Supply Chain Resilience and Firm Performance: The Mediating Role of Innovation Capability in Manufacturing Firms in Freetown, Sierra Leone

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ABSTRACT

This study identifies the relationship between the supply chain resilience and performance of firms with a specific focus on the mediating effect of innovation capability of manufacturing firms in Freetown, Sierra Leone. The study draws on DC theory to define supply chain resilience as the ability of a firm to prepare for, react to and recover from disruptive events, and defines innovation capability as the mechanism by which the knowledge generated by disruptive events is converted to better products, processes, organizational practices and marketing strategies. The survey resulted in 345 responses from managerial respondents from manufacturing firms selected through stratified sampling. After data screening, the proposed relationships were analysed by partial least squares (PLS) structural equation modelling. The results indicate that the supply chain's resilience positively affects the firm's performance and their innovation capability. The innovation capability also has a positive impact on firm performance and partly transmediates the positive effect of supply chain resilience on firm performance. This partial mediation suggests that resilience positively affects performance both directly (in terms of the continuity of operations) and indirectly (through its positive influence on the innovative capacity of firms). The model accounts for 62.8% of the variance in firm performance and is predictive relevant for the innovation capability and firm performance. The results build on Dynamic Capabilities Theory by adding resilience as another pathway that reinforces innovation in organisational performance in a developing economy context where resources are limited. In practice, handling risk preparedness, supplier coordination, recovery planning, organisational learning and investment in innovation together. Resilient infrastructure, more affordable finance, technological improvement and capability building programmes should be supported by policymakers to build the competitiveness of manufacturing companies.

Keywords: Supply Chain Resilience, Innovation Capability, Firm Performance

1. INTRODUCTION

Global supply chains have, over the past decade, faced unprecedented shocks, from the COVID-19 pandemic to geopolitical conflict, climate disasters, and trade protectionism, exposing the fragility of internationally dispersed supply chains (Belhadi et al., 2024; Chen et al., 2025). These shocks have pushed global value chain (GVC) resilience to the forefront of international business scholarship, as multinational enterprises confront the limits of efficiency-driven sourcing (Ryan et al., 2022). McKinsey (2021) estimates that firms face major disruptions roughly every 3.7 years, eroding cumulative pre-tax profits by up to 42% over a decade, while the World Economic Forum (2023) projects profit erosion exceeding 40% per decade. Consequently, supply chain resilience (SCR), the capacity to anticipate, absorb, adapt to, and recover from disruption, has become a central strategic priority for firms within global suppl chains (Wong et al., 2020; Akbar & Isfianadewi, 2023). Innovation capability has emerged as a critical resource enabling firms to reconfigure processes, products, and routines amid turbulence (Golgeci & Ponomarov, 2013; Sabahi & Parast, 2020), with firm performance the ultimate criterion against which such investments are judged (Akbar & Isfianadewi, 2023; Zhou et al., 2025).

Manufacturing firms in emerging economies occupy a particularly important position here, serving as engines of domestic development and as upstream GVC nodes that lead firms scrutinize for sourcing risk (McKinsey,

2021; Ryan et al., 2022). Manufacturing is widely regarded as an engine of structural transformation, employment, and value addition in developing economies (Asamoah, 2014; Du Toit et al., 2010), yet such firms face infrastructural deficits, limited technological capability, fragile supplier networks, and constrained finance, which intensify disruption exposure and can determine whether they are retained within, or bypassed by, international supply networks (Abdisa & Hawitibo, 2021; Ajayi & Laseinde, 2023). Against this backdrop, the capacity to absorb shocks and innovate becomes decisive for both domestic survival and international competitiveness (Sabahi & Parast, 2020; Golgeci & Ponomarov, 2013).

Sierra Leone offers a compelling, underexamined context, representing an extreme case of the institutional voids that international business scholars argue shape firm strategy in the weakest-institution segments of the global economy (Khanna & Palepu, 1997; Hoskisson et al., 2013). Manufacturing is recognised in national policy as central to diversifying an economy historically dependent on mining and agriculture (Republic of Sierra Leone Ministry of Trade and Industry, 2017), yet the sector remains small, accounting for only 4–5% of the labour force, and is dominated by import-substituting activities such as beverages, cement, and light fabrication (World Trade Organization, 2025). Chronic power shortages, weak transport infrastructure, bureaucratic customs procedures, and limited credit access undermine supply chain stability and constrain integration into regional and global value chains (Millennium Challenge Corporation, 2021; United States Department of State, 2025). Freetown was purposively selected because it hosts the country's primary commercial port and the bulk of its formal manufacturing activity, including the Special Economic Zone and the emerging Koya Industrial Zone, making it the most representative locus for examining how firms at the institutional periphery of the global economy build resilience and innovate under acute resource scarcity (United States Department of State, 2025; UrbanShift, 2024).

Despite growing global interest in the SCR-performance relationship, the empirical literature remains concentrated in developed and large emerging economies, particularly China, where most recent studies use large listed-firm datasets (Chen et al., 2025; Zhou et al., 2025). Evidence from Sub-Saharan Africa is comparatively limited, concentrated in South Africa, Kenya, Zimbabwe, and Ghana (Ali et al., 2024; Opoku, 2025), and research situated in Sierra Leone is virtually absent. Where innovation has been incorporated into SCR-performance models, it has predominantly been treated as a moderator or antecedent rather than a mediator, leaving the resilience-to-performance pathway via innovation capability theoretically underspecified (Zehir et al., 2015; Opoku, 2025). This matters for international business theory specifically, because GVC resilience research has focused almost exclusively on multinational lead firms' location and governance choices (Ryan et al., 2022), leaving the resilience-building behaviour of the small, peripheral upstream manufacturers on which those firms depend largely untheorized. This study addresses these gaps directly.

The general objective is to examine the mediating role of innovation capability between supply chain resilience and firm performance among manufacturing firms in Freetown, Sierra Leone. Specifically, the study seeks to examine the effect of supply chain resilience on firm performance; assess its effect on innovation capability; determine the effect of innovation capability on firm performance; and examine the mediating role of innovation capability in this relationship.

The study makes four contributions. Theoretically, it extends Dynamic Capabilities Theory and the Resource-Based View into a setting marked by acute institutional voids, testing whether innovation capability mediates resilience and performance under institutional weakness as it does in the better-resourced contexts where this literature developed (Helfat & Peteraf, 2003; Wong et al., 2020; Khanna & Palepu, 1997), and asking whether firms facing a liability of emergingness can substitute internal innovation for institutional support (Hoskisson et al., 2013). Empirically, it provides novel evidence from Sierra Leone, addressing a gap in Sub-Saharan African and international business scholarship. Managerially, it guides manufacturing executives on prioritising innovation investment to convert resilience into performance. Finally, it informs policymakers and development partners integrating peripheral manufacturers into global value chains on the role of innovation support in strengthening resilience.

2. THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

LITERATURE AND THEORETICAL BACKGROUND

2.1 Supply Chain Resilience

Supply chain resilience has emerged as a key tool for helping companies face and recover from disruption, and maintain their competitive performance, which entails systematically developing their anticipative, absorptive and adaptive capacity in their operations to cope with uncertainty (Belhadi et al, 2024). Conceived as an idea much more advanced than managing risks to reduce loss of costs from disruption, what has developed is the proactive and dynamic approach to managing risks to ensure long-term profit is not impacted by disruptions (Hosseini et al., 2019). Scholars tend to quote the five factors below as the key dimensions in which resilience can be operationalised, each with different but complementary approaches to disruption response that include flexibility, redundancy, visibility, collaboration and agility (Shekarian & Mellat Parast, 2021). In line with this multidimensionality, resilience is now more frequently described as a proactive strategic competency, enabling companies to 'bend but not break' when faced with a crisis and/or use unforeseen disruption as an opportunity for innovation or growth, rather than simply a survival mode (Christopher & Peck, 2004; Tukamuhabwa et al., 2015). Theoretically the dominant lens is still a dynamic capabilities perspective and resilience is viewed as important and contigent capabilities that allow a business to be inherently resilient by incorporating disrupted situations into its operations rather than seeing them as an external “disruptive shock”. The definition of supply chain resilience that is adopted for this study is its ability to deliberately and proactively manage to preempt, absorb, adapt to and recover from disruption without impacting its capacity to continue and to remain competitive.

2.2 Innovation Capability

Innovation capability has been described as processes which enables firms to convert, ideas, knowledge as well as resources to new systems, processes and products and also transform intangible competencies into competitive advantage (Daronco et al., 2023)

Innovation capability has been extensively regarded as key intangible resources of firms with respect to long-term sustenance, competitiveness particularly for firms established in developing economies which are capacity constrained (Heenkenda et al., 2022).

The idea has developed from individual to institutional level, and has now become a coherent at an organisational level that includes vision, competence development, organisational intelligence and technology management, which makes it possible to maintain excellent firm performance over the long-term (lawson and samson, 2001). The absorptive capacity of the firm is the ability to discern the usefulness of external knowledge, to internalise it, and to use it for commercial purposes, a competence thought to be at the heart of innovative capacities (cohen & levinthal, 1990).

Four aspects are typically recognized as the main strands by which the term "innovation capability" is translated into practice and that drive different but complementary paths to innovation (Moreira et al., 2024; Tsakalerou et al., 2025): knowledge and learning capability, organisational structure and culture, innovation management and strategy, and external networks and collaboration.

Interestingly, the dynamic capabilities perspective has, as yet, been the most dominant conceptual framework, with innovation capability viewed as a firm-specific resource, which can be used to sustain the creation of durable advantage through embedding the process of innovation within repeated organisational routines instead of considering it an episodic phenomenon. Innovation capability as a concept used for this study is defined as the deliberate, capability-based ability of the firm to discover, acquire and convert knowledge into innovation outputs that enable the firm to maintain its competitive capabilities.

2.3 Firm Performance

Firm performance is a key outcome variable on which organisations demonstrate their ability to add value (by integrating, developing and reconnecting their internal and external competencies) from resources, and it is the ability to do so through a process of integrating, developing and reconnecting their internal and external competencies that is now increasingly seen as the mechanism that translates to long-term performance in a changing environment (Teece et al., 1997). There are many concepts that conceptualize it as a multidimensional construct that reflects different aspects of profitability, positioning, satisfaction of the consumer, and process management, both financial and non-financial aspects of the success of the organization (Taouab & Issor, 2019).

The concept has transcended its limited accounting conception to become a wider-ranging assessment, including four types of perspectives, operational, financial, environmental, and governance with special care taken to consider environmental and governance factors when performing this assessment in emerging-market settings (Almulhim et al., 2024). Firm performance is typically measured across multiple balanced measure systems that incorporate financial results in addition to customer and internal-process and learning and growth metrics, which are taken to be an indicator of organisational health in itself, rather than just financial results (Kaplan & Norton, 1992). Conceptually the RBV is still considered to be the most prevailing, with the understanding that the function of the firm is to manage valuable, rare, inimitable and non-substitutable resources to maintain a competitive advantage over other firms (Barney, 1991). In this study, firm performance is considered a multidimensional construct that measures with a specific scale the financial, operational and market-based successes or failures of the firm as compared to their strategic goals and competitive setting.

2.4 Conceptual Integration

Collectively, the literature indicates that supply chain resilience is a strategic capability that leads to firm performance; however, only with the help of relevant internal mechanisms that convert resilience into competitive value. This study defines innovation capability as the intervening mechanism that transforms supply chain resilience into improved financial and operational outcomes for manufacturing firms. This composite view conceives of resilience to performance as a mediated relationship in which innovation capability acts as the vehicle to convert a firm's anticipatory, absorptive and adaptive resilience into a lasting competitive advantage, rather than positing an unmediated relationship between resilience and performance.

2.5 Theoretical Framework

This study is anchored in Dynamic Capabilities Theory (DCT), which extends the resource-based view by explaining how firms integrate, build, and reconfigure internal and external competencies to address rapidly changing environments (Teece et al., 1997). Whereas the resource-based view emphasises the possession of valuable, rare, inimitable, and non-substitutable resources, Eisenhardt and Martin (2000) note that such static resource positions are insufficient in volatile markets, since competitive advantage instead depends on the specific, identifiable organisational routines through which firms continuously achieve new resource configurations. Teece (2007) operationalised this renewal process through three interrelated microfoundational capacities. Sensing refers to the identification and assessment of opportunities and threats within a firm's technological and market environment, often through active scanning, learning, and interpretive activity. Seizing refers to the action of resources being mobilized, designing a suitable business model, and calling the right shots in terms of the investment that is needed in order to work with an opportunity and create value from that opportunity. Transforming refers to the ongoing renewal, recombination and reconfiguration of the resources, structures and processes within organisations to maintain their competitive fitness as internal and external conditions change. This study covers the following three processes, which map directly onto the constructs. Sensing can be associated with the anticipatory dimension of supply chain resilience that involves companies identifying vulnerabilities and keeping track of disruption signals in the supply network before they become actual (Stadtfeld & Gruchmann, 2024). Seizing aligns with agility, flexibility, and redundancy as firms' other resilience capabilities that can help maintain operational continuity under pressures, as cited in the literature (e.g., Stadtfeld & Gruchmann, 2024); this aligns with the literature on the direct effect of sensing and analytics capabilities on strengthening a firm's sustained competitive advantage under environmental uncertainty,

particularly in manufacturing environments facing volatility in demand and supply (e.g., Wong & Ngai, 2023). Transforming is most closely associated with innovation capability, since converting sensed opportunities and seized resources into new products, processes, and routines requires the reconfiguration capacity that innovation capability supplies; recent evidence confirms that the sequential progression from sensing through seizing to transforming exerts a measurable, cumulative effect on innovation performance, with each stage building upon, rather than substituting for, the preceding one (Zabel & O'Brien, 2024). The cumulative outcome of this sensing-seizing-transforming sequence is firm performance, since dynamic capabilities are theorised to generate the long-run financial and competitive advantage that constitutes superior enterprise performance in environments characterised by rapid technological and market change (Teece, 2007).

DCT therefore supports H1–H4 by supplying a coherent causal logic linking resilience, innovation, and performance. It supports H1 by treating resilience as a sensing-and-seizing capability with direct performance consequences. It supports H2 because seized resilience capacity supplies the raw material that transforming processes convert into innovation. It supports H3 since transforming is theorised as the proximate driver of sustained advantage (Eisenhardt & Martin, 2000). Finally, it supports H4 because performance gains from resilience are realised only once transforming capabilities are engaged, positioning innovation capability as the necessary conduit between resilience and performance.

2.6 Hypothesis Development

2.6.1 Supply chain resilience and firm performance

The Dynamic Capabilities Theory (DCT) considers resilience as a sensing-and-seizing process, which helps companies to capture the signals of disruption and coordinate their resources to safeguard operational continuity and create sustainable competitive advantages for companies that have fewer resources to do so (Teece, 2007). This is confirmed by empirical literature which, on the basis of analysing 58 papers, finds that resilient firms always generate better operational and financial results than their competitors (Negi et al., 2025). But this is far from an agreed-upon truth. Resilience research is empirically shown to often come with the trade-off of leaving operational efficiency and processes less efficient (Berendes et al., 2025), and when examining Saudi Arabian SMEs, Alshahrani and Salam (2022) conclude that the effects of resilience on firm performance are dimension specific, not general. The rationale behind H1 is however explicitly that resilience in the form of agility, flexibility, and redundancy will ensure the business continuity of companies, preserve their customer relationships, and prevent the revenue that will otherwise be lost on companies that are not prepared for disruption by its impact (Alshahrani & Salam, 2022; Negi et al., 2025). The performance dividends of resilience emerge, concretely, in times of disruption, thus requiring that the relationship between resilience and performance be observed during disruption as was the case here in the manufacturing sector in Freetown, Sierra Leone (Berendes et al., 2025).

H1: Supply chain resilience positively influences firm performance.

2.6.2 Supply chain resilience and innovation capability

Dynamic capabilities theory focuses on the dynamic process of mobilisation, seizing as a process that creates excesses in the levels of attention. attending to organisations, content of knowledge that flows across them and routines for problem-solving, which provide the raw ingredients of innovation capability (Teece, 2007). This argument is also supported by empirical studies: Liu and Liu (2024) based on a study of listed companies in China, they argue that resilience efforts increase the profitability of listed firms by fostering innovation levels through improving operational efficiency and widening market opportunities; Wang et al. (2025) based their study on small and medium enterprises in China conclude that supply chain resiliency strengthens manufacturing competitiveness in the long run by fostering innovation vitality. But there is an example to the contrary that should be taken into account. Also, Zhang and Mohammad (2024) acknowledge that while sustainability innovation demands substantial initial investment expenses, resilience action programs can also limit the possibility of such investment in the first place, especially for the companies in resource-constrained settings where investing in resilience can in turn be a decision that suffers from a scarcity of funds for innovation. Disruption can also act as a case of involuntary innovation training because disruption causes firms to build up the very knowledge and re-combination skills they need to innovate; disruption-prone contexts of manufacturing

are thus highly relevant to studying this relationship the fact that firms survive disruption time and time again leaves them structurally better equipped to innovate than firms that find themselves out of the running, changing their production habits to become more innovative (Dickens et al., 2024; Liu & Liu, 2024).

H2: Supply chain resilience positively influences innovation capability.

2.6.3 Innovation capability and firm performance

Logically, innovation capability, in turn, is the organisational capability that enables transforming, and innovation capability is the immediate antecedent of sustained competitive advantage, inasmuch as dynamic capabilities theory suggests that it is transforming that leads to sustainable competitive advantage (Teece, 2007). The relationship is supported by empirical evidence as Peprah et al. (2023) in their quantitative study of 200 manufacturing companies in Ghana found that an innovation orientation had a positive and significant impact on financial performance, whereas Al Mamun et al. (2022) who studied the Malaysian manufacturing SMEs concurred that product and process innovation mediates financial performance as function of innovation orientation, proving that innovation contributes directly to enterprise performance generation. The relationship is by no means consistent, though. Peprah et al. (2023) admit that previous research results have been mixed, their innovation-performance effects widely ranging across firm size, firm type and sectoral context, meaning that it is not just a matter of the ability to innovate, but of the rewards.

Explained reasons for H3 are: First, Innovation capability of firms; better performance will manifest as cost, revenue and competitive positioning benefits of the firm, and better performance will bring new products and process efficiencies earlier than its rival firms as a result of well-designed disruption induced learning (Al Mamun et al., 2022; Opoku et al., 2025).

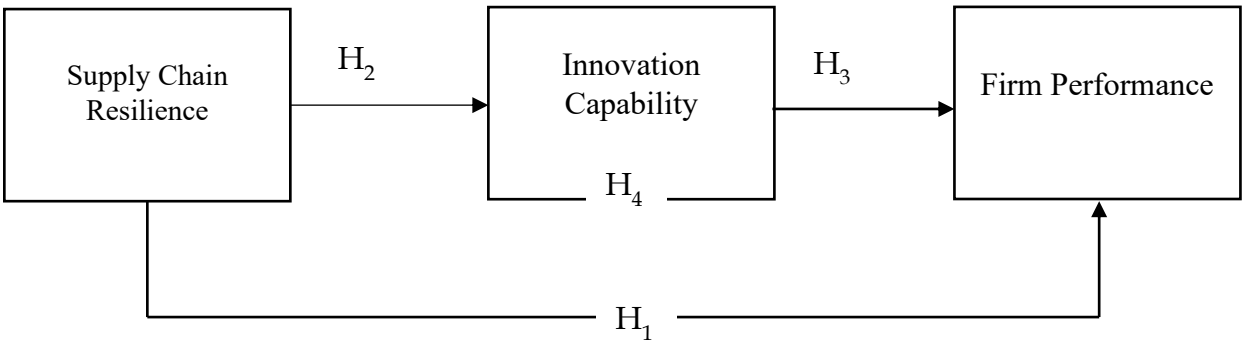
H3: Innovation capability positively influences firm performance.

2.6.4 Mediating role of innovation capability

The mediation is supported by Dynamic Capabilities Theory, which makes the following sense: sensing and seizing capacities lead to resilience, transforming capabilities lead to rebuilt products, processes and routines that are redefined as innovation capacity while innovation capacity, in turn, positively impacts firm performance (Teece, 2007). Thus, if the transforming stage is not included, the benefits of resilience on performance are unlikely to be realised commercially, as sensing and seizing without transformation would not result in new value configurations that firms would need to achieve the performance benefits desired (Eisenhardt & Martin, 2000). Evidence of this mediated relationship is also increasing: Dickens et al., (2024) draws a dynamic capabilities perspective to uncover that firm innovativeness reshapes the link between investments in resilience and outcomes in competition; Opoku et al., (2025) in their study of 385 manufacturers in Ghana found that technology innovation partially mediates the relationship between dynamic capabilities and sustainable firm performance. However, other scholars argue that resilience must impact performance directly and not through innovation capability and that in some contexts it would not be a perfect mediation as this would rely on the firm's resources, the industry dynamics and the environment (Negi et al., 2025). It is interesting to note that while roles of resilience are significant, the nature of the impact of the learning experiences it facilitates cannot be easily improved, but can be improved when the firm has the capability to transform the disruption-induced learning into other value-creating assignments whilst the arbitrariness of H4 is evident.

H4: Innovation capability mediates the relationship between supply chain resilience and firm performance.

Figure 1 Research Model



Source: Researcher's Construct (2026)

3. METHODS

3.1 Sample and data collection

The manufacturing industry has a great contribution to generating employment, developing industries and promoting economic growth in Sierra Leone. This study focused on the manufacturing sector in Freetown. There are 400 registered manufacturing companies operating in various industrial sub-sectors. Three key officers were selected from each organisation, thus, Procurement Officer, Finance Officer and Budget Officer. This made up a total target population of 1200. These respondents were chosen as they are directly involved in the procurement, finance and budgeting processes. This can therefore give a better understanding of factors such as supply chain resilience, innovation capability and firm performance. The sample size was calculated using the Krejcie and Morgan (1970) formula and found that a minimum sample size of 292 was needed. After collecting and screening data a total of 345 responses were obtained and used in the final analysis. This number was above the minimum required sample size and so gave a sufficient amount of data for the PLS-SEM analysis (Hair et al., 2022; Kline, 2023). The principal data was gathered from a structured questionnaire given to senior supply chain professionals, operations managers, procurement managers, production managers and other managers with a vast experience on the workings of their firms supply chain operations and strategic decisions. The respondents were chosen as key informants owing to their in-depth knowledge about the organisations, organisational resilience practices and innovation activities, in addition to their first-hand awareness of firm performance (Kumar et al., 1993). The questionnaires were mainly presented online for convenient data collection, and to make it easy for the respondents to get them.

3.2 Common Method Bias

Given that the independent, mediating, and dependent variables were measured from the same people in each manufacturing firm and by using a questionnaire, common method bias (CMB) was considered in the research design and analysis of data. Common method bias can occur when data are from a single source and at a single time, which can lead to an inflated estimate of the correlations among the variables in a study (Podsakoff et al., 2003). A number of procedural measures were taken to reduce this risk. To minimise evaluation apprehension and social desirability bias, respondents were assured, first, of their anonymity and confidentiality in their responses. Second, within the questionnaire, the predictor, mediator and outcome variables explicitly were broken down into their respective blocks and given explicit instructions to reduce the possibility of respondents' inferring relationships between the respective constructs. Thirdly, the words used throughout the questionnaire were kept simple, clear, and unambiguous, and a pilot test was conducted to enhance the questionnaire's clarity, relevance and reliability before the final survey (Podsakoff et al., 2003; Saunders et al., 2023). Beyond these procedural controls, statistical tests were employed to act as a preliminary check and determine if common method bias existed. Common method bias was not a serious issue as the variance accounted for by the first unrotated factor from Exploratory Factor Analysis was less than 50% of the total variance as indicated by Harman's single-factor test (Podsakoff et al., 2003). In addition, complete the VIF values for the collinearity

factors were evaluated according to the recommendation by Kock (2015) which indicate the degree of collinearity. Further evidence that common method bias did not substantially affect the study results was that all full collinearity VIF values were below the suggested limit of 3.3. These procedural and statistical remedies enhanced confidence in the true association instead of any measurement artefact between supply chain resilience, innovation capability, and firm performance.

3.3 Measures

To ensure content validity and reliability, measurement instruments used in this study were modified from previously existing and validated measurement instruments showed in previous empirical studies. The measurement items that were selected were critically analyzed and contextually modified to capture the nature of the manufacturing firms in Freetown, Sierra Leone, while keeping the conceptual content of the original constructs. Accordingly, all constructs were measured by brief multiitem scales to maximize the accuracy of the measures and minimize respondent fatigue following the common practice in supply chain and management studies. All the statements were answered on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree).

Supply chain resilience (SCR) was assessed as a multi-dimensional construct with readiness (preparedness), response capability and recovery capability components. The measure contained ten items that were developed by adapting the items from the validated scale developed by Chowdhury and Quaddus (2017), and supported by the resilience measurement framework proposed by Ambulkar et al. (2015). Specifically, there were four items measuring readiness, three items measuring the response capability, and three items measuring recovery capability. These dimensions, when combined, reflect the firm's ability to prognosticate the potential for such disruption, to be able to recover quickly from disruptions, and to respond effectively to disruption as it occurs.

Operationalization of innovation capability (IC) was done by a multidimensional approach, including product innovation capability, process innovation capability, organizational (managerial) innovation capability and marketing innovation capability. Ten items measured the construct, which were developed from recent innovation capability scales by Rajapathirana and Hui (2018), Saunila (2016), Çalık et al. (2017), and Paovangsa et al. (2025). A total of three items were used for product innovation capability, three items for process innovation capability, two items for organisational (managerial) innovation capability and two items for marketing innovation capability. All these dimensions address the firm's ability to create and market new products, improve production process, manage firm's innovative activities and employ innovative marketing practices, leading to the enhancement of the firm's competitiveness and future performance.

Firm performance (FP) was considered as a multi-dimensional measure with including operational performance, financial performance and market performance. It was measured with twelve items adapted from recent validated scales from the field of operations, supply chain, and strategic management (Abusalma et al., 2024; Liu et al., 2025; Phuanerys, 2025; Saunila et al., 2024). In particular, there were four items for operational performance, four items for financial performance and four items for market performance. These measurements individually assessed the company's performance in operational efficiency, product quality, delivery reliability, profitability, sales growth, financial performance compared to competitors, customer satisfaction and competitive market position.

3.4 Data Analysis

The data were analysed using the PLS-SEM (Partial Least Squares Structural Equation Modelling) with software named SmartPLS 4. As the research models analysed in this study were deemed to be complex due to higher order latent variables included, mediation relationships, and a prediction-oriented research, PLS-SEM was considered appropriate (Hair et al., 2022; Sarstedt et al., 2022). In line with the recommended disjoint two-stage approach for hierarchical component models, first, the measurement model was evaluated for construct reliability, and discriminant validity (Hair et al., 2022; Henseler et al., 2015) using indicator loadings, the Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE) of the measurement model. Then the structural model was assessed in terms of hypothesis testing involving all the relations and the mediating effect of innovation capability through bootstrapping procedure (5000 resamples). As per the existing guidelines in the PLS-SEM literature, the assessment of the structural mode was carried out through the output

of PLS-SEM, such as path coefficients (β), t-values, p-values, coefficient of determination (R^2), and predictive relevance (Q^2) (Hair et al., 2022; Sarstedt et al., 2022). The analytical procedure complies with that followed in the sample article in which the measurement model was evaluated prior to testing the structural model with the PLS-SEM.

3.5 Ethical Concerns

Ethical considerations were adhered to throughout this study. All participants were given the choice to take part and they were informed about the purpose of the study. The participants provided informed consent and were assured that their answers would remain anonymous and confidential. No personal information was needed and all data was used for academic purposes only. Participants were also informed that they could withdraw from the study at any point and there would be no repercussions. All data was handled securely and only used for research purposes. The study ensured that no harm, discrimination or risk to reputation would occur to participants or their organisation. This ensured that the research was carried out in an ethical manner and participants' rights were protected.

4. RESULTS

The data analysis was conducted in two phases. The first phase involved assessment of the measurement model to establish the reliability and validity of the measures used to operationalize supply chain resilience (SCR), innovation capability (IC), and firm performance (FP). The measurement model was evaluated using indicator loadings, Cronbach's alpha, composite reliability, average variance extracted (AVE), and the heterotrait–monotrait ratio (HTMT). The second phase involved assessment of the structural model using partial least squares structural equation modelling (PLS-SEM) to test the hypothesized relationships among the study constructs. PLS-SEM was considered appropriate because the model incorporates higher-order latent constructs, examines direct and indirect relationships, and seeks to explain variance in innovation capability and firm performance. The structural model assessment subsequently examined the proposed direct effects of supply chain resilience and innovation capability and the mediating role of innovation capability in the relationship between supply chain resilience and firm performance.

4.1 Measurement Model Assessment

The psychometric properties of the measurement model were assessed to establish the reliability and validity of the study constructs. The evaluation criteria included indicator loadings, Cronbach's alpha, composite reliability, average variance extracted (AVE), and the heterotrait–monotrait ratio (HTMT). The loadings of the indicators of supply chain resilience were between 0.748 and 0.798, and the loadings of the indicators for innovation capability were between 0.773 and 0.850 as presented in Table 1. These loadings were found to be greater than 0.708, which is the threshold recommended to determine the proportion of variance explained by the indicators in their constructs. The loadings for firm performance ranged from 0.599 to 0.755. Although some firm-performance indicators were below 0.708, they remained above the minimum acceptable level of 0.40 and were retained to preserve the construct's conceptual coverage because its internal-consistency measures were satisfactory (Hair et al., 2022).

Internal consistency reliability was established using Cronbach's alpha and composite reliability. Cronbach's alpha values were 0.922 for supply chain resilience, 0.904 for firm performance, and 0.944 for innovation capability. Similarly, composite reliability values were 0.923, 0.904, and 0.945, respectively. The level of internal consistency for all values was satisfactory to excellent (above recommended threshold of 0.70). Furthermore, the maximum was not greater than 0.95, indicating they were not overly redundant to measure items.

Convergent validity was evaluated using AVE and each construct and the values of the supply chain resilience and innovation capability were 0.589 and 0.665, respectively, exceeding the suggested value of 0.50, indicating that the constructs accounted for more than 50% of the variance in their indicators.

Firm performance recorded an AVE of 0.485, marginally below the conventional threshold. However, its high composite reliability of 0.904, together with the theoretical relevance of its operational, financial, and market-

performance dimensions, provided reasonable grounds for retaining the construct. Nevertheless, this marginal result should be acknowledged when interpreting the findings.

Discriminant validity was assessed using the HTMT criterion. As reported in Table 2, the HTMT values were 0.690 between firm performance and innovation capability, 0.721 between firm performance and supply chain resilience, and 0.512 between innovation capability and supply chain resilience. All values were below the conservative threshold of 0.85, confirming that the constructs were empirically distinct (Henseler et al., 2015). Collectively, the results demonstrated satisfactory reliability, convergent validity with a marginal qualification for firm performance and discriminant validity. The measurement model was therefore considered sufficiently robust for subsequent structural-model assessment.

Table 1: Construct Reliability and Validity

Code	**Items**	**Factor Loadings**	**Cronbach's Alpha**	**Composite Reliability (CR)**	**AVE**
Supply Chain Resilience			0.922	0.923	0.589
SCR1	Our firm continuously monitors potential supply chain risks.	0.755			
SCR2	Our firm has contingency plans for major supply chain disruptions.	0.748			
SCR3	Our firm maintains adequate resources to cope with unexpected disruptions.	0.749			
SCR4	Our firm regularly reviews and updates its supply chain risk management plans to address emerging risks.	0.753			
SCR5	Our firm responds quickly when supply chain disruptions occur.	0.774			
SCR6	We coordinate effectively with suppliers during disruptions.	0.798			
SCR7	Our firm reallocates resources rapidly to address unexpected disruptions.	0.787			
SCR8	Our firm restores normal operations quickly after disruptions.	0.753			
SCR9	Our firm minimizes operational losses during the recovery process.	0.789			
SCR10	Our firm is able to restore its supply chain performance to pre-disruption levels within an acceptable period.	0.767			
Firm Performance			0.904	0.904	0.485
FP1	Our firm's operational efficiency has improved over the past three years.	0.599			
FP2	Our firm consistently delivers products and services to customers within the expected time.	0.614			
FP3	The quality and reliability of our products and production processes have improved compared with our major competitors.	0.723			

FP4	Our firm has reduced production lead times over the past three years.	0.744			
FP5	Our firm's profitability has improved over the past three years.	0.689			
FP6	Our firm's sales growth has improved over the past three years.	0.755			
FP7	Overall, our firm's financial performance is better than that of our major competitors.	0.725			
FP8	Our firm has achieved satisfactory returns on its investments over the past three years.	0.726			
FP9	Customer satisfaction with our products and services has improved over the past three years.	0.725			
FP10	Our firm's competitive position in the market has improved over the past three years.	0.75			
FP11	Our firm's market share has increased over the past three years.	0.631			
FP12	Our firm has been more successful than its major competitors in attracting and retaining customers.	0.654			
Innovation Capabilities			0.944	0.945	0.665
IC1	Our firm frequently introduces new or significantly improved products to meet changing customer and market needs.	0.811			
IC2	Our firm continuously improves existing products by incorporating new technologies and customer feedback.	0.828			
IC3	Our firm consistently develops new or significantly improved products faster than major competitors.	0.846			
IC4	Our firm regularly introduces improvements in production or operational processes to enhance efficiency.	0.785			
IC5	Our firm adopts new technologies and production methods to improve operational performance.	0.802			
IC6	Our firm continuously improves production processes to reduce costs and increase productivity.	0.773			
IC7	Management actively encourages employees to generate and implement innovative ideas.	0.826			
IC8	Our firm provides employees with adequate support and resources to develop and implement innovative ideas.	0.832			
IC9	Our firm regularly develops innovative marketing approaches to promote its products and services.	0.85			

IC10	Our firm frequently adopts innovative marketing strategies to strengthen its competitive position in the marketplace.	0.799			

Abbreviations: Supply Chain Resilience (SCR), Innovation Capability (IC), Firm Performance (FP)

The reliability of the measurement model was sufficient and the validity was acceptable for conducting structural analysis, so that the instruments used were appropriate. The range of the indicator loadings was 0.599 – 0.850. The indicators of supply chain resilience had high loadings ranging from 0.748 to 0.798 suggesting that firms' preparedness, response and recovery capabilities were clearly captured by the indicators. The loadings of innovation capability produced the highest and consistent loadings ranging from 0.773 to 0.850, indicating that the innovation capability represented the activities of product, process, organizational, and marketing innovation. Firm performance loadings ranged from 0.599 to 0.755. Although several indicators were below the preferred threshold of 0.70, they remained above the acceptable minimum of 0.40 and were retained because of their theoretical relevance to the operational, financial, and market dimensions of firm performance.

Internal consistency was strong, with Cronbach's alpha values ranging from 0.904 to 0.944 and composite reliability values ranging from 0.904 to 0.945, all exceeding the recommended threshold of 0.70. The reliability coefficients in the areas of innovation capability, supply chain resilience and firm performance were the highest. The results show very high consistency between the indicators and a moderate level of measurement error. The findings on reliability hold together to support the adequacy of the constructs to estimate the structural model. The mean values of variance extracted were from 0.485 to 0.665. The convergent validity was endorsed by AVE values for Supply chain resilience and Supply chain innovation capability of 0.589 and 0.665, respectively, which are above the recommended threshold of 0.50. The greatest proportion of variance of the indicators of innovation capability was accounted for by conceptual coherence and empirical homogeneity. The performance of the firms had an average of 0.485, which is slightly lower than the recommended level. It had an acceptable evidence of convergent validity (CI = 0.904), acceptable evidence of internal consistency (s = 0. 60), and multidimensional theoretical coverage, however, it was a composite to get these results. Overall, the results indicate that the measurement model is sufficiently reliable and valid for structural model assessment (Table 1).

Table 2: HTMT Result

	FP	**IC**	**SCR**
FP			
IC	0.69		
SCR	0.721	0.512	

Supply Chain Resilience (SCR), Innovation Capability (IC), Firm Performance (FP)

Table 3: Fornell–Larcker

	FP	**IC**	**SCR**
FP	0.697		
IC	0.68	0.816	
SCR	0.683	0.481	0.767

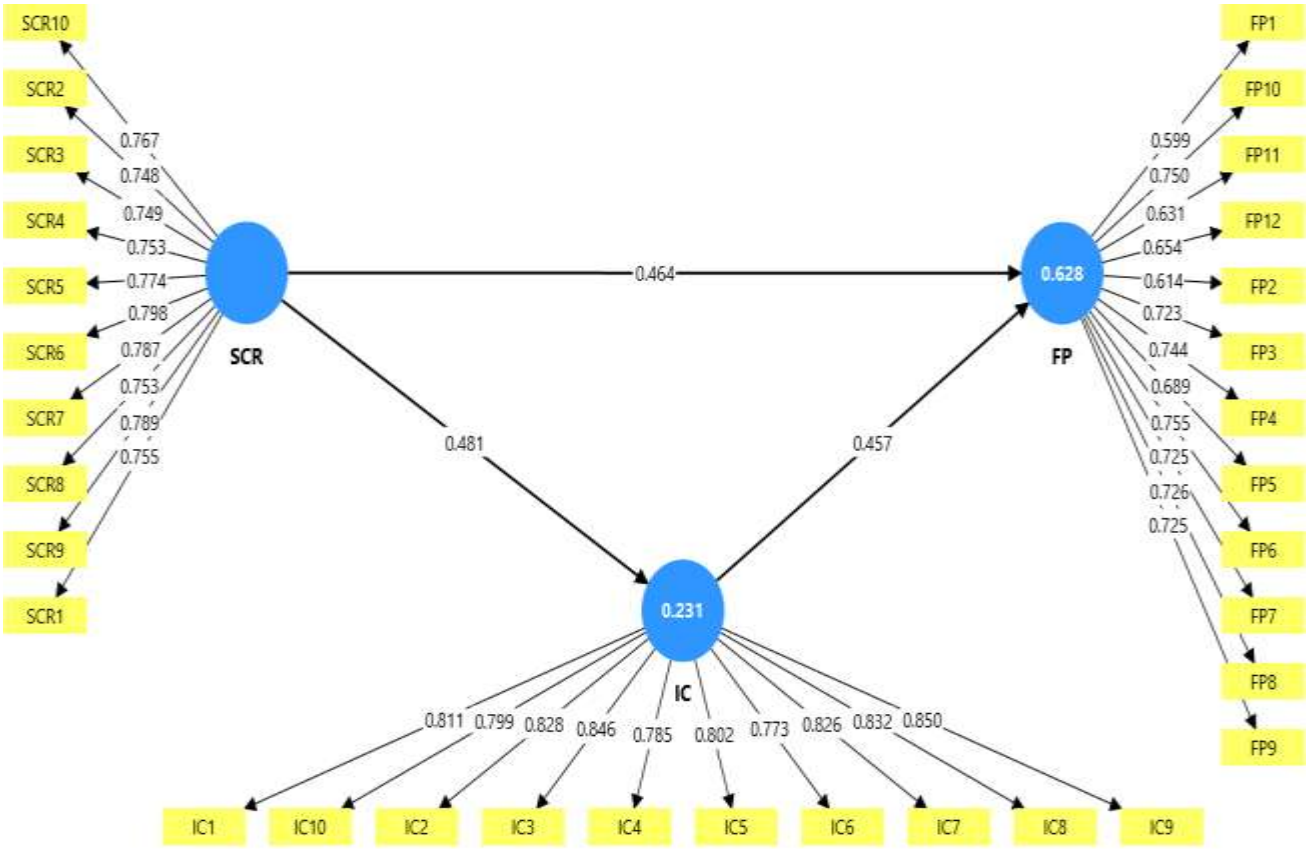
Discriminant validity was assessed using the heterotrait–monotrait (HTMT) ratio, with all values falling below the conservative threshold of 0.85, thereby confirming that the constructs were empirically distinct. The HTMT results indicate that supply chain resilience, innovation capability, and firm performance capture related but conceptually independent phenomena. The relationship between supply chain resilience and firm performance was the most positive, theoretically consistent link between the constructs (HTMT = 0.721), indicating that the more resilient the firm, the better their situation would be for maintaining performance and operations when

disruptions occurred, but does not indicate that resiliency is redundant in terms of the constructs. The moderate level was identified in relation to the innovation capability and the firm performance (HTMT = 0.690), which also provides evidence of the meaningful conceptual-relatedness between the two concepts, but demonstrates that innovation capability is different from the performance outcomes it achieves. The lowest HTMT was observed between resilience and supply chain resilience (HTMT = 0.512), suggesting that innovation capability should be considered a different organizational mechanism that could be impacted by resilience and result in firm performance. Table 2 shows that all the HTMT values are less than the critical value of 0.85, so there is a good discriminant validity across the measurement model in general.

4.2 Assessment of the structural model

FIG 2. Confirmatory Factor Analysis

Structural Modelling



Abbreviations: Supply Chain Resilience (SCR), Innovation Capability (IC), Firm Performance (FP)

Figure 2. PLS-SEM structural model results

The estimated structural model, relating supply chain resilience, innovation capability and firm performance, is depicted in figure 2. Meanwhile, the results suggest positive path coefficients between supply chain resilience and firm performance ($\beta = 0.464$), supply chain resilience and innovation capability ($\beta = 0.481$), and innovation capability and firm performance ($\beta = 0.457$). The coefficients show that better ability to mitigate disruptions in the supply chains is linked with increased capability to innovate and better firm performance, and also increased capability to innovate is linked with better firm performance. Modest explanatory power was also found with the coefficient of determination ($R^2 = 0.231$) for the supply chain resilience and the innovation capability. Supply chain resilience and innovation capability were found to account for a significant amount of variance in firm performance ($R^2 = 0.628$), together explaining 62.8% of the variance in firm performance. The result of bootstrapping was then used to evaluate statistical significance of the relationships and the mediating effect of innovation capability.

Table 4: Hypothesis-Testing Results

Hypothesis	Relationship	β	t-value	p-value	Decision
H1	SCR → FP	0.464	6.655	<0.001	Supported
H2	SCR → IC	0.481	5.979	<0.001	Supported
H3	IC → FP	0.457	6.45	<0.001	Supported
H4	SCR → IC → FP	0.22	4.99	<0.001	Supported

Abbreviations: Supply Chain Resilience (SCR), Innovation Capability (IC), Firm Performance (FP)

The bootstrapping procedure yielded path and t values, and p values, which were used to evaluate the structural model. All the hypothesized relationships had a positive and significant direction, as presented in Table 3. Supply chain resilience was positively and significantly associated to firm performance ($\beta = 0.464$, $t = 6.655$, $p < 0.001$), in support of H1. This finding indicates that organisations with greater readiness, response and recovery capabilities are more likely to be able to maintain business continuity and achieve better financial and

market performance in the event of SC disruption. Results also reveal positive and significant impacts of supply chain resilience on the innovation capability ($\beta = 0.481$, $t = 5.979$, $p < 0.001$), supporting H2. This indicates that the companies that are resilient are better equipped to convert both disruption experiences and knowledge into innovations in product, process, organisation and marketing. Overall, this is backed by the findings that Innovation capability has a positive and significant effect on Firm performance ($\beta = 0.457$, $t = 6.450$, $p < 0.001$; H3 supported). Therefore, companies which design and implement breakthroughs in products, processes, organisation systems and marketing strategies are more likely to have better operational, financial and market results. The specific indirect effect between supply chain resilience and firm performance via innovation capability was also positive and statistically significant ($\beta = 0.220$, $t = 4.990$, $p < 0.001$), and this supported H4. As both the direct linkage between supply chain resilience and firm performance, and the indirect linkage via innovation capability were positive and strong, the results suggest partial mediation in a complementary manner. For this purpose, supply chain resilience contributes to firms' performance on direct and indirect ways, via increasing the firms' innovation capability. Overall, the result is in line with the empirical test of all four hypotheses and the proposed structural model.

Table 5: Model Evaluation

	R-Square	Adj. R^2	Q^2 Predict	RMSE	MAE
Firm Performance	0.628	0.626	0.456	0.756	0.487
Innovation Capability	0.231	0.229	0.215	0.902	0.582

Abbreviations: Supply Chain Resilience (SCR), Innovation Capability (IC), Firm Performance (FP)

The explanatory and predictive power of the structural model is presented in Table 4. The coefficient of determination revealed that SC resilience and SC innovation capability explained together 62.8% of the variance in the firms' performance (R2 =0.628). The adjusted value was almost the same adjusted (R2=0.626) which also shows a moderate to substantial explanatory value and that the estimation was not overly influenced by complexity of the model. Therefore, the model is able to give a good explanation of variance in performance of the manufacturing firms studied. The variance of innovation capability was explained by 23.1% of the supply chain resilience (R2=0.231), and 0.229 for the adjusted value. This is a modest exogenous explanatory power, suggesting that supply chain resilience plays a role as a significant predictor of innovation capability, though other organisational and environmental factors which are not included in the model may also have an impact on the firms' innovation capabilities. Limited overfitting and model stability is also confirmed by the close proximity of the R2 and adjusted R2 values for both endogeneous constructs. Positive values of Q2 predicts were found for firm performance (0.215), and innovation capability (0.456), suggesting that the model was out of sample predictive valid for both constructs. The model showed slightly higher predictive relevance for the innovation capability construct, suggesting that the model was better at predicting this construct than firm performance. The RMSE values were 0.902 for firm performance and 0.756 for innovation capability with the mean absolute error

values being 0.582 and 0.487, respectively. The lower value of prediction errors for innovation capability is consistent with the higher value of Q2 predict. Overall, the findings show satisfactory explanatory capacity (explained variance), as well as predictive relevance (predictive performance) especially with respect to firm performance (in terms of explained variance) and with respect to innovation capability (in terms of predictive performance) (Table 4). There is one qualification: RMSE and MAE do not alone qualify the ability to predict to be "weak" or "strong. A more precise PLS predict classification needs to be done in comparison with linear-model classification errors, which are the corresponding benchmark errors.

5. DISCUSSIONS

These findings provide support for the model, as they have shown that supply chain resilience has direct and indirect impacts on firm performance through the innovation capability. The four hypotheses were accepted, indicating that there are capabilities within an organisation in relation to preparedness, response, recovery and innovation that are inter-reinforcing. In dynamic capabilities view, resilient companies are not only resilient when facing disruption, but also able to 'read' it, capitalize on it at the right moment and turn knowledge about it into a valuable change (Teece, 2007). Firstly, the supply chain resilience positively and significantly influenced the firm's performance, thus supporting H1. Companies that can track risk events, have contingency plans, communicate with suppliers, quickly reallocated resources and resume operations are likely to be able to maintain business continuity and enhance their performance. This discovery backs the resilience idea that it is an adjustment ability in which organizations get ready for, take care of, and get better from harmful situations (Ponomarov & Holcomb, 2009; Ambulkar et al., 2015). It further confirms evidence that enhances resilience and/or performance during times of disruption through visibility, connectivity, and relational skills (Wieland & Wallenburg, 2013; Brandon-Jones et al., 2014). Second, the resilience of the supply chain was positively associated with innovation capability, thus supporting H2. Processes of disruption management can thus generate potential for organisational learning, experimentation and reconfiguration of resources. Risk monitoring can identify some vulnerabilities and new customer needs; response and recovery actions can yield knowledge to improve innovations in products, processes, organisations and markets. This explanation is in line with the dynamic capabilities theory that postulates the three pillars of renewal (sensing, seizing and transforming) (Teece, 2007). It also dovetails with evidence establishing the link between resilience and innovativeness by means of information sharing and capability development (Dickens et al., 2024), and how technology enabled innovation can boost resilience and performance in the presence of supply chain dynamism (Belhadi et al., 2024). Third, the innovation capability correlation positively and significantly supported the hypothesis H3, meaning that there is a significant relationship between great innovation capability against firms performance.

Companies that produce better products, implement efficient technology, hone processes, consider employee suggestions, and come up with new marketing strategies are more likely to cut costs, produce better quality, please customers, and get more competitive. This finding is consistent with the results of Rajapathirana and Hui (2018) that has confirmed the positive relationship between innovation capability and innovation outcomes and firm performance. It also aligns with Yusheng and Ibrahim (2020) who concluded that product, market and organisation innovations led to performance benefits in Ghana. Thus, the ability to innovate means that manufacturing companies can convert knowledge and resources into operations and value. Fourthly, innovation capability played a significant mediating role between supply chain resilience and firm performance, which helped to verify H4. Since the direct and indirect effects were positive and significant, the result confirms complementary partial mediation. Supply chain Resilience have a direct positive link to minimizing disruption losses and maintaining production lines AND an indirect positive link through innovation. This finding is consistent with the result of Hamidu et al., (2023) who reported the mediation effect of technological innovation between resilience and performance in Ghana.

It also reflects Chang et al. (2026), who demonstrated the performance effects of organisational resilience pass through innovative capabilities. Resilience, therefore, supports and complements the direct performance benefits of innovation. Last but not least, the model was able to account for the variance in performance of the firms as well as their ability to innovate by 62.8% and 23.1% respectively. Positive values of Q2predict reinforced predictive relevance, but would need to be compared to a benchmark model to determine predictive strength. The results bring insights to the field of manufacturing companies in Freetown, Sierra Leone, and contribute to the literature on dynamic capabilities theory in a context that is under-represented in supply chain research

literature. Resilience and innovation provide more strength when they are built in tandem: Resilience must ensure firms continue to operate during disruption, while innovation must transform knowledge gained during disruption to future competitiveness.

6. THEORETICAL AND MANAGERIAL IMPLICATIONS

6.1 Theoretical Contributions

This study contributes to supply chain resilience and strategic management literature by clarifying how resilience translates into firm performance. First, the findings extend Dynamic Capabilities Theory by empirically connecting supply chain resilience with the sensing, seizing, and transforming processes proposed by Teece (2007). Supply chain resilience reflects firms' capacity to sense potential disruptions and seize appropriate responses, while innovation capability represents the transforming mechanism through which disruption-related knowledge and resources are reconfigured into improved products, processes, organisational practices, and marketing approaches. The strong correlation between the resilience of the supply chain and its capability to innovate therefore shows that resilience is not just about withstanding shocks and restoring old ways of doing things, but can also deliver knowledge and adaptive routines to support the renewal of the organisation.

Secondly, the study contributes to the resilience–performance literature through suggesting the presence of innovation capability as a complementary mediating mechanism. The strong indirect path is consistent with some other studies that found that the performance improvements associated with resilience and other dynamic capabilities can be passed through to innovation (Hamidu et al., 2023; Chang et al., 2026). The direct link between supply chain resilience and firm performance, however, was not completely mediated by the innovation capability, indicating that the innovation capability was just a partial mediator. This is a complimentary "partial mediation" suggesting that the creation of value from resilience is viewed as moving through two separate but reinforcing pathways. It directly protects continuity and reduces disruption losses, while indirectly improving performance by stimulating innovation. The finding therefore reconciles direct-effect and mechanism-based explanations of the resilience–performance relationship.

Third, the study extends Dynamic Capabilities Theory to manufacturing firms operating in Freetown, Sierra Leone. Much of the existing evidence has originated from developed and major emerging economies. Demonstrating these relationships in a resource-constrained and institutionally challenging environment indicates that dynamic capabilities remain performance-relevant even where firms face infrastructural limitations, restricted finance, supply uncertainty, and technological constraints. The study consequently strengthens the contextual applicability of Dynamic Capabilities Theory and contributes evidence from an underrepresented African economy.

6.2 Implications for Practice

The results show that supply chain resilience and innovation capability are complementary strategic investments that managers must consider. Manufacturing companies need to bolster risk monitoring, contingency planning, supplier coordination, resource flexibility and recovery systems to ensure smooth operations. But resilience efforts should NOT stop once it is back to normal operation. The managers should formalise processes such as post-disruption reviews, cross-functional learning teams, employee suggestion systems and knowledge repositories with the ability of turning disruption experiences into product, process, organisational and marketing innovations. Also, resilience planning should include innovation goals by providing funding to experiment, test digital tools, redesign processes and create a staffing plan for developing innovation skills. Supplier-development programmes and information-sharing can benefit companies by enabling them to find risks early and work together to find alternative materials, production processes and solutions for delivery. Performance systems should therefore measure recovery measures like response time, operational recovery, as well as innovation results such as process innovation, new product development, reduced cost, and customer retention.

6.3 Implications for Policymakers

The findings indicate that the promotion of resilience and innovation should not be handled separately in policy making for manufacturing to enhance the performance of manufacturing in Sierra Leone. Policies that enable

access to low-cost financing for resilient infrastructure, back-up systems, digital supply chain technologies, process modernization and product development. The financial obstacles that hinder manufacturing companies from investing in these capabilities could be overcome with targeted tax incentives, innovation grants, credit guarantees and technology-adoption programmes. It is also recommended that government agencies and industry associations create training programmes for supply chain risk management, business continuity, diversification of suppliers, digitalisation and innovation management. Collaboration between industrial clusters and public-private knowledge-sharing platforms would be possible for manufacturers, suppliers, and universities, financial institutions and technology providers. In addition, enhancements to electricity supplies, transport connectivity, customs clearance, and digital connectivity would provide a more conducive climate for firm-level resilience and innovation investments to yield better performance results.

6.4 Limitations and Avenues for Future Research

In spite of its contribution, the study has some limitations in which further studies can be conducted. Firstly, cross-sectional research design does not allow for direct causality assertions and time order. Supply chain resilience and innovative capacity is developed by experience, learning and repetition of disruption. Longitudinal or panel designs need to be used in future research to explore the changes in resilience capabilities over time, and if the mediating effect from innovation capability grows stronger with increased disruption-management experience.

Second, the study was restricted to manufacturing firms in Freetown. While Freetown is the main commercial and manufacturing hub of Sierra Leone, the institutional, infrastructural and market environment in Freetown may be different from what exists in other regions or countries. This reduces the generalisability of the results. Future studies are recommended to repeat the model in other parts of Sierra Leone, and to make a cross-country comparison with other economies of West Africa and developing economies. Comparative research might prove if the observed relationships are consistent under alternative institutional, economic and infrastructural situations.

Third, the study relied primarily on perceptual data collected from key managerial respondents. Although procedural and statistical measures indicated that common method bias was not a serious concern, self-reported measures may still be affected by social desirability, recall limitations, and respondent subjectivity. Future studies should adopt multi-respondent designs and combine survey responses with objective indicators such as profitability, sales growth, recovery time, delivery reliability, market share, innovation expenditure, patents, and new-product introductions.

Fourth, the model examined innovation capability as the principal mechanism linking supply chain resilience with firm performance. Other organisational capabilities may operate alongside or sequentially with innovation capability. Future research could investigate organisational learning, absorptive capacity, supply chain agility, digital transformation capability, collaboration, and knowledge-management capability as alternative or additional mediators.

Finally, the model did not examine conditions that may strengthen or weaken the proposed relationships. Some other factors that deserve to be studied in the future are the firm size, organisational age, the dynamics of the environment, the complexity of the supply chain, the digital maturity, financial resource access and institutional support. In-depth analysis of these boundary conditions would offer a more detailed understanding of the conditions under which supply chain resilience and innovation capability creates the highest performance benefits.

REFERENCES

1. Abusalma, A., Al Oraini, B., Al-Daoud, K., & Alshurideh, M. T. (2024). The impact of supply chain performance on financial performance: Dimensions of the SCOR model. Uncertain Supply Chain Management, 12, 1409–1416. https://doi.org/10.5267/j.uscm.2024.4.010
2. Al Mamun, A., Hayat, N., Fazal, S. A., Salameh, A. A., Zainol, N. R., & Makhbul, Z. K. M. (2022). The mediating effect of innovation in between strategic orientation and enterprise performance: Evidence

from Malaysian manufacturing small-to-medium-sized enterprises. Frontiers in Psychology, 13, Article 887895. https://doi.org/10.3389/fpsyg.2022.887895

3. Almulhim, T., Almubarak, N., & Aljabr, N. (2024). How to comprehensively evaluate firm performance from operational, financial, and sustainability perspectives? A two-stage data envelopment analysis approach. Emerging Markets Finance and Trade, 60(7), 1447–1467. https://doi.org/10.1080/1540496X.2023.2278651
4. Alshahrani, M. A., & Salam, M. A. (2022). The role of supply chain resilience on SMEs' performance: The case of an emerging economy. Logistics, 6(3), Article 47. https://doi.org/10.3390/logistics6030047
5. Ambulkar, S., Blackhurst, J., & Grawe, S. (2015). Firm's resilience to supply chain disruptions: Scale development and empirical examination. Journal of Operations Management, 33–34, 111–122. https://doi.org/10.1016/j.jom.2014.11.002
6. Barney, J. B. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99–120. https://doi.org/10.1177/014920639101700108
7. Belhadi, A., Mani, V., Kamble, S. S., Khan, S. A. R., & Verma, S. (2024). Artificial intelligence-driven innovation for enhancing supply chain resilience and performance under the effect of supply chain dynamism: An empirical investigation. Annals of Operations Research, 333(2–3), 627–652. https://doi.org/10.1007/s10479-021-03956-x
8. Berendes, K., Arabmaldar, A., Hammerschmidt, M., Loske, D., & Klumpp, M. (2025). Measuring the resilience-efficiency trade-off: An empirical application for retail logistics. Logistics Research, 18(1–2), 110–134. https://doi.org/10.1108/LORE-12-2024-0016
9. Brandon-Jones, E., Squire, B., Autry, C. W., & Petersen, K. J. (2014). A contingent resource-based perspective of supply chain resilience and robustness. Journal of Supply Chain Management, 50(3), 55–73. https://doi.org/10.1111/jscm.12050
10. Çalık, E., Çalışır, F., & Cetingüç, B. (2017). A scale development for innovation capability measurement. Journal of Advanced Management Science, 5(2), 69–76. https://doi.org/10.18178/joams.5.2.69-76
11. Chang, Y.-Y., Durst, S., Hughes, M., Kraus, S., Clauss, T., & Chang, C.-Y. (2026). From organizational resilience capability to firm performance: A time-lagged investigation. Journal of Product Innovation Management. Advance online publication. https://doi.org/10.1111/jpim.70035
12. Chowdhury, M. M. H., & Quaddus, M. (2017). Supply chain resilience: Conceptualization and scale development using dynamic capability theory. International Journal of Production Economics, 188, 185–204. https://doi.org/10.1016/j.ijpe.2017.03.020
13. Christopher, M., & Peck, H. (2004). Building the resilient supply chain. The International Journal of Logistics Management, 15(2), 1–14. https://doi.org/10.1108/09574090410700275
14. Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. Administrative Science Quarterly, 35(1), 128–152. https://doi.org/10.2307/2393553
15. Daronco, E. L., Silva, D. S., Seibel, M. K., & Cortimiglia, M. N. (2023). A new framework of firm-level innovation capability: A propensity–ability perspective. European Management Journal, 41(2), 236–250. https://doi.org/10.1016/j.emj.2022.02.002
16. Dickens, J. M., Uvet, H., Anderson, J. R., Ponomarov, S. Y., & Nowicki, D. R. (2024). An empirical examination on firm innovativeness and supply chain resilience: The role of information sharing from a dynamic capabilities view. Knowledge and Process Management, 31(4), 295–308. https://doi.org/10.1002/kpm.1785
17. Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? Strategic Management Journal, 21(10–11), 1105–1121. https://doi.org/10.1002/1097-0266(200010/11)21:10/11%3C1105::AID-SMJ133%3E3.0.CO;2-E
18. Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). A primer on partial least squares structural equation modeling (PLS-SEM) (3rd ed.). SAGE Publications.
19. Hamidu, Z., Mensah, B. D., Issau, K., & Asafo-Adjei, E. (2023). Does technological innovation matter in the nexus between supply chain resilience and performance of manufacturing firms in a developing economy? Journal of Manufacturing Technology Management, 34(6), 981–1003. https://doi.org/10.1108/JMTM-11-2022-0384
20. Heenkenda, H. M. J. C. B., Xu, F., Kulathunga, K. M. M. C. B., & Senevirathne, W. A. R. (2022). The role of innovation capability in enhancing sustainability in SMEs: An emerging economy perspective. Sustainability, 14(17), Article 10832. https://doi.org/10.3390/su141710832

21. Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8
22. Hohenstein, N.-O., Feisel, E., Hartmann, E., & Giunipero, L. (2015). Research on the phenomenon of supply chain resilience: A systematic review and paths for further investigation. International Journal of Physical Distribution & Logistics Management, 45(1/2), 90–117. https://doi.org/10.1108/IJPDLM-05-2013-0128
23. Hosseini, S., Ivanov, D., & Dolgui, A. (2019). Review of quantitative methods for supply chain resilience analysis. Transportation Research Part E: Logistics and Transportation Review, 125, 285–307. https://doi.org/10.1016/j.tre.2019.03.001
24. Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard—Measures that drive performance. Harvard Business Review, 70(1), 71–79.
25. Kline, R. B. (2023). Principles and practice of structural equation modeling (5th ed.). Guilford Press.
26. Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. International Journal of e-Collaboration, 11(4), 1–10. https://doi.org/10.4018/ijec.2015100101
27. Kong, Y., & Ibrahim, M. (2020). Innovation capabilities, innovation types, and firm performance: Evidence from the banking sector of Ghana. SAGE Open, 10(2), 1–12. https://doi.org/10.1177/2158244020920892
28. Kumar, N., Stern, L. W., & Anderson, J. C. (1993). Conducting interorganizational research using key informants. Academy of Management Journal, 36(6), 1633–1651. https://doi.org/10.2307/256824
29. Lawson, B., & Samson, D. (2001). Developing innovation capability in organisations: A dynamic capabilities approach. International Journal of Innovation Management, 5(3), 377–400. https://doi.org/10.1142/S1363919601000427
30. Liu, P., & Liu, J. (2024). Market access, supply chain resilience and enterprise innovation. Journal of Innovation & Knowledge, 9(3), Article 100515. https://doi.org/10.1016/j.jik.2024.100515
31. Liu, Y., & Jiang, Y. (2025). The impact of supply chain quality management on firm performance in manufacturing business: The moderating role of digital intelligence. Sustainability, 17(9), Article 4165. https://doi.org/10.3390/su17094165
32. Moreira, A., Navaia, E., & Ribau, C. (2024). Innovation capabilities and their dimensions: A systematic literature review. International Journal of Innovation Studies, 8(3), 313–333. https://doi.org/10.1016/j.ijis.2024.07.001
33. Negi, P., Jaiswal, A., & Rekunenko, I. (2025). Supply chain resilience, organizational effectiveness, and firm performance: A systematic review and future research agenda. SAGE Open, 15(4), Article 21582440251393994. https://doi.org/10.1177/21582440251393994
34. Opoku, R. K., Ampah, J., Korsi, N. J. N., Manzoor, A., Kaku, G., & Nsiah-Sarfo, D. J. (2025). Achieving sustainable performance through dynamic capabilities in disruptive manufacturing environments: Does technology innovation matter? Business Process Management Journal. Advance online publication. https://doi.org/10.1108/BPMJ-02-2025-0221
35. Paovangsa, S., Kamil, M., Aaqil, M., & Xing, K. (2025). Assessing innovation capability, innovation types, and its impact on innovation performance in FDI enterprises: Configurational recipes for Laos. SAGE Open, 15(3), Article 21582440251365311. https://doi.org/10.1177/21582440251365311
36. Peprah, W. K., Amankwaa, G., & Bukari, Z. (2023). Innovation orientation and firms' financial performance: The moderating role of new product development. Cogent Business & Management, 10(3), Article 2292525. https://doi.org/10.1080/23311975.2023.2292525
37. Phuanerys, S. R. (2025). An empirical analysis of the impact of supply chain strategy and organizational structure on operational and financial performance. American Journal of Business Science Philosophy, 2(2), 324–335. https://doi.org/10.70122/ajbsp.v2i2.44
38. Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. Journal of Applied Psychology, 88(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879
39. Ponomarov, S. Y., & Holcomb, M. C. (2009). Understanding the concept of supply chain resilience. The International Journal of Logistics Management, 20(1), 124–143. https://doi.org/10.1108/09574090910954873
40. Rajapathirana, R. P. J., & Hui, Y. (2018). Relationship between innovation capability, innovation type, and firm performance. Journal of Innovation & Knowledge, 3(1), 44–55.

https://doi.org/10.1016/j.jik.2017.06.002
41. Sarstedt, M., Ringle, C. M., & Hair, J. F. (2022). Partial least squares structural equation modeling. In C. Homburg, M. Klarmann, & A. Vomberg (Eds.), Handbook of market research. Springer. https://doi.org/10.1007/978-3-319-57413-4_15
42. Saunders, M., Lewis, P., & Thornhill, A. (2023). Research methods for business students (9th ed.). Pearson.
43. Saunila, M. (2016). Performance measurement approach for innovation capability in SMEs. International Journal of Productivity and Performance Management, 65(2), 162–176. https://doi.org/10.1108/IJPPM-08-2014-0123
44. Saunila, M., Ukko, J., & Jääskeläinen, A. (2024). The importance of performance measurement and management in sustainable supply chain governance among SMEs. International Journal of Operations & Production Management, 44(13), 229–250. https://doi.org/10.1108/IJOPM-06-2023-0492
45. Sekaran, U., & Bougie, R. (2020). Research methods for business: A skill-building approach (8th ed.). Wiley.
46. Shekarian, M., & Mellat Parast, M. (2021). An integrative approach to supply chain disruption risk and resilience management: A literature review. International Journal of Logistics Research and Applications, 24(5), 427–455. https://doi.org/10.1080/13675567.2020.1763935
47. Stadtfeld, G. M., & Gruchmann, T. (2024). Dynamic capabilities for supply chain resilience: A meta-review. The International Journal of Logistics Management, 35(2), 623–648. https://doi.org/10.1108/IJLM-09-2022-0373
48. Taouab, O., & Issor, Z. (2019). Firm performance: Definition and measurement models. European Scientific Journal, 15(1), Article 93. https://doi.org/10.19044/esj.2019.v15n1p93
49. Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. Strategic Management Journal, 28(13), 1319–1350. https://doi.org/10.1002/smj.640
50. Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. Strategic Management Journal, 18(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7%3C509::AID-SMJ882%3E3.0.CO;2-Z
51. Tsakalerou, M., Abil, A., Ribiere, V., Lukhmanov, Y., & Tynybayeva, N. (2025). The innovation capability equation: A systematic review of global determinants of SME's success. Journal of Innovation & Knowledge, 10(4), Article 100757. https://doi.org/10.1016/j.jik.2025.100757
52. Tukamuhabwa, B. R., Stevenson, M., Busby, J., & Zorzini, M. (2015). Supply chain resilience: Definition, review and theoretical foundations for further study. International Journal of Production Research, 53(18), 5592–5623. https://doi.org/10.1080/00207543.2015.1037934
53. Wang, H., Chen, Y., Xie, J., & Liu, C. (2025). Research on digital empowerment, innovation vitality and manufacturing supply chain resilience mechanism. PLOS ONE, 20(2), Article e0316183. https://doi.org/10.1371/journal.pone.0316183
54. Wieland, A., & Wallenburg, C. M. (2013). The influence of relational competencies on supply chain resilience: A relational view. International Journal of Physical Distribution & Logistics Management, 43(4), 300–320. https://doi.org/10.1108/IJPDLM-08-2012-0243
55. Wong, D. T. W., & Ngai, E. W. T. (2023). The impact of advanced manufacturing technology, sensing and analytics capabilities, and planning comprehensiveness on sustained competitive advantage: The moderating role of environmental uncertainty. International Journal of Production Economics, 265, Article 109007. https://doi.org/10.1016/j.ijpe.2023.109007
56. Zabel, C., & O'Brien, D. (2024). Understanding dynamic capabilities in emerging technology markets: Antecedents, sequential nature, and impact on innovation performance in the extended reality industry. European Journal of Innovation Management, 27(9), 305–336. https://doi.org/10.1108/EJIM-07-2023-0574
57. Zhang, B., & Mohammad, J. (2024). The effects of sustainability innovation and supply chain resilience on sustainability performance: Evidence from China's cold chain logistics industry. Cogent Business & Management, 11(1), Article 2353222. https://doi.org/10.1080/23311975.2024.2353222