THE EFFECT OF SUPPLY CHAIN INTEGRATION ON BUSINESS PERFORMANCE: THE MEDIATING ROLE OF INNOVATION CAPABILITY

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Abstract: This study takes supply chain integration as the independent variable, business performance as the dependent variable, and innovation capability as the mediating variable. A core conceptual framework was established using demographic variables such as position and industry. This study proposes the following hypotheses: 1. Supply chain integration has a positive and significant impact on business performance. 2. Supply chain integration has a positive impact on innovation capabilities at the product, process and business model levels. 3. Innovation capabilities play a mediating role between supply chain integration and business performance. This paper takes middle and senior managers working in companies in various industries in China as the case, and a total of 400 questionnaires were distributed and 388 valid questionnaires were returned.

The study found that: 1. Supply chain integration has a significant positive impact on business performance; 2. Supply chain integration has a positive impact on innovation capabilities; 3. Innovation capabilities partially mediate the relationship between supply chain integration and business performance. This study investigates the extent to which supply chain integration affects business performance and assesses whether innovation capabilities are a mediating factor in this relationship, which contributes to both the theoretical knowledge and practical application of supply chain management and innovation strategies.

Keywords: Supply Chain Integration, Business Performance, Innovation Capability

Introduction

In contemporary globalized business environments, organizations are compelled to achieve and maintain competitive advantages through continuous improvement of their operational efficiency, adaptability, and responsiveness. A widely acknowledged strategy for realizing these strategic objectives involves the integration of supply chain processes, fostering enhanced collaboration and coordination across different entities within the supply chain (Flynn, Huo, & Zhao, 2010). This integration encompasses internal integration (within organizational boundaries), supplier integration (collaboration with upstream partners), and customer integration (collaboration with downstream partners). Collectively, these dimensions of supply chain integration (SCI) are recognized as foundational to achieving superior performance outcomes, enhancing strategic agility, and strengthening long-term competitive capabilities (Christopher, 2016).

Supply chain integration, when effectively implemented, equips firms with essential capabilities required to navigate complex and volatile markets characterized by rapid technological advancements, fluctuating consumer demands, and evolving regulatory requirements (Christopher, 2016). The ability to seamlessly connect internal processes, supplier partnerships, and customer interactions has evolved from a mere operational practice to a critical strategic competence. Consequently, SCI serves dual functions within contemporary organizations. Internally, integrated operations facilitate seamless information flows, enabling firms to eliminate operational redundancies, optimize resource utilization, enhance productivity, and make timely, data-driven decisions (Pagell, 2004). Externally, supplier integration ensures timely access to high-quality materials, minimizes disruption risks, and reduces procurement inefficiencies (Cao & Zhang, 2011). Similarly, customer integration enables organizations to proactively understand customer preferences, respond to market volatility, and capture emerging market opportunities (Schoenherr & Swink, 2012).

Despite extensive acknowledgment of supply chain integration's direct benefits—such as cost reductions, shortened lead times, and improved customer satisfaction—the underlying mechanisms driving these positive relationships remain under-explored (Vanpoucke, Vereecke, & Boyer, 2014). Although existing literature has extensively documented the operational advantages of supply chain integration, the capacity of these integration practices to enhance an organization's innovation potential remains inadequately addressed. Innovation capabilities, encompassing a firm's ability to create and implement new products, processes, and business models (Tidd & Bessant, 2020), emerge as a crucial yet understudied intermediary factor in this dynamic. Hence, exploring the mediating role of innovation capabilities in the relationship between supply chain integration and business performance represents a critical research gap.

Innovation is increasingly acknowledged as a crucial determinant of sustained competitive advantage, particularly in sectors experiencing swift technological shifts and evolving market dynamics (Wong, Wong, & Boon-itt, 2013). Firms proficient in innovation leverage diverse knowledge-sharing

mechanisms and cross-functional collaborative networks to foster breakthrough solutions that differentiate their market positioning. Supply chain integration offers unique advantages by providing organizations access to external knowledge resources, facilitating collaborative innovation activities, and enabling co-development of new technologies and solutions. Specifically, internal integration fosters a culture of continuous improvement through real-time data sharing across organizational functions. Supplier integration empowers firms to harness upstream partners' technical expertise and process efficiency, thereby accelerating product innovation cycles. Customer integration offers market insights, allowing firms to develop tailored, customer-centric innovations that resonate with market trends and consumer preferences (Schoenherr & Swink, 2012).

Despite these compelling theoretical arguments, empirical evidence clarifying the mediating influence of innovation capabilities on the integration-performance nexus remains limited. Many organizations implement integration strategies without fully capitalizing on their potential to drive innovative outcomes. The ambiguous mediating effects of innovativeness underscore a critical research gap, necessitating deeper empirical exploration to optimize integration strategies for enhanced innovation and superior performance. Addressing this gap is critical to equip firms with strategies that effectively balance efficiency-oriented objectives and innovation-driven growth goals in integrated supply chain networks.

Therefore, this study explicitly investigates innovation capabilities as mediating factors within the relationship between supply chain integration and organizational performance. Adopting rigorous theoretical frameworks and robust empirical methodologies, the study seeks to illuminate the underlying mechanisms linking supply chain integration practices to enhanced innovation outcomes and, consequently, superior business performance.

In terms of research significance, this study fills an important knowledge gap in the current supply chain management and innovation research literature. Existing scholarship predominantly highlights direct efficiency-related outcomes associated with supply chain integration, such as cost reductions, enhanced efficiency, and improved customer satisfaction (Vanpoucke et al., 2014). However, explorations into integration-driven innovativeness and its subsequent impacts on organizational performance are sparse. By considering innovation capability as a pivotal mediator, this research enhances the existing body of knowledge, providing a nuanced understanding of how integration strategies can cultivate sustained innovation and strategic competitiveness.

Moreover, this research presents comprehensive theoretical and practical frameworks, which underscore specific integrative practices instrumental for fostering organizational innovation. By identifying particular integration mechanisms—such as collaborative product development and real-time data-sharing practices—the study offers empirical insights to guide managerial decision-making. The findings provide clarity for practitioners concerning effective integration strategies, which can significantly augment firms' innovative capacities and strategic performance outcomes.

The study further contributes by highlighting the role of digital technology adoption in enhancing integration-driven innovation potential. Advanced digital solutions—such as artificial intelligence, big data analytics, blockchain technologies, and Internet of Things (IoT) applications—represent critical enablers for improving supply chain visibility, facilitating real-time decision-making, and fostering cross-stakeholder collaboration. Thus, the research underscores the vital importance of leveraging technological innovations as part of integrated supply chain strategies.

The insights derived from this research have broader implications, specifically for policymakers aiming to strengthen national innovation ecosystems and economic resilience. By identifying effective integration practices that foster innovation, policymakers can establish relevant initiatives—such as incentives or supportive regulatory frameworks—to facilitate robust, collaborative innovation ecosystems.

In terms of research contributions, first, this research significantly expands the existing theoretical framework in the fields of strategic management, supply chain management, and innovation research. It integrates the resource-based view (RBV) and dynamic capabilities theory (DCT), thereby emphasizing supply chain integration as both an operational efficiency mechanism and a strategic innovation-enabling dynamic capability. According to RBV, integrated supply chains represent valuable, rare, and difficult-to-imitate organizational resources that confer sustainable competitive advantages through effective information exchange, coordination, and resource optimization (Barney, 1991). Complementing the RBV, dynamic capabilities theory underscores the necessity for organizations to continuously renew, integrate, and adapt their competencies in response to environmental dynamism (Teece, Pisano, & Shuen, 1997). By conceptualizing supply chain integration as a dynamic capability, this study demonstrates that integration practices empower firms with adaptive, innovation-oriented capabilities essential for navigating increasingly complex and unpredictable business landscapes. Furthermore, the study enriches the theoretical discourse by explicitly examining the mediating role of innovativeness. Prior literature predominantly addresses direct performance impacts (Flynn, Huo, & Zhao, 2010; Cao & Zhang, 2011); however, this study explores innovation capabilities as key mechanisms through which supply chain integration translates into sustainable competitive outcomes. Additionally, the research differentiates among dimensions of integration (internal, supplier, and customer integration), acknowledging their unique contributions to innovation performance.

Second, in terms of practice, these findings will provide managers and practitioners with practical strategies to optimize supply chain integration efforts and thereby enhance innovation capabilities. By clearly identifying specific integration mechanisms conducive to innovative outcomes—such as cross-functional collaboration, real-time information sharing, and collaborative product development—the study provides managerial guidance for leveraging supply chain practices to drive sustainable innovation and performance excellence. The research further emphasizes the

importance of digitization and technological advancements in maximizing integration-driven innovation opportunities. Practitioners will gain insights into leveraging advanced digital tools to strengthen supply chain collaboration, improve operational visibility, and enhance innovation agility. Additionally, human capital development emerges as an essential consideration for successful integration implementation. Companies must foster an organizational culture of continuous learning, cross-functional teamwork, and proactive collaboration to fully realize innovation benefits derived from supply chain integration.

From a policy standpoint, the research informs government and regulatory agencies about the necessity to nurture integrated supply chain ecosystems through targeted incentives, regulatory frameworks, and supportive infrastructures. Recommendations emerging from this study can assist policymakers in developing comprehensive policies aimed at promoting supply chain resilience, innovation ecosystems, and digital transformation.

Collectively, this study provides meaningful theoretical and practical insights, advancing the understanding of supply chain integration's critical role in fostering innovation capabilities and achieving sustained competitive advantage within dynamic, contemporary market environments.

Research Objectives

This study aims to explore the intricate relationships between supply chain integration (SCI), innovation capabilities, and business performance. Given the increasing complexity of global supply chains and the necessity for firms to remain competitive in dynamic markets, this research seeks to provide a deeper understanding of how SCI influences organizational outcomes. The study is structured around three key objectives, each designed to contribute to both theoretical advancements and practical applications in the field of supply chain management and business innovation.

Objective 1: To assess the direct impact of supply chain integration on business performance, focusing on financial and operational results.

The first objective of this study is to examine the direct effects of supply chain integration on business performance, with a particular emphasis on financial and operational outcomes. Extensive research has highlighted the positive relationship between SCI and various performance indicators, including cost reduction, lead-time improvement, and enhanced customer satisfaction. However, existing literature primarily focuses on efficiency-related outcomes, often overlooking the broader strategic implications of SCI on firm competitiveness and long-term sustainability. This study aims to bridge this gap by analyzing how different dimensions of SCI—including internal integration, supplier integration, and customer integration—individually and collectively contribute to business success. Internal integration ensures seamless coordination between various organizational functions, thereby eliminating redundancies and improving decision-making efficiency. Supplier integration facilitates strategic collaboration with upstream partners, optimizing procurement and production processes to

minimize supply disruptions. Meanwhile, customer integration enhances firms' ability to anticipate and respond to market demands, thereby improving customer service and brand loyalty. By empirically examining these dimensions, this study seeks to provide a comprehensive understanding of how SCI influences both financial performance—such as revenue growth, profitability, and return on investment—and operational performance—such as supply chain efficiency, agility, and product quality. The findings from this objective will offer valuable insights for business leaders and policymakers seeking to optimize SCI strategies for improved organizational outcomes.

Objective 2: To investigate the relationship between supply chain integration and innovation capabilities, particularly with regard to product, process and business model innovation.

The second objective of this study is to explore the relationship between supply chain integration and innovation capabilities, particularly in relation to product, process, and business model innovation. While prior research has established that SCI improves operational efficiency, its role in fostering innovation remains relatively under explored. Innovation capability, defined as a firm's ability to develop and implement new products, processes, and business models, is increasingly recognized as a key determinant of sustained competitive advantage in dynamic industries. SCI provides firms with unique opportunities to enhance their innovation potential by enabling knowledge-sharing networks, collaborative problem-solving, and co-creation initiatives. Internal integration fosters a culture of continuous improvement, where cross-functional collaboration facilitates the development of innovative solutions. Supplier integration allows firms to leverage external expertise, accelerating the adoption of new technologies and reducing the risks associated with innovation-related investments. Customer integration further enhances firms' innovation potential by ensuring a deep understanding of consumer needs and market trends, thus enabling the development of customer-centric innovations. By systematically analyzing the link between SCI and innovation capabilities, this study seeks to determine whether supply chain integration acts as a catalyst for innovation or whether its impact is contingent upon other organizational and environmental factors. The findings from this objective will contribute to a more nuanced understanding of how firms can leverage SCI to not only optimize efficiency but also drive innovation-led growth.

Objective 3: To investigate the mediating role of innovation capability in the relationship between supply chain integration and business performance.

The third objective of this study is to investigate whether innovation capability serves as a mediating factor in the relationship between supply chain integration and business performance. While SCI has been widely acknowledged for its direct impact on firm performance, the extent to which innovation capabilities act as an intermediary mechanism remains ambiguous. Firms that successfully integrate their supply chains often gain access to valuable external knowledge, expertise, and technological advancements, which, in turn, may enhance their ability to develop innovative products, optimize business processes, and create new business models. Building on the dynamic capabilities

theory (Teece et al., 1997), this study posits that firms must not only integrate their supply chains but also cultivate innovation capabilities to fully capitalize on SCI's potential benefits. Organizations that merely focus on cost-cutting and efficiency improvements without leveraging SCI for innovation-driven growth may fail to sustain long-term competitive advantage. Therefore, this study seeks to empirically test the extent to which innovation capability mediates the SCI-performance relationship, providing new insights into the mechanisms through which firms can enhance their strategic responsiveness and market adaptability. Through this objective, the study aims to provide both theoretical and practical contributions by clarifying how firms can optimize their supply chain strategies to simultaneously achieve operational excellence and innovation-driven competitive advantage. The findings will be particularly relevant for managers seeking to balance efficiency and innovation objectives while navigating complex and uncertain business environments.

In summary, this study seeks to contribute to the existing body of knowledge by examining the direct and indirect effects of supply chain integration on business performance. By addressing these three research objectives, the study will offer new insights into the role of SCI in driving financial and operational success, fostering innovation capabilities, and enabling firms to sustain long-term competitive advantage. The findings will have important implications for business leaders, supply chain managers, policymakers, and scholars seeking to understand how supply chains can be effectively integrated to support both efficiency and innovation goals in an increasingly competitive global economy.

Literature Review

In the contemporary, highly competitive global marketplace, organizations increasingly recognize that achieving sustained business success necessitates the alignment of internal processes with those of external stakeholders, including suppliers and customers. Supply chain integration (SCI) has emerged as a strategic imperative for firms aiming to enhance operational efficiency, agility, and responsiveness. By fostering integration across various supply chain activities, organizations can streamline operations, minimize inefficiencies, and adapt more effectively to market fluctuations. Given this context, understanding the impact of SCI on business performance is crucial for both academic inquiry and managerial practice.

Business performance, often evaluated through financial and operational metrics, is significantly influenced by the extent to which firms manage their supply chain processes effectively. While prior research has extensively documented the direct relationship between SCI and business performance, growing scholarly interest has been directed toward the mediating role of innovation capability in this relationship. Innovation capability, defined as a firm’s ability to develop novel products, processes, and business models, plays a pivotal role in translating supply chain integration into a competitive advantage and driving superior performance outcomes. In an era characterized by

volatile and dynamic markets, innovation has become a fundamental differentiator, enabling firms to respond to evolving customer demands and sustain long-term competitiveness.

This literature review seeks to bridge the gap in existing knowledge by examining the mediating effect of innovation capability on the relationship between supply chain integration and business performance. Grounded in established theoretical perspectives, such as the resource-based view (RBV) and dynamic capabilities theory (DCT), this study offers a comprehensive analysis of the mechanisms through which SCI contributes to organizational performance and how innovation capability serves as a catalyst in amplifying these effects. Furthermore, this review synthesizes existing models that describe the interrelationships among supply chain integration, innovation capability, and business performance, thereby offering insights into their collective impact on organizational success.

From a practical standpoint, this review provides valuable implications for managers seeking to optimize supply chain strategies. By elucidating the relationship between SCI, innovation, and performance, organizations can make more informed decisions regarding resource allocation, fostering a culture of innovation while strengthening supply chain integration efforts. Additionally, this study outlines key performance indicators (KPIs) essential for evaluating the effectiveness of SCI initiatives, thereby equipping managers with a structured framework to assess supply chain performance in alignment with strategic business objectives.

Ultimately, this chapter serves as a foundation for the subsequent sections of this study by exploring the fundamental constructs of supply chain integration, business performance, and innovation capability. Through a critical examination of the literature, this review underscores the significance of SCI and innovation as key enablers of sustainable competitive advantage. By integrating supply chain processes and fostering innovation, firms can position themselves strategically in an increasingly complex and interconnected global business environment.

Regarding the definition of supply chain integration, Kahn & Mentzer (1996) suggest that supply chain integration is the process by which different departments within an enterprise improve the efficiency of collaboration through certain ways and promote the integration of each department into a cohesive collective.Flynn et al. (20l0) point out that supply chain integration is a process in which the core enterprise, through the strategic collaboration with the enterprises in the supply chain, works together to supervise and manage all aspects of product production to accomplish production work more efficiently. Li Xinran and Sun Xiaojing (2009) believe that supply chain integration refers to the optimization of processes and their management by the core enterprise on the whole chain of products from the supply side to the demand side.Danese and Bortolotti (2014) believe that supply chain integration mainly refers to the enterprise and the product supplier to obtain stable material supply, reduce transaction costs and reach more efficient production by reaching strategic collaboration. Huang J. J (2016) argues that supply chain integration is an innovative strategy for companies to optimize the production function of the entire supply chain by managing the supply chain as a whole rather than

individual companies. Zhu H. L. (2023) and others believe that supply chain integration includes the optimization of business processes between internal operations and related enterprises in the external supply chain, and optimizes production efficiency by reducing intermediate links as much as possible through integration. Supply chain integration has been widely recognized as a key factor in improving organizational performance. Experience has shown that integrating internal and external supply chain processes can positively impact an organization's operational efficiency, cost management, and overall competitiveness (Flynn, Huo, and Zhao, 2010). Organizations that successfully integrate their supply chains are able to eliminate redundancies, streamline processes and reduce delays, ultimately improving performance.

The key advantage of supply chain integration is its ability to improve operational efficiency. Internal integration involves coordinating the processes and resources of different departments within an organization, which helps to eliminate bottlenecks and ensure that different functions such as purchasing, production and logistics work in harmony. This coordination helps in better coordination, more accurate forecasting and optimization of resource allocation (Pagell, 2004). In addition, supplier integration involves working closely with suppliers, sharing information and coordinating activities, thereby ensuring timely availability of quality materials and helping to reduce supply disruptions. This enhances an organization's ability to meet customer needs in a timely manner, further contributing to operational excellence and improved business performance. On the other hand, customer integration enables organizations to build stronger relationships with their customers and ensure that the products or services offered are closely aligned with their needs and expectations. By sharing real-time data with customers and engaging in collaborative demand planning, firms can better anticipate fluctuations in customer demand, which can lead to improved service levels, increased customer satisfaction, and ultimately increased customer loyalty (Schoenherr & Swink, 2012). Improvements in service levels and responsiveness often translate directly into competitive advantage, enabling organizations to differentiate themselves in the marketplace.

As early as 1912, economist Joseph Alois Schumpeter first put forward the concept of innovation in his book The Theory of Economic Development, and then systematically elaborated the theory of innovation in the journal Business Cycle in 1939. He regarded innovation as a new configuration and combination of resources, which leads to the construction of the following five combinations: first, a new product or a new product characteristic; second, a new method of production; third, the expansion of a new market; fourth, the acquisition of a new source of supply of resources; and fifth, a new way of organizing. Schumpeter (1934) pointed out that "innovation" is an activity based on a new "production function" with the goal of obtaining a new "production mix". The goal is to obtain a new "production mix". In Wechsler's Dictionary, the word "capability" means "the ability or potentiality to perform the work assigned to it", and it focuses on the "limits of what is possible to achieve". It focuses on "the limits of what can be achieved". In addition, some scholars such as Furman et al. (2000)

used the term "capacity" to refer to "ability" in earlier times, for example. In general, the academic community still lacks a comprehensive and systematic understanding of the meaning of creativity. Most studies describe creativity in an implicit form. Leonard (1992) first distinguished creativity from core competencies and suggested that creativity can be understood in terms of skill and knowledge dimensions, technological system dimensions, management system dimensions, and value dimensions, but did not provide a clear definition of creativity. After that, Dutta et al. (2005) proposed a kind of "transformation efficiency" between resources and goals on the basis of resource-based theory, and analyzed R&D investment and innovation capacity. Domestic scholars Chen Litian et al. (2012) found that the connotation of enterprise innovation capability has gone through the evolution of "capability-core capability-absorption capability-dynamic capability-innovation capability" through the study of enterprise innovation capability. " evolution. Wei Xuan and Chen Wei (2019) argue that the meaning of creativity varies with the theoretical background it is studied in, but in general, it still possesses a clear theoretical conceptual boundary.

The ability to innovate is increasingly recognized as a core determinant of business performance, especially in industries characterized by rapid technological advances, changing consumer preferences and increasing competition. In today's turbulent business environment, companies with strong innovation capabilities are better able to adapt to change, drive growth, and maintain a competitive advantage over time. Innovation capability is the ability of a firm to continuously develop new products, processes, services, or business models to meet the changing needs of the marketplace (Tidd & Bessant, 2020). This capability enables firms to stay ahead of their competitors by providing differentiated and innovative solutions, which is critical for long-term success in a dynamic industry. What is the promotional effect of innovation ability on enterprise performance Hut (2005) through the investigation of American enterprises, we can see that the enterprise's technological innovation can make the enterprise's profit, sales revenue, and market share get obvious improvement; Li Wei (2014) through the empirical analysis of China's manufacturing companies, the results show that: the R & D investment has an obvious promotional effect on the company's performance, but the role will be constrained by corporate governance factors. Liao Zhongju (2013) conducted an empirical analysis by taking 312 manufacturing companies as survey respondents, and the results showed that R&D investment can significantly improve the economic performance of the company, and it can also indirectly improve the performance of the company through more innovative patents.

Business performance is a broad and multifaceted concept that includes both financial and non-financial indicators. Financial performance indicators, such as profitability, return on investment, and revenue growth, have traditionally been used to assess a company's success (Venkatraman and Ramanujam, 1986). However, non-financial metrics, including operational performance, customer satisfaction, and employee engagement, have also become increasingly important in assessing the overall effectiveness of an organization (Schoenherr & Swink, 2012). In the context of supply chain

integration, business performance is often measured through improvements in operational efficiency, cost reductions, and customer satisfaction (Wong, Wong, & Boon-itt, 2013).

Domestic and foreign researchers have different opinions on the definition of business performance, Campbell (1990) believes that business performance is the action or behavior that can be observed and related to the organization's goals, Lebas (1995) believes that "business performance" is an effective means of measuring the success of the enterprise to achieve the predetermined goals. Lebas (1995) believes that "business performance" is an effective means of measuring the success of an organization in achieving its intended goals. According to Yang Guobin (2001), the performance of an enterprise refers to the results of its operations during a certain period of time, including the operation of assets, financial efficiency, capital preservation and appreciation. According to Zhang Rui (2002), business performance refers to the achievement or results achieved by an enterprise engaged in relevant business management activities. Su Wukang (2003) points out that company performance refers to the operational efficiency that reflects the company's operating results and the manager's level of management. Overall, there are three current understandings of the meaning of business performance. First, it refers to the performance of the enterprise alone, i.e., it refers to the results of the enterprise in a certain operating period alone. The second is the definition of business performance in the Rules for Evaluation of the Performance of State-owned Capital Funds issued by China in June 1999: business performance refers to the operating efficiency of the enterprise and the performance of the operator during a certain operating period, which is different from the first understanding in that it incorporates the performance of the operator into the definition of business performance. The third is business performance in a broad sense, i.e. business performance is divided into two parts, namely, organizational performance and personnel performance, including performance at the organizational level, including effectiveness, efficiency and change, as well as performance at the individual level, including the level of effort, efficiency, characteristics and capabilities of operators and employees.

This literature review emphasizes the complexity and interconnectedness of supply chain integration, innovation capabilities and operational performance. Supply chain integration is a key enabler of operational and strategic performance, while innovation capabilities play a mediating role in transforming supply chain integration into superior outcomes. Theoretical perspectives such as the resource base view and dynamic capabilities theory provide useful frameworks for understanding these relationships. However, significant gaps remain in understanding the mediating role of innovation capabilities and how supply chain integration dimensions interact to influence performance, especially in emerging economies such as China.

Methodology

This study used a quantitative research design to examine the relationship between supply chain integration, innovation capability, and business performance. Quantitative research is suitable for this

investigation because it allows for the systematic collection and analysis of numerical data to test hypotheses and establish causal relationships. A cross-sectional survey method was used to collect data from managers and senior executives in the fields of supply chain, operations, and innovation management across multiple industries.

Data will be collected using a structured questionnaire comprising validated measurement scales for the study variables. Supply Chain Integration will be assessed using items adapted from Huo et al. (2020), capturing internal, supplier, and customer integration. Innovation capability will be measured using scales derived from Carmeli et al. (2018), focusing on product, process, and business model innovation. Business performance will be evaluated using items from Chavez et al. (2018), covering financial and operational performance dimensions. Each item will be rated on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire will also collect demographic information such as industry type, firm size, and geographic location.

The population of this study includes managers and senior executives from organizations in China across a wide range of industries, including manufacturing, retail, logistics, and technology. These individuals are directly involved in strategic decisions related to supply chain management, innovation processes, and organizational performance. Their expertise ensured the reliability and validity of the data collected as they were able to provide insightful insights into the structures studied.

The sample size of a study depends on several factors, including the level of confidence in the results, the margin of error that can be tolerated, and the statistical methods planned to be used. Larger sample sizes usually provide more reliable results, but may also be more resource intensive. Common methods for determining sample size include efficacy analysis and statistical calculators.

Since the overall study is unknown and the overall distribution of

$$n=\frac{Z^2}{4e^2}$$

$$n=\frac{(1.96)^2}{4\ (0.05)^2}=384.16$$

Therefore, the minimum acceptable sample size is 384.

This study uses Stratified Random Sampling (SRS) to ensure that the sample is well represented across different industries, firms of different sizes, and geographic regions in China. Stratified Random Sampling is a common probability sampling technique that improves the external validity of a study and the generalizability of results by reasonably stratifying the population and randomly selecting samples within each stratum. Compared with simple random sampling, stratified sampling can effectively reduce sampling error, ensure the balance and scientific nature of the research data, and enable different categories of enterprises to be adequately represented in the sample.

This study is stratified based on three key criteria: industry type, firm size and geographic region to ensure that the sample can cover different categories of firms and enhance the applicability of

the findings. First, in terms of industry type, the study covers manufacturing, retail, logistics, and technology industries to reflect the variability of supply chain integration and innovation capabilities in different industrial contexts. Manufacturing companies usually have more complex supply chain management systems, while the retail industry is more concerned with demand forecasting and logistics coordination downstream of the supply chain. The logistics industry itself is the core link of the supply chain, and its integration level has a direct impact on the overall supply chain efficiency, while the technology industry is driven by innovation capability, and its supply chain management model is significantly different from that of traditional industries. Second, in terms of enterprise size, the research object is divided into small enterprises (less than 100 people), medium-sized enterprises (100 to 500 people) and large enterprises (more than 500 people) in order to analyze the impact of enterprise size on supply chain integration and innovation ability. Firms of different sizes differ significantly in terms of resource inputs, management modes and supply chain optimization strategies; therefore, their inclusion in stratified sampling can improve the explanatory power of the study. Finally, in terms of geographic regions, the Yangtze River Delta, Pearl River Delta, and Beijing-Tianjin-Hebei regions, which are the most economically developed regions in China, are selected in this study to ensure that the study sample can cover groups of firms with different levels of supply chain integration and innovation capability development. The Yangtze River Delta region (including Shanghai, Jiangsu, and Zhejiang) is an important center of China's manufacturing and high-tech industries, the Pearl River Delta (including Guangdong, Shenzhen, and Foshan), as a global manufacturing base, has a high level of supply chain integration, and the Beijing-Tianjin-Hebei region (including Beijing, Tianjin, and Hebei) has a unique advantage in terms of technological innovation and supply chain collaboration.

The target sample size of this study was set at 300-400 corporate respondents, which is a sample size with sufficient statistical efficacy to support the application of advanced statistical methods such as multiple regression analysis, mediation analysis and moderation analysis. According to the criteria for statistical efficacy analysis proposed by Cohen (1988), a sample size of more than 300 ensures the robustness of the regression model and provides reliable hypothesis testing results at moderate effect sizes and 0.80 statistical efficacy levels. In practice, each stratum will be allocated a proportional sample to ensure balance across industries, firm sizes, and geographic regions. For example, if manufacturing firms account for 40% of the overall total number of firms, the target sample should contain a similar proportion of manufacturing firms. This stratified proportionality approach can improve the representativeness of the study data and ensure a balanced distribution of data across different types of enterprises, thereby enhancing the generalizability of the findings.

To increase the accuracy of the findings and the generalizability of the conclusions, this study conducted a questionnaire study with managers and senior executives from companies operating in different industries (including manufacturing, logistics, retail, and technology) in China. A total of 400 questionnaires were distributed and excluding invalid questionnaires, a total of 388 valid questionnaires

were returned with a 97% recovery rate. The questionnaires were pretested in a small pilot survey of 20 respondents to ensure clarity, reliability and validity of the project. Feedback from the pretest was used to refine the wording, order and format of the items. Cronbach's coefficients were calculated for each structure to confirm internal consistency, with values above 0.7 being acceptable.

This study used statistical methods such as descriptive statistics, ANOVA, correlation analysis, regression analysis and mediation analysis in order to systematically analyze the relationship between supply chain integration, innovation capability and business performance. Descriptive statistics provide a general overview of sample characteristics, ANOVA is used to test for differences in means across groups, correlation analysis explores the dependencies between variables, and regression analysis is used to establish causality and control for confounding variables. In addition, through mediation analysis, this study further tests whether innovativeness plays a mediating role between supply chain integration and business performance to provide a more comprehensive theoretical explanation. The statistical methods used in this study have strong theoretical support and practical application value, and lay a solid foundation for subsequent data analysis and derivation of research conclusions.

Results

This study is based on a survey of 388 respondents, covering different management levels, industry types, business sizes, geographical regions and market competitive environments, to ensure the representativeness of the data and the reliability of the research conclusions. In terms of management level, the respondents were mainly composed of middle managers (200 people, 51.5%) and senior managers (188 people, 48.5%). This proportion indicates that the sample covers the strategic decision-making and executive management levels of the enterprise, providing a multi-level management perspective for analyzing the relationship between supply chain integration, innovation capabilities and enterprise performance.

In terms of industry distribution, the respondents' companies cover a wide range of industries, with manufacturing accounting for 16.2% (63 people), retailing 27.8% (108 people), logistics 26.8% (104 people), technology 20.1% (78 people), and other industries 9% (35 people). This distribution reflects the industry diversity of the research subjects, including both the manufacturing and logistics industries, which rely on supply chain efficiency, and the highly innovation-oriented technology industry, making the research results more applicable to industry.

In terms of enterprise size, the respondents' enterprises were evenly distributed, covering small enterprises (107 people, 27.6%), medium-sized enterprises (164 people, 42.3%) and large enterprises (117 people, 30.2%). This distribution ensures that the research conclusions can be applied to enterprises of different sizes, revealing the differences in the impact of supply chain integration and innovation capabilities in enterprises of different sizes.

In terms of geographical distribution, the interviewed enterprises were mainly concentrated in

the four major economic regions of China, including the Yangtze River Delta (66 people, accounting for 17%), the Pearl River Delta (83 people, accounting for 21.4%), the Beijing-Tianjin-Hebei region (161 people, accounting for 41.5%), and other regions (78 people, accounting for 20.1%). This distribution covers China's major economic growth poles, enabling the study to examine the impact of regional economic characteristics on supply chain integration and innovation capabilities.

In addition, in terms of the competitive market environment, there are significant differences in the competitive environment in which the surveyed enterprises operate, with highly competitive markets accounting for 32.2% (125 people), moderately competitive markets accounting for 43.8% (170 people), and low competitive markets accounting for 24% (93 people). This diversity of competitive environments allows this study to explore the role of supply chain integration and innovation capabilities in different market environments, providing a reference for enterprises to optimize their strategies under different competitive pressures.

In summary, the sample of this study covers different management levels, industry types, enterprise sizes, regional distributions and market competitive environments, providing a solid empirical basis for in-depth exploration of the relationship between supply chain integration, innovation capabilities and enterprise performance.

This study combines independent sample t-tests and analysis of variance to explore the impact of management hierarchy, industry type, enterprise scale, geographical location and market environment on supply chain integration, innovation capability and enterprise performance. The results show that industry type, enterprise scale and market environment have a significant impact on supply chain integration, innovation capability and enterprise performance, while the impact of management hierarchy and geographical location is not significant.

In terms of management level, the results of the independent sample t-test show that there is no significant difference in the ratings of middle managers and senior managers in terms of supply chain integration ($p = 0.268$), innovation capability ($p = 0.711$) and enterprise performance ($p = 0.552$). This indicates that the management level of the enterprise does not affect the perception of supply chain integration, innovation capability and enterprise performance, and the views of managers within the enterprise tend to be consistent in these areas.

In terms of industry type, the results of the analysis of variance show that different industries have a significant impact on supply chain integration ($p = 0.000$), innovation capability ($p = 0.000$) and enterprise performance ($p = 0.000$). The manufacturing and logistics industries have a higher level of supply chain integration, while the technology industry stands out in terms of innovation capability. Enterprise performance varies due to industry characteristics and fluctuations in market demand.

In terms of enterprise size, the results of the analysis of variance show that supply chain integration ($p = 0.000$), innovation capability ($p = 0.000$) and enterprise performance ($p = 0.000$) are significantly affected by enterprise size. Large enterprises perform better in terms of supply chain

integration, innovation capability and enterprise performance, while SMEs are relatively weak in supply chain and innovation capabilities due to resource constraints.

In terms of geographical location, the results of the analysis of variance show that there are no significant differences in supply chain integration (p = 0.919), innovation capability (p = 0.856) and business performance (p = 0.819). This shows that in the modern business environment, supply chain integration, innovation capability and business performance are no longer limited by the location of the enterprise, but are more dependent on enterprise strategy, technological level and market positioning.

In terms of market environment, the results of the analysis of variance show that different market environments have a significant impact on supply chain integration (p = 0.000), innovation capability (p = 0.000) and enterprise performance (p = 0.000). A highly competitive market drives enterprises to strengthen supply chain integration and innovation investment, while enterprises in a low-competitive market pay more attention to operational stability and cost optimization.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.817a	.668	.667	4.37547

a. Predictors: (Constant), Supply Chain Integration

Table 2: ANOVA [a]

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14863.869	1	14863.869	776.394	.000b
	Residual	7389.871	386	19.145		
	Total	22253.740	387			

a. Dependent Variable: Business Performance

b. Predictors: (Constant), Supply Chain Integration

Table 3: Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.358	1.219		1.935	.054
	Supply Chain Integration	.958	.034	.817	27.864	.000

a. Dependent Variable: Business Performance

In the regression analysis, as can be seen from Table 1 and Table 2, the adjusted R-square is 0.667. Supply chain integration (independent variable) can explain 66.8% of the variation in business

performance (dependent variable). In the variance test, the F value is 776.394, and the significance P value is .000b less than 0.01, which means that the regression model is highly significant at the 0.01 level, and the model is usable and meaningful.

In Table 3 above, after analyzing the coefficients[a], we find that the unstandardized coefficient of the interaction term of supply chain integration and business performance is 0.985, the standardized coefficient is 0.817, and the P value is 0.000, indicating that there is a significant positive correlation between supply chain integration and business performance. The results show that supply chain integration is a key driver of performance. These findings highlight the critical role that supply chain strategies play in achieving sustainable competitive advantage, and reinforce the need for companies to prioritize integration to improve efficiency, responsiveness, and overall performance.

Table 4: Correlation Analysis between Supply Chain Integration and Innovation Capabilities

		Supply Chain Integration	Innovation Capability
Supply Chain Integration	Pearson Correlation	1	.949**
	Sig. (2-tailed)		.000
	N	388	388
Innovation Capability	Pearson Correlation	.949**	1
	Sig. (2-tailed)	.000	
	N	388	388

** Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis between supply chain integration and innovation capability shows a strong and significant positive correlation between the two, with a Pearson correlation coefficient of 0.949. This extremely high correlation indicates that companies with well-integrated supply chains tend to have significantly higher innovation capabilities. The p-value (significance test, two-tailed) is 0.000, indicating that this relationship is statistically significant at the 0.01 level, i.e., the probability of this correlation occurring by chance is extremely low. The strength of this correlation indicates that supply chain integration is closely related to a company's ability to develop and implement innovative products, processes and business models. This finding is consistent with the existing literature, which states that enhanced collaboration with suppliers and customers, seamless internal coordination and efficient information sharing mechanisms can create an environment conducive to innovation. By effectively integrating supply chain functions, companies can better leverage external knowledge, improve resource utilization and accelerate the adoption of new technologies, all of which contribute to innovation capabilities.

Table 5: Mediation Analysis

Model	Effect	Standard Error	t-value	p-value	Lower Confidence Interval (LLCI)	Upper Confidence Interval (ULCI)	Standardized Effect
Total Effect Model	0.9584	0.0344	27.8639	0	0.8908	1.0261	0.8173
Direct Effect	0.2829	0.1027	2.7544	0.0062	0.0809	0.4848	0.2412
Indirect Effect	0.6756	0.098			0.5035	0.887	0.5761

The above results of the mediating analysis show that supply chain integration significantly affects business performance directly and indirectly through innovation capability. The total effect of supply chain integration on business performance is 0.9584 ($p<0.01$), indicating a strong and significant statistical relationship between the two. This confirms that companies with a higher degree of supply chain integration are likely to have higher business performance.

However, considering the direct and indirect effects, the results show that innovation capability plays a partial mediating role. The direct effect of supply chain integration on business performance is 0.2829 ($p<0.01$), which means that supply chain integration can independently promote business performance, but its impact is not as strong as the total effect, which indicates that another mechanism (innovation capability) plays a crucial role in explaining this relationship. The indirect effect of supply chain integration on business performance through innovation capability is 0.6756, and the bootstrap confidence interval is 0.5035 to 0.8870, excluding zero. This confirms that innovation capability significantly mediates the relationship between supply chain integration and business performance. The standardized indirect effect (0.5761) indicates that a large part of this relationship is explained through the innovation mechanism.

These findings suggest that while supply chain integration directly improves business performance, its full potential can only be realized when firms also invest in innovation capability. The larger indirect effect than the direct effect more prominently indicates the strategic role of innovation capability as a key driver linking supply chain and business performance.

The results confirm a partial mediation model, indicating that supply chain integration positively affects business performance both directly and through its impact on innovation capabilities. The stronger indirect effect highlights the critical role of innovation in translating supply chain integration into tangible performance improvements. This has important managerial implications, suggesting that firms should not only focus on integrating their supply chains, but also invest in innovation-driven strategies to fully leverage the benefits of supply chain collaboration. Firms that effectively integrate their supply chains while nurturing innovation capabilities are more likely to achieve sustainable competitive advantage and superior performance outcomes.

Discussion

1. Relationship Between Supply Chain Integration and Business Performance

Empirical findings indicate a strong and statistically significant positive correlation between supply chain integration (SCI) and business performance, thereby reaffirming the critical role of integration in achieving superior organizational outcomes. Firms that implement a comprehensive supply chain integration strategy, encompassing internal operational coordination, supplier collaboration, and customer engagement, exhibit enhanced financial and operational efficiencies. This improvement is largely attributable to the facilitation of seamless information sharing, process synchronization, and strategic alignment, which collectively contribute to superior decision-making, optimized resource allocation, and enhanced service quality.

The primary mechanisms through which supply chain integration enhances business performance are cost reduction and operational efficiency. By integrating supply chain activities, organizations can streamline procurement, production, and distribution processes, thereby eliminating redundancies and reducing excessive expenditures. Efficient supply chain management enables firms to lower inventory costs, optimize logistics operations, and minimize waste, ultimately leading to a reduction in operational costs and an increase in profitability. Moreover, enhanced coordination between suppliers and manufacturers improves demand forecasting accuracy, thereby mitigating risks associated with stock shortages and overproduction, which are common causes of financial inefficiencies.

Another crucial advantage of supply chain integration is its role in enhancing responsiveness and agility. Given the volatility of contemporary business environments, firms must possess the ability to swiftly adapt to market fluctuations, evolving customer demands, and unforeseen disruptions within the supply chain. An integrated supply chain framework facilitates real-time data utilization, predictive analytics, and collaborative planning, which collectively enable firms to reduce response times and improve adaptability. By leveraging these capabilities, firms can anticipate challenges, mitigate risks, and adjust supply chain operations proactively, thereby ensuring business continuity and sustaining competitiveness in dynamic market conditions.

Furthermore, supply chain integration significantly contributes to customer satisfaction and market competitiveness. Firms with integrated supply chain processes can accelerate product delivery times, maintain product quality consistency, and respond more effectively to customer requirements. Establishing robust relationships with suppliers ensures access to high-quality raw materials, minimizes production lead times, and enhances product reliability. Additionally, customer integration facilitates direct feedback collection, product customization, and tailored service provision, thereby enhancing the overall customer experience. Consequently, firms with well-integrated supply chains tend to achieve higher customer retention rates, stronger brand loyalty, and improved market positioning.

Empirical studies substantiate these findings, highlighting the substantial benefits of supply

chain integration on financial and operational performance. For instance, Flynn, Huo, and Zhao (2010) and Cao and Zhang (2011) assert that firms with advanced integration capabilities outperform competitors in key performance indicators such as profitability, revenue growth, and cost efficiency. Similarly, Schoenherr and Swink (2012) emphasize that supply chain integration enhances logistics coordination, supplier responsiveness, and overall business resilience, thereby serving as a critical enabler of sustainable competitive advantage.

Despite these advantages, the degree to which firms can fully leverage supply chain integration is contingent upon several environmental factors, including firm size, industry characteristics, and technological capabilities. Larger firms typically have greater financial and technological resources to invest in advanced integration systems, whereas smaller enterprises may encounter financial and operational constraints that impede full integration. Additionally, industry-specific challenges, such as regulatory compliance and supply chain complexity, can influence the effectiveness of supply chain integration in driving performance improvements.

In conclusion, the findings affirm that supply chain integration is a pivotal determinant of business success, facilitating cost reduction, operational efficiency, enhanced responsiveness, and customer satisfaction. However, to maximize the benefits of supply chain integration, firms must adopt a strategic and context-specific approach, ensuring alignment with their industry conditions and operational capabilities.

2. Relationship Between Supply Chain Integration and Innovation Capabilities

The study's findings indicate a strong and statistically significant positive relationship between supply chain integration (SCI) and innovation capabilities, underscoring the essential role of supply chain coordination in fostering innovation within firms. This relationship suggests that organizations that strategically integrate their supply chains are better positioned to enhance innovation through collaboration, knowledge sharing, and the adoption of emerging technologies. By facilitating seamless information exchange and resource flow between suppliers, customers, and internal stakeholders, firms can develop more agile, adaptable, and innovation-driven business models.

A primary mechanism through which supply chain integration influences innovation capabilities is collaborative knowledge exchange. Integrated supply chains enable real-time communication and data sharing among stakeholders, allowing firms to acquire valuable insights into market trends, customer preferences, and technological advancements. For instance, supplier collaboration facilitates the co-development of innovative materials, components, and manufacturing techniques, thereby driving product innovation. Similarly, customer integration allows firms to respond proactively to changing consumer demands, fostering the development of customized and differentiated products.

Furthermore, supply chain integration significantly enhances research and development (R&D) efficiency by aligning supply chain operations with innovation strategies. When sourcing, production,

and distribution are seamlessly integrated, firms can allocate resources more effectively, accelerate product development cycles, and reduce innovation costs. Early supplier involvement in product design and material selection further minimizes development delays and inefficiencies, thereby streamlining the innovation process.

Moreover, SCI plays a crucial role in facilitating the adoption of new technologies, a key determinant of innovation capability. Firms with digitally integrated supply chains can leverage Artificial Intelligence (AI), the Internet of Things (IoT), and Blockchain technologies to enhance automation, predictive analytics, and decision-making processes. These technological advancements enable firms to improve supply chain visibility, optimize resource utilization, and expedite product commercialization. Additionally, firms that integrate external technology partners into their supply chains can expand technological competencies, enhance market competitiveness, and accelerate innovation.

Empirical studies corroborate these findings. Wong, Wong, and Boon-itt (2013) demonstrate that firms with highly integrated supply chains exhibit superior innovation performance in areas such as product development, service enhancement, and business process improvement. Likewise, Tidd and Bessant (2020) assert that supply chain integration reduces innovation risk by fostering cross-functional collaboration and efficient resource allocation.

Despite these advantages, firms must also consider potential trade-offs between supply chain integration and innovation flexibility. While highly integrated supply chains can enhance efficiency and structure innovation processes, they may also introduce rigidities that constrain disruptive innovation. Firms operating in rapidly evolving industries, such as technology and pharmaceuticals, may require more adaptive supply chain integration models to accommodate dynamic innovation strategies.

In summary, the positive correlation between supply chain integration and innovation capabilities highlights the strategic importance of supply chain networks as enablers of innovation. Firms that effectively integrate their supply chains not only improve operational efficiency but also create a foundation for sustained innovation and market leadership. To maximize these benefits, firms should align supply chain processes with innovation objectives, invest in digital transformation, and cultivate a collaborative organizational culture.

3. The mediating role of innovation capabilities

The findings confirm that innovation capabilities play a partial mediating role between supply chain integration (SCI) and business performance, suggesting that supply chain integration has a direct and positive impact on performance and that the full benefits are only realized when firms actively develop innovation capabilities. This suggests that organizations that successfully integrate their supply chains but do not invest in innovation may not be able to take full advantage of the performance gains achieved through a more innovation-focused approach.

The mediating role of innovation capabilities can be understood through Dynamic Capability

Theory (DCT), which posits that firms must continually evolve and reconfigure their capabilities to remain competitive in a changing environment (Teece, Pisano, & Shuen, 1997). In this study, supply chain integration provides the structural basis for efficiency and coordination, while innovative capabilities enable firms to adapt, evolve, and create new competitive advantages. Thus, firms that integrate their supply chains but fail to develop strong innovation processes may only realize incremental gains in business performance, whereas those that invest in both SCI and innovation capabilities may realize sustained and substantial improvements.

One of the key mechanisms by which innovation capacity enhances the supply chain integration-business performance relationship is its role in accelerating knowledge transfer and the development of new solutions. When supply chain integration is combined with an organization's focus on research and development (R&D), partnerships, and continuous learning, businesses are better able to leverage real-time insights, market trends, and emerging technologies. This helps improve performance by accelerating the innovation cycle, improving product development efficiency, and better adapting to changing customer needs.

In addition, technological advances play a key role in harmonizing the relationship between supply chain integration and business performance. Digital transformation, including artificial intelligence (AI), the Internet of Things (IoT), blockchain, and big data analytics, enables companies to integrate supply chain activities while improving innovation. By leveraging predictive analytics and real-time data sharing, companies can identify inefficiencies, optimize logistics, and introduce process innovations that drive overall performance.

The findings also highlight the importance of fostering an innovation-oriented organizational culture. While supply chain integration improves efficiency, standardization, and operational alignment, its full potential is unlocked when companies encourage creative problem solving, cross-functional collaboration, and risk-taking innovation. Organizations that prioritize employee-driven innovation, strategic partnerships with external stakeholders, and an open innovation mindset can effectively translate SCI-driven efficiencies into long-term market differentiation and business growth.

Empirical research further supports these findings.Flynn, Huo, and Zhao (2010) show that while supply chain integration can improve operational performance, its impact on long-term competitiveness is greater when firms integrate innovation into their supply chain strategy. Similarly, Wong, Wong, and Boon-itt (2013) find that firms that actively invest in technological capabilities and collaborative innovation networks have stronger operational performance gains than those that focus on supply chain integration without an innovation-driven approach.

However, there are also potential challenges and trade-offs that firms must address when implementing supply chain integration and innovation initiatives. Highly integrated supply chains can sometimes limit organizational agility, making it more difficult for firms to quickly try out new ideas or respond to disruptive market forces. To balance efficiency and agility, companies should adopt a

dual-focus strategy that ensures supply chain processes remain structured and efficient while allowing for adaptive innovation paths to support long-term business growth.

In summary, the ability to innovate partially mediates the relationship between supply chain integration and business performance, which confirms the need for firms to make innovation an important part of their supply chain strategy. By investing in research and development, leveraging digital transformation, and fostering a culture of continuous improvement, firms can extend the benefits of supply chain integration, increase adaptability, and maintain competitive advantage in an increasingly dynamic business environment. The findings emphasize the importance of adopting an integrated approach that combines supply chain efficiency with an innovation-driven strategy to ensure that firms can simultaneously achieve short-term performance growth and long-term market success.

Conclusions

The study emphasizes the strategic importance of supply chain integration and innovation capabilities as key enablers of business success. Synthesizing the results of this study, the following conclusions can be drawn.

The empirical analysis conducted in this study provides strong support for all three proposed hypotheses, reinforcing the critical role of supply chain integration (SCI) in driving both business performance and innovation capabilities, as well as the mediating role of innovation in this relationship.

Hypothesis 1, which posited that supply chain integration has a positive and significant effect on business performance, is supported. The findings confirm that organizations that effectively integrate their supply chains achieve greater financial and operational efficiency, primarily through cost reduction, enhanced coordination, and improved responsiveness to market demands. These improvements contribute to higher profitability, revenue growth, and competitive positioning, demonstrating the direct performance benefits of SCI.

Hypothesis 2, which suggested that supply chain integration positively influences innovation capabilities at the product, process, and business model levels, is also supported. The results highlight that SCI facilitates collaborative knowledge exchange, resource optimization, and the adoption of emerging technologies, all of which are essential for fostering innovation. By enhancing supplier and customer collaboration, streamlining R&D processes, and integrating digital technologies, firms with well-developed supply chain integration strategies exhibit greater innovation capacity, leading to the continuous development of new products, process improvements, and innovative business models.

Hypothesis 3, which proposed that innovation capabilities mediate the relationship between supply chain integration and business performance, is supported as well. The findings indicate that while SCI directly enhances business performance, its full potential is realized when firms actively develop innovation capabilities. This mediating effect is aligned with Dynamic Capability Theory (DCT), which suggests that firms must continually reconfigure and evolve their capabilities to sustain

competitive advantages. The results suggest that firms that integrate SCI with a strong innovation focus achieve more substantial and sustained performance improvements compared to those that rely solely on supply chain efficiency without emphasizing innovation.

Overall, the findings validate the theoretical framework of this study, demonstrating that supply chain integration serves as a foundational enabler of both business performance and innovation. Furthermore, the mediating role of innovation underscores the necessity for firms to adopt a dual-focus strategy, balancing supply chain efficiency with continuous innovation efforts, to maximize competitive advantage and long-term success.

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