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**The relationship between supply chain disruptions
and financial performance in the manufacturing
industry**

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ABSTRACT:

This thesis examines the impact of supply chain disruptions on the financial performance of manufacturing companies. The aim is to understand how logistics-related disruptions affect financial performance and how supply chain resilience can moderate these effects. As global supply chains become increasingly complex and vulnerable to disruptions, understanding their financial outcomes is important for manufacturing firms operating in uncertain environments.

This study has been conducted as a narrative literature review. It focuses on defining supply chains and logistics disruptions in the manufacturing industry, examining resilience practices, and linking these theoretical insights to financial performance. The study uses primarily research material published in the 2000s.

The literature review suggests that common disruptions in the manufacturing industry include transportation interruptions, supplier delivery disturbances, and infrastructure bottlenecks. These disruptions influence financial performance through increased operational costs, reduced capacity utilization, revenue losses, and negative investor reactions. Financial impacts are measured using various indicators such as return on assets, return on equity, and shareholder returns. The literature indicates that supply chain resilience weakens the negative relationship between disruption exposure and financial performance.

In conclusion, logistics disruptions represent not only operational challenges but also serious financial risks, and resilience is essential for reducing their negative effects on the performance of manufacturing firms.

KEYWORDS: supply chains, manufacturing industry, resilience, risk management, disturbances, economic condition

VAASAN YLIOPISTO**School of Technology and Innovations**

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TIIVISTELMÄ:

Tutkielmassa tarkastellaan toimitusketjuhäiriöiden vaikutusta valmistavan teollisuuden alan yritysten taloudelliseen suorituskykyyn. Tutkielman tavoitteena on selvittää, miten logistiikan häiriöt vaikuttavat yritysten taloudelliseen suorituskykyyn ja miten toimitusketjujen resilienssin avulla näitä vaikutuksia voidaan lieventää. Globaalien toimitusketjujen monimutkaistuminen ja toimintaympäristön epävarmuuden kasvu ovat lisänneet häiriöiden esiintyvyyttä, minkä vuoksi niiden taloudellisten vaikutusten tutkiminen on tärkeää valmistavan teollisuuden yritysten kilpailukyvyn kannalta.

Tutkielma on toteutettu narratiivisena kirjallisuuskatsauksena. Sen keskeisessä osassa on toimitusketjujen ja logistiikkahäiriöiden määrittely valmistavan teollisuuden alalla, toimitusketjujen resilienssin tarkastelu sekä taloudellisen suorituskyvyn määrittelemine ja mittaaminen. Lisäksi edellä mainittuja teoreettisia näkökulmia yhdistämällä tarkastellaan niitä mekanismeja, joiden kautta logistiikkahäiriöt heijastuvat yritysten taloudellisiin tunnuslukuihin. Tutkimuksessa käytetään pääosin 2000-luvulla julkaistua tutkimusaineistoa.

Tutkielmassa tehdyn kirjallisuuskatsauksen perusteella voidaan todeta, että valmistavan teollisuuden yleisimpiä toimitusketjuhäiriöitä ovat kuljetuskatkokset, toimittajien toimitusviiveet sekä infrastruktuurin pullonkaulat. Häiriöiden havaittiin heikentävän taloudellista suorituskykyä muun muassa lisäämällä operatiivisia kustannuksia, alentamalla kapasiteetin käyttöastetta, aiheuttamalla liikevaihdon menetyksiä sekä synnyttämällä sijoittajissa negatiivisia reaktioita. Taloudelliset vaikutukset heijastuvat erityisesti kannattavuutta ja pääoman tehokasta käyttöä kuvaaviin tunnuslukuihin, kuten sijoitetun pääoman tuottoa, oman pääoman tuottoa ja osaketuottoja mittaaviin lukuihin. Tutkimuskirjallisuus korosti, että toimitusketjun resilienssi lieventää häiriöiden ja taloudellisen suorituskyvyn välistä negatiivista yhteyttä.

Tutkimuskirjallisuuden perusteella voidaan todeta, että toimitusketjuhäiriöt muodostavat merkittävän taloudellisen riskin valmistavan teollisuuden yrityksille. Resilienssikäytänteiden kehittäminen voi kuitenkin lieventää näiden häiriöiden vaikutuksia ja tukea yrityksen taloudellista suorituskykyä.

AVAINSANAT: toimitusketjut, valmistava teollisuus, resilienssi, riskienhallinta, häiriöt, taloudellinen tila

Contents

1	Introduction	7
1.1	Purpose of the study	8
1.2	Research objective and questions	8
1.3	Scope and limitations	8
1.4	Research methodology	9
1.4.1	Research design	9
1.4.2	Data collection and analysis procedure	9
1.4.3	Reliability and validity	11
1.4.4	Ethical consideration	12
1.5	Structure of the thesis	12
2	Supply chains	13
2.1	Supply chains in the manufacturing industry	14
2.2	The role of logistics in supply chains	16
2.3	Logistics disruptions	17
2.3.1	The most common logistics disruptions in the manufacturing industry	19
2.4	How logistics disruptions are measured in the manufacturing industry	20
3	The role of supply chain resilience	22
3.1	Logistics-specific resilience practices	24
3.2	Resilience as a disruption-performance moderator	25
4	Financial performance	27
4.1	Measuring financial performance	27
4.2	Financial impact mechanisms of logistics disruptions	28
5	Discussion and conclusions	30
5.1	Findings	30
5.2	Evaluation of source reliability	33
5.3	Limitations and suggestions for future research	33
	References	35

Appendices	40
Appendix 1. Statement on the use of artificial intelligence (AI)	40
Appendix 2. List of the reviewed articles according to the theme	41

Figures

Figure 1. Supply chain as a figure.	13
Figure 2. Horizontal, vertical, and spatial complexity of the upstream supply chain	15
Figure 3. Supply chain resilience (Ivanov et al., 2014).	23

Tables

Table 1. Boolean operators used in searching articles.	10
Table 2. Adapted from Ho et al. (2015), logistics-related risks in supply chains.	19

1 Introduction

In the modern manufacturing industry, firms operate in a highly networked environment and depend on complex supply chains that enable the timely flow of materials, components, and finished products. Over the past few decades, globalisation and the outsourcing of procurement have lengthened and dispersed these supply chains. While these developments have generated cost savings and improved efficiency for companies, they have simultaneously increased the vulnerability of supply chain disruptions (Christopher & Peck, 2004).

In recent years, disruptions in global supply chains have received increasing attention. The Covid-19 pandemic, the temporary closure of the Suez Canal due to an accident, as well as other geopolitical events, have demonstrated how quickly logistics chains can be disrupted and how widely the resulting problems can affect companies operating globally. For instance, the closure of the Suez Canal left goods worth more than 26.5 billion dollars stranded on vessels, causing inventory carrying costs of 76.3 million dollars, which further increased customers' financial burden through the growth of pipeline inventories (Tran et al., 2025, p. 11).

The impact of supply chain disruptions on a firm's financial performance is important to study, as such disruptions can significantly influence how a company performs in the long term (Hendricks & Singhal, 2005). Moreover, understanding the economic consequences of supply chain disruptions helps firms to assess the associated risks and thereby develop risk management plans. Various risk management measures, such as safety stocks and alternative transport routes, can mitigate the negative financial effects of disruptions. Taken together, these considerations highlight the need to understand how disruptions in logistics affect firm performance and how companies can strengthen their supply chains against such events.

1.1 Purpose of the study

The purpose of this study is to examine how logistics-related supply chain disruptions affect the financial performance of manufacturing companies and how supply chain resilience practices can mitigate these effects. The study focuses on logistics-related supply chain disruptions, the most common logistics disruptions in the manufacturing industry, and how these disruptions translate into financial outcomes and the financial indicators that best capture these disruptions' effects.

1.2 Research objective and questions

The research objective is to examine how logistics-related supply chain disruptions affect the financial performance of manufacturing companies. The objective of this research will be achieved by answering the following research questions:

1. How can logistic-related supply chain disruptions in the manufacturing industry be defined and measured?
2. To what extent do resilience practices mitigate the financial impact?
3. What mechanisms link supply chain disruption to the financial performance of manufacturing companies, and which indicators best capture disruption effects?

1.3 Scope and limitations

This study is focused on logistics-related supply chain disruptions in the manufacturing industry and their relationship with the financial performance of manufacturing companies. The research is limited to disruptions that occur in logistic activities, such as transportation, warehousing, and distribution. This study does not cover internal production disturbances or demand-side shocks. The scope is restricted to manufacturing companies, and other sectors such as services or retail are left outside of this research.

The focus is kept on an industrial management perspective. As this study is conducted as a literature review, it is based on previously published academic research. Most of the literature used in this study has been published after 2010. While supply chain disruptions and financial performance are also influenced by factors such as corporate strategy, market conditions, and macroeconomic developments, these aspects are discussed only to the extent necessary to understand the mechanisms through which logistics-related disruptions and resilience practices affect financial outcomes.

1.4 Research methodology

1.4.1 Research design

This study is conducted as a narrative literature review. A narrative literature review systematically collects and combines previous studies to create a basis for understanding a topic and developing theory (Snyder, 2019). This method is an appropriate research method for this study, as the relationship between logistics-related supply chain disruptions, resilience practices, and financial performance has already been studied in many separate academic articles. This thesis can provide an integrated overview of current knowledge by systematically collecting and synthesizing earlier studies.

1.4.2 Data collection and analysis procedure

The articles used in this thesis were retrieved from various academic databases, ScienceDirect (Elsevier), Business Source Ultimate, Emerald Journals, Taylor & Francis online, and ABI Inform Complete (ProQuest). Boolean operators were used during the search to find relevant articles. The Boolean operators that were used are illustrated in Table 1 below. Although the operators were edited throughout the search process, those presented in the table formed the basis for the search strategy. In addition, differences

in how different databases interpreted and highlighted search terms also required adjustments to search commands.

Table 1. Boolean operators used in searching articles.

Theme	Boolean operators used	Approx. number of articles found	Number of potential articles screened for review
Supply chains	“supply chain” OR “supply network” AND manufacturing OR “manufacturing industry” OR “manufacturing firms”	~40 000	30
Supply chain disruptions	“supply chain disruption*” OR “logistics disruption*” OR “supply disruption*” OR “transport disruption*” AND manufacturing OR “manufacturing firms”	~20 000	20
Resilience practices	“supply chain resilience” OR “logistics resilience” AND practice* OR capability* OR flexibilit* OR redundanc*	~15 000	15

Financial performance	perfor-	“financial performance” OR profitability OR “firm performance” AND manufacturing OR “manufacturing firms”	~100 000	10
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The selected literature was analyzed using thematic analysis. Thematic analysis is a qualitative research method used to systematically recognize, analyze, and examine structures or themes within a data (Nowell et al, 2017). It helps organize and interpret data systematically to better understand key concepts related to the research question.

During the review process, the collected articles were categorized according to themes based on the research questions. The key themes included supply chain disruptions, resilience practices, and financial performance. This approach helped organize findings clearly. Around 75 potential articles were initially selected for detailed examination, of which 32 were ultimately deemed suitable and included as references in this thesis. The reviewed articles are provided in Appendix 2.

1.4.3 Reliability and validity

To ensure the suitability of an article for academic use, the following criteria were applied: published in an academic journal, peer-reviewed, JUF0-rating 1-3. After careful review, priority was given to articles published after 2010 to ensure the inclusion of recent and relevant research. Also, earlier studies were considered when they were deemed theoretically significant or directly relevant to the research topic. In such cases, particular attention was paid to the nature of the topic and its sensitivity over time. For topics considered conceptually stable, research published prior to 2010 was regarded as appropriate and applicable to this study.

1.4.4 Ethical consideration

To ensure ethical research practice, all the materials used as sources in this study are properly referenced. Pictures, figures, and tables presented in this study are either published or based on other people's publications, which are mentioned in relation to them. Artificial intelligence has not been used to produce any text or material for this thesis. The clarification regarding its use is provided in Appendix 1.

1.5 Structure of the thesis

This study is a narrative literature review structured into five main chapters: an introduction, theoretical chapters on supply chain disruptions in the manufacturing industry, the role of resilience and its impact on financial performance, and lastly, a chapter presenting discussion and conclusions based on existing literature and theoretical frameworks.

2 Supply chains

Supply chain is a network of organisations involved in the upstream and downstream flows of materials, information, and finances from raw-material suppliers to end customers (Mentzer et al, 2001, p.3). Menzer et al. (2001, p. 3) describe that the supply chain consists of multiple firms on both the supply and distribution sides, and the final consumer. Figure 1 illustrates a simplified supply chain structure in which raw materials flow through suppliers, manufacturers, distributors, and retailers to the final consumer. Logistics activities connect each stage and consumer demand guide production and supply activities.

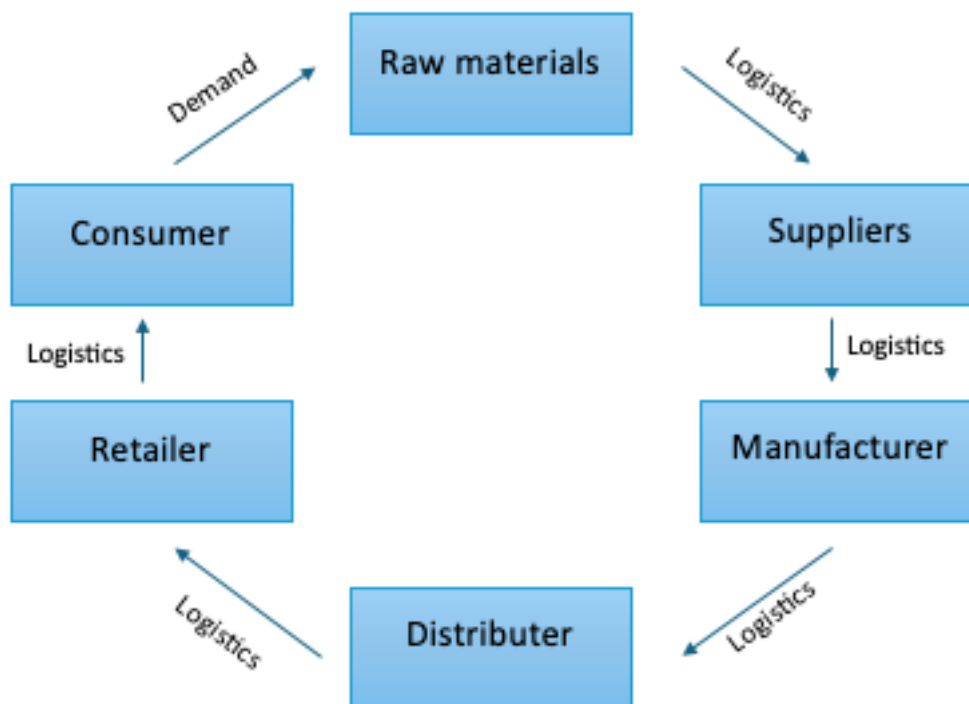


Figure 1. Supply chain as a figure.

Managing multiple relationships across the supply chain is referred to as supply chain management (SCM) (Lambert et al, 1998, p. 1). According to Lambert et al (1998, p. 1), supply chain management is defined as coordinated integration of key business

processes across firms, linking end customers back to the original supplier so that product, service, and information flows are managed in ways that create value for customers and other stakeholders throughout the entire chain. This view shows that supply chains are not just simple linear chains but complex networks where multiple firms interact and depend on each other's performance.

2.1 Supply chains in the manufacturing industry

Supply chains in the manufacturing industry are characterized by complex, multi-tiered network structures that extend across organizational and geographical boundaries. Manufacturing supply chains operate as interconnected networks composed of multiple upstream and downstream actors. Upstream networks often involve numerous suppliers that provide raw materials, components, and subassemblies. Bode and Wagner (2015) demonstrate that upstream supply chain complexity includes horizontal (number of suppliers), vertical (number of tiers), and spatial (geographical dispersion) dimensions (Figure 2). They further highlight that systems composed of many interconnected elements are more likely to experience disruptions than less complex systems. The downstream supply network has been described as a mechanism that connects manufacturers with end users (Yee & Platts, 2006, p.723). The structural complexity of upstream and downstream supply networks underscores the structural vulnerability and coordination challenges in modern manufacturing supply chains.

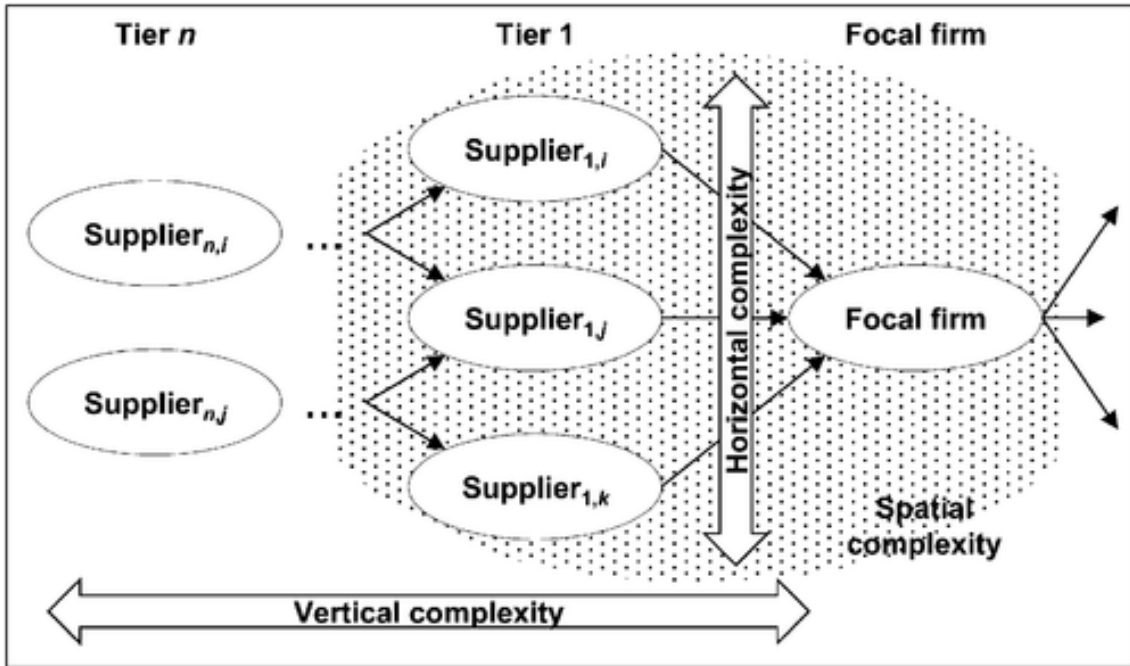


Figure 2. Horizontal, vertical, and spatial complexity of the upstream supply chain (Bode & Wagner, 2015, p.217).

A central characteristic of modern manufacturing supply chains is their high level of globalization. Manufacturing firms increasingly source materials internationally, operate production facilities in multiple countries, and distribute products across global markets (Caniato et al, 2013, p. 285). This global expansion has largely been driven by increasing competitive pressures, as firms seek advantages such as cost reductions in sourcing and access to international markets (Caniato et al, 2013, p. 285). However, while globalization offers strategic benefits, it also introduces new challenges, including longer lead times, more complex networks, and heightened exposure to risk (Caniato et al, 2013, p. 285). Consequently, rising levels of globalization have further intensified supply chain complexity (Wiengarten et al, 2014). Consistent with this view, Caniato et al. (2013, p. 285) note that increased supply chain complexity and difficulty in controlling errors in management can significantly impact a company's performance.

Time-sensitivity represents another core characteristic of manufacturing supply chains. Production systems depend on the timely arrival of materials to maintain continuous

operations and avoid costly downtime (Chang & Lin, 2019, p.298). Chang and Lin (2019, p. 299-300) emphasise that lead time constitutes a fundamental structural characteristic of supply networks. They state that extended supplier replenishment lead times increase planning uncertainty and constrain operational flexibility, thereby influencing a firm's resilience and recovery performance following disruptions. In the manufacturing industry, prolonged lead times can intensify both operational and financial consequences of supply interruptions, particularly with limited inventory buffers.

The increasing complexity and globalization of manufacturing supply chains further increase their vulnerability. As supply networks extend beyond organizational and geographical boundaries, the material flows, information, and financial resources become challenging to manage. Bode and Wagner (2015, p. 215) argue that rising complexity in these interconnected flows can reduce supply chain efficiency and increase systemic vulnerability, as disruptions can spread more easily through highly connected networks. In response, manufacturing firms seek to address these challenges through greater supply chain integration. By integrating supply chain activities with partners, manufacturing companies aim to manage flows more effectively in order to reduce costs, improve on-time delivery, shorten lead times, and enhance flexibility (Wiengarten et al., 2014). They also state that empirical evidence suggests that supply chain integration is positively associated with improvements in both operational and business performance. Overall, integration may help mitigate the vulnerability arising from increasing supply chain complexity and globalization.

2.2 The role of logistics in supply chains

Logistics has an important role in supply chain management, particularly in a manufacturing context where material flows must be closely synchronized with the production process. The Council of Logistics Management has defined logistics as a part of SCM and highlighted that logistics focuses on planning, implementing, and controlling the efficient flow of storage of goods between the point of origin and the point of consumption

(Lambert, 1998, p.3). Logistics activities such as transportation, warehousing, and material handling physically connect different stages of the supply chain and ensure that materials and products move to the right place, at the right time, and in the right quantity, supporting continuous production and timely deliveries. In contrast to the broader strategic scope of SCM, which coordinates integrated sourcing, manufacturing, marketing, and distribution activities across firms, logistics focuses more specifically on the efficient movement and storage of goods to meet customer requirements (Mentzer et al, 2001, p.16).

In addition to managing physical flows, logistics plays a key role in facilitating supply chain integration and enhancing overall operational performance. Prajogo and Olhager (2012) highlight that their empirical findings demonstrate a direct and positive relationship between logistics integration and operational performance, indicating that the management of transportation, inventory positioning, and physical distribution is not merely a supporting activity but a core determinant of supply chain effectiveness in manufacturing environments. Beyond internal coordination, logistics contributes to stronger interorganizational integration. Gligor and Holcomb (2014) examine the integration of logistics capabilities among supply chain partners and find that coordinated logistics processes are associated with enhanced operational and relational performance. Their findings suggest that cooperation, communication, and joint planning facilitate the development of integrated logistics capabilities, which enhance overall supply chain performance. Wiengarten et al. (2014) also note that logistics extends beyond firm-level operations and functions as a structural enabler conditioned by institutional and infrastructural environments. Consequently, logistics represents a foundational element in the functioning of manufacturing supply chains.

2.3 Logistics disruptions

Ambulkar et al. (2015, p.111) describe supply chain disruptions as an event that disrupts the flow of goods in a supply chain, which can have severe negative consequences on

the financial, market, and operational performance of the company. Unlike normal operational variability, which involves predictable fluctuations in demand, lead times, or process performance and can typically be managed through established planning and inventory buffers, disruptions represent unexpected and unusual events that significantly interrupt material flows and exceed the coping capacity of standard operational controls (Bode & Wagner, 2015, p.216). In the logistics context, disruptions affect key activities such as transportation, warehousing, or inventory allocation and distribution processes that are critical for maintaining stable supply chains.

Logistics disruptions can be categorized according to their source, particularly separating internal and external origins. According to Hossain et al. (2022, p.684-685), internal disruptions are generally more frequent and controllable, while external disruptions are less common, less controllable, and often associated with more significant consequences. Ho et al. (2015, p.5036) classify disruptions into several categories, distinguishing between risk originating within the firms' internal processes and those arising from the external environment. They define internal risks as operational and process-oriented factors originating within the organization. These include process risk and control risk, which may result from operational breakdowns, planning, and coordination failures. In contrast, external risk originates outside the organization and is normally beyond direct managerial control and includes categories such as supply risk, demand risk, and environmental risks, which may result from natural disasters, demand fluctuations, and political instability (Ho et al, 2015, p.5036). These risks arise from the broader environment in which logistics-related operations take place. Table 2 clarifies how logistics-related risks are divided into internal and external categories and provides illustrative examples of the different types of risks within each category.

Table 2. Logistics-related risks in supply chains (Adapted from Ho et al. (2015)).

Main Category	Subcategory	Examples
Internal risk	Process risk	<ul style="list-style-type: none"> • Warehouse operational failures • Transportation planning errors
	Control risk	<ul style="list-style-type: none"> • Shipment coordination failures
External risk	Supply risk	<ul style="list-style-type: none"> • Delivery delays
	Demand risk	<ul style="list-style-type: none"> • Logistical overload
	Environmental risk	<ul style="list-style-type: none"> • Natural disasters • Port closures • Political border restrictions • Infrastructure failures

In addition to their origin, logistics disruptions are influenced by the structural features of the supply network. Bode and Wagner (2015, p.215) demonstrate that greater supply network complexity, measured by the number of suppliers, tiers, and geographical dispersion, increases the frequency of disruptions. Also, Ivanov et al. (2014, p. 2156) highlight the potential for disruptions to spread through interconnected networks via ripple effects, where disturbance at one logistics node affects other parts of the supply chain. These structural elements make manufacturing operations more sensitive to logistics disruptions, especially when logistics and production are closely integrated (Ivanov et al, 2014, p.2156).

2.3.1 The most common logistics disruptions in the manufacturing industry

Empirical and review-based studies suggest that supplier delivery disturbances, coordination failures, and infrastructure-related bottlenecks are the most frequent logistics disruptions in manufacturing supply chains (Ho et al., 2015, p. 5036). Ho et al. (2015, p.5036) note that transportation risks have received comparatively less attention in the literature, although they play a critical role in manufacturing supply chain performance. Transportation disruptions interrupt the movement of materials between suppliers and

production facilities, which can delay deliveries of inputs and thereby affect production scheduling and continuity (Zhen et al, 2016, p.51). Supplier delivery failures constitute another common disruption type, particularly in modern geographically dispersed manufacturing multi-tier supply networks, where structural complexity increases disruption frequency (Bode & Wagner, 2015, p.215). In addition, process and control risks, such as disruptions related to coordination and information system failures, can negatively affect logistics performance (Ho et al, 2015, p.5036). Infrastructure-related disruptions affecting transportation nodes or routes are common in globally distributed manufacturing supply chains, where geographical dispersion increases exposure and enables disruptions to spread across interconnected networks (Ivanov et al, 2014, p.2156).

Real-world cases illustrate the variety and impact of logistics disruptions in manufacturing supply chains. For example, the fire at the Philips semiconductor facility in Albuquerque in 2000 disrupted component deliveries to Ericsson and led to significant revenue losses, demonstrating how localized supplier facility accidents can generate significant downstream impacts in manufacturing supply chains (Ivanov et al, 2014, p.2154). Similarly, the 2021 Suez Canal incident temporarily blocked a major global shipping route, delaying shipments of raw materials and components and illustrating how disruptions at critical logistics nodes can affect manufacturing supply chains globally (Tran et al., 2025).

2.4 How logistics disruptions are measured in the manufacturing industry

In the logistics disruptions research, disruptions are typically measured using a limited number of measurement approaches that allow comparison across firms and link operational disturbance to performance outcomes. A widely used approach is to measure disruptions through event occurrence and frequency, for instance, by examining the number of disruption events a firm experiences within a specified time frame (Bode & Wagner, 2015). Bode and Wagner (2015, p.216) apply this logic by measuring disruptions as the total number of events experienced over 12 months, enabling the analysis of how structural factors relate to disruption exposure.

As manufacturing processes depend heavily on timely deliveries, a second commonly applied approach measures disruptions using time-based indicators, such as delay magnitude and recovery duration. In transportation-based analyses, disruptions are represented by interruptions in transport capacity and the time required for its recovery, making the recovery process itself a measurable dimension of disruption (Zhen et al, 2016, p.53). Within the broader resilience literature, time-to-recovery (TTR) is treated as a key metric to evaluate how quickly systems return to normal after a disruption (Behzadi et al, 2020, p.145). These measures are particularly applicable to manufacturing supply chains, where disruptions in delivery timing may affect production continuity and translate into financial impacts.

The third measurement approach focuses on disruption severity or operational impact, often using survey-based constructs to assess the degree to which events disturb normal operations and require recovery actions. Ambulkar et al. (2015) measure disruption-related constructs using established and validated scales and differentiate disruption situations based on their level of impact, allowing comparisons between high- and low-impact contexts. Taken together, frequency-based, time-based, and impact-based measures offer a systematic framework for synthesizing prior research on logistics disruptions in manufacturing and establish a basis for analyzing their implications for resilience and financial performance.

3 The role of supply chain resilience

Supply chain resilience is defined as the ability of a supply chain to cope with unexpected disturbances and maintain or quickly recover operational performance (Wieland & Wallenburg, 2013, p.311). Similarly, Ambulkar et al. (2015, p.112) define resilience as an organizational capability that allows a firm to mitigate the effects of disruptions and effectively restore operations.

The resilience concept is commonly viewed as multidimensional. Wieland and Wallenburg (2013) identify flexibility, visibility, and collaboration as relational and operational capabilities that strengthen a supply chain's ability to respond to disruptions. Ambulkar et al. (2015) further propose that resilience is composed of preparedness, response capability, and recovery capability, emphasizing the dynamic role of resilience in disruption situations. Ivanov et al. (2014) share a similar perspective, highlighting that resilience involves adaptive and restorative capacities that enable the supply chain to respond to and recover from disruptions. These perspectives suggest that resilience extends beyond risk prevention and centers on the ability to adapt and return to normal operations following disruptive events. Figure 3 illustrates the different dimensions of supply chain resilience, including preparedness, mitigation, stabilization, and recovery, which together describe how supply chains prepare for, manage, and recover from disruptions.

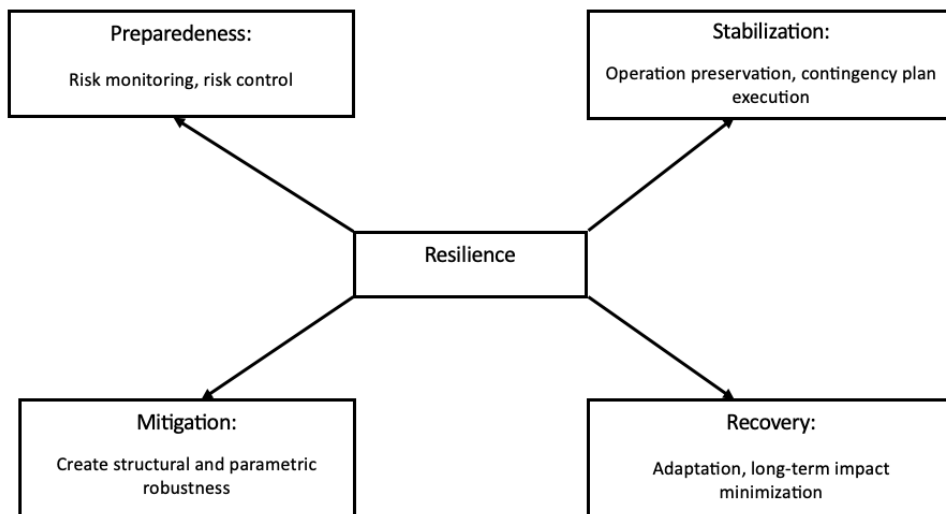


Figure 3. Supply chain resilience (Ivanov et al., 2014).

In manufacturing supply chains, resilience is particularly important because operational processes are closely interconnected with inbound and outbound logistics flows. Ivanov et al. (2014) demonstrate that disruptions can spread through interconnected supply networks via ripple effects, leading to broader operational consequences beyond the initial disturbance. As disruptions can propagate through these interconnected structures, resilience must consider not only local disturbances but also their potential impacts across the broader supply network (Ivanov et al, 2014).

The existing research suggests that resilience moderates the relationship between disruption exposure and performance outcomes. Ambulkar et al. (2015) point out that firms with higher resilience capability can mitigate negative operational impacts under disruption conditions. Similarly, Wieland and Wallenberg (2013, p.301) demonstrate that relational competencies linked to resilience contribute positively to supply chain performance in unstable environments. Taken together, these findings indicate that resilience strengthens manufacturing supply chains by moderating disruption impacts and supporting operational performance (Ambulkar et al, 2015).

3.1 Logistics-specific resilience practices

Resilience practices in logistics refer to operational arrangements within transportation, warehousing, and distribution systems that enable continuity of material flows under disruption conditions (Ivanov et al, 2014). In manufacturing supply chains, these practices are very critical because production continuity depends directly on logistics reliability.

One fundamental component of logistics resilience is transportation flexibility, which involves the ability to switch transport modes, carriers, or routes when a disruption occurs (Ishfaq, 2012, p.216). Alternative routing and multi-carrier strategies reduce dependence on single transport links and lower exposure to localized infrastructure disturbances (Ishfaq, 2012, p.216). Ishfaq (2012) highlights that by designing a transportation network with predefined alternative routes, firms can switch from disrupted routes to available ones, limiting delivery delays.

A second component of resilience practises in logistics involves redundancy and buffering. According to Ivanov et al. (2014), redundancy involves maintaining excess capacity or backup resources that can absorb disruptions without causing significant operational breakdowns. In logistics, redundancy may include backup transportation contracts, additional warehousing capacity, or safety stock buffers. Inventory-based buffering strategies are identified as a core resilience mechanism in disruption management research as they reduce the likelihood of stockouts and service failures during supply disruptions (Guo et al. 2025, p.451). Backup transportation represents another important strategy that is commonly used after a disruption occurs. In such cases, a distribution center may authorize alternative distribution centers to transport products to the company or its customers, although this arrangement typically results in additional costs (Zhen et al, 2016, p 52). Ivanov et al. (2014, p.2156) highlight the trade-off between efficiency and resilience, suggesting that lean and highly optimized supply chains are more vulnerable to ripple effects during disruptions. While redundancy strategies increase operating

costs in stable conditions, it reduces severity and duration of disruption impacts (Ivanov et al.2014).

Because logistics activities extend across multiple organizations, supply chain resilience depends on effective collaboration and information sharing, as strong relational competencies enhance coordination and resource allocation and positively influence resilience (Wieland & Wallenburg, 2013, p.303). Scholten and Schilder (2015) also suggest that collaboration enhances supply chain visibility and velocity, as collaborative practices improve information sharing and coordinated decision making, which strengthens resilience capabilities. In practical terms, visibility of shipment status and coordinated response routines enable firms to detect disruptions early and implement corrective actions faster. Thus, logistics resilience does not rely solely on structural redundancy or flexibility, but also on relational and informational capabilities.

3.2 Resilience as a disruption-performance moderator

Previous research consistently indicates that supply chain disruptions have negative effects on both operational and financial performance (Bode & Wagner, 2015, p.216). However, empirical studies also show that the impact of supply chain disruptions on performance varies considerably among firms facing similar disturbances, which suggests that certain organizational capabilities influence how strongly disruptions affect performance (Banghersad & Zobel, 2021, p. 3). Donadoni et al. (2018, p. 301) conceptualize resilience as a capability that influences the extent to which disruption events affect firm performance. Specifically, higher levels of resilience are associated with a weaker negative relationship between disruption frequency or severity and performance measures (Donadoni et al, 2018, p.302).

This moderating role implies that resilience does not eliminate disruptions but reduces their operational impact and limits the decline of performance. This view aligns with broader resilience research, which suggests that resilience does not necessarily improve

performance under stable conditions but buffers performance during times of disruption (Ataburo et al, 2024). Accordingly, resilience can be described as a stabilizing capability that influences the extent to which logistics disruptions affect the financial performance of manufacturing firms.

4 Financial performance

Financial performance refers to the profits and broader economic returns generated by an organization (Taoketao, 2018, p.1040). Those economic returns are typically reflected in profitability, growth, and market valuation indicators. In the supply chain context, financial performance is also treated as an outcome influenced by firm strategy, operational events, and disruptions (Baby et al., 2024). The manufacturing financial performance literature commonly defines financial performance in terms of productivity and efficiency measures used in empirical studies (Baby et al., 2024, p.10). Empirical studies highlight that financial performance reflects the firm-level economic effects of operational events, including supply chain disruptions (Baghersad & Zobel, 2021). Within the manufacturing industry, financial performance is highly dependent on operational efficiency, as production systems are capital-intensive and depend on timely material flows.

4.1 Measuring financial performance

Financial performance is frequently measured using accounting-based and revenue-based measures that capture profitability and efficiency, including the most commonly used indicators such as cost, return on assets (ROA), sales, asset turnover, return on investment (ROI), market share, inventory turnover, profit margin, and revenue growth (Rahiminezhad Galankashi & Mokhatab Rafiei, 2021). Baby et al. (2024, p.10) further note that return on equity (ROE) and various market-based indicators are also commonly used to assess financial performance.

Accounting-based measures include ROA, ROI, ROE, and profit margin. Return on assets (ROA) is commonly used in manufacturing research because it indicates how effectively firms use their assets to generate profits; therefore, in an asset-intensive manufacturing environment, ROA represents a particularly relevant indicator. Return on equity (ROE) is a common measure that indicates the profitability available to shareholders relative to equity investment. Profit margin indicators, such as operating margin or net profit

margin, are applied to evaluate how operational conditions influence profitability after costs are considered. Although return on investment (ROI) is widely used as a measure of financial performance, it has been subject to criticism. ROI does not account for the time value of money or the opportunity costs, which limits its effectiveness as a performance indicator (Rahiminezhad Galankashi & Mokhatab Rafiei, 2021, p.1679). Revenue-based measures, such as sales growth or revenue appears less frequently in empirical studies than profitability ratios (Baby et al., 2024). Market-based indicators include market share, earnings per share (EPS), and shareholder return, which can be measured through annual stock price change plus dividends, which captures a market-oriented perspective of performance (Baby et al., 2024).

From a manufacturing perspective, inventory-related financial metrics are particularly relevant as they indicate how effectively firms convert inventory holdings into sales and cash flow. Kwak (2019) analyses inventory turnover as a performance metric in manufacturing and emphasizes its significance, as it indicates how quickly products move out of the factory and how much cash is tied up in inventory.

4.2 Financial impact mechanisms of logistics disruptions

Logistics disruptions influence financial performance through cost-related mechanisms that raise operational costs while also contributing to revenue losses in manufacturing firms (Ivanov et al., 2019). Disruptions in transportation and material flow often require reactive corrective actions, which increase logistics and procurement costs (Ivanov et al, 2019). Increased costs directly decrease profitability indicators when higher operating expenses cannot be fully transferred to customers (Baghersad & Zobel, 2021).

A second mechanism relates to production interruptions and lower capacity use. Manufacturing systems depend on timely inbound logistics, and delivery delays can disrupt production schedules, leading to idle resources and reduced output (Bode & Wagner, 2015). When output decreases in an asset-intensive environment, unit costs increase

because fixed costs are spread over fewer produced units. Logistics disruptions also affect financial performance through revenue-related mechanisms. Unreliable deliveries can result in delayed orders or loss of sales when firms are unable to meet customer demand on time (Wong et al, 2020). Empirical studies suggest that disruption exposure is associated with weaker firm performance, particularly under conditions of high uncertainty (Baghersad & Zobel, 2021).

Another financial mechanism relates to inventory management and working capital. Disruptions often lead firms to increase safety stock or inventory levels, which raises holding costs and ties up capital (Guo et al, 2025). Higher inventory levels reduce asset efficiency and may negatively affect financial ratios, for example, return on assets (ROA). Similarly, disruption-related cost increases can reduce return on equity (ROE) by lowering net income relative to shareholder equity.

Finally, logistics disruptions may impact financial performance through risk and market perception mechanisms. Empirical studies show that supply chain disruption announcements are associated with significant negative abnormal stock returns, indicating a decrease in shareholder value following disruption events (Hendricks & Singhal, 2005). Furthermore, Hendricks and Singhal (2005) find that firms affected by disruptions experience long-term stock price underperformance, reflecting sustained negative investor expectations about future cash flows and risk exposure.

Overall, the previous research demonstrates that logistics disruptions influence financial performance through cost increases, reduced capacity utilization, revenue loss, working capital adjustments, and negative investor reactions. Taken together, these mechanisms explain how operational disruptions can lead to measurable financial decline in manufacturing firms.

5 Discussion and conclusions

This thesis aimed to examine supply chains, logistics disruptions, resilience practices, and the impact of disruptions on the financial performance of manufacturing firms. The research was carried out as a literature review, based primarily on studies published after 2010.

5.1 Findings

This study was guided by the following research questions:

1. How can logistic-related supply chain disruptions in the manufacturing industry be defined and measured?
2. To what extent do resilience practices mitigate the financial impact?
3. What mechanisms link supply chain disruption to the financial performance of manufacturing companies, and which indicators best capture disruption effects?

To answer the first question — how can logistics related supply chain disruptions in manufacturing industry be defined and measured — the literature review shows that logistics related supply chain disruptions are defined as an unexpected events that significantly interrupt the flow of goods and materials in a supply chain, which can have severe consequences on firm performance (Amulkar et al., 2015, p.111; Bode & Wagner, 2015, p.216). In contrast to normal operational variability, which can be managed through planning and buffers, disruptions exceed the coping capacity of standard control mechanisms and can lead to substantial disturbances in transportation, warehousing, inventory allocation, or distribution activities (Bode & Wagner, 2015). Logistics disruptions originate internally, from operational or process failures within the firm or externally, from environmental, supply, or demand-related factors outside managerial control (Ho et al, 2015, p.5036). The findings also indicate that supplier delivery disturbances,

transportation interruptions, coordination failures and infrastructure bottlenecks are the most frequently occurring logistics disruptions in the manufacturing industry (Ho et al, 2015, p.5036). The research also suggests that in the manufacturing industry, globally dispersed and structurally complex supply networks increase exposure to disruptions and enable their propagation across interconnected manufacturing systems (Bode & Wagner, 2015, p.215; Ivanov et al, 2014, p.2156).

Logistics-related supply chain disruptions in the manufacturing industry are commonly measured using the three main approaches. First frequency-based measure assesses the number of disruption events a firm experience within a defined time period, capturing overall disruption exposure (Bode & Wagner, 2015). Second, time-based measures evaluate delay magnitude and time-to-recovery (TTR), indicating how long logistics activities are interrupted and how quickly normal operations are restored (Zhen et al, 2016, p.53; Behzadi et al., 2020, p.145). Third, impact-based measures assess the severity of disruptions by examining the extent to which events disturb normal operations and require recovery efforts (Ambulkar et al., 2015).

To answer the second research question — To what extent do resilience practices mitigate the financial impact — Resilience practices mitigate the financial impact of logistics-related supply chain disruptions to a significant but moderating extent (Ambulkar et al., 2015). The literature indicates that resilience does not eliminate disruptions, but rather weakens the negative relationship between disruption exposure and performance outcomes. Empirical studies show that higher levels of resilience are associated with a weaker negative relationship between disruption frequency or severity and firm performance (Donadoni et al., 2018, p.302). In manufacturing supply chains, resilience practices such as transportation flexibility, redundancy, buffering, and enhanced collaboration and visibility reduce the severity and duration of operational disturbances (Ishfaq, 2012; Ivanov et al., 2014; Guo et al., 2025; Scholten & Schilder, 2015). These practices may increase costs under stable conditions, but they limit disruption propagation and shorten recovery time, thereby mitigating financial losses (Ivanov et al., 2014). Overall

resilience functions as a moderating capability, reducing the financial impact of logistics disruptions by mitigating operational consequences and supporting faster recovery, rather than by preventing disruptions entirely.

To address the final research question — What mechanisms link supply chain disruption to the financial performance of manufacturing companies, and which indicators best capture disruption effects — Logistics-related supply chain disruptions affect the financial performance of manufacturing firms through several mechanisms. First, cost-related mechanisms increase operational expenses due to reactive corrective actions, thereby reducing profitability when higher costs cannot be transferred to customers (Ivanov et al., 2014; Baghersad & Zobel, 2021). Second, production interruptions caused by delayed inbound logistics reduce capacity utilization and output, increasing unit costs as fixed costs are spread over fewer produced units (Bode & Wagner, 2015). Third, revenue-related mechanisms capture effects when unreliable deliveries lead to lost sales (Wong et al., 2020). Fourth, disruptions influence inventory and working capital, as higher safety stocks increase holding costs and reduce asset efficiency (Guo et al., 2025). Finally, market perception mechanisms link disruptions to negative abnormal stock returns and long-term shareholder value decline (Hendricks & Singhal, 2005). To capture these effects, financial performance can be measured using various indicators. Profitability measures, such as return on assets (ROA), return on equity (ROE), and profit margins, reflect the firm's ability to generate earnings (Baby et al., 2024; Rahiminezhad Galankashi & Mokhatab Rafiei, 2021). Efficiency-related indicators, including inventory turnover, assess asset utilization, while revenue-based indicators, such as sales growth, capture changes in income generation. In addition, market-based indicators, including market share, earnings per share (EPS), and shareholder return, reflect investor valuation and market performance (Baby et al., 2024; Rahiminezhad Galankashi & Mokhatab Rafiei, 2021). Together, these measures reflect the cost, revenue, efficiency, and market value effects of supply chain disruptions.

To summarize the findings, logistics-related supply chain disruptions negatively affect the financial performance of manufacturing companies through multiple channels. They increase operational costs, disrupt production and capacity utilization, cause revenue losses due to unreliable deliveries, and raise inventory and working capital requirements. In addition, disruptions can reduce shareholder value through negative market conditions. These effects are reflected in lower profitability (ROA, ROE, profit margins), reduced efficiency (inventory turnover), weaker revenue growth, and declining market-based indicators such as earnings per share and shareholder returns.

5.2 Evaluation of source reliability

The articles used in this thesis were retrieved from various academic databases, ScienceDirect (Elsevier), Business Source Ultimate, Emerald Journals, Taylor & Francis online, and ABI Inform Complete (ProQuest). The journals of the reviewed articles were verified via the JUFO-portal to ensure scientific quality. JUFO-portal is a Finnish classification and rating system for academic journals.

5.3 Limitations and suggestions for future research

This thesis is subject to certain limitations. As this study is conducted as a literature review, it depends exclusively on secondary sources, thereby limiting opportunities for deeper empirical investigation. The scope of this thesis also causes limitations, as the analysis is limited to disruptions occurring in logistics activities and does not consider internal production disturbances or demand-side shocks. Furthermore, the scope is restricted to manufacturing firms, excluding other sectors such as services or retail.

This thesis examines how logistics-related supply chain disruptions affect the financial performance of manufacturing companies and how supply chain resilience practices can mitigate these effects. Future research on supply chain disruptions is also important as

firms operate in increasingly global networks, where disruption exposure is unlikely to decline, although emerging technologies may enable more advanced analysis and management of these risks.

During the research process and reviewing the relevant literature, it became evident that transportation-related disruptions have received comparatively less research attention than broader supply chain or demand-side disturbances, despite their significant implications for firms' financial performance. Therefore, further research focusing specifically on transportation disruption would be valuable.

Another interesting future research possibility would be to examine how AI-based practices can strengthen resilience capabilities and thereby mitigate the financial impacts of supply chain disruptions. As artificial intelligence is currently a highly relevant topic and increasingly integrated into firms' operations, it would be valuable to investigate how AI-driven tools can be used to reduce the performance consequences of disruptions.

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Appendices

Appendix 1. Statement on the use of artificial intelligence (AI)

In this study, artificial intelligence (AI) tools were used only as supportive tools. AI was used for language maintenance and translation in selected sections. It was also used to help identify relevant academic literature. Specifically, ChatGPT (OpenAI, GPT-4 mode) and Grammarly Desktop were used for support purposes. Artificial intelligence was not used to generate any text or other content.

Appendix 2. List of the reviewed articles according to the theme

Authors	Year	Title of the article	Related theme
Ambulkar, S., Blackhurst, J., & Grawe, S.	2015	Firm's resilience to supply chain disruptions: Scale development and empirical examination.	Logistics disruptions
Ataburo, H., Ampong, G. E., & Essuman, D.	2024	Developing operational resilience to navigate transportation disruptions: The role and boundaries of efficiency priority	Resilience practices
Baby, A., Mia, M. A., & Pitchay, A. A.	2024	A systematic review of financial performance in the manufacturing industry.	Financial performance
Baghersad, M., & Zobel, C. W.	2021	Assessing the extended impacts of supply chain disruptions on firms: An empirical study.	Supply chain disruptions
Behzadi, G., O'Sullivan, M. J., & Olsen, T. L.	2020	On metrics for supply chain resilience.	Logistics disruptions
Bode, C., & Wagner, S. M.	2015	Structural drivers of upstream supply chain complexity and the frequency of supply chain disruptions.	Supply chains, financial performance, Logistics disruptions
Caniato, F., Golini, R., & Kalchschmidt, M.	2013	The effect of global supply chain configuration on the relationship between supply chain improvement programs and performance.	Supply chains

Chang, W.-S., & Lin, Y.-T.	2019	The effect of lead-time on supply chain resilience performance.	Supply chains
Christopher, M., & Peck, H.	2004	Building the Resilient Supply Chain.	Supply chains
Donadoni, M., Caniato, F., & Cagliano, R.	2018	Linking product complexity, disruption and performance: The moderating role of supply chain resilience.	Resilience practices
Gligor, D. M., & Holcomb, M. C.	2014	Antecedents and Consequences of Integrating Logistics Capabilities across the Supply Chain.	Logistics in supply chains
Guo, Y., Liu, F., Song, J.-S., & Wang, S.	2025	Supply chain resilience: A review from the inventory management perspective.	Resilience practices
Hendricks, K. B, Singhal, V. R.	2005	An empirical analysis of the effect of supply chain disruptions on long-run stock price performance and equity risk of the firm.	Financial performance
Ho, W., Zheng, T., Yildiz, H., & Talluri, S.	2015	Supply chain risk management: a literature review.	Logistics disruptions
Hossain, M. A., Chowdhury, Md. M. H., Pappas, I. O., Metri, B., Hughes, L., & Dwivedi, Y. K.	2023	Fake news on Facebook and their impact on supply chain disruption during COVID-19.	Logistics disruptions
Ishfaq, R.	2012	Resilience through flexibility in transportation operations.	Resilience practices

Ivanov, D., Sokolov, B., & Dolgui, A.	2014	The Ripple effect in supply chains: Trade-off 'efficiency-flexibility-resilience' in disruption management.	Resilience practices & Financial performance
Kwak, J. K.	2019	Analysis of Inventory Turnover as a Performance Measure in Manufacturing Industry.	Financial performance
Lambert, D. M., Cooper, M. C., Pagh, J. D.	1998	Supply Chain Management: Implementation Issues and Research Opportunities.	Supply chains
Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G.	2001	DEFINING SUPPLY CHAIN MANAGEMENT	Supply chains
Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J.	2017	Thematic Analysis: Striving to Meet the Trustworthiness Criteria.	Thematic analysis
Prajogo, D., & Olhager, J.	2012	Supply chain integration and performance: The effects of long-term relationships, information technology and sharing, and logistics integration.	Logistics & Supply chains
Rahiminezhad Galankashi, M., & Mokhatab Rafiei, F.	2022	Financial performance measurement of supply chains: A review.	Financial performance
Scholten, K., & Schilder, S.	2015	The role of collaboration in supply chain resilience.	Resilience practices

Snyder, H.	2019	Literature review as a research methodology: An overview and guidelines.	Literature review
Taoketao, E., Feng, T., Song, Y., & Nie, Y.	2018	Does sustainability marketing strategy achieve payback profits? A signaling theory perspective.	Financial performance
Tran, N. K., Haralambides, H., Notteboom, T., & Cullinane, K.	2025	The costs of maritime supply chain disruptions: The case of the Suez Canal blockage by the 'Ever Given' megaship.	Logistics disruptions
Wieland, A., & Wallenburg, C. M.	2013	The influence of relational competencies on supply chain resilience: A relational view	Resilience practices
Wiengarten, F., Pagell, M., Ahmed, M. U., & Gimenez, C.	2014	Do a country's logistical capabilities moderate the external integration performance relationship?	Supply chains
Wong, C. W. Y., Lirn, T.-C., Yang, C.-C., & Shang, K.-C.	2020	Supply chain and external conditions under which supply chain resilience pays: An organizational information processing theorization.	Financial performance
Yee, C. L., Tan, K. H., & Platts, K. W.	2006	Managing 'downstream' supply network: A process and tool.	Supply chains
Zhen, X., Li, Y., Cai, G. (George), & Shi, D.	2016	Transportation disruption risk management: Business interruption insurance and backup transportation.	Logistics disruptions