah-Amoah et al.'s (2021), and Santos et al.'s (2023) findings, which suggest that despite the negative implications of uncertainty, COVID-19 provided a fertile environment in which digital transformation could thrive. It is worth looking at how the COVID-19 crisis affected SMEs and how it shaped firm strategy after the pandemic.

Therefore, digitalization is one of the main drivers of business survival during the pandemic. However, understanding the effects of COVID-19 and devising solutions based on crisis perception has been of vital importance for firm strategies during and after the pandemic. Based on the literature, the questionnaire is designed to identify strategies that firms adopted during COVID-19 to overcome challenges. It focuses on areas such as reducing production and operating costs, divesting of loss-making/less profitable business units, decreasing salaries and removing perks and benefits, reducing or stopping investments, developing marketing channels, investing in technological innovation, integrating the supply chain, and diversifying business activities. The final hypothesis of this research is as follows:

**Hypothesis 4:** *The crisis response strategy mediates the relationship between COVID-19 perception and firm strategy after the pandemic.*

## Research methodology

### *Data collection and sampling*

We conducted a series of interviews with four experts from academia and four experts from industry to develop the survey and perform content analysis. After incorporating adjustments guided by the experts' input, we moved into a preliminary testing phase with the participation of 15 managers who served as both reviewers and respondents. Based on their feedback, we refined and enhanced the survey to create the definitive version. The survey was initially translated from English to Turkish by the primary author. To ensure accuracy, the translated version underwent the conventional back-translation process—a valuable technique for identifying misunderstandings and misinterpretations prior to survey implementation (Gölgeci et al., 2019).

The target group for this research comprised SMEs operating in Turkey. We specifically selected SMEs in manufacturing and service industries in Istanbul, affiliated with the Union of Chambers and Commodity Exchanges of Turkey and the Istanbul Chamber of Commerce. Given that approximately 50 percent to 55 percent of enterprises in Turkey are located in Istanbul, our sample ensures a high representation of the country. The sectors were delineated based on data from the Social Security Institution in 2021 with the help of a professional survey firm. Using a simple random sampling method, we invited 500 firms to take part in the survey. We received 206 usable questionnaires, indicating an effective response rate of 41.1 percent, which exceeded our expectations, given the confidential nature of the questionnaire and the position of respondents. The survey targeted high- and mid-level managers with a comprehensive understanding of their firms' digitalization and technology processes. Descriptive statistical information about the participating enterprises is presented in Table 1. As seen in Table 1, most of the respondents held the position of owner/partner or CEO/senior manager, ensuring a well-informed perspective on their firm's crisis management strategies and digitalization and technology processes.

**Table 1.** Demographic characteristics of the sample.

	Number	%
<b>Characteristics of the companies</b>		
Company age (foundation year)		
Established before 2010	96	46.6%
Established after 2010*	110	53.4%
Industry		
Manufacturing	48	23.3%
Service	158	76.7%
Number of employees		
10 people or more	69	33.5%
Fewer than 10 people	137	66.5%
<b>Total</b>	<b>206</b>	<b>100%</b>
<b>Characteristics of the respondents</b>		
Gender		
Women	112	54.4%
Men	94	45.6%
Level of education		
Associate's degree and below	113	54.9%
Bachelor's degree and above	93	45.1%
Management level at the company		
Owner/partner	96	47%
Senior manager	58	28%
Mid-level manager	27	13%
Manager	25	12%
Total number of years at the company		
5 years or more	104	50.5%
Less than 5 years	102	49.5%
<b>Total</b>	<b>206</b>	<b>100%</b>

\*2010 year included.

\*\*10<sup>th</sup> people included.

\*\*\*5<sup>th</sup> years included.

## Measurement

Data collection involved a structured questionnaire with a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree). The study incorporates six variables: strategic flexibility (*Flex*), digitalization (*Dig*), digital technology adoption (*DTA*), crisis response strategy (*CRS*), COVID-19 perception (*CP*), and firm strategy after the pandemic (*FSAP*). Demographic questions about companies and participant profiles were included.

## Dependent variable

Companies respond to crises with short-term strategies for immediate challenges and long-term strategies to navigate future advancements. Short-term strategies focus on survival while long-term strategies include diversification of products and market and revenue generation. Thus, *FSAP* is the study's dependent variable, adapted from Kahveci (2022a) to measure which strategies the firms used.

## Independent variables

This study features four independent variables: *CP*, *Flex*, *Dig*, and *DTA*. *CP* items are adapted from Kahveci (2022a), emphasizing the need for companies to understand the pandemic's impact. *Flex* items are adapted from Gorodutse et al. (2020) and F. Thomas (2014), denoting the capacity to address dynamic demands and adapt to significant shifts in the external landscape. Finally, *Dig* and *DTA* items were adapted from Guo et al. (2020).

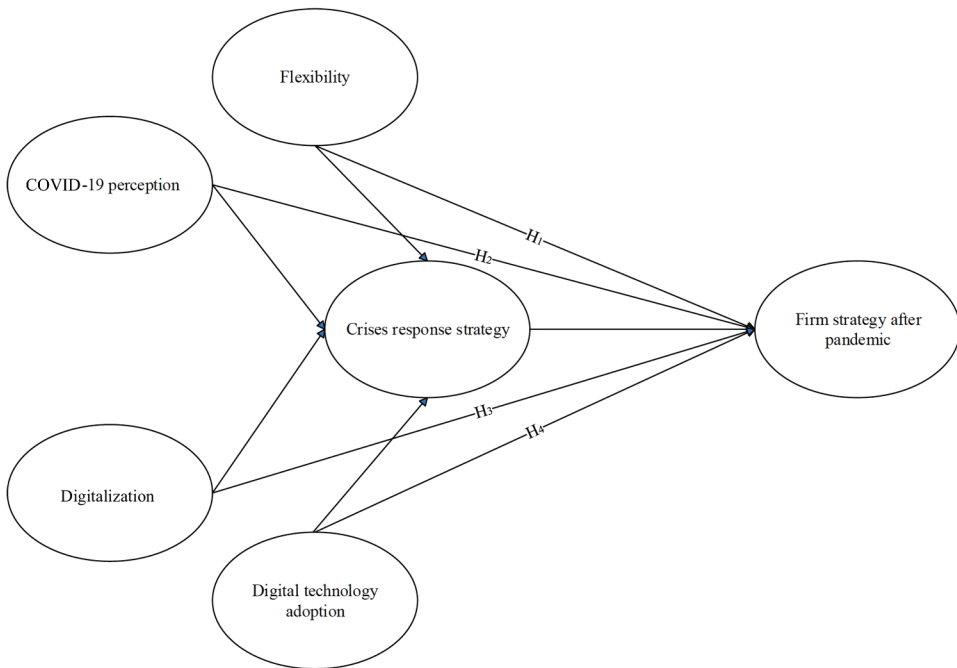
## Mediator variable

The *CRS*, adapted from Guo et al. (2020), plays a critical mediating role in the proposed model. *CRS* serves in a mediator role between *CP*, *Flex*, *Dig*, *DTA*, and *FSAP*, indicating that the strategies adopted during the crisis have an essential impact on the subsequent strategies implemented after the crisis, thereby, addressing a critical research gap.

## Analysis

We employed the variance-based structural equation modeling (PLS-SEM) approach to analyze the proposed research model (Figure 1) by utilizing the Smart PLS software package (Ringle et al., 2022).

Initially, we undertook a confirmatory factor analysis (CFA) to validate the reflective constructs. The outcomes of the confirmatory factor analysis were subsequently employed to assess both convergent and discriminant validity. Convergent validity explains the extent to which the scale aligns with other items that measure the same underlying construct (Hair et al., 2014).



**Figure 1.** Proposed model.

Convergent validity was evaluated by analyzing a range of metrics, which encompassed Cronbach's alpha, average variance extracted (AVE) scores, composite reliability (CR), and factor loadings (Fornell & Larcker, 1981). Table 2 shows that Cronbach's alpha and CR values were above the critical value of 0.70. The AVE measurements fall above the recommended threshold of 0.5, confirming that all constructs examined in the study are sufficiently reliable and exhibit satisfactory convergent validity. Factor loading values were also found to be statistically significant. These findings suggest the attainment of convergent validity (Table 3).

In our study, discriminant validity was evaluated through two distinct methods. Initially, we adhered to the approach proposed by Fornell and Larcker (1981), which involves assessing discriminant validity by analyzing the square root of the AVE. As in Table 4, the square roots of the AVEs for each construct are greater than the interconstruct correlation values. This indicates a satisfactory level of discriminant validity. A second method used to test discriminant validity is the heterotrait-monotrait (HTMT) ratio. To distinguish between the two factors it is crucial that the HTMT ratio be significantly less than 1 (Henseler et al., 2016). Specifically, Henseler et al. (2015) suggested a threshold of less than 0.85 for achieving discriminant validity. Upon detailed examination of the HTMT ratios presented in Table 4, it is evident that all the values fall below 0.85, affirming the

**Table 2.** Confirmatory factor analysis results.

Factors/items	Factor loadings (CFA)	Cronbach's Alpha	CR	AVE
<b>COVID-19 perception (CP)</b>				
CP1: You cannot be ready for this type of crisis. Whatever you do for the preparedness you cannot get over it.	0.760	0.713	0.719	0.632
CP2: Professional consulting services would be helpful for the right strategy during the crisis.	0.829			
CP3: The government should help more.	0.794			
<b>Crises response strategy (CRS)</b>				
CRS1: Optimize business models to capture new customer needs	0.678	0.822	0.834	0.587
CRS2: Develop marketing channels and remove dependence on offline transactions	0.689			
CRS3: Actively invest in technological innovation	0.832			
CRS4: Diversify into new business areas	0.791			
CRS5: Integrate supply chain	0.825			
<b>Digital technology adoption (DTA)</b>				
DTA1: Big data technology (such as big database, data analysis technology)	0.733	0.877	0.882	0.575
DTA2: AI technology (such as machine learning)	0.737			
DTA3: Mobile technology (such as mobile Internet, wireless communications)	0.721			
DTA4: Cloud computing technology (such as cloud computing)	0.761			
DTA5: IoT technology (such as network distribution technology)	0.803			
DTA6: Social technology (such as online commerce, instant messaging)	0.740			
DTA7: Platform development technology (such as network platforms)	0.810			
<b>Digitalization (Dig)</b>				
Dig1: We fully adopt digital artifacts, (products, or services)	0.840	0.906	0.909	0.679
Dig2: We fully adopt digital platforms that support digital products and services	0.834			
Dig3: We fully adopt digital infrastructures, such as technology tools and systems	0.836			
Dig4: We fully adopt digital business models	0.847			
Dig5: We fully adopt digital management models	0.828			
Dig6: Firm digitalization relies on internal R&D	0.757			
<b>Firm strategy after the pandemic (FSAP)</b>				
FSAP1: Change existing product lines	0.796	0.773	0.780	0.687
FSAP2: Change regional market coverage	0.841			
FSAP3: Change external cooperative relation	0.850			
<b>Flexibility (Flex)</b>				
Flex1: Introduce a new pricing schedule in response to changes in competitor's prices	0.793	0.866	0.869	0.651
Flex2: Expand into new regional or international markets	0.833			
Flex3: Change (i.e. expand or reduce) the variety of products available for sale	0.810			
Flex4: Adopt new technologies to produce better, faster, and cheaper products	0.817			
Flex5: Change in the cost structure	0.780			

**Table 3.** Discriminant validity (Fornell-Lacker criterion) and correlation coefficients between variables.

	CP	CRS	DTA	Dig	FSAP	Flex
CP	<b>0.795</b>					
CRS	0.512	<b>0.766</b>				
DTA	0.351	0.563	<b>0.759</b>			
Dig	0.412	0.642	0.695	<b>0.824</b>		
FSAP	0.459	0.664	0.491	0.605	<b>0.829</b>	
Flex	0.365	0.587	0.570	0.740	0.540	<b>0.807</b>

**Table 4.** Discriminant validity (Heterotrait-Monotrait ratio).

	CP	CRS	DTA	Dig	FSAP	Flex
CP						
CRS	0.659					
DTA	0.429	0.653				
Dig	0.501	0.732	0.774			
FSAP	0.601	0.821	0.583	0.715		
Flex	0.458	0.691	0.644	0.830	0.656	

achievement of discriminant validity. In addition, correlation coefficients among the constructs are given in the Appendix.

### **Common Method Variance (CMV) analysis**

There is a potential concern known as common method variance (CMV), which arises when participants respond to multiple variables simultaneously using the self-assessment method (Malhotra et al., 2006). To investigate the presence of CMV, we employed Harman's single-factor test with EFA. The measurement items subjected to unrotated factor analysis did not converge under a single factor, indicating that a significant portion of the explained variance was not attributed to a single underlying factor (Luo et al., 2014; Podsakoff et al., 2003; Shashi et al., 2018). The results revealed that the common method variance accounted for 40 percent of the total variance. Hence, the CMB is not considered to be statistically significant since it is lower than the threshold value of .50. Moreover, to ascertain the significance of CMB in our research, we employed Harman's single-factor test with CFA, as outlined by Malhotra et al. in 2006. Using this approach, we explored whether the majority of the variance in our study could be attributed to a single factor, thereby, indicating the presence of considerable CMB. The results, however, suggested that the common method variance accounted for a mere 36% ( $0.60^2 = .36$ ) of the total variation, below the critical threshold of 0.50 (Podsakoff & Organ, 1986).

We also assessed common method bias using marker variables (Lindell & Whitney, 2001; Richardson et al., 2009; Simmering et al., 2015) utilizing the government support type construct as a marker variable. Although this construct was not originally designed for this purpose, its removal from the study allowed us to repurpose it. The marker variable assessed the type of governmental support received by the firms during the pandemic period. We formed three competing models to test common method bias using methods described by Simmering et al., 2015, and Spector et al. (2019). The first model included the original confirmatory factor model, the second involved the Harman single-factor CFA model without the marker construct, and the third model involved the Harman single-factor CFA model with the marker construct. Model comparisons (Model 1:  $\chi^2/df = 1.89$ ,  $TLI = 0.89$ ,  $CFI = 0.90$ ,  $RMSA = 0.067$ ; Model 2:  $\chi^2/df = 1.69$ ,  $TLI = 0.91$ ,

**Table 5.** Gaussian copula results.

Test	Relations	Coefficient	P value
Gaussian copula of model: (endogenous variable; Crises Response Strategy)	<i>CP</i> -> <i>CRS</i>	0.273	.000
	<i>CP</i> -> <i>FSAP</i>	0.127	.033
	<i>CRS</i> -> <i>FSAP</i>	0.453	.009
	<i>DTA</i> -> <i>CRS</i>	0.173	.014
	<i>DTA</i> -> <i>FSAP</i>	0.025	.785
	<i>Dig</i> -> <i>CRS</i>	0.271	.001
	<i>Dig</i> -> <i>FSAP</i>	0.218	.021
	<i>Flex</i> -> <i>CRS</i>	0.188	.009
	<i>Flex</i> -> <i>FSAP</i>	0.089	.32
	<i>GC (CRS)<sup>C</sup></i> -> <i>FSAP</i>	-0.057	.736

*CFI* = 0.92, *RMSA* = 0.058; Model 3:  $\chi^2/df$  = 1.73, *TLI* = 0.90, *CFI* = 0.91, *RMSA* = 0.059) indicated no significant difference in model fit. Thus, we conclude that common method bias is not a concern in this study.

### Endogeneity

Prior to hypothesis testing, we conducted a preliminary assessment to examine the possibility of endogeneity, particularly concerning potential reverse causality between crisis response strategy and firm strategy after the pandemic (Lu et al., 2018). To address this, we adopted the Gaussian copula approach and tested for an endogeneity threat without instrumental variables (Park & Gupta, 2012). The Gaussian copula approach requires the use of latent variable scores from the original model estimation. Subsequently, whether the variables are nonnormally distributed should be checked (Sarstedt et al., 2020). The normality of the latent variable scores for both the crisis response strategy and firm strategy after the pandemic was assessed using the Kolmogorov-Smirnov test with Lilliefors correction. The findings, presented in Table 5, indicate that neither of the latent variables demonstrated a normal distribution. The results reveal that Gaussian copulas labeled as *GC(CRS)C* are not significant at 0.05 level in copula models. This analysis indicates that there is no evidence of an endogeneity issue.

### Results

Once it was confirmed that the model exhibited satisfactory reliability and validity, we proceeded to evaluate the structural model by computing the  $R^2$  and  $Q^2$  values as illustrated in Table 6. The  $R^2$  value, which reflects predictive precision, indicates the variability in the endogenous variable explained by the

**Table 6.** R square ( $R^2$ ) and Q square ( $Q^2$ ).

	$R^2$	$R^2$ adjusted	$Q^2$
<i>CRS</i>	0.52	0.50	0.485
<i>FSAP</i>	0.51	0.49	0.402

exogenous variable(s) (Afum et al., 2020). The calculated  $R^2$  values of *CRS* and *FSAP* were 0.52 and 0.51, respectively. According to Chin (1998), these  $R^2$  values fall within the medium range of explanatory power.

Furthermore, we assessed the predictive relevance of the model using the  $Q^2$  value, following the methodology outlined by Afum et al. (2020). The obtained  $Q^2$  values for *CRS* and *FSAP* through blindfolding procedure, were 0.485 and 0.402 respectively, indicating the model’s ability to make meaningful predictions.

Table 7 shows the standardized coefficients ( $\beta$ -values) representing the relationships, along with the  $t$ -values calculated using the bootstrapping approach, effect size ( $f^2$ ) values, and variance inflation factor (VIF) values. The study included  $f^2$  values to supplement the information provided by the path coefficients, as they offer a better understanding of the effect size. As per Cohen’s (1988) guidelines, an  $f^2$  value greater than 0.35 indicates a strong effect, while values between 0.15 and 0.35 represent a reasonable effect, and values ranging from 0.02 to 0.15 suggests a weak effect. These effect sizes provide a comprehensive understanding of the relationships examined in the study.

Furthermore, we investigated mediation effects following the guidelines outlined by Agyabeng-Mensah et al. (2020) and using both Baron and Kenny’s (1986) approach and the bias-corrected bootstrap (BCB) confidence interval technique, as recommended by Preacher and Hayes (2008).

Baron and Kenny (1986) proposed several conditions for identifying a variable as a mediator. First, the independent variable (IV) must significantly relate to the mediator and the mediator must significantly relate to the dependent variable (DV). Additionally, the direct relationship between the IV and DV should be significant. The mediating effect occurs when the previously significant relationship between the IV and DV becomes nonsignificant when the mediator is included in the analysis.

For the first step, we examined the relationships between the IVs and DV without the mediator (*CRS*). The results, presented in Table 8 under the total effect column and in Figure 2, indicate significant relationship between *Flex* and *FSAP* ( $p < .05$ ) with a standardized weight of 0.162. Similarly, When *CP*

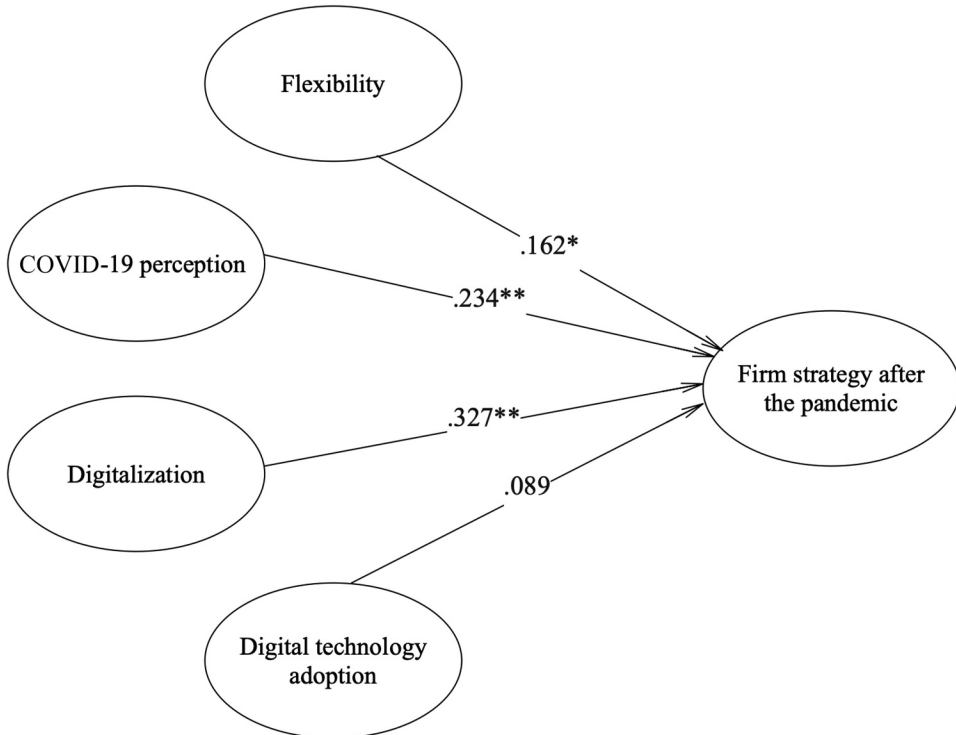
**Table 7.** Direct relations results.

Direct relations	$\beta$	$t$ value	$P$ value	$f^2$	VIF
<i>Flex</i> -> <i>CRS</i>	0.190	2.620	.009	0.035	2.257
<i>Flex</i> -> <i>FSAP</i>	0.087	0.991	.322	0.000	2.332
<i>CP</i> -> <i>CRS</i>	0.271	3.720	.000	0.125	1.226
<i>CP</i> -> <i>FSAP</i>	0.127	2.157	.031	0.024	1.379
<i>Dig</i> -> <i>CRS</i>	0.269	3.454	.001	0.050	3
<i>Dig</i> -> <i>FSAP</i>	0.220	2.325	.020	0.031	3.151
<i>DTA</i> -> <i>CRS</i>	0.172	2.467	.014	0.033	1.977
<i>DTA</i> -> <i>FSAP</i>	0.021	0.247	.805	0.000	2.038
<i>CRS</i> -> <i>FSAP</i>	0.395	4.442	.000	0.153	2.085

**Table 8.** Hypotheses testing results.

Hypotheses	Total effect	Direct effect	Indirect effect (CI)	Level of support
<i>Mediation effects</i>				
H <sub>1</sub> : <i>Flex</i> → <i>CRS</i> → <i>FSAP</i>	.162*	.087	.075*(.014–.148)	Full Mediation Supported
H <sub>2</sub> : <i>Dig</i> → <i>CRS</i> → <i>FSAP</i>	.327**	.220**	.106**(.038–.190)	Partial Mediation Supported
H <sub>3</sub> : <i>DTA</i> → <i>CRS</i> → <i>FSAP</i>	.089	.021	.068*(.013–.137)	Indirect Effect
H <sub>4</sub> : <i>CP</i> → <i>CRS</i> → <i>FSAP</i>	.234**	.127*	.107**(.041–.145)	Partial Mediation Supported

\* $p < .05$ ; \*\* $p < .01$  (two-tailed); Bootstrapping  $N = 5000$ .



**Figure 2.** Total effects of the structural model. \* $p < .05$ ; \*\* $p < .01$  (two-tailed)

and *Dig* exhibit significant relationship with *FSAP* ( $p < .01$ ) with standardized weights of 0.234, and 0.327, respectively. However, the relationship between *DTA* and *FSAP* was found to be nonsignificant.

In the second step, we introduced the mediator (*CRS*) to the model and reevaluated the relationships among the variables. As shown in Table 7, the relationship between *Flex*, *CP*, *Dig*, and *DTA* and *CRS* are all significant at the 0.01 level, with standardized weights of 0.190, 0.271, 0.269, and 0.172, respectively. Additionally, the relationship between *CRS* and *FSAP* was significant at the 0.01 level, with a score of 0.395 (Table 7).

Further analysis was conducted to examine the mediation effects of *CRS* on the relationships between the IVs (*Flex*, *Dig*, *DTA*, *CP*) and the DV (*FSAP*). Using the traditional Sobel test approach (Baron & Kenny, 1986), we found

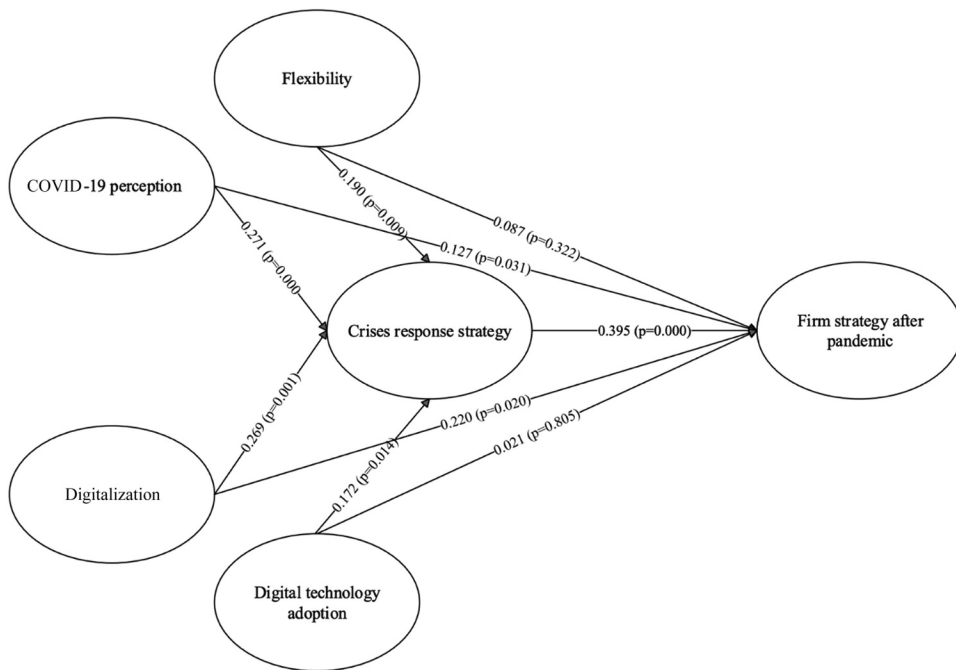
that *CRS* fully mediated the link between *Flex* and *FSAP* at the 0.05 level (Sobel test = 2.24). Additionally, the relationship between *CP* and *FSAP* through *CRS* exhibited a partial mediating effect (Sobel test = 2.84) as did the relationship between *Dig* and *FSAP* through *CRS* (Sobel test = 2.83). However, *DTA* had only indirect impact on *FSAP* through *CRS* (Sobel test = 2.15). These results confirm that the effect of *Flex* on *FSAP* is fully mediated by *CRS*, while the effects of *CP* and *Dig* on *FSAP* are partially mediated by *CRS*, supporting our hypotheses H1, H2 and H4 (Table 8).

In line with Preacher and Hayes (2008), we also utilized bias-corrected bootstrap (BCB) confidence interval technique to analyze mediation effects. This approach has been favored over traditional methods like the Sobel test or causal steps method due to its superior control over Type I errors (Preacher & Hayes, 2008). To run the BCB method, 5,000 resamples were generated to check whether the indirect effects differ significantly from zero. The BCB analysis revealed significant indirect effects of *Flex*, *CP*, and *Dig* on *FSAP* through *CRS*, further supporting H1, H2, and H4 (Table 8). Specifically the standardized estimates for indirect effect of *Flex*, *CP*, and *Dig* on *FSAP* through *CRS* were calculated as 0.075 (bias-corrected CI [0.014-, 0.148]), 0.107 (bias-corrected CI [0.041-, 0.145]) and 0.106 (bias-corrected CI [0.038-, 0.190]), respectively, and all significant at 0.05 or 0.01 levels. However, *DTA* exhibited only an indirect effect on *FSAP* through *CRS*, with a score of 0.068 (bias-corrected CI [0.013-, 0.137]) significant at the 0.05 level.

## Discussions

The present study investigated the impacts of *Flex*, *Dig*, *DTA*, and *CP* on *FSAP* with the mediator role of *CRS* among SMEs. The findings revealed significant positive relationships between *Flex*, *Dig*, *DTA*, *CP*, and *CRS* (Table 7, Figure 3). Moreover, *CRS* was found to play a critical mediator role in shaping firm strategies to survive and thrive post-pandemic (Table 8). On the other hand, only *Dig* and *CP* exhibit a direct impact on *FSAP* (Table 7). In contrast, *Flex* and *DTA* do not have a direct influence on *FSAP* (Table 7). This suggests that the effectiveness of these strategic factors in influencing firm strategies after the pandemic is contingent on the extent to which SMEs developed and implemented crisis response strategies during the COVID-19 pandemic. SMEs that proactively devised and implemented crisis response strategies were better positioned to capitalize on the benefits of digital transformation and strategic flexibility, translating them into sustainable firm strategies in the post-pandemic era.

The results of the study indicate a positive relationship between *Flex* and *FSAP* with the full mediation support role of *CRS* during the COVID-19 pandemic. *Flex* refers to the firm's ability to modify its strategy in response to the challenges posed by the COVID-19 pandemic by utilizing its available resources—namely, introducing a new pricing schedule; expanding into new



**Figure 3.** Results of the structural model.

markets; changing the cost structure; adjusting product variety available for sale; and adopting new technologies to offer better, faster, and cheaper products. This flexibility plays a significant role in enhancing a company's competitive edge, particularly during times of crisis. Furthermore, the full mediation role of *CRS* between *Flex* and *FSAP* highlights the importance of adaptability and agility in navigating the uncertainties and challenges brought about by the pandemic and effective crisis response in shaping business strategies to survive and thrive post-pandemic. SMEs with higher strategic flexibility are better positioned to proactively identify and respond to digitally enabled growth opportunities to enhance their presence in digital markets and engage with customers (North et al., 2019), especially during the crisis.

Furthermore, the findings reveal a direct positive relationship between *Dig* and *FSAP* with partial mediation of *CRS* during the COVID-19 pandemic. Digital technology has created a significant shift in society, with organizations transitioning from analog-based production processes to digital-based value-creation processes. The successful utilization of digital technologies enables SMEs to swiftly respond to market changes, and leads to a competitive advantage. Leveraging digital technology for innovative product/service development, effective management of digital technology, adapting to digital changes, identifying new digital opportunities, and adopting relevant digital technologies plays a vital role in SMEs' survival, growth, and sustainable development (Gomez-Trujillo & Gonzalez-Perez, 2022).

However, although the findings indicate that there is a significant indirect effect between *DTA* and *FSAP*, the total and direct effect are nonsignificant with the mediating role of *CRS*. *DTA* involves the integration of various digital technologies, such as social media, mobile technologies, big data, cloud computing, Internet of things (IoT), platform development, and artificial intelligence-related (AI-related) technologies into business processes, products, and services. The adoption, implementation, and adaptation of digital technologies are crucial for SMEs as they significantly impact various aspects of business operations, including products and services, workflows, organizational structure, industrial facilities, and business models. Therefore, with the catalyzing effect of COVID-19, *DTA* became more important in terms of coping with the crisis, since it required the adoption of digital products and services, digital platforms infrastructures, and business models by relying on either internal R&D or external purchases of necessary tools.

The study aligns with previous research indicating that the COVID-19 pandemic involved a structural break (Kitching et al., 2009; Rumelt, 2009), a black swan event (Amankwah-Amoah et al., 2021; Thorgren & Williams, 2020), that challenged SMEs but had a catalyzing effect (Amankwah-Amoah et al., 2021; Antonopoulou et al., 2023) on digitalization and digital technology adoption opportunity to overcome the negative impacts of the pandemic. Moreover, digitalization positively influences the value proposition and value capture aspects of a business model, resulting in increased and additional revenue (Mancuso et al., 2023; Rachinger et al., 2019). Digital technologies provide SMEs with opportunities to access new markets, develop long-term business strategies, improve performance, and gain a competitive advantage (Ciurea et al., 2021; Costa & Castro, 2021; Rossato & Castellani, 2020; Sousa-Zomer et al., 2020). These technologies also lead to significant operational and financial efficiency, improved productivity, enhanced integration and interaction, knowledge sharing, and stimulation of innovation (Kahveci & Tambunan, 2023; Khin & Ho, 2019; Quinton et al., 2018). Additionally, digital technologies enable SMEs to personalize their products and services, automate routine tasks, streamline business processes, and improve data management, which contributes to a better overall customer experience (Kalidas et al., 2020; Rossato & Castellani, 2020).

The findings also reveal that *CP* positively affects *FSAP* with partial mediation of *CRS*. Understanding how SMEs perceived and responded to the pandemic is essential for shaping their future strategies. This finding suggests that how SMEs perceived and understood the impact of the pandemic influenced their response strategies during the crisis. As SMEs faced intensified pressure to seek greater efficiency during the pandemic, those with better access to advanced digitalization programs benefited by enhancing their performance, sustainability, and competitive advantage. The pandemic presented opportunities for SMEs to effectively apply their flexibility and leverage

the digitalization process to improve their performance and adapt to challenging circumstances. To the best of our knowledge, there are no existing studies on how crisis perception influences post-crisis strategies. Therefore, this aspect represents a novel contribution to the literature.

The study offers insightful findings on how crisis response strategies, including optimizing business models, developing marketing channels, investing in technological innovation, diversifying into new business areas, and integrating the supply chain, play a crucial mediating role. These strategies have a profound impact on shaping SMEs' firm strategies beyond the pandemic. Specifically, SMEs are seen to adapt by reevaluating and restructuring their product portfolios, expanding their presence in regional markets, and establishing strategic collaborations to thrive in the evolving business landscape. The research underscores the pivotal significance of strategic flexibility, perceptions related to COVID-19, and digitalization and the adoption of digital technology in SMEs' crisis response strategies. These factors were instrumental in ensuring the survival and long-term viability of SMEs during the challenging COVID-19 period. Notably, the crisis response strategies adopted during the pandemic have left a lasting imprint on SMEs' business strategies post-pandemic. This underlines the indispensable role of flexibility, digitalization, and digital technology adoption in achieving enduring success within the dynamic business milieu.

Looking ahead, the study suggests that SMEs should actively incorporate crisis-driven strategies into their overarching vision. Furthermore, embracing strategic flexibility, digitalization, and digital technology adoption become paramount for SMEs to bolster their resilience and secure a competitive edge in the future. The study's findings illuminate a pathway for SMEs to navigate the complexities of the business landscape by leveraging crisis-acquired strategies as catalysts for sustained growth and competitiveness.

## **Conclusion**

The COVID-19 pandemic has had a significant negative impact on public health and has caused substantial adverse effects on the business environment, particularly affecting SMEs. Due to their limited specialized knowledge, skills, and financial resources, SMEs faced greater challenges during the pandemic.

To overcome disruptions in supply chains and remain operational, SMEs accelerated their digitalization efforts by moving operations online and implementing digital tools. This shift toward digital transformation provided SMEs with resilience and better prepared them for future disruptions. Digital technologies, such as digital payments; online sales; mobility tracing apps; touchless service; and material delivery through robots, digital health passports, and identity controls, played a central role in response strategies to combat

COVID-19. Additionally, cloud computing, video conferencing, project management tools, and analytics facilitated remote work and helped SMEs analyze customer behavior and market trends in real time, allowing them to adapt their products and services more quickly to meet changing demands during the crisis.

The findings of our study suggest that *Dig* and *CP* have a direct positive impact on *FSAP* and *Flex*, *Dig*, *DTA*, and *CP* have an indirect positive impact on *FSAP*. In addition, *CRS* fully mediates between *Flex* and *FSAP*, while partially mediating between *CP*, *Dig*, and *FSAP*. This indicates that firms' response strategies during the pandemic are crucial and have influenced their future business strategies.

During crises, firms have to employ short-term strategies to navigate the immediate challenges and to ensure survival, this is the crisis response strategy in our study. They also have to focus on long-term strategies that allow them to focus on future developments and to identify and seize opportunities for long-term thriving. Our study showed that SMEs should first focus on short-term crisis response strategies, and after successfully surviving through the crisis they should then focus on long-term strategies. The key point here is that the strategies chosen as crisis response strategies will have a fundamental effect on firms' strategies after the pandemic. The combination of both short-term and long-term strategies enables firms to effectively respond to crises and maintain competitiveness.

SMEs, in particular, demonstrate a greater capability of developing ambidextrous strategies during economic crises compared with larger firms. SMEs' flexible organizational structure, risk anticipation skills, and networking capabilities enable them to effectively identify new market opportunities and adopt ambidextrous strategies. Proactive strategies and strong market orientation are identified as the most effective approaches for crisis management as they contribute to cost reduction, reinforce marketing processes, and explore new, crisis-resistant markets. Proactive strategies are essential for survival in dynamic environments.

On the other hand, reactive strategies primarily focus on cost reduction but may lead to service elimination, lower service quality, and profit loss. Companies prioritizing reactive strategies during crises often struggle to remain in the market and face increased debt.

By adopting crisis response strategies that align with their specific context and circumstances, firms can better position themselves to navigate the challenges presented by crises and seize opportunities for growth and success in the post-pandemic period. The study highlights the importance of adaptive and forward-thinking approaches to crisis management and strategic planning, as well as the role of strategic flexibility in driving competitiveness and resilience in dynamic environments.

Overall, the findings suggest that SMEs with strong flexibility are better equipped to respond effectively to a crisis. This emphasizes the significant impact of digitalization and digital technology adoption on crisis response strategies that enable firms to remain competitive and resilient in the face of the pandemic's impact on business environments. This study highlights the importance of flexibility, digitalization, digital technology adoption, COVID-19 perception, and crisis response strategies in guiding SMEs' decision-making processes during the COVID-19 pandemic. It also lays the foundation for further research on the long-term implications of these strategies on firm performance and survival beyond the pandemic.

### **Practical implications**

Based on the findings, there are several practical implications and suggestions for SMEs, owners, and CEOs to enhance their resilience, competitiveness, and long-term success:

SMEs should embrace strategic flexibility, which refers to their capacity to modify strategies in response to external opportunities and threats. This adaptability plays a crucial role in addressing rapidly changing environments and allows SMEs to respond effectively to changing market conditions and crises. SMEs should focus on integrating, developing, and reconfiguring internal and external competencies to adapt to market shifts and identify emerging opportunities. They should also continuously monitor market trends to identify new opportunities and potential threats and to gather customer insights and feedback to tailor products and services to meet changing demands.

The pandemic has shown the importance of digital technologies in ensuring business continuity. SMEs should invest in digital technologies and tools to improve operational efficiency, customer experience, and business processes. This can include adopting cloud computing, mobile technologies, AI-related technologies, and utilizing social media for marketing and customer engagement. The pandemic also highlighted the importance of e-commerce and digital payment options. SMEs should consider expanding their online presence and accepting digital payments to cater to changing customer preferences.

Proactive strategies have been identified as more effective in crisis management. SMEs should adopt proactive measures to optimize operational expenses, explore new markets, and retain loyal customers. They might leverage collaboration and networking capabilities to acquire resources and share knowledge with other organizations. They might also develop flexible strategies that involve balancing exploratory and exploitative activities to identify new market opportunities while maintaining core competencies.

## Limitations and directions for future research

Like many studies, this paper is not exempt from certain limitations. A primary limitation is its exclusive focus on SMEs' flexibility, digitalization, digital technology adoption, COVID-19 perception, crisis response strategy, and firm strategy after the pandemic. These dynamics may manifest differently in larger firms. The significance of digitalization and technology adoption was also evident for larger enterprises during the pandemic, suggesting a promising avenue for future research that would extend this study to encompass larger firms. This expansion could enhance the applicability and broader implications of the findings. Furthermore, the model's scope could be broadened by introducing additional variables as potential mediators or moderators. For instance, examining the challenges SMEs encounter in crisis scenarios, the effectiveness of proactive versus reactive crisis response strategies, or the role of specific digital technologies in enhancing strategic flexibility and exploring the impact of government support on their performance could yield insightful insights. Investigating SMEs' crisis performance, and evaluating whether digitalization and innovation efforts boost their pandemic resilience and creativity can also be an intriguing avenue. Lastly, the research solely draws from Turkish SMEs, potentially limiting the generalizability of findings. To address this, future research could encompass SMEs in diverse countries or compare conditions across developed, developing, and underdeveloped markets, offering a cross-country perspective. This expansion could enrich discussions and furnish valuable insights for both academia and business practitioners.

The present research study collected cross-sectional data, which captures the views of respondents at a single point in time (Malhotra, 2014). This research design involves limitations in terms of establishing causal relationships. Cross-sectional data is susceptible to endogeneity issues, wherein the independent and dependent variables may simultaneously influence each other, leading to reciprocal causal effects (Wooldridge, 2002). To eliminate these effects we have diligently assessed the potential presence of common method variance in our data through the utilization of the CFA marker technique. Furthermore, we have provided a comprehensive overview of the various steps undertaken during the examination of alternative models. Nevertheless, it is important to recognize that the methodologies employed in this manuscript to mitigate common method bias, although valuable in uncovering its extent, may not entirely eliminate the presence of common method bias. Nonetheless, our study significantly contributes to the understanding of SMEs' crisis response strategies and digitalization efforts, offering both theoretical and practical insights. Grounded in robust theoretical foundations, our conceptual framework underwent tests for reversed causality (Hayes, 2018), revealing that our proposed model exhibited a notably superior

fit to the data compared to alternative models. To overcome the limitations caused by cross-sectional data, future researchers should consider conducting longitudinal studies. Longitudinal data, collected over multiple time periods, would allow for a more robust econometric analysis to verify the causal linkages between the constructs. By observing the same individuals or units over time, longitudinal studies can better disentangle the direction of causality and identify the dynamic relationships between the variables of interest. Thus, it would make it possible to reveal the development of strategies over time and their long-term effects on firm performance. This would provide stronger evidence for understanding the underlying processes and mechanisms at play, rather than relying solely on cross-sectional snapshots, which are limited in their ability to establish causal inference.

This study is based on the inputs from SME managers in Turkey. Naturally, the results do not reflect the general scenario. To reach a more general conclusion, we recommend that future researchers collect data from different parts of the world and even conduct cross-country studies to better understand perceptions across different countries.

### Disclosure statement

No potential conflict of interest was reported by the author(s).

### ORCID

Eyup Kahveci  <http://orcid.org/0000-0002-5941-1387>

Zehra Binnur Avunduk  <http://orcid.org/0000-0001-6627-6454>

Tuğrul Daim  <http://orcid.org/0000-0003-1432-8958>

Selim Zaim  <http://orcid.org/0000-0003-3540-2264>

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**Appendix**

	CP1	CP2	CP3	CRS1	CRS2	CRS3	CRS4	CRS5	DTA1	DTA2	DTA3	DTA4	DTA5	DTA6	DTA7
CP1	1														
CP2	.449**	1													
CP3	.470**	.439**	1												
CRS1	.241**	.249**	.322**	1											
CRS2	.303**	.292**	.433**	.527**	1										
CRS3	.280**	.451**	.327**	.464**	.425**	1									
CRS4	.169*	.338**	.255**	.312**	.345**	.643**	1								
CRS5	.248**	.410**	.288**	.416**	.429**	.586**	.654**	1							
DTA1	0.064	.177*	.275**	.200**	.289**	.403**	.288**	.332**	1						
DTA2	0.066	.200**	.200**	.189**	.221**	.364**	.274**	.292**	.615**	1					
DTA3	.168*	.247**	.276**	.326**	.289**	.375**	.268**	.356**	.378**	.450**	1				
DTA4	.185**	.166*	.286**	.274**	.388**	.282**	.251**	.260**	.473**	.525**	.511**	1			
DTA5	.243**	.142*	.271**	.242**	.289**	.375**	.347**	.383**	.529**	.474**	.519**	.575**	1		
DTA6	.137*	.358**	.294**	.285**	.401**	.431**	.362**	.439**	.454**	.347**	.498**	.459**	.543**	1	
DTA7	0.066	.308**	.178*	.270**	.232**	.456**	.402**	.407**	.505**	.600**	.513**	.525**	.585**	.522**	1
Dig1	.219**	.358**	.279**	.349**	.430**	.526**	.477**	.404**	.525**	.450**	.418**	.483**	.491**	.477**	.480**
Dig2	.234**	.281**	.265**	.390**	.393**	.541**	.449**	.502**	.424**	.327**	.378**	.340**	.525**	.495**	.446**
Dig3	.292**	.282**	.270**	.374**	.393**	.455**	.400**	.506**	.340**	.348**	.439**	.465**	.510**	.450**	.442**
Dig4	.146*	.281**	.253**	.233**	.288**	.414**	.407**	.388**	.407**	.362**	.350**	.471**	.483**	.445**	.435**
Dig5	.212**	.260**	.219**	.236**	.337**	.388**	.360**	.365**	.364**	.330**	.417**	.508**	.472**	.447**	.414**
Dig6	.249**	.375**	.287**	.264**	.425**	.454**	.373**	.403**	.386**	.445**	.421**	.419**	.428**	.416**	.446**
FSAP1	.213**	.391**	.232**	.327**	.250**	.438**	.458**	.405**	.237**	.252**	.144*	.272**	.276**	.283**	.326**
FSAP2	.211**	.335**	.227**	.343**	.318**	.457**	.388**	.471**	.239**	.283**	.241**	.329**	.305**	.335**	.338**
FSAP3	.321**	.358**	.367**	.396**	.419**	.510**	.496**	.547**	.295**	.280**	.302	.368**	.423**	.413**	.398**
Flex1	.216**	.277**	.235**	.321**	.278**	.353**	.313**	.370**	.291**	.283**	.288**	.267**	.366**	.476**	.310**
Flex2	.201**	.300**	.263**	.310**	.358**	.389**	.363**	.494**	.326**	.320**	.308**	.364**	.464**	.511**	.372**
Flex3	.244**	.246**	.184**	.255**	.355**	.276**	.405**	.404**	.293**	.176*	.308**	.332**	.394**	.472**	.277**
Flex4	.184**	.220**	.253**	.265**	.398**	.311**	.399**	.466**	.375**	.315**	.286**	.421**	.415**	.445**	.329**
Flex5	.152*	.268**	.232**	.277**	.408**	.428**	.374**	.412**	.272**	.287**	.340**	.345**	.344**	.358**	.298**



	Dig1	Dig2	Dig3	Dig4	Dig5	Dig6	FSAP1	FSAP2	FSAP3	Flex1	Flex2	Flex3	Flex4	Flex5
CP1														
CP2														
CP3														
CRS1														
CRS2														
CRS3														
CRS4														
CRS5														
DTA1														
DTA2														
DTA3														
DTA4														
DTA5														
DTA6														
DTA7														
Dig1	1													
Dig2	.675**	1												
Dig3	.621**	.639**	1											
Dig4	.651**	.593**	.674**	1										
Dig5	.619**	.595**	.646**	.765**	1									
Dig6	.542**	.572**	.542**	.554**	.536**	1								
FSAP1	.484**	.442**	.348**	.400**	.340**	.406**	1							
FSAP2	.406**	.346**	.485**	.365**	.344**	.366**	.533**	1						
FSAP3	.501**	.468**	.432**	.384**	.385**	.461**	.483**	.579**	1					
Flex1	.512**	.495**	.509**	.489**	.423**	.397**	.360**	.322**	.286**	1				
Flex2	.536**	.529**	.520**	.502**	.436**	.447**	.342**	.422**	.453**	.622**	1			
Flex3	.485**	.487**	.501**	.462**	.482**	.357**	.322**	.308**	.382**	.582**	.566**	1		
Flex4	.525**	.470**	.553**	.550**	.497**	.483**	.329**	.397**	.333**	.556**	.576**	.622**	1	
Flex5	.601**	.485**	.593**	.500**	.419**	.423**	.379**	.362**	.389**	.484**	.560**	.526**	.545**	1