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Supply Chain Resilience in the Face of Global Disruptions: Strategic Responses of Multinational Firms

Zeye Xu

College of Business, Stony Brook University, Stony Brook, USA
zeye.xu@stonybrook.edu

Abstract. Over the last decade, serious global supply chain disruptions such as pandemics, political tensions, and climate events have been on the increase. These crises have revealed vulnerabilities within globally integrated operations, leading firms to re-examine their resilience plans. This paper will discuss the actions of multinational firms that react to international shocks by adopting resilience-promoting solutions. This paper presents a literature-based study that utilizes the resource-based view and dynamic capabilities theory to analyze how firms develop dynamic, collaborative, and flexible supply chains. The central research question addresses how multinational companies develop resilience strategies and deploy them in situations of global disruption, as well as the potential capabilities and tools to support this resilience. This paper identifies key strategies documented in existing scholarly literature, namely digital transformation, supply base diversification, and cross-border coordination. The findings indicate that resilience may be viewed as a risk-reducing instrument and strategic asset, which helps a company to sustain operations and remain competitive in a crisis. The paper ends by giving implications on the theory and practice, which underline the fact that the supply chain design should constantly evolve.

Keywords: Supply chain resilience, global disruptions, dynamic capabilities, multinational firms, digital transformation

1. Introduction

Multinational enterprises (MNEs) are becoming more vulnerable to disasters due to pandemics, geopolitical tensions, and climate-related disasters that are taking their toll on global supply chains [1]. Such disruptions have led to a shift from efficiency-focused models to resilience-enhancing ones [2]. Strategic capability, as a long-term source of competitiveness, has increasingly been examined in relation to resilience (predictive, shock-absorptive, and recuperative) [3].

According to recent literature, such enablers of core resilience are agility, redundancy, digital integration, and a cross-collaborative network [4]. The Resource-Based View (RBV) [5] and Dynamic Capabilities Theory (DCT) [6] define resilience as an organizational capability that firms can develop internally and leverage to respond effectively to turbulent environments. Consistent with this, contingency theory suggests that approaches to managing uncertainty are context-dependent; resilience measures must therefore be tailored to fit environmental conditions [7]. The

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recovery process after the disruption caused by climate change is influenced by the complexity of the network and social capital [8].

Another critical pillar is digital transformation, which enhances visibility and responsiveness through technologies such as data analytics and real-time tracking. Notably, JD.com's integrated digital systems supported business continuity during the COVID-19 pandemic [9]. Empirical evidence also underscores the need for resilience strategies and institutional support (e.g., government infrastructure and digital policies) to be closely aligned [10].

This paper utilizes a literature-based methodology, where the author evaluates how MNEs become resilient to global disruption. It investigates how MNEs achieve supply chain resiliency and how they cope with uncertainty through capabilities and strategies.

This research paper is aimed at giving theoretical knowledge and practical guidelines on how to come up with resilient and dynamic global supply chains.

2. Theoretical framework

There are four complementary theoretical frames on which the paper is founded, among which are Supply Chain Resilience (SCR), the Resource-Based View (RBV), the Dynamic Capabilities Theory (DCT), and the Contingency Theory. Together, these frameworks not only explain the notion of resilience, but also the ways in which multinational enterprises (MNEs) develop and deploy the notion of resilience in the turbulent global environments.

The concept of supply chain resilience has evolved, with the focus now on strategic supply chain management, as opposed to recovery. In the initial stages of the study, the term resilience is used to refer to the ability to recover operations after a disruption [11,12]. New studies present a development of this observation and compare resilience with absorptive, adaptive, and transformative potentials that make firms restructure their operations to emerge stronger following a crisis [13]. Such an expanded knowledge is one that recognizes that disturbances are commonplace rather than extraordinary. However, resilience comes with its share of challenges and trade-offs. For instance, flexibility, buffers, and redundancy investments may be incompatible with the efficiency aim and may cause trade-offs between efficiency and robustness by managers [14].

The Resource-Based View has been the micro-foundational explanation of resilience. RBV supposes that competitive advantage is grounded on valuable, rare, inimitable, and non-substitutable resources [5]. Such resources in the supply chain context include relational capital, knowledge integration mechanisms, and digital infrastructure. These are non-physical resources that enhance coordination in international networks and the ability to respond to disruptions [1]. In the RBV approach, resilience is achieved not through structural redundancy, but from an organizational capacity that differentiates firms in turbulent markets.

The Dynamic Capabilities Theory builds on this argument but puts more emphasis on the processes rather than fixed assets. Teece et al. argue that firms should perceive the changes in the environment, seize new opportunities, and adjust business operations internally to the new changes [15]. Lifelong learning, fast decision-making, and reconfiguration are the ways in which resilience in disruptive environments is exhibited. Thus, DCT defines resilience as an evolutionary capability developed through managerial cognition and organizational adaptation [2,4].

Finally, Contingency Theory focuses on matching context. Resilience strategies must be aligned with environmental volatility, industry structure, and network complexity [7]. These differences between pharmaceutical and consumer goods can be substantial. Therefore, resilience is not something that can be prescribed, and it has to be applied strategically.

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3. Strategic resilience capabilities of MNEs

Chapter 3 uses the theoretical backgrounds that have been established to examine the manner in which multinational enterprises operationalize resilience in global supply chains. Instead of the theoretical discourse, it focuses on empirical implementation and examines the interaction of firm resources, responsive processes, and strategic decision-making in the face of disruption. Resilience is thus viewed as a dynamic, evolving capability shaped by learning, reconfiguration, and context-sensitive managerial action.

3.1. Agility as an adaptive capability

Within the DCT framework, agility falls under the dimension of sensing and seizing—the organizational ability to identify changes and rapidly mobilize resources [15]. Corporations such as Procter & Gamble quickly adapted to COVID-19 by localizing manufacturing and redirecting logistics to affected regions [16].

Organizational decentralization and digital connectivity aid agility. For instance, in the case of using digital platforms at Schneider Electric, regional teams could make timely decisions and prevent overload of the corporate level [5]. Flexibility is extended to the product mix. Substitution of inputs or the manufacturing time schedule can also be done by the modular product design firms to ensure the throughput.

Moreover, in-house training is used to develop agile skills, and cross-functional teams are formed. The operations, procurement, and logistics functions are closely linked with each other, which facilitates faster and more responsive decision-making. Agility is not technology but the culture that is the ability of the employees to move quickly with clear-cut instructions in case there is a crisis within the organization [13].

3.2. Redundancy and supply base diversification

Redundancy has traditionally been viewed as inefficient; however, it has recently been revalued as a form of strategic insurance. It is the induced shock absorption of critical resources that are deliberately duplicated, such as through a dual-sourcing strategy, buffer inventory, or multi-location warehousing. According to a McKinsey Global Institute survey (2021), 40 percent of MNEs reported increased supplier redundancy in the wake of COVID-19, particularly in pharmaceuticals and semiconductors [17] (See Figure 1). This is consistent with the RBV, under which, in unpredictable conditions, slack resources (e.g., excess capacity) are useful.

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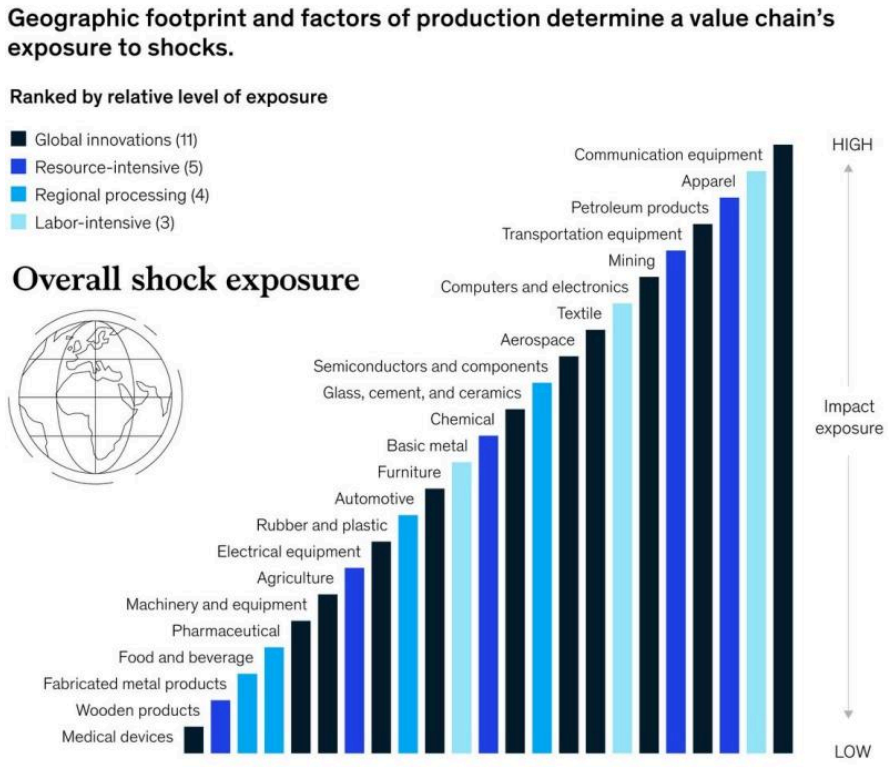


Figure 1. Factors exposing value chains to shock [17]

Contingency Theory is also supported by diversification strategies that differ according to context. For example, nearshoring models were used by companies highly reliant on Asian-based suppliers to minimize geopolitical risk. Electronic chip sourcing was diversified among automotive companies to protect against factory closures in Taiwan and Malaysia [7,18].

3.3. Collaboration and network resilience

The cross-tier collaboration improves the resilience through the existence of relational capital- trust, shared objectives, and congruent motivation. This is a core part of RBV, in which such intangible assets become the foundation of long-term capabilities [19]. According to Wieland and Wallenburg , information and planning sharing between suppliers and customers can significantly mitigate the effects of disruption [20]. For example, JD.com coordinated with last-mile service providers and warehouse operators during lockdowns to maintain delivery schedules [9]. Chowdhury and Quaddus empirically confirmed that firms with high levels of supply chain collaboration recovered nearly 30 percent faster from disruptions. These alliances enable resource pooling (e.g., common transport or backup warehousing) to form a more responsive network [21]. Moreover, the flexibility of contracts and the transparency of communication throughout the supply chain enable more fluid adjustments in the event of disruption. These relationship processes improve the absorptive and adaptive ability of the whole ecosystem.

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3.4. Strategic fit and organizational learning

Agility, redundancy, and collaboration are valuable capabilities, but their effectiveness depends on strategic alignment. According to Contingency Theory, resilience strategies must align with environmental complexity [7]. An example would be that redundancy is needed in volatile markets (e.g., energy or semiconductors), but not in stable markets (e.g., paper goods).

Machineries of learning are important. Strong organizations conduct a post-disruption audit to learn lessons, enhance processes, and restore supplier scorecards. These are the steps that constitute the transforming capacity of DCT, through which organizational practices are changed via experiential learning [22].

Resilience is not an initial investment; it is a planned and ongoing process. It is anchored on the ability of the company to evolve, the application of digital skills, and the establishment of international partnerships [9]. When these theories are applied to such capabilities, MNEs not only survive crises but also build sustainable competitive advantage post-crisis.

3.5. Limitations of the strategic resilience framework

This discussion reveals that although agility, redundancy, collaboration, and organizational learning are key pillars of supply chain resilience, they cannot be used alone when operating in a more complex and digitally interconnected global network. Agility can be overly reactive; redundancy can be costly and inefficient; collaboration can be constrained by regulatory and power imbalances; and institutionalized organizational learning can be uneven or slow. All these restrictions demonstrate the gap between the structural adjustment of old models of resilience and the realities of cascading disruptions, geopolitical instability, and uncertainty after the pandemic [8,11,13]. Buffering and relational coordination cannot be the basis of resilience any longer; rather, resilience requires the presence in the system, foresight, and interconnected judgment. To address these gaps, resilience must be embedded into technological systems to enable real-time sensing, predictive intelligence, and rapid response [19,20]. The following chapter, therefore, explores digital transformation as a strategic enabler that enhances and broadens resilience in global supply chains.

4. Digital transformation as a resilience enabler

Supply chain resilience, which is based on the digital transformation, is also a feature of the post-COVID world. It drives innovation, automation, and the execution of real-time decision-making and an agility strategy. The chapter explains the utilization of digital technologies to promote resilience at three levels, which are visibility and control, predictive analytics, and strategic integration.

4.1. Visibility and control

Supply chain endurance is founded on visibility. Cloud-based solutions, control towers, and Internet of Things (IoT) sensors can be used to monitor the value chain in real-time. These tools also provide more detailed data on supplier locations, supply chain bottlenecks, and inventory levels, which can be applied to identify disruptions at the initial stages [23]. The sensemaking ability, as defined by the Dynamic Capabilities Theory (DCT), is supported by the visibility, in which the location of firms enables them to perceive the changes occurring in the environment and react to them [15]. For example, Unilever used digital dashboards to monitor shipping delays during the pandemic and to enable real-time rerouting of cargo ([16,24,25] (See Figure 2).

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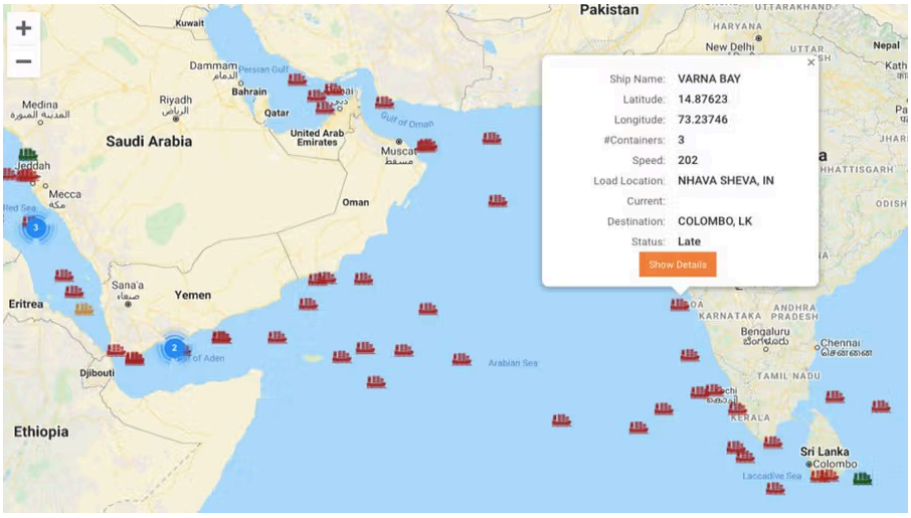


Figure 2. Unilever's Virtual Ocean Control Tower dashboard for fleet management [25]

As shown by the example above, digital visibility is a key determinant in the e-commerce environment. The existing supply chains must respond to the changing consumer demand trends, and thus, both need end-to-end visibility and real-time decision-making. The use of the control tower strategy enabled Amazon to localize inventory and reduce delays during lockdowns [26].

Collaboration is also made possible by visibility. MNEs can use digital channels to exchange real-time information with their suppliers and logistics vendors to minimize the bullwhip effect and enable collaborative decision-making. This connectedness is the focus of the Resource-Based View (RBV) in which digital platforms are distinctive firm resources that generate enduring advantage [19].

4.2. Predictive tools and scenario planning

Supply chains have shifted from being event-driven to being predictive-analytics-driven. Artificial intelligence (AI) and machine learning (ML) algorithms process large volumes of structured and unstructured information to predict disruptions and recommend optimal responses. For instance, the COVID-19 crisis demonstrated that Schneider Electric used AI to model various disruption scenarios and adjust sourcing plans [5]. These systems enhance the functions and capabilities of seizing and transforming under DCT by offering firms situation-based planning instruments that support real-time operational changes.

Predictive tools are also very contextual. According to Contingency Theory, the firm's environment must be complex and volatile; otherwise, the analytical models should capture these characteristics [7]. Examples of predictive tools include modelling lead-time variability in regulated markets by a pharmaceutical company and modelling raw-material shortages by an electronics manufacturer.

In short, predictive analytics can combine internal enterprise and external macroeconomic indicators, enabling firms to redesign distribution networks, adjust prices, or proactively focus on high-margin customers.

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4.3. Strategic integration and alignment of digital capabilities

Many companies fail to achieve digital maturity because of a lack of alignment between digital investments, business models, governance processes, and organizational culture. Strategic integration and alignment demand that digital tools must be integrated into the fundamental decision-making frameworks instead of the technological programs working as a standalone initiative. JD.com illustrates a good example of such alignment. On one hand, the adoption of AI and automation in warehouses and optimizing routes resulted in the company cutting by a third the time spent fulfilling orders in the event of COVID-induced demand spikes [9]. This is reflective of the RBV perspective in which digitally entrenched capabilities prove hard to replicate and create a long-term competitive advantage.

Besides, cross-functional procurement, production, and distribution can be integrated using enterprise systems like SAP Integrated Business Planning (IBP) and Oracle SCM. When combined with AI, these platforms become strategic assets that improve decision quality and reduce latency. Training is also crucial. According to Braunscheidel and Suresh, digital tools should be complemented with the upskilling of the workforce to help achieve their full potential [27]. Employees must be equipped to interpret analytics and respond rapidly when disruptions occur.

Overall, digital transformation helps to enable resilience due to increased visibility, predictive flexibility, and strategic alignment. Digital tools are not just enablers as perceived through DCT and RBV, but are integrated into the adaptive and competitive ability of the firm. MNEs that invest in strategic digital integration will be better positioned to withstand future shocks and capture long-term benefits.

5. Conclusion

This paper discusses how multinational companies can stabilize themselves against supply chain shocks across the globe. This paper discusses two key points: how multinational enterprises construct supply chain resilience and the strategic capabilities they use to deal with uncertainty. In recent scholarship, resilience has been found to be a dynamic capability, not based on a discrete quality, but encompasses agility, collaboration, redundancy, and digitalization. Strong supplier relationships, buffer capacity development, and supplier diversification are among the key measures implemented by robust MNEs to strengthen their supply chains. These activities are further supported by investments in digital technologies, which provide real-time information and forecasting. The evidence from the cases also shows that integrated supply chain systems, such as the one adopted by JD.com, are far more effective at responding to disruptions.

The study also has its deficiencies despite its contributions to theoretical and practical knowledge. As a literature review lacking primary data, it is difficult to generalize the findings to specific industries. Future research should be done using empirical research via intersectoral analysis to study context-specific differences in resilience. Resilience investments, particularly those in resource-limited environments, should also be taken into account in terms of cost. Overall, supply chain resilience has become a necessity for companies worldwide operating in volatile environments. The MNEs will not only be able to survive but also thrive even in the face of a crisis thanks to strategic alignment, capabilities, and technology. The environmental risks are dynamic, and therefore, resilience is one of the important features of the supply chain strategy in a business.

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