International Journal of Financial, Administrative, and Economic Sciences (IJFAES)

المجلة الدولية للعلوم المالية والإدارية والاقتصادية

Vol. (5), No. (6) June 2026 الإصدار (5)، العدد (6)

Supply Chain Management During Crises and Its Impact on Organizational Financial Performance: An Empirical Study on the Financial Performance of UPS

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Abstract

The study investigates the effect of supply chain management (SCM) components during crises on the organizational financial performance of United Parcel Service UPS, Inc, one of the global leaders in logistics and shipping companies. The study explores three major independent variables, including the quality of information, the efficiency of logistics services (in terms of time and distance), and supplier relationship management. The research methodology is descriptive–analytical, and the data collection method involves a questionnaire given to a purposeful sampling of 50 branch managers of UPS Germany who held different managerial positions such as logistics manager, supply chain director, procurement officer, operations manager.

Hypotheses were tested through simple linear regression analysis using EViews 12, and Cronbach's Alpha coefficient was computed to assess the internal consistency (reliability) of the measurement instruments. All variables demonstrated excellent reliability levels ($\alpha \geq 0.89$).

The results reveal a statistically significant positive impact of all three SCM components on financial performance during crises such as the COVID-19 pandemic and geopolitical conflicts. Logistics services emerged as the most influential variable ($r = 0.728$; $R^2 = 0.530$; $p < 0.001$), followed by supplier relationship management ($r = 0.620$; $R^2 = 0.384$; $p < 0.001$), and information quality ($r = 0.379$; $R^2 = 0.144$; $p < 0.01$). Multicollinearity diagnostics confirmed the absence of problematic collinearity ($VIF < 10$).

These findings underscore the strategic importance of logistics efficiency in crisis resilience and provide actionable insights for decision-makers in global logistics firms seeking to build more adaptive and financially robust supply chains.

Keywords: Supply Chain Management; Crisis Management; Financial Performance; Logistics Services; Information Quality; Supplier Relationship Management; Resilience; UPS.

1. Introduction

The emergence of new technologies and the growing global competition of modern business have created a complex and fast-paced business environment. In this context, supply chain management (SCM) has developed into one of the most important strategic tools used by organisations to create improvements in operational effectiveness and revenues through coordination of a seamless flow of material, information and services between suppliers and the ultimate end-customer (Christopher, 2016; Chopra & Meindl, 2021). The effectiveness of a supply chain is rooted in three key elements: (1) the quality of information shared between supply chain partners; (2) the efficiency of logistics services such as transportation, warehouse, inventory management and distribution; and (3) the quality of supplier relationship management (SRM). The quality of information used is critically important as accurate, on-time and transparent information reduces uncertainty and improves responsiveness to supply chain logics (Ivanov & Dolgui, 2020). Logistic efficiency has a direct impact on an organisation's cost structure and level of customer service, thus creating a competitive advantage in dynamic markets (Bowersox et al., 2020). The establishment of strategic supplier relationships based on trust, collaboration and shared information enhances the ability of an organisation to protect its supply continuity, reduce its level of input risk and stimulate innovation (Monczka et al., 2020). In times of crisis, the strategic importance of these components is heightened due to the COVID-19 pandemic, as well as the conflict between Russia and Ukraine, which both revealed critical vulnerabilities in the supply chain.

Recent research literature continues to identify the leading causes of supply chain resilience and operational continuity during crises as: information quality, logistics capability and strong supplier relationships (Ivanov, 2021; Queiroz et al., 2022). Therefore, this study will investigate the varying contributions of each SCM component on financial performance for an organisation in times of crisis. In doing so, the study will use UPS as an empirical example and aims to: (1) develop quantitative measures of the contribution of each SCM component to financial performance, (2) rank the contributions of these components by degree of explanation and (3) derive actionable managerial implications for logistics organisations that operate in crisis regions. The structure of the paper will be as follows: the theoretical framework and research hypotheses will be outlined in Section 2; methodology will be outlined in Section 3; results will be presented with statistical tests for research hypothesis in Section 4; discussion of research findings will be provided in Section 5 and recommendations and summary will be made in Sections 6 and 7.

1.1. Research Gap:

Despite the growing body of research on supply chain resilience and crisis management, significant gaps persist in the existing literature that this study aims to address. While scholars such as Ivanov (2021) and Queiroz et al. (2022) have theorised the role of SCM components in sustaining operational continuity during disruptions, the majority of prior studies have relied on conceptual frameworks or qualitative case analyses rather than quantitative empirical measurement. As a result, the relative contribution of each individual SCM component — namely information quality, logistics services

efficiency, and supplier relationship management — to organisational financial performance during crises has not been rigorously quantified within a single unified empirical study.

Furthermore, extant research has tended to examine SCM performance outcomes in general or stable business environments, with comparatively limited attention to crisis-specific contexts such as global pandemics or geopolitical conflicts (Koh et al., 2007; Chopra & Meindl, 2021). Where crisis contexts have been studied, the focus has predominantly been placed on supply disruption and recovery at the operational level, rather than on the measurable financial consequences for the organisation as a whole. This constitutes a critical gap: without empirical evidence linking specific SCM components to financial performance outcomes during crises, practitioners lack an evidence-based hierarchy for resource allocation and crisis-preparedness investment.

A further gap concerns the choice of empirical context. Prior quantitative studies in this domain have frequently aggregated data across multiple industries or relied on secondary archival records, limiting their contextual specificity and practical applicability. No published study, to the authors' knowledge, has applied primary survey-based regression analysis to examine the differential impact of SCM components on the financial performance of a leading global logistics firm — specifically UPS — during concurrent crises. This study directly addresses these three gaps by: (1) quantifying the individual explanatory power of each SCM component through regression analysis; (2) situating the analysis within an explicit crisis context encompassing COVID-19 and geopolitical disruptions; and (3) grounding the empirical investigation in the operational realities of one of the world's foremost logistics organisations. In doing so, the study contributes both theoretically — by testing established SCM frameworks under crisis conditions — and practically, by offering decision-makers an empirically ranked guide to SCM investment priorities during periods of systemic disruption.

2. Theoretical Framework

2.1. Supply Chain Management: Concept and Global Dimensions:

2.1.1. The Concept of Supply Chain Management:

SCM, or Supply Chain Management, has been defined as the control and coordination (planning) of all activities involved in the sourcing, purchasing, and manufacturing of goods. In addition to these functions, SCM includes coordination (collaborative efforts) with supply chain partnering firms to achieve mutually beneficial business outcomes (Council of Supply Chain Management Professionals (CSCMP), 2021). Christopher, 2016 states that SCM is defined as upstream and downstream management of supplier and customer relationships with the intention of providing superior value to the customer at the lowest cost to the supply chain as a whole. Additionally, David Simchi-Levi defines SCM as the strategic integration of the supply chain; this means that operations are combined to achieve optimisation of goods and information flows, minimisation of costs, and maximisation of value creation through the operations of the supply chain. Supply chain performance can be assessed across five dimensions as defined in the SCOR Model; the SCOR Model defines the guidelines for measuring supply chain performance. As documented by APICS, Inc., 2022, there are five (5)

dimensions on which supply chain performance can be assessed: reliability, responsiveness, agility, cost effectiveness and asset management efficiency.

2.1.2 Global Supply Chains:

Interconnected systems of sellers, producers, and distributors that are linked through global supply chain networks to facilitate the movement of goods, services, and data internationally (Chopra & Meindl 2021). Due to the constant growth in technology and globalization throughout the world, supply chains have become increasingly more complex, and attached, leading to a change in the way businesses compete - moving from a focus on the firm or establishment level, to an emphasis on the entire supply chain (Ivanov & Dolgui 2020) in order to achieve superior competitive advantage from the coordination of existing resources, cost savings, and speed of response.

2.1.3 UPS: Company Overview:

UPS (United Parcel Service) is the largest global logistics and supply chain company, and it was started in 1907. Today, the company provides service in over 220 countries/territories worldwide. In the shipment tracking area and logistics operations management, they have created sophisticated digital systems that serve as a benchmark for fully integrated supply chains globally (UPS Annual Report, 2023). UPS is an ideal candidate for analyzing the relationship between Operational Efficiency and Financial Implications of SCM Component Performance during times of crisis.2.2 Crises and Their Impact on Supply Chains

A crisis is a sudden and impactful event that has the capability of severely disrupting regular functions and threatening the stability of an organization (Ivanov, 2021). Crisis management aims to reduce harmful impacts from a crisis and improve the ability of an organization to be flexible in their response. Recent crises such as COVID-19 and the Russia-Ukraine geopolitical conflict have highlighted some of the basic weaknesses present in global supply chains, and resulted in lost production, increased transportation costs, and shortages of raw materials (Queiroz et al., 2022). Due to these recent supply chain disruptions, both scholars and practitioners are currently focused on creating supply chains that are more resilient through using alternative suppliers, improving information flow, and enhancing the capabilities of their logistics.

2.3 Supply Chain Resilience and Robustness:

The ability of a supply chain to recover quickly from disruptions and resume its normal level of performance is classified as supply chain resilience (resilience); however, robustness is defined as the ability of a supply chain to continue to operate as normal during an emergency with minimal deterioration in level of performance (Ivanov & Dolgui 2021). The following are ways in which both of these capabilities can be obtained by an organisation:

- Increasing the quality of information to assist in decreasing uncertainty;
- Creating logistics capabilities to provide for on-going operational continuity; and
- Diversifying suppliers to eliminate reliance on one supplier.

2.4 SCM Components and Financial Performance: Hypotheses Development:

The literature affirms that organisational performance is directly influenced by the efficiency of SCM component management, particularly under crisis conditions (Koh et al., 2007; Ivanov, 2021). Performance is typically expressed through two lenses: financial performance (profitability, cost reduction) and operational performance (service quality, response speed). This study focuses on financial performance as the dependent variable.

2.4.1 Information Quality and Financial Performance:

An important factor that will help to reduce uncertainty and facilitate supply chain partner coordination is whether or not the quality of the information is satisfactory. According to Transaction Cost Theory (Williamson, 1985), the way information is exchanged between an organization and its trading partners impacts transaction costs and the level of risk due to information asymmetry. Thus, high-quality, timely, accurate, and transparent information increases decision-making quality and improves the operational efficiency of an organization, which ultimately benefits the organization's financial performance (Ivanov & Dolgui, 2020). Therefore, the following hypothesis is offered: **H1:** Quality of the information (during a crisis) will have a statistically significant, positive impact on organizational financial performance.

2.4.2 Logistics Services and Financial Performance:

Logistical services form the basis of the supply chain's operations and can include transportation, warehousing, distribution, and inventory management. The efficiency of these logistics services is one of the primary determinants of an organisation's cost structure and level of customer service. Studies have shown that organisations with better logistics performance will have lower operating costs and higher levels of customer satisfaction, which will lead to stronger financial performance (Bowersox et al., 2020; Christopher, 2016). The importance of efficient logistics service during a crisis is even more critical than at other times, as the speed and flexibility of distribution will determine if the business will be successful or not.

Therefore: **H2:** Logistic Services efficiency in a crisis will have a statistically significant positive relationship with the organisation's financial performance.

2.4.3 Supplier Relationship Management and Financial Performance:

Supplier relationship management (SRM) is a strategic asset for ensuring supply continuity and managing procurement risk. Long-term strategic partnerships grounded in collaboration and trust improve input quality, reduce costs, and foster innovation (Monczka et al., 2020). Close supplier collaboration also enhances supply chain flexibility and dampens the negative financial effects of crisis-driven disruptions (Ivanov, 2021). Accordingly:

H3: Supplier relationship management during crises has a statistically significant positive impact on organisational financial performance.

Main Hypothesis (H): Supply chain management components (information quality, logistics services, and supplier relationship management) during crises collectively exert a statistically significant positive impact on organisational financial performance.

3. Methodology

3.1 Population and Sample:

The target population comprises major global shipping and logistics companies that represent advanced models of international supply chain management, including DHL, FedEx, Aramex, and comparable firms. UPS was selected as the empirical case study due to its pre-eminent global standing, its extensive operational history in logistics and shipping, and its presence in over 220 countries and territories — characteristics that render it an apposite model for examining supply chain behaviour during crises.

A purposive sample of 50 branch managers from UPS Germany was drawn, selected because Germany represents one of the most strategically significant European logistics markets. The sample encompassed logistics managers, supply chain directors, procurement managers, and operations managers. The questionnaire was distributed electronically, with data confidentiality and informed consent assured for all participants.

3.2 Measurement of Study Variables:

The instrument for measuring the variables was developed using an extensive literature review. The measurement instrument was tested using a five-point Likert scale (1=strongly disagree, 5=strongly agree). The instrument contains:

• Independent Variables: Information quality (3 items); logistics service efficiency (3 items); supplier relationship management (3 items)

• Dependent Variable: Financial performance (3 items) Additionally, all items were specifically designed to reflect the context of major global crises (e.g., COVID-19 pandemic; geopolitical conflicts).

3.3 Reliability: Cronbach's Alpha:

Cronbach's Alpha Coefficient was used to measure the internal consistency (reliability) of the measurement tool. The table below indicates that all variables are at excellent levels of reliability ($\alpha \geq 0.89$), thus confirming the appropriateness of using the instrument for statistical analysis.

Table 1. Cronbach's Alpha Reliability Results - Source: Compiled by the author using EViews 12 output.

Variable	No. of Items	Cronbach's Alpha	Reliability Level
Financial Performance	3	0.89	Excellent
Information Quality	3	0.90	Excellent
Logistics Services	3	0.90	Excellent
Supplier Relationship Management	3	0.89	Excellent

3.4 Statistical Methods:

Data analysis was conducted using EViews 12. The following statistical procedures were applied:

- Simple linear regression analysis (one regression model per hypothesis);
- Coefficient of determination (R^2) to assess explanatory power;
- t-statistic for testing individual regression coefficients;
- F-statistic for testing overall model significance;
- Variance Inflation Factor (VIF) for multicollinearity diagnostics;
- Model stability tests to verify parameter consistency.

Diagnostic results confirmed the absence of problematic multicollinearity (VIF < 10) and stable model coefficients across all regression specifications.

4. Results

4.1 Effect of Information Quality on Financial Performance (H1):

According to regression analysis results, there is strong evidence to support the idea that there is a statistically significant positive relationship between the quality of information presented to clients and the financial performance of UPS during times of crisis. The correlation using the Pearson correlation coefficient demonstrated a moderate level of correlation between the two variables as evidenced by an r = 0.379; therefore, this indicates a moderate positive relationship between the two. Based upon the coefficient of determination R^2, the quality of information provided as clients contributes 14.4% of the overall variance in the financial performance of UPS. All of these statistics were tested for significance, as table 2 displays.

Table 2. Effect of Information Quality on Financial Performance - Source: Compiled by the author using EViews 12 output.

Indicator	Value	Interpretation
r	0.379	Moderate positive correlation
R^2	0.144	Explains 14.4% of variance
t-statistic	2.830	Statistically significant
p-value	0.006	< 0.05
F-statistic	8.009	Statistically significant

These findings indicate that information quality functions as an important enabling factor that reduces decision-making uncertainty during crises, thereby contributing positively to financial performance. H1 is supported.

4.2 Effect of Logistics Services on Financial Performance (H2):

The logistics service sector has been identified as having the biggest effect on financial outcomes. There is a strong positive correlation between logistics services and financial performance as represented by the correlation coefficient of r = 0.728. There is also a significant amount of variance explained by logistics services with a coefficient of determination (R^2) of 0.530, meaning that logistics services alone explain 53% of the variance in financial performance across all study variables. Full details can be found in Table 3.

Table 3. Effect of Logistics Services on Financial Performance - Source: Compiled by the author using EViews 12 output.

Indicator	Value	Interpretation
r	0.728	Strong positive correlation
R^2	0.530	Explains 53.0% of variance
t-statistic	8.909	Highly significant
p-value	0.000	< 0.001
F-statistic	79.37	Highly significant

These results reflect the pivotal role of logistics operations — transportation, distribution, and inventory management — in sustaining revenue continuity during crisis periods. H2 is strongly supported.

4.3 Effect of Supplier Relationship Management on Financial Performance:

The relationship between supplier relationship management and financial performance was shown to have a significant positive correlation (r = 0.620). Also, the supplier relationship management variable is shown to account for 38.4% of the variance in financial performance (r^2 = 0.384). The details of the results can be found in Table 4.

Table 4. Effect of Supplier Relationship Management on Financial Performance - Source: Compiled by the author using EViews 12 output.

Indicator	Value	Interpretation
r	0.620	Strong positive correlation
R^2	0.384	Explains 38.4% of variance
t-statistic	5.411	Statistically significant
p-value	0.000	< 0.001
F-statistic	29.28	Statistically significant

These findings underscore the critical role of strategic supplier partnerships in stabilising supply chain operations under unstable conditions and reducing operational risk exposure. H3 is supported.

4.4 Summary of Hypothesis Testing Results:

Table 5 consolidates the hypothesis-testing results across all three independent variables.

Table 5. Summary of Hypothesis Testing Results - Source: Compiled by the author using EViews 12 output.

Hypothesis	Independent Variable	r	R^2	p-value	Decision
H1	Information Quality	0.379	0.144	0.006	Supported
H2	Logistics Services	0.728	0.530	0.000	Supported
H3	Supplier Relationship Mgmt.	0.620	0.384	0.000	Supported

The findings on the whole prove that all three elements of Supply Chain Management (SCM) positively impact the financial performance of UPS during crisis periods, such as COVID-19 and geopolitical disruption, thus supporting all study sub-hypotheses, as well as the overall hypothesis tested in this research. Logistics services provided the greatest amount of variance in UPS's financial performance, accounting for 53.0% of the total variance ($R^2 = 0.530$). This finding illustrates that transportation and distribution are the core revenue-generating activities of UPS and that operational continuity and supply flow are critical to successful delivery of those activities. The second most significant contributor to UPS's financial performance was supplier relationship management (38.4%, $R^2 = 0.384$), indicating the significance of stable strategic partnerships in reducing operational risk and ensuring continued supply delivery amid adversity. While information quality represents only 14.4% of variance in UPS's financial performance ($R^2 = 0.144$), it still had a statistically significant impact on UPS's financial performance; thus, this finding supports the position that high-quality information is a necessary component of any decision support mechanism that lessens uncertainty during crisis situations, albeit indirectly, compared to logistics services and supplier relationship management. Taken as a whole, the findings support the conclusion that, collectively, these three elements of SCM create the systemic structure that supports the ability of UPS to generate crisis-resistant financial performance. In this context, logistics services, supplier relationship management, and information quality act as the complementary building blocks of supply chain resilience.

5. Discussion

Logistics services are vital to UPS's financial success in times of crisis. UPS's primary business model relies on transportation and distribution, therefore, UPS's revenue is directly dependent on the uninterrupted functioning of UPS's logistics system. Reliable and timely parcel deliveries are critical to sustaining revenues for UPS at times of crisis. This finding is reinforced by logistics researcher Bowersox et al.'s (2020) and Christopher's (2016) research, thereby supporting the idea that unique operational capabilities are sources of lasting competitive advantage as illustrated in the Resource-Based View. Effect of supplier relationship management ($R^2 = 0.384$) in any industry is strongly consistent with the position taken by Monczka et al. (2020) that building strategic partnerships based on collaboration and sharing of information leads to resilient and adaptable supply chains. In the midst of crises caused by geopolitical uncertainties, supplier diversification and trust-based collaboration

are not just operational choices but are critical for companies to be competitive in the market. Investments in long-term supplier relationship management practices enable a company to quickly respond to supply-related shocks and thus positively impact their financial stability. The impact of information quality ($R^2 = 0.144$) on the supply chain was smaller than expected but still statistically significant. Therefore, first careful interpretation needs to be applied when analyzing this relationship as lower levels of explanation may not be indicative of a lack of a relationship.

The dominance of logistics services ($R^2 = 0.530$) in explaining financial performance is both theoretically consistent and practically intuitive. UPS operates at the intersection of time-critical delivery demands and complex global distribution networks, making logistical continuity its primary source of competitive advantage. This finding strongly aligns with the Resource-Based View (RBV) of the firm (Barney, 1991), which posits that rare, valuable, and inimitable operational capabilities constitute the foundation of sustained competitive advantage. In the context of crises such as COVID-19, competitors that lacked the infrastructure resilience of UPS experienced severe revenue contractions, while UPS's integrated logistics network enabled continued service delivery and, consequently, revenue protection. This corroborates the empirical work of Bowersox et al. (2020) and Christopher (2016), who consistently demonstrate that superior logistics capabilities translate directly into measurable financial outcomes. Furthermore, this finding extends prior literature by confirming that logistics efficiency is not merely a cost-control mechanism but a crisis-resilience driver with direct implications for top-line financial performance.

The significant contribution of supplier relationship management ($R^2 = 0.384$) is equally noteworthy. During periods of geopolitical instability — most notably the Russia–Ukraine conflict — supply chains characterised by shallow or purely transactional supplier relationships suffered disproportionate disruptions in input availability and procurement costs. By contrast, organisations that had cultivated long-term, trust-based partnerships with diversified supplier networks were better positioned to absorb shocks and maintain operational continuity. This finding is consistent with Transaction Cost Theory (Williamson, 1985), which predicts that relational governance mechanisms reduce opportunistic behaviour and transaction costs in conditions of environmental uncertainty. It also aligns with Monczka et al. (2020), who argue that strategic supplier collaboration enhances flexibility and reduces the financial impact of supply-side disruptions. The strength of SRM's predictive power in this study suggests that investment in collaborative supplier relationships yields measurable financial dividends precisely when market conditions are most adverse — a finding with direct strategic relevance for logistics executives managing crisis-prone global supply chains.

The comparatively modest explanatory power of information quality ($R^2 = 0.144$) warrants careful interpretation and should not be construed as evidence of its irrelevance. Several explanations may account for this pattern. First, information quality may exert its influence on financial performance indirectly — operating as an enabling condition that amplifies the effectiveness of logistics services and supplier relationships rather than generating financial returns autonomously. In this view, information quality functions as a moderating or mediating variable whose full effect is only

discernible within a more complex, multi-variable model. Second, the measurement instrument captured managers' perceptions of information quality at a general level; it did not differentiate between specific dimensions such as accuracy, timeliness, completeness, or accessibility. More granular measurement in future studies may reveal stronger direct effects. Third, it is plausible that in a firm as technologically advanced as UPS — which has invested heavily in digital tracking, data analytics, and supply chain visibility platforms — a baseline level of information quality is already institutionalised, creating a ceiling effect that limits observable variance across respondents. These interpretations are consistent with Ivanov and Dolgui (2020), who conceptualise information quality as a foundational supply chain enabler rather than a standalone performance driver, and suggest that its strategic value may be best captured through integrated modelling approaches such as structural equation modelling (SEM).

Taken collectively, the findings of this study make a substantive contribution to the emerging body of literature on supply chain resilience and crisis management. While prior studies (Ivanov, 2021; Queiroz et al., 2022) have theorised the importance of SCM components during disruptions, fewer have empirically quantified their relative contributions to financial performance within a single organisational context using primary survey data. This study addresses that gap by providing comparative effect-size estimates (R^2) for each component, enabling a clearer prioritisation framework for practitioners. The ordering of effect sizes — logistics services first, supplier relationship management second, and information quality third — offers an empirically grounded hierarchy that managers can use to allocate resources and crisis-preparedness investments more strategically. Future research employing multiple regression or structural equation modelling across multiple firms and industries would further enrich this evidence base and test the robustness of these rankings across different organisational and crisis contexts.

6. Conclusion

The results of this study indicate that the three factors considered in this study, which comprised: (a) information quality, (b) logistics services and (c) supplier relationship management, all have a significant influence on UPS's performance during crisis periods. The empirical evidence presented supports that the three components function as an integrated system and collectively improve an organisation's ability to adapt and maintain its financial performance during a crisis. Logistics services were identified as the strongest predictor of USC's financial performance ($R^2 = 0.530$), supporting the operational importance of having transportation and distribution line continuity within UPS's business model. Supplier relationship management was identified as the second largest predictor of USPs financial performance ($R^2 = 0.384$), corroborating the strategic importance of having strong partnerships in maintaining a stable supply chain in times of geopolitical or pandemic-related disruptions. Information quality, while having lower direct predictive results ($R^2 = 0.144$), was also statistically significant and enabled effective decision-making and reduced uncertainty. The overall conclusion of this study is that supply chain resilience is now a critical attribute of every organisation and, as a result of increased economic volatility, climate disruption and the risk of pandemics, it is an

organisation's strategic imperative for financial sustainability. The organisations that make a systematic investment in SCM excellence across all three dimensions are best positioned to effectively navigate a crisis with financial security and emerge from it with greater than before.

7. Limitations of the Study

While this study provides meaningful empirical insights into the relationship between supply chain management components and financial performance during crises, several limitations must be acknowledged in order to contextualise the findings appropriately and guide future research.

First, sample size and geographic scope: The study relies on a purposive sample of 50 branch managers drawn exclusively from UPS Germany. Although this selection was strategically justified by Germany's importance as a European logistics hub, the relatively small sample size and single-country focus constrain the statistical power of the findings and limit their generalisability to other national markets, organisational contexts, or logistics firms operating under different regulatory and cultural conditions.

Second, reliance on self-reported perceptual data: The measurement instrument employs a five-point Likert scale administered to managerial respondents, meaning that all variable scores reflect subjective perceptions rather than objective financial records. This introduces the risk of common method bias, as both the independent and dependent variables were collected from the same respondents using the same instrument. Future research should triangulate perceptual data with archival financial data, such as UPS's publicly available annual reports, to enhance construct validity.

Third, use of simple linear regression models: Each hypothesis was tested independently using simple linear regression, which precludes the simultaneous examination of all three SCM components within a single unified model. As a consequence, potential interaction effects among information quality, logistics services, and supplier relationship management on financial performance remain unexplored. The application of multiple regression analysis or structural equation modelling (SEM) in future studies would allow for a more nuanced and comprehensive assessment of the collective and interactive effects of these variables.

Fourth, cross-sectional research design: The study adopts a cross-sectional design, capturing respondents' perceptions at a single point in time. This design does not allow for the examination of causal dynamics or temporal changes in the relationship between SCM components and financial performance across different phases of a crisis. A longitudinal study design would be better suited to capturing how these relationships evolve over time as crises unfold and organisations adapt their supply chain strategies.

Fifth, single-company focus: The empirical analysis is centred on UPS as a single case organisation. While this approach allows for contextual depth and specificity, it inherently limits the external validity of the conclusions. The unique operational scale, global network, and technological infrastructure of UPS may not be representative of smaller or mid-sized logistics firms. Comparative

multi-firm or multi-industry studies would substantially strengthen the generalizability of the findings.

8. Recommendations

The recommendations based on this research were made to help improve future company effectiveness:

1. Companies should invest heavily into improving their transportation infrastructure to prepare for future disruptions (increased transportation systems, improved inventory management systems/technology, improved distribution networks, etc.).
2. Companies should develop long term collaborative relationships with the companies that supply them materials (more than just placing an order with a company, they should work with their suppliers to minimize the risk of disruption).
3. Companies should invest in technology to allow them to share real time information between suppliers and customers so that they can make better decisions quickly in times of crisis.
4. Companies should diversify the sources of supply so they do not rely on one company for their products (to increase the number of suppliers).
5. Companies should have a buffer of stock available for their most critical products so that they can continue to operate while they look for new sources of supply.
6. Future research should use more advanced analytical techniques like SEM or panel data and collect data from multiple industries and countries in order to establish greater validity of the results.

References

- APICS. (2022). SCOR model reference guide: Supply chain operations reference model. Association for Supply Chain Management.
- Bowersox, D. J., Closs, D. J., & Cooper, M. B. (2020). Supply chain logistics management. McGraw-Hill Education.
- Chopra, S., & Meindl, P. (2021). Supply chain management: Strategy, planning, and operation (8th ed.). Pearson.
- Christopher, M. (2016). Logistics & supply chain management (5th ed.). Pearson Education.
- CSCMP. (2021). Supply chain management definitions and glossary. Council of Supply Chain Management Professionals.
- Ivanov, D. (2021). Supply chain viability and the COVID-19 pandemic: A conceptual and formal generalisation of four major adaptation strategies. International Journal of Production Research, 59(12), 3535–3552. https://doi.org/10.1080/00207543.2020.1760510
- Ivanov, D., & Dolgui, A. (2020). Viability of intertwined supply networks: Extending the supply chain resilience angles. International Journal of Production Research, 58(10), 2904–2915. https://doi.org/10.1080/00207543.2020.1750727

- Ivanov, D., & Dolgui, A. (2021). A digital supply chain twin for managing the disruption risks and resilience in the era of Industry 4.0. International Journal of Production Research, 59(1), 1–24. https://doi.org/10.1080/00207543.2020.1763038
- Koh, S. C. L., Demirbag, M., Bayraktar, E., Tatoglu, E., & Zaim, S. (2007). The impact of supply chain management practices on performance. International Journal of Production Economics, 103(1), 103–124. https://doi.org/10.1016/j.ijpe.2006.05.011
- Monczka, R. M., Handfield, R. B., Giunipero, L. C., & Patterson, J. L. (2020). Purchasing and supply chain management. Cengage Learning.
- Queiroz, M. M., Ivanov, D., Dolgui, A., & Fosso Wamba, S. (2022). Impacts of epidemic outbreaks on supply chains: Mapping a research agenda amid the COVID-19 pandemic. International Journal of Operations & Production Management, 42(1), 1–24. https://doi.org/10.1108/IJOPM-04-2020-0241
- UPS. (2023). Annual report 2023. United Parcel Service. https://investors.ups.com
- Williamson, O. E. (1985). The economic institutions of capitalism. Free Press.