Strategic Alliance for Resilience in Supply Chain

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Resilience is a particularly important quality for supply chains in this turbulent environment. Resilience in the supply chain is the ability to retain, resume, and recover operations after an intense destructive incident. One of the strategic solutions for managing supply chain disruptions is to establish collaboration and strategic alliances in order to achieve competitive advantage.

Keywords: strategic alliance ; supply chain resilience ; resilient supply chain ; bibliometric analysis

1. Introduction

In recent years, the number of studies in the field of supply chain resilience has increased. Both managers and scholars are more concerned about the impact of widespread disruptions in the supply chain and pay attention to controlling the factors that affect the supply chain [1]. These disruptions are irreparable and usually occur due to natural disasters, fires, terrorist activities, or environmental changes [2]. Therefore, it is necessary to decrease the impact of supply chain disruptions through resilient actions [3]. Indeed, resilience in a supply chain can be defined as a company's ability to resist disruption, recover to the original state, and even move toward a more favorable situation after experiencing disruption. Resilience reveals the extent to which a supply chain is able to withstand disruptions while maintaining function [4].

Resilience seeks to expand the supply chain's capacity to respond quickly to a change in demand [5]. The occurrence of events that cause disruption to the supply chain, even if these events take place far away, can create disruptions on a large scale. These disruptions can ripple through the supply chain and lead to many negative effects. If the supply chain's activities cannot manage disruptions well, it will be faced will potentially negative consequences, which in turn increases the risk of continued forecast of the business [6] and leads financial losses that cannot be compensated. Pandemics, economic recession, and more remind us that we live in a constantly changing and unpredictable world [7] and there is no way to eliminate the risks of and disruptions to the supply chains. To reduce the risk, supply chains must be multi-faceted and designed in a way that prepares them for any course of events, so that they are able to return to the original or even an improved stage after a disruption in addition to providing an effective and efficient response; this is what supply chain resilience means [8]. Overall, supply chains are vulnerable to disruption and a reduced cost, high qualities, a reduced lead time, and a higher level of service are not the only factors that determine their competitiveness. The ability to overcome various disruptions that could put the supply chain at risk is among important factors that determine supply chain competitiveness; therefore, supply chains must be resilient [9].

There are several factors in the supply chain that can increase resilience [10][11]. The concept of resilience in supply chain is still new, and there is a notable gap between expectations of scholars and experiences [12]. While resilience can be derived from a wide range of supply chain functions, strategies of collaboration, agility, flexibility, and redundancy are recognized as the most important capabilities to improve a company's response to supply chain resilience [13][14]. Shekarian and Mellat Parast [15] revealed that collaboration is the most important factor for managing control risk; a low level of collaboration and minimal flexibility have a great impact on supply chain resilience [16]. In addition, Wieland and Wallenburg [17] indicate that "communicative and cooperative relationships have a positive effect on resilience".

Yet, when faced with an uncertain environment, many companies choose alliances as a way of collaboration to reduce disruptions [18]. Alliances can increase the use of resources, learning, and development of corporate activities. Additionally, the communication network created by the alliance can moderate the unpredictability of the environment, increase predictability and flexibility, and provide adaptation to environmental changes [19]. Collaboration through alliances leads to sharing of information, equipment, and strategic plans and enables supply chain members to gain resilience [20].

2. Supply Chain Resilience

Supply chain includes a collective of people, processes, resources, and information that are responsible for turning raw material into products and delivering them to the customers. A supply chain generally consists of several stages that include customers, retailers, wholesalers, producers and suppliers of raw materials and machinery [21]. Every stage of a supply chain is connected to others through the flow of goods, information, and money; this exchange usually flows both ways [22].

Today's competitive market involves a high level of adaptability and uncertainty, which makes the supply chain even more vulnerable and leads to greater risks. At the same time, the issues of globalization, short life spans for products, and greater demand from customers have had undesired effects on the supply chain. In recent years, due to various events that have taken place, the topic of supply chain vulnerability and disruption has received immense attention. The managers of different organizations have reached the important conclusion to manage supply chains in such a way that they are responsive to change [23].

The first step to explaining resilience in the context of supply chain was taken by Rice and Caniato [24]: the ability to react to an unexpected disruption, such as a terrorist attack or a natural disaster, and return to the natural order. Nest, Christopher and Peck [25] and Sheffi and Rice [26] offered brief conceptions on the notion of supply chain resilience. Theoretically, perhaps the broadest definition of supply chain resilience is from Ponomarov and Holcomb [8]. They defined supply chain resilience as "The supply chain's adaptability to prepare for unexpected events, respond to disruptions, improve by maintaining operations on the desired communications level, and exert control on the structure and the operation". Grotsch et al. [27] suggested that supply chain risk management pursues the specific purpose of creating and maintaining a resilient supply chain. Accordingly, some studies show that supply chain resilience can create a sustainable competitive advantage and a more resilient supply chain by maintaining adaptability and expanding the required capacities.

Ja'farnejad and colleagues [28] started a study titled supply chain resilience in the medical equipment industry. The goal of this study was to find the key factors influencing the resilience and flexibility of the medical equipment supply chain, which plays a critical role in the functioning of the health system on a national level, and eventually examine and analyze the dynamic relations of these factors, use the Delphi method to identify the key factors in supply chain resilience, and analyze the relations between these factors using the dynamic system method.

Rajesh and Ravi [29] used the grey methodology to create a model for choosing a supplier and developing supply chain resilience. They selected an electronic supply chain with six alternative suppliers as a case study and, by calculating the grey possibility values for supplier selection, prioritized them. The qualities they took into consideration for a resilient supply included quality, cost, flexibility, speed, transparency, vulnerability, collaboration, risk awareness, persistency, technology, research and development, security, and environmental concerns.

Ambulkar et al. [30] studied how reconfiguration of resources and risk management infrastructure can affect the relations between different types of disruptions and companies' resilience. In this regard, they found that reconfiguration of resources plays a critical role when it comes to high-impact disruptions. Nonetheless, risk management infrastructure is also a key factor in responding to low-impact disruptions.

3. Strategic Alliance

With increasing uncertainty in the global atmosphere, companies have turned to strategic alliances to maintain their competitive advantages [31]. Strategic alliances have become an important part of the companies' global strategies and are used by commerce managers to achieve different strategic goals. Strategic alliances are voluntary agreements between companies that include the exchange, sharing, or shared development of products, technologies, or services. These alliances can have different types and occur on vertical or horizontal lines [32].

Businesses no longer act as independent entities due to their competitive nature; they compete by joining the supply chain alliance. Therefore, suppliers, producers, logistics companies, and retailers always form stronger horizontal or vertical alliances for competing in the supply chain. Immunization of technologies and critical knowledge, expansion of entries and shares in the market, and spreading out of costs and risks are the three main advantages to creating alliances in supply chains. An alliance is a flexible tool for learning, a method to transfer knowledge effectively among partners and join resources, and a way to realize technological potentials and other complex capacities [19].

When facing an uncertain environment, many companies seek alliances as a strategy to reduce their risk with the main stakeholders [18]. The alliance configuration capacity allows a company to choose its network of inter-organizational partnerships for confrontation with changing environmental conditions [33]. This capacity includes skills such as identification of valuable alliance opportunities, alliance design, alliance coordination, and alliance learning integration [34]. This ability allows the company to explore new markets with its new partners [35], shape the environment in response to changing customer needs by offering new products through strategic alliances, and stabilize the environment by using the alliance and creating a competitive advantage [36].

Although many alliance studies place emphasis on learning and relationship capital in creating competitive advantages, there is limited focus on the process of transferring resources and abilities, as well as integration [37]. Alliances can maximize the use of resources, learning, and development of companies' activities. Alliances are dependent on investments and relational structures that facilitate joint learning and provide advantages for cooperation and interaction. Factors determining success of alliances have a close connection with the network's capacity and a high level of trust among partners. Alliances can increase the chance for partners to enter novel technology fields, while the communication network created as the result of an alliance can also balance the unpredictability of the environment, increase the predictability and flexibility, and facilitate greater adaptability with the changing environment. Alliances can strengthen coordination and integration of inside and outside company processes and positively increase the value of partner companies [38].

4. Strategic Alliance and Collaboration Influence over Supply Chain Resilience

Collaboration means working together on a joint project. Since the resilient supply chain is a network, supply chain members must arrange all their forces to deal with a disruption when it appears. Thus, collaboration reduces mistrust and prepares the unit to deal with events. In addition, collaboration has been introduced as a glue that sticks the supply chain members together at times of disaster.

Collaboration prevents the opportunist behaviors of certain members that negatively affect the response capacity of the whole system. Coordination of decision-making is among the important factors in collaborating; eventually, collaboration is essential in terms of sharing the gained experiences among members after overcoming a crisis to better prepare for confronting future crises.

Supply chains need advanced abilities to oversee, report on, adjust, explore, and analyze all the events that have taken place. To be able to manage such events, there is a need to collaborate with partners and suppliers of goods and services. In the current competitive climate, all companies face numerous challenges, including supply chain disruptions, short lifespan of products, and natural and synthetic disasters. Yet, companies cannot respond alone to such challenges. They need to collaborate with their supply chain partners and beneficiaries to be more prepared to face such challenges. Entering the alliance and collaborating with the supply chain partners can help strengthen supply chain resilience. A main component of this collaboration is the sharing of information and data. Supply chains must become more resilient. Increased vision within the supply chain has become an important strategy for all companies. Observation in events related to supply chain partners, as well as the ability to respond and adjust, are among the features that shape a resilient supply chain. Long-term joint partnerships are considered to reduce such risks; therefore, companies need to focus on improving their cooperation, speed of interactions, and integrating the process with their supply chain partners. To create resilience, the business processes of all partners must be deeply intertwined. Information must flow among supply chain members smoothly and quickly. Communication is the main point since plans change, orders change, and the quality of information, production, inventories, and transportation directly affects the supply chain and must be discussed among partners.

With the growth of supply chains across international borders, the requirement for supply chain members to abide by different laws in several countries. Trustworthy supply of materials is essential in all supply chains. In a resilient supply chain, suppliers must demonstrate the same characteristics presented by the central company. Supply chain members must be as predictable in abnormal times as they are in normal times. Many scholars have studied supply chain collaboration and its advantages since the 2000s [39][40]. Companies that collaborate can improve their business performance, boost their customer satisfaction, increase the market share, and gain more income while strengthening their positive relationship with supply chain partners. Collaboration can lead to development of implicit and explicit knowledge [41] to support the competitive advantage and stability of the supply chain. Banomyong [42] examined that collaboration between beneficiaries and alliance making can help build resilience in supply chains. He explored innovative ways like collective transportation, sharing profits, and stock economics to improve supply chain performance and

strengthen supply chain resilience, and showed that sharing data plays an important role in supporting a close partnership between the beneficiaries.

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