yönetim ve ekonomi araştırmaları dergisi
journal of management and economics research

*Cilt/Volume: 23 Sayı/Issue: 1 Mart/March 2025 ss. /pp. 266-296*
M. B. Dinçer, C. Tufan, http://dx.doi.org/10.11611/yead.1436506

# THE NEXUS AMONG SUPPLY CHAIN MANAGEMENT, STRATEGIC AGILITY, AND OPERATIONAL PERFORMANCE[1]

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## ABSTRACT

*It is becoming essential for the managers of companies operating in dynamic environments with a high degree of environmental uncertainty to be aware of the antecedents that affect supply chain activities and, therefore, their performance, and at the same time, to understand how they can cope with environmental factors. Using the dynamic capabilities theory as a basis, this study examines the sequential relationships among supply chain management, strategic agility, and operational efficiency of manufacturing firms. The data was collected from middle- and upper-level managers of the 60 manufacturing enterprises. According to the multiple regression analysis results, supply chain management has a direct and significant relationship with strategic agility. Furthermore, strategic agility has a positive, significant relationship with operational performance. Another finding is that supply chain management directly and significantly relates to operational performance. The study's conclusions emphasize the factors that enhance organizations' operational performance in the manufacturing sector.*

***Keywords:*** *Supply Chain Management, Operational Performance, Strategic Agility, Dynamic Capabilities Theory, Manufacturing Firms.*

***Jel Codes:*** *R41, L1, M10*

## 1.INTRODUCTION

As a result of accelerating globalization since the 1990s, the increased movement of goods and services has paved the way for a significant supply, transportation, and storage demand. (Kumar & Rajeev, 2016). However, globalization has led to an increase in these needs and radical changes in the global market. The acceleration in globalization has also triggered a rise in competition, and businesses have taken advantage of various opportunities that can keep their costs at the lowest level to survive. In parallel, due to combining production knowledge with technology, production costs have started to decrease (Petricevic & Teece, 2019). In this context, from the value chain point of view stated by Porter

[1] This article is mainly based on the master's thesis of the first author under the supervision of the second author.

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**Makale Geçmişi/Article History**

Başvuru Tarihi / Date of Application : 13 Şubat / February 2024
Düzeltme Tarihi / Revision Date : 17 Eylül / September 2024
Kabul Tarihi / Acceptance Date : 20 Şubat/ February 2025



**Araştırma Makalesi/Research Article**

in the 1980s, the theoretical foundations of the supply chain concept were laid when products and services began to participate in the production process integrated with technology (Sindi & Roe, 2017).

From a supply chain perspective, the firms inside the chain are not rivals but rather strategic allies (Zhang, Tay, Alvi, Wang & Gong, 2023). As a result of implementing strategic partnerships, optimizing processes such as production, distribution, and planning along the supply chain has come to the fore. As a result, the competition experienced at the enterprise level has been replaced by a competitive environment formed between supply chains (Xia, Li & He, 2023). According to Ramirez-Barreto (2020), the increasing competition due to globalization, the short life cycle of the products produced, and the continuous increase in customer demand lead enterprises to focus on the functioning of supply chains and improving them.

Supply chain management is a crucial strategic instrument that enables firms to navigate competitive market conditions and solidify their position effectively. To exist in competitive global markets, enterprises must effectively manage their supply chain functions (Kumar & Rajeev, 2016). However, due to the rapid increase in the number of enterprises due to globalization, enterprises need to conduct supply chain management processes correctly and effectively in order not only to produce high-quality products and services but also to respond quickly to threats and opportunities in the market. (Xia et al., 2023).

At this point, strategic agility is a critical element that will ensure the enterprise's long-term survival by enabling it to manage unexpected risks and unforeseen uncertainties that it may encounter in market conditions. Strategic agility enables enterprises to adapt to environmental changes continuously and respond dynamically to changing market conditions and customer demands (Doz & Kosonen, 2010; Vagnoni & Khoddami, 2016; Omoush, 2020). Strategic agility also helps the company improve its operational performance by enabling it to manage its internal and external activities flexibly, adaptively, and quickly within the market conditions. In other words, enterprises with strategic agility prevent them from reducing their operational performance by reacting dynamically to competition and changes in the market (Ofoegbu & Akanbi, 2012; Gerald, Obianuju & Chukwunonso, 2020).

Nevertheless, it is noted that organizations functioning inside business contexts where uncertainty is high and commercial and economic instability prevail, especially like Turkey, cannot respond to their operational problems in a timely manner due to the failure to manage their supply chain management practices successfully. It is stated that many companies that cannot adapt to environmental conditions where uncertainty is high, cease their existence in a short time by failing to adapt to new conditions (Tufan & Kılıç, 2019). In research conducted in the manufacturing sector, we noticed some shortcomings related to the need for a firm to confidently perform supply chain management by focusing on its strategic agility to cope with environmental changes. This study also aims to respond to the calls presented by some authors as research proposals in the literature. For example, Arokodare, Asikhia, and

Makinde (2019) stated that further empirical research is required to investigate the correlation between sustainable corporate performance and strategic agility . Tufan and Mert (2023) stated further research is necessary to elucidate the notions of agility, differentiate strategic agility from other forms of agility, ensure that institutions comprehend its significance, and address the existing gaps in the literature. Therefore, we could not find any studies in the literature review that examined the relationships among supply chain management, strategic agility, and operational performance of companies operating in the manufacturing sector. Determining the antecedents that lead to increased operational performance for enterprises to survive in the long term is crucial.

Within this particular framework, we have subsequently formulated the research questions.:

- What factors influence the performance of manufacturing enterprises? What is the connection with supply chain management?

- What are the general characteristics of companies that implement an agility strategy? Do the agility practices of companies involved in the supply chain impact their performance?

The aim of this study, which was prepared based on dynamic capabilities theory, is to examine the relationships among supply chain management, strategic agility, and operational performance of enterprises operating in Turkey's manufacturing sector. For this purpose, the middle and upper-level managers of the enterprises engaged in machine manufacturing within the Antalya Organized Industrial Zone (AOSB) constitute the research universe. In order to collect the research data, an online survey was prepared to be applied to the middle and senior managers of 60 companies engaged in machine manufacturing at AOSB. 361 of the submitted surveys were returned.

In this context, the study consists of 4 parts, briefly mentioned below. The first part shares the theoretical basis of the study's theoretical framework. In the second part, the relationship between the concepts of operational performance, supply chain management, and strategic agility in the literature and the analysis of the studies conducted were shared. The method and findings used in the third part of the study were shared. Limitations were noted and the research findings were appraised in the fourth section. Lastly, recommendations for additional study and the business sector were offered.

## 2. THEORETICAL BACKGROUND

Globalization has brought various opportunities and threats for businesses in almost all sectors. Considering the speed of technology development and the continuous changes in the market structure, the uncertainty in the environments in which enterprises operate has increased, and the competition in the market has intensified (Kyove et al., 2021). Enterprises must cultivate specific capabilities to effectively respond to dynamic and competitive situations, allowing them to enhance their creativity and operational efficiency (Woo et al., 2021).

In this context, developing strategic agility capability for enterprises is critical in maintaining their existence and providing strategic competitive advantage in the long term by turning such uncertain situations into an advantage for themselves (Tarba et al., 2023). In the literature, the most important problems encountered in supply chain management include uncertainty, differences in perspectives and lack of coordination. In their study on these problems, Jodlbauer et al. (2024) offer solutions by making an in-depth examination of current practices. Their work provides valuable insights into our understanding of these complex challenges and how we can address them.

Strategic management theory argues that creating a sustainable competitive advantage is possible for enterprises with rare, valuable, impossible to imitate and substitute, and unattainable resources. In today's conditions, having resources bearing these characteristics is vital in ensuring an enterprise's sustainable competitive advantage (Doz & Kosonen, 2008).

Dynamic capabilities stand out as a framework that explains how enterprises can improve their sustainable competitive advantage while developing as an extension of the resource-based view. These guide businesses want to compete in the international environment. Businesses that want to gain a competitive advantage in the international market need dynamic, solid capabilities (Arokodare et al., 2019). Diversity and change in environmental conditions place dynamic capabilities in an essential position for international enterprises, and the concept of "Dynamic Capabilities" should be considered together with the concepts of adaptation, flexibility, and rapid innovation. In addition, the internationalization processes of enterprises can also be seen as a factor gaining momentum thanks to dynamic capabilities (Woo et al., 2021).

Dynamic capabilities refer to an enterprise's capacity to effectively incorporate, construct, and modify its internal and external skills to adapt to swiftly evolving environmental circumstances (Teece, Pisano & Shuen, 1997).

The foundation of the dynamic capacities theory is routine activities formed by the unique characteristic features of an organization but at the same time repeated around a specific pattern (Gerald, Obianuju & Chukwunonso, 2020)

The theory of dynamic capabilities aims to provide a consistent framework for enterprises to develop a competitive advantage and maintain this advantage over time. The theory of dynamic capabilities is interested in determining the foundations that support organizational growth and well-being in the long term (Cavusgil, Seggie & Talay, 2007). Dynamic capability is the capacity of a business to adapt and reorganize its unique assets and abilities to react to shifts in technology and market trends effectively (Teece, 2018). Hence, the concept of dynamic capabilities extends beyond enterprises' capacity to discern evolving consumer demands, opportunities for technological advancement, and a competitive market. In addition, it comprises the organization's capacity to promptly and effectively

adjust to the business environment while also having the ability to influence and mold said environment (Woo et al., 2021).

Dynamic capabilities can be based on change routines (such as a well-known product development process) and analysis (such as analysis of investment opportunities) in certain situations. In addition, they are often based on creative managerial and entrepreneurial activities (such as discovering new markets). Conversely, this situation reflects the speed and degree of how the enterprise's unique, irreplaceable resources and competencies can be repositioned according to the opportunities and needs in the business environment (Barreto, 2010). Also, evaluate when and how cooperation can be established with other enterprises. In order to determine the standard "solution" point evaluated by customers and to use the global value chain, enterprises must develop and combine their assets and capabilities (Teece, 2010).

Especially enterprises operating in markets where environmental dynamism and uncertainty situations are high, such as Turkey, will be more successful to the extent they develop their dynamic capabilities. In other words, enterprises with dynamic capabilities can bring their competitive advantages to a sustainable level thanks to dynamic capabilities (Cavusgil, Seggie & Talay, 2007).

In summary, dynamic capabilities adapt between operational competencies, dynamic environments, and activity routines. The theory of dynamic capabilities is an integrated approach. For this reason, dynamically talented managers should set out a strategic vision that facilitates cooperation between the internal units of the organization. The main goal should be for the business to operate effectively to the extent of a living and healthy organism (Teece, 2018).

## 3. HYPOTHETICAL DEVELOPMENT

### 3.1. Supply Chain Management and Strategic Agility

Supply chain management, at its core, ensures the timely and cost-effective delivery of the appropriate services and products to customers, utilizing the most efficient methods (Khan, Zaman & Khan, 2023). This approach includes supply, logistics, inventory, distribution, retail, production, and planning processes (Chowdhury & Islam, 2021). The main objective of effective supply chain management is to enable the enterprise to operate with higher profit margins thanks to cost savings and, therefore, to create an effective source of competitive advantage for differentiating from competitors in terms of customers(Cichosz, Wallenburg & Knemeyer, 2020). Furthermore, the objective is to establish a supply chain that seeks to optimize customer value (Supriadi, Husniati, Rialmi & Manggabarani, 2022).

Prabhu and Srivastava (2023)emphasized that supply chain management practices are combinations of functions performed in enterprises to create a management form appropriate to the unique supply chain structures that enterprises have. Supply chain management strategies enhance

financial and operational performance of organizations, hence improving organizational performance (Chowdhury & Islam, 2021).

Omoush (2020) examines supply chain practices under four different sub-dimensions: *Cooperation with suppliers* is is a prevalent mode of organization in supply chain management. It allows the enterprise to increase its competitive advantage by enabling it to develop various functions such as production, marketing, and sales. *Customer relationship management* is a strategy designed to protect and expand the end customer environment of the enterprise. Marketing, sales, and customer service functions can support this management process. *Logistics* is a process that closely concerns the entire network within supply chain management. The company needs to perform logistics operations successfully by taking the proper steps. *Information and knowledge sharing* refers to providing knowledge sharing back and forth along the supply chain, allowing the enterprise to gain advantages in such issues as efficiency and fast decision-making.

Being strategic requires businesses to develop flexible and creative strategies to see the future, make solid choices, and change current commitments (AlTaweel & Al-Hawary, 2021). In today's conditions, enterprises face environmental changes due to constantly increasing competition, developing technology, fluctuating demand levels, and supply chain disruptions caused by human-caused or impossible-to-prevent situations. The significant environmental change causes the enterprise to face uncertainties and risks in its activities (Hermundsdottir & Aspelund, 2021). The literature identifies the strategic agility of an enterprise as an essential way for an enterprise to manage unforeseen uncertainties and risks that it may face (Vagnoni & Khoddami, 2016; Hutter, Brendgens, Gauster & Matzler, 2023; Sreenivasan & Suresh, 2023).

Strategic agility is a strategic choice required to achieve the necessary agile practices to improve long-term competitive advantages, such as meeting customer demands and needs and adapting to market situations through managerial stages (Tufan & Mert, 2023). Strategic agility seeks to empower organizations to adapt to changes in their external environment and to modify conventional procedures that hinder the enterprise from swiftly, efficiently, and effectively achieving its goals. (Tarba et al., 2023).

Enterprises are trying to create a complete set of applications in order to make progress in all processes. For this reason, agile management practices enable a business to gain agility and provide quick responses by managing time requirements and changing consumer demands(Hutter et al., 2023). In this context, agile supply chain strategies are becoming a critical dynamic capability for enterprises that offer multiple products or services during demand fluctuations(Suradi, Mahrinasari & Hasnawati, 2020). Supply chain agility requires the competencies of managing, detecting changes, and restructuring resources in order to respond quickly to the final goals of the enterprise, market changes, and customer demands in order to gain operational agility (Teece et al., 1997; Yawson & Yamoah, 2022).

Strategic agility also contributes to the sustainability of enterprises by adapting quickly to unforeseen situations and developing practical solutions to emerging problems. An example of this is the implementation of the company's activities by outsourcing during disruptions in the supply chain (Olaleye, Anifowose, Efuntade & Arije, 2021). The driving force of strategic agility and flexibility throughout the supply chain is restructuring resources within a supply chain to achieve optimal performance (Shams, Vrontis, Belyaeva, Ferraris & Czinkota, 2021).

Omoush (2020) investigated the effects of strategic agility on supply chain management activities and operational performance of 16 pharmaceutical companies traded on the Amman Stock Exchange in Jordan and stated that according to the research results, strategic agility partially affects supply chain management activities. Pfaff (2023), in his study on the digitalization of supply chains and the socio-economic relations of supply chain members, examined 16 case studies involving industry 4.0 applications using the multiple case study method. According to the research result, in order to manage digitalization in the context of the supply chain and to ensure competitive advantage, it is stated that it is a micro basis for managers in supply chain management to adjust the relational governance structure of the supply chain by using strategic agility, which is a dynamic capability. It has been found that supply chains managed with strategic agility affect the efficiency and productivity of the enterprise.

The findings of the study conducted by Tufan, Çiğdem, Kılıç, and Sayar (2024) on 27 enterprises selected from Türkiye's Top 500 Industrial Enterprises indicate that supply chain agility can influence the impact of supply chain management on financial performance by enabling businesses to adapt to changing market conditions. This highlights the importance of flexibility, innovation, and responsiveness in enterprises..

The study conducted by Sharma, Antony, Sharma, and Daim (2024) on 234 participants in the United Kingdom demonstrated that Industry 4.0 applications have a significant impact on the implementation of smart and sustainable supply chain management practices. The findings also revealed that supply chain management has a partial mediating effect on the relationship between supply chain agility and Industry 4.0.

Hussain, Abood, and Talib (2018) researched with the assistant deans and department heads of 15 faculties at Babel University to investigate the relationship between strategic agility and organizational supply chain success. As a result, it has been found that there is a critical impact relationship between strategic agility and organizational supply chain success. Suradi et al. (2020)conducted research by collecting data from 300 supply chain managers in their study in which they examined the intermediary effect of strategic agility on the relationship between supply chain management activities and business performance in the Indonesian textile industry and found that supply chain management activities are an essential determinant for improving strategic agility and business performance.

In the light of these explanations, the following hypothesis has been produced:

H1: Supply chain management has a positive relationship with strategic agility.

H1a: Cooperation with suppliers has a positive relationship with strategic agility.

H1b: Customer relationship management has a positive relationship with strategic agility.

H1c: Logistics has a positive relationship with strategic agility.

H1d: Information flow and knowledge sharing positively relate to strategic agility.

### 3.2. Strategic Agility and Operational Performance

Operational performance pertains to an organization's capacity to effectively handle operational objectives or services, such as timely delivery. These goals include operational features such as on-time delivery, reduced processing, and cycle times. In addition, it also includes other main elements that contribute to increasing resource utilization and reducing costs (Alkhatib & Momani, 2023). While aiming to reach the maximum level of profitability with operational performance, competitive superiority, and customer satisfaction, it also refers to the standards and measures used at this stage (Al-Nattar & Alazzawi, 2020). In this context, operational performance has been defined as measuring the efficiency and effectiveness of activities (Alkhatib ve Momani, 2023: 7). Effectiveness refers to meeting consumer requirements, while efficiency refers to how economically the resources of enterprises are used while ensuring consumer satisfaction (Gerald et al., 2020).

Product or service design, process management, and supply chain applications, which express the enterprise's internal processes, affect the enterprise's operational performance level in direct proportion to the degree of success of these applications. In addition, managing the enterprise's internal processes to improve its operational performance and eliminate unnecessary costs enables it to develop a strategy of offering its products and services at lower prices (Quang et al., 2016). Since the enterprise's operational processes are essential in improving competitiveness and ensuring continuity, manufacturing enterprises should develop operational plans that help implement corporate competitiveness strategies (Alkhatib & Momani, 2023).

Agility, as one of these strategies, refers to a dynamic capability that allows enterprises to adapt to the current situation by changing their operation routines in order to cope with the changing business environment and market conditions (Teece et al., 1997; Sambamurthy, Bharadwaj & Grover, 2003). In today's conditions, businesses that consider the turbulent situations around the business can predict or predict changes before positioning in the market through strategic agility. Thus, businesses can develop immunity against rapid changes in the market, ensuring their performance remains consistently optimal and differentiate themselves from other enterprises, thereby gaining a competitive advantage (Al-Nattar & Alazzawi, 2020).

Strategic agility refers to an organization's capacity to rapidly make decisions in its day-to-day operations and adapt and innovate without losing momentum. The organization's strategic agility ensures that the appropriate services and products are developed and delivered to customers at the right location, time, and price (Ofoegbu & Akanbi, 2012; Clauss, Abebe, Tangpong & Hock, 2019).

Shin, Lee, Kim, and Rhim (2015) state that improving enterprises' internal processes by gaining strategic agility will lead to the acquisition of operational sensitivity and, therefore, the improvement of operational performance criteria. Strategic agility enables the company to produce strategic, operational responses in dynamic and competitive international markets by creating rapid responses to market changes. In this respect, it positively affects operational performance by providing the enterprise with the advantage of the first move in the market and enabling it to establish the supply chain before its competitors (Ahammad, Basu, Munjal, Clegg & Shoham, 2021). Strategic agility enables the enterprise to create an organizational ability to adapt its strategic direction continuously and at a sufficient level in order to maximize the overall company performance (Weber & Tarba, 2014).

In the study conducted by Aljawazneh (2024) on pharmaceutical manufacturing companies in Jordan, the mediating role of supply chain digitalization in the relationship between supply chain agility and operational performance was investigated. The results indicate that there is a statistically significant relationship between supply chain agility and operational performance. Furthermore, the findings show that supply chain agility has a direct effect on supply chain digitalization, while supply chain digitalization has an indirect effect on operational performance. Sriboonlue, Sriboonlue and Onputtha (2024) examined the impact of strategic agility, which includes technological capability, co-innovation, organizational learning and internal alignment, on operational responsiveness and firm performance in import, export and logistics businesses. The findings of the study conducted on 400 importers, exporters and logistics service providers in the Bangkok Metropolitan Region emphasize that strategic agility has a strong positive effect on operational responsiveness and firm performance, while operational responsiveness mediates the effect of strategic agility on firm performance.

Shin et al. (2015) stated that agility should be considered a strategic goal and investigated its effects on operational and company performance. In a study conducted on small and medium-sized enterprises in Korea, it was stated that strategic goals on agility have a positive impact on both operational performance and customer retention. Clauss et al. (2019)have shown that the strategic agility of enterprises is a mechanism that contributes positively to company performance as a result of studies conducted on 432 German enterprises. Kale, Aknar, and Başar (2019), As a result of their research on hospitality enterprises in Turkey, examined strategic agility in the purchase and utilization dimension and found that both dimensions impact strategic agility. Therefore, strategic agility positively affects business performance. Uğurlu, Çolakoğlu & Öztosun (2019), as a result of their research conducted on 88 manufacturing enterprise managers operating in Gaziantep province, showed that technology ability and internal compliance abilities, which are considered components of strategic agility, positively affect

company performance. The concept of company performance, which includes the concept of operational performance, and the relationship between strategic agility have been examined in the literature within the scope of different industries, and it has been shown that enterprises increase their competitive advantages and overall company performance through strategic agility practices (Arokodare et al., 2019).

H2: Strategic agility has a positive relationship with operational performance.

### 3.3. Supply Chain Management and Operational Performance

SCM focuses on enhancing the procurement of raw materials, the manufacturing process, and the delivery of products/services to customers (Al-Nattar & Alazzawi, 2020). Therefore, effectively implementing SCM principles offers prospects for enhancing OP throughout the supply chain (Chowdhury & Islam, 2021).

Supply chain management is an operational approach in terms of supply, and all supply chain members must have the correct flow of knowledge. In supply chain management, the connections and knowledge flow between the supply chain members are essential for overall supply chain performance (Johannson, 1994). In this context, supply chain management includes approaches and practices aimed at effectively coordinating suppliers, manufacturers, distributors, and customers in order to achieve a harmonious and high-performance business model for both individual members of the supply chain and the long-term performance of the supply chain (Chowdhury & Islam, 2021).

Mentzer et al. (2001) define supply chain management as the organized and strategic coordination of conventional business functions across the supply chain, to enhance the long-term performance of each organization involved and optimize all supply chain processes. Enterprises within the supply chain are facing time-based competition that requires them to be able to respond to changes in the current market and customer demands (Kumar & Kushwaha, 2018).

In order to create a comprehensive and good performance criterion, all members, financial and non-financial performance items, and all supply chain processes must be taken into account, and performance is measured by operational performance (Shahbaz, Rasi, Ahmad & Sohu, 2018). Performance is a set of metrics used to measure the efficiency and effectiveness of supply chain processes and relationships formed during the process, which include multiple organizational functions and enable the supply chain to be organized when necessary by covering multiple enterprises (Maestrini, Luzzini, Maccarone & Caniato, 2017).

With supply chain management, enterprises can reduce expenses and plan for supply, production, and transportation at the right time. Supply chain management improves performance by helping enterprises coordinate the supply chain using existing business strategies and goals, enabling them to establish connections with trading partners (Vencataya, Seebaluck & Doorga, 2016).

In terms of operational performance, businesses that can achieve the desired level of metrics ensure that customer requests are fulfilled thanks to effective supply chain management practices. Supply chain management practices contribute to increasing operational efficiency in order to fulfill market demands at the lowest cost in line with the targeted quality. For this reason, researchers identify supply chain management as one of the most effective tools that can be used to increase efficiency in any business (Chowdhury & Islam, 2021). The positive effects of supply chain management on operational performance can manifest themselves in various dimensions such as cooperation, the transition of processes to an integrated structure, establishment of long-term relationships, knowledge sharing, development of processes, reduction of inventories and delivery times (Ahirwar, Singh, Shrivanasta & Dhakde, 2014).

Various studies in the literature investigate the relationship between supply chain practices and operational performance. A study by Kumar and Kushwaha (2018) on 200 companies in India found that the three dimensions of supply chain practices have a positive and meaningful relationship with operational performance.

The research conducted by Emir and Sulistyowati (2024) on 265 employees revealed that the implementation of effective supply chain management and total quality management strategies can lead to the development of a competitive advantage, which in turn contributes to the improvement of operational performance.

In the study conducted by Rubiyatno and Theodorus (2024), the impact of operational performance on financial performance was emphasized, and it was observed that supply chain practices have a direct effect on operational performance, while operational performance has a direct effect on financial performance.

De Souza Miguel and Brito (2011) studied 103 companies in Brazil. Researchers who examined operational performance in 4 different dimensions: cost, quality, flexibility, and delivery, found that supply chain management has a positive impact on all performance dimensions as a result of the study.

A study conducted by Latifah, Wijayanti, and Utami (2021) to examine the impact of supply chain management on the operational performance of SMEs found that supply chain management has a positive and significant impact on operational performance.

Lenny Koh, Demirbag, Bayraktar, Tatoglu, and Zaim (2007), in a study conducted on 203 manufacturing companies operating in metal products and machinery manufacturing in Turkey, showed that supply chain management significantly and positively impacts operational performance.

H3: Supply chain management has a positive relationship with operational performance.

H3a: Cooperation with suppliers has a positive relationship with operational performance.

H3b: Customer relationship management has a positive relationship with operational performance.

H3c: Logistics has a positive relationship with operational performance.

H3d: Information flow and knowledge sharing have a positive relationship with operational performance.

**Table 1. Summary of Literature Review**

| Author(s) and Year | Main Findings | Sample Size | Dependent Factors | Independent Factors |
|---|---|---|---|---|
| Omoush (2020) | Strategic agility partially affects supply chain management activities. | 16 companies | Supply chain management activities | Strategic agility |
| Pfaff (2023) | Strategic agility is crucial for managing digitalization in supply chain management. | 16 case studies | Strategic agility and digitalization in SCM | Strategic agility |
| Hussain et al. (2018) | Critical impact relationship between strategic agility and organizational supply chain success. | 15 faculties | Organizational supply chain success | Strategic agility |
| Suradi et al. (2020) | Supply chain management activities are an essential determinant for improving strategic agility and business performance. | 300 supply chain managers | Business performance | Strategic agility |
| Shin et al. (2015) | Strategic agility positively impacts both operational performance and customer retention. | Small and medium-sized enterprises in Korea | Operational and firm performance | Strategic agility |
| Clauss et al. (2019) | Strategic agility is a mechanism that contributes positively to company performance. | 432 German enterprises | Company performance | Strategic agility |
| Kale et al. (2019) | Both dimensions of strategic agility impact business performance positively. | Hospitality enterprises in Türkiye | Business performance | Strategic agility dimensions |
| Uğurlu et al. (2019) | Components of strategic agility positively affect company performance. | 88 manufacturing enterprise managers | Company performance | Strategic agility components |
| Kumar & Kushwaha (2018) | Supply chain practices have a positive and meaningful relationship with operational performance. | 200 companies | Operational performance | Supply chain practices |

| | | | | |
|---|---|---|---|---|
| de Souza Miguel & Brito (2011) | Supply chain management has a positive impact on all performance dimensions. | 103 companies | Operational performance dimensions | Supply chain management |
| Latifah et al. (2021) | Supply chain management has a positive and significant impact on operational performance. | SMEs | Operational performance | Supply chain management |
| Lenny Koh et al. (2007) | Supply chain management significantly and positively impacts operational performance. | 203 manufacturing companies | Operational performance | Supply chain management practices |
| Aljawazneh, B. (2024) | Statistically significant relationship between supply chain agility and operational performance | 268 valid surveys pharmaceutical manufacturing companies | Operational Performance | Supply Chain Agility |
| Sriboonlue, O., Sriboonlue, U., & Onputtha, S. (2024) | Strategic agility has a strong positive effect on operational responsiveness and firm performance | 400 importers, exporters and logistic service providers | Firm Performance | Strategic Agility |
| Emir and Sulistyowati (2024) | Supply chain management has positive effect on operational performance through competitive advantage | 265 employees survey at Ooredoo Hutchison Company | Operational Performance | Supply Chain Management |
| Rubiyatno and Theodorus (2024) | Supply chain management has direct effect on operational performance | 100 SMEs | Operational Performance | Supply Chain Management |
| Tufan, Çiğdem, Kılıç, and Sayar (2024) | SCA has regulating role in the relationship between supply chain management and financial performance | 27 manufacturing enterprises in Türkiye's Top 500 Industrial Enterprises | Financial Performance | Supply Chain Management |
| Sharma, Antony, Sharma, and Daim (2024) | Smart supply chain has significant and positive relationship with supply chain agility | 234 surveys from supply chain professionals in UK | Supply Chain Agility | Smart Supply Chain Management |

## 4. METHODOLOGY

### 4.1. Research Paradigm

Based on post-positivist philosophy and technical interest, this research is ontologically deterministic, covers concrete world data, and is based on the functional paradigm (Günbayi & Sorm, 2018). Epistemology deals with what constitutes knowledge and the ways to obtain it. From an epistemological point of view, the data obtained in this research, which uses the method of prediction, measurement, and proof based on a research hypothesis, are axiologically objective (Burrell & Morgan, 1979). The functional paradigm based on the quantitative descriptive relational screening is used to

study social relations, organization, and social systems. It focuses on finding solutions to practical problems from a pragmatic approach (Günbayi & Sorm, 2018). The data used in this research were collected through online surveys distributed to managers between February and May 2022.The variable scales were determined for the methodologically generated research design, and the obtained data were subjected to multiple regression analysis after reliability analysis. The research focuses on detecting the relationship between the determined variables.

The variables investigated in this study and the relationships between them were previously determined conceptually in the literature, and the aim was to test the direct effects. Multiple regression analysis is an effective method to test direct effects between variables based on a particular theory. Since the study aimed to evaluate linear relationships that would validate this theoretical framework, multiple regression analysis was deemed an appropriate methodological choice. Considering the sample size and simplicity of the model in our study, multiple regression analysis was thought to be both efficient and more appropriate in terms of the interpretability of the results. Additionally, another reason for using multiple regression analysis is that it can directly answer our research questions and make the results understandable in a practical sense. Since the study's scope is examining linear relationships and direct effects, multiple regression analysis was considered a more effective tool in this context.

### 4.2. Purpose and Scope

The study's aim, grounded in the dynamic capabilities theory, is to investigate the effects of supply chain management on strategic agility and operational performance in manufacturing enterprises.The field articles mention that adequate performance can only be achieved if supply chain management applications are related to the strategic agility of enterprises (Irfan, Wang & Akhtar, 2019; Omoush, 2020; Yawson & Yamoah, 2022). As far as is known, this study is the first to examine the effects of supply chain management and strategic agility variables on the operational performance of manufacturing enterprises in Turkey and to determine the antecedents of the operational performance of manufacturing enterprises.

### 4.3. Scales

The survey form of the research consists of 3 main dimensions and 29 expressions. In the survey, 6 descriptive question expressions were used to reach the descriptive data of the participants. Thus, there are 34 expressions in total.

The supply chain management scale developed by Omoush (2020) consists of four sub-dimensions and sixteen expressions. The sub-dimensions of the supply chain management scale are cooperation with suppliers (COOP), customer relationship management (CRM), Logistics (LOG), information flow, and knowledge sharing (IKS).

The strategic agility scale (AGLT) was developed by Tallon and Pinsonneault (2011) and consists of one dimension and eight expressions.

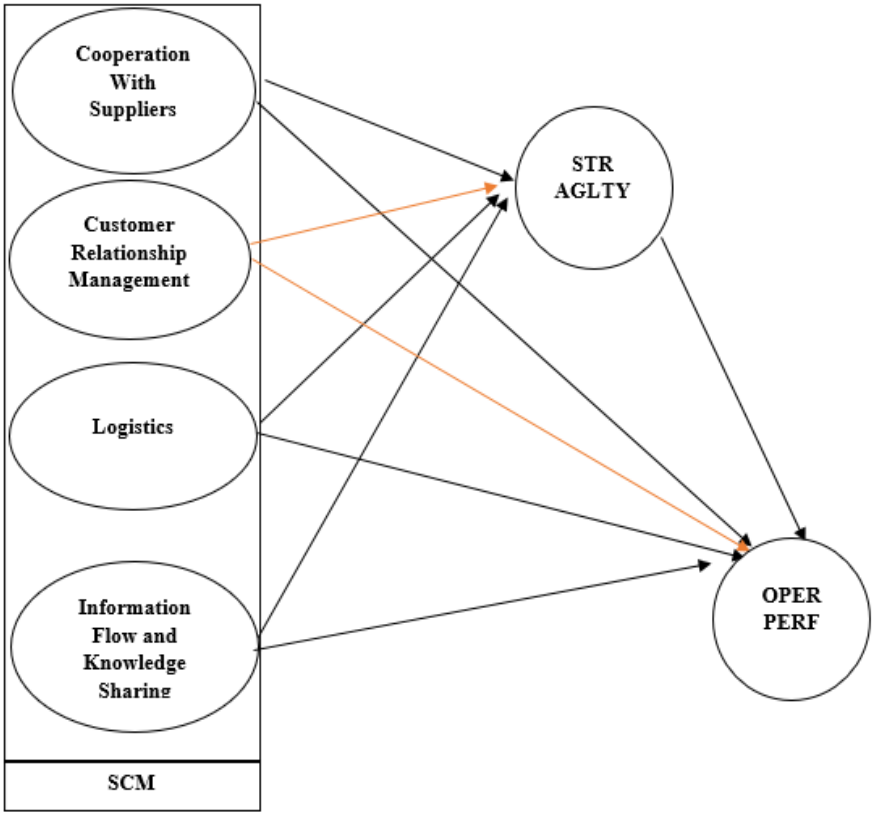
The operational performance scale (PRF) was developed by Powell and Dent-Micallef (1997) and consists of one dimension and five expressions.

All items used in the research, except for descriptive questions, were measured with a 5-point Likert-style scale ranging from 1 (I strongly disagree) to 5 (I strongly agree).

### 4.4. Research Model

In the literature, there is a belief about the necessity of linking the strategic agility of enterprises and supply chain management practices with different elements, such as providing economic value and competitive advantage in order for the operational performance of enterprises to be successful (Sağbaş & İnce, 2015; Omoush, 2020). For this reason, under this heading, the design of the conceptual model created to understand the sequential relationships among supply chain management, strategic agility, and operational performance variables is shown, and the hypotheses explain the possible relationships among the variables.

**Figure 1. Research Model**



### 4.5. Descriptive Statistics

The data control of the study, the validity and reliability of the scales, descriptive analyses, and eight research questions belonging to the research were analyzed using the SPSS 23.0 statistical program. Measurement models were determined for supply chain management, strategic agility, and operational performance, which are the main dimensions of the research, and these structural models were tested based on eight hypotheses that were prepared.

The results of the analysis of the study data are displayed in this section. The findings derived from the structural models have been thoroughly examined, together with the assessment of the research scales' reliability and validity. Table 2 contains detailed information about the research sample.

**Table 2. Descriptive Statistics**

| Descriptive Statistics | Groups | N | % |
|---|---|---|---|
| **Gender** | Men | 224 | **62** |
| | Women | 137 | 38 |
| **Age** | Less than 25 | 54 | 14,9 |
| | 25-35 | 143 | **39,6** |
| | 36-45 | 123 | 34,2 |
| | More than 45 | 41 | 11,3 |
| **Educational Status** | High School | 73 | 20,2 |
| | University | 280 | **77,5** |
| | Graduate School | 8 | 2,3 |
| **How many years has the company been operating in the sector?** | 1-5 years | 32 | 8.9 |
| | 6-10 years | 56 | 15,5 |
| | 11-20 years | 119 | 33 |
| | 20 years+ | 154 | **42,6** |
| **The number of years worked in the current company** | 1-2 years | 98 | 27,1 |
| | 3-5 years | 109 | 30,2 |
| | 6-9 years | 123 | **34,1** |
| | 10 years+ | 31 | 8,6 |
| **Total work experience** | 1-2 years | 63 | 17,5 |
| | 3-5 years | 89 | 24,7 |
| | 6-9 years | 107 | **29,7** |
| | 10 years+ | 102 | 28,1 |
| **TOTAL** | | **361** | **100** |

Table 2 provides the descriptive characteristics of the 361 participants. According to Table 2, 62% of the participants in the study were men, and 38% were women. The vast majority of the participants in the study (39.6%) are in the 25-35 age group and are university graduates (77.5%).

When the sectoral activity period of the companies is examined, it is seen that 42.6% of them are more than 20 years, 33% are 11-20 years, 15.5% are 6-10 years, and 8.9% are in the 1-5 years. Considering the participants' experience in the current companies, it is seen that 34.1% have been working for 6-9 years, 30.2% for 3-5 years, 27.1% for 1-2 years, and 8.6% for 10 years or more. It is seen that 29.7% of the participants in the research have a total work-life experience of 6-9 years; 2.1% have 10 years and above, 24.7% have 3-5 years, and 17.5% have 1-2 years.

### 4.6. Factor Analysis

The expressions of the variables examined in the study were subjected to factor analysis. According to factor analysis, IKS4, LOG4, COOP4, and PRF5 coded expressions with factor load below 0.50 were excluded from the analysis since the KMO test statistic is more significant than 0.70. The Bartlett test chi-square value is statistically significant ($p< 0.05$), and it was decided that the data are suitable for factor analysis (See Fig. Table 3). Essential components analysis was used as a factor analysis, and the Varimax method, one of the upright rotation methods, was used as a rotation method. As a result of the factor analysis, 6 factors with an intrinsic value greater than 1 were obtained. The factors explain 74.649% of the total variance. Detailed information about the factor analysis results is shown in Table 3.

**Table 3. Factor Analysis**

| Expressions | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| AGLT3 | ,820 | | | | | |
| AGLT5 | ,808 | | | | | |
| AGLT7 | ,802 | | | | | |
| AGLT4 | ,788 | | | | | |
| AGLT6 | ,764 | | | | | |
| AGLT8 | ,748 | | | | | |
| AGLT2 | ,615 | | | | | |
| AGLT1 | ,540 | | | | | |
| CRM2 | | ,943 | | | | |
| CRM3 | | ,942 | | | | |
| CRM1 | | ,917 | | | | |
| CRM4 | | ,694 | | | | |
| PRF2 | | | ,875 | | | |
| PRF4 | | | ,865 | | | |
| PRF3 | | | ,807 | | | |
| PRF1 | | | ,761 | | | |
| IKS3 | | | | ,934 | | |
| IKS2 | | | | ,930 | | |
| IKS1 | | | | ,876 | | |
| LOG1 | | | | | ,932 | |
| LOG3 | | | | | ,930 | |
| LOG2 | | | | | ,919 | |
| COOP2 | | | | | | ,925 |
| COOP1 | | | | | | ,919 |
| COOP3 | | | | | | ,893 |
| Explained Variance | 22,834 | 12,723 | 10,792 | 10,154 | 9,344 | 8,800 |
| Kaiser-Meyer-Olkin test= 0,740 | | | Bartlett's Test $\chi^2(300)$= 7553,226; p< 0,05 | | | |

As a result of the reliability analysis, it was seen that the Cronbach alpha values of all variables took values above 0.70, and it was seen that the scales provided reliability criteria (See. Table 4). Descriptive statistics of the factors are shown in Table 4. Since the skewness and kurtosis values of all variables take values between -2 and +2, it has been decided that the data are ordinarily distributed.

**Table 4. Descriptive Information About The Variables**

| Factors | Avarg. | Std. Deviation | Skew | Kurtosis | Cronbach Alfa |
|---|---|---|---|---|---|
| AGLT | 3,3965 | ,34330 | -,904 | ,225 | ,888 |
| CRM | 4,5125 | ,52227 | -,640 | -,331 | ,906 |
| PRF | 4,4155 | ,53986 | -1,235 | 1,827 | ,869 |
| IKS | 4,3324 | ,61388 | -,508 | -,486 | ,930 |
| LOG | 4,2096 | ,40531 | 1,235 | -,100 | ,926 |
| COOP | 4,8144 | ,28495 | -,989 | -,898 | ,915 |

Multiple linear regression analysis was used to test the research hypotheses. First, whether the prerequisites of the multiple linear regression analysis applied as two models were met was examined. Criteria such as normal distribution of data, absence of multiple linear connection problems between independent variables, and absence of autocorrelation between error terms should be provided. Since the kurtosis and skewness values of the expressions used in the research are between -2 and +2, it was determined that the data show a normal distribution (See. Table 4). It was decided that there is no multilinear connection problem because the tolerance values are greater than 0.2, and the VIF values are less than 0.5. There is no autocorrelation problem because the Durbin-Watson value is close to 2 (See. table 5).

Since it was found that the COOP, LOG, and IKS variables had statistically significant relationships with the dependent variable agility (AGLT) in the first multiple linear regression analysis models, the H1a, H1c, and H1d hypotheses were accepted; the H1b hypothesis was rejected because the relationship between the CRM variable and AGLT was statistically insignificant. Table 5 provides comprehensive details regarding the analyses.

**Table 5. Regression Model 1**

| Independent Variables | Beta | t | p. | Tolerance | VIF | D-W |
|---|---|---|---|---|---|---|
| CRM | ,077 | 1,508 | ,133 | ,992 | 1,008 | 1,604 |
| IKS | ,230 | 4,491 | ,000 | ,991 | 1,010 | |
| LOG | ,100 | 1,992 | ,019 | ,995 | 1,002 | |
| COOP | ,101 | 1,996 | ,048 | ,997 | 1,003 | |
| $R^2$= 0,073 | F(4;356)= 6,969; p< 0,05 | | | | | |

In the second multiple linear regression model, the H3a, H3c, H3d, and H2 hypotheses were accepted because it was observed that the COOP, LOG, IKS, and AGLT variables had statistically significant relationships with the dependent variable PRF; the H3b hypothesis was rejected because the relationship between the CRM variable and PRF was statistically insignificant. Table 6 provides comprehensive details regarding the analyses.

**Table 6. Regression Model 2**

| Independent variables | Beta | t | p | Tolerance | VIF | D-W |
|---|---|---|---|---|---|---|
| CRM | ,088 | 1,710 | ,088 | ,985 | 1,015 | 1,669 |
| IKS | ,184 | 1,864 | ,026 | ,937 | 1,067 | |
| LOG | ,101 | 1,994 | ,019 | ,997 | 1,003 | |
| COOP | ,103 | 1,998 | ,046 | ,986 | 1,014 | |
| AGLT | ,194 | 3,669 | ,000 | ,927 | 1,078 | |
| $R^2$= 0,078 | F(5;355)= 6,032; p< 0,05 | | | | | |

## 5. CONCLUSION AND DISCUSSION

The dynamic business landscape resulting from the worldwide COVID-19 epidemic has exposed numerous significant organizational obstacles concerning product supply chains in emerging economies like Turkey. Strategic agility can be employed as a robust analytical framework to address supply chain issues and enhance the operational efficiency of businesses, enabling them to assess, track, and assess these concerns during uncertain periods. The results derived from this research can be utilized to identify the elements of supply chain management at operational, tactical, and strategical tiers. This will provide a rapid and effortless means of ensuring and monitoring strategic agility, thus enhancing operational performance.

The main objective of this study, which is organized according to the principles of dynamic capabilities theory, is to investigate the relationships between supply chain management, strategic agility, and operational performance of companies in Turkiye's manufacturing sector. The study's results are significant in understanding how manufacturing companies will adapt to changes in their supply chain management environment due to their strategic agility capabilities and how this will affect their operational performance.

When the study's data were analyzed, it was seen that the three sub-dimensions of supply chain management (cooperation with suppliers, logistics, information flow, and knowledge sharing) have direct and significant relationships with strategic agility. This finding means that successful supply chain management will be the premise of strategic agility. This result also parallels the research in the literature and complements them (Irfan et al., 2019; Suradi et al., 2020; Yawson & Yamoah, 2022; Yun, Shun, Jackson, Newiduom & Browndi, 2023). Customer relationship management, another sub-dimension of supply chain management, has not been found to have a significant relationship with strategic agility. This situation may be because the manufacturing enterprises operating in the AOSB, which constitute the sample framework, have not been fully institutionalized. In the observations made during the research, it has been seen that the manufacturing enterprises operating in AOSB carry out customer relationship management activities through marketing staff in order to cope with cost-related difficulties. The fact that these activities are carried out under a separate department without due attention may be the basis for achieving this result.

Another conclusion obtained from the research is that strategic agility has a positive significant effect on operational performance. This finding is also compatible with the studies conducted in the literature and supports their results (Shin et al., 2015; Clauss et al., 2019; Lungu, 2020; Suradi et al., 2020).

When examining the study results, it has been concluded that the three sub-dimensions of supply chain management (collaboration with suppliers, logistics, information flow, and knowledge sharing) have direct and significant relationships with operational performance. Accordingly, it is concluded that supply chain management is the antecedent of operational performance. When the studies conducted in the literature are examined, they show parallels with the results obtained from this research (Kannan & Tan, 2005; de Souza Miguel & Brito, 2011; Truong et al., 2017; Saragih, Tarigan, Pratama, Wardati & Silalahi, 2020; Khan et al., 2022). It has emerged that the customer relationship management sub-dimension of the supply chain management variable does not have a significant relationship with operational performance. The statement can also explain that customer relationship management does not have a significant relationship with the strategic agility variable (H1b hypothesis). In other words, the fact that manufacturing enterprises operating in the AOSB conduct customer relationship management activities through marketing staff is again considered an explanation that can be brought to this issue.

According to the Dynamic Capabilities Theory, strategic agility is crucial for businesses to achieve long-term success in today's competitive and rapidly changing environment. Strategic agility allows businesses to promptly respond to these changes by utilizing their dynamic capabilities (Tarba et al., 2023). Therefore, it is acknowledged that manufacturing enterprises, through their flexible structures, can adapt more swiftly to the evolving conditions brought about by globalization (Yilmaz, Alpkan & Ergun, 2005). However, considering Turkiye's geopolitical position, the instability in its vicinity, internal turmoil, and the economic uncertainties within, coupled with potential inaccuracies in supply chain management practices by manufacturing executives, the long-term prospects for the sustained viability of manufacturing enterprises are increasingly diminishing.

The research aims to mitigate these drawbacks and expects its findings to contribute to the existing body of literature. This contribution will be in terms of determining the antecedents that will significantly relate to the operational performance of manufacturing enterprises. This determination is based on the fact that supply chain management activities of manufacturing enterprises in Turkey will positively impact their strategic agility and operational activities. In addition, the findings to be obtained from this study will guide managers in the manufacturing sector in improving the operational performance of their enterprises.

This research contributes to the literature in various ways. Strategic agility and supply chain management are the primary factors influencing operational performance levels, particularly for

enterprises working in the manufacturing sector of developing nations. Secondly, the conclusions drawn from looking at the variables we employed in the study can direct managers of businesses in the manufacturing sector and future research toward a valuable conclusion. Lastly, this research will offer valuable recommendations on how manufacturing sector businesses in developing nations like Turkey may strengthen their competitiveness and overcome obstacles to thrive in markets with limited resources. In addition, it is anticipated that the study's findings will inform corporate managers' supply chain and strategic management methods.

### 5.1. Theoretical Contributions

This study makes a significant contribution to the existing literature on the subject by examining the relationships between supply chain management, strategic agility, and operational performance within the framework of dynamic capabilities theory (Teece et al., 1997). A review of the literature indicates that only a limited number of studies have focused on this triadic relationship. Specifically, it addresses the knowledge gap regarding the relationship between supply chain management and strategic agility, and how this relationship is reflected in operational performance. This study broadens the scope for applying the dynamic capabilities theory in the context of supply chain management and demonstrates the possibility for businesses to cultivate strategic agility capabilities and , consequently, enhance their operational performance (Barreto, 2010; Vagnoni & Khoddami, 2016).

Moreover, this study highlights the significance of strategic agility as a concept in the business literature, particularly in terms of its impact on operational performance. The findings indicate that enhancing businesses' strategic agility capabilities can facilitate greater flexibility and adaptability in dynamic and competitive market conditions (Doz & Kosonen, 2010; Shin et al., 2015). This supports the existing theoretical frameworks that argue that businesses should gain a competitive advantage by developing their dynamic capabilities.

### 5.2. Pratical Contributions

The practical contributions of this study offer significant insights for business managers, particularly those in the manufacturing sector. The direct relationship between supply chain management and strategic agility practices with operational performance indicates that managerial actions to enhance these two areas can improve business efficiency and competitiveness (Irfan et al., 2019; Suradi et al., 2020). For example, implementing effective supply chain management practices enables businesses to respond expediently and adapt to customer demands. Furthermore, strategic agility allows businesses to adapt to unforeseen market shifts swiftly. (Hussain et al., 2018; Omoush, 2020).

Moreover, this study provides practical guidance to business managers regarding the relationship between supply chain management components and strategic agility, including customer relationship management, logistics, information flow, and supplier collaboration. In particular, this study demonstrates the limited relationship between customer relationship management and strategic agility

and suggests that businesses should develop strategies to institutionalize and structure this area (Clauss et al., 2019; Pfaff, 2023).

In conclusion, this study makes valuable contributions to the existing literature on both theoretical and practical levels. From a theoretical standpoint, this study extends the applicability of the dynamic capabilities theory in the context of supply chain management. From a practical standpoint, it guides business managers in developing supply chain management and strategic agility practices.

### 5.3. Limitations

Several limitations constrain this study. First, it focuses on Antalya Organized Industrial Zone (AOSB) manufacturing firms. The limited scope precludes generalizing the findings to other sectors or regions. In particular, the direct applicability of these findings to other business types or sectors is limited because the dynamics of supply chain management and strategic agility may differ in different geographical and sectoral contexts.

In the second place, the incomplete institutionalization of enterprises in AOSB raises concerns, particularly regarding deficiencies in crucial areas such as customer relationship management. This may narrow the scope of the findings on supply chain management and strategic agility. Incomplete institutionalization may not fully account for the effects of enterprises on strategic agility and operational performance.

Third, using online surveys as a data collection method may result in limitations, such as potential response bias and respondents providing answers that align with their perceptions. Although online surveys offer the advantage of rapid and comprehensive data collection, the inherent limitations of this method may raise concerns about the extent to which the data obtained are free from bias.

### 5.4. Recommendations for Future Research

It is recommended that future research be conducted to overcome this study's limitations. Prior to this, similar research in different geographical regions and sectors can enhance the generalizability of the findings. This will facilitate a more nuanced understanding of the interrelationship between supply chain management and strategic agility in diverse business contexts.

It is further recommended that future studies examine the effects of incomplete institutionalization in greater detail. In particular, examining the level of institutionalization of important functions, such as customer relationship management, could provide a more comprehensive picture of the effects on businesses' strategic agility and operational performance.

With regard to data collection, it would be beneficial for future research to employ a combination of quantitative and qualitative data collection techniques using a mixed methods approach. This approach minimizes participant bias and allows for the corroboration of online survey results with qualitative data, such as in-depth interviews or focus groups.

Future studies should consider utilizing more sophisticated statistical techniques, such as Structural Equation Modeling (SEM), to gain a deeper understanding of the interrelationships among supply chain management, strategic agility, and operational performance. This could facilitate a more comprehensive understanding of intricate relationships and potential latent variables, thereby enhancing the precision and interpretability of the analyses.

**Appendix A**

| | |
|---|---|
| **MEASUREMENT INSTRUMENTS SUPPLY CHAIN MANAGEMENT** | |
| *Cooperation with suppliers* | |
| COOP1 | The company confirms communication openness with the basic suppliers. |
| COOP2 | The company deals with its suppliers based on the partnership. |
| COOP3 | The company works to engage the basic suppliers in process of developing its products and services. |
| COOP4 | The company's strategy depends on building good relationships with the basic suppliers. |
| *Customer Relationship Management* | |
| CRM1 | Customer satisfaction is a good which the company seeks for. |
| CRM2 | In the company there is a specialized division for the customer's service. |
| CRM3 | The company deals with the customers notes and complaints in an appropriate way.CRM4 The company keeps a complete database about the customers. |
| *Logistics* | |
| LOG1 | Does the company respond to the orders from time of receiving the order and during its transportation and till handling the bill andreceiving the financial merits? |
| LOG2 | Is there a system in the company for accuracy and complete orders—the absence of returned orders? |
| LOG3 | Logistics management in the company includes planning, scheduling the productions, and monitoring them. |
| LOG4 | Logistic management includes all planning and implementation levels (The Executive and Tactical Strategy). *Information Flow and Knowledge Sharing* |
| IKS1 | The company possesses an electronic system to speed up the information exchange internally. |
| IKS2 | The company uses the electronic networks for exchanging information with the customers. |
| IKS3 | The company uses the electronic networks to exchange information with the suppliers. |
| IKS4 | The company shares the knowledge and the information with the suppliers in building its plans. |
| **OPERATIONAL PERFORMANCE** | |
| PRF1 | The company can respond to changes in product quality and output according to environmental changes. |
| PRF2 | The company continuously updates the promotional tools and methods for its products. |
| PRF3 | The company maintains a minimum stock level to continue operations in case of delays in raw materials and to reduce per-unit costs |

| | |
|---|---|
| PRF4 | The company prioritizes delivering urgent orders quickly and with high quality |
| **SUPPLY CHAIN AGILITY** | |
| SCA1 | Our supply chain is able to respond to changes in demand without overstock or lost sales. |
| SCA2 | Our supply chain can forecast market demand and respond to real market demand. |
| SCA3 | Joint planning with suppliers is important in purchasing, production, and logistics. |
| SCA4 | Information integration with suppliers, logistic service providers, and customers in the supply chain is important. |
| SCA5 | Improving our level of customer service is a high priority. |
| SCA6 | Improving delivery reliability is a high priority. |
| SCA7 | Improving responsiveness to changing market needs is a high priority. |
| SCA8 | Inventory and demand levels are visible throughout the supply chain |

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**Hakem Değerlendirmesi:** Dış bağımsız.

**Çıkar Çatışması:** Yazar çıkar çatışması bildirmemiştir.

**Finansal Destek:**. Yazar bu çalışma için finansal destek almadığını beyan etmiştir.

**Teşekkür:** -

**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.

**Acknowledgement:** -