JÖNKÖPING UNIVERSITY
Jönköping International Business School

Adapting the New Procurement Strategies in the Face of Disruption:

How organizational ambidexterity enhanced the SCRES during Covid-19?

MASTER DEGREE PROJECT

THESIS WITHIN *Business Administration*

NUMBER OF CREDITS 30

PROGRAMME OF STUDY *International Logistics and Supply Chain Management*

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JÖNKÖPING August, 2023

Master Thesis in Business Administration

Title: Adapting the New Procurement Strategies in the Face of Disruption: How organizational ambidexterity enhanced the SCRES during Covid-19?
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Date: 2023-08-11

Key terms**:** Supply chain management, procurement, supply chain resilience, socio-ecological resilience, adaptive cycle, organizational ambidexterity, Covid-19, manufacturing.

Background: Organizations have established risk management strategies to prevent disruptions; nevertheless, the disruptions created by Covid-19 proved that existing risk management procedures are insufficient to absorb that kind of disruption. As these supply chain activities were mainly scattered across a limited geographical region, they substantially impacted businesses' procurement operations. As the number of disruptions grows and risk-management strategies may not be capable of responding to every type of disruption, the ability to constantly adapt to changing environments has become critical to overcoming disruptions.

Purpose: This research aimed to investigate how the ambidextrous capability of an manufacturing organization can leverage changes in procurement strategies to enhance supply chain resilience in the time of Covid-19. Initially, the researcher identified the changes in the procurement strategies, then presented the role of ambidexterity in times of high-level disruptions**.**

Method: A qualitative multiple case study design of seven organizations affected by the disruptions caused by Covid-19. Ten professionals handling procurement tasks in Turkey and Europe manufacturers participated in semi-structured interviews. Primary data is analyzed by content analysis and literature used to support the study.

Conclusion: The empirical data showed that the ambidexterity ability of the organizations enhanced the organizations' supply chain resilience. Furthermore, even though the level of exploration and exploitation was shifting throughout the process,

organizations needed to maintain both capabilities simultaneously to overcome the high-level disruptions. The changes in the procurement strategies are mainly adopted as temporary solutions. However, organizations adopt some of these strategies permanently depending on the performance and cost-benefit.

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Abbreviations

Covid-19	Coronavirus disease 2019
CAS	Complex adaptive systems
SCRES	Supply chain resillience

1. Introduction

The influence of the disruptions and Covid-19 on the global scale is addressed in the first chapter of this thesis. The problem that inspired this study is described, and its purpose and research questions are laid forth. Finally, the study's shortcomings and research plan are described.

1.1. Background

In recent years, the increasing number of disruptions are significantly impacting businesses worldwide (Moosavi et al., 2022). The disasters generally grouped under; natural or man-made (artificial). The latest line of natural events which caused massive natural disruptions: The earthquake and tsunami in Japan in 2011 caused significant disruption in the electronics components supply chain worldwide because factories had to close down. Hurricane Harvey in 2017 had a massive impact on the petrochemical industries and caused plastic material shortages for many sectors (Lund et al., 2021). The Coronavirus Disease (Covid-19) has had one of the biggest and broadest impacts on world trade in recent memory. Covid-19 had a massive impact on numerous industries, and the strict restrictions imposed by governments exacerbated the negative impact on businesses worldwide (Moosavi et al., 2022). Artificial disasters are not as impactful as natural disasters but are costly and severe disruptions, such as the USA-China trade dispute. According to World Bank's political stability report, from 2000 to 2019, the countries at the bottom of the list increased by 13% (Lund et al., 2021).

As the averaging across industries, firms anticipate supply chain disruptions lasting a month or more will happen every 3.7 years. This time period is more narrowed for shorter disruptions (Lund et al., 2021). Lund et al. (2021) explored the magnitude of supply chain disruptions through two different scenarios using actual data from 25 companies from 13 different industries. They found that a single extended production-only shock would erase from 30 to 50 percent of a firm's EBITDA (Earnings Before

Interest, Tax, Depreciation, and Amortization) for many industries. A company's strategy during a disruption plays a vital role because some strategies that a company maintains might exacerbate the impact of the disruption (Tukamuhabwa et al., 2015). Therefore, building a resilient supply chain is critical to withstand and respond to disruptive events and improve operational performance following the disruption (Tukamuhabwa et al., 2015; Wiedmer et al., 2021). A better response to disruption promotes the company's place in the market, creating a competitive advantage. For these reasons, the resilient supply chain is fundamental for both short- and long-term competitiveness (Tukamuhabwa et al., 2015). Organizational ambidexterity is a new idea discussed in the literature to improve supply chain resilience. This new concept concerns the opposing dualities between exploitation (efficiency) and exploration (flexibility). In the literature, organizational ambidexterity is explained by the researchers as a paradigm that strengthens the supply chain's resilience by enabling organizations to continue operating under unpredictable or disruptive situations (Ocicka et al., 2022).

Companies' supply networks are becoming more interconnected and complex in the global business environment, as are their company strategies to reduce costs and improve coordination, such as the lean initiative and single-sourcing policies, making companies' supply chains more fragile and vulnerable to risks (Bak et al.,2023; Tukamuhabwa et al., 2015). Although causes disruption might arise from any supply chain activity. More specifically, the impact of the upstream is the most crucial for the organizations to maintain (Pereira et al., 2014). Therefore, managing supply risk became more challenging for procurement managers due to increasing disruptions (He et al., 2014).

1.2. Problem Discussion

The supply chain strategies are considered antecedents, but enhancing one could result in counterproductivity and increase the chance of a moving issue or risk reduction (Tukamuhabwa et al., 2015). Thus, building resilient supply chains is an expensive investment for organizations. These resilient strategies only sometimes enable the

companies to respond to the disruption due to the increasing number and complexity of supply chain disruptions (Alikani et al., 2022; Wiedmer et al., 2021).

Resilient firms are more capable of managing unexpected events which cause disruptions to delivering value to their customers and are assumed to respond to disruptions and recover from them. However, if the supply chain cannot manage the disruption, what would its consequences be? (Ambulbakar et al., 2015; Vega et al., 2022). As seen with Covid- 19, the impact on global businesses was massive and unprecedented, demonstrating that the preparedness and existing resilience plans needed more to tackle the high disruptions (Betti & Heinzmann, 2020; Pal & Altay, 2022).

Covid-19 severely impacted manufacturing organizations' operations. It was challenging to manage the production flow, and the limited use of plant capacity due to the restrictions pushed the organizations to find alternative solutions (Furtado et al., 2020). Furthermore, manufacturers had to face order cancellations, fluctuations in the market, and altered supply-demand motives. On the other hand, despite the problems that organizations were facing due to the fluctuations in the market, new market opportunities arose for the manufacturers (Bettiol et al., 2023). Despite the challenges, researchers' interest in manufacturing organizations during Covid- 19 remains limited, as highlighted by Hilmola et al. (2020), Ardolino et al. (2021), and Kapoor et al. (2021).

Nowadays, the risk in the supply chain is higher than before. In addition to supplier-specific risks such as machine breakdowns and supply shortages, disruptions increase with the distance between suppliers. These risks in geographical distances can cause systematical risks in procurement activities of the organizations, such as natural disasters, volatile exchange rates, and terrorism. One of these possible disruptions might significantly impact a group of suppliers (Merzifonoglu, 2015). As Covid-19 demonstrated, most of the companies supply chains depended on supplies from the Far East, and lockdowns were the primary barriers preventing the companies from obtaining raw materials or components (Ocicka et al., 2022). Covid-19 indicated that how upstream supply chain is crucial for the organizations, however, it also revelaed that the lack of knowledge to interprete and act on the supply chain disruptions(Ocicka et al., 2022; van Hoek, 2020). According to the surveys taken during COVID-19, neither firms

thoroughly understand its supply chain and are unprepared for disruption. Beroe's procurement intelligence agency survey indicated that merely 49% of the 450 organizations had business continuity plans (van Hoek, 2020).

1.3. Research Purpose

This study intends to contribute to SCRES by filling identified gaps in the literature. This study focuses on manufacturing organizations' procurement activities during disruptions caused by Covid-19. In this study, a qualitative multiple case study was undertaken, and employees practicing procurement activities from manufacturing organizations' participated in interviews.

The explanation for this geographic selection is given below. Regarding the national economy, manufacturing companies promote job possibilities, economic growth, and innovation (Ataberk et al., 2017; European Commission, n.d.). There are more than 2 million manufacturing organizations in Europe, accounting for almost one in ten firms. According to Eurostat's (2023) data, these manufacturing companies employed 29.4 million people, contributing 23% of the employment rate to the European economy. The manufacturing sector has been crucial to the expansion of the Turkish economy; in fact, the minister of industry and technology cited this sector as having the most significant contribution to Turkey's GDP performance in 2020 (Ergocun, 2021). Furthermore, from a general perspective, manufactured goods generate the highest export rates (WTO Secretariat, 2016). Turkish and European manufacturing sectors followed the same trend in 2019 manufacturing sector decreased, and this sector recovered gradually in the following years (Eurostat, 2023; Statista, 2023).

The motivation behind this study is explained in Chapter 1.3. research problem, the supply chain risk management strategies cannot respond to all kinds of disruptions, as Covid-19 demonstrated. Therefore, constant adaptation and transformation towards a constantly changing environment became crucial for organizations (Wieland et al., 2023). In this study, the researcher draws on the socio-ecological resilience literature to help define and conceptualize supply chain resilience (SCRES) and, by adopting a complex adaptive system (CAS) perspective, better understand and demonstrate the dynamics of the procurement relationship between manufacturing organizations and

their suppliers. The study also used an adaptive cycle to visualize the process of evolution and transformation in the procurement strategy.

The supplier base of an organization is crucial to its supply chain. The supply base can be defined as the collection of providers who provide the materials organizations require. Therefore, the supply base needs to be developed with top-performing suppliers for the organizations to succeed in the market and survive during disruptions (Namdar et al., 2017). Procurement activity is one of the fundamental forces that enable firms to thrive and compete in the market (Merzifonoglu, 2015). Procurement efforts enable firms to lower the cost of high-quality products and boost customer satisfaction while gaining a competitive edge (Nicholson et al., 2018). Consequently, given that procurement activities contribute to the organization's finances and customer satisfaction, procurement activities are another motivating factor for this study.

This study's objective was to investigate how an organization's ambidexterity competence may help it become more resilient in the face of highly disruptive events. Organizational ambidexterity is an organization's ability to explore and exploit (Bettiol et al., 2022). The ambidexterity capability of a firm is viewed as a significant antecedent for adjusting to a changing environment in the SCRES literature, even though it is a novel concept As ambidexterity enables an organization to change with its environment without affecting its current workflow (Gayed & El Ebrashi, 2021).

1.4. Research Questions

To achieve the research goal researcher identified the following these research questions:

- How have manufacturing organizations changed their procurement strategies to secure sourcing during Covid-19?

Companies' SCRES strategies vary depending on the organization's risk perception and managers. The researcher's goal in this study was to identify the strategies used by manufacturing organizations to respond to high disruption by focusing on procurement.

- How did the ambidexterity of the firm leverage the manufacturing organizations to explore and exploit new procurement strategies?

According to Tukahuwamba et al. (2015), resilience strategies should focus on identifying strategies and understanding how the strategies can be implemented. With this question, the researcher aims to understand how these identified strategies are implemented with the ambidexterity of manufacturing organizations.

1.5. Delimitation

Beyond the already-existing quantitative data, a qualitative method was used in this study to comprehend the implications of the new procurement strategy fully. This study only focused on the supply chain level in the panarchy model. The study's primary focus in obtaining perceptions and insights is manufacturing organizations' procurement activities. Also, the samples used in this study are restricted geographically to Europe and Turkey and must be able to exhibit ambidextrous abilities. The focus of this study's time frame is limited to COVID-19 disruptions since they are the most recent and novel, making it the most relevant for illustrating how organizations have adapted to significant disturbances.

1.6. Research Outline

This study is divided into six chapters. Following the introduction chapter, SCRES is described along with elements. From the theoretical standpoint of this study, CAS presented in the concept of supply chain management, Socio-ecological resilience, and Adaptive cycle model presented, ambidexterity described. Its role in the disruption was explained, and procurement strategies were explained. In Chapter 3, the researcher explained the study's methodological procedures: multiple case studies, purposeful sampling, and content analysis. Chapter 4 provides the findings and data analysis of this study's empirical data. Then, with support from the literature, the researcher discusses the findings in Chapter 5. Lastly, in Chapter 6 conclusion of this study is presented

2. Literature Review

There are five sections to this study's chapter. First, aspects of SCRES were provided, along with their connections to procurement and a discussion of the theoretical foundations of this study. In the following, adaptive cycles and socio-ecological resilience are discussed. Next, ambidexterity capabilities and their connection to SCRES were covered. The researcher summarized the literature in the final section to emphasize the study areas that needed development and key topics.

2.1. Supply Chain Resilience

In the literature, resilience is conceptualized as multidimensional and multidisciplinary, and the term was applied to psychology and ecosystems before its application in supply chain management (Kalamahadi & Parast, 2016). SCRES as a concept has become attractive to researchers and practitioners since the earlier 2000s following the seminal publication of research by Christopher and Peck (2004) and Sheffi and Rice (2005) (Pettit et al., 2019). Many researchers aimed to investigate to define SCRES from other disciplines' resilience concepts, but there is no one agreed definition of SCRES in the literature (Han et al., 2020; Kalamahadi & Parast, 2016). In line with the idea of this study, the definition of SCRES should view the supply chain as CAS since this approach considers dynamic multiscale relationships amongst the supply chain's stakeholders and its supporting systems. As stated by Novak et al. (2022), the CAS-motivated definition used in this work can be articulated as follows. The system's core functionality must be maintained to the extent of a resilient supply chain while responding to the various levels of dynamic feedback from numerous institutions, interconnected organizations, and social-ecological systems that are components of larger supply chains. Furthermore, SCRES is commonly evaluated in the literature in four aspects: preparing for the disruptive event, responding to it, and recovering from the disruption (Han et al., 2020), and Tukamuhabwa et al. (2015) added the growth/competitive advantage after the disruptive event on to these four aspects of SCRES.

The literature is organized into three categories to help readers better understand the notion of SCRES: engineering, ecological, and social-ecological resilience (also referred to as evolutionary resilience in certain studies) (Davoudi et al., 2012; Ponomarov & Holcomb, 2009; Wieland & Durach, 2021).

A social-ecological resilience perspective was used in this study. One of the causes is that the socio-ecological and supply chain systems are both open systems. For instance, the unintended effects of the climate crisis on the forest and the erratic nature of customer behavior impacted the supply chain's structure. It would be appropriate to state that supply networks act like socio-ecological systems because both involve social variables (Wieland & Durach, 2021).

2.1.1. SCRES elements

Numerous SCRES measures are presented in the SCRES literature. These measures were considered under different categories by Christopher and Peck (2004), in their study recognized four main different SCRES elements. These elements are mentioned in the literature as; supply chain (re-engineering), supply chain collaboration, agility, and supply chain risk management culture (SCRM culture). Further on, these elements, starting with supply chain (re-) engineering, describe the strategies regarding organizations' supply base and redundancy. Supply chain collaboration is related to the strategies to create synergy, collaborative planning, and information exchange between stakeholders. Agility describes the strategies that enable organizations to respond faster to disruptions in supply or demand. Lastly, SCRM culture is related to the strategies that focus on quality and business continuity concerns (Cristopher & Peck, 2004).

Several researchers conducted numerous different SCRES measures to enhance the concept of supply chain resiliency. Sheffi and Rice (2005) shared that enhancing the supplier base and designing a flexible supply chain are the two aspects that allow organizations to improve SCRES. Pomorov and Holcomb (2009) described the SCRES

through components of resilience and stated that adaptability, flexibility, and collaboration are the main elements of SCRES. More researchers explored ways to improve the SCRES in the literature, which will be reflected in Table- 1 below. However, these contributions have much in common and mainly fall into the SCRES elements stated by Christopher and Peck (2004). Therefore, in this study researcher adopted the categorization of the SCRES elements and examined the measures under the categories.

Researchers also contributed to the SCRES literature from a variety of perspectives. For instance, while some researchers focused on supply chain collaboration (e.g., Sa et al., 2018; Sholten and Schilder, 2015), others focused on the role of social capital in supply chain resiliency (e.g., Polyviou et al., 2019; Gölgeci and Kuivalainen, 2020). As researchers examined this idea in their studies by focusing on one measure or a small number of measures, several studies that attempted to contribute to this concept did not always give an overview.

2.1.2. Procurement and Supply Chain Resilience

Procurement has played an essential role in the organization by bringing resources from external actors to be used for internal operations (Virolainen, 1998). The term procurement was chosen for this study to avoid complications because several terminologies in the literature can be used interchangeably to represent ideas like purchase, procurement, and buying (Hofmann et al., 2020). Due to the suitability of this study's concept, the definition of procurement provided by Pereira et al. (2014) has been adopted: "Procurement as a boundary-spanning function, which looks at both sides of the extended enterprise in order to find good and reasonable solutions for them" (p. 628). Procurement's responsibility area within the organization is quite broad, which includes delivery time, product/ service cost and quality, and supply chain decisions (e.g., supplier relationship). Furthermore, procurement can be an information-sharing bridge between the supplier and the buyer at the management level (Pereira et al., 2014).

According to Pereira et al. (2014), procurement is a crucial supply chain activity because it boosts an organization's profitability, increases competitiveness in uncertain

environments, supports business continuity, and fosters SCRES. According to Jain et al. (2022), procurement strategies have different outcomes. Supplier diversification has a higher positive impact on responding to disruptions but a lesser positive impact on the recovery phase. On the other hand, the long-term supplier relationships positively impacted both the response and recovery phases.

Modern society has an enlarged supply network pipeline due to cost-cutting measures, which lengthens logistics, raises the danger of interruption, and increases reliance on distant resources. Consequently, strategic procurement choices must consider supply chain risk mitigation to increase risk mitigation (van Hoek, 2020). Even though many procurement techniques to improve supply chain resiliency have been discussed in the literature, there has yet to be an agreement on them since there is a chance that the disadvantages will outweigh the benefits, such as with single sourcing (Dube et al., 2022). A single supplier's failure increases the risk of a business being disrupted, so while single sourcing strategy establishes a collaborative relationship and gives more negotiating power over terms and prices, it also makes it more dependent on that one supplier (Dube et al., 2022; van Hoek, 2020).

Covid-19 had a massive negative impact on manufacturing organizations' operations. From the procurement perspective, it was challenging to find the raw material; importing the material became difficult, and there was a lack of cash flow (Biswas & Das, 2020; Cai & Luo, 2020; Kapoor et al., 2021). As the supply chain operations functionality was in jeopardy, the organizations took several actions, such as buffering stocks (Biswas& Das, 2020; Cai & Luo, 2020). Manufacturers tried to find the source alternative in the same region to overcome the scarcity of raw materials. Deficient cash flow also negatively impacted the manufacturers' procurement decisions (Biswas & Das, 2020). Even though these problems apply to different organization sizes, the impact of these problems increases towards smaller organizations due to the smaller organizations' limited resources and experience (Ellegard, 2006). Furthermore, the contribution of procurement methods to the company was viewed less favorably by SMEs than by large enterprises, who are more favorable about the matter (Ho, 2019).

SC Elements	Measures	References
Supply Chain (re-) engineering	Resilient-oriented Supplier Selection	(Parkouhi and Safaei, 2017); (Costa et al., 2018); (Hou et al., 2018); (Cavalcante et al., 2019); (Mari et al., 2019) ; (Parkouhi et al., 2019); (Shin and Park, 2020); (Rajesh, 2020)
	Resilient-oriented supply chain design	(Thomas et al., 2014); (Thomas et al., 2016); (Ruiz-Benitez et al., 2018); (Kamalahmadi et al., 2016); (Rajesh, 2020)
	Redundancy	(Amini & Li, 2021); Doug and Tomlin, 2012); (Sawik. 2014); (Kamalahmadi et al., 2021)
	Dual sourcing	(Ramasesh et al., 1991); (Yu et al., 2009); (Allon and van Mieghem, 2010); (Amini & Li, 2011); (Namdar et al., 2018); (Zhu et al., 2020); (van Hoek, 2020)
	Sourcing localization/ regionalization (Nearshoring)	(Slepinov et al., 2013); (Biswas & Das, 2020);(Cai & Luo, 2020); (Zhu et al., 2020); (Kapoor et al., 2021); (Fernandez-Miguel, 2022)
Supply chain collaboration	Information sharing	(Wagner & Bode, 2008); (Kochan et al., 2018); (Ruiz-Benitez et al., 2018); (van Hoek, 2020); (Rajesh, 2020); (Butt et al., 2022)
	Collaborative planning	(Sholten & Schilder, 2015); (Ruiz- Benitez et al., 2018); (Zhu et al., 2020)
	Risk hedging	(Ponomarov & Holcomb,2009); (Rajesh, 2020)
Agilitiy	Manufacturing flexibility	(Golgeci & Ponomarov, 2013); (Biswas & Das, 2020); (Cai & Luo, 2020); (Rajesh, 2020); (Zhu et al., 2020); (Kapoor et al., 2021)
	Demand Management	(Tang, 2006a); (Urciuoli et al., 2014);
	Logistics flexibility	(Ruiz- Benitez et al., 2018); (Zhu et al., 2020)
	Velocity	(Wu & Zang, 2011); (Bode & Macdonald, 2016)
	Enhance supply chain visibility	(Glickman & White, 2006); (Ruiz- Benitez et al.,2018); (Zhu et al., 2020)
	Spot Market Purchase	(Merzifonoglu, 2015); (Xu et al., 2023)

SCRM Culture	Managerial involvement	(Xu et al., 2008); (Zhang et al., 2011)
	Resilience-oriented talent management	(Biswas & Das, 2020); (Cai & Luo, 2020); (van Hoek, 2020)
	Risk Considerations	(Tang, 2006b); (Urciuoli et al., 2014); (Rajesh, 2020)
	Implication of New Digital Tools	(Erol et al., 2010); (Cai & Luo, 2020)

Table 1 Overview of SC Measures and Elements in Literature

2.1.3.Complex Adaptive Systems (CAS) and Supply Chain Resilience

From a theoretical standpoint, the researcher approached this topic from a CAS viewpoint. Since CAS shares several characteristics with supply chains and social-ecological resilience, which are addressed in this section, Adabor and Mccollin (2018) and some of the other researchers in the literature (e.g., Novak et al., 2020; Surana et al., 2015), conceptualized the supply chain as a CAS in their study. In the roots of the CAS, the term rose from complexity and chaos theory which applied to living systems through adaptation and self-organization (Tukahumabwa et al., 2015).

Both artificial and natural systems can be described as complex in that they involve nonlinear interactions between all agents, participants, and components and can evolve through time (Akpinar & Ozer-Caylan, 2022). These agents must evaluate and respond to one another's conduct to improve both their behavior and the behavior of the system they are a part of due to a set of rules controlling their interactions. The contact between these organizations occurs through the exchange of information and tangible items, which may be explained from the supply chain perspective (Adabor & McMullen, 2017).

Additionally, from the viewpoint of each of these entities, the supply chain is self-organizing, and the resilience shown via this process is a characteristic of a CAS. Due to

the network's extensive geographic spread and the involvement of an enormous number of participants and players, control and management of the supply chain are only possible for businesses (Tukamuhabwa et al., 2015). These organizations participate in the supply chain by making localized decisions, such as ensuring timely order fulfillment (Surana et al., 2005). This localized decision-making can be shared with the other participants when necessary to improve the system. Also, the results of each of these improvement initiatives will impact the supply chain either favorably or unfavorably (Adabor & McMullen, 2017).

Contemporary supply chain systems go beyond the traditional systems; more dynamic and interconnected systems, complex components of modern supply chains interact with one another and their environment in an adaptive manner. For this reason, to become resilient, supply chains need to have the capacity to adapt and co-evolve to survive in the face of disruption without losing their integrity (Tukamuhabwa et al., 2015). Another connection between CAS and the supply chain is that both are described as co-evolving with their environments to create dynamic realities (Adabor & McMullen, 2017). Due to their systematic character, CAS systems, like supply chains, are nonlinear and have recursive and modular linkages among the agents. Because of this, one tiny modification initiative from an agent can significantly impact the other links in the chain. As a result of these numerous interactions and their consequences, the outcome is naturally nonlinear and may trigger large-scale reactions such as ripple effects (Dentoni et al., 2021).

CAS maintains a quasi-equilibrium state, balancing complete and incomplete order under normal circumstances (Choi et al., 2001). This balance point is called the " edge of chaos," and CAS co-evolves on this balance point (Choi et al., 2001; Pathak et al., 2007). Further on the coevolution, in the time of disruption, which external events can trigger, CAS reacts and creates its environment. These environmental changes might impact agents to change since agents must adapt (Pathak et al., 2007). From the operational perspective, the environment depends on the chosen scale of analysis. These environments are rugged and highly dynamic; constant adaption is necessary (Surana et al., 2005).

For this reason, the single entities in the network need to adjust themselves and alter the boundaries of the network toward emerging threats (Surana et al., 2005). Predicting the exact future behavior of complex systems is not possible, but the future is not random. Due to CAS's recursive characteristics, small changes might immensely impact the future direction, but the emerging behavior pattern will remain despite the change (Choi et al., 2001).

2.2. Socio-Ecological Resilience

The studies in the ecology field were the first realized that the engineerable system could not apply to the unique characteristics of the systems in that field. For this reason, ecological resilience interpretation developed, better reflecting ecological systems' characteristics (Wieland & Durach, 2021). However, socio-ecological perspectives on resilience have contested the idea that nature "remains fixed over time" (Davoudi et al., 2013, p. 309). Holling and his research associates developed the social-ecological notion of resilience, including society in this concept (Davoudi et al., 2012). Socio-ecological resilience holds that society and the environment are interconnected systems, and that resilience is the ability to alter, adapt, or evolve in the face of pressures and difficulties (Davoudi et al., 2013). In addition, the social-ecological view conceptualizes resilience in terms of two dimensions: the first is the system's ability to absorb disturbances while maintaining a state of equilibrium, and the second is the system's level of capacity for self-organization, learning, and adaptation (Talubo et al., 2022).

This resilience perspective views the world as chaotic, complex, and unexpected rather than mechanical or somewhat predictable. Socio-ecological resilience is included in societal or natural systems that appear stable but are capable of quick change and radical transformation into something very different from the initial condition (Davoudi et al., 2012). A system's strength is determined by its ability to endure in building resilient systems. These improvements in social-ecological systems can result in a more fundamental transformative change from a socio-ecological perspective, in addition to persistence and adaptability (Wieland et al., 2023).

Supply networks interact nonlinearly to maintain a quasi-equilibrium state of outcomes that change and evolve through time, just as social-ecological systems. Because the "newer and enhanced state" of the supply chain may require transformation and resource reconfiguration in addition to adaptation, socio-ecological resilience would help to explain the "newer and improved state" of the supply chain after the disruption. Moreover, socio-ecological resilience can adapt to changes brought on by internal pressures and external shocks (Adobor & McMullen, 2018). Also, the adaptive cycle is crucial for structuring resilience concepts (Carpenter et al., 2001). This idea was developed in response to the demand for a visual representation of ongoing transformation, adaptation, and change (Wieland & Durach, 2021). The following section provides a detailed explanation of adaptive cycles

2.2.1. Adaptive Cycles

Socio-ecological resilience led to the adaptive cycle framework before the panarchy concept was presented, based on several adaptive cycles (Wieland et al., 2023). The adaptive cycle framework, famously visually depicted in Holling's model, plays an essential role in structuring the concept of resilience and understanding resilience (Carpenter et al., 2001; Davoudi et al., 2012). The adaptive cycle is a framework developed to visualize to understand the change and resilience in complex systems. Adaptive cycles enable us to visualize and contextualize how continuous transformation happens in dynamic environments. Achieved success in one object in adaptive cycles will provide a ground for the other to develop as the disturbance experienced and socio-ecological changes (Mirzabeiki & Aitken, 2022).

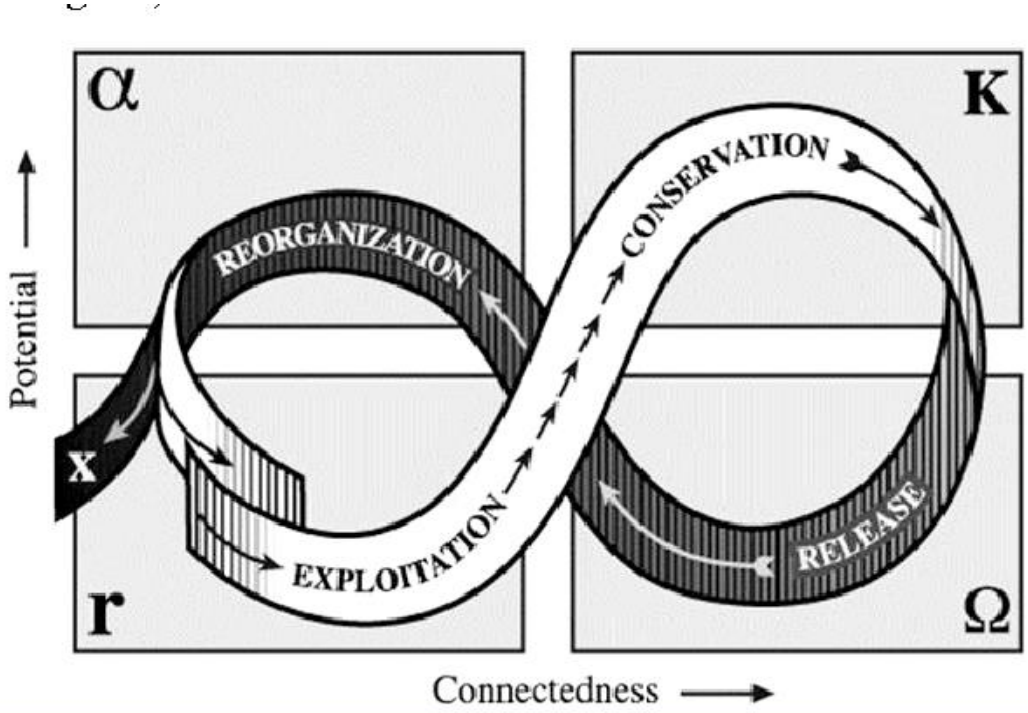

Figure 1 Adaptive Cycle Model

Source: This model adopted from Fath et al. (2015)

***Note**: In line with Vega et al. (2022), to avoid any misunderstandings with regard to the "exploitation" of ambidexterity. The exploitation phase in adaptive cycle is described as new growth or optimization in this study.j*

Adaptive cycles and dynamic systems do not evolve around a stable position; on the contrary, adaptive cycles and dynamic systems such as societies and economies strive to move beyond the equilibrium state by going through four distinct phases: "new growth, optimization (r)," "conservation (K)," "collapse or release (Ω)," and "renewal or reorganization (α)" (see Figure 1) (Carpenter et al., 2001; Vega et al., 2022). The following is how Davoudi et al. (2013, p. 311) explain the phases: new growth/ optimization (r) is characterized by the rapid acquisition of resources and the exploitation of opportunities, as well as by an increase in the degree of variety and connections and resilience that is both high yet declining. The rise of "conservation" (K) slows as resources are stocked and allocated for system maintenance. This phase is characterized by stability, certainty, limited adaptability, and low resilience. "Collapse or release" (Ω) is defined as the disorderly release of capital and collapse. Resilience is

still low at this point but is growing. Renewal or restructuring, in other words, is a period of innovation marked by high resilience and a significant degree of uncertainty.

Furthermore, these four characteristic phases can be grouped under 2 phases; front loop/" maturing phase of a system" and back loop/" collapse or renewal" (Vonck & Notteboom, 2016, p. 309). Front and back loops are essential to understand how resilience may contract and expand over time (Adobor, 2020). The front loop, the span from r to k, represents a slow and gradual phase of growth where organizations accumulate resources. The front loop describes how complex systems emerge, structure and functions develop (Adobor, 2020). Connectedness rises in this period, so this high connectedness makes the system more vulnerable to disruptions (Sundstrom & Allen, 2019). While the system in the front-loop phase became more rigid and declined, at the same time, it opened new opportunities (Adobor,2020). The back loop, the span from Ω to α, represents a rapid phase of reorganization leading to renewal (Elvira & Francesco, 2015). In the back loop, a system might lose its capacity due to the shock, destroying the system before it reorganizes (Adobor, 2020).

The front loop, compared to the back loop, is more predictable, and systems spend more time in these phases; the K phase is understood to be a stable attractor. Compared to the front, the back loop changes run faster. Opportunities for innovation and experimentation are created in the back loop phase, making this phase uncertain and unpredictable, so the resilience level decreases (Adobor, 2020; Sundstrom & Allen, 2019). Consequently," human agency" can keep the system in the desired state, and the needed capabilities to maintain the system in the desired state can be insightful for supply chain resiliency. Further, on SCRES, managers need to take advantage of building innovation as the system reaches the back loop (Adobor, 2020).

The movement of this system happens within a three-dimensional state space;" resilience, connectedness and system potential" (Kuffner et al., 2022, p. 4). In the literature, as Adobor (2020) explained, this three-dimensional state is mentioned as the" properties" that shape adaptive cycles and the system's future state. These three dimensions are explained in the following:

System potential is the initial property of an adaptive cycle related to the span of available resources, e.g., economic and social capital, for future system responses (Adobor, 2020; Kuffner et al., 2022). Social capital promotes supply chain performance and improves the flexibility of the organizations, promoting adaptive capacity and collaboration in the system. Another form of capital is economic capital which is resistant to waving in the cash flow, and protecting the company's market position is an essential capability for SCRES. As a result, social and financial capital promote a high level of potential, which is essential because it influences the firm's future system development and determines future system capabilities (Adobor, 2020).

Connectedness indicates the relationships between elements and processes of the system (Kuffner et al., 2022). From the supply chain perspective, connectedness represents the number of firms in the supply network and the ties they share. For instance, while tightly coupled networks make the actors more vulnerable to risks, loosely coupled networks promote flexibility, increasing SCRES (Adobor, 2020).

Adaptive capacity describes the disruption level that can be absorbed without transitioning new configuration (Kuffner et al., 2022). Self-organization is a way CAS builds its adaptive capacity, and the supply chain has adaptive capacity. Adaptability is essential to improve SCRES, promoting ecological resilience in supply chains (Adobor, 2020).

2.3. Ambidexterity of firms and Supply Chain Resilience

The origin of ambidexterity comes from the individual's ability to use both hands skillfully. This term carried to the businesses, shaping the organization's capability to manage to perform two different tasks simultaneously and balanced, such as efficiency and flexibility, adaptability and alignment (Birkinshaw & Gupta, 2013). Ambidexterity term first time used by Robert Duncan (1976), companies needed to change structures to start and, in turn, execute innovation (O'Reilly & Tushman, 2013). Tushman and

O'Reilly started to work on this concept after 20 years from Robert Duncan (1976), and their approach was understanding how firms can deal with both evolutionary and revolutionary change; in other words, explore and exploit, and to be ambidextrous firms need to explore and exploit simultaneously (Birkinshaw & Gupta, 2013; O'Reilly & Tushman, 2013).

According to the study conducted by Gayed and El- Ebrashi (2022), the most commonly used definition of ambidexterity in the literature belongs to March (1991), and the definition states that the firms can execute both exploration and exploitation simultaneously. Exploitation refers to concentrating on employing existing assets and presenting a competitive advantage. On the other hand, exploration focuses on seeking new assets and expanding markets. While exploitation contains production-related activities and their efficient implementation and execution, on the other hand, exploration contains more investigative and experimental flexible, innovative activities (Lee et al., 2016). Even though exploitation and exploration are necessary for the firm to survive in the long prospect, they are conflicting activities that the firm must undertake (Ragazou et al., 2022). Furthermore, exploitation and exploration are deliberated as self-reinforcing, focusing more on exploitation which might lead" success trap," which can be explained as the firm resources used for exploitation that prevent firms from exploring more new assets. If the firm focuses more on exploration might end up as a failure trap, which can be explained as untested results of exploration might fail and reduced efficiency (Gayed & El-Ebrashi, 2022). Therefore, the consensus on this matter and also mentioned above, these two capabilities need to be executed as balanced (Kafetzopoulos, 2020).

The studies in the literature on ambidexterity indicate that ambidexterity has positive relations with sales growth, innovation, market valuation, and a firm's survival (O'Reilly & Tushman, 2013). Furthermore, the ambidexterity of the firm is one of the significant drivers for the organization's success in the fast-changing market environment by utilizing the existing resources and abilities while improving a new optimized combination of resources to match the future market needs (Hill & Birkinshaw, 2012). Furthermore, the ambidexterity of a firm has positively related to the firm's performance

in the time of uncertainties in the literature (e.g., Aslam et al., 2020; Bettiol et al., 2023; Gayed & El- Ebrashi, 2022; O'Reilly & Tushman, 2013).

In the literature, the antecedent of ambidexterity is classified under three forms: structural or simultaneous, contextual, and sequential (O'Reilly & Tushman, 2013). This study adopts the contextual ambidexterity presented by Gibson and Birkinshaw in 2004. In contrast to other ambidexterity forms, contextual ambidexterity first emphasizes the individuals' adjusted exploration and exploitation; secondly, ambidexterity can be achievable when the individuals agree on their unit alignment and adaptability. Lastly, it promotes freedom, discipline, and trust (O'Reilly & Tushman, 2013). Contextual ambidexterity promotes the simultaneous use of different actions on whole business units, like alignment and adaptability (Aslam et al., 2022).

Furthermore, ambidexterity is particularly applicable to understanding how a company should behave during disruption (Bettiol et al., 2023). Gayed and El-Ebrashi (2022) emphasized that as a capability, organizational ambidexterity is essential to improve the firm's resilience by enabling the firm to attain a competitive advantage in an uncertain and dynamic environment (Gayed & El- Ebrashi, 2022). In times of disruption, the resilience capability of a firm is crucial. On the other hand, innovation also plays a significant role in resilience, and the firm's exploration and exploitation capabilities are essential (Arsawan et al., 2022). For instance, Krammer (2022) stated that during Covid-19, innovative companies were the ones who survived, and even some of the firms bounced back stronger than before.

After 2010, ambidexterity in the literature expanded beyond the firm's boundaries, and the supply chain started having a role in the ambidexterity literature (Roscoe& Blome, 2019). As Aslam et al. (2022) demonstrate that the ambidexterity capability enabled SCRES and defined the supply chain ambidexterity as:" the ability to modify supply chain design to adapt according to the market changes while aligning the incentives of the supply chain partners." (Aslam et al., 2020, p. 1189). Different activities of ambidexterity capabilities have unique benefits (Aslam et al., 2022). Alignment guarantees that risk, cost, and benefits are equally distributed among the partners in the

supply chain. It requires a transparent relationship among the actors in the supply chain to a high level of collaboration to succeed (Konstantinou et al., 2021). Alignment creates a stable and controllable environment, preventing disruptions (Aslam et al., 2022). Whereas, Adaptation enables managers to make decent adjustments towards any unexpected disruptions and guarantee the desired functionality level (Konstantinou et al., 2021). Adaptation enables innovation and flexibility, so resilience is an essential prerequisite to resilience (Aslam et al., 2022; Konstantinou et al., 2021). Further adaptation relies on selecting suitable strategic options that prompt reshaping the supply chain as a quick reaction to disruption (Konstantinou et al., 2021). This adaptability entails SCRES, a simultaneous building of stability and flexibility which can be achieved solely via organizational ambidexterity (Aslam et al., 2022)

Additionally, ambidexterity reinforces the infrastructure of logistics and supply chains by continuously seeking new suppliers. Ambidexterity enables building and organizing robust inventory to recover inventory loss due to any disruption. Supply chain ambidexterity also adds value to the firms' performance by monitoring the market needs for supply chain opportunities, such as finding new supply chain markets (Konstantinou et al., 2021). Consequently, ambidexterity enables building resilience to reduce the negative impact of supply chain disruptions, optimize firms' performance, and quickly adapt to a fast-changing environment. Thus firms that perform in a disruptive and dynamic environment must adopt organizational ambidexterity to remain resilient (Ocicka et al., 2022).

2.4. Conclusion of Literature Review

The researcher identified areas where the SCRES literature has been deficient based on his (systematic) literature analysis. Initially, research publications in the literature primarily targeted to answer the question what? about SCRES techniques, but they lack to answer how" with the example cases from the practitioners. Therefore, this study aimed to contribute to the SCRES literature on the subject, as Tukawumba et al. (2015) mentioned, by demonstrating the application of procurement strategies during Covid- 19 stated. Additionally, although numerous articles have been published on SCRES

elements, Sholten et al. (2019) stated in their study that there is a significant need to explore this literature. To contribute to the literature that Sholten et al. (2019) stated, the researcher will touch upon the SCRES element in this study.

The literature discusses supply chain resiliency from various angles, but it needs to go into better detail about how organizational ambidexterity affects SCRES. Organizational ambidexterity is a newly developed idea that improves an organization's capacity for resilience (e.g., Aslam et al., 2020; Bettiol et al., 2023; Iborra et al., 2020; Lee & Rha, 2016; Ocicka et al., 2022; Vega et al., 2022;).

Additionally, Socio-ecological resilience is an emerging concept in the SCRES literature, as Covid-19 demonstrated that supply chains should not be considered static and reductionist approaches; they should be more transformative. Therefore, several researchers highlighted the importance and the need for more studies in this area (e.g., Adobor, 2020; David & Novak, 2021; Vega et al., 2022; Wieland, 2021). Thus, to respond to the calls from the researchers on this novel approach to SCRES, this study adopted both ambidexterity capability and social-ecological resilience, drawing inspiration from the work of Vega et al. (2022). Consequently, this study aims to contribute to the socio-ecological literature by empirically demonstrating how ambidexterity capability leveraged the changes in the procurement strategies on the adaptive cycle model.

3. Methodology

The chapter describes the applied methods in this study. The design of the study, as well as its philosophical grounds, are scrutinized. Case companies were displayed. The data collection technique and sample strategy were described. Finally, the topics of research quality and ethics were presented.

3.1. Research Philosophy

Ontology and epistemology are the two significant terms used to categorize research philosophy in the literature. While discussing the specific ontology used in this work, it is crucial to define the ontology. Ahmed (2008) shared the definition of ontology in his study as; " the study of being" (p.2). The researcher's fundamental presumption about the nature of reality and existence leads to ontology (Easterby- Smith et al., 2018). These presumptions set the researcher's perspective and research goals. The object of the study from the business and management perspective comprising companies, management, people's working life, and organizational events (Saunders et al., 2019).

Easterby- Smith et al. (2018) shared four ontology viewpoints: realism, internal realism, relativism, and nominalism. Relativist ontology was used in this study, which can be characterized by the idea that there is no single reality but rather a variety of views that change based on the observer (Easterby- Smith et al., 2018). Following is an explanation of the rationale for the study's adoption of relativism. Even though the disruptions' caused by Covid-19 impacted the supply chains worldwide, these disruptions were not affected every organization on the same level due to different supply chain management strategies and approaches, resources, and experiences (Pal & Altay, 2021). Furthermore, decision-makers behavior generates organizations' procurement strategies during disruptions (Mane et al., 2019). This behavior might be influenced by several aspects (e.g., cost, quality) and trade-offs such as nearshoring or offshoring (Webster & Wind, 1972). Consequently, as the procurement strategies vary depending on the decision makers' perception, there is no single objective truth but a group of truths from various circum-

stantial aspects. Therefore, the adoption of relativist ontology is the best suit for this study to acknowledge the complexity and subjectivity of this study's concept.

The epistemology standpoint of the study is another key term in the research philosophy. As a term, epistemology explains the topic and understanding of issues regarding knowledge. These concerns are about defining acceptable knowledge by asking; what? (Davidavičienė, 2018). From the business and management perspective, there are different data types, such as numerical, textual, and visual (Saunders et al., 2019, p. 133). The most prevalent epistemological stances in literature are positivism and social constructivism (Davidavičienė, 2018). The positivist epistemological perspective leans more toward a quantitative method of investigating reality, and the phenomenon should be determined by impartial standards, among other positivist traits. As a result, the researcher thinks this characteristic could constrain the study's findings because social factors are essential to the supply chain, and resilience and procurement strategy can vary depending on how they are interpreted.

The epistemological stance adopted in this work is social constructionism. Realities are socially formed and given meaning by individuals, according to social constructivism (Easterby- Smith et al., 2018). In this study, the retrieved information from the interviews is socially constructed and within the concept. Furthermore, this study will solely use qualitative data to explore the topic; hence, it will be used to understand the interviewee's and company's behavior. As Cunliffe (2008) stated, social constructivism has become a trend in organization study within approximately 20 years, and researchers developed methodological approaches to study. In the social constructivist approach, a researcher must thoroughly analyze the subject matter, considering the historical, geographical, and societal background (Saunders et al., 2019). However, in social constructivism, in addition to acquiring data, the researcher must also consider a variety of constructions and interpretations that people add based on their experiences (Easterby-Smith et al., 2018). For this reason, the researcher also believes that the social constructivist stance will support the in-depth understanding of how procurement strategies can be implemented with the leverage of the ambidexterity of the organization among the organizations in the exact geographical location.

However, the social constructivist stance does not privilege the particular reality, so the researcher's credibility can be considered low level (e.g., Marshall, 2005; Easterby-Smith et al., 2018; Proctor, 1998). These multiple images of reality have no ground for differentiating among the perspective, which blocks finding underlying reality but only enables researchers to construct reality socially (Marshall, 2005). For this reason, the complementary epistemologist stance of "pragmatic realism" was adopted in this study. Pragmatic realism constitutes critical realism and pragmatism; this epistemologist stance enriches the social constructivist perspective, as it recognizes that social construction in shaping knowledge and looks to practical consequences to evaluate the knowledge (Brannick & Coghlan, 2006; Proctor, 1998). The researcher believes that the pragmatist realist viewpoint supports this study to provide a clearer picture of the facts relating to the triangled notions of resilience, procurement, and ambidexterity. This position fosters a better understanding of the process for exploring and exploiting procurement strategies that support the concept of ambidexterity competence in highly disruptive situations.

3.1.1. Research Approach

One of the primary techniques researchers employ to link premises with conclusions and support the assertions of the study's objective is the application of reasoning principles. The elementary form of reasoning is divided into three: deduction, induction, and abduction (Mantere & Ketokivi, 2013). An inductive approach was adopted to this study by the researcher. The inductive approach refers to the process of formulating a theory based on the observation of particular facts (Davidavičienė, 2018).

The reason for adopting an inductive approach in this study is explained as follows. The supply chain is constantly experiencing disruptions, which leads to the development of company resilience strategies. Nevertheless, because the effects of disruptions vary, the implemented risk management strategies might not be sufficient to respond. Consequently, this study demonstrates how continual adaptation, within the framework of this study, can be accomplished in times of disruption. In this study, the notion was identified using an inductive approach in conjunction with data analysis from the research. Additionally, there has yet to be an attempt made in this created theory to support or refute any earlier research.

3.2. Research Method

In this paper, the researcher adopted the multiple case study of seven manufacturing organizations in Europe and Turkey. As Halkias et al. (2022) stated, to determine if the case study is suitable for the study, there are three conditions to be considered. First, if the research is looking for an answer to "How, What, and Why," this study focuses on answering two of these questions; "what and "how." The second and third conditions relate to the scale of control over the behavioral events and the level of focus on contemporary events, which this study provides by investigating Covid-19 without manipulation or control over the behavioral events. Furthermore, according to Adams et al. (2014), using multiple case studies enables the researcher to assess the case parallels and discrepancies. Thus, the evidence generated from the multiple case study is solid and reliable. The researcher can confirm whether the findings of the study whether or not valuable.

The purpose of the case study is to study the phenomena in a particular setting (Adams et al., 2014). The case study method is one of the most used and is particularly useful for analyzing businesses in the context of business research (Halkias et al., 2022). As Halkias et al. (2022) shared, the uniqueness of the case study is that it aims to understand and particularize rather than generalization, which this study demonstrates by investigating how ambidextrous capabilities enhance the adaptability of the manufacturing organizations in the time of Covid-19 by focusing on procurement strategies. Furthermore, this study aims to generate a theory rather than a testing hypothesis that suits the characteristics of the multiple case study (Adams et al., 2014).

Eisenhardt (1998) stated that if there are fewer than four cases, the results might not be convincing; however, if there are more than ten cases, the complexity may increase, and the volume of data may be more challenging to manage (Eriksson et al., 2019). Accordingly, the empirical data for this study were taken from seven carefully chosen cases. The study intended to broaden the generalizability of this phenomenon by these seven cases (Eisenhardt, 2021). The cases came from a range of organizational sizes and or-

ganizational structures. In particular, Case- D shows how decentralized companies manage ambidextrous capacities at various organizational levels by allocating resources, using flexible decision-making criteria, and being decentralized. In order to get in-depth knowledge, interviewees were chosen at all scales, from the local to the global.

One of the criticisms in the literature on case studies is that the generalization is to be made from particular cases, and this vast amount of collected data enables the researcher to make any interpretations they want. To address this critique, Easterby- Smith et al. (2018) share the statement by Yin in 2002, which can be explained as; that all case studies have a defined design that includes the following: primary questions and propositions, the unit of analysis, relationships between data and assertions, and technique for interpretation before any data are collected. Therefore, in this study, this case design model was used to present the connections from the context of this study to the unit of analysis.

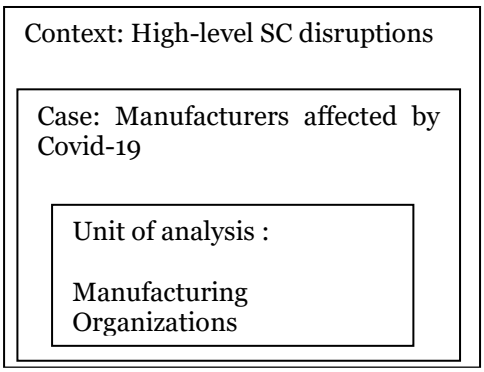

Figure 2 Utilization of multiple case study design

Source: Utilized to this study from Yin (2017)

3.2.1. Case Descriptions

Case A

Case- A performing in Electrical appliances and Electronics manufacturing in Denmark. Case- A employs 201 and 500 people. Case- A mainly produces products for the industrial environment, and the leading product Case- A produce is signal-controlling devic-

es. Interviewee-1 works in this company as a Strategic Purchasing Specialist. In their own words, the initial impact of Covid-19 on Case- A was; "It turned it upside down […] We experience incredibly long lead times from one day to another, and as we are data-driven, it was very worrying to see". However, despite the negative effect of Covid-19, Case- A grew approximately 20 percent during Covid-19. Case-A still maintains and has been improving the procurement strategies implemented during Covid-19.

Case B

Case-B is active in the Renewable Energy Semiconductor Manufacturing company, which is in Finland. The company has between 201-500 employees. Case B focuses on product research and development to increase energy efficiency, reduce emissions, and bring new industry solutions using renewable energy sources. Case-B's focus area in the industry is; burners and combustion systems for different fuels, industrial heat pumps, and cooling systems. Interviewee-2 works in Case-B as a Purchasing Manager. In the initial phase of Covid-19, the biggest challenge for Case-B was unresponsive suppliers, which caused Case- B to delay noticing the problem in their supply chain.

Case C

Case- C is a machinery manufacturing firm with between 11 to 50 employees. The focused item group Case- C focuses on producing cylindrical Gears with a particular focus on precision. Case-C is located in Denmark. Interviewee 3 is a Quality Manager who also participates in supplier-related activities and the purchasing processes for particular item groupings. According to Interview-3, the impact of Covid-19 was not significant as the other organizations in the market. We always put the orders in a very long time ahead. Therefore, when Covid-19 hit, materials were already in stock of its suppliers as its very sorts of material. However, if the supplier did not have it in stock, we could get it from another supplier in another dimension which caused us more work, but we still had the right material."

Case- D

Case D is a prominent actor in industrial machinery manufacturing, with around 17.500 employees worldwide. The headquarters of Case-D is located in Sweden. Case-D is one of the primary producers of products for heat transfer, separation, and fluid handling. Four interviewees from different departments contributed to this study. Case- D to respond the urgent matters and small-scale issues have local sourcing, interviewee 4 provides insight from this department's point of view and handles small-scale problems. Interviewee-8 is a Sourcing Manager at Case-D's factory in Poland, responsible for Central and Eastern European suppliers. Interviewees- 9 and 10 work as Global Category Managers, in other words, Global Sourcing, responsible for supplying the different division item groups to the worldwide Case-D factories. All of the interviewees from Case-D stated that the initial hit caused by Covid-19 did not create a massive problem; the wave after the initial hit caused a significant disruption due to a massive increase in customer demand and raw material shortages. In interviewee-7's words: "If I look back, the beginning of Covid-19 was easy, then the world was booming, and everybody needed goods, and everything rose 100 percent within a year." To tackle the problem, Case-D's employees had to try novel approaches; in interviewee seven words: "We did many things in our strategies that you would normally never accept as a purchaser…". Furthermore, these strategic changes positively impacted Case-D's market performance compared to other companies by "supplying better than the competitors" (Interviewee 7).

Case- E

Case- E operates in chemical manufacturing with between 11 to 50 employees. Case-E is located in Turkey. Case E's specialty and focus product is non-stick coating. The Interviewee- 6 working as Chief Operations Officer. By the end of 2020, Case-E had a challenging period due to the low demand, the company had the raw material, but the sales were insufficient to maintain the business, so the company came to the edge to stop production. In March 2021, the market demand boomed, this was unexpected for Case- E, and the other actors in this market were caught unprepared. Interviewee-6 explains the situation: "Even though the orders were for 60 tonnes per month, I could close the month with only 10 tonnes". The main reasons seen by Interviewee- 6 were;

unreliable suppliers and raw material shortages. Case-E is currently seeking controlled growth.

Case- F

Case-F is a family business within Electrical Appliances and Electronics Manufacturing company. Currently, Case-F employs around 900 people. Case-F produces products for electricity distribution networks. Interviewee-7 works as Purchasing Manager at Case-F's factory in Estonia. In the early stage of Covid-19, due to the closed borders, material shortages negatively affected Case-F. Another main problem, according to the Interviewee- 7 was the transparency of the communication both internally and externally, on Interviewee-7's words: "When you have problems is the communication that everybody is keeping silent, that nobody wants to want to tell that you are having the problem.". This issue disallows the identification of the problem in the beginning phase; however, with the long-term and strong relationship with its suppliers and some of the experienced employees, the company tackled this problem. After Covid-19, Case-F retained some of the changes and tried to adapt to the new normal; now, the supply chain is more stable.

Case- G

Case-G is a private family-owned company in Railroad Equipment Manufacturing located in Italy. Case-G is one of the leading companies in Europe about hot forging non-ferrous alloys. Case- G has between 51-200 employees. Interviewee- 5 is the CEO of Case- G, who manages and approves the quality and the other operational tasks, procurement activities, and supply planning. As the demand for rail transportation was increasing due to sustainability concerns in transportation, the negative impact of Covid-19 was not profoundly affected Case- G. Case- G was planning its production in line with the forecasts received from the customer, as with Covid-19 the extremely long lead times were a big issue.

3.3. Data Collection

Following the study's design, data gathering was decided to be semi-structured qualitative interviews (Appendix- B). Interviews are one of the specific characteristics of business and management studies because it enables the researcher to learn the motive behind the people's intentions about why? How? and what? (Adams et al., 2014). This study collected data and information from the interviewees, their perspectives, and their impressions of the experienced event. The case study method is grounded on the relativist and constructivist views, which is well suited for studies on the perception of truths (Halkias et al., 2022).

After carefully reviewing the possible interviewees, ten interviews were conducted by specialists from seven manufacturing organizations in Europe or Turkey that fit the above criteria (Appendix C). These interviews varied between approximately 50 to 90 minutes, and in total length of interviews was around ten hours and were conducted from May to June 2023. Interviews were conducted mainly in English, except one interviewee was Turkish (Interviewee -6 Case- E), which was translated to English after the interview.

In this study, the researcher followed the interview guidelines Adams et al. (2014) shared. Initially, interview questions were designed to be in the same order, and the questions were across the subject so that the researcher could compare and contrast the Interviewee's answers. The questions were designed as open-ended to retrieve detailed answers during the interview, most of the time given to the Interviewee to share their opinion. Furthermore, as Maxwell (2009) stated, the questions were refined throughout the interviews to understand more about the subject of this study. During the interview, as Adams et al. (2014, p.147) stated, to researcher needs to show interest actively, and to do so, a researcher should "listen actively, probe, and reflect (LAPAR)." Furthermore, the researcher used the follow-up question for two purposes; to go more into detail and minimize the possible bias and error that might occur during interviews (Adams et al., 2014).

Before the interviews, the researcher delivered documents containing a brief explanation of the study and their role in this study. In this explanation, to avoid misunderstanding, the researcher avoids using terminology due to the language differences that can become an obstacle to fully grasping the context of the study. Since the interviewees were geographically spread around Europe, the remote interview was more suitable to conduct for time and resource efficiency for the interviewer and Interviewee.

3.3.1. Sampling Strategy

Qualitative approaches like multiple case studies utilize research strategies like purposeful sampling (Halkias et al., 2022). Purposeful sampling is well-suited for the case study research due to the required low sample size (Saunders et al., 2012). Furthermore, purposeful sampling enables the researcher to choose the sample members following the needed sample units for the study, which are determined by the researcher (Easterby-Smith et al., 2018).

In this study, as a sampling method, purposive sampling was adopted. The motivation behind this chosen sampling method is that this study sought depth information on ambidextrous manufacturing organizations' procurement strategies. Therefore, to achieve this aim, the samples of this study were chosen by the criteria developed by the researcher to collect sufficient information to generate a theory by answering the research questions.

The researcher determined four different criteria that can serve the study's purpose and the selection of the interviewees chosen accordingly. This study's initial criteria were that a manufacturing organization in Europe or Turkey should employ the interviewee. Due to the business structure and hence the job title differentiation, the researcher applied the criteria to the job description. Therefore, the second criterion was that the interviewee should perform the organization's procurement activities. The third criterion was that the interviewee should have been working at that company when Covid- 19 started; this way interviewee could provide a clear picture of how Covid-19 changed the organization's procurement strategies. Forth criterion was that the manufacturing organization should be an ambidextrous organization to be able to examine the role of the

ambidexterity capability of the organization, exploring and exploiting identified procurement strategies.

3.3.2. Desk Research

To have a better knowledge of the topic at hand and to discover potential topics for this study, the researcher did a preliminary investigation before beginning further in-depth research. After themes are determined, keywords are generated, each corresponding to its theme. In the following, the researcher conducted a systematic review of the literature to explore the available literature on the decided themes.

In the field of business and management studies, Researchers are growing more interested in systematic literature. In a systematic review, the researcher establishes a thorough approach to identify the published studies and assess the significance of these findings (Saunders et al., 2012). The researcher began this study by looking for and analyzing previously published papers. In this investigation, the researcher developed literature for this subject with the help of identified keywords. Due to the unique characteristics of qualitative investigations, researchers have expanded upon or gone into greater depth about studies already published in the literature (Aboujaode et al., 2018).

This study mainly used the Web of Science, JU Online Library, and Google Scholar for literature scanning and browsing. Supply chain resilience, procurement strategies, and ambidexterity capabilities are thus the themes under which the keywords were grouped. The keywords used in this study were; organizational ambidexterity, procurement, adaptive cycles, supply chain resilience, manufacturing, Covid-19, and socio-ecological resilience.

3.4. Data Analysis

A content analysis approach was used in this study to examine the data gathered from the interviews. Content analysis allows the reader to analyze the data gathered from interviewees systematically, and from this gathered data researcher classifies the several

meanings expressed by the interviewees during the recorded interview. Content analysis is well-suited for narrative studies like case studies. The researcher can utilize quotations to provide the report of the cases, as applied in this study (Adams et al., 2014).

To transcribe the interview records Microsoft Teams software program was used. To ensure the data's accuracy, the researcher manually checked these transcribed interview data. As an initial step, each case is evaluated to learn about contextual variables. In the second stage, the researcher conducted a cross-case analysis of the data to find similarities and differences across categories and themes (Halkias et al., 2022). The coding process is the primary method for analyzing the exploratory research after carefully reviewing the transcribed data and the observation notes taken during interviews.

In this study, initially identification of the emerged procurement strategies from the data gathered from the interview transcriptions. Then, these identified procurement strategies organized and categorized under the SCRES elements proposed by Christoper and Peck (2004) (Chapter 2.1.1. SCRES Elements). Additionally, the adaptation process codes categorized under the Holling's Adaptive cycle model's phases (see Chapter 2.2.1. Adaptive Cycles). These phases also allow the researcher to examine the ambidexterity capability to categorize, and these adaptive cycle phases also enabled the researcher to have insight from the broader context of how manufacturing organizations' adapted to disruptions caused by Covid-19 in the scope of procurement activities.

3.5. Research Quality

Research trustworthiness has significant importance for researchers. Therefore, all the researchers take research quality-related issues too seriously. Three different types can be found in the literature to show the caliber of the qualitative investigation. In this study, Lincoln and Guba's (1985) "Four Dimensions Criteria" approach followed. Lincoln and Guba (1985) formulated the previous criteria in the literature and presented it under four criteria: dependability, credibility, transferability, and confirmability (Saunders et al., 2019), in following these four criteria explained in the context of this study.

Dependability means that the findings of the study are consistent and can recur. The literature contains three distinct types to demonstrate the standard of the qualitative study (Stahl & King, 2020). The researcher reviewed the interview transcripts several times to prevent data misinterpretation and bias. Furthermore, the researcher presented the outcome of the analysis of interview transcripts to the supervisor for its evaluation.

Credibility means how the findings are relevant to reality. This study used data triangulation, one of the suggested procedures, to increase the study's credibility. Data triangulation means using more than one kind of data (Stahl & King, 2020) by using interview transcriptions as primary data and as secondary data from different journals, books, and conference proceedings. Peer examination was also demonstrated in this study; this paper was periodically evaluated by the supervisor and the other researchers and provided feedback to the researcher. In line with the feedback, the researcher made the necessary adjustments to this research paper.

Transferability means that the research can apply to other qualitative researchers. In this study, in addition to an in-depth explanation of this study, a purposeful sampling method was used (Stahl & King, 2020). Samples needed to work for the same manufacturing organizations during Covid- 19 and these organizations needed to be in Europe and Turkey. Furthermore, to give a clear picture of the samples used in this study, interviewees and cases are introduced in Chapter 4.1. Case Description.

Lastly, the confirmability of the study refers to the study's objectivity by ensuring the research is constructed by the samples (Stahl & King, 2020). In this study, to ensure confirmability, it was to describe how the interview data was generated and analyzed clearly. Furthermore, quotations from the interview transcripts were used in this study.

3.6. Ethical Consideration

In the research, information is retrieved from people about their interpretations of reality. Therefore, researchers must anticipate the occurrence of the possible risk which creates ethical concerns (Creswell, 2014). Therefore, researchers, to build trust between the researcher and the interviewee, prepared a participation letter and GDPR privacy notice (Appendix- A) to present the topic and purpose of the thesis, informed the interviewee of the number of participants and confidentiality concept, and stated the contact number and e-mail address in case needed by the interviewee.

The researcher followed the principles that Bell and Bryman (2007) shared. Initially, the researcher to prevent any possible occurrence of conflict of interest by influencing the interviewee, except the clarifying the interviewees' questions and follow-up questions to gain more understanding, the researcher did not make any additional comments that might affect the interviewees' answers. In order to avoid any potential harm or invasion of the interviewee's privacy, the confidentiality of the interviews and the interviewee's anonymity are explained in the invitation, before and after the interviews, as well as while asking for the interviewee's authorization to record the interviews. The researcher informed the interviewees about their rights to withdraw from the interview. If there is any concern by the interviewee or the researcher due to technical issues, the researcher asked the interviewee to confirm the statement either during or after the interview to avoid misunderstanding and deception. Further to the misunderstanding, during the interviews, the definitions were explained to enhance their understanding of the concept of this study. Lastly, the researcher aimed to create transparent and honest communication with the interviewee during the interview process.

Interviewees guaranteed that this research conducting solely for educational purposes and that the provided information would not be shared anywhere. Throughout the document, when cited from the interviews, the researcher used codes to refer to the case companies or interviewees, such as Interviewee-1 and Case-A.

4. Empirical Findings and Data analysis

The key empirical findings from the interviews are outlined in the following chapter. The first part summarizes the empirically identified procurement strategies explained under SCRES Elements concerning the Covid-19 disruption. The second section describes and discusses the implication of these SCRES strategies on the adaptive cycle model. Lastly, the shifting between exploration and exploitation capabilities is presented.

4.1. SCRES Elements

4.1.1. Supply chain (Re-) engineering

Resilient-oriented supplier selection is stated by Case D, E, F, and G to tackle the disruption caused by Covid-19.

"One of the suppliers from Germany stated that they could not supply the fan we used to cool down our machines. All our escalations to this supplier's management team showed that this supplier could not deliver the quantities we needed. Then we found out that 5G Telecom Networks also use cooling. We found companies that can deliver this item in China […] We started to purchase this fan from this Chinese supplier." Interviewee 9 (Case D)

Resilient-oriented supply design, mentioned by Case D and F. Case F started to produce the item in-house because the supplier was having a problem, in Interviewee 7 own words*: "If we talk about some cables, that were preassembled, but the supplier was having problems. Then we set the system up in the production".*

Case- D designed an independent supply chain specifically for the factories in Europe and Asia. Interviewee-8 explains*," During Covid-19, we tried to build an independent supply chain. While our factory in India procured the material around India, we procured the materials from Europe."*

Dual sourcing was mentioned by three of the interviewees, which were Case A, D, and E. This strategy was implemented both independently and dependently on Covid-19. For instance, while Case-E implemented dependently of the Covid-19, Interviewee- 6 explained, *"I developed alternatives for all our main suppliers. Then I diversify my purchasing between those suppliers […] For example, if there is a raw material that I purchase each month and I bought this month from Company A, then the next month, I purchase the same item from Company B. I go back to the company for the third-month purchase. This way, I am trying to keep my connections tight with the suppliers and aim to overcome the problems that we had previously".*

Case A was already working on the Double sourcing strategy when Covid-19 started; further on that, Interviewee- 1 explains this*: "It was a project that we started before Covid-19. We had to speed up the process and identify the items where we need to single source and double source."*

Creating Redundancy by enlarging the stock level mentioned by the following companies; Case A, B, D, E, F, and G. Additionally, independently of the Covid-19 disruptions, Case-D has backup suppliers.

"We were able to increase the stock value in the short and long term […] However, the effects have relied on the supplier and how they would react to our changes […]. We increased the stock value once the orders came in from the supplier." Interviewee 2 (Case- B)

Case companies to prevent disruptions during transportation or at customs and keep the transportation lead time minimum. During Covid-19, the new supplier investigation, Case- D and Case- F considered the distance between the manufacturing plant and sup-

plier should be in the same local area or region as an essential aspect to better control the material supply. On the other hand, Case- C and Case- G have been selecting their suppliers from the local area or region before Covid-19. Interviewee- 5 explained that Case- G's supplier selection was mainly European suppliers because of the trust and material quality, and the suppliers in the close distance enhanced the collaboration.

"[…] More regional sourcing to have alternatives geographically near Sweden, where we are located. For that time, it was worth exploring that option […] "Interviewee- 4 (Case- D)

"When we saw this transportation lead times were too long from our suppliers in China. Then, we checked and started using some of the local suppliers to procure the material we were looking for." Interviewee-7 (Case- F)

4.1.2. Supply Chain Collaboration

Generally, It is widely acknowledged that there has been a significant enhancement in communication and collaboration among supply chain actors. Several interviewees mentioned that the communication was intensified with mainly its suppliers, also communication with customers mentioned by Case D. Interviewee 8 (Case- D) explained that *"we informed our customers and suppliers quite frequently in both directions. We held a meeting with suppliers either weekly or bi-weekly regarding their development situation, what was their capacity because, as during the Covid period, there were restrictions."*

Interviewee-6 (Case-E) underlined the importance of close relationships with suppliers had a positive impact on solving the supply problems.

"We have this long-lasting cooperation with our main suppliers. As we know each other when we have an order problem, we contact the right person and solve the issue […] I think this was one of our strengths."

Initially, information sharing was named by Case A, B, C, D, and F. The transparency of the information sharing is essential to identify the problems in the early stages; *Interviewee- 2 (Case- B)* shares that in the beginning, it made it harder because suppliers were not accepting that they were having problems until the last minute. For this reason, Case- B had a problem with the accuracy of the information on their system, which affected planning. However, after suppliers admitted to having supply problems, the internal effort changed the internal parameters. Then*, "after internally revised, we provided new forecast to our suppliers, and then it was just a lot of communication back and forth with the supplier. So, we know, if we could get the entire order […] ".*

Additionally, Case-F to share the data with internal suppliers using an electronic system. In Inteviewee-7's words*: "We are using Vendor Managed Inventory (VMI) system […] our other companies that are supplying components to us, they were able to plan it via ERP systems, and it is all connected."*

Second, collaborative planning was mentioned in Case- A, B, C, D, and F. Interviewee-7 (Case-F) referred to intensified collaboration with its supplier *"We were sharing the forecast with our suppliers and make sure that suppliers understand this information that we are sharing."* Also, some of the case companies used their market position to support their suppliers.

"For some of our suppliers, we did contact the big manufacturers and tried to push them to supply the item to our suppliers. If we were big customers to their supplier, we took our suppliers under our umbrella and tried to help them, so our supplier gets the volume they needed. For example, I helped one of our suppliers to get a motor item from a big manufacturing company because we [Case- D] were a bigger customer to this manufacturing company than our supplier." Interviewee- 10 (Case- D).

Lastly, Case-D was the only one to mention risk-sharing or risk hedging. Case-D's primary small-size suppliers were experiencing delivery issues, which reduced their manufacturing capacity. These small suppliers thus required financial assistance. Case-D used a collaborative approach to issue-solving by compensating its suppliers in advance. To maintain its operations, Case-D shared the risk with its small suppliers.

"Unfortunately, we also saw that many of our small suppliers were going bankrupt because they produced the item without a component. Therefore, suppliers could not invoice their customers. We offered some small suppliers to pay for the item beforehand, even if it was missing a component. This way, we know that the supplier will not go bankrupt." Interviewee 10 (Case- D)

4.1.3. Agility

In the literature, the firms' agility is influenced by several aspects. In this study, the researcher identified five different measures according to the received interview responses. First, manufacturing flexibility was mentioned in Case C, D, E, F, and G. This flexibility played a significant role in these companies. Case- C changed the production line and produced another product if the needed component was delayed.

Additionally, these companies (D, E, F, and G) found the substitution for the component they could not purchase or receive for different reasons, such as the component phased out by the supplier (Interviewee- 5, Case G). As the components were phasing out, as a solution, these case companies (Case- B, D, E, G) promoted different item or material that was possible to source to its customer.

"We tested the new material, which was a very special solid. So we went to our customer and suggested that new material could be used for their product. Then we tested and convinced our customer this is the way." Interviewee- 5 (Case- G)

"There was a special color we used for our essential customer. We learned from the supplier that this color cannot be made anymore because the raw materials are no longer produced. Therefore, we notified our customer and introduced the color we could make closest to the desired color." Interviewee- 6 (Case- E)

Due to the temporary shortage of material, Case D could not produce the advanced product. Therefore, as a precaution that if Case- D receives an order from the customer

to fulfill this customer demand, Case- D designed and produce old fashion product as an alternative solution.

"We did one old fashion product in our company one old fashion product. We did a complete design of a time relay-based control of a machine simply because I would instead send a poor product than deliver anything. The new one was not a perfect product, but it could run the customers until we get the right product back in stock. "Interviewee 9 (Case- D)

Second, logistics flexibility was named by Case D and F. This adjustment enabled companies to reduce the lead time and respond the urgent need.

"We saw that we were not able to deliver for some reason, then mostly we took operational actions to those orders related to late customer orders […] this should be delivered with air transport. […] If the item was small enough, we switched from see to air." Interviewee-7 (Case-F)

Third, Case- D and F have shortened the decision-making process to be more adaptable and decide faster.

"*You need to have this cooperation also internally to fasten the process. You might miss your chances if you were not making these quick decisions. For example, if you are checking this alternative material because you decide too late, you might look for a second alternative material." Interviewee- 7 (Case- F)*

"I would say Covid did make some of our engineers extremely fast in answering questions. So, when I come to them and say we cannot get this item. Can we use this other item instead? […] I would say the time factor and how fast you get an answer from the engineers has never been better. They recognized the need to act quickly and even cut some corners." Interviewee-9 (Case-D)

Fourth, supply chain visibility is named by Case A, B, D, and F. Case companies to have the most accurate information to plan the product's production and the customer

deliveries started to monitor their transportation and supply lead times. Monitoring enhanced the organizations' flexibility and helped them react faster to possible delays in supply or transportation. Interviewee 7 (Case- F) explained: *"We tried to monitor both transportation and supply lead times; if any of these were extended, we also keep our system up to date. So, it was visible in our systems, and we kept following."*

Lastly, most case companies (C, D, E, and F) performed spot market purchasing during Covid-19. The organizations faced severe problems in their production due to supply shortages. Purchasing the materials from the brokers, the distributors, or the previous suppliers enabled organizations to maintain production and fulfil their urgent need. However, it was *"only temporary until the market stabilized because no one wanted to pay more." Interviewee 8 (Case- D).* Additionally, Interviewee-8 also stated that Case-D had a limited option when it came to spot market purchasing due to "*most of the components being designed by our company, so it is not available in the market. Therefore, we made spot purchases from the manufacturing companies where we worked previously." Interviewee-8 (Case- D)*

"We did spot purchasing, especially in electronics. We realized that we must make these spot purchases from the brokers and buy from them when it was impossible to get the item." Interviewee-10 (Case-D)

4.1.4. Supply chain risk management culture

According to the literature, organizational cultures that admit and handle risks play a big part in dealing with major disruptions. The researcher identified three measures for the supply chain risk management culture category. Initially, resilience awareness was mentioned by Case D, F, and G. Interviewee- 9 (Case- D) mentioned the importance of building solid relationships at the managerial level for critical products to be prioritized by the supplier.

"We have some suppliers that customers specifically request. So, we have a different relationship and setup with those suppliers. Especially with Covid-19, this relationship has been tested to the limit because we are heavily dependent on them. Our strategy is

close with the suppliers, like with division managers of our company; we had managerial level meetings with these suppliers to make sure that the supplier prioritized us by influencing them on how much our company can bring business for the future." Interviewee- 9 (Case D)

Second, resilience-oriented talent management was named Case-D. Training and development programs increased the organizations' ability to tackle disruptions under the guidance of trained employees for these situations.

"*I think it shows that during Covid-19, we managed pretty well because our organization was used to working with that kind of thing. Also, we went through a lot better than other companies because we had trained people for this." Interviewee- 10 (Case- D)*

Third, different approaches mentioned on risk considerations influenced the decision-making. One of the different approaches mentioned by the interviewees from Case- A and G. Initially, creating appropriate contractual agreements, Interviewee- 5 (Case- G) explains: *"The first thing we did is to place a long-term agreement to be sure that we secured the quantity. Also having little time allowance to state the material dimensions"*. By doing this, Case-G safeguards itself against fluctuations in customer forecasting and increases flexibility with the supplier regarding the material while securing the quantity. Additionally, Case - D took financial precautions against the possibility of its suppliers going bankrupt by forging partnerships or paying invoices before obtaining all requested materials. Furthermore, these decisions are made upon assessing the supplier's performance and relationship. Cases D and F highlighted the fact that they chose small-size suppliers so that they would receive priority in delivery from those suppliers during times of disruption.

Fourth, the application of technological innovation mentioned by Case- D and E. Case-D implemented the new digital system to consolidate all the information from the supplier and exchange it with its supplier. Case- E already had the ERP system, but during Covid-19, Case- E decided to extend the scope of its ERP system by including production, procurement, and sales. Hence, the information about different supply chain activities became more accurate.

"We implemented the Jakamo system; it was like an umbrella system where we could connect and consolidate the pool of information in one place and share it with our suppliers. Also, we used to support to calculate the more accurate delivery time." Interviewee- 8 (Case D)

"Before me, the company purchased an ERP system called Luca, but the company was only using the accounting function […]. We first adopted this ERP system's production module […], then finalized the purchasing module's implementation in 2023." Interviewee- 6 (Case- E)

Lastly, more intelligent supply chain planning has become one of the priorities (Interviewee- 4, Case- D) due to the disruptions caused by Covid-19. Therefore, Case- D implemented a new supply chain planning system to prevent future disruptions.

4.2. Adaptive Cycle

In this part, the researcher began to examine the empirical data from the adaptive cycle's conservation phase. Reorganization came next, followed by the release period, tipping point, and new growth.

4.2.1. Conservation Phase

The conservation phase describes the rigidity and additional durability of the system, and this is where the risk of disturbance is most significant (Vega et al., 2022). The samples of this study indicated that case companies reacted when they saw the impact of Covid-19 due to a lack of transparency in the communication with both external and internal stakeholders; case companies could not identify the problem in their supply chain.

"I started to notice the impact of Covid-19 when I could not receive order confirmations from the suppliers. Then, deliveries started dragging, so they were not delivered as

promised. Meanwhile, suppliers did not want to admit they were having problems." Interviewee-2 (Case- B)

After the impact of the Covid-19 recognized by the case companies, the situation described by most interviewees was defined as the survival mode or equivalent definitions. Initial reactions from the case companies were taken by the case companies increasing communications with suppliers. For Case- D, *"communications with customers"* also intensified by having more frequent calls or holding weekly or bi-weekly meetings. Additionally, most case companies (Case A, B, C, D, and F) started to share more information to learn from their stakeholders about; the availability of items, the capacity of the workplace, delivery on time, and suppliers' supply problems.

Following that, several interviewees mentioned that case companies adjusted their system's supply information (e.g., transportation and supply lead time) with the information they retrieved from their suppliers. Also, case companies A, B, D, E, F, and G aimed to create redundancy by increasing their stock level.

4.2.2. Release Phase and Tipping Point

The release phase in the adaptive cycle can be explained as where the system collapse and dissolute (Vega et al., 2022). After case companies started to make internal adjustments and intensified communication, in this phase, case companies started to implement new internal and external strategies to tackle the disruptions. Organizations with supplier pools started to check the availability of the material in this pool as an initial step to supply the material.

Companies were working to address supply problems such as supplier material shortages, factory closures, and customs-related problems at that point in time. In the meantime, to counteract the disruption brought on by Covid-19, the case companies began to develop alternative strategies. Therefore, some of the case companies' (e.g., Case B) management level meetings internally or the task forces (Case- D) who trained for this sort of situation took the lead to tackle the disruptions. Additionally, as time matters

when making decisions during disruption, Case- D and F shorten the internal decision-making process by narrowing it down.

Research findings indicate that suppliers' and transportation companies' performance is closely monitored during this time by some of the case companies. Furthermore, it was seen that to support their suppliers, large companies in our samples took more initiative. While Case- F was sharing and educating its suppliers regarding the forecast they shared, Case- D supported its suppliers by either supporting to get material from their (supplier) suppliers or financially by paying for the uncomplete products.

During Covid-19, one of the common problems amongst the case companies was phasing out materials or late deliveries from their suppliers. Case companies started investigating alternative suppliers or finding substitute materials to overcome these challenges. However, according to several interviewees finding new suppliers was not the first option because it was risky, some items were unique for the case company, and most of the suppliers had the same problem. Therefore, these case companies tried to support some of their suppliers instead of replacing them.

4.2.3. Reorganization Phase

The reorganization phase is alluded to redesigning the system and further developments (Vega et al., 2022). To overcome the struggle with the deliveries from their existing supplier, case companies (D, E, F, G) started to purchase the item from different suppliers. This selection of the new suppliers by sending out quotations to the suppliers located in the same region, then if they could not find then the span extended gradually on a global scale. Case- D developed an independent supply chain for each factory. Some case companies (D and F) stated that the new suppliers should be in the same region as the factory's location, in this case, Europe. Some case companies (A, D, and E) also executed a dual-sourcing strategy. Case A started to analyze its components and classify them depending on the items critically in the production to develop a sourcing strategy. If the item was critical, then Case A decided to do double sourcing; if not, there is no other alternative for the current supplier to maintain as a single source.

Case company C changed the production line when the component of the item in the production would not be delivered on the promised date. Case D and F found alternatives in their production or the produce item to overcome the material shortages. Case-D to design an old-fashioned product to create an alternative option for advanced technology products. Case-F started in-house production for an item. Additionally, several case companies (D, E, F, and G) started to purchase the identified substitute materials for their production.

"We turned to polyester silicone resins instead of Japanese-origin polyamide. We brought new raw materials from Japan, and we built new equipment. We switched to a ball milling system. We had to change our entire production system." Interviewee- 6 (Case- E)

Case A and G had a new contractual agreement with their suppliers to secure the supply quantity. As the lead times were long, case companies D and F, to reduce the lead time, made changes in the transportation mode depending on the urgency of the material and size. Additionally, when the current provider could not supply the material, some case companies (C, D, E, and F) made spot purchases to meet their production's urgent needs.

Case-D set up a digital tool so that Case-D and its suppliers could exchange information. This digital tool allowed Case-D and its supplier network to share updated, consolidated information with all relevant parties to maintain the information accuracy at the highest possible level.

4.2.4. A new growth/ optimization phase

The beginning of the new adaptive cycle involves the growth and use of novel structures, with a contribution from the preceding cycle (Vega et al., 2022). Upon the implication of the new strategies mentioned in the previous sub-section, case companies started overcoming some supply-related problems. Despite the delays, many companies and their suppliers have forged solid alliances and collaborations through collaboration

and increased communication. As a result, the case companies are given priority by their supplier during material shortages to meet urgent case company needs.

Case companies aimed to influence its customer with replacement materials to counteract the phased-out materials. Additionally, new digital tools were adopted by case companies (D and E) to increase the accuracy of supply planning and production.

The interviews revealed that some of the tactics used by organizations to adapt to supply constraints were just temporary. When materials became accessible in the market or the suppliers resumed their previous performance levels, case companies stopped with some of the new supply strategies, such as spot market purchases (explained in Chapter 4.1.3. Agility).

4.3. Organizations' ambidexterity to adapting disruptions

Throughout Covid-19, companies faced several disruptions in their supply chain and investigated new strategies to adapt to these disruptions to maintain their business activities. In this study, "exploitation" describes the effective use of the available resources and supply base and staying in that scope. "Exploration" describes the finding of new suppliers or materials, exploring the additional strategies outside of the existing supply structure even though case companies had to make trade-offs about the cost and quality of the material.

4.3.1. Starting with high exploitation and low exploration

After the effect of the supply chain disruptions started to feel by the case companies, the initial step was to examine their suppliers' item availability and capacity issues. Therefore, case companies either created direct communication lines with suppliers (e.g., Case- A) or scheduled weekly or bi-weekly meetings with suppliers to closely monitor their situation (e.g., Case- D). Furthermore, case companies supporting their suppliers shared more information and educated their suppliers, supporting the suppliers financially. Because, as in the initial phase case companies preferred to maintain work with current suppliers rather than exploring new suppliers; they preferred to maintain the business relationships with the existing suppliers. However, in the following time, de-

pending on the suppliers' performance case companies started to seek alternative solutions, which were contacting new suppliers and looking for alternative components. Some of the case companies (A and G) made new agreements with their suppliers to secure the deliveries.

As the disruption advanced, receiving the materials on the promised date or crossing borders became harder. Therefore, in some cases, companies use internal resources by either starting to produce items internally or changing the production line to another to maintain production. Additionally, several case companies started to boost their stocks or adjust their quantity depending on the amount supplier could send. Even though receiving some of the quantity was suitable for the case companies, more was needed as *Interviewee- 10 stated: "we [Case- D] could not fulfill all of the customer orders, so they needed to choose the customer to deliver."*

Due to phased-out materials, case companies started to work to find substitute materials. Case- D, as it was hard to produce advanced products due to the scarcity of the materials, designed products with poor technological systems but the high material availability in the market. Additionally, due to the urgent need for the material for production, several case companies executed different delivery modes in their shipments from suppliers.

The supply situation differed from expected, and case companies had problems with inventory and materials. Several case companies developed alternative strategies to overcome these supply-related challenges, such as suppliers "*We [Case- A] started to identify some unauthorized distributors" (Interviewee-1, Case- A).* When searching for a new supplier, several case companies prioritized geographical proximity. The goal was to discover new suppliers in the same region. Additionally, several companies started by classifying the materials depending on their importance or need to develop a dual or single-sourcing strategy. Case companies maintained to work with the existing supplier for single sourcing for different reasons. For example, the material the supplier produced was unique to case companies, so procuring it from somewhere else required much work.

Even though the level of exploitation and exploration showed differences for some case companies such as Case-G, case companies identified the suppliers to be channelled to the supply process in the time of supply shortage. Therefore, several companies balanced the exploitation and exploration activities.

4.3.2. Shifting to high exploration and low exploitation

This moment matches the collapse point in the adaptive cycles. Case companies started to make purchases from the identified suppliers. Some case companies, like Case-A, had screened and tested the materials before placing a big order to their unauthorized distributors. On the other hand, in local-level supplier decisions, Case- D used the companies' supplier pool or external suppliers and needed more time to place sample orders to the new suppliers. Therefore, Case- D embedded quality control in the supply process. As a final resort, the case companies started to make spot market purchases. It mentioned that due to the scarcity of material around the globe, case companies have been contacted or contacted the brokers, distributers, or the previous suppliers to purchase the material. As there was no trust built between stakeholders, mainly the initial purchases were low amounts. If the material quality was approved by the case company and the supply of the material was well-performed for future purchases, the order quantity increased.

"We were out of components because we did not get parts from the supplier, so we found in the grey market [brokers] 60 times more expensive than the normal price. They gave us 2 hours to make a decision; otherwise, they were going to sell someone else" Interviewee- 9 (Case- D)

Several case companies followed different approaches when applying the new suppliers for their double-sourcing strategy. While Case-A employed double sourcing for crucial components, Case-D took an alternative route based on the material need. Case-D factories use each other's suppliers, such as the plant in Poland using the supplier of the factory in Sweden or vice versa.

In the global sourcing level Case- D, to support some of its suppliers with their material shortages, it contacted the supplier's supplier to request prioritization for its supplier by using the relationship with the supplier's supplier. Furthermore, when Case- D's supplier informs Case- D of the material scarcity. Case-D assisted its supplier in searching the market for the material or went to brokers and asked them to find the required material in the supply chain for Case-D and submit an offer.

Case D found and executed the new digital tool to consolidate the supply-related data in one portal. Furthermore, Case D started to work on applying a new supply planning system. Additionally, Case- E started to investigate how integrating other functions can enhance the current ERP system.

4.3.3. Return to high exploitation and low exploration

The new structures were established after case companies secured most of the supply issues, and the supply chain was expanded by adding new suppliers and commodities. Case companies that used substitute materials in their production tried to convince the customer by promoting the alternative product made with the new materials. Furthermore, as a risk management strategy, Case- D used a new digital tool for supply planning and Case- E began exploiting some features of its new ERP system as a risk management strategy. Case companies dropped some of the strategies implemented during Covid-19, such as Case- B stopped boosting the stock levels and started to work on reducing the stocks to go back to the usual parameters.

The strong relationships established with the suppliers even led some businesses to form partnerships with some of their suppliers. Additionally, making spot market purchases at first was considered risky due to the need for more trust between the two stakeholders. However, trust was developed throughout the purchases made during COVID-19, and sometimes, to respond to the urgent needs, an alternative supply network was established through the spot purchases made from these new contacts.

5. Discussion

This section aims to examine and interpret the findings of this research. In this section, initially identified procurement strategies are analyzed. These identified strategies' implications are reflected and analyzed across cases. Lastly, they explain how ambidexterity leveraged the organizations' resiliency.

This study uses a qualitative approach to discover how manufacturing companies' procurement strategies have changed during the Covid- 19 pandemic. In addition, it shows how ambidexterity could leverage an organization to become more resilient in the face of highly disruptive occurrences. In light of the purpose of this study, this research's first research question is**, " How have manufacturing organizations changed their procurement strategies to secure sourcing during Covid-19?"** To respond to this research question, the researcher examined and explained the identified changes in the procurement strategies of manufacturing organizations.

5.1. SCRES Elements

In this section, the new strategies implemented by the case companies to mitigate the Covid-19 disruptions impact.

5.1.1. Supply chain (RE-) engineering

As organizations' supply chains spread around the globe to find a good quality item for a lower price, the risk of disruption is increasing accordingly. During Covid-19, it was seen that mainly several case companies aimed to find alternate sources as close as possible to the factories to prevent risks in shipment or regulations. Furthermore, even though finding new suppliers was costly and risky, as Interviewee- 8 mentioned and In-

terviewee-10 continued, *the situation in the market affected most of the manufacturers, case companies needed to find suppliers that performed better and prioritize case companies' orders.*

Large companies had more advantages in finding new suppliers due to their supplier pool, backup suppliers, and network. If large-size case companies cannot find an alternative supplier from their supplier pool, then start to contact new suppliers. On the other hand, it was more complex. It took longer for the SMEs to find alternative suppliers, as Interviewee- 6 (Case-F) mentioned, as the company has limited resources, so the organizational memory has yet to be developed. Furthermore, as Case C operates in a niche industry, the supplier options could have been more extensive, and for Case- D, due to quality concerns, Case- D has to check with its customer for their approval. These difficulties reduced these companies' flexibility to respond quicker to disruptions caused by Covid-19.

As the markets and suppliers' performance were unstable, case companies used companies' resources. They created new supply chain networks in each of their factories (Case-D) or started to set up a new layout to produce the item in-house (Case-F). However, the empirical data reflected, and van Hoek (2020) shared that these strategies significantly impact tackling the disruptions. However, the impact will be shown in the extended period.

In line with Kamalahmadi et al. (2022), it was seen that creating redundancy was one of the initial strategies implemented by most of the case companies. Case companies increase the stock levels to respond the unstable market conditions. Interviewee-5 (Case-G) pointed out that due to the low interest fee, it was easier to decide to increase the safety stock.

5.1.2. Supply Chain Collaboration

The empirical findings of this study show that all the companies having a solid relationship with suppliers played an essential role in the face of disruptions caused by Covid-19, as Butt et al. (2022) demonstrated in their study. Furthermore, having a solid network allowed us to reach out to the source during material shortages in the market.

In line with Sholten and Schilder (2015), samples of this study present that the intensified communication between suppliers and the case companies, along with information sharing, increased the visibility and velocity for both sides. Under uncertain times like Covid-19, information sharing with the stakeholders increases the efficiency and effectiveness of work for the whole supply chain network (Butt et al., 2022)—for instance, Case- A created direct communication channels with their suppliers to get faster responses. Additionally, in Case- D, while local sourcing managed the operational communications with the suppliers, global sourcing maintained the management-level communications. According to interviewee-9, this way of communication did not work as effectively as they assumed because, during Covid-19, the impact of the decision taken at the management level was not reflected as sufficient at the operational level.

Collaborative planning through frequent meetings with suppliers, case companies, and suppliers planned the deliveries collaboratively in accordance with the production capacity. Even though it was a rare practice in this study's samples, educational support was provided to interpret the forecast. Large organizations supported their small suppliers by leveraging their market position to pressure supplier's suppliers to prioritize its supplier and look for the material its supplier need to produce the product. Furthermore, based on the performance of their suppliers, Case- D began a partnership with them. The findings indicate that the collaboration enhanced the organization's supply planning and allowed them to react faster toward any possible instability in supply and demand.

Risk hedging is only applied by one case company, Case- D. The purpose was to maintain work with the supplier. Case- D closely monitored its suppliers, their financial conditions, and Case-D's need for that product. In this situation, Case-D, due to the market condition, instead of looking for an alternative supplier, Case- D offered financial support and paid for the uncompleted products.

5.1.3. Agility

The findings of this research indicated that identified strategies in the agility category were implemented for the short term to respond to the disruption. As also mentioned in section 5.1.2. supply chain collaboration, higher-level collaboration, and information sharing reflected the organizations' agility, as it allowed the organizations to identify the problems in the supply chain in the early stage of disruption and react to them.

As the deliveries from suppliers and the availability of the items were inconsistent, case companies, using their flexibility in manufacturing, either changed the production line or produced an alternative item. The case companies' most common action was upon the material phased-outs, finding alternative materials, and changing the production layouts if necessary. Furthermore, these new products are promoted to the customers for their interest. Additionally, Logistics flexibility is used by some of the case companies in the time urgency like the risk of production being stopped because of the missing material.

In line with Bode and MacDonald (2016), the empirical findings indicated the importance of faster decision-making during disruption. For instance, one of the problems stated by several case companies was that they could not retrieve the materials for different reasons. Companies had to solve those issues and do it faster to respond to those cases. As Interviewee- 7 (Case- F) explains, "… *if you were not making these quick decisions, you might miss your chances."*

Spot market purchasing is seen as another common practice amongst the case companies. In line with Merzifonoglu (2015), spot market purchasing is a powerful and emergency tool to secure production in times of material scarcity. Even though spot market purchasing strengthens organizations' hands to react to disruptions, it has several disadvantages, as the case companies share. The spot market was the last resort to find the material that could not be found within the company supply network or in the market. The reasons for spot market purchases seen as the last resort to purchase the material were; the high cost of material, the quality of material being unknown, and the lack of trust between buyer and seller.

5.1.4. Supply chain risk management culture

The findings of this study highlighted the importance of this supply chain risk management culture to mitigate the disruptions caused by Covid-19. Further, the findings indicated that SCRM culture needed to be fully embraced by the SMEs that contributed to this study. Building managerial-level relationships was already explained in Chapter 5.1. 2. Supply chain collaboration.

Regarding resilience-oriented talent management, only exercised by Case- D. In the time of disruption, some people must be trained for this sort of disruption to guide the

organization. As interviewee-10 attributed this capability as one of the reasons for Case-D performed better compared to the competitors.

Empirical findings indicated that risk consideration, case companies applied different strategies to mitigate the possible negative impact that Covid-19 can cause on their supply chain. Contractual agreements and financial support to the supplier depending on the risk assessment initiated to create a safer environment for the case companies in terms of securing the supply of the materials.

The application of new digital tools and this strategic implication is seen mainly at the end of the disruption stage. Therefore, the role of mitigating the disruptions caused by Covid-19 was limited. Additionally, the digital tool that Case-D's Poland factory initiated was not directly related to mitigating the impact of Covid-19.

5.2. The role of ambidexterity in the time of disruption

The second research question of this study was, "**How did the ambidexterity of the firm leverage the manufacturing organizations to explore and exploit new procurement strategies?"**. In the following part, we will discuss how the example companies' newly identified procurement practices were analyzed to explain this query.

The effect of the disruptions caused by Covid-19 demonstrated that most companies were not ready for this shock (Pal & Altay, 2022). Case companies changed their procurement methods, decision-making, and execution of new sources, among other things, to survive the disruptions. The empirical findings of this study used the adaptive cycle model to analyze and expand a notion in the literature on social-ecological resilience and organizational ambidexterity to show insights into SCRES at times of significant disturbance.

Several companies used the exploitation and exploration sufficiently demonstrated in every stage of the adaptive cycle. Due to the industry in which Case C and Case G operate, the impact of Covid-19 was not as heavy as other case companies. For instance, Interviewee- 5 explains that: ”W*e [Case-G] are working in the rail industry, which is always in need, especially after the sustainability aspect comes forefront during Covid-*

19. Therefore, we continue to purchase the amount we are supposed to receive." On the other hand, Case- C mentioned that due to the niche industry that the company performs because its hands were tied, it could only explore a limited number of external possibilities.

In this study, Case-D companies demonstrate the decentralized organization, and SMEs demonstrate the centralized organization. Due to centralized decision-making, the process allowed the SMEs to be faster and more flexible in exploring new procurement strategies. Case- D on the local level, procurement was performed more in the organization's established structure for procurement activities as much as possible. Therefore, Case- D at the local level had a small room for exploration. On the other hand, at the global sourcing and management level, exploration and exploitation abilities are performed at the utmost level regarding the organization's capability.

The case companies mainly use exploitation and exploration abilities for two different purposes; to deal with supply shortages and prepare for future disruptions. In line with O'Reilly and Tushman (2013), the empirical findings indicated that the case companies utilized exploration and exploitation abilities simultaneously in times of disruption. Furthermore, compared to large companies, due to a lack of resources, some of the SMEs in this study had more performed exploration capability than exploitation capability except Case C due to the reason stated above.

The exploitation capability described in this study is a higher level of close communication and collaboration with existing suppliers, creating appropriate contractual agreements with existing suppliers, utilizing the resources, e.g., using interchangeable materials, and manufacturing flexibility to respond to the initial phase of the disruptions caused by Covid-19. Furthermore, compared to the other companies in this study, large companies, in addition to these strategies, exploited risk-oriented talent management, used the supplier pool, resilience-oriented supply chain design, the implication of digital tools (only Case- D), and shortening the decision-making process. Exploration ability complied the spot market purchasing, resilience-oriented supplier selection, preferably near-shoring, new material investigation, double sourcing and diversification, and investigation of new digital tools.

Even though case companies moved from exploration to exploration or exploitation to exploration, in line with Vega et al. (2022), the empirical data indicated that the exploitation ability performed in the front loop (from r to k) of the adaptive cycle, while the exploration ability performed in the back loop (from Ω to α).

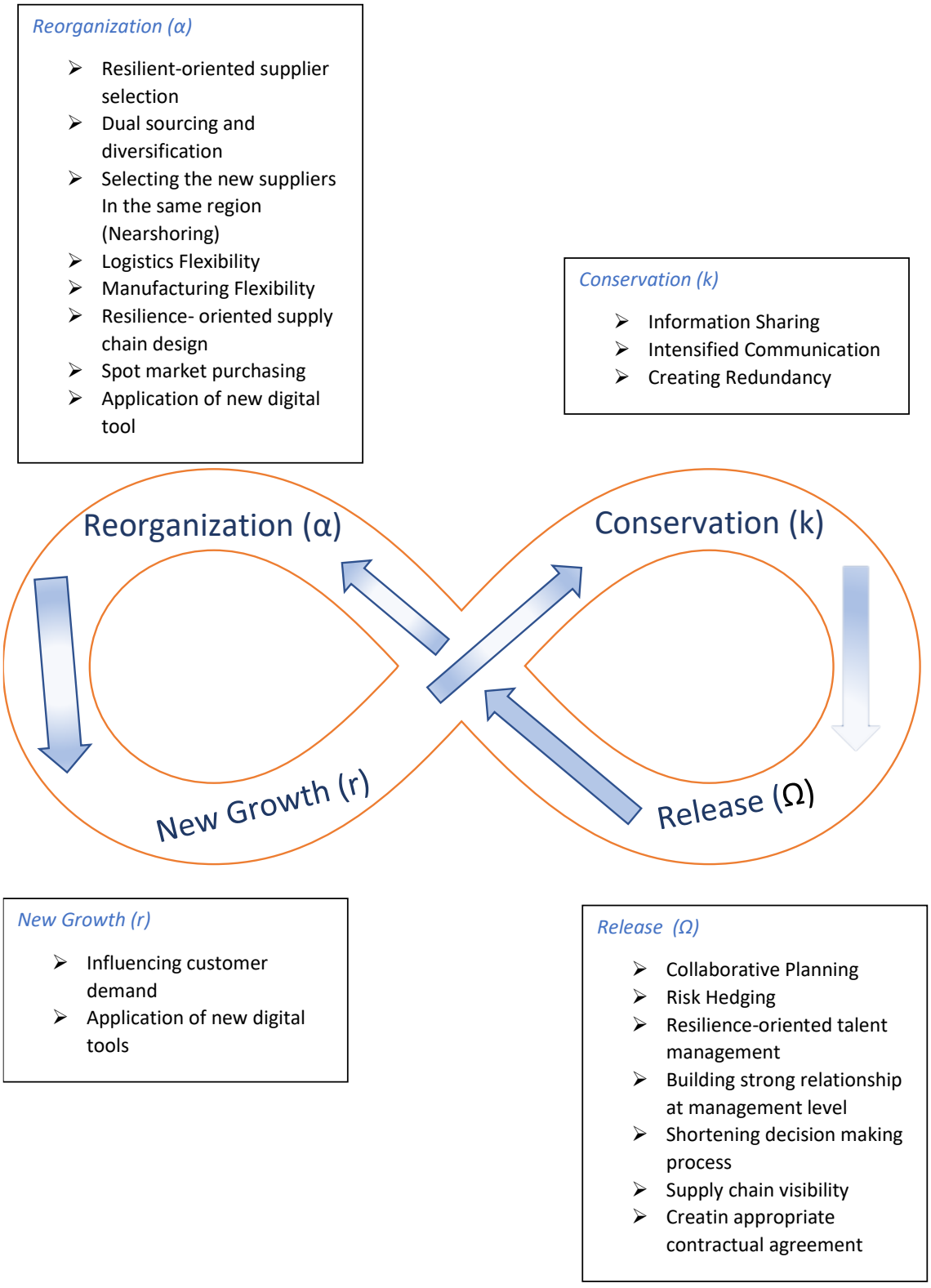

Figure 3: Illustration of empirically discovered procurement strategies on adaptive cycle model

6. Concluding remarks and implications

This last chapter of the thesis presents this research's literature and managerial implications. Lastly, limitations and future research suggestions are discussed together.

With this study researcher aimed to discover how organizations' procurement strategies changed and how ambidextrous capabilities can enhance SCRES in times of high disruption from a novel perspective. In this study from social-ecological literature, adaptive cycle model and organizational ambidexterity. In the new procurement strategies categorization from the literature, prevalent SCRES elements are used as it has been acknowledged that mainly strategies can be analyzed under these elements. The result of this study indicated that exploration and exploitation capability enhance the SCRES of the organization to respond the high-level disruptions.

6.1. Literature implications

The empirical findings of this study indicated that the simultaneous use of exploration and exploration capabilities created flexibility and improved organizations' resiliency to respond to the supply shortage or delayed deliveries in customer orders. The tipping point, where it changed from more exploitation to more exploration, of these new procurement tactics was observed in the adaptive cycle's release and re-organization phase.

This study contributes to the literature while identifying the set of procurement strategies in the concept of SCRES elements. It also enlightens how exploitation and exploration capabilities are supported to respond to the disruptions caused by Covid-19. Furthermore, this study contributes to the social-ecological resilience literature by demonstrating with the empirical data how organizations adapted to the high-level disruptions caused by Covid-19. Consequently, this study contributed to the literature by responding to the calls for areas that need to be expended or questions to be answered from Wieland (2021) and Adobor (2020) on the social-ecological literature by

enriching the data empirically from this study, Vega et al. (2022) by exploring the role of ambidexterity in for-profit organizations, and Tukahuwamba et al. (2015) by demonstrating how the identified procurement strategies implicated.

Lastly, samplings of this study indicated that the SCRES elements spread through the different stages of the adaptive cycle phases, which enables this study present and bring a new perspective on how to execute new strategies to adapt to the disruptions caused by Covid-19. Furthermore, the outcome of this study indicated that even though most of the companies, after the market stabilized, they strived to go back to the pre-disruption stage with some of their procurement strategies. Organizations maintained the new strategies, which allowed the organizations to perform better at an acceptable cost during Covid-19 disruptions. This way, the study contributed to the structure by enlightening the direction of where organizations should move to, either going back to the pre-disruption stage or aiming to develop after the disruption.

6.2. Managerial Implications

After the disruption, exploiting the initial procurement strategies implemented by the organizations was to increase collaboration, communication with the suppliers, and resource allocation. At the same time, companies explored new suppliers and materials, enhancing digital resources. It was seen that building solid relationships and long-lasting collaborative work with the suppliers created a head start for the organizations in the initial phase of disruption. Furthermore, the empirical findings indicated it is essential to build a network in a supply chain environment that will enhance the exploration process of the new suppliers or access to the materials.

As this study demonstrates how the organizations' supply chain adapts to the disruptions, this study recommends that managers should prepare for releasing the not functioning strategies while planning for a new way of working, product designing and producing, and presenting new procurement strategies to tackle the supply shortages. Empirical findings also demonstrated that organizations become more aware of the flaws in their supply chain, such as relying on one supplier or specific materials. During

the re-organization phase, organizations should learn their lesson and improve their identified flaws to enhance their SCRES. For instance, it might be considered to have backup suppliers for critical materials that can produce a unique material for the organization; this can leverage the organization if the initial supplier becomes inoperative. Additionally, the empirical results of this study further highlight the significance of simultaneously examining how leveraged firms can adapt successfully to Covid-19 disruptions. Therefore, the study recommends that managers use both simultaneously with a different focus instead of using exploitation and exploration one at a time.

The organizations highlight transparency in both internal and external communications. Therefore, this study suggests that for internal communications, managers should be transparent and more frequently provide status updates to their employees and vice versa. For external communications with suppliers, both stakeholders should be transparent with each other in order to identify the supply problems in the early phase. As the samples of this study indicated, organizations should frequently conduct risk assessments and monitor their suppliers' performance and needs to prepare for possible supply shortages.

6.3. Limitations and further research areas

The findings of this Master thesis have some limitations that the readers should acknowledge. Initially, case companies were selected from different manufacturing industries and sizes. Therefore, no particular outcome can be reflected on one specific industry or the size of the organizations, and both aspects. Future studies should be conducted on one specific industry.

As the empirical findings of this indicated that the level of ambidexterity shows a difference in decentralized companies compared to centralized ones, further studies should consider investigating these two types of organizational structures either by selecting one structure to explore in more detail or by conducting a comparative analysis between these two types of organizational structures. Additionally, as mentioned in the study of the relationship with the other internal departments, future

studies should concentrate on internal department collaboration in times of high-level disruptions.

The geographical focus of this study was EU countries and Turkey. For future studies, different geographical areas should be considered. Furthermore, upon interviewee-6's statement of how Turkey has both economically volatile and politically unstable geography, the researcher believes that further studies on Turkey can give a better picture of the constant need for adaptability towards high-level disruptions. Due to geographical distance, the interviews were conducted through the online communication platform Microsoft Teams; therefore, the observations were limited. Future studies should consider conducting interviews to observe the organizations in real life.

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7. Appendices

Appendix- A: Interview request

Participant Information Sheet & GDPR Privacy Notice

Title of the study: Adapting in the Face of Disruption: Leveraging Organizational Ambidexterity to Change Manufacturers' Procurement Strategies During High-Level Disruption.

Name of Researcher: Atakan Durmaz

You are respectfully invited to participate in this study for this master's thesis. I want you to comprehend the purpose of the research and what it entails for you before you make a decision. Please carefully read the following material, and if anything is unclear, please forward your questions via mail or phone.

This thesis aims to investigate how an organization's ambidexterity capability can enable it to become more resilient in the face of highly disruptive events. To do this, the researcher will concentrate on the Manufacturing Organization's procurement strategies and how they changed during the Covid-19 period. The researcher will next look at how these new strategies have been implemented by leveraging the organization's ambidexterity capability.

You have been asked to participate because you work for a manufacturing company and perform procurement activities in your organization. Nine more people participate in this study with you. You have the choice of participating or not. If you choose to participate, you will be handed this information sheet to keep and asked for your permission. Please get in touch with the researcher at the specified mail address below if you have any questions about any aspect of the study. If you want to participate, you are still able to revoke your participation at any moment and without stating a reason.

If you participate in the study, the information gathered from the interviews will be held in strict confidence. You and your firm won't be able to be identified from the research because it will be anonymized and utilize a special code.

Further information and contact details:

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Appendix- B: Interview Guide

1- Introduction
■ Can you please present yourself and the company? (Your role, the industry your company perform)
2- The role of ambidexterity capability and possible improvements
■ How is the current ambidexterity strategy being used within your firm? ■ Do you believe the ambidexterity strategy is having positive effects on your firm (economic, social, etc) ■ What more would you like to see from your ambidexterity strategies?
3- Procurement
■ What are the current procurement strategies being used within your firm? ■ How did the COViD-19 pandemic affect your procurement strategies between 2020-2022? (How have you changed your procurement strategies to overcome these gaps or challenges?) ■ During these challenges and gaps you experienced, I would like you to walk me through the process of how you identified the need for new procurement strategies and how you executed these strategies?
4- Ambidexterity and Procurement
■ To support the adoption of the new procurement strategies, did you need to create or acquire new capabilities? Which approach/ method did you employ? ■ Were there ambidextrous capabilities leveraged when you investigated and used the new procurement strategy(s)? If so, how? ■ When using ambidexterity to support new procurement methods, were

there any obstacles or trade-offs that needed to be made? How did you address them?

4.1. Demonstration of procurement and ambidexterity capability

- Can you give any examples of success where your organization's ability to be ambidextrous increased its resilience to disruptive events?

5- Future Perspective

- Looking for the future, how do you anticipate disruptions evolving and impacting procurement? How do you plan to stay agile and adaptive in times of disruption?

Appendix- C – List of Interviews

Case Company	Interviewee Number	Occupation	Industry	Number of Employees
A	1	Strategic Purchasing Specialist	Electrical Appliances and Electronics Manufacturing	201- 500
B	2	Purchasing Manager	Renewable Energy Semi-conducter Manufacturing	201- 500
C	3	Quality Manager	Machinery Manufacturing	11- 50
D	4	Sourcing Specialist	Industrial Machinery Manufacturing	17.500
	8	Sourcing Manager		
	9	Global Sourcing/ Category Manager		
	10	Global Sourcing/ Category Manager		
E	6	Chief Operation Officer	Chemical Manufacturing	11- 50
F	7	Purchasing Manager	Electrical Appliances and Electronics Manufacturing	900
G	5	CEO	Railroad Equipment Manufacturing	51-200