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Adaptation-Resilience-Innovation Framework for Competitive Advantage during Severe Supply Chain Disruptions

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Abstract

This study aims to investigate the roles of firm adaptation, supply chain resilience, and business model innovation in sustaining competitive advantages following a severe supply chain disruption. The study is based on case studies using executive interviews from four Thai retail firms that experienced severe supply chain disruptions and made deliberate responses to such disruptions. The case findings indicate that a firm's adaptation is crucial for building supply chain resilience, which in turn supports the firm's survival when viewed from a reactive approach. Conversely, supply chain resilience forms the basis for business model innovation when considered from a proactive approach, significantly contributing to the maintenance of competitive advantage. The study showcases how retail firms adapt and evolve in the face of significant disruption until they achieve a new level of performance. This insight can be valuable for firms when they encounter major challenges and need to navigate through them effectively. These findings address a gap in the literature by expanding on the dynamic capabilities view through the interactions among firms' adaptation, supply chain resilience, and business model innovation, as firms navigate severe disruptions and strive to sustain competitive advantage.

Keywords

Dynamic capabilities, Supply chain resilience, Business model innovation, Severe disruption

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Introduction

Business these days operates in a global landscape that is increasingly exposed to more severe and frequent disruptions, characterized by vulnerability, uncertainty, complexity, and ambiguity, often referred to as a VUCA world (Schoemaker et al., 2018). Firms are thus more susceptible to supply chain disruptions. Severe supply chain disruptions (SCDs) can impose considerable operational and financial difficulties on firms, resulting in closures for numerous businesses. Some firms can recover from such disruptions and remain competitive better than others. Why and how they do so is quite intriguing, particularly in today's economy, when severe disruptions may occur more often.

Supply chain resilience (SCR) is an important area of study addressing severe supply chain disruptions (Ivanov, 2021) and is a competency businesses strive to acquire. SCR closely aligns with the concept of firm resilience because the effectiveness of SCR depends on specific nodes within the chain, rather than the chain as a whole (Scholten et al., 2019). SCR can be used to mitigate vulnerabilities in an uncertain environment and enable firms to survive when confronted with challenges (Nikookar & Yanadori, 2022). Research has viewed SCR as a capability to maintain uninterrupted business operations which is vital to business survival (Ambulkar et al., 2015). However, strategic adaptation could be as crucial as resilience planning (Adobor & McMullen, 2018). Therefore, business model innovation (BMI) has been touted in the literature as a potentially critical vehicle in response to disruptive events (Adobor & McMullen, 2018) through re-creating value propositions for the changing business landscape (Clauss et al., 2021). From the managerial standpoint, SCR and BMI come to the forefront when dealing with severe disruptions (Buliga et al., 2016; Ivanov, 2021).

Dynamic capabilities are often regarded as a prerequisite for both SCR (Aslam et al., 2020) and BMI (Zhang et al., 2021). Previous research has underlined dynamic capabilities as an important element in coping with environmental turbulence by reconfiguring firms' current resources as a mechanism for firm adaptation (FA) (Eisenhardt & Martin, 2000; Teece, 2007; Teece et al., 1997). Although the concepts of dynamic capabilities, supply chain resilience, and business model innovation have been established in the literature and are important to firms' ability to cope with supply chain disruptions, their inter-relationships in doing so are not clear and have not been addressed in the literature. For instance, the impact of supply chain resilience on its outcome such as firm performance remains uncertain, as some studies report a positive effect (Bahrami & Shokouhyar, 2021; Wong et al., 2020), while others do not observe such a relationship (Abeysekara et al., 2019; Wieland & Wallenburg, 2012). A similar situation applies to business model innovation, as its effect on performance remains

uncertain (Clauss et al., 2021). Moreover, research on the connection between firm resilience and business model innovation is still evolving (Buliga et al., 2016), requiring further studies to confirm this phenomenon. Within the context of this study on Thailand's retail industry, retail industries worldwide face similar disruptions, such as economic downturns, supply chain issues, digital transformation, and changing consumer behaviors. Thailand's experience in navigating these challenges—particularly in an emerging market context—offers valuable lessons for other nations. All the points mentioned emphasize the necessity of further exploring the relationship between supply chain resilience, business model innovation, and their impacts, including firm competitive advantage. Therefore, adopting a more integrated perspective will help address this gap in the literature, which has driven our study to explore the following research questions: (1) how are Supply Chain Resilience and Business Model Innovation implemented during a severe supply chain disruption? (2) how do Supply Chain Resilience and Business Model Innovation contribute to sustaining competitive advantage afterward?

To address these research questions, the study employs a theory elaboration method using four case studies of retail firms in Thailand to comprehend how severe supply chain disruptions prompt the development of dynamic capabilities to sustain a firm's competitive advantage through FA, SCR, and BMI. Through the qualitative interview data, this study also reveals a new construct, the downstream locus of attention (i.e., the attention of firms' managers toward their direct customers downstream in the supply chain), which potentially plays an important role in facilitating this dynamic process. Our qualitative findings are then summarized into an adaptation-resilience-innovation model for competitive advantage during severe supply chain disruptions. This study thus contributes to the current literature by elaborating the relationships among FA, SCR, and BMI and extending the consequence of DCV on competitive advantage within the context of severe supply chain disruptions.

Literature review

Dynamic Capabilities View (DCV) and Firm Adaptation (FA)

The dynamic capabilities view (DCV) offers a theoretical background for studying firms' abilities to respond to the changes and challenges caused by severe supply disruptions (Hohenstein, 2022). Dynamic capabilities consist of essential sensing, seizing, and reconfiguring capabilities that facilitate the process of organizational adaptation (Teece et al., 1997). The development of dynamic capabilities is facilitated by the reconfiguration and deployment of resources by contingency needs. Resource reconfiguration is considered a firm adaptation (FA) effort. It involves adjusting and

realigning a firm's resources, such as human capital, technology, and infrastructure, in response to external changes or disruptions. A firm's adaptation efforts can therefore not only minimize negative impacts but also successfully leverage market changes for commercial opportunities (Eisenhardt & Martin, 2000).

Severe Supply Chain Disruption (SCD) and Supply Chain Resilience (SCR)

Supply chain disruptions are often unexpected events that interfere with the regular flow of goods and materials, significantly impacting the supply chain's functionality (Ivanov, 2021). Although there are various types of supply chain disruptions, severe supply chain disruptions are often referred to as “environmental disruptions,” as they are external to both the firm and its supply chain (Parast & Subramanian, 2020). This type of disruption is long-term, difficult to predict, and causes simultaneous disruptions in supply, demand, and logistics infrastructure (Ivanov, 2021). They include events such as pandemics, natural disasters (such as earthquakes), political instability, economic crises, and terrorist attacks (Parast & Subramanian, 2020). Research on supply chain management has introduced the concept of supply chain resilience as a solution for supply chain disruptions (Nikookar & Yanadori, 2022). Resilience comes from the ability of an organization to adapt its existing routines and processes to effectively navigate and overcome challenges (Ponomarov & Holcomb, 2009). Supply chain resilience implies persistence, the ability to endure, withstand, and contain adversity in the face of challenges and to recover from disruptions (Wieland & Durach, 2021). Supply chain resilience can also be considered “learning” from adaptive behaviors and can be developed and strengthened over time through experience and practice (Ponomarov & Holcomb, 2009).

Business Model Innovation (BMI) and Competitive Advantage (CA)

Embracing an innovative business model is often critical for an organization's survival and competitiveness (Sosna et al., 2010). Business model innovation is an expansion of the concept of the business model, which is a unique configuration of three aspects: value proposition, value creation, and value capture (Clauss, 2017; Clauss et al., 2021; Saebi et al., 2017). Business model innovation is the process by which firms commercialize their products or services to attract clients, achieved by offering new value, creating additional value, and capturing that value to generate financial returns (Bocken & Geradts, 2020). There is a growing agreement that business model innovation serves as a key factor in elucidating a firm's performance, as evidenced by several researchers (Clauss et al., 2021; Hossain, 2017; Zhang et al., 2021). A firm’s competitive

advantage can be obtained by innovating either individual components or the entire business model (Clauss et al., 2020).

Methodology

Research Methods

This study adopts a theory elaboration approach, utilizing four case studies to gain a deeper understanding of how severe supply chain disruptions have triggered the development of dynamic capabilities, SCR, and BMI. With theory-elaborating case research, the researcher has already identified a broad theory that can be applied to the empirical setting (Ketokivi & Choi, 2014). In this study, the DCV is a broad theoretical framework that is applied to the major disruption to reveal the interplays among dynamic capabilities, SCR, and BMI in the context of firms responding to such severe disruption and leveraging it toward their longer-term competitive advantage.

We applied the elite interviewing method (Aberbach & Rockman, 2002) to collect the information required. The use of this method is particularly useful for accessing insights from individuals who hold a position of authority or may have deep insights. This approach has been noted as a valuable tool for researchers seeking to explore under-researched topics (Aberbach & Rockman, 2002).

Case Selection

The selection of cases was not random but deliberate, as the objective of qualitative sampling is to obtain a richness of information (Crabtree, 1999). We chose the four cases in this study based on three criteria for case selection: First, we focused on four of the leading retailers, two of which have faced severe supply chain disruption in the past. We have given these two retailers the names "Alpha" and "Beta." The other two retailers have not experienced a situation as critical as the other two, and we referred to these firms as “Gamma” and “Delta.” In doing so, our findings can be more applicable to firms with or without prior disruption experiences. Second, each had to be a well-known Thai retail firm to ensure a high magnitude of supply chain activities. Third, only top-level executives (at least a vice president or comparable positions) involved in the company-wide policy formulation and strategic planning were preferred for the interview.

Data Collection

Since elite informants typically have limited time or may only be interviewed once, a semi-structured format is appropriate (Solarino & Aguinis, 2021). In directing the interviews, the developed protocol aided researchers in having both open discussions

and specific questionnaire-based conversations. The duration of each firm's interview ranged from 120 to 140 minutes, divided into two sessions, and was carried out both in person and via video conference. All interviews were recorded with permission and afterward transcribed word for word before implementing qualitative content analysis (Forman & Damschroder, 2007). Altogether, we conducted eight interview sessions involving four prominent retail firms.

One top executive represented each different firm, except one retail firm (Alpha), for which we interviewed two top executives. This is because one of them was a foreign executive. Another local executive was interviewed to ensure that culture and language differences did not affect the study Therefore, a total of five elite informants, all top executives from four leading retail firms in Thailand, participated in our study. We ensured the participants' anonymity and confidentiality to enhance the accuracy and impartiality of their interviews.

The interviews started by asking informants to recall their most significant supply chain disruption, which was then used as a reference throughout the semi-structured interview. These questions were originally developed from the literature. Table 1 summarizes the case companies and participants. All interviews were voice-recorded with permission and transcribed verbatim.

Table 1 Overview of the case companies and participants

Cases	**Alpha**	**Beta**	**Gamma**	**Delta**
Interviewees	Chief Commercial Officer (COO) & Executive Vice President (EVP)	Head of Operations (VP)	Executive Vice President (EVP)	Managing Director (Owner)
Type of business	Retail	Retail	Retail	Retail
Age of firm	>20	>20	<15	<15
Turnover (billion US$)	1-10	1-10	<1	<1
Number of employees	>1000	>1000	<500	<500
Length of time in total	130 minutes	120 minutes	120 minutes	140 minutes

Source: Author's analysis

Validity and Reliability

Validity and reliability were ensured as recommended by Münch and Hartmann (2022). Interview questions were developed through an extensive literature review and reviewed by three academic experts. Participants were given the compiled case information to verify data accuracy, and they reviewed transcripts for any errors. Data analysis involved a layered interpretation, ensuring consistency with theoretical constructs until saturation was reached. For reliability, two additional experts cross-checked and verified the categorization, assigning categories only when consensus was achieved.

Data Analysis

The study's analysis used a two-stage approach, alternating between theory and interview data (Roscoe & Blome, 2019), with multiple cycles of comparison (Guba & Lincoln, 1994) until saturation was reached. In the first step, *"open coding variables,"* the transcribed interviews were analyzed to identify thematic keywords from recurring patterns, which were interpreted based on theory and literature and labeled as *"subcategories"* (see appendix).

The second step, *"axial coding analysis"* (Table 2), focused on linking subcategories to form overarching categories. This process aimed to identify relationships between subcategories and main categories, which represent key theoretical constructs in our conceptual framework. To ensure reliability, three experts classified the subcategories, and a subcategory was assigned to a category only when all experts reached a consensus.

Table 2 Axial coding analysis

	Subcategories	Category	Acronym
1.	Environmental disruptions	Severe Supply Chain Disruption	SCD
2.	Negative impact		
3.	Uncertainty/Unpredictable		
1.	Prioritizing resources	Firm Adaptation	FA
2.	Changing processes		
3.	Reducing negative impact		
4.	Streamlining resources		
5.	Improvisation		
1.	Recovery/Endurance/Stability	Supply chain resilience	SCR
2.	Learning/Awareness/Visibility		

Table 2 Axial coding analysis (continued)

Subcategories	Category	Acronym
1. New opportunities 2. New ways	Business Model Innovation	BMI
1. Superior performance 2. Maintained performance 3. Weaker performance	Competitive Advantage	CA
1. Concerning for customers 2. Understanding customers 3. Customer relationship 4. Customer service	Downstream Locus of Attention	DLA

Source: Author's analysis

Through iterative data analysis, six key categories emerged: (1) severe supply chain disruption, (2) firm adaptation, (3) supply chain resilience, (4) business model innovation, (5) competitive advantage, and (6) downstream locus of attention. While the first five is established in the literature, the downstream locus of attention is a new concept from our interview data. It refers to managers focusing on their direct customers during severe disruptions, rather than on their upstream suppliers. This focus helps firms make timely decisions and take necessary actions during disruptions, as highlighted in managerial cognition literature (Ocasio, 1997; Stubbart, 1989).

Findings and Theoretical Propositions

After identifying the six building-block constructs from the interview data, we examined the relationships among them based on the literature and formulated six theoretical propositions.

Relationship between Severe Supply Chain Disruption (SCD) and Firm Adaptation (FA)

In our study, all four retailers were asked to share their direct experiences with severe supply chain disruptions. They identified the recent COVID-19 pandemic as the most significant disruption, along with instances of bird flu, political uncertainty, and the Asian financial crisis (Tom Yum Kung Crisis). These disruptions are classified as "environmental disruptions," which typically have a substantial impact on supply chains.

During the severe supply chain disruption, all four retailers prioritized generating enough sales to ensure their survival. They encountered difficulties reaching customers and struggled to achieve sufficient sales while managing high fixed costs related to

personnel. Low sales increased the burden of fixed and operating costs, jeopardizing their survival, particularly for larger firms with more employees and higher costs relative to declining revenues. Consequently, their initial action was to eliminate unnecessary resources or costs, such as personnel, stores, and lower-priority partners. The next step included modifying operations and retooling capabilities with the remaining resources, concentrating on essential needs to sustain business operations. We refer to this process as *"firm adaptation,"* which is deemed *"reactive"* since there was no prior plan for such an unforeseen event, supporting the initial proposition:

Proposition 1. *In response to a severe supply chain disruption, the initial action for firms is to adapt to mitigate negative effects.*

Relationship between Firm Adaptation (FA) and Supply Chain Resilience (SCR)

Retail firms adopted various survival strategies, including workforce reductions, closing physical stores, decreasing the number of business partners, and reallocating unused staff to essential functions. This approach, referred to as *"firm adaptation,"* is a reactive measure to address or lessen the negative effects of severe supply chain disruptions. Firm adaptation involves reconfiguring resources to maintain operations in a challenging environment, showcasing resilience.

Among the four firms, only Beta strategically encouraged staff to resign through an early retirement program. Alpha permitted voluntary resignations due to salary and commission cuts but did not force any staff to leave, urging their staff to have faith. Gamma and Delta chose not to reduce their workforce, believing any issues would be short-term and that employees are valuable assets. They worked to maintain employee morale by communicating their policy to retain all staff from the start. These observations lead to the suggestion of the second proposition:

Proposition 2. *The initial course of action, firm adaptation, can enhance supply chain resilience to minimize negative impacts to achieve the firm's stabilization.*

Relationship between Supply Chain Resilience (SCR) and Business Model Innovation (BMI)

The interview data also emphasized the significance of learning from this adaptation process which is also a characteristic of being resilient. Alpha acknowledged that over-reliance on a single client group was problematic, emphasizing the importance of diversity. Beta recognized that remaining prudent helped them endure challenges. Delta concluded that being cautious and maintaining a long-term vision was the best approach for their continued success.

Moreover, Alpha and Gamma acknowledged the need for digital transformation after realizing their lack of diverse customer insights. They aimed to prioritize digital transformation for long-term advantages, demonstrating their readiness to innovate. This understanding developed only after they adapted to their limitations. In contrast, Beta and Delta had already started investing in digital initiatives before the disruption, enabling them to quickly determine the right direction thanks to their existing resources. Digital transformation fosters substantial business improvements and encourages innovation in business models (Mies & Hausberg, 2023).

To survive in a new and challenging environment, firms learned to acknowledge their limitations during difficult periods. This awareness allows them to take a more proactive stance, utilizing new tools to improve efficiency and exploring new markets and products to mitigate losses. This shift is reflected in their commitment to business model innovation for future growth. Ultimately, their advancements in supply chain resilience can provide a strong foundation for such innovation. Based on these insights, the third proposition is put forward:

Proposition 3. *Supply chain resilience could lead to business model innovation.*

Relationship between Business Model Innovation (BMI) and Sustainable Competitive Advantage (CA)

Alpha and Gamma experienced significant challenges that highlighted the need for digital transformation, while Beta and Delta had already invested in such initiatives before the pandemic, allowing them to effectively utilize digital resources. Beta and Detta noted that the disruption accelerated their digital development, despite their prior efforts. The degree of digitization is crucial for a firm's success during severe supply chain disruptions (Ludin et al., 2022). It functions as a vital resource that firms can use to boost efficiency, attract customers to new products or services, and enable more effective value creation. This indicates that business model innovation can be implemented more easily. Furthermore, this means that businesses can quickly seize opportunities as they arise, allowing them to compete more effectively against their rivals.

During interviews, Alpha expressed concerns about poor performance, whereas Gamma noted they only managed to maintain stability post-disruption. In contrast, Beta and Delta accelerated their business plans and felt confident in seizing market opportunities, leading to quick adoption of business model innovation. Both firms reported stronger performance compared to competitors.

While Alpha's performance significantly declined and Gamma's remained stable, Beta and Delta reported superior results. This suggests that supply chain

resilience alone is insufficient for sustaining performance during disruptions; rather, business model innovation, following supply chain resilience, plays a vital role. This leads to Proposition 4:

Proposition 4*. Business model innovation could lead to firm performance.*

Downstream Locus of Attention as a Moderator

All four retailers in this study frequently mentioned their attention to and concerns for customers, consistently using terms such as “customer-centric,” “concerned about the impact on [our] customers,” “their [customers’] well-being,” and “customer service.” During the disruption, they were less concerned with their suppliers and more focused on their customers. For example, Alpha aimed to satisfy their customers by optimizing pricing to meet their clients' needs. Beta leveraged a robust customer database to strengthen client relationships. Gamma emphasized building customer loyalty and a deep understanding of their clients. Delta concentrated on customer relationships, service quality, and customer insights.

During severe supply chain disruptions, it becomes evident that the focus shifts to the downstream rather than the upstream of the supply chain. This shift was observed in all four firms, though with varying degrees and approaches. This emphasis can be termed the “downstream locus of attention.” This focused attention on key downstream constituents of these firms helped sharpen their strategic focus and enabled their decisions and actions during the disruption crises. Thus, the downstream locus of attention can facilitate the firms’ adaptation efforts in achieving their resilience during the severe supply chain disruption. Similarly, as the downstream locus of attention enhances the firms’ understanding of their customers as well as strengthening their customer relationships, it can facilitate the firms’ business model innovation attempts in creating new values for their customers or new ways to meet their needs to enhance firm performance during the disruption. We thus articulate the moderating roles of the downstream locus of attention in Propositions 5 and 6 as follows:

Proposition 5. *Downstream locus of attention could strengthen the relationship between firm adaptation and supply chain resilience.*

Proposition 6. *Downstream locus of attention could strengthen the relationship between business model innovation and firm performance.*

Toward a Conceptual Framework

Taking the six theoretical propositions together, we proposed a conceptual framework, as illustrated in Figure 1, to elaborate the concept of dynamic capabilities and competitive advantage within the severe disruption context.

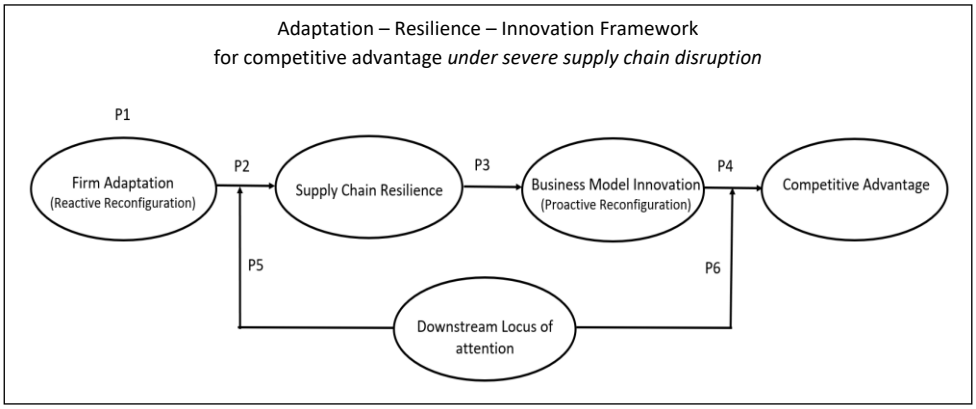

Figure 1 Conceptual Framework

Source: Author's analysis

The conceptual framework depicted in Figure 1 is in the context of a severe supply chain disruption. The disruption calls for the activation of dynamic capabilities in the part of resource reconfiguration. Since the initial reconfiguration appears to be spontaneous, we termed it "reactive reconfiguration." This initial reconfiguration is seen as an adaptation to external changes. As Dolgui and Ivanov (2021) suggest, a firm's reconfiguring capability is critical for retaining current customers and ensuring delivery in the downstream supply chain, which is crucial for survival. Adaptation necessitates businesses to modify their resources to reduce the negative impact. Resources, such as certain personnel, inventory, and physical assets, are permitted to be discarded or repurposed. The capability to prioritize resources becomes more prominent in the face of disruption.

As a result of reactive reconfiguration (firm adaptation), firms learned and possessed resilience in their supply chain at the downstream level. Put differently, the firm's ability to reconfigure resources acted as a mechanism to develop resilience (Ambulkar et al., 2015), as it permits the firm's routines to be changed to accommodate the prioritized resources. Developing resilience may entail less accumulation of resources and more development of competencies that enable organizations to exploit their existing resources flexibly and responsively (Parker & Ameen, 2018). In the

dynamic capabilities view, this adaptation-resilience stage involves the firms trying to make “sense” of events and occurrences and coping with them accordingly.

Firms that have firmly established their resilience are better equipped to “seize” opportunities, as they distinguish a promising path from trying several paths and gain valuable insights in the process. Their resources and capabilities used during survival could be used to navigate toward a positive outcome. Therefore, innovating their business model would not be wasteful or entail excessive risk. We refer to this as “proactive reconfiguration” because it depicts the firm's deliberate and proactive efforts. In a sense, supply chain resilience (SCR) paves a foundation for the firm’s proactive reconfiguration. SCR establishes the groundwork to embrace business model innovation (BMI), which is akin to possessing “seizing” capability within the DCV. BMI, supported by SCR, is a critical factor influencing a firm's competitive advantage and overall performance (Adobor & McMullen, 2018; Zhang et al., 2021).

Finally, the strengths of the relationships (1) between the firm adaptation and SCR and (2) between the firm’s business model innovation and competitive advantage hinge on the downstream locus of attention (DLA) established by management. Firms with deeper attention to customers become more effective in their adaptation and business model innovation efforts; thus, they tend to survive and perform better during significant supply chain disruptions (Juliana, 2024).

Discussion

The retail industry is one of the sectors that has experienced the most disruptions, from the rise of online platforms partly replacing brick-and-mortar stores to the most recent and severe disruption caused by the pandemic. Using severe supply chain disruption in the Thai retail industry as a research context, this study conducted top executive interviews and used the interview data in tandem with related literature to develop a conceptual framework to elaborate the interplays of dynamic capabilities (i.e., resource reconfiguration), supply chain resilience, and business model innovation. Dynamic capabilities view (DCV) is utilized as a theoretical lens to comprehend a company's response to severe supply chain disruption. Given that actions or solutions cannot be pre-planned, resource reconfiguration is seen as a crucial strategic response for addressing significant disruptions (Ivanov, 2021).

Oriented by the interview data, we have categorized resource reconfiguration by two distinct postures: reactive and proactive. The reactive posture of reconfiguration is represented by firm adaptation, which could lead to resilience. The proactive posture of reconfiguration, after the successful adaptation-resilience stage, could lead to business

model innovation. The reactive approach represents the necessity of adaptation to reduce or cope with negative impacts, ultimately leading to supply chain resilience. This approach aims to preserve or restore the status before the disruption as much as possible and is often referred to as “recovery” in academic literature. This reactive stance is vital for firms to gain insights and recognize their constraints during their adaptation effort. This understanding fosters their resilience and subsequently business model innovation. The proactive approach represents the drive to capture emerging opportunities. This approach aims to achieve positive outcomes or maximize benefits. Business model innovation plays an instrumental role in this approach. The two approaches in reconfiguration, bridged by supply chain resilience, are complementary in sustaining a firm's competitive advantage.

Additionally, our study suggests that firms’ downstream attention toward their clients can play a positive role in both the reactive posture to attain resilience and the proactive posture to achieve business model innovation during severe supply chain disruptions. In such crisis-begging situations, problematic symptoms can be widespread in firms’ operations and supply chain systems. Having a focal point of management attention, downstream clients in our case, can galvanize firms’ reconfiguration efforts, both reactively and proactively, thus increasing the success likelihood of the firms in both reconfiguration efforts during such disruptions. Based on our four case studies, while all organizations recognized the importance of their clients, their ability to build resilience and maintain a competitive edge was also shaped by the infrastructure supporting these relationships. For example, Beta and Delta were more equipped to assist both existing and new clients, having undergone digital transformation before the major disruption. This allowed them to efficiently reallocate resources and sustain client engagement. In contrast, Alpha and Gamma struggled to respond effectively due to weaker connectivity. Therefore, customer information remains paramount, particularly during significant disruptions. The faster firms can adapt to serve their clients, the more they demonstrate resilience, paving the way for future value creation.

Theoretical Contributions & Practical Implications

Theoretical Contributions

This study makes four key contributions to the existing literature on dynamic capabilities theory, positioning it as a comprehensive framework that links the smaller components of supply chain resilience and business model innovation, ultimately leading to the outcome of firm competitive advantage as follows.

1) Dynamic Capabilities View for Two Purposes (to Solve and to Seize)

Adaptation is a well-established concept in the literature (Helfat & Winter, 2011; Teece et al., 1997) and is an important mechanism from the "reactive" aspect of DCV, a crucial survival component. This aspect of reconfiguration is essential but has been minimally discussed in previous studies. During the period of adaptation, businesses realized which resources needed to be prioritized or eliminated. It permits businesses to modernize themselves. In addition, their capabilities are stretched by changing routines to accommodate the prioritized resources during difficult times. This new set of resources and capabilities can become a new source of competitive advantage, which resides in the firm's ability to capitalize on its resources and capabilities to pursue emerging opportunities brought about by environmental changes (Zahra et al., 2006). The latter viewpoint represents a “proactive” side of DCV. This study thus suggests that DCV can be elaborated to capture both reactive and proactive reconfiguration, providing a deeper explanation for the two distinct outcomes of surviving when used reactively and thriving when used proactively. Previous studies have rarely distinguished between reactive and proactive reconfigurations. Emphasizing the significance of "reconfiguring" in both approaches allow scholars and managers to better understand supply chain resilience and business model innovation through the lens of dynamic capabilities. Supply chain resilience focuses on reallocating resources to solve problems, whereas business model innovation involves reallocating resources to seize new opportunities or attract customers. Both serve as short-term and long-term strategies that work together to sustain a firm’s competitive advantage.

2) Reconfiguring - Sensing: Crucial Processes of Supply Chain Resilience to Solve the Problem

SCR is strongly related to dynamic capabilities (Aslam et al., 2020; Wong et al., 2020), but there is no clear evidence supporting that SCR is one element of dynamic capabilities or just a related factor. Some have suggested that SCR serves as a dynamic capability (Ponomarov & Holcomb, 2009; Wong et al., 2020) whereas others have suggested that SCR enables dynamic capabilities (Teece, 2007)–or is achieved by dynamic capabilities (Aslam et al., 2020; Teece, 2007). In this study, building on the interview data, we theorized that, within the severe disruption context, SCR is a connector that allows reactive and proactive reconfigurations in the DCV to complement each other. Supply chain resilience (SCR) is shown through the reconfiguration process, which evolves into sensing within the dynamic capabilities view (DCV), and is typically applied to address challenges. SCR is, therefore, both a product and a source of

dynamic capabilities. Identifying SCR as a consequence and a source of dynamic capabilities permits scholars to refine the concept of DCV more clearly.

3) Sensing - Seizing: Crucial Processes of BMI to Sustain a Firm's Competitive Advantage

Although antecedences of BMI adoption can be both from an external factor, which is a passive response to the environment (Zhang et al., 2021), and internal intention by management's cognition (Martins et al., 2015; Zhang et al., 2021), it is unclear which approach is better for the success of BMI adoption. We argue that both drivers could be present in a single situation. As SCR is a product of firms' reactive reconfiguration in responding to an external change, we can assert that the successful adoption of BMI typically follows a sequential process, starting with a reactive reconfiguration to respond to external changes and mitigate negative impacts, then progressing to sensing new business opportunities, followed by leveraging opportunities for growth. This progression is especially relevant for well-established firms that must navigate their future while ensuring they do not neglect their existing products, allowing them to fade away completely. It is viewed as a proactive reconfiguration aimed at securing long-term competitive advantage. BMI adoption without learning from the initial reactive reconfiguration to necessitate the development of SCR may be somewhat risky or analogous to a leap of faith, making the BMI efforts more prone to failure. Both reactive and proactive perspectives are essential because they contribute to the success of BMI. Therefore, this study also advances the BMI literature by elaborating on its relationships to dynamic capabilities and SCR within the severe disruption context.

4) Downstream Locus of Attention

Finally, our study reveals a moderating role of "downstream locus of attention (DLA)," a new construct emerging from our interview data, in the overarching relationships among FA, SCR, BMI, and firm competitive advantage during severe supply chain disruptions. This may highlight a delicate interplay between management attention, a form of managerial cognition (Ocasio, 1997; Stubbart, 1989), and the performance-influencing mechanisms of dynamic capabilities (Gayed & El Ebrashi, 2022; Zahra et al., 2006)**.** This is an intriguing and promising domain that future studies can further investigate.

Practical implications

This study also offers three practical implications for managers which can be drawn from the adaptation-resilience-innovation framework.

1) Adaptation – Resilience – Innovation (The Inside – Out Strategy)

Firms must recognize that the success of business model innovation relies on their ability to adapt—demonstrating resilience within their supply chain through an inside-out strategy. Adaptation allows firms to address challenges and develop a deeper insight into their strengths and weaknesses, especially during difficult periods like severe supply chain disruptions. By applying this strategy in times of crisis, firms can learn to manage their resources more efficiently. As a result, they become better positioned to successfully innovate their business model to seize new opportunities with well-prepared resources and capabilities. By implementing this strategy, businesses can undoubtedly sustain their competitive advantage. Our study suggests that, without resilience as a foundation, business model innovation may not lead to competitive advantage. The lack of success has been observed in many business model innovation efforts. The investment in such efforts may eventually be futile if managers do not perform due diligence in assessing the level of foundational resilience, particularly when firms face major external changes and disruptions. Therefore, managers can mitigate the risk of failure in adopting business model innovation by first establishing strong resilience capabilities within their firms. Firms may evaluate how their members tackle challenges under time and budget constraints. Effective adaptation is a fundamental aspect of resilience and can greatly increase the chances of success in business model innovation, as it ensures resources and capabilities are optimally utilized.

2) Supply Chain Resilience and Business Model Innovation (The Two-Pronged Approach: Reactive and Proactive)

Firms should not overlook the potential benefits of the sequential reactive-proactive reconfiguration of their resources and capabilities. Reactive reconfiguration in response to an external change can provide firms with opportunities to learn and develop the necessary resilience so that the proactive reconfiguration can be more oriented and be implemented with a greater success likelihood of achieving a longer-term advantage. On the one hand, an isolated proactive reconfiguration effort without reactive reconfiguration can be risky and prone to a high failure rate. On the other hand, firms that rely solely on reactive configuration without efforts to move toward proactive reconfiguration may only be able to manage their survival but may not be able to grow and advance in the long haul. A reactive approach can serve as a valuable short-term approach that businesses should not overlook, as it focuses on problem-solving—an essential capability not only for the company itself but also for addressing client needs. On the other hand, a proactive approach, driven by business model innovation, is a long-

term approach that is vital for maintaining a firm's competitive advantage. It focuses on increasing the value of the firm's products or services, aiming to attract customers and foster their loyalty. Both strategies are complementary and should be implemented in tandem to ensure business success.

3) Customers as the Focal Point during Severe Supply Chain Disruptions

Directing management attention toward customers during a crisis is an important aspect that businesses cannot overlook. During severe supply chain disruptions, customers often shift their demand, making it crucial to understand the dynamic changes on their end. Our study suggests that with management attention toward downstream customers, firms' both reactive and proactive reconfiguration efforts can become more effective. Thus, managers can take heed of what happens at the customers' end and use that knowledge to guide their efforts to reconfigure the firms' resources and operations during such severe disruption. During a severe supply chain disruption, limited time and resources can be managed more efficiently by maintaining a clear focus. Prioritizing the downstream aspect does not imply neglecting suppliers or solely concentrating on clients. Instead, each firm should support its immediate customers within the supply chain, while suppliers do the same for their next tier of clients, and the suppliers' suppliers follow the same approach. This coordinated approach enhances responsiveness and reinforces the overall resilience of the supply chain. Our study also highlights that crises often generate new business opportunities, as they give rise to evolving customer needs. When demand is unpredictable, understanding and responding to emerging needs quickly is essential. Firms that are highly responsive to these changes can navigate challenges effectively. During severe supply chain disruptions, businesses must stay attuned to emerging customer needs, requiring innovative solutions while avoiding the frustration of outdated offerings.

Limitations and Future Research

While this study has made important theoretical and practical contributions, it is not without limitations. These limitations can provide valuable guidance for future research in this area.

First, all four retailers in our study perceived the COVID-19 pandemic as their most severe supply disruption, and the retail industry in Thailand was used to depict the incidents. This could be subject to a narrow empirical context. Thus, the theoretical framework and the propositions derived in this study are more suggestive and

exploratory. Future research can cross-validate them with different empirical contexts or broader base data to ascertain the empirical generalizability of this study.

Another limitation is that, in this study, SCR is found to be more likely to emerge through firms' reactive reconfiguration in the downstream domain than in the upstream domain. This finding can be context-dependent and specific to the retail industry. It is also possible that managerial attention might be generally limited when firms face a major disruptive crisis. Under such circumstances, the managers' attention may primarily flow in one direction of the supply chain, which is downstream in the context of our study. This phenomenon, although not part of the initial research inquiry in this study, can be an interesting area of behavioral supply chain research and can be further investigated by future research.

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Appendix

Opening coding variables

Subcategories	Examples of Dialogues
Environmental disruptions	*"Our most severe disruption was caused by COVID-19."* *"The more severe disruptions we encountered previously were bird flu, which helped us adapt before facing the more severe COVID-19 pandemic."* *"We have experienced several major disruptions, including political uncertainty, the Asian financial crisis (Tom Yum Kung), and flooding, but the COVID-19 pandemic stands out as the most serious."*
Negative impact	*"The lockdown compelled us to close all operations."* *"Customers reduced the spending because there is no confidence."* *"No sales could be generated from physical stores."* *"The business certainly disappeared 90% overnight."*
Uncertainty/ Unpredictable	*"We don't know how long COVID-19 will stay with us."* *"We don't know how it will affect our business."* *"We can't foresee the situation; we don't know whether it will take longer and we don't know the magnitude of the problem. It is chaos."*
Prioritizing resources/ Changing processes	*"We spent more resources online which we left behind in the past."* *"Some processes or functions were changed or removed at least temporarily."* *"We used the tools and made them more useful."*
Reducing negative impact/ Streamlining resources	*"We reduced our manpower and reduced wages. It became panic."* *"We hibernated some business that is a loss-making or a business that causes us to bleed non-stop in the long run."* *"We recognized that we are overweight and are committed to slimming down."*

Subcategories	Examples of Dialogues
Improvisation	*"It is to improvise on how we have to deal with the crisis and how it will be."*
	"It forced us to figure out how to generate sales."
	"We have to find ways to generate income to survive."
Recovery/	*"We can recover very quickly."*
Endurance/	*"Many technologies allow us to stretch more endurance."*
Stability	*"It is easier for us to adapt than others because we have a lot of support tools."*
Learning/	*"It gave us a good lesson. We know that if we go this way we won't die. It gave us a clear picture to move forward."*
Awareness/	
Visibility	*"It made us very determined to get the new technology; a digital transformation."*
	"It allows us to come back and look at ourselves where we have been over necessary and where we should focus."
	"The disruption made online happen faster. This has been in our plan for ten years."
	"When we have a crisis, we see the fast way to develop ourselves."
	"We should not rely only on one group of customers."
	"The disruption is the catalyst for finding and exploiting opportunities more quickly."
	"The disruption made us realize whether our long-term plans are in the right direction or not so we are now certain on that."
Concerning for customers	*"The ultimate answer is customer-centric. Customers are one of the key aspects that we and everyone consider. We tried to increase the number of loyal customers."*
	"We were more concerned about the impact on our customers. If our real demand customers lose their desire to buy due to facing uncertainty themselves, what will happen in the long term?"
	"What we focus on the most is the customer base that we already have in hand."

Subcategories	Examples of Dialogues
Understanding customers	*"We learn as much as possible about our customers and then work backward to translate that into strategy."* *"We tried to understand the customer journey and know what they want to buy next. The demand and supply will improve, and the importance of data points will increase."* *"Managing customer feelings is important; it is one of the things we must do."* *"We make sure we have the right pricing to satisfy the customers."*
Customer relationship	*"We constantly stay in touch with our customers to check on their well-being, which leads to clientele, and we keep doing it more and more."* *"Everyone has a list of regular customers, and everyone calls their regular customers."*
Customer service	*"We enhanced customer service measures with greater intensity, focusing on providing an excellent customer experience."* *"Before the crisis, we got a certain level of customer service but it will become more."*
New opportunities/ New ways	*"You will be given some sort of idea that we should not focus only on one country and you have to diversify to go to other countries to tap into the other business opportunities. The threats always allow us to grow the business."* *"We had new channels and new groups of customers."* *"When faced with restricted customer visits, we took the initiative to reach out to customers instead. Consequently, we expanded our franchise overseas, tapping into a new market."*
Superior performance/ Maintained performance/ Weaker performance	*"I believe we are superior to our competitors."* *"The firm's performance has maintained."* *"Since we have a stronger structure than before, we are more competitive."* *"The potential of the company has been greatly reduced by COVID-19 due to poor infrastructure in the firm's technology."*