

# Supply Chain Resilience on SMEs' Performance

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Small and Medium Enterprises (SMEs) play a critical role in every economy, and limited studies have highlighted the significance of resilience in the firms. To determine the impact of supply chain resilience on SMEs' performance in Saudi Arabia based on three dimensions of resilience, namely agility, robustness, and flexibility.

resilience

robustness

agility

flexibility

## 1. Introduction

The supply chain issues that affect the SMEs sector have become an increasingly important area of interest for academia and business globally <sup>[1]</sup>, contributing to continuous changes in the business environment, the dynamics of globalization, rapid economic growth, and the spread of the global pandemic COVID-19 <sup>[2]</sup>. Businesses have attempted to improve their supply chains, remain competitive, and achieve higher performance. Whether reactively or proactively, coping with changes has been described by <sup>[3]</sup> as the essence of business management. To succeed in the era of substantial economic disruptions and turbulence in the current supply chain, meticulous market focus has led to strategies that lower the supply chain risks <sup>[4]</sup>. According to <sup>[5]</sup>, firms with the most chance to succeed are those with the ability to rebuild themselves after encountering seemingly daunting market problems, commonly known as resilience. Firms characterized by resilience were able to survive the pandemic and its compounded effects. Ref. <sup>[1]</sup>, it is noted that resilience is the supply chain's ability to bounce back to normal operations after market turbulence.

The SME sector can apply three fundamental constructs of resilience to withstand the disruptions of the COVID-19 pandemic, namely agility, flexibility, and robustness. Agility entails the speed a supply chain takes to counter disturbances <sup>[5]</sup>. Supply chain agility is crucial in handling the current volatile market <sup>[2][6]</sup>. In the existing literature, agility scholars have highlighted agility as positively influencing the supply chain. The pandemic has also been a test for a firm's flexibility <sup>[7]</sup>. According to <sup>[8]</sup>, flexibility is an enterprise's reactive response to build and balance supply and demand. Robustness refers to the proactiveness of a business in anticipation of a change before it happens. The researchers of <sup>[9]</sup> found that robustness and agility were prominent in improving customer value in the supply chain.

## Problem Statement

Consequently, researchers seek to bridge the gap and assist the firms in managing the associated uncertainties with supply chain management operations. Furthermore, this research aids in creating a knowledge base for enhancing the understanding of the link between Supply Chain Resilience and firm performance [6]. Based on available evidence, researchers considered one of the earliest papers conducted in the field of supply chain resilience in the SME sector in the Gulf Cooperation Council countries. To address the above research gaps, this research is based on the following questions: How does supply chain resilience as an internal capability influence the SMEs' performance in Saudi Arabia? How does agility affect SMEs' performance? How does robustness affect SMEs' performance? How does flexibility affect SMEs' performance?

SMEs play a critical role in the global and domestic economy. As per Saudi Arabia's Vision 2030, the SME sector in Saudi Arabia is projected to contribute approximately 35 percent of the Gross Domestic Product (GDP). The feasibility of this Vision 2030 has been threatened and is now dependent on how quickly the resilience of SMEs recovers. The General Authority of SMEs (2020) indicates that the pandemic adversely affected SMEs' marketing, management, and operational performance. The impact on SMEs has led to cuts in employment. Though the government allocated \$20 US billion in stimuli, long-term solutions are needed [10]. SMEs should be equipped with strategies such as resilience to help them survive and thrive. Surprisingly, a limited number of studies highlight the significance of resilience practices in firms.

Prior research into supply chain resilience has primarily concentrated on developed economies [11]. However, contemporary evidence suggests that developing economies suffer the most from supply chain resilience failures [6][12]. Furthermore, SMEs are more vulnerable to disruptions in the supply chain than large corporations [3][13]. This vulnerability is thought to be caused by a lack of sufficient resources (i.e., SMEs usually operate on a limited financial capacity) to tackle these disruptions [12][14][15] or a lack of enough preparation for supply chain issues [16]. Additionally, research into SMEs' resilience practices in supply chains is limited [6][13][17]. SMEs play a critical role in the economy, and limited studies have highlighted the significance of resilience practices in the firms. As Saudi Arabia looks forward to transitioning into a global business hub as one of the major global economies, more studies in supply chain management are fundamental [18].

## 2. Underlying Theory

Researchers consider the role that resilience plays in the performance of SMEs. SMEs are managed, run, and sustained by the supply chain business managers' hard work, capability, wealth, routines, and systems. Therefore, the dynamic capability theory has been chosen. The initial definition of the concept of Supply Chain Resilience is the capability that enables firms to return quickly to normal operations following disruption [1][19][20]. It defines the concept as the ability of organizations to adapt to change and reorganize following a disturbance in supply chains. Firms that are able to persist and transform following a supply chain disturbance have the most effective Supply Chain Resilience [1][3].

The dynamic capabilities theoretical framework, introduced by [1], can be incorporated into the present study. The framework has gained popularity as a useful tool for explaining performance dynamics across firms [9][10]. The

model integrates concepts and strategies that enable businesses to withstand turbulence created by an unstable market. Thus, the dynamic capability theory develops superior organizational performance and competitive advantages [21]. According to [22], dynamic capabilities involve organizations generating and modifying operating practices to achieve a sustainable competitive advantage [21]. The capability view focuses on constructing or encompassing firm resources to develop the firm's capabilities, asking how organizations may contribute to creating sustainable human competencies at work [23]. According to [24], for SMEs to establish a competitive advantage, they must have superior resources and capabilities. However, a firm's ability to deploy these resources or capabilities influences its performance and competitive advantage.

### **3. Supply Chain Resilience**

Resilience is the ability of firms to bounce back to normal operations within a given range of time after market turbulence [1]. Supply Chain Resilience was initially termed as the capability to enhance a supply chain's chance to bounce back when faced with disturbance [1] and is believed to have been borrowed from the field of mechanical engineering. According to [20], resilience as a multidisciplinary concept emerged from material science; it describes the characteristics of a material returning to its original shape after undergoing deformation. In a real-world application, this concept entails the properties of integrating, rearranging, and adapting available resources to respond to external environmental disturbances. The concept of resilience has been recognized in several disciplines, seen in literature domains such as psychology adversities recovery, management of risks and developing threats, and social and ecological vulnerabilities [25]. Holling is accredited as the scholar who first introduced the term to social sciences and differentiated it from the concept of stability (1973). In the context of firms, resilience denotes the capability of a system to withstand disruptions and maintain operations or the ability to bounce back after unplanned events [9]. Supply Chain Resilience is seen as the firm's reactive responsiveness and recovery ability during unstable business environments.

A supply chain comprises the firm, the suppliers, consumers, and other engaged parties in its running. Within the modern social-ecological area, Supply Chain Resilience is viewed as the characteristic that brings about systematic change, adaptation, reorganization, and disruption handling [6]. However, the researchers of [26] believe that the supply chain framework logistics capabilities define Supply Chain Resilience. These capabilities include the low cost of distribution, responsiveness, reliability, and delivery speed. However, researchers [27] have suggested that a supply chain's responsibility is to develop managerial capabilities to prepare for unplanned business disruptions. The researcher refers to the flexibility of the logistic practices in the supply chain through reduced lead time, selecting and verifying suppliers, collaborations with reliable supplier networks, a culture of tackling risks, and various means of transportation of products. Many researchers have stated that an enhanced supply chain resilience depends on the collaboration and diversification of suppliers to cope with unplanned business disruptions [9]. Having a wide selection of suppliers allows the firm to have resources to establish additional Supply Chain Resilience and create a swift production process that can make quick changes when there are disruptions.

According to [9], a strong culture of handling risks and a vast network of suppliers can be combined with using practices [27], such as using certified suppliers, splitting the manufacturing process, and entering into flexible contractual agreements. Another perspective, offered by [28] states that an efficiently running supply chain plans and puts in order its inventory to guarantee the availability of a product and ensure multiple routes of transportation of products. The concern with this kind of strategy is explained by [29] as having redundant stock, which creates higher expenses for the business. However, the extra resources in the inventory ensure a quick company comeback in the event of market interruptions.

Agility encompasses the speed at which a supply chain can counter disturbances [5][30]. A suitable supply chain should be able to bounce back in the shortest time possible after encountering disruptions. Based on the discussion in [5], Supply Chain Agility reflects the adaptability and flexibility of a business's supply chain in a stock market full of hurdles. Ref. [1] postulated that Supply Chain Agility represents the dynamic capability that positively impacts an enterprise's operational performance. That viewpoint is shared by [29], who added that agility requires applying market knowledge and a virtual corporation to seize profitable opportunities in a volatile environment.

The swiftness of a solid ability to act quickly after a disruption to market dynamics is a bigger percentage factored by the capabilities of the trading partners [6]. Therefore, agility, as a concept, has to be pushed beyond a mere firm to its supply chain operations. In a market full of unpredicted changes, agility is useful in enhancing firm responsiveness and effectiveness of the strategies used [30].

Having a diverse, reliable transportation network is echoed by [27], who suggested that capable firms execute a transportation fleet that ensures more effective control and less effort in re-planning. Large multinationals such as Coca-Cola, Atlanta, GA, Toyota, Japan, Proctor & Gamble, and Cincinnati, OH try to maintain operations despite internal or external disruptions [6]. This concept is called Supply Chain Robustness, where the firm carries with its supply chain process despite unplanned events. An example is given by [31], who document that, after the earthquake that hit Japan in 1995, a company was able to reorganize and restart production at most of its plants in a record time of less than a week. The supply chain ensured that the sales and marketing operations of the company resumed.

Robustness is a business's ability to be proactive in anticipation of a change before it happens [3]. In [23], robustness is defined as the reliance on various suppliers instead of a single supplier and having a contingency of waiting suppliers in case of an emergency. A supply chain can remain effective in the future. It maintains performance before and after disruptions and is slow to act on noise factors. Similarly, ref. [6] added that, for modern firms, the robustness of the supply chain is witnessed in their ability to withstand internal and external disturbances and disruptions. Robustness in the supply chain can be examined under different risks, including catastrophic, supply-side, and demand-oriented risks [14]. Catastrophic risks are caused by natural environmental hazards, terrorist attacks, economic instability, civil unrest, and social-political instabilities [23]. Natural hazards could include flooding, droughts, hurricanes, earthquakes, and tsunamis. In most cases, the supply chain has a global influence; local issues can significantly impact the performance of the vast supply chain network. Supply-side links involve poorly executed logistical performance, substandard supply chain quality, product design

changes, technological changes, capacity issues, and risks associated with firm suppliers. An example of this type of risk is the late delivery of resources. Demand-affiliated risks emanate from downstream supply chain activities [6]. These risks are seen in the physical distribution of the goods to the end consumer. There can be considerable differences between the actual and forecasted demand, issues in the operating warehouse, transportation issues, or poor coordination in the supply chain. Demand-side risks can lead to inefficient supply operations, obsolescence, and costly changes.

In the supply chain, the issues affecting robustness are created by the firm having few suppliers, as in single sourcing, supplier dependence, and customer dependence. Global sourcing is also vulnerable due to poor visibility, transparency, and heightened uncertainty. The most effective solution to these vulnerabilities has a well-executed supply chain robustness. Robustness can be achieved by creating greater customer accounts, improved responses, having redundant suppliers, increasing the firm inventory, and adding the firm's capacity [29]. However, according to [23], robustness and resilience should be taken up as performance outcomes. This viewpoint borrows from the research-based view that suggests that the supply chain disruptions lead to the necessity to create supply chain resilience and robustness. Firms see the need to develop robustness due to the short- and long-term threats caused to the organizational performance by different market disruptions

Flexibility is the reactive response that an enterprise needs in building and balancing its supply and demand [8]. Flexibility is the capability of the firm supply chain to change its possible options and differentiate the degree of variation in coping with different market conditions. In contrast, ref. [8] suggested that flexibility is the ability to quickly acclimatize to novel situations. With flexibility, a firm can survive market disruptions due to the ability to circumvent conditions that could hinder various operations [7]. An instance of Supply Chain Flexibility is seen in provisions. With flexibility, it is possible to change the source of materials or the channel for obtaining resources. The same goes for the management, or as it is called in [26], the execution of orders, in that administration should have a contingency plan when unexpected changes occur.

Ref. [23] found that the concept of flexibility goes hand-in-hand with agility. An example of this link is when the supply chain process is modularized, enabling actions such as using strategic resources, postponing production, using a flexible supply channel, switching between the norm of buying or making, using different modes of transport, and managing price and revenue. In a firm, the concept of flexibility can be put into place using tangible and intangible resources [7]. Financial resources are an example of resources that can be harnessed to absorb ups and downs in the market. Security stocks are also an effective way for a firm to absorb market disruptions. However, according to [1], the different sources of flexibility are essential to lowering costs and creating competitive advantages. In contrast, ref. [29] believed that the use of operational buffers for flexibility could cause redundancy

## **4. Firm Performance**

A firm is said to be made of various business functions, including market, sales, and production performance. A combination of these variables leads to general performance. The researcher recognizes that there are other functional areas, including research and development, human resource management, and financial management.

The study follows [22]'s concept of primary and secondary functions making up a firm's supply chain, focusing on production performance and market and sales performance (2001). According to [24], production, market, and sales are among the salient functional areas for many modern SMEs in the technological sector. Firms should not be looked at as a single entity but rather as a combination of the sum of various functional areas, i.e., market, sales, and production. This perspective is important in enabling managers to discern if the functional areas of their firm are performing differently from rival businesses. The value chain is used in differentiating various relationships among functional variables.

The value chain systematically reviews the different activities in a firm and how they correlate. The value chain system may impact marketing approaches used in the business on overall organizational performance. The study by [5] used a value chain to explore the relationship between firm performance and new product development practices. Scholars have examined the relationship between the market and sales practices on the overall firm performance. Effective and quality production function leads to more effective marketing, increasing sales [28]. Therefore, it is clear that the stated function is closely linked, leading to an internal value chain that affects the firm's performance. Whether global or domestic, supply chain operations are regularly disrupted by both internal and external events [1]. Unforeseen events affecting most businesses include earthquakes, diseases like COVID-19, war, typhoons, and tsunamis [2][8]. Internal threats such as economic recessions are also devastating to SMEs' overall performance and functionality [32]. Furthermore, new technologies, loss of customers, and the state of infrastructure threaten a firm's sales, marketing, and output.

Supply chain success depends on the firm's level of resilience and how it handles the threats. The issue is sensitive to SMEs due to the dynamics of the sector. Supply Chain Resilience practices enable firms to cope with quick changes through flexibility [7]. Agility and robustness enable the business to configure its market, sales, and production in a way that relies on creating competitive advantages over rivals. Ref. [33] argued that resilience can be created in a firm through robustness and agility. Moreover, ref. [34] added factors such as risk management, leadership, and innovation. Flexibility and redundancy created through robustness strategy have also been found by [7][35] to be advantageous to the movements of firms' products and enhance the overall performance levels of a firm's supply chain.

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