SUSTAINABILITY RISKS AND SUPPLY CHAIN DYNAMICS STRATEGIES IN VIETNAM'S FMCG INDUSTRY

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Dedication

This dissertation, entitled “Sustainability Risks and Supply Chain Dynamics Strategies in Vietnam’s FMCG Industry,” is respectfully dedicated to my family, whose unwavering support, patience, and belief in my aspirations have been the foundation of my academic journey. Their encouragement has sustained me through every challenge and milestone of this doctoral pursuit.

I also dedicate this work to my mentors and those who have inspired me to responsible and sustainable supply chain management. Their guidance and integrity have profoundly shaped my academic values.

To my colleagues and friends, whose understanding, encouragement, and companionship have enriched both my professional and personal growth, I offer this dedication with gratitude.

May this work contribute, in meaningful ways, to advancing sustainability and resilience within Vietnam’s FMCG supply chains and beyond.

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ABSTRACT

Recent rapid changes in supply chains, such as the COVID-19 pandemic, globalization, the development of information technology, and the trend of outsourcing software and manufacturing, have made supply networks much more complex, especially in terms of sustainability. This increases the vulnerability and fragility of supply chains to sustainability-related risks, making supply chain risk management a crucial and challenging issue, particularly in the sensitive and volatile FMCG sector in Vietnam. The author conducted theoretical research, synthesized appropriate measurement scales, and studied over 250 companies to develop a comprehensive scale for assessing sustainability risks in supply chains and empirically verified the impact of these risks on suppliers, customers, and the economic performance of businesses. In addition, the study will also evaluate the effectiveness of dynamic supply chain management techniques in addressing the impact of sustainability-related risks on business performance characteristics. The results found that three groups of SSCRs—Macro-economic Risks, Customer Demand Risks, and Supplier Risks—all have a negative impact on SCP. This finding aligns with the characteristics of the Vietnamese market, which is considered immature and highly sensitive to price. Finally, the study rejected the moderating role of Supply Chain Risk Management (SCRM) practices on the negative relationship between SSCRs and SCP. However, the SCRM strategies were proven to have a positive direct impact on SCP. These findings provide several theoretical and managerial implications for managers in addressing the economic, social, and environmental issues associated with sustainable supply chain risks.

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CHAPTER I: INTRODUCTION

1.1 Introduction

Recent transformative events have significantly reshaped global supply chains, introducing new layers of complexity and vulnerability—particularly in the realm of sustainability. The COVID-19 pandemic, rapid globalization, technological advancements, the rise of outsourcing, and the shift toward offshore production have collectively intensified the challenges faced by supply networks. These developments have not only disrupted traditional supply chain models but have also exposed critical weaknesses in sustainability-related risk management. As supply chains become more interconnected and globally dispersed, they are increasingly susceptible to environmental, social, and economic shocks that can ripple across entire networks (Doetsch & Huchzermeier, 2024).

In this evolving landscape, sustainability issues have emerged as a central concern. The fragility of supply chains in the face of climate change, labor rights violations, and reputational threats has made risk management a more complex and urgent task. Companies must now navigate a dynamic environment where sustainability risks are no longer isolated incidents but systemic challenges that demand strategic foresight and operational agility (Carayannis et al., 2025). This study focuses on the fast-moving consumer goods (FMCG) sector in Vietnam—a rapidly growing market with unique supply chain characteristics—to develop a comprehensive framework for measuring sustainability-related risks.

Using empirical data from FMCG firms operating in Vietnam, the study constructs a multidimensional scale to assess supply chain sustainability risks. This scale captures the impact of environmental, social, and economic hazards on key stakeholders, including suppliers, customers, and internal business performance metrics (Ağan et al., 2016). The research aims to provide a robust analytical foundation for understanding how these risks manifest in real-world operations and how they influence decision-making across the supply chain.

Furthermore, the study evaluates the effectiveness of dynamic supply chain management techniques in mitigating the adverse effects of sustainability-related risks. These techniques include supplier collaboration, digital integration, scenario planning, and adaptive logistics strategies. The findings reveal that while economic risks tend to follow a predictable risk-return trade-off—where higher risks may yield higher returns—this pattern does not hold for social and environmental risks (Bali & Peng, 2006). Instead, these dimensions require more nuanced and proactive management approaches.

Importantly, the research highlights that supplier relationship management and supply chain integration play a critical role in addressing environmental risks. By fostering transparency, accountability, and shared sustainability goals, firms can create win-win outcomes that benefit both business performance and environmental stewardship (Beckmann et al., 2014). These insights offer valuable theoretical and managerial implications, guiding supply chain leaders in Vietnam and similar emerging markets to better navigate the complexities of sustainability-related risks. The study underscores the

need for integrated, context-sensitive strategies that align economic objectives with long-term sustainability commitments.

This study aims to explore the complex and evolving relationship between Supply chain sustainability-related risks and the performance of firms supply chain within FMCG supply chains. As global supply chains face increasing pressure from environmental concerns, social accountability, and economic volatility, understanding how these risks influence business outcomes has become a critical area of inquiry (Klassen & Vereecke, 2012). The FMCG sector, known for its high volume, rapid turnover, and extensive supplier networks, is particularly vulnerable to sustainability-related disruptions (Prashar & Sunder, 2025). These risks can manifest in various forms—ranging from climate-induced supply interruptions and labor rights violations to reputational damage from failing to meet sustainability standards (Zhai et al., 2024).

In response to these challenges, this study not only investigates the direct and indirect impacts of sustainability-related risks on firm performance but also seeks to identify and evaluate effective mitigation strategies. The goal is to provide both theoretical insights and practical tools that can help businesses enhance their resilience, maintain operational continuity, and align their supply chain practices with broader sustainability goals. By focusing on FMCG companies in Vietnam—a market characterized by rapid growth, evolving regulatory frameworks, and diverse supplier structures—the study offers a localized perspective on global sustainability issues.

To achieve these objectives, the study is guided by a set of specific research questions that break down the broader purpose into focused areas of investigation. These main purposes can be broken down into some specific research questions:

RQ1: What is the measurement scale of different categories of sustainability-related supply chain risks (SSCRs) in the FMCG industry?

RQ2: What are the impacts of SSCRs on supply chain performance in the FMCG industry?

RQ3: How do supply chain risk management practices moderate the impacts of SSCRs on supply chain performance in the FMCG industry?

To address these research questions, the following research objectives are proposed as follows:

(1) To identify various sustainability-related risks in the FMCG Supply Chains.

(2) To validate the measurement scale of different categories of SSCRs in the FMCG Supply Chains.

(3) Using the validated measurement scales of SSCRs to assess the impact of these risks on firms' performance in the FMCG Supply Chains.

(4) To assess the effectiveness of supply chain management mitigation strategies to minimize the impact of sustainability-related risks on dimensions of firms' performance in the FMCG Supply Chains.

This study provides new insight into SSCRs by developing original measurement scales for SSCRs, which could be used for further empirical investigation. The study also covers all three triple bottoms of sustainability issues, economic, social, and environmental impacts when dealing with SSCRs, and is one of the first to empirically and quantitatively test the effects of SSCRs on firms' supply chain performance. The findings confirm the expected relationship between risk and return or the risk-return trade-offs for the economic risks, including supply risks, transportation risks, demand risks, and operation risks (Bali & Peng, 2006). However, the study also found that there are no risk-return trade-offs regarding the social and environmental categories of SSCRs. This is quite in contrast with the traditional business models in the FMCG industry, especially in emerging countries where firms always try to cut costs in terms of labor salary/benefits and environmental-related issues for better financial performance (Ngo et al., 2024). The study also found that customer focus strategy could enhance the impacts of environmental risk exposures on financial performance following the traditional trade-offs between risks and returns in the Vietnamese FMCG industry. However, if supplier management and supply chain integration practices are extensively applied to manage environmental risks, it could change the usual risk-return trade-offs. On this particular occasion, when lowering environmental risks, firms could significantly enhance their financial performance (Semenova & Hassel, 2016). This scenario will be the desired win-win situation for both firms and the environment.

1.2 Research Problem

Sustainability-related supply chain risks

The concept of sustainable development is widely framed through the lens of the triple bottom line, which encompasses three core dimensions: environmental, social, and economic performance. This framework has been consistently referenced in supply chain literature to define sustainability-related risks (Brandenburg et al., 2014; Giannakis & Papadopoulos, 2016). According to the Brundtland Commission's foundational definition, sustainability risks are those that threaten the long-term viability of supply chains by undermining ecological integrity, social equity, or economic stability. In this context, sustainable supply chain management (SSCM) is understood as the deliberate integration of environmental and social objectives into traditional economic goals, contrasting with conventional supply chain management, which typically prioritizes cost reduction and financial performance (Seuring & Müller, 2008).

SSCM is increasingly recognized not only as a moral and regulatory obligation but also as a strategic lever for enhancing long-term profitability and operational efficiency (Wang & Sarkis, 2013). Giannakis and Papadopoulos (2015) further refined the triple bottom line in SSCM by defining it as the "integrated management of supply chain risks that are connected to the natural environment, the society, and the profitability of the enterprise." However, alternative conceptualizations, such as that of Hofmann et al. (2014), propose a broader view of sustainability that emphasizes social, ecological, and ethical considerations, sometimes excluding the economic dimension altogether. This divergence highlights the evolving nature of sustainability discourse and the need for context-specific interpretations.

Despite the growing attention to sustainability in supply chain research, the study of SSCRs remains relatively nascent. It is only within the past decade that scholars have begun to systematically explore how sustainability challenges translate into operational and strategic risks (Foerstl et al., 2010; Hofmann, 2019). Many existing definitions of SSCRs are essentially rebranded versions of traditional supply chain risks, reframed to reflect their sustainability implications—such as financial losses due to environmental fines or reputational damage stemming from unethical labor practices.

Lee and Vachon (2016) offer a more targeted definition of SSCRs, emphasizing the reputational risks that arise from unsustainable practices within upstream supply chain partners. They argue that poor sustainability performance by suppliers can trigger negative stakeholder reactions, ultimately harming the lead firm's public image and brand equity (Lee & Vachon, 2016). However, reputational risk is only one facet of SSCRs. There are also operational risks, such as delays in lead times, which are particularly critical in the FMCG sector where product turnover is rapid and time sensitivity is high. For example, political unrest or labor strikes that lead to factory shutdowns can severely disrupt supply continuity, resulting in missed deliveries and financial penalties.

In addition to reputational and operational risks, environmental risks pose significant financial threats. Substandard environmental practices by upstream suppliers—such as illegal dumping, excessive emissions, or non-compliance with environmental regulations—can expose the lead firm to fines, legal action, and loss of market access (Simpson & Evens, 2024). These risks are especially relevant in Vietnam, where regulatory

enforcement is still developing, and global sustainability standards are increasingly influencing trade and investment decisions.

Given the multifaceted nature of SSCRs and their growing relevance in global and local supply chains, there is a pressing need for research that systematically identifies, categorizes, and measures these risks. Furthermore, understanding how these risks impact supply chain performance—and how firms can effectively mitigate them through strategic risk management practices—is essential for building resilient and sustainable supply networks. This study aims to address these gaps by developing a comprehensive framework for SSCR assessment and exploring the interplay between risk exposure, performance outcomes, and mitigation strategies in Vietnam's dynamic FMCG sector.

Hofmann et al. (2014) argue that while traditional supply chain risks typically arise from disruptions such as accidents, natural disasters, or political instability, sustainability-related risks are fundamentally shaped by the reactions of key stakeholders. These risks are not solely the result of operational failures but are triggered when stakeholders—such as consumers, investors, regulators, and NGOs—perceive sustainability violations and respond with punitive actions. This stakeholder-centric view contrasts with the broader sustainability principles of continuity, longevity, and viability emphasized by (Giannakis & Papadopoulos, 2016), who suggest that conventional hazards themselves can threaten the long-term stability of supply chains, regardless of stakeholder response.

To better understand how SSCRs unfold, Wilhelm et al. (2016) propose a four-stage process that illustrates the progression of sustainability risk exposure for a buying firm:

(1) There is a dangerous sustainability-related condition or event within the upstream supply chain.

(2) Stakeholders learn about it.

(3) Stakeholders assign the buying firm enough blame to prevent such conditions or events.

(4) Stakeholders decide to take punitive action.

This framework highlights the importance of extended supply chain visibility, urging companies to monitor sustainability practices beyond their immediate (first-tier) suppliers. Failure to do so can result in reputational harm and financial penalties, even if the firm is not directly involved in the unsustainable activity (Wilhelm et al., 2016). In sectors like FMCG, where speed, volume, and brand perception are critical, such risks can be particularly damaging.

Despite the growing recognition of SSCRs, the literature remains fragmented and conceptually ambiguous. Many studies conflate sustainability risks with general supply chain disruptions, offering limited guidance on how to identify and measure SSCRs in specific industries. Raian emphasize that SSCRs differ fundamentally from traditional supply chain risks: while the latter stem from physical or logistical disruptions, sustainability risks are often socially constructed, emerging from stakeholder judgments and ethical expectations (Raian et al., 2022).

However, this distinction is not always clearly operationalized in research. Hofmann et al.'s (2014) stakeholder-based definition, while insightful, lacks specificity in identifying concrete SSCRs across different supply chain contexts. This ambiguity may stem from the fact that SSCRs are highly context-dependent, varying by industry, geography, regulatory environment, and stakeholder sensitivity (Valinejad & Rahmani, 2018). For example, what constitutes a critical sustainability risk in the apparel industry may differ significantly from that in the FMCG sector, where product turnover is rapid, and supply chains are often global and fragmented.

Given these challenges, there is a pressing need for empirical research that develops validated measurement scales tailored to the unique characteristics of specific supply chains—such as those in the FMCG industry in Vietnam. Such research should aim to clarify the dimensions of SSCRs, distinguish them from conventional risks, and explore how stakeholder responses translate into tangible performance impacts. By doing so, scholars and practitioners can move beyond abstract definitions and build actionable frameworks for managing sustainability risks in complex, high-pressure supply chain environments.

1.3 Purpose of Research

Sustainability-related supply chain issues in the FMCG industry

The purpose of this research is to investigate how sustainability-related risks manifest within supply chain management (SCM) in the fast-moving consumer goods (FMCG) industry, with a particular focus on Vietnam. While supply chain risk assessment

and management have been widely studied, relatively few investigations have specifically addressed how sustainability concerns—such as environmental degradation, social injustice, and ethical violations—translate into tangible risks within supply chains. These risks are increasingly relevant as global supply chains become more complex and exposed to scrutiny from regulators, consumers, and investors.

In the context of agricultural supply chains, Jianying et al. (2021) identified 73 distinct sustainability-related supply chain risks (SCSRs) across eight categories: economic, social, collaboration, accident, quality, technical, management decision, and environmental. This categorization provides a useful foundation for understanding the multifaceted nature of sustainability risks. However, the FMCG sector presents unique challenges due to its high volume, rapid turnover, and reliance on extensive supplier networks, often spanning multiple regions and regulatory environments (Jianying et al., 2021).

In Vietnam's FMCG supply chains, environmental and social risks are particularly prominent. These include pollution, excessive carbon emissions, poor waste management practices, labor exploitation, and non-compliance with both local and international sustainability standards. Tran, T. (2019) highlighted the environmental impact and waste management practices in Vietnam's FMCG industry, pointing to systemic issues in production and distribution that contribute to ecological degradation.

Moreover, the integration of sustainability into supply chain strategy remains a complex balancing act for many FMCG firms. Chu Nhat et al., (2025) examined how

companies attempt to reconcile cost-efficiency with environmental and social responsibility. Their findings suggest that while firms recognize the importance of sustainability, trade-offs between short-term financial performance and long-term ethical commitments often hinder full integration (Chu Nhat et al., 2025).

The geographical diversity and operational complexity of FMCG supply chains further amplify sustainability risks. These risks are shaped not only by internal business decisions but also by external pressures, including government regulations, international trade policies, and global sustainability frameworks. The World Bank Group (2020) emphasized the role of sustainability and trade policies in shaping Vietnam's supply chain practices, noting that compliance with international standards is increasingly becoming a prerequisite for market access and investor confidence.

Despite growing awareness, unsustainable manufacturing methods remain prevalent in the FMCG sector. Practices such as exploiting labor, ignoring safety standards, and polluting the environment during production and distribution are often driven by the pressure to reduce costs and accelerate turnaround times. These practices not only pose ethical and legal risks but also threaten long-term business viability and brand reputation.

Therefore, this research seeks to fill a critical gap by examining how sustainability-related risks are identified, measured, and managed within Vietnam's FMCG supply chains. It aims to provide actionable insights into how firms can mitigate these risks through strategic supply chain integration, stakeholder engagement, and compliance with evolving sustainability standards. Ultimately, the study contributes to the broader discourse

on sustainable supply chain management by offering a localized perspective on global challenges.

1.4 Significance of the Study

The FMCG sector faces mounting pressure to manage SSCRs not just to comply with regulations, but to secure long-term competitiveness. This research tackles that challenge by examining how SSCRs influence firm performance and by recommending targeted mitigation tactics that enhance both resilience and sustainability across FMCG supply networks.

From a theoretical perspective, this study responds to a clear gap in sustainable supply chain management literature. While existing work often treats general supply chain risks or sustainability practices in isolation, few investigations have created and validated a dedicated SSCR measurement framework for the FMCG context. By addressing RQ1 and RQ2, I introduce and confirm a robust set of scales that parse environmental, social, and economic risk dimensions. These validated instruments will serve as a foundation for future cross-industry comparisons and longitudinal studies, thereby extending academic inquiry into SSCR dynamics.

Empirically, our analysis sheds light on which types of SSCRs most strongly undermine critical performance metrics—such as delivery reliability, cost control, and innovation rates—in FMCG supply chains. Through rigorous testing of RQ2, I link distinct risk categories to measurable operational and financial outcomes. This bridges a longstanding divide between conceptual risk taxonomies and practical performance

indicators, offering fresh insights for scholars developing quantitative models of supply chain risk.

Importantly, by probing RQ3, I go beyond risk identification to evaluate how various risk management practices can buffer the adverse effects of SSCRs. I assess both proactive (e.g., emission-reduction strategies, digital platforms) and reactive (e.g., inventory buffering, collaborative risk-sharing) approaches. Our findings highlight the pivotal role of supply chain agility and technological adoption in mitigating sustainability risks, thus contributing to contingency theory and enriching understanding of resilience mechanisms.

On the managerial front, this study delivers an actionable roadmap. Practitioners gain access to validated SSCR scales for benchmarking and prioritization. Our moderation analysis pinpoints the most cost-effective mitigation levers—enabling firms to tailor supplier development programs, disaster-preparedness plans, and digital investments to the risks that most threaten service levels and profitability.

Finally, the insights generated here are valuable for policymakers and industry bodies aiming to elevate sustainability standards across global supply chains. By quantifying the performance trade-offs and mitigation payoffs associated with different SSCR categories, this research provides evidence-based guidance for designing regulations and cooperative initiatives that encourage proactive risk governance and shared accountability.

In sum, this study advances scholarly knowledge by offering validated measurement tools and empirically grounded SSCR–performance linkages, while

furnishing FMCG managers and regulators with clear strategies to transform sustainability risks into sources of competitive strength and enduring resilience.

1.5 Research Purpose and Questions

The overarching aim of this study is to develop a deeper and more comprehensive understanding of how SSCRs influence firm performance in the FMCG industry, particularly within the context of Vietnam. As sustainability becomes an increasingly critical factor in global supply chain operations, firms are under pressure to not only identify and manage these risks but also to integrate sustainability into their core strategic and operational frameworks. This study seeks to bridge the gap between theoretical models and practical applications by examining the real-world implications of SSCRs and evaluating the effectiveness of various risk mitigation strategies.

The research is designed to generate actionable insights for both academic scholars and industry practitioners. It aims to provide a robust analytical framework for measuring sustainability-related risks, assessing their impact on key performance indicators, and identifying the most effective supply chain risk management practices. By doing so, the study contributes to the growing body of literature on sustainable supply chain management and offers practical guidance for FMCG firms striving to balance profitability with environmental and social responsibility.

To achieve this overarching aim, the study is guided by the following specific objectives:

- **Identify and catalogue the full spectrum of sustainability-related risks** present in FMCG supply chains, including environmental, social, and economic

dimensions. This involves a thorough review of existing literature and industry practices to ensure comprehensive coverage of risk categories relevant to the Vietnamese FMCG context.

- **Develop and psychometrically validate measurement scales** for distinct SSCR categories. These scales will be designed to capture the severity, frequency, and detectability of risks, and will undergo rigorous statistical testing to ensure reliability and validity.
- **Apply the validated scales to empirically quantify the effects of SSCRs** on key performance dimensions within FMCG firms. These dimensions include delivery reliability, cost efficiency, product innovation, customer satisfaction, and overall supply chain resilience.
- **Assess the moderating role of supply chain risk management practices** in buffering the adverse effects of SSCRs on firm performance. This includes evaluating strategies such as supplier collaboration, digital integration, sustainability audits, and scenario planning to determine which practices yield the most significant improvements in performance outcomes.

By fulfilling these objectives, the study will produce a set of empirically grounded tools and insights that can be used to guide decision-making in FMCG supply chain operations. It will also offer a strategic blueprint for embedding sustainability risk mitigation into supply chain design and execution, helping firms to navigate the increasingly complex landscape of global sustainability expectations.

To address the research purpose and objectives, the study will explore the following key questions:

- RQ1: What is the measurement scale of different categories of sustainability-related supply chain risks in the FMCG industry?

This question focuses on developing a reliable and context-sensitive framework for identifying and quantifying environmental, social, and economic risks within supply chains.

- RQ2: What are the impacts of SSCRs on supply chain performance in the FMCG industry?

This question investigates how sustainability risks affect operational and strategic performance metrics, and whether these impacts vary across different risk categories.

- RQ3: How do supply chain risk management practices moderate the impacts of SSCRs on supply chain performance in the FMCG industry?

This question examines the effectiveness of various mitigation strategies in reducing the negative consequences of sustainability risks and enhancing overall supply chain resilience.

CHAPTER II: REVIEW OF LITERATURE

2.1 Theoretical Framework

Recent literature increasingly emphasizes the importance of adopting a holistic approach to supply chain risk management—one that integrates both reactive and proactive strategies into a unified framework. Reactive strategies, which focus on responding to disruptions after they occur, remain essential for managing immediate threats and minimizing short-term damage (Kleindorfer & Saad, 2005). These include contingency planning, crisis response protocols, and recovery mechanisms that help firms stabilize operations during unforeseen events.

However, there is a growing recognition that reactive measures alone are insufficient in today's volatile and sustainability-driven supply chain environments. As supply chains face mounting pressures from climate change, social accountability, and global regulatory shifts, proactive strategies are gaining prominence. These strategies involve anticipating potential risks, embedding sustainability into decision-making, and designing systems that are inherently resilient (Settembre-Blundo et al., 2021). Examples include supplier audits, predictive analytics, scenario planning, and the integration of environmental and social governance (ESG) criteria into procurement and logistics.

This integrated risk management perspective acknowledges that no single strategy can universally address all types of risks (Lenssen et al., 2014). Instead, effective mitigation requires a tailored combination of approaches that reflect the unique characteristics of each supply chain—its geography, industry, stakeholder expectations, and risk exposure. The

literature suggests that while both reactive and proactive strategies have distinct roles and benefits, there is an emerging consensus around the need to prioritize proactive measures (Buysse & Verbeke, 2003). These forward-looking practices not only reduce the likelihood of disruptions but also enhance long-term resilience, stakeholder trust, and sustainability performance.

In essence, the shift toward proactive risk management reflects a broader transformation in supply chain thinking—from short-term efficiency to long-term adaptability and responsibility. By embedding sustainability into risk frameworks, firms can better navigate uncertainty, meet evolving stakeholder demands, and contribute to more ethical and environmentally sound supply chain ecosystems.

Reactive strategies, such as carrying inventory and contingent rerouting, are essential for responding to immediate disruptions and mitigating their impacts. These strategies provide a buffer against sudden shocks and help maintain continuity in the supply chain. However, they are often associated with higher costs and may not be sufficient to address complex and ongoing risks, such as those arising from global pandemics, climate change, and geopolitical events (Darmawan, 2024).

On the other hand, proactive strategies aim to prevent or minimize risks before they occur, focusing on building resilience and adaptability within the supply chain (Can Saglam et al., 2021). Some prominent proactive strategies mentioned in the literature include adopting industry 4.0 technologies, enhancing supply chain collaboration, and improving visibility and information sharing between stakeholders. These strategies enable

supply chains to anticipate and respond more effectively to potential disruptions, reducing the need for reactive measures and enhancing overall supply chain performance. It is evident from the current literature that, there is a growing focus on the role of technology and data-driven decision-making in implementing proactive strategies (Can Saglam et al., 2021). Industry 4.0 technologies, such as IoT, AI, and big data analytics, enable real-time monitoring, predictive modeling, and agile decision-making, empowering supply chain managers to anticipate and address risks proactively.

There are three mitigation approaches: pre-positioning inventory, backup suppliers, and protected suppliers, to address supply chain disruptions due to supply and environmental risks (Kamalahmadi & Parast, 2017). Lee and Ulferts (2011) suggested strategic planning as a mitigation approach to manage supply chain risks, focusing on cost, quality, delivery, and flexibility strategies. Tran research found that managers adopt various mitigation approaches, including risk assessment, data exchange control, and building trust and interpersonal relationships with trading partners in supply chains (Tran et al., 2023). Wang research proposed an integrated framework incorporating fuzzy set theory and multiple criteria decision analysis to compare and rank alternative risk mitigation strategies individually and collectively for effective supply chain risk communication and management (Wang, 2018). (Davis & Vogt, 2021) emphasized the importance of using Incoterms(R) strategically as a risk mitigation approach in supply chain contracts to avoid unexpected costs and operational challenges. (Kurniawan et al., 2017) identified risk mitigation strategies such as supply chain visibility, supply chain flexibility, and supplier development to enhance supply chain effectiveness, moderated by risk culture. (Zhou et

al., 2023) provided practical risk mitigation strategies for the cruise supply chain, including control and detection, relationship-based, marketing, policy-based, risk transfer and share, and flexibility strategies. (Tarei et al., 2020) developed a Decision Support System (DSS) that recommended risk-mitigation and risk-sharing as effective mitigation approaches, with corresponding enablers, for managing supply chain risks in the Indian petroleum supply chain.

Visibility and transparency is one of mitigation strategy on improving the flow of information and data sharing across the supply chain, allowing stakeholders to have real-time visibility into inventory levels, production schedules, transportation status, and other critical aspects of the supply chain. This approach enhances collaboration, enables quicker response to disruptions, and improves overall supply chain efficiency (Mohammad et al., 2021). On the other hand, flexibility in supply chain management refers to the ability of the supply chain to adapt and respond to changes and disruptions effectively (Can Saglam et al., 2021). By incorporating flexibility into the supply chain design, companies can enhance their ability to mitigate risks and uncertainties, ensuring a more resilient and robust supply chain (Kraude et al., 2022; Mohammaddust et al., 2017). Relationships in supply chain management involves building strong collaborative relationships with suppliers, customers, and other stakeholders in the supply chain to enhance coordination, communication, and mutual support (Mohammad et al., 2021; Suryadi & Rau, 2023). Collaborative relationships foster trust, which is essential for effective risk sharing and joint problem-solving (Dohale et al., 2022; Huong Tran et al., 2016). Postponement in supply chain management involves delaying the final customization or assembly of

products until closer to the actual demand, thereby reducing the risk of producing and holding finished goods that may not be needed (Can Saglam et al., 2021; Kraude et al., 2022). By adopting postponement strategies, companies can reduce inventory holding costs, minimize the risk of inventory obsolescence, and improve supply chain responsiveness (Rodrigues et al., 2022). Multiple sourcing and flexible contracts involve diversifying suppliers and establishing contracts that allow for adaptability in response to changing market conditions or disruptions (Raj et al., 2022; Üstündağ et al., 2022). Multiple sourcing can reduce their dependence on a single source and spread the risk of supply disruptions across different suppliers (Mohammad et al., 2021; Tarei et al., 2020) A traditional strategy, redundancy involves creating backup resources or capacity to maintain the flow of goods and services during disruptions (Raj et al., 2022; Tomlin, 2006). Redundancy can be implemented in various ways, such as maintaining excess inventory, having multiple facilities for production or distribution, or establishing alternative supply routes or transportation modes (Suryadi & Rau, 2023). Collaboration is often considered a proactive strategy as it involves establishing strong relationships and partnerships before disruptions occur, enabling quicker and more coordinated responses during times of crisis (Mohammad et al., 2021; Raian et al., 2022). Joint planning and coordination" involve collaborative efforts among supply chain partners to plan and coordinate their activities to manage risks effectively (Mohammaddust et al., 2017; Raj et al., 2022). By jointly planning and coordinating, supply chain partners can identify potential risks, allocate resources effectively, and develop contingency plans to respond swiftly to disruptions.

In response to the shift in strategy and implementation activities to ensure the efficiency of the FMCG industry supply chain, the research topic will use the dynamic capability theory and resource dependence theory to investigate the relationship between risks related to sustainable development of the supply chain and the efficiency of the supply chain. At the same time, the topic also tries to find out whether the current supply chain risk management practices in Vietnam contribute to regulating the impacts of risks related to sustainable development of the supply chain.

By integrating the Resource-Based View (RBV), which emphasizes unique internal resources, with the dynamic capabilities framework, which focuses on aligning internal resources with external environmental demands, this study proposes three dynamic supply chain management practices to effectively mitigate the impact of sustainability-related supply chain risks on organizational performance.

To begin with, effective risk management in supply chains necessitates a coordinated and collaborative effort among all participating entities to ensure comprehensive identification and mitigation of potential risks. Organizations typically employ two main categories of strategies to address risk: control-oriented and prevention-oriented approaches (Li et al., 2021). Control strategies often involve operational buffers such as maintaining alternative suppliers, building surplus capacity, and stockpiling inventory to absorb environmental uncertainties. However, these methods are generally resource-intensive and do not significantly enhance the agility or responsiveness of supply chains (Munir et al., 2020). On the other hand, prevention strategies focus on structural and locational adjustments—such as onshoring, reshoring, nearshoring, and back-shoring—

and emphasize the strategic importance of supply chain integration and information exchange. Facilitating transparent and timely information sharing both within and across organizational boundaries enhances supply chain visibility, thereby reducing uncertainty and mitigating risk. Moreover, it enables supply chain partners to react promptly and effectively to emerging disruptions in volatile environments (Craighead et al., 2011). As such, fostering strong supply chain integration among diverse actors is considered a critical dynamic capability for managing sustainability-related supply chain risks (SSCRs).

Secondly, achieving effective supply chain integration necessitates a unified strategic direction among all participating firms. Organizations must align their objectives and coordinate efforts to foster seamless collaboration across the supply chain. In response to increasing complexity and volatility, many companies are transitioning toward long-term, strategic partnerships with suppliers, emphasizing cooperation and mutual commitment. However, traditional supplier relationships have been challenged by evolving market demands—such as smaller batch sizes, greater product diversity, and more frequent deliveries—which have diminished the effectiveness of conventional collaboration models. Consequently, firms are adopting supply base rationalization and enhancing dynamic collaboration with key suppliers, recognizing their pivotal role in addressing social and environmental sustainability concerns (Islam et al., 2021). The literature on sustainable supply chain management highlights several structural barriers to adoption, including globalization, outsourcing, extended and geographically dispersed supply chains, and limited visibility and control (Rafi-Ul-Shan et al., 2018). These challenges are particularly significant given that many sustainability-related supply chain risks (SSCRs) originate in

the upstream supply chain, where hazardous events often occur (Rafi-Ul-Shan et al., 2018). Therefore, this study identifies supplier management capability as a critical dynamic practice for mitigating SSCRs and enhancing overall supply chain resilience.

Third, in the FMCG sector, timely delivery and consistent material quality are critical performance factors, as consumer purchasing behavior is predominantly driven by impulse and desire rather than necessity. To capitalize on short-lived market trends, firms must demonstrate both proactive trend identification and agile responsiveness in product deployment, often with a limited number of stock-keeping units (SKUs) to optimize profitability within narrow sales windows. Scholarly literature underscores the importance of tightly integrated management structures characterized by synchronized processes, responsive communication channels, and collaborative customer engagement. These elements are essential for achieving customer satisfaction and resolving demand-side challenges. In dynamic market environments, the ability to understand and cooperate with customers is increasingly recognized as a strategic capability that contributes to long-term competitive advantage and economic performance. Moreover, sustainability-related supply chain risks are frequently triggered by adverse stakeholder reactions to firms' unsustainable practices, with customers being among the most vocal and influential stakeholders (Rafi-Ul-Shan et al., 2018). Given this context, the ability to align supply chain practices with evolving customer expectations—particularly regarding sustainability—is not only a driver of satisfaction but also a critical risk mitigation strategy. Accordingly, this study identifies customer-centric capability as a key dynamic practice for managing SSCRs, emphasizing

the strategic importance of responsiveness to customer needs and values in sustainable supply chain management.

Drawing upon the theoretical foundations of the Resource-Based View (RBV), which emphasizes the strategic value of unique internal resources, and the Dynamic Capabilities (DC) perspective, which focuses on the ability of firms to adapt and reconfigure resources in response to external changes, this study identifies three critical dynamic supply chain management practices for mitigating the adverse effects of sustainability-related supply chain risks (SSCRs) on organizational performance. Specifically, the proposed practices include: (1) supplier management capability, which enables firms to build resilient and sustainable supplier relationships; (2) supply chain integration, which facilitates coordinated and transparent operations across supply chain actors; and (3) customer focus, which ensures responsiveness to evolving consumer expectations and stakeholder pressures related to sustainability. Together, these capabilities represent a strategic approach to enhancing supply chain agility, resilience, and long-term performance in the face of sustainability-driven disruptions.

Extensive scholarly research has examined various strategies for mitigating risks within supply chain management. Across this body of literature, mitigation approaches are commonly categorized into two principal groups: prevention strategies and control strategies. Prevention strategies are designed to proactively reduce the likelihood of risk occurrence by addressing root causes and enhancing system resilience, often through structural adjustments, improved visibility, and strategic planning. In contrast, control strategies focus on minimizing the impact of risks once they materialize, typically through

contingency measures such as inventory buffers, backup suppliers, and flexible capacity. This classification framework provides a foundational understanding of how firms can systematically approach risk management in supply chains, particularly in the context of sustainability-related disruptions.

2.2 The resource-based view:

The resource-based view (RBV) has emerged as one of several important explanations for persistent differences in firm performance in the field of strategic management (Barney & Arikan, 2005). After undergoing a period of intense theoretical development and dissemination in the early 1990s, the basic RBV theory was established and began to influence empirical research in the field. At the same time, resource theory began to influence theoretical and empirical work in other non-strategic management disciplines including human resource management, marketing, management information systems, operations research, etc.

First among these is the term “resource”. Although the term has been defined elsewhere (Barney, 1991; Barney, 2001; Rumelt, 1984; Wernerfelt, 1984), the current usage of the term suggests the following definition: Resources are tangible and intangible assets that firms use to formulate and implement their strategies. According to Barney & Arikan (2006), resources are valuable when they enable a firm to develop and implement strategies that reduce the firm's net costs and/or increase the firm's net revenues beyond what would have occurred if the resources had not been used to develop and implement these strategies. The value of resources can also be determined by their ability to enable firms to formulate

and implement strategies appropriate to the markets in which they operate. Thus, resources, including tangible, intangible, and existing capabilities of the firm, influence the firm's behavior and activities. In the studies of Rumelt (1984), Wernerfelt (1984), and Barney (1991), it is argued that the performance differences between firms are not primarily due to the products they offer or the market environment in which they operate. Instead, these differences in competitive performance are due to their resources and how these resources are actually used. Leading firms are most likely to use their resources more effectively than their competitors. Resources are defined here in a broad sense to include tangible and intangible resources of the firm. Specifically, they are understood here as human resources, financial resources, technology and knowledge, customer relationships, and stakeholder relationships of the firm. In the opposite perspective, companies without effective resources will be limited in their activities and advantages in the market Barney (1991).

Research by Hauschild & Knyphausen-Aufseß considers RBV as a promising tool to study the internal resource needs of enterprises to conduct innovation and improvement (Hauschild & Knyphausen-Aufseß, 2013). Similar to the external resources of enterprises, according to Kraaijenbrink et al. proposed that the internal resources of enterprises need to be observed in tangible and intangible forms and in addition, the capabilities of enterprises (Kraaijenbrink et al., 2010). In the studies of Taylor et al. 2009; Hitt et al. 2016, RBV theory allows us to clearly explain the interaction between the strategic resources of the company and the organization to achieve higher competitive advantage (Hitt et al., 2001). The efficiency of sustainable supply processes is also a huge competitive advantage for companies in the FMCG sector. Therefore, using RBV to understand the operational

management system and supply chain to bring sustainable supply efficiency to businesses is appropriate (Bowen & Chen, 2001; Brandon-Jones et al., 2014; Gligor & Holcomb, 2014; Hunt & Davis, 2012; Rungtusanatham et al., 2003).

2.3 Dynamic Capabilities

The term “Dynamic” was first discussed by Teece and Pisano (1994) to refer to environmental changes. According to Teece et al. (1997), the definition of the term “dynamic” is “the ability to renew capabilities to achieve congruence with the changing environment”. Thus, “dynamic” refers to changes originating from both external factors and internal conditions of the enterprise. External changes are objective changes through which internal activities of the enterprise need to transform to best adapt to the “dynamic” conditions from the outside.

The theory of dynamic capabilities was developed based on the RBV resource theory of Barney (1991). In the context of a rapidly and strongly changing business environment, creating, maintaining and developing competitive advantages requires businesses to be dynamic and flexible to change, create and renew resources and capabilities, helping to effectively adapt to environmental changes (Zahra et al., 2006). Based on the explanation of the characteristics of "dynamic", Teece et al. (1997) proposed the concept of dynamic capabilities as "the ability of businesses to integrate, build, and reshape internal and external capabilities, to respond quickly to environmental changes" (Teece et al., 1997, p. 516). Dynamic capabilities are a special form of capability, considered as a high-level capability, which plays a role in connecting and coordinating

common capabilities and improving business performance of the enterprise (Winter, 2003; Zahra et al., 2006).

Sustainable supply chain is an internal resource of the enterprise that changes more rapidly than other conventional resources. In the context of the FMCG industry, SSC resources become more volatile and difficult to predict. This makes sustainable supply chain management an important and key resource for FMCG enterprises to gain an advantage in the market. SSCM helps to forecast and minimize risks in the process of FMCG enterprises implementing sustainable development activities of their SC system. At the same time, SSCM helps to promote the effectiveness of sustainable supply systems in enterprises. There are very few studies that combine SSCM with DC (Beske, 2012; Clifford Defee & Fugate, 2010), so this topic, through the process of studying theory, exchanging experts and typical lessons learned in the FMCG industry in Vietnam, proposes aspects of sustainable supply chain management. This will help future research projects to build a complete theoretical framework between SSCM and DC.

2.4 The Concept of Risk of Sustainable Supply Chain

The triple bottom line, which includes the environmental, economic, and social elements, is used to characterize sustainable development in most research (Giannakis and Papadopoulos, 2016; Hamani and Boudjema, 2013; Brandenburg et al., 2014). The environmental, social, and economic hazards are included in the sustainability risks according to the Brundtland Commission's concept of sustainable development (Giannakis & Papadopoulos, 2016). Sustainable supply chain management (SSCM) is defined as the

explicit integration of environmental and social goals into economic development, in contrast to traditional supply chain management, which typically focuses on economic and financial business performance (Seuring & Müller, 2008) . Supply chain sustainability is widely recognized as a critical factor in lowering costs and boosting firms' long-term profitability (Wang & Sarkis, 2013).

The triple bottom line in SSCM was defined by (Giannakis & Papadopoulos, 2016) as "the integrated management of supply chain risks that are connected to the natural environment, the society, and the profitability of the enterprise." Nevertheless, in Hofmann et al. (2014) 's conceptualization of sustainability, the economic component is disregarded in favor of three other considerations (social, ecological, and ethical). Similar to Freise and Seuring (2015), who investigated the motivations and drives for SSCRs management by focusing on the clothes supply chain, but who took into account social and environmental factors rather than adopting a triple bottom line strategy.

Risks in the supply chain that are relevant to sustainability have just recently been researched for just more than a decade (Foerstl et al., 2010; Klassen & Vereecke, 2012). Thus, most definitions of the SSCRs have merely renamed versions of sustainability challenges that result in financial or reputational losses.

According to Lee and Vachon's definition of SSCRs (2016, p. 251), the reputational harm that might come from upstream supplier behavior is the primary consideration: Poor sustainability practices in an organization's supply chain (upstream) might cause adverse stakeholder reactions and may damage that organization's image.

However, there is also a risk of supply chain disruption in terms of lead time delay, which could be crucial in the case of fast fashion products and could ultimately result in real financial risk. This risk is in addition to the reputational risk for the lead firm that results from subpar sustainability practices in upstream suppliers. For instance, since factories were shut down due to riots, fashion merchants could experience delays in shipments. Additionally, in the case of environmental sustainability, subpar upstream practices might expose the lead firm to financial risk in the form of environmental fines or penalties.

According to Hofmann et al. (2014), although disruptions bring on typical supply chain risks, sustainability risks must be based on the responses of key stakeholders. This argument runs counter to the sustainability traits of continuity, longevity, and viability observed by Grant et al. (2015), which suggests that supply chain continuity, longevity, and viability might be jeopardized by conventional hazards rather than only the responses of essential stakeholders. SSCRs for a buying firm appear along a four-stage process:

(1) There is a dangerous sustainability-related condition or event within the upstream supply chain.

(2) Stakeholders learn about it.

(3) Stakeholders assign the buying firm enough blame to prevent such conditions or events.

(4) Stakeholders decide to take punitive action.

Therefore, a company must evaluate the sustainability behavior throughout its supply chain beyond first-tier suppliers to minimize loss from unfavorable stakeholder responses (Wilhelm et al., 2016).

Generally, even though current conceptualizations of SSCRs provided in the existing literature remain ambiguous, it is argued by most studies that there is a clear distinction between traditional SCs risks and SSCRs (Raian et al., 2022). In this sense, traditional SC risks come from disruptive occurrences (such as accidents and political upheaval). In contrast, sustainability risks come from stakeholder responses (such as consumer boycotts and reputational damage) (Hofmann, 2019). However, this conceptualization of SSCRs is ambiguous and provides little value in identifying specific SSCRs. This issue could be because SSCRs are industry- and context-dependent (Valinejad & Rahmani, 2018). Therefore, it is imperative to provide further empirical evidence of measurement scales of SSCRs concerning unique features of a specific supply chain such as GSCs.

2.5 Risks of Sustainable Supply Chain in FMCG Sector

Few studies have focused on how sustainability concerns materialize as a risk in SCM, even though many have been done on SC risk assessment and management. In the context of grape SC, (Jianying et al., 2021) identified 73 SCSRs across eight categories: economic, social, collaboration, accident, quality, technical, management decision, and environmental. The leather sector has forty-four SCSRs, which (Moktadir et al., 2020) identified and grouped into five categories: economic, environmental, social, technical, and

institutional. Based on the three sustainability dimensions, Xu et al. (2019) assessed SCSR variables in the context of the garment and automobile sectors.

With the specific characteristics of the FMCG industry requiring a solid SC system to generate profits, understanding the risks of the SSC system is a mandatory trend for businesses to develop sustainably. However, there are not many research works that correctly define and appropriately model the risks as well as risk management solutions of sustainable supply chains in the FMCG industry. In addition, short product life cycles, supplier base rationalization, buffers and stocks, increasing need for on-time delivery, changes in customer tastes and preferences, technological transitions, and changes in supplier goals are some industry-specific reasons that cause SSCRM to become more complicated (Caniato et al., 2012; Pfohl et al., 2010).

Increased social and environmental sustainability risks and pressures result from these complicated features and geographical diversity of FMCG's SCs. These include the excessive use of chemicals and raw-materials production, unsafe working conditions and the exploitation of human resources in the FMCG industry, carbon emissions from transportation, and the growth of post-consumer textile waste (Freise & Seuring, 2015). Unsustainable manufacturing methods, including exploiting workers and contaminating the environment during production and distribution, are rife in the fast moving product industry because of the push to reduce costs and turnaround times (Turker & Altuntas, 2014).

2.6 Concept of Sustainable Supply Chain Risk Management – SCSR

Business structures and strategies designed under assumptions of a stable environment are not applicable in modern turbulent, volatile and highly unstable business environments (Lee & Vachon, 2016). Christopher and Holweg (2011) suggested a move from dynamic to structural flexibility by getting closer to the centre of gravity or reducing supply chain length and designing adaptable supply chains, where performance measurement integrates flexibility, adaptability, responsiveness and agility rather than traditional accounting measures of performance based on financial parameters. Existing SCRM empirical studies do not extend to the holistic network or total supply chain level. Moreover, a major shortcoming of existing studies is a heavy reliance on financial outcomes (Christopher & Holweg, 2011) or analysis at dyadic level or a limited number of supply chain tiers (Tang, 2006). Furthermore, current knowledge is insufficient (Hofmann et al., 2014), overly descriptive (Wagner & Bode, 2008) and underdeveloped at complex supply network level (Harland et al., 2003; Masson et al., 2007). Although SCRM is a fairly well developed area, it appears that risk management research in the global supply chain context, especially in a demand-driven, volatile and short product life-cycle context such as fashion is still missing.

Various frameworks for SCRM exist (Christopher & Holweg, 2011; Norrman & Jansson, 2004; Nyoman Pujawan & Geraldin, 2009; Ritchie & Brindley, 2007; Tang, 2006; Tummala & Schoenherr, 2011). Norrman and Jansson (2004) argued that although different researchers have proposed different stages of risk management process, these are to a large extent similar to each other. The following three main activities are found in the risk management process literature (Norrman & Jansson, 2004; Tummala & Schoenherr, 2011):

Risk Identification: identifying risk sources, triggers and drivers, for example, by looking at drivers and sources of risks and the internal and external environment of the organisation;

Risk Prioritisation: risk assessment, evaluation and analysis to find out the most important risks for management. For example, by categorising them into low, medium and high risks, looking at their impact and consequences, high impact and high consequences risks will be prioritised as important risks for the management consideration;

Risk Mitigation: strategies for risk treatment, handling, reduction, monitoring, control and contingency planning.

However, there is no agreed upon risk management process, nor one that has been designed in the context of fashion supply chains, which suggests a need to explore how fashion supply chains are managing or can manage their risks. As Giannakis and Papadopoulos (2016, p.458) noted the "distinctive nature of sustainability-related risks", it follows that traditional risk management frameworks may not be sufficient.

2.7 Supply Chain Risk Management Practises

Supply chain management mitigation strategies have been covered extensively in previous studies. Collectively, the authors classified it into two main groups, Prevent Strategies and Control Strategies.

Literature revolves around the shift towards integrating both reactive and proactive strategies into a comprehensive risk management framework. While reactive strategies remain crucial for immediate response, proactive measures are becoming increasingly important in creating resilient and sustainable supply chains. This integrated approach

recognizes that risk mitigation is not a one-size-fits-all solution and requires a combination of strategies tailored to specific supply chain contexts and risks. While both types of strategies have their merits and are necessary in managing supply chain risks effectively, there seems to be an emerging discussion on the need to prioritize proactive approaches to enhance supply chain resilience and sustainability.

Reactive strategies, such as carrying inventory and contingent rerouting, are essential for responding to immediate disruptions and mitigating their impacts. These strategies provide a buffer against sudden shocks and help maintain continuity in the supply chain. However, they are often associated with higher costs and may not be sufficient to address complex and ongoing risks, such as those arising from global pandemics, climate change, and geopolitical events.

On the other hand, proactive strategies aim to prevent or minimize risks before they occur, focusing on building resilience and adaptability within the supply chain. Some prominent proactive strategies mentioned in the literature include adopting industry 4.0 technologies, enhancing supply chain collaboration, and improving visibility and information sharing between stakeholders. These strategies enable supply chains to anticipate and respond more effectively to potential disruptions, reducing the need for reactive measures and enhancing overall supply chain performance. It is evident from the current literature that, there is a growing focus on the role of technology and data-driven decision-making in implementing proactive strategies. Industry 4.0 technologies, such as IoT, AI, and big data analytics, enable real-time monitoring, predictive modeling, and agile

decision-making, empowering supply chain managers to anticipate and address risks proactively.

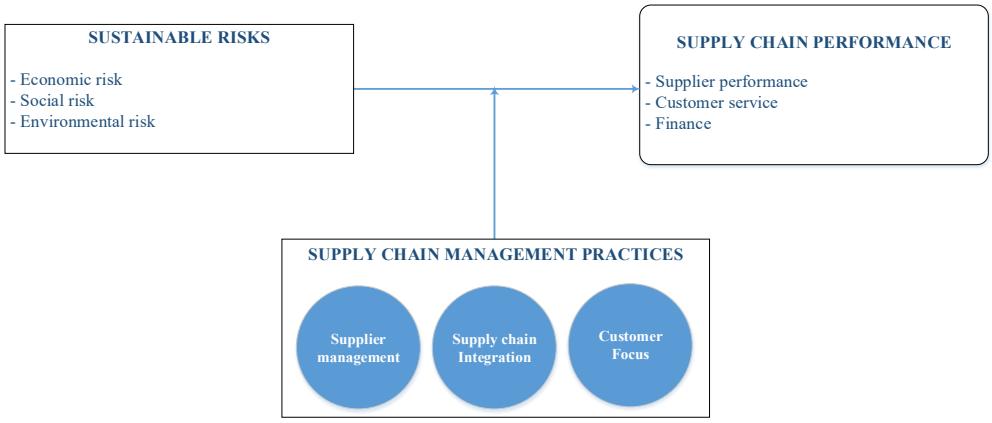
Kamalahmadi and Parast (2017) identified three mitigation approaches: pre-positioning inventory, backup suppliers, and protected suppliers, to address supply chain disruptions due to supply and environmental risks. Lee and Ulferts (2011)suggested strategic planning as a mitigation approach to manage supply chain risks, focusing on cost, quality, delivery, and flexibility strategies. Tran et al. (2016) found that managers adopt various mitigation approaches, including risk assessment, data exchange control, and building trust and interpersonal relationships with trading partners in supply chains. Wang et al. (2017) proposed an integrated framework incorporating fuzzy set theory and multiple criteria decision analysis to compare and rank alternative risk mitigation strategies individually and collectively for effective supply chain risk communication and management. Davis and Vogt (2021) emphasized the importance of using Incoterms(R) strategically as a risk mitigation approach in supply chain contracts to avoid unexpected costs and operational challenges. Kurniawan et al. (2017) identified risk mitigation strategies such as supply chain visibility, supply chain flexibility, and supplier development to enhance supply chain effectiveness, moderated by risk culture. Zhou et al. (2023) provided practical risk mitigation strategies for the cruise supply chain, including control and detection, relationship-based, marketing, policy-based, risk transfer and share, and flexibility strategies. Tarei et al. (2020) developed a Decision Support System (DSS) that recommended risk-mitigation and risk-sharing as effective mitigation approaches, with

corresponding enablers, for managing supply chain risks in the Indian petroleum supply chain.

Visibility and transparency is one of mitigation strategy on improving the flow of information and data sharing across the supply chain, allowing stakeholders to have real-time visibility into inventory levels, production schedules, transportation status, and other critical aspects of the supply chain. This approach enhances collaboration, enables quicker response to disruptions, and improves overall supply chain efficiency (Mohammad et al., 2021). On the other hand, fflexibility in supply chain management refers to the ability of the supply chain to adapt and respond to changes and disruptions effectively (Can Saglam et al., 2021). By incorporating flexibility into the supply chain design, companies can enhance their ability to mitigate risks and uncertainties, ensuring a more resilient and robust supply chain (Kraude et al., 2022; Mohammaddust et al., 2017). Relationships in supply chain management involves building strong collaborative relationships with suppliers, customers, and other stakeholders in the supply chain to enhance coordination, communication, and mutual support (Sharma et al., 2020; Suryadi & Rau, 2023). Collaborative relationships foster trust, which is essential for effective risk sharing and joint problem-solving (Dohale et al., 2022; Tran et al., 2016). Postponement" in supply chain management involves delaying the final customization or assembly of products until closer to the actual demand, thereby reducing the risk of producing and holding finished goods that may not be needed (Kraude et al., 2022; Saglam et al., 2021). By adopting postponement strategies, companies can reduce inventory holding costs, minimize the risk of inventory obsolescence, and improve supply chain responsiveness (Aragao & El-Diraby,

2019; Magalhaes et al., 2022). Multiple sourcing and flexible contracts involve diversifying suppliers and establishing contracts that allow for adaptability in response to changing market conditions or disruptions (Çıkmak & Ungan, 2022; Raj et al., 2022). Multiple sourcing can reduce their dependence on a single source and spread the risk of supply disruptions across different suppliers (Sharma et al., 2020; Tarei et al., 2021). A traditional strategy, redundancy involves creating backup resources or capacity to maintain the flow of goods and services during disruptions (Raj et al., 2022; Tomlin, 2006). Redundancy can be implemented in various ways, such as maintaining excess inventory, having multiple facilities for production or distribution, or establishing alternative supply routes or transportation modes (Suryadi & Rau, 2023). Collaboration is often considered a proactive strategy as it involves establishing strong relationships and partnerships before disruptions occur, enabling quicker and more coordinated responses during times of crisis (Ali et al., 2023; Sharma et al., 2020). Joint planning and coordination" involve collaborative efforts among supply chain partners to plan and coordinate their activities to manage risks effectively (Mohammaddust et al., 2017; Raj et al., 2022). By jointly planning and coordinating, supply chain partners can identify potential risks, allocate resources effectively, and develop contingency plans to respond swiftly to disruptions.

Figure 2.1 schematically depicts the conceptual research model of the SSCRs' impacts on supply chain performance and moderating effects of dynamic supply chain management practices.



2.8 The Concept of Supply Chain Performance

Balanced Scorecard Model for performance measurement

Traditionally, costs have been recognized as a key performance indicator (KPI) for measuring supply chain performance. The primary goal of supply chain management is to reduce costs - and waste - leading to a better supply chain. However, this measure tends to be historical and does not reflect the current business environment or future operating results(Quang et al., 2016).

Obviously, financial measures still play an important role. However, in the full scale of supply chain performance, it is necessary to balance with more strategic, intangible and contemporary measures (Fernandes et al., 2022; Quang et al., 2016)

The contemporary approach describes how short- and long-term measures affect supply chain performance (Kaplan, 2009) This approach leads to the emergence of two concepts:

- "Lagging" indicators represent what has actually happened in the past, e.g. financial measures.

- "Leading" indicators provide an early warning of what could happen in the future. Some such examples are (1) customer-oriented metrics, e.g. customer satisfaction, delivery time, percentage of "perfect orders" delivered, value of products perceived by the customer, product/service quality, response time to customer queries, etc., or (2) learning-driven and innovation metrics, e.g. number of new products developed per year, workforce flexibility, timing of new-product launches, etc.

Developed by Kaplan and Norton (1992), the balanced scorecard model identifies the limitations of traditional financial performance measures and integrates supply chain strategy into its performance goals. Furthermore, this model includes intangible assets of a supply chain, e.g., innovation, workforce skills, supplier capabilities, and customer satisfaction. In short, this new approach shifts the usual focus on physical assets to both physical and intangible resources of a supply chain for long-term future growth. Based on the four balanced perspectives of the balanced scorecard model, including finance, customer, internal processes, and innovation and learning, this study proposes a set of supply chain performance measurements, comprising (1) supplier performance, (2) internal

business, (3) innovation and learning, (4) customer service and (5) financial performance (Table 2.1).

Based on the balanced scorecard approach, Chopra and Sodhi (2012) and Quang et al. (2016) asserted that supply chain management involves tracking and finding ways to improve operational performance and strategic performance indicators, as detailed:

Operational efficiency:

- Supplier performance: reliability, response time.
- Innovation and learning: the number of new products developed each year, the flexibility of the workforce.
- Operational performance: production waste, inventory management costs, workforce productivity.
- Customer satisfaction: delivery time, percentage of "perfect orders" delivered, product value perceived by customers, product/service quality, response time to inquiry customer problems.

Strategic performance: market share growth, return on investment (ROI).

Given the scope of this study, the three perspectives of supplier performance, customer services, and financial performance are used for empirical investigation in this study, given their measurability features compared to innovation and learning and internal business perspectives.

Table 2.1. Supply chain performance measures

SUPPLY CHAIN PERFORMANCE INDICATORS				
Supplier performance	**Innovation and learning**	**Internal business**	**Customer service**	**Finance**
▪ Reliability	▪ Number of new products developed per year	▪ Amount of production waste	▪ Delivery timelines	▪ Market share growth
▪ Response time	▪ Workforce flexibility	▪ Costs of inventory management	▪ Percentage of "perfect orders" delivered	▪ Return on Investments (ROI)
▪ Supply disruptions		▪ Workforce productivity	▪ Product value perceived by the customer	
▪ Total inbound lead time			▪ Product/ Service quality	
			▪ Response time to customer queries	

Source: by Author

2.9 Summary

Sustainable supply chain risk factors in Vietnam's FMCG Sector

The growing emphasis on sustainability in global supply chains has prompted a deeper investigation into the risks associated with sustainable practices, particularly in emerging markets like Vietnam. Within the fast-moving consumer goods (FMCG) sector,

supply chains are increasingly exposed to a range of sustainability-related risks that can disrupt operations, damage reputations, and erode long-term competitiveness. This literature review provides a multidisciplinary foundation for understanding these risks and the strategic responses available to firms operating in Vietnam. Drawing from academic research and industry frameworks, the chapter addresses three core research questions (RQs) concerning the measurement of sustainable supply chain risks (SSCRs), their impact on performance, and the mechanisms available for mitigation.

RQ1: Measurement Scale of SSCRs

Scholars such as Govindan et al. (2014) and Sodhi & Tang (2012) have developed conceptual models that classify SSCRs into three primary dimensions:

- **Environmental Risks**: These include pollution, excessive carbon emissions, inefficient energy use, and poor waste management. In Vietnam, where industrial growth often outpaces environmental regulation, such risks are particularly pronounced.
- **Social Risks**: These refer to unethical labor practices, unsafe working conditions, displacement of local communities, and violations of human rights. The prevalence of informal labor and subcontracting in Vietnam's supply chains heightens exposure to these risks.
- **Reputational Risks**: These are linked to public perception and stakeholder trust, encompassing issues such as media backlash, ethical violations, and failure to meet sustainability commitments.

To quantify these risks, researchers advocate for multi-criteria assessment tools that evaluate severity, frequency, likelihood, detectability, and organizational preparedness. Common methodologies include Likert-scale surveys, exploratory factor analysis, and reliability testing to ensure the robustness of measurement instruments. Notably, environmental risks often dominate perceived severity in developing economies like Vietnam, where climate vulnerability and ecological degradation are pressing concerns. The literature also highlights the importance of contextualizing risk measurement tools to reflect local realities, including regulatory gaps and cultural attitudes toward sustainability.

RQ2: Impacts of SSCRs on Supply Chain Performance

A substantial body of research (e.g., Lee & Klassen, 2008; Ashby et al., 2012) confirms that SSCRs have a direct and measurable impact on various supply chain performance indicators. These include:

- **Inventory Availability and Procurement Cycles**: Environmental disruptions such as floods or regulatory penalties can delay procurement and reduce inventory reliability.
- **Logistics Efficiency and Transport Resilience**: Poor infrastructure, extreme weather events, and emissions-related restrictions can hinder transportation and increase operational costs.
- **Brand Reputation and Market Share**: Social and reputational risks can damage consumer trust, reduce brand equity, and lead to loss of market share, especially in markets where sustainability is a purchasing criterion.

- **Supplier Continuity and Contract Enforcement**: Ethical violations or environmental non-compliance can result in contract termination, supplier blacklisting, or increased scrutiny from regulators and NGOs.

These risks are no longer peripheral concerns; they have become central to supply chain strategy and resilience. Firms that fail to address sustainability risks face not only operational disruptions but also strategic disadvantages in terms of stakeholder engagement, investor confidence, and regulatory compliance. The literature underscores how sustainability has evolved from a voluntary initiative to a core determinant of supply chain health and competitiveness.

RQ3: Moderating Role of Risk Management Practices

To mitigate the adverse impacts of SSCRs, researchers propose a range of proactive and integrated risk management strategies. These include:

- **Supplier Audits and Ethical Sourcing Policies**: Regular audits and clear sourcing guidelines help ensure compliance with environmental and social standards.
- **Sustainability Dashboards and KPIs**: Real-time monitoring tools enable firms to track sustainability metrics and respond quickly to emerging risks.
- **Environmental Management Systems (EMS) and ISO Certifications**: These frameworks provide structured approaches to managing environmental performance and improving operational discipline.

- **Stakeholder Engagement and Grievance Redressal Mechanisms**: Transparent communication channels and feedback systems build trust and accountability across the supply chain.
- **Scenario Planning and Real-Time Risk Detection Technologies**: Predictive analytics and digital tools support agile decision-making and enhance supply chain responsiveness.

Research by Sodhi & Tang (2012) and Beske & Seuring (2014) demonstrates that firms with integrated sustainability risk management systems tend to exhibit higher resilience, faster recovery times, and stronger stakeholder relationships. In the Vietnamese context, the literature emphasizes the need for localized frameworks that account for informal supplier structures, fragmented regulatory enforcement, and varying levels of sustainability awareness among supply chain actors (Beske et al., 2014; Sodhi et al., 2012). Tailored approaches that combine global best practices with local insights are essential for building robust and sustainable supply chains in Vietnam's dynamic FMCG sector.

CHAPTER III – METHODOLOGY

3.1 Overview of the Research Problem

Vietnam's fast-moving consumer goods sector has undergone rapid expansion in recent years, driven by rising consumer demand, urbanization, and increased foreign investment. However, this growth has also brought heightened scrutiny and pressure to align supply chain operations with sustainability principles. As global supply chains become more interconnected and exposed to environmental, social, and ethical challenges, firms in Vietnam are increasingly vulnerable to sustainability-related supply chain risks. These risks include environmental degradation, unethical labor practices, non-compliance with international standards, and reputational damage—all of which can significantly disrupt operations and erode stakeholder trust.

Despite growing awareness of sustainability issues, there remains a notable gap in structured frameworks and empirical evidence guiding how these risks are identified, measured, and managed within the FMCG supply chain context. While global corporations may have access to sophisticated sustainability tools and reporting mechanisms, many local and regional firms in Vietnam lack the resources or strategic clarity to effectively integrate sustainability into their supply chain risk management practices. This disconnect between sustainability expectations and operational capabilities presents a critical research problem that demands attention.

This study seeks to address this gap by investigating the relationship between SSCRs and supply chain performance in Vietnam's FMCG industry. It applies behavioral and societal theories to understand how firms perceive, prioritize, and respond to sustainability challenges. Specifically, the research explores three key dimensions: (1) how SSCRs are categorized and measured, (2) the extent to which these risks impact supply chain performance, and (3) whether and how risk management practices moderate these impacts to enhance resilience and competitiveness.

The theoretical foundation of this study is anchored in the Theory of Reasoned Action (Fishbein & Ajzen, 1975), which posits that organizational behavior is influenced by attitudes and perceived social norms. This theory helps explain why firms may choose to adopt or resist sustainability practices based on internal beliefs and external pressures. Additionally, the study draws on Human Society Theory (Parsons, 1951; Granovetter, 1985), which emphasizes the role of embedded societal structures and relationships in shaping organizational decisions. These frameworks suggest that companies operate not only to maximize efficiency and profit but also to maintain legitimacy within their communities, industries, and institutional environments.

Understanding these behavioral and societal influences is essential for designing supply chain strategies that are both responsive and socially attuned. In Vietnam, where informal supplier networks, evolving regulatory landscapes, and cultural norms play a significant role in business operations, a nuanced approach to sustainability risk management is required. Firms must navigate a complex interplay of local expectations,

global standards, and operational constraints to build resilient and responsible supply chains.

This chapter outlines the methodological approach used to operationalize these theoretical constructs into measurable variables. It details the research design, including the development of psychometric scales for SSCRs, the selection of performance indicators, and the data collection and analysis procedures. By grounding the study in both theory and empirical investigation, this research aims to contribute meaningful insights into how sustainability risks can be effectively managed in the context of Vietnam's dynamic FMCG sector.

3.2 Operationalization of Theoretical Constructs

To address the research questions concerning SSCRs in Vietnam's FMCG industry, this study operationalizes key constructs through a structured framework grounded in existing literature and empirical validation. The constructs include SSCRs, supply chain performance, and SCRM practices, each measured using multi-item scales adapted from prior studies.

SSCRs are conceptualized as multidimensional risks that arise from environmental, social, and economic sustainability concerns. These include:

- **Environmental risks**: such as carbon emissions, pollution, and resource depletion.
- **Social risks**: including labor rights violations, unsafe working conditions, and community displacement.
- **Economic risks**: such as cost volatility, supplier bankruptcy, and unethical sourcing.

- **Operation risks:** such as production disruption; production process too complicatied; lack of production capabilities.
- **Demand risks:** Payment delay; demand fluctuations; Competitive on the market; Customers bankrupcity; Customer fragmentation.
- **Supplier risks:** Lack of green suppliers; failure to provide sustainable performance; lack of flexibility in vuca environment; price volatile; supplier bankrupcity.

Each risk category is measured using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), with items adapted from Han and Um (2024) and Giannakis and Papadopoulos (2016). For example, environmental risk items may include "Our suppliers are frequently non-compliant with environmental regulations," while social risk items may include "There is a high risk of labor exploitation in our upstream supply chain."

Confirmatory factor analysis (CFA) will be used to validate the dimensionality and reliability of these scales, ensuring internal consistency (Cronbach's alpha > 0.7) and construct validity (AVE > 0.5).

Supply chain performance is operationalized as a second-order construct comprising three dimensions:

- **Operational performance**: efficiency, lead time, and inventory turnover.
- **Sustainability performance**: environmental compliance, waste reduction, and energy efficiency.
- **Responsiveness**: ability to adapt to disruptions and meet customer demands.

Measurement items are drawn from Mollenkopf et al. (2009) and Tang and Musa (2011), using Likert scales. For example, "Our supply chain responds quickly to sustainability-related disruptions" captures responsiveness, while "Our operations consistently meet environmental standards" reflects sustainability performance.

SCRM practices are modeled as moderating variables that influence the relationship between SSCRs and supply chain performance. These include:

- **Risk avoidance** (e.g., supplier audits, certifications),
- **Risk control** (e.g., contingency planning, dual sourcing),
- **Risk sharing** (e.g., insurance, partnerships),
- **Risk acceptance** (e.g., tolerating minor disruptions).

These practices are measured using scales adapted from Tang and Musa (2011), with items such as "We regularly conduct risk assessments for sustainability issues" and "We collaborate with suppliers to manage sustainability risks."

Moderation effects will be tested using interaction terms in structural equation modeling (SEM), allowing for the assessment of how SCRM practices buffer or amplify the impact of SSCRs on performance outcomes.

3.3 Research Purpose and Questions

The central purpose of this research is to conduct an in-depth investigation into the nature, measurement, and performance implications of SSCRs within Vietnam's FMCG industry. As sustainability continues to evolve from a peripheral concern to a strategic imperative for both global and domestic firms, supply chains are increasingly exposed to a wide array of risks. These risks stem from tightening environmental regulations, rising

expectations around corporate social responsibility, and growing economic uncertainties. In emerging markets like Vietnam, these challenges are further intensified by infrastructural limitations, inconsistent regulatory enforcement, and shifting consumer awareness regarding sustainability issues (Nguyen Thi, 2021).

This study seeks to fill a critical gap in the literature by developing a validated and context-specific framework for identifying and measuring SSCRs. It also aims to assess the extent to which these risks influence supply chain performance and to evaluate the effectiveness of various supply chain risk management (SCRM) practices in mitigating their impact. Drawing on the foundational work of Giannakis and Papadopoulos (2016), SSCRs are classified into three primary dimensions: environmental, social, and economic. These categories reflect the multifaceted nature of sustainability risks and provide a structured basis for empirical analysis. Additionally, the study builds upon Tang and Musa's (2011) typology of risk mitigation strategies, which includes avoidance, control, sharing, and acceptance, to explore how firms can strategically respond to sustainability challenges.

The research is designed to generate both theoretical insights and practical recommendations for FMCG firms operating in Vietnam. By examining the interplay between risk exposure, performance outcomes, and mitigation strategies, the study contributes to a more nuanced understanding of sustainable supply chain management in emerging economies. It also provides a foundation for future research and policy development aimed at enhancing supply chain resilience and sustainability.

To achieve these objectives, the study is guided by the following research questions:

1. *What is the measurement scale of different categories of sustainability-related supply chain risks (SSCRs) in the FMCG industry?*

   This question focuses on identifying the key dimensions of SSCRs and validating them through empirical data and established theoretical models. It aims to develop a reliable and context-sensitive tool for assessing environmental, social, and economic risks within supply chains.

2. *What are the impacts of SSCRs on supply chain performance in the FMCG industry?*

   This question investigates how sustainability risks affect various aspects of supply chain performance, including operational efficiency, responsiveness, innovation capability, and compliance with environmental and social standards. It seeks to quantify the extent of these impacts and identify which risk categories are most detrimental.

3. *How do supply chain risk management practices moderate the impacts of SSCRs on supply chain performance in the FMCG industry?*

   This question evaluates the effectiveness of different mitigation strategies in reducing the negative consequences of sustainability risks. It explores whether practices such as risk avoidance, control mechanisms, collaborative risk sharing, and strategic acceptance can buffer the adverse effects and enhance overall supply chain resilience.

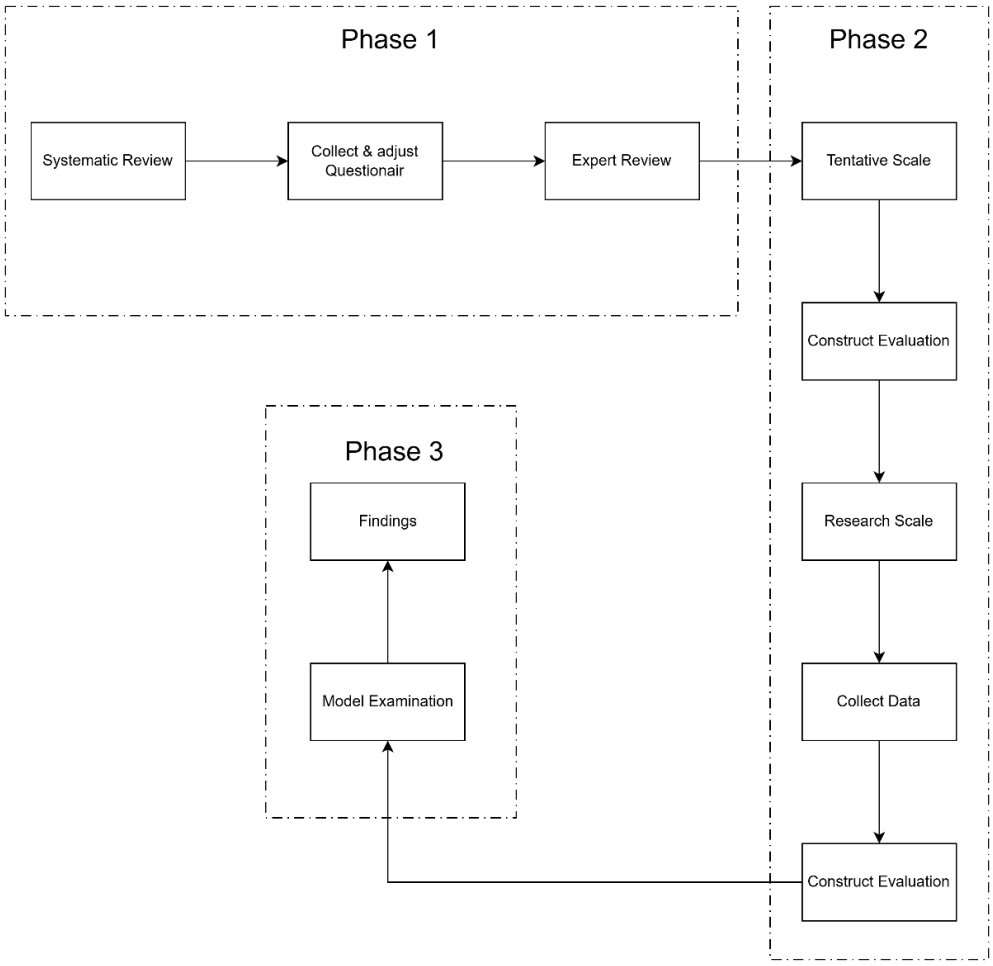
By addressing these research questions, the study aims to make a meaningful contribution to the academic discourse on sustainable supply chain management. It also

offers actionable insights for practitioners seeking to navigate the complex and evolving landscape of sustainability risks in Vietnam's FMCG sector. Ultimately, the findings will support firms in designing more resilient, responsible, and performance-driven supply chain strategies that align with both local realities and global sustainability standards.

3.4 Research Design

To find answers to three research questions, the author visualized the research process as shown in Figure 3.1. In which, I will have three stages corresponding to three different goals of the financial topics: Scale Development and Validation; Impact Assessment; and Moderation Analysis.

Figure 3.1 – Proposed Research Process



Source: by Author

Phase 1 – Scale Development and Validation:

Find a list of questions to measure SSCRs; SCP and SCRM: The topic conducts a statistical process of measuring and evaluating factors including SSCRs; SCP and SCRM. The research was statistically conducted in the period 2003 to 2024, the author focuses on studies that build questions around the topics of SSCRs; SCP and SCRM. Research works or case studies related to FMCG are carefully analyzed to find suitable questions to

measure the factors that the research needs. The process of synthesizing and building the scale is mainly based on the Likert scale.

The topic wants to use a 5-point or 7-point Likert scale to measure SSCRs; SCP and SCRM. Likert scales provide a convenient way to measure unobservable constructs, and published tutorials detailing the process of their development have been highly influential, such as Clark and Watson (1995) and Hinkin (1998) (being cited over 6,500 and 3,000 times, respectively, according to Google scholar). The next step after the process of synthesizing the questions, the topic conducts interviews with experts in the field of SC in the FMCG industry in Vietnam. This process helps the research topic to determine which questions are appropriate to the characteristics of the FMCG industry in Vietnam. The expectation of the topic is to be able to study the feasibility of groups of questions in the Vietnamese FMCG market. This contributes to the scale being compiled to be suitable, localized and easily accepted by respondents. The final result of this process is a completed Vietnamese questionnaire based on the Likert scale and responding to the issues in the FMCG industry in Vietnam.

The first phase focuses on identifying and validating the measurement scale for SSCRs. Drawing from existing literature (Giannakis & Papadopoulos, 2016; Han & Um, 2024), SSCRs are categorized into environmental, social, and economic risks. A structured questionnaire will be developed using a 5-point Likert scale to capture perceptions of risk across these categories. The instrument will be pre-tested with supply chain professionals in the FMCG sector to ensure clarity and relevance. Confirmatory factor analysis (CFA) will be conducted to assess construct validity, reliability, and dimensionality.

Phase 2 – Impact Assessment

Evaluation of the model that can express the relationship between SSCRs and SCP in the FMCG sector: After synthesizing the observation questions for use in the research, the topic will conduct preliminary sampling. The synthesized scale is uploaded to the Google Forms platform for easy distribution to respondents. The study will target supply chain managers, procurement officers, and sustainability professionals in Vietnam's FMCG industry. Data will be collected through an online survey distributed via professional networks and industry associations. The research design ensures methodological rigor and practical relevance, offering insights into how firms can enhance resilience and sustainability in their supply chains. Data collection time is from January 2025 to June 2025. The collected data will be processed by the author through Smart PLS software. It is expected that there will be a total of a models that will describe the relationship between SSCRs and SCP.

In the second phase, the validated SSCR scale will be used to evaluate the impact of these risks on supply chain performance. Performance is operationalized through three dimensions: operational efficiency, responsiveness, and sustainability outcomes (Mollenkopf et al., 2010). Structural equation modeling (SEM) will be employed to test the hypothesized relationships between SSCRs and performance metrics.

Phase 3 – Moderation Analysis

Assessing the ability of SCRM to moderate the relationship between SSCRs and SCP in the models found in the second research question: After completing the process of evaluating the model expressing the relationship between SSCRs and SCP, the topic will

proceed to investigate the moderating role of SCRM in this relationship. Specifically, the data used in step 2 will continue to be studied. Corresponding to the expected relationship models between SSCRs and SCP, the topic also expects SCRM to have a moderating role in SSCRs to SCP.

The third phase investigates the moderating role of supply chain risk management (SCRM) practices. Based on Tang and Musa's (2011) framework, SCRM strategies such as risk avoidance, control, sharing, and acceptance will be measured and tested for their ability to buffer the negative effects of SSCRs. Moderation analysis will be conducted using interaction terms within the SEM framework.

An extensive literature review of supply chain risk factors and supply chain performance measures was identified (Annex 1). Then structural interviews of academicians with the participation of eleven managers were conducted to preliminarily assess the one-dimensionality, validity, and reliability of research concepts. Hence, the questionnaire was developed and presented in Table 3.1 and Table 3.2. In total, there are 122 items are defined as related to SSCRs, dynamic supply chain risk management practices and supply chain performances.

Table 3.1: Sustainability-related supply chain risks

Main risk types	**Items**
Supply risk	Limited number of green suppliers

	Failure to select suppliers with better sustainable performance in social, environmental, and economic goals
	Suppliers' inflexibility in adapting to environmental changes
	Price volatility
	Unstable quality and quantity of input materials
	Supplier bankruptcy
	Long production time for green products/materials
Operational risk	Production disruptions
	High variability in production processes
	Insufficient production capacity during peak seasons
	Design and technology changes due to greening
	Occupational accidents
	Labor disputes
	Inability to use green fuels
	Communication failures within the project team
	Distorted information
	Information leakage

	Digital security issues
	Unclear inspection and acceptance procedures
	Failure to meet product quality standards
	Inflexibility in arranging free flow of raw materials
	Inadequate processing/maintenance/inventory/material equipment strategies
Demand risk	Inflation
	Delayed payment
	Demand variability
	Market competition
	Customer bankruptcy
	Customer fragmentation
Social risk	Hazardous working conditions
	Violations of dignity
	Mandatory overtime
	Strict regulations on settlement of layoffs
	Use of hazardous materials

	Inadequate personal protective equipment
	Unfriendly relationships between top management and workers
	Discrimination
	Use of child labor and forced labor
Environmental risk	Air pollution
	Radiation
	Noise
	Climate change
	Disease transmission
	Natural disaster
Economic risk	Exchange rate fluctuations
	Economic recession
	Labor instability
	Lack of qualified personnel
	Language and cultural differences when working with buyers
	Political instability

	War and terrorism

Source: by Author

Table 3.2 – Supply Chain Performance

Factor	**Items**
Supplier Chain Performance	Supplier response time
	Supplier reliability
	Labor productivity
	Production waste volume
	Inventory management cost
	Number of new products developed per year
	Workforce flexibility
	On-time delivery
	Customer inquiry response time
	Perfect order rate
	Product/service quality
	Perceived product value by customers
	Market share growth

	Return on investment (ROI)

Source: by Author

Throughout phase 1 of the study, the topic also synthesizes aspects to be able to measure and evaluate the SCRM system of FMCG enterprises in Vietnam. Specifically, there will be two SCRM strategic directions found a lot: Reactive Strategies and Proactive Strategies presented in Table 3.3. The list of original question was put at the Annex 1

Table 3.3 – Supply Chain Risk Management

Practices	**Items**
SUPPLY CHAIN MANAGEMENT PRACTICES	The company implements preventive measures before risks occur.
	The company implements control measures after risks occur.
	There is an official system to evaluate the performance effectiveness of suppliers.
	The company develops strategic supplier relationships.
	The company's efforts are focused on customers' needs.
	The company uses standardized design.
	The company's production processes are automated.

	The company can meet custom delivery lead times for each specific customer requirement.
	Personnel are trained to respond to risk situations.
	Senior management supports risk management programs.
	Suppliers and customers are integrated into the company's risk management process.
	The company shares information with supply-chain members to manage risk.
	The company applies information technology to mitigate risks.
	The company maintains sufficient inventory levels to minimize supply-chain disruptions.
	The supply chain has contingency plans to reroute flows in case of disruption.
	Distribution centers hold buffer stock to ensure continuity during disruptions.
	A strategic distribution center holds buffer stock to support other centers during disruptions.

	Facilities and plants maintain excess capacity to handle sudden demand spikes or disruptions.
	The company proactively avoids supply-chain risks by adjusting operations.
	The company shares risk with its supply-chain partners to improve resilience.
	There is close coordination and collaboration among stakeholders in the supply chain.
	The company actively implements emission-reduction strategies (e.g., process optimization, waste reduction)???
	The company has well-established disaster preparedness and response strategies for supply-chain disruptions.
	The company regularly assesses and monitors risks across its supply chain.
	The company has adopted Industry 4.0 technologies to improve supply-chain operations.
	Collaboration with supply-chain partners is a key part of the company's operational strategy.

	Responsibility for supply-chain risk management is shared among all stakeholders.
	The company has clear visibility into all aspects of its supply chain (inventory, supplier operations, etc.).
	The company regularly evaluates suppliers based on performance, quality, and reliability.
	The company's operational processes are flexible enough to adjust for supply-chain disruptions.
	The company's supply chain is resilient and can recover quickly after interruptions.
	The supply chain can respond to changes in demand and operational disruptions.
	The supply chain is agile, allowing rapid adaptation to unexpected situations.
	Stakeholders openly share information to improve coordination.
	Continuous quality improvement is a primary focus of the company's supply-chain operations.

	The company implements technology-driven strategies to mitigate supply-chain risks.
	The company relies on multiple suppliers to reduce disruption risks.
	The company holds safety stock to address potential supply-chain disruptions.
	The company has alternative shipping methods to ensure continuity during transport disruptions.
	The company collaborates with logistics partners to ensure flexible shipping options.
	The company uses risk-allocation strategies to distribute supply-chain risks among stakeholders.
	The company reserves capacity at its facilities to handle unexpected supply-chain challenges.
	The company's supply chain has clearly identified pathways to manage multiple potential disruptions.
	A cross-functional risk management culture is embedded in the company's approach to supply-chain operations.

Source: by Author

Based on the SCRM process approach, there are two commonly used risk prevention strategies: Reactive and Proactive. Specifically, in Reactive Strategies, managers focus on predicting possible risks and then build three main management aspects to minimize or eliminate those SCRM risks. These aspects include: Contingency planning; Disaster management; and Demand management.

For Proactive risk mitigation strategy, research projects around the world propose plans to accompany, share risks and promote mutual development between businesses and parties related to the business's supply chain. Specifically, it will include activities: Building and managing suppliers; Commitments on the supply chain; Managing processes and products; and managing relationships with suppliers. These activities demonstrate the spirit of cooperation between businesses and stakeholders. In the context of the 4.0 Industrial Revolution, research projects also propose many aspects of technology promotion thanks to which the business relationship between businesses and stakeholders on the supply chain is more effective.

3.5 Population and Sample

The population for this study comprises professionals working in Vietnam's fast-moving consumer goods industry who are directly involved in supply chain operations and sustainability-related initiatives. These individuals include supply chain managers, procurement officers, logistics coordinators, sustainability specialists, operations executives, and other roles that contribute to the strategic and operational management of supply chains. Their practical experience and decision-making authority make them ideal key informants for this research, as they possess firsthand knowledge of how sustainability-

related supply chain risks are identified, assessed, and mitigated in real-world business contexts (Giannakis & Papadopoulos, 2016).

Vietnam's FMCG sector is marked by rapid expansion, rising consumer expectations, and increasingly complex supply networks that span both domestic and international markets. This complexity is further amplified by the diversity of firms operating in the sector, which includes small and medium-sized enterprises, large local corporations, and multinational companies. These firms vary in terms of ownership structure, supply chain maturity, and product categories—ranging from food and beverages to personal care and household goods. Capturing this diversity is essential to ensure that the study reflects a wide range of sustainability challenges and risk management practices across different organizational contexts.

To ensure the relevance and depth of insight, the study will adopt a purposive sampling strategy, targeting professionals with a minimum of two years of experience in supply chain or sustainability-related roles. This criterion ensures that respondents have sufficient exposure to supply chain dynamics and sustainability pressures to provide informed and meaningful responses. The sample will be drawn from multiple sources, including professional networks, industry associations, LinkedIn groups, academic partnerships, and direct outreach to FMCG companies operating in Vietnam. This multi-channel recruitment approach enhances the representativeness of the sample and increases the likelihood of reaching qualified participants across various regions and organizational types.

The target sample size for the study is 250 respondents, which is considered appropriate for advanced statistical techniques such as structural equation modeling (SEM). SEM requires a sufficiently large sample to ensure statistical power and model stability, particularly when testing complex relationships between latent variables. In addition, confirmatory factor analysis (CFA) will be used to validate the measurement model, ensuring that the constructs used to assess SSCRs and supply chain performance are both reliable and valid. The sample size also allows for subgroup analysis based on demographic variables, such as job title, years of experience, company size, and product category, which can provide deeper insights into how different organizational contexts influence risk perception and management.

To facilitate broad participation and overcome geographic barriers, the survey will be administered online, using a secure and user-friendly platform. This mode of data collection ensures accessibility for respondents across Vietnam, including those in remote or regional locations. The survey instrument will be designed to be concise yet comprehensive, incorporating both closed-ended and scaled questions to capture quantitative data on SSCRs, performance metrics, and risk management practices.

Demographic data will be collected to support descriptive analysis and segmentation, enabling the researcher to explore patterns and differences across various respondent groups. This will enhance the generalizability of the findings and allow for more targeted recommendations based on firm size, industry segment, or role within the supply chain. Overall, the sampling strategy is designed to ensure that the study captures a

representative, analytically robust, and contextually relevant view of sustainability-related risks and supply chain risk management practices in Vietnam's dynamic FMCG sector.

3.6 Participant Selection

The selection of participants for this study is guided by the need to obtain informed insights from professionals directly involved in supply chain operations and sustainability initiatives within Vietnam's FMCG industry. Given the study's focus on SSCRs, it is essential to engage individuals who possess practical experience and decision-making authority in areas such as procurement, logistics, supply chain strategy, and corporate sustainability.

Participants will be selected using a **purposive sampling** method, which is appropriate for research that seeks to understand complex phenomena from knowledgeable informants Tang & Musa, 2011). The inclusion criteria are as follows:

- **Professional role**: Participants must hold positions such as supply chain manager, procurement officer, sustainability coordinator, or logistics executive.
- **Industry relevance**: Participants must be employed in companies operating within the FMCG sector, including food and beverage, personal care, and household products.
- **Experience level**: A minimum of two years of experience in supply chain or sustainability-related roles is required to ensure familiarity with risk management practices and sustainability challenges.
- **Geographic scope**: Participants must be based in Vietnam or work for companies with significant supply chain operations in the country.

To recruit participants, the study will leverage professional networks, industry associations, LinkedIn outreach, and referrals from FMCG firms. Invitations will include a brief overview of the study's purpose, confidentiality assurances, and a link to the online survey. Participation will be voluntary, and informed consent will be obtained prior to data collection.

This targeted approach ensures that the sample reflects the diversity and complexity of Vietnam's FMCG supply chains while maintaining the analytical rigor necessary for quantitative analysis. By focusing on experienced professionals, the study aims to generate reliable data on the measurement and impact of SSCRs and the effectiveness of supply chain risk management strategies.

3.7 Instrumentation

On the first phase, the topic conducted in-depth interviews with experts to build a structured questionnaire to measure the factors that make up the research model. The experts selected in this interview process all have a lot of experience in managing the supply system of the FCMG industry in Vietnam. In order for the interview process to be effective, the topic also built an interview script (Annex 2). The information of the interview was completely confidential and only lasted 30 minutes.

After that, thesis will conduct 2nd and 3rd phase which will use a structured questionnaire as the primary research instrument to collect quantitative data on SSCRs, supply chain performance, and SCRM practices. The questionnaire is designed based on validated scales from prior literature and adapted to the context of Vietnam's FMCG industry.

SSCRs are measured across listed dimensions: environmental, social, economic risks, and other dimension which the expert interview suggestion. Items are adapted from Giannakis and Papadopoulos (2016) and Han and Um (2024), using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Example items include:

- "Our suppliers frequently fail to meet environmental compliance standards."
- "There is a high risk of labor rights violations in our supply chain."
- "We face frequent cost fluctuations due to sustainability-related disruptions."

Supply Chain Performance is assessed using three sub-dimensions: operational efficiency, responsiveness, and sustainability outcomes. Items are adapted from Mollenkopf et al. (2009) and include:

- "Our supply chain consistently meets delivery deadlines."
- "We are able to quickly respond to sustainability-related disruptions."
- "Our operations contribute to reducing environmental impact."

SCRM practices are measured to assess their moderating effect on the relationship between SSCRs and performance. These practieces will be sellected by the expert board during the interview on the first phase.

The questionnaire will be pre-tested with a small group of supply chain professionals to ensure clarity, relevance, and reliability. Feedback will be used to refine item wording and structure. The final instrument will be administered online, and responses will be analyzed using SPSS 23 and Smart-PLS to validate constructs and test research questions.

3.8 Data Collection Procedures

This study will employ a **quantitative survey-based approach** to collect primary data from professionals working in the FMCG industry in Vietnam. The data collection process is designed to ensure reliability, validity, and ethical compliance while capturing insights into SSCRs, supply chain performance, and risk management practices.

Survey Instrument Development

The survey questionnaire will be developed based on validated scales from prior studies (Giannakis & Papadopoulos, 2016; Tang & Musa, 2011; Han & Um, 2024). It will consist of four sections:

- Demographic and organizational information
- SSCRs (environmental, social, and economic risks)
- Supply chain performance (operational, responsiveness, and sustainability outcomes)
- Supply chain risk management (SCRM) practices

All items will be measured using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The questionnaire will be pre-tested with 10–15 supply chain professionals to ensure clarity and contextual relevance. Feedback will be used to refine the instrument before full deployment.

Sampling and Distribution

Participants will be selected using purposive sampling, targeting professionals with at least two years of experience in supply chain or sustainability roles within the FMCG sector. The survey will be distributed electronically via:

- Email invitations to industry contacts
- LinkedIn and professional groups
- Collaboration with industry associations and business chambers

A cover letter will explain the study's purpose, assure confidentiality, and include informed consent. Participation will be voluntary and anonymous.

Data Collection Timeline and Tools

Data collection will be conducted over a 4–6 week period. The survey will be hosted on a secure online platform such as Google Forms, allowing for efficient data management and export for analysis. Reminders will be sent periodically to improve response rates.

The target is to collect at least **250 valid responses**, which is sufficient for structural equation modeling (Hair et al., n.d.). All data will be stored securely and used solely for academic purposes.

3.9 Data Analysis

The data collected through the structured questionnaire will be analyzed using **quantitative statistical techniques** to examine the relationships among SSCRs, SCP, and SCRM practices. The analysis will be conducted in three main stages: data screening, measurement model validation, and structural model testing.

Data Screening and Preparation

Before analysis, the dataset will be screened for missing values, outliers, and normality. Descriptive statistics will be used to summarize demographic information and provide an overview of the sample characteristics. Reliability of the scales will be assessed

using **Cronbach's alpha**, with values above 0.70 indicating acceptable internal consistency (Hair et al., 2012).

Measurement model evaluation

First of all, SPSS was employed to evaluate the scale's reliability based on the following requirements. Specifically, Cronbach's Alpha coefficient was required to be greater than 0.6. In addition, the Corrected Item - Total Correlation coefficient needed to be at least 0.3. Therefore, the observed variables that did not meet these requirements were removed.

The remaining observed variables were used for the exploratory factor analysis (EFA). According to (Hair et al., 2012), EFA was used to uncover the underlying structure of a large set of variables. Additionally, the explored structures could remain at the same values as the original set of variables. Hair also stated that researchers needed to consider several requirements to ensure that the EFA exploratory factor analysis conditions were satisfied:

- The KMO coefficient must be between 0.5 and 1.
- The Barlett test coefficient must be less than or equal to 0.5.
- The total variance extracted needed to be greater than 50% to ensure that the discovered factors could almost entirely represent the value of the old variable sets.
- The Eigen Value coefficient needed to be greater than 1.
- The factor loading of each observed variable needed to be greater than 0.5.
- Explored factors needed to satisfy both convergent and discriminant validity.

Base on the EFA result, I will re-name or re-group our dependent variables. After all, the SmartPLS was used to assess the measurement model by evaluating the outer loadings of the observed variables, the reliability assessment, the convergence validity, and the discriminant validity.

Structural model assessment

First of all, the PLS Algorithm was conducted to assess the Collinearity Statistics (VIF), the Coefficient of determination (R square) and the effect size (F square). Secondly, the data was bootstrapped to evaluate the path coefficient and test hypotheses.

Specifically, Hair et al. (2019) claimed that researchers could assess the VIF coefficients to evaluate the phenomenon of multicollinearity between independent latent variables (Hair et al., 2019). The multicollinearity could increase the confidence interval and the standard errors of some regression coefficients, which decreased the precision of the estimated coefficients. According to Hair et al. (2019), the possibility of multicollinearity was very high if VIF coefficients were higher than 5. Additionally, multicollinearity could exist if VIF coefficients were between 3 and 5. By contrast, if VIF coefficients were lower than 3, the multicollinearity did not exist.

Secondly, Henseler et al. (2009) stated that researchers could measure R square to evaluate the Coefficient of determination (Henseler et al., 2009). According to Henseler et al. (2019), the R square represented the proportion that the independent variables could explain the variance of the dependent variables (Henseler et al., 2009).

Thirdly, the F square was evaluated to assess the correlation between independent and dependent variables (Cohen, 1988). According to Cohen (1988), the independent

variables had almost no effect on the dependent variables if the F square was less than 0.02. If the f square was between 0.02 and 0.15, the impact of independent variables on the dependent was small. If the f square was between 0.15 and 0.35, the effect of independent variables on dependent variables was considered medium. Finally, if the F square was higher than 0.35, the impact of independent variables on the dependent variable was considered high (Cohen, 1988).

Additionally, the data was bootstrapped with the SmartPLS tool to evaluate the path coefficient and test hypotheses. According to Hair et al. (2014), the path coefficient and hypotheses were assessed based on two primary index columns consisting of the Original sample and P-values columns. Specifically, a hypothesis was adopted if its p-value did not exceed 0.5. Then, the interaction between the independent, intermediate, and dependent variables was concluded based on the accepted hypotheses.

3.10 Research Design Limitations

While this study is designed to provide valuable insights into SSCRs and risk management practices in Vietnam's FMCG industry, several limitations must be acknowledged that may affect the generalizability and interpretation of the findings.

Sampling Method and Generalizability

The use of purposive sampling, while appropriate for targeting knowledgeable professionals, limits the generalizability of the results. Participants are selected based on their roles and experience, which may introduce selection bias. As a result, the findings may not fully represent the perspectives of all stakeholders in the FMCG supply chain,

particularly those in smaller firms or informal sectors that are underrepresented in formal networks (Tang & Musa, 2011).

Self-Reported Data

The study relies on self-reported data collected through an online questionnaire. This approach is subject to common method bias, including social desirability bias and recall bias, which may affect the accuracy of responses (Podsakoff et al., 2003). Although anonymity and confidentiality are assured, participants may still overstate their organization's sustainability practices or underreport risks.

Cross-Sectional Design

The research adopts a cross-sectional design, capturing data at a single point in time. This limits the ability to infer causality between SSCRs, supply chain performance, and risk management practices. Longitudinal studies would be more effective in capturing the dynamic nature of supply chain risks and the evolving impact of mitigation strategies (Giannakis & Papadopoulos, 2016).

Contextual Constraints

The study is context-specific to Vietnam's FMCG industry. While this focus enhances relevance and depth, it may limit the applicability of findings to other industries or geographic regions. Cultural, regulatory, and economic differences may influence how sustainability risks are perceived and managed in other contexts.

Measurement Limitations

Although the study uses validated scales from prior research, the adaptation of these instruments to the Vietnamese context may introduce measurement error. Despite pre-

testing and expert review, some items may not fully capture local nuances or emerging sustainability challenges unique to the region (Han & Um, 2024).

3.11 Conclusion

This chapter has presented a detailed overview of the methodological framework employed to investigate the measurement, impact, and mitigation of sustainability-related supply chain risks (SSCRs) in Vietnam's fast-moving consumer goods (FMCG) industry. Given the complexity and multidimensional nature of SSCRs, a quantitative research design was selected to ensure objectivity, replicability, and analytical rigor. This approach allows for the systematic collection and analysis of data from a broad sample of supply chain professionals, providing statistically valid insights into how sustainability risks are perceived and managed in practice.

The research design is structured into three sequential phases to address the study's core objectives. The first phase involves the development and psychometric validation of a measurement scale for SSCRs, capturing environmental, social, and economic dimensions. This scale is grounded in established constructs from prior literature, including the works of Giannakis & Papadopoulos (2016) and Tang & Musa (2011), and adapted to reflect the specific characteristics of Vietnam's FMCG supply chains. The second phase assesses the impact of SSCRs on supply chain performance, focusing on key indicators such as delivery reliability, cost efficiency, product innovation, and customer satisfaction. The third phase evaluates the moderating role of supply chain risk management (SCRM) practices, identifying which strategies most effectively buffer the negative effects of sustainability risks.

To ensure the relevance and expertise of the data collected, purposive sampling will be used to select participants with direct experience in supply chain operations and sustainability management. Data will be gathered through a structured online survey, designed to be both accessible and comprehensive. A target sample size of 250 respondents has been set, which is appropriate for conducting structural equation modeling (SEM)—a robust statistical technique that enables the testing of complex relationships between latent variables. Confirmatory factor analysis (CFA) will be employed to validate the measurement model, ensuring that the constructs used are both reliable and valid. SEM will then be used to assess both the direct effects of SSCRs on performance and the moderating effects of SCRM practices.

While the methodology is designed to be rigorous and comprehensive, several limitations are acknowledged. These include the reliance on self-reported data, which may be subject to bias; the cross-sectional nature of the study, which limits the ability to observe changes over time; and the contextual specificity to Vietnam's FMCG sector, which may affect the generalizability of findings to other industries or regions. To mitigate these limitations, the research instruments will undergo pre-testing and refinement, and findings will be reported with full transparency regarding methodological constraints.

Despite these limitations, the chosen methodology provides a solid foundation for addressing the research questions and achieving the study's objectives. It enables a nuanced and empirically grounded understanding of how sustainability risks are perceived, measured, and managed in one of Southeast Asia's most dynamic consumer markets. The insights generated from this study will contribute to both academic literature and

managerial practice, offering a validated framework for SSCR assessment and a strategic guide for integrating sustainability into supply chain risk management.

CHAPTER IV – RESULTS

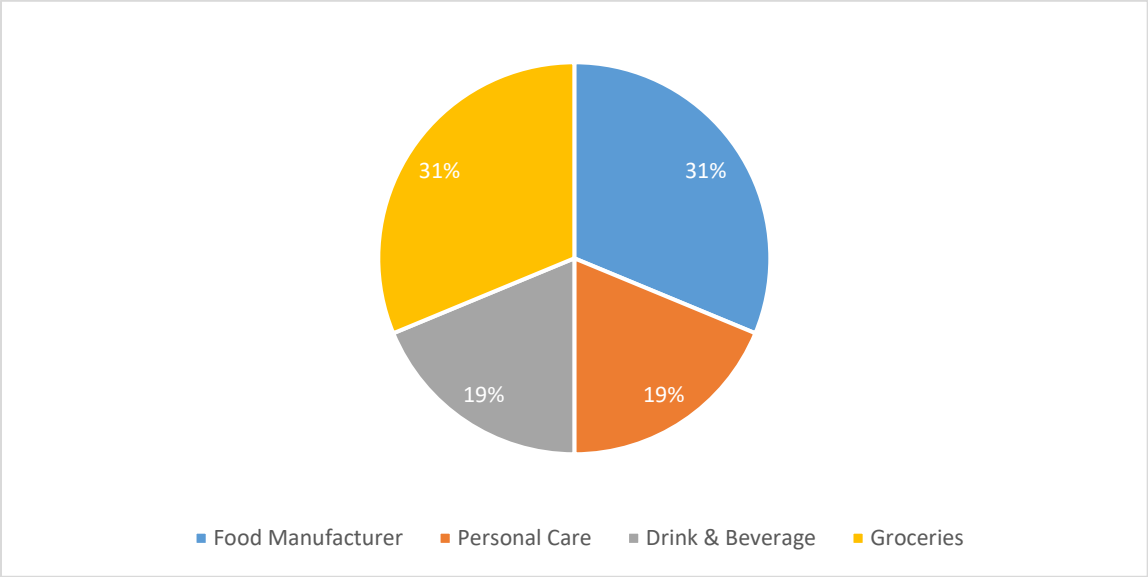
Chapter 4 consists of three main sections. The first section includes the results from the preliminary study and interview result. Based on these results, the author conducts some adjustments to improve the quality of the research scales. The second section presents the assessment and results from the formal quantitative study. Specifically, descriptive statistics are conducted to describe the features of demographic data and observed variables. Additionally, this section consists of the results from cronbach's alpha test, exploratory factor analysis, the evaluation of the measurement model, and the structural model assessment. The third section presents the moderator effect of SCM practicese to SSCRs and SCP.

4.1 Phase 1 – Scale development

The preliminary questionnaire is presented in the Appendix 1 with 64 questions to help evaluate SSCRs; 44 questions to evaluate SCRM practices and 14 questions to evaluate the performance of the SC system in FMCG companies in Vietnam. On the 2nd of June 2025, the interview were conducted in-depth interviews with 16 experts which described in the figure 4.1. Experts are leader of 16 companies from 4 industrial: Food manufacture; Personal care manufactures; Drink and Beverage manufacture; and Groceries retail. The one-on-one interviews were conducted in the spirit of confidentiality and for scientific research purposes. The structure of the interview script is presented at Appendix 2. The experts gave comments on the topic's questionnaire revolving around the following

aspects: The suitability of the questions for FMCG companies in Vietnam; the level of understanding of the questions.

Figure 4.1 – Distribution of expert portfolio by field



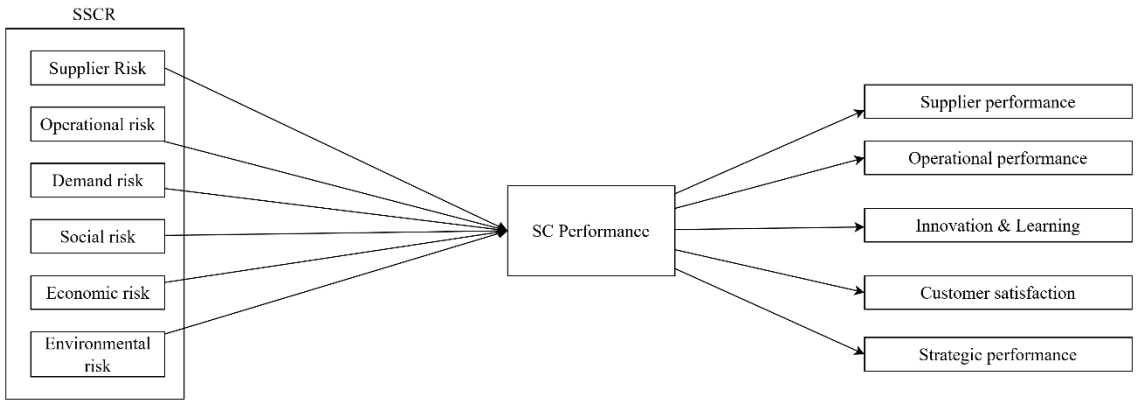
Source: by Author

After the expert interview process, the 57-question SSCRs questionnaire was refined to 43 questions in 6 risk groups: Supplier Risk, Operational risk, Demand risk, Social risk, Economic risk, and Environmental risk. For the SCP assessment questions, the experts agreed to keep the 14 proposed questions in 5 observation aspects: Supplier performance; Operational performance; Innovation and learning; Customer satisfaction; and Strategic performance. For the questions related to SCRM, the experts kept 6 practices: prevent; improve; info sharing; technology; supplier supported; inventory back-up; and risk management culture.

The proposed model for the first and second Research Question in our research will be SSCRs (in 6 groups) effect to SCP. Included 43 questions in 6 risk groups: Supplier

Risk, Operational risk, Demand risk, Social risk, Economic risk, and Environmental risk. For the SCP, I will observe on 14 questions in 5 aspects: Supplier performance; Operational performance; Innovation and learning; Customer satisfaction; and Strategic performance. The propose model was showed on figure 4.2

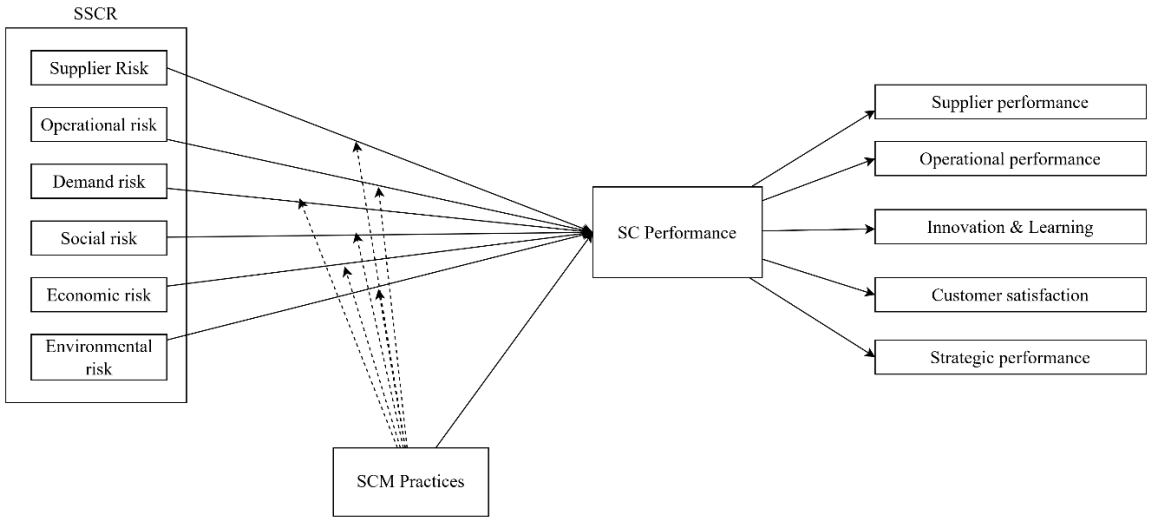
Figure 4.2: The proposed model for 1st and 2nd RQ



Source: by Author

For the 3rd research questions, the thesis propose the model with both effect directly from SCRM practices to SCP and moderate effect of SCRM between SSCRs and SCP. The expert provided 7 aspect of supply chain management pactices included: **Prevention activities; improvement activities; information sharing activities; technology application activities; supplier diversity activities; inventory increase activities; and risk prevention culture building activities**. The model for 3rd RQ was showed on figure 4.3

Figure 4.3: The proposed model for 3rd RQ



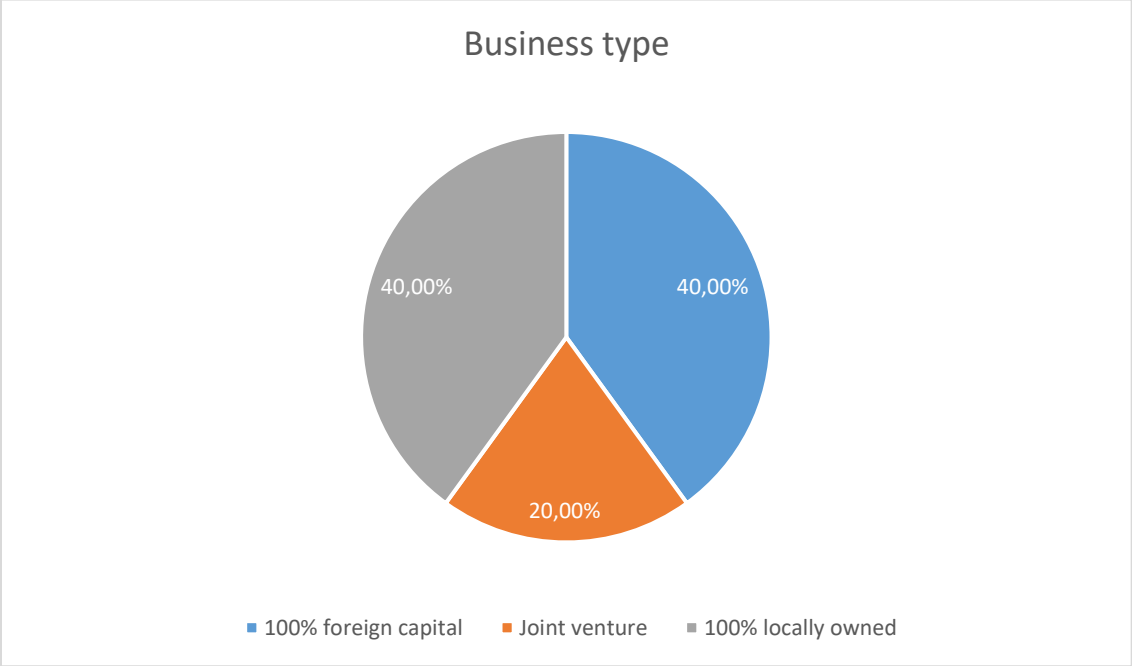
Source: by Author

4.2 Phase 2 - Impact Assessment

The data collected through the structured questionnaire analyzed using **quantitative statistical techniques** to examine the relationships among SSCRs, supply chain performance, and SCRM practices. The analysis will be conducted in three main stages: data screening, measurement model validation, and structural model testing.

There are a total of 275 valid interview questionnaires, the respondents are officers who are performing the role of Supply System Manager of FMCG companies in Vietnam. Using Excel tool, the topic to calculate descriptive indicators for the survey group in Vietnam as shown in the figure 4.4; figure 4.5; and figure 4.6. In which, the distribution rate of business type is equal among three types of businesses: domestic capital (accounting for 40%); foreign investment capital (40%) and equitization (20%).

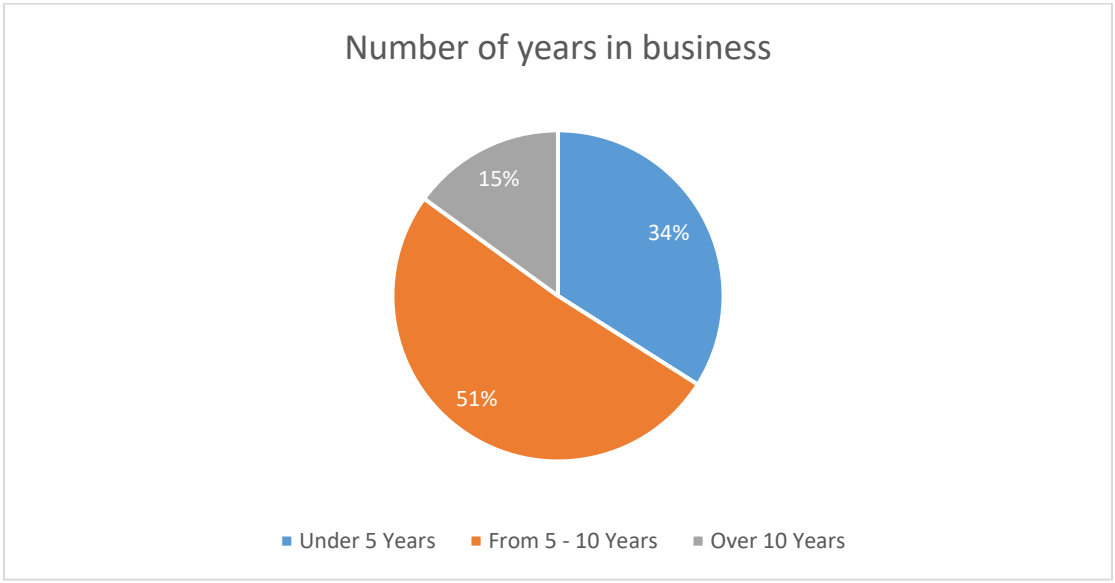
Figure 4.4: Business type



Source: by Author

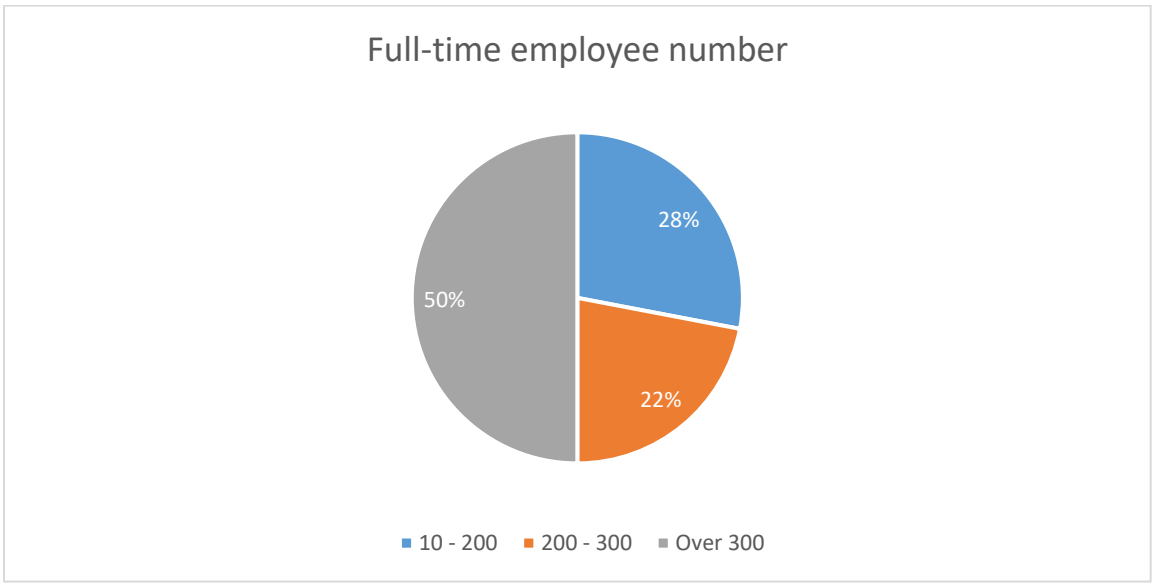
Most of the companies participating in the study have been in operation for more than 5 years, with a large number of businesses having been in operation for 5 to 10 years. Most FMCG businesses in Vietnam after 5 years of operation will have a lower bankruptcy rate and are more sustainable in the market. Due to the characteristics of the FMCG industry, which requires abundant human resources for production, the businesses participating in the survey all have a human resource of over 200 people. Regarding the allocation of charter capital, the businesses participating in the survey are allocated a charter capital of less than 50 billion VND. This is consistent with the description of businesses with an average operating time of 5 to 10 years. Most FMCG businesses in Vietnam sell to consumers.

Figure 4.5: Number of Years in Business



Source: by Author

Figure 4.6: Full-time emplyee number of research business



Source: by Author

Evaluation of the scale model:

After collecting data, the topic proceeds to filter the collected data (eliminate answers with missing content). Next, the topic uses SPSS software to evaluate the scale model. The reason for performing this process using SPSS software for the scale model evaluation process is because the testing models are in the form of simple linear regression. Here, the topic investigates the relationship between each group of SSCRs affecting SCP with the purpose of SPSS helping the topic to be flexible in streamlining the survey questions and grouping the questions according to different research models.

Reliability of the scale:

Before analysis, the data were coded according to the groups SSCRs; SCP; and SCRM. The coding table is presented in the appendix … including the risk groups: Supplier Risk (SR); Operation Risk (OR); Demand Risk (DR); Social Risk (SOR); Economic Risk (ER); and Evironment Risk (EVR). For Supply Chain Performance, I will code as SCP. For Supply Chain Management Practices, the topic will be coded as SCRM.

Reliability of the scales will be assessed using **Cronbach's alpha**, with values above 0.70 indicating acceptable internal consistency (Hair et al., 2010). Cronbach's alpha results of the factors range from 0.849 to 0.945 which showed in table 4.1. This proves that the proposed scale of the topic has high reliability.

Table 4.1: Cronbach's Alpha analysis result

Factors	Cronbach's Alpha
Supplier Risk	0,849
Operation Risk	0,915
Demand Risk	0,870
Social Risk	0,944
Economic Risk	0,880
Evironment Risk	0,911
Supply Chain Performance	0,930
Supply Chain Management Practices	0,854

Source: by Author

Exploratory factor analysis – EFA:

The research topic aims to find a suitable model to evaluate the relationship between SSCRs; SCP; and SCRM, so EFA evaluation is necessary. EFA evaluation helps the topic eliminate duplicate questions; obscure observation questions and group influencing factors. The EFA evaluation process is performed on SPSS software, the data is presented in the Appendix 5

The topic conducted a total of two exploratory factor analyses, the first EFA analysis results in KMO 0.949 and Bartlett's test showed sig = 0.000 < 0.05. The total

variance extracted from the first exploratory factor assessment was 69.660%, satisfying the requirements for explaining the research model. There were a total of 6 groups of factors of SSCRs affecting SCRM. However, questions SR4 and OR2 did not show loading factors >0.5, so they were eliminated. The topic continued to conduct EFA for the second time, at this time KMO reached 0.948 and Bartlett's test showed sig = 0.000 < 0.05, meeting the requirements. The variance extracted from the second analysis resulted in an explanation of up to 70.491%. The questions of SSCRs were divided into 6 groups, presented in the table 4.2

Table 4.2 – EFA result of Sustainability Supply Chain Risks

Question	Group	Coded
1. Limited number of green suppliers	Supplier Risk	SR1
2. Failure to select suppliers with better sustainable performance in social, environmental, and economic goals		SR2
3. Suppliers' inflexibility in adapting to environmental changes		SR3
8. Production disruptions	Demand Risk	DR1
23. Inflation		DR2
24. Payment delays		DR3
25. Demand fluctuations		DR1
26. Market competition		DR2

27. Customer bankruptcy		DR3
10. Insufficient production capacity during peak seasons	Operation Risk	OR1
11. Design and technology changes due to greening		OR2
12. Occupational accidents		OR3
13. Labor disputes		OR4
14. Inability to use green fuels		OR5
15. Communication failures within the project team		OR6
16. Distorted information		OR7
36. Dangerous working conditions	Social Risk	SOR1
37. Violations of human dignity		SOR2
38.Mandatory overtime		SOR2
39. Strict regulations on termination procedures		SOR1
40. Use of hazardous materials		SOR2
41. Inadequate personal protective equipment (PPE)		SOR2
42. Unfriendly relationships between senior management and employees		SOR1
43. Workplace discrimination		SOR2

44. Child labor and forced labor		SOR2
45. Exchange rate fluctuations	Economic Risk	ER1
46. Economic recession		ER2
47. Labor instability		ER3
48. Lack of qualified personnel	Environment Risk	EVR1
49. Language and cultural differences when working with buyers		EVR2
50. Political instability		EVR3
52. Strikes and incidents related to natural disasters, fires, etc.		EVR4
53. Epidemics (e.g. Covid-19)		EVR5
54. Air pollution		EVR6
55. Radiation exposure		EVR7
56. Noise pollution		EVR8
57. Climate change		EVR9

Source: by Author

Evaluate strucure model:

To evaluate the structural model of the correlation between SSCRs and SCP, the topic used Smart-PLS software version 3.0 to evaluate the SEM model. Because the sample

size collected was 275 answers, the topic proposed to use Smart-PLS instead of continuing with SPSS.

The results of the reliability assessment of the structural model show R square adjusted = 0.382 showed in table 4.3. The F square coefficient shows in table 4.4 prove there is an impact of the factors Supplier Risk; Demand Risk; and Economy Risk on SCP. While the factors Operation Risk; Social Risk; and Geopolitical Risk have no impact on SCP.

Table 4.3: R square of the 1st model

	R Square
SCP	0,395

Source: by Author

Table 4.4: F square of the 1st model

Factors	**F square SCP**
Supplier Risk	0,030
Demand Risk	0,037
Operation Risk	**0,005**
Social Risk	**0,007**
Economic Risk	0,077

Evironment Risk	**0,000**

Source: by Author

The Construct Reliability and Validity assessment results obtained were consistent, including Cronbach's alpha greater than 0.7; CR coefficient greater than 0.9; and Average Variance Extracted (AVE) greater than 0.5. At the same time, the Discriminant Validity and Collinearity Statistics (VIF) results were consistent (table 4.5).

Table 4.5: The Construct Reliability and Validity assessment

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Supplier Risk	**0,855**	**0,856**	**0,912**	**0,775**
Demand Risk	**0,879**	**0,884**	**0,909**	**0,624**
Operation Risk	**0,914**	**0,921**	**0,931**	**0,660**
Social Risk	**0,945**	**0,947**	**0,953**	**0,694**
Economic Risk	**0,814**	**0,849**	**0,889**	**0,727**
Evironment Risk	**0,936**	**0,937**	**0,946**	**0,662**
SCP	**0,930**	**0,931**	**0,939**	**0,525**

Source: by Author

The topic proceeds to eliminate groups of factors that have no impact on SCP and continues to conduct Boost-Straping analysis with a coefficient of 5,000 times. The verification results show on the table 4.6 presented three groups of factors Supplier Risk; Demand Risk; and Economy Risk have an impact on SCP of enterprises (p values are all <0.05). Specifically, these impacts have beta coefficients according to Supplier Risk (beta = -0.183); Demand Risk (beta = -0.238); and Economy Risk (beta = -0.317). This shows that all three risk groups have a negative impact on the operational efficiency of the Supply Chain system in the FMCG sector.

Table 4.6: Boost-strapping result on 1st model

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Supplier Risk -> SCP	-0,183	-0,184	0,068	2,681	**0,007**
Demend Risk -> SCP	-0,238	-0,246	0,116	2,052	**0,040**
Economic Risk -> SCP	-0,317	-0,318	0,099	3,219	**0,001**

Source: by Author

4.3 Phase 3 – Moderation Analysis

Next, the author also evaluated the second model with the participation of SCRM. The initial research objective was to determine the moderating role of SCRM on the relationship between SSCRs and SCP. Based on the model that was evaluated for suitability in Phase 2, the topic continued to include SCRM data for analysis.

In this Phase, the topic uses Smart-PLS software to evaluate both the reliability of the scale and the structural model. The results obtained increased R square adjusted to 0.567; F square results in turn include: Supplier Risk (0.017) - no impact; Demand Risk (0.022) - impact; Economy Risk (0.066) - impact; and SCRM (0.272) - strong impact (table 4.7).

Table 4.7: R square of the 2nd model

	R Square
SCP	0,567

Source: by Author

The study also evaluates the moderating role of SCRM factor on the relationship between SSCRs and SCP. In which, the table 4.8 showed F square of SCRM moderating role with the relationship between Supplier Risk and SCP has a value of 0.001 - no moderating role. As for the relationship between Demand Risk and Economy Risk, SCRM has a moderating role with F square of 0.093 and 0.022 respectively.

Table 4.8: F square of the 2nd model

Factors	**F square SCP**
Supplier Risk	**0,017**
Demand Risk	0,022
Economic Risk	0,066
Moderating Effect Supplier Risk	**0,001**
Moderating Effect Demand Risk	0,093
Moderating Effect Economic Risk	0,022

SCRM	**0,272**

Source: by Author

In order to better understand this moderating role, the study conducted Boost-strapping with a factor of 5,000 times to evaluate the moderating role of SCRM. The results obtained had coefficient p values rejecting the impact of Supplier Risk; and Demand Risk on SCP. However, the moderating role of SCRM on the relationship between Economy Risk and SCP was also rejected with p values = 0.253.

Table 4.9: Boost-strapping result on 2nd model

	Original Sample (O)	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**T Statistics (|O/STDEV|)**	**P Values**
SR -> SCP	-0,112	-0,110	0,061	1,825	**0,068**
DR -> SCP	-0,150	-0,164	0,076	1,982	**0,048**
ER -> SCP	-0,225	-0,220	0,073	3,085	**0,002**
Moderating Effect SR -> SCP	-0,029	-0,029	0,066	0,441	**0,659**
Moderating Effect DR -> SCP	0,267	0,238	0,105	2,550	**0,011**

Moderating Effect ER -> SCP	-0,109	-0,095	0,096	1,132	**0,257**
SCRM -> SCP	0,420	0,427	0,063	6,683	**0,000**

Source: by Author

Therefore, through Phase 3, the study determined that SCRM does not have a moderating role on the relationship between SSCRs and SCP. Moreover, SCRM has a significant positive impact on SCP.

4.4 Summary of Findings

The research design is structured into three sequential phases to address the study's core objectives. The first phase involves the development and psychometric validation of a measurement scale for SSCRs, capturing environmental, social, and economic dimensions. This scale is grounded in established constructs from prior literature, including the works of Giannakis & Papadopoulos (2016) and Tang & Musa (2011), and adapted to reflect the specific characteristics of Vietnam's FMCG supply chains. In addition, the topic also synthesized aspects of SCRM practices to answer the third research question. Through the expert interview process, the topic reduced the number of SSCRs observation questions from 57 questions to 40 observation questions. At the same time, the SCRM practices were also reduced by experts to 7 observation questions including: **Prevention activities; improvement activities; information sharing activities; technology application activities; supplier diversity activities; inventory increase activities; and risk prevention culture building activities**.

The second phase assesses the impact of SSCRs on supply chain performance, focusing on key indicators such as delivery reliability, cost efficiency, product innovation, and customer satisfaction. The results obtained in the second phase show that there are 3 groups of SSCRs that have impacts on SCP of FMCG enterprises in Vietnam. All three impacts are negative impacts, including Supplier Risk; Demand Risk; and Economy Risk.

The third phase evaluates the moderating role of supply chain risk management (SCRM) practices, identifying SCRM ability for recover the negative effects of sustainability risks. The results obtained show that SCRM does not have a moderating role in the negative impact of SSCRs on SCP. Moreover, the study collected the positive impact of SCRM on SCP of FMCG enterprises in Vietnam.

4.5 Conclusion

Despite these limitations, the chosen methodology provides a solid foundation for addressing the research questions and achieving the study's objectives. It enables a nuanced and empirically grounded understanding of how sustainability risks are perceived, measured, and managed in one of Southeast Asia's most dynamic consumer markets. The insights generated from this study will contribute to both academic literature and managerial practice, offering a validated framework for SSCR assessment and a strategic guide for integrating sustainability into supply chain risk management

CHAPTER V – DISCUSSION

This research is structured into three sequential phases which answered relevent research question. Phase 1 involved developing and psychometrically validating a measurement scale for Sustainable Supply Chain Risks (SSCRs), which was adapted for Vietnam's FMCG supply chains. Expert interviews reduced the SSCR observation questions from 57 to 40, and the Supply Chain Risk Management (SCRM) practices were reduced to 7 activities (including prevention, information sharing, and technology application). Phase 2 assessed the impact of SSCRs on Supply Chain Performance (SCP), finding that three SSCR groups (Supplier Risk, Demand Risk, and Economy Risk) all have negative impacts on SCP. Phase 3 evaluated the moderating role of SCRM practices in mitigating the negative SSCR-SCP relationship, but the results indicated that SCRM does not have a moderating role. However, the study did find evidence of a positive direct impact of SCRM on the SCP of FMCG enterprises in Vietnam.

5.1 The first Research Question – Develop research scale

Through the research process, the SSCRs measure the synthesis of the topic; SCP and SCRM in Vietnamese FMCG enterprises. Vietnam is a country with a very fast growth rate in Southeast Asia. Vietnamese FMCG enterprises are extremely dynamic, creative and adapt quickly to world trends. With the United Nations established the Sustainable Development Goals (SDGs) in 2015 to guide the global and local towards creating a peaceful world, free of major social problems, and at the same time providing sustainability

(Amoako et al., 2022). Enterprises in Vietnam have quickly started and transformed to suit the new world trends. Especially with the support from domestic consumers and the Vietnamese government, FMCG enterprises have benefited greatly in sustainable development.

The fast-moving consumer goods (FMCG) industry, characterized by high sales volumes and rapid consumption cycles, is facing intense scrutiny regarding its environmental footprint (Hossain et al., 2024). Especially in emerging markets like Vietnam, FMCG products represent a critical intersection between economic development and environmental sustainability, where the growing purchasing power of consumers creates pressure to develop supply chain systems with increasingly negative environmental impacts from packaging, transportation, and handling of fast-moving consumer goods (A. Sharma & Foropon, 2019). Not only is it a burden on the environment, but an unsustainable supply chain system also poses many risks of disruption and material loss, as in the recent Covid-19 pandemic. Therefore, transforming the supply chain to a sustainable development system is a vital factor for Vietnamese FMCG businesses.

As a fast-growing and constantly improving industry, Vietnamese FMCG businesses have been racing to apply sustainable technologies and operational strategies. This meets the needs of a sustainable supply system but contains many overall risks for the business. A supply system can hardly be sustainable if it lacks efficiency and eliminates potential risks.

Due to the urgent nature of the transformation process, systematic studies to find a suitable scale to assess the risks when using sustainable supply chains are still lacking.

Moreover, the assessment of an effective sustainable supply system is still open and has not been systematically studied in Vietnam. Therefore, the topic has set the first objective and research question to find a suitable scale to assess SSCRs and SCPs of FMCG enterprises in Vietnam.

Research results of the first research question:

Through the process of theoretical synthesis, the research topic has synthesized questions to assess the risks of the sustainable supply system of the FMCG industry in Vietnam. These questions revolve around 3 aspects: Economic risks; social risks; and environmental risks. The topic conducts one-on-one interviews with leading experts in the field of sustainable supply chain management in the FMCG industry in Vietnam. The results obtained from this in-depth interview process have many new points when the experts propose to separate the risks of sustainable supply chains into 6 groups. Specifically, the experts propose to separate the risks related to the supply chain operation process; risks from suppliers; risks from market demand from the economic risk group. At the same time, the experts suggest that economic risks must originate from the macroeconomic aspect (including economic factors outside the enterprise).

The expert interview results also helped improve the questions for assessing the effectiveness of the supply chain system. By editing the semantics of the questions, the questionnaire was made easier to understand for respondents from the FCMG industry in Vietnam. The expert interview process also pointed out that there are 6 risk prevention activities in the application and operation of the Sustainable Supply Chain: prevent;

improve; info sharing; technology; supplier support; inventory back-up; and risk management culture.

5.2 The second Research Question – Assessing the impact of SSCRs on SCP:

Based on the results of data analysis, the research obtained 3 groups of risk factors that have both negative impacts on the performance of the supply chain in the FMCG industry in Vietnam.

Risks from macro-economic factors outside the business:

Leading among these risks is the group of risks from macroeconomic factors outside the enterprise with a beta coefficient of -0.317. Specifically, risks related to changes in exchange rates, economic recession, and fluctuations in the labor market.

In a deeper analysis, Vietnam is an FMCG production market that mainly serves the domestic market, which is an immature market (Bao et al., 2021). With such a market nature, Vietnamese FMCG manufacturers always have headaches with factors such as product prices; promotional programs and especially fluctuations in customers' income. Because of the specific nature of the market, businesses are willing to cut costs in their operations to ensure an advantage in the market.

The application of innovations to shift from traditional supply chain systems to sustainable and environmentally friendly ones will create additional costs in the production process of enterprises. Therefore, risks that directly affect the costs of Vietnamese FMCG enterprises easily affect the efficiency of general operations and supply chain activities of enterprises. Risks related to economic recession and fluctuations in the labor market not only directly affect the cash flow of enterprises but also indirectly affect the purchasing

power of customers in the market. Therefore, when incidents or crises occur in these aspects, the sustainable supply chain system of Vietnamese FMCG enterprises will certainly be strongly affected.

In addition, Vietnamese FMCG enterprises depend heavily on third-party supply service providers. Most of the supply chain service providers in Vietnam come from developed countries in the world such as the US, Germany, Australia, Japan, etc. Because of the dependence on third-party suppliers from countries with currency values much higher than the Vietnamese Dong, Vietnamese FMCG enterprises face many difficulties when facing changes in exchange rates. When the exchange rate changes, the costs of using third-party supply services will skyrocket, which creates many difficulties in the process of ensuring a sustainable and effective supply chain.

Risks from customer demand factors:

The analysis results of the topic show that the group of risk factors related to customer demand in the FMCG sector in Vietnam has a negative impact on the efficiency of sustainable supply chains (beta coefficient = -0.238). Specifically, these risks are related to: competitive market; bankrupt customers; changing customer demand; late payment; rising inflation; and interrupted ordering process.

As noted in Bao et al. (2021) study, the FMCG market in Vietnam is highly sensitive to price factors. This explains why sustainable supply chains are easily undermined when risks related to fluctuations in customer demand increase. Typically, during the Covid-19 pandemic, FMCG customers experienced a new shopping model, which is online shopping. This process created a mindset of saving money through online channels in the minds of

consumers. Worse, customers have higher expectations regarding delivery time; the value of promotional programs and the quality of goods supply services. In fact, this electronic process creates an additional burden on the supply chain of FMCG companies. Businesses have to invest more to have a supply chain that operates faster, more efficiently but at a lower cost. This explains the results from the data collected in the study: at the current stage, businesses are struggling to balance the efficiency of sustainable supply chains with the risks from customer demands.

Risks from suppliers

Finally, the group of risk factors from suppliers has a negative impact on the efficiency of sustainable supply chains (beta coefficient = -0.183). Specifically, there are three risks in this group including: The number of clean and green suppliers in Vietnam is limited; Choosing the wrong sustainable supplier; and the supplier lacks flexibility to adapt to market changes.

Firms rely on the supply chain network to comply with sustainable requirements as well as achieving the economic benefits, environmental, and social impacts to meet the demands from customers, governments, and society (Silvestre et al.,87 2018). However, the number of companies producing and providing services related to sustainable supply chains in Vietnam is still very limited. These units are mainly large corporations from developed countries that have long had sustainable policies, strategies, and cultures. In the context of Vietnamese FMCG companies needing to effectively use supply chain operating costs. This makes the relationship between manufacturing enterprises and supply chain service providers tense and in some cases, antagonistic. Shou et al. (2019) argued that for

a supply chain to develop sustainably, manufacturing companies and supply chain partners also need to pay attention to environmental responsibility; social and economic benefits for each other. This is a mutual motivation to connect FMCG enterprises with sustainable supply chain service providers in Vietnam. For that reason, the risk in choosing sustainable supply chain providers in Vietnam becomes a negative factor affecting the efficiency of sustainable supply chain operations in Vietnam.

5.3 The third Research Question – Assessing the mediating role of SCM practices on the impact between SSCRs and SCP:

In the third phase of the study, the author conducted an evaluation of the mediating role of SCM practices on the relationship between SSCRs and SCP. However, the results of the data rejected this hypothesis. Specifically, the data collected in the Vietnamese FMCG industry showed that SCM does not have a mediating role in coordinating the relationship between SSCRs and SCP. The practices proposed by the expert group include: Prevention activities; improvement activities; information sharing activities; technology application activities; supplier diversity activities; inventory increase activities; and risk prevention culture building activities. The proposed risk prevention strategies in supply chain management do not show a moderating role in the negative impact between SSCRs and SCP. This is in contrast to previous studies in the world by: Waqas et al. (2022); Frank et al. (2015); Hoffmann et al. (2013).

The data analysis results also show that the proposed risk prevention strategies have a positive impact on the efficiency of the supply chain. Specifically, the results of the booststraping run of the proposed model show that the Sample Mean is 0.427 with p Value

= 0.000. This result is supported by the study of Wieland et al. (2012). In this study, the authors evaluated the impact of SCM practices on SCP through the agility and sustainability of the supply chain system.

5.4 Conclution

The research topic synthesizes a scale to serve the process of assessing risks from sustainable supply chains in the FMCG sector in Vietnam. Through the process of studying previous studies and interviewing experts in the FMCG industry, the measurement questionnaire was refined and optimized to suit the research subjects in Vietnam. The results calculated from 275 survey questionnaires identified three groups of risk factors that negatively impact the efficiency of sustainable supply chains in FMCG enterprises in Vietnam. These are risks related to the external macro economy; risks from customer demand, and risks from suppliers. These results are consistent with the characteristics of the FMCG industry in Vietnam - an immature market, greatly influenced by prices; promotional factors and customer shopping experiences. Vietnamese FMCG enterprises are under pressure to meet higher expectations from customers; to share benefits with sustainable suppliers; and to survive in a fiercely competitive market. Finally, the study also evaluates and rejects the moderating role of risk prevention strategies in supply chain management in Vietnam on the negative impact of risk on supply chain performance. The proposed risk prevention strategies have a direct impact on supply chain performance in the FMCG industry in Vietnam.

CHAPTER VI – SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

6.1 Summary

This research was conducted in three phases, aiming to develop a measurement scale for Sustainable Supply Chain Risks (SSCRs) and evaluate their impact on Supply Chain Performance (SCP) in the Vietnamese FMCG industry. The results found that three groups of SSCRs—Macro-economic Risks, Customer Demand Risks, and Supplier Risks—all have a negative impact on SCP. This finding aligns with the characteristics of the Vietnamese market, which is considered immature and highly sensitive to price. Finally, the study rejected the moderating role of Supply Chain Risk Management (SCRM) practices on the negative relationship between SSCRs and SCP. However, the SCRM strategies were proven to have a positive direct impact on SCP.

6.2 Implications

The research topic has helped to synthesize and find many new aspects in risk measurement work to develop a strong supply chain; evaluate the effective results of a strong hardware Supply Chain and evaluate the price of failure prevention strategies in the chain results.

Firstly, the topic has compiled a questionnaire to help measure different aspects of risk in the process of developing a sustainable supply chain. These questions have been evaluated and commented by experts in the Vietnamese FMCG industry and then continued to be verified by the topic through 275 survey results in the industry.

Next, the topic also evaluates the impact and impact intensity of 6 groups of risk factors on the operational efficiency of supply chains of Vietnamese FMCG enterprises. The results show the consistency between the negative impact of risks on the operational efficiency of supply chains. Specifically, the topic identifies 3 risk groups including risks from the macro economy; risks from customer demand; and risks from suppliers that negatively affect the operational efficiency of sustainable supply chains.

Finally, the study assesses the mediating role of risk prevention strategies for the supply chain. However, the results obtained from the Vietnamese FMCG industry group show that this mediating role does not occur. Here, these prevention strategies have a direct impact on the performance of sustainable supply chains and this is a positive impact.

6.3 Recommendations for Future Research

In the current period of rapid technological innovation, in-depth research on the possible risks of sustainable supply chains is necessary. The topic has summarized 6 aspects of possible risks for FMCG enterprises in Vietnam. Continuing to study these aspects in other fields is what the next research projects can do. This process helps to perfect the risk groups and observed variables. From there, it provides a theoretical foundation for enterprises to have appropriate response and prevention strategies.

Furthermore, further research is needed on the role of risk prevention strategies in sustainable supply chains. This will help to clarify which strategies will reduce the negative impact of risks on operational performance and which strategies will directly improve sustainable supply chain performance.

6.4 Limitation of the study

With limited resources, the topic can only synthesize studies from the period 2022 and earlier. The proposed risk aspects to be studied are therefore not updated. Data collected from the implementation topic only focuses on enterprises at a systematic scale. Meanwhile, the Vietnamese FMCG industry focuses more than 98% on small and medium enterprises - SMEs. This makes the assessment data somewhat focused on large-scale enterprises and does not cover the entire industry.

The study also proposed six risk groups that could negatively impact the performance of sustainable supply chains, but many aspects of the risks remain unproven. The questions used in the survey also encountered difficulties due to language barriers. The role and experience of the respondents in the company also likely made the collected data unreliable.

6.5 Conclution

This research provides a comprehensive evaluation of Sustainable Supply Chain Risks (SSCRs) and their impact on performance within the Vietnamese FMCG sector. Through a three-phase methodology, the study successfully developed a measurement scale tailored to the local market's unique characteristics.

The empirical results demonstrate that Macro-economic Risks, Customer Demand Risks, and Supplier Risks exert a significant negative pressure on Supply Chain Performance (SCP). This underscores the vulnerability of the Vietnamese FMCG industry—characterized by high price sensitivity and market immaturity—to external disruptions and upstream instabilities.

A critical finding of this study is the redefined role of Supply Chain Risk Management (SCRM). While SCRM practices were found not to moderate the relationship between risks and performance, they were proven to have a direct, positive impact on operational efficiency. This suggests that for Vietnamese firms, risk management should not be viewed merely as a defensive shield, but as a proactive driver of competitive advantage.

Despite its contributions, the study is limited by a sample bias toward large-scale enterprises, leaving a gap in understanding the SMEs that constitute 98% of the industry. Additionally, language barriers and the rapidly evolving technological landscape suggest that the risk variables identified require continuous updating.

In conclusion, while the research offers a robust theoretical foundation for risk measurement, future studies should expand these frameworks to SMEs and diverse industries to further clarify the distinction between risk-mitigating strategies and performance-enhancing ones.

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Annex 1 – Proposed Survey Questions

Dear Sir/Madam,

I am a student at the Swiss School of Business and Management Geneva (SSBM), currently conducting a research project entitled **"SUSTAINABILITY RISKS AND SUPPLY CHAIN DYNAMICS STRATEGIES IN VIETNAM'S FMCG INDUSTRY"**

I kindly invite you to complete the following survey. Your feedback is extremely valuable to me and to the success of this project.

I am sincerely grateful for your time and support.

SECTION I: COMPANY INFORMATION

1. Type of Business:

☐ 100% Locally Owned ☐ 100% FDI ☐ Joint Venture

2. Area of Activity:

☐ Processed Foods (e.g., fast food, canned goods, bread, instant noodles, etc.)

☐ Beverages (e.g., soft drinks, refreshments, fruit juices, beer, wine, coffee, tea, etc.)

☐ Fresh Foods (e.g., vegetables, meat, seafood, fruits, etc.)

☐ Personal Care (facial cleansers, skincare creams, shampoo, toothpaste, mouthwash, soap, shower gel, deodorant, perfumes…)

☐ Household Care (laundry detergent, dishwashing liquid, floor cleaner, toilet paper, tissues, disinfectants, cleaning tools, room deodorizers…)

☐ Healthcare Products (cold medicine, pain relievers, digestive aids, dietary supplements…)

☐ Other Consumer Products (baby supplies, stationery items, small electronic goods…)

3. Number of Years in Business

☐ Below 5 years ☐ 5 - 10 years ☐ 10 - 20 years

☐ 20 - 30 years ☐ 30 - 40 years ☐ 40 - 50 years

4. How many full-time employees are currently working for your company

☐ Below 10 ☐ 10 - 200

☐ 200 - 300 ☐ Above 300

5. Charter Capital

☐ Below VND 20 Billion ☐ VND 20 Billion to 100 Billion ☐ Above VND 100 Billion

6. Who are your company's main target customers

☐ B2B ☐ B2C ☐ Both B2B and B2C

SECTION II: RISKS IN THE FAST-MOVING CONSUMER GOODS INDUSTRY

Limited number of green suppliers

Failure to select suppliers with better sustainable performance in social, environmental, and economic goals
Suppliers' inflexibility in adapting to environmental changes
Price volatility
Unstable quality and quantity of input materials
Supplier bankruptcy
Long production time for green products/materials
Production disruptions
High variability in production processes
Insufficient production capacity during peak seasons
Design and technology changes due to greening
Occupational accidents
Labor disputes
Inability to use green fuels
Communication failures within the project team
Distorted information
Information leakage
Digital security issues
Unclear inspection and acceptance procedures
Failure to meet product quality standards
Inflexibility in arranging free flow of raw materials
Inadequate processing/maintenance/inventory/material equipment strategies
Inflation
Payment delays
Demand fluctuations
Market competition
Customer bankruptcy
Customer fragmentation
Inappropriate carrier performance
Delays in raw material transportation
Damage due to accidents or improper cargo handling

Lack of timely communication among supply chain partners
Insufficient enterprise IT infrastructure to connect with large buyers
Internal information systems not sufficiently secure
Data/information vulnerable to cyberattacks due to weak security systems
Dangerous working conditions
Violations of human dignity
Mandatory overtime
Strict regulations on termination procedures
Use of hazardous materials
Inadequate personal protective equipment (PPE)
Unfriendly relationships between senior management and employees
Workplace discrimination
Child labor and forced labor
Exchange rate fluctuations
Economic recession
Labor instability
Lack of qualified personnel
Language and cultural differences when working with buyers
Political instability
War and terrorism
Strikes and incidents related to natural disasters, fires, etc.
Epidemics (e.g. Covid-19)
Air pollution
Radiation exposure
Noise pollution
Climate change

SECTION III: SUPPLY CHAIN PRACTICES

The company implements preventive measures before risks occur.
The company implements control measures after risks occur.
There is an official system to evaluate the performance effectiveness of suppliers.

The company develops strategic supplier relationships.
The company's efforts are focused on customers' needs.
The company uses standardized design.
The company's production processes are automated.
The company can meet custom delivery lead times for each specific customer requirement.
Personnel are trained to respond to risk situations.
Senior management supports risk management programs.
Suppliers and customers are integrated into the company's risk management process.
The company shares information with supply-chain members to manage risk.
The company applies information technology to mitigate risks.
The company maintains sufficient inventory levels to minimize supply-chain disruptions.
The supply chain has contingency plans to reroute flows in case of disruption.
Distribution centers hold buffer stock to ensure continuity during disruptions.
A strategic distribution center holds buffer stock to support other centers during disruptions.
Facilities and plants maintain excess capacity to handle sudden demand spikes or disruptions.
The company proactively avoids supply-chain risks by adjusting operations.
The company shares risk with its supply-chain partners to improve resilience.
There is close coordination and collaboration among stakeholders in the supply chain.
The company actively implements emission-reduction strategies (e.g., process optimization, waste reduction)
The company has well-established disaster preparedness and response strategies for supply-chain disruptions.
The company regularly assesses and monitors risks across its supply chain.
The company has adopted Industry 4.0 technologies to improve supply-chain operations.
Collaboration with supply-chain partners is a key part of the company's operational strategy.
Responsibility for supply-chain risk management is shared among all stakeholders.
The company has clear visibility into all aspects of its supply chain (inventory, supplier operations, etc.).
The company regularly evaluates suppliers based on performance, quality, and reliability.

The company's operational processes are flexible enough to adjust for supply-chain disruptions.
The company's supply chain is resilient and can recover quickly after interruptions.
The supply chain can respond to changes in demand and operational disruptions.
The supply chain is agile, allowing rapid adaptation to unexpected situations.
Stakeholders openly share information to improve coordination.
Continuous quality improvement is a primary focus of the company's supply-chain operations.
The company implements technology-driven strategies to mitigate supply-chain risks.
The company relies on multiple suppliers to reduce disruption risks.
The company holds safety stock to address potential supply-chain disruptions.
The company has alternative shipping methods to ensure continuity during transport disruptions.
The company collaborates with logistics partners to ensure flexible shipping options.
The company uses risk-allocation strategies to distribute supply-chain risks among stakeholders.
The company reserves capacity at its facilities to handle unexpected supply-chain challenges.
The company's supply chain has clearly identified pathways to manage multiple potential disruptions.
A cross-functional risk management culture is embedded in the company's approach to supply-chain operations.

SECTION IV: SUPPLY CHAIN PERFORMANCE

Supplier response time
Supplier reliability
Labor productivity
Production waste volume
Inventory management cost
Number of new products developed per year
Workforce flexibility
On-time delivery
Customer inquiry response time
Perfect order rate
Product/service quality
Perceived product value by customers

Market share growth
Return on investment (ROI)

SECTION V: General Information (This section aims to classify and aggregate the data.)

1. What is your job title?

☐ Senior (top-level) management ☐ Middle management ☐ First-level/line management

☐ Coordinator ☐ Staff/Associate ☐ Others: ……

2. What is your functional area/department?

☐ Procurement ☐ Logistics ☐ Operations/Project Management

☐ Human Resources ☐ Risk Management ☐ Finance

☐ Sales ☐ Marketing ☐ Others: ……

THANK YOU VERY MUCH FOR YOUR COOPERATION IN COMPLETING THIS SURVEY.

Annex 2 – Interview Script

Greetings and an overview of the expert interview process.

I would appreciate your feedback on the list of observational aspects in Supply Chain Risk, Supply Chain Practices, and Supply Performance. Based on your experience in the FMCG sector, which elements should be removed (due to inadequacy) or refined to be more relevant?

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Distorted information
Information leakage
Digital security issues
Unclear inspection and acceptance procedures
Failure to meet product quality standards

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Payment delays
Demand fluctuations
Market competition
Customer bankruptcy
Customer fragmentation
Inappropriate carrier performance
Delays in raw material transportation
Damage due to accidents or improper cargo handling
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Violations of human dignity
Mandatory overtime
Strict regulations on termination procedures
Use of hazardous materials
Inadequate personal protective equipment (PPE)
Unfriendly relationships between senior management and employees
Workplace discrimination
Child labor and forced labor
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Economic recession
Labor instability

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Workforce flexibility

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Customer inquiry response time
Perfect order rate
Product/service quality
Perceived product value by customers
Market share growth
Return on investment (ROI)

Annex 3 – Vietnamese FMCG Expert for Interview

First Name	Last Name	Job Title	Department
David	Nguyen	Head of Production	Production
Sophia	Tran	Director of Supply Chain	Supply Chain
Michael	Le	Procurement Manager	Procurement
Emily	Pham	Planning Lead	Planning
Daniel	Hoang	Sales Director	Sales
Olivia	Vu	Marketing Manager	Marketing
James	Bui	Quality Assurance Head	Quality Assurance
Grace	Dang	R&D Director	Research & Development
William	Do	Finance Manager	Finance
Isabella	Truong	HR Director	Human Resources
Henry	Vo	Logistics Manager	Logistics
Charlotte	Ly	Customer Service Head	Customer Service
Benjamin	Phan	Operations Director	Operations
Victoria	Ngo	Trade Marketing Manager	Trade Marketing
Christopher	Dinh	Business Development Lead	Business Development
Natalie	Huynh	Regulatory Affairs Manager	Regulatory Affairs
Ella	Mai	Sustainability Manager	Sustainability
Matthew	Lam	Packaging Head	Packaging
Hannah	Giang	Innovation Lead	Innovation
Lucas	Nguyen	Marketing Director	Marketing
Amelia	Tran	Marketing Manager	Marketing
Ethan	Le	Brand Lead	Marketing
Noah	Hoang	FSQR Director	FSQR
Lily	Vu	FSQR Manager	FSQR

Jacob	Bui	Food Safety Lead	FSQR
Ava	Dang	Quality Compliance Head	FSQR
Logan	Do	Trade Marketing Lead	Marketing

Annex 4 – SPSS Data Processed (Cronbach's Alpha)

Case Processing Summary

		N	%
Cases	Valid	275	100,0
	Excluded[a]	0	0,0
	Total	275	100,0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,849	,849	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SR1	10,1782	3,899	,702	,532	,803
SR2	10,1782	3,797	,712	,535	,799
SR3	10,1418	3,750	,771	,594	,773
SR4	10,1273	4,287	,574	,367	,855

Case Processing Summary

		N	%
Cases	Valid	275	100,0
	Excluded[a]	0	0,0
	Total	275	100,0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,915	,916	9

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
OR1	26,1382	20,893	,594	,385	,913
OR2	26,0873	21,014	,588	,388	,914
OR3	26,2982	20,341	,684	,530	,907
OR4	26,2364	20,349	,737	,591	,904
OR5	26,2036	19,783	,762	,609	,902
OR6	26,2255	19,788	,771	,650	,901
OR7	26,1455	20,271	,718	,584	,905
OR8	26,1818	20,054	,770	,625	,901
OR9	26,1200	19,894	,716	,556	,905

Case Processing Summary

		N	%
Cases	Valid	275	100,0
	Excluded[a]	0	0,0
	Total	275	100,0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,870	,871	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
DR1	13,0109	5,872	,661	,456	,851
DR2	13,0291	5,583	,687	,512	,845
DR3	13,0655	5,485	,770	,624	,824
DR4	12,9964	5,719	,681	,539	,846
DR5	13,0909	5,455	,682	,468	,847

Case Processing Summary

		N	%
Cases	Valid	275	100,0
	Excluded[a]	0	0,0
	Total	275	100,0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,944	,945	9

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SOR1	26,0036	30,106	,785	,686	,938

SOR2	26,0582	30,186	,811	,711	,936
SOR3	26,0145	30,197	,787	,681	,938
SOR4	26,0400	31,564	,714	,555	,941
SOR5	25,9709	30,255	,796	,645	,937
SOR6	25,9673	30,273	,768	,654	,939
SOR7	25,9782	30,328	,817	,745	,936
SOR8	25,9927	29,839	,804	,727	,937
SOR9	26,0109	29,412	,775	,646	,939

Case Processing Summary

		N	%
Cases	Valid	275	100,0
	Excluded[a]	0	0,0
	Total	275	100,0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,880	,880	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
ER1	16,2327	9,384	,711	,561	,856
ER2	16,1891	9,738	,626	,516	,869
ER3	16,2509	9,678	,661	,473	,864
ER4	16,3018	9,533	,636	,437	,868
ER5	16,3273	9,119	,715	,664	,855
ER6	16,3345	8,742	,779	,700	,843

Case Processing Summary

		N	%
Cases	Valid	275	100,0
	Excluded[a]	0	0,0
	Total	275	100,0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,911	,912	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
EVR1	15,5782	9,427	,726	,563	,899
EVR2	15,5927	9,198	,737	,564	,898
EVR3	15,5818	9,390	,772	,604	,893
EVR4	15,6400	9,056	,825	,711	,885
EVR5	15,6764	9,585	,727	,610	,899
EVR6	15,6582	9,773	,733	,544	,898

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,930	,930	14

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SCP1	44,6145	39,727	,667	,539	,925
SCP2	44,6255	39,651	,690	,568	,925
SCP3	44,7527	39,880	,659	,491	,926
SCP4	44,8000	39,723	,647	,496	,926
SCP5	44,7636	39,882	,642	,502	,926
SCP6	44,6800	39,737	,631	,455	,927
SCP7	44,7345	39,298	,686	,524	,925
SCP8	44,6873	39,478	,701	,538	,924
SCP9	44,6655	39,515	,688	,550	,925

SCP10	44,6255	39,571	,687	,555	,925
SCP11	44,6509	39,812	,620	,449	,927
SCP12	44,5927	38,987	,724	,594	,924
SCP13	44,6945	39,687	,696	,513	,924
SCP14	44,8618	39,601	,671	,475	,925

Annex 5 – SPSS Data Processed (Explore Factor Analysis) – 1st time

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,949
Bartlett's Test of Sphericity	Approx. Chi-Square	8898,447
	df	741
	Sig.	0,000

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	18,671	47,875	47,875	18,671	47,875	47,875	6,114	15,677	15,677
2	2,848	7,302	55,177	2,848	7,302	55,177	6,071	15,567	31,243
3	1,869	4,793	59,970	1,869	4,793	59,970	4,799	12,306	43,549
4	1,471	3,771	63,742	1,471	3,771	63,742	4,700	12,052	55,602
5	1,251	3,206	66,948	1,251	3,206	66,948	3,151	8,079	63,681
6	1,058	2,712	69,660	1,058	2,712	69,660	2,332	5,980	69,660
7	,879	2,254	71,915						
8	,797	2,042	73,957						
9	,704	1,806	75,763						
10	,649	1,664	77,427						
11	,622	1,596	79,023						
12	,585	1,500	80,523						
13	,543	1,392	81,916						
14	,528	1,353	83,269						
15	,494	1,267	84,536						

16	,468	1,200	85,736						
17	,438	1,122	86,858						
18	,399	1,023	87,881						
19	,392	1,005	88,885						
20	,363	,931	89,816						
21	,331	,848	90,664						
22	,324	,830	91,494						
23	,300	,770	92,264						
24	,281	,721	92,985						
25	,274	,703	93,688						
26	,255	,655	94,343						
27	,243	,622	94,965						
28	,234	,599	95,564						
29	,222	,569	96,133						
30	,200	,512	96,645						
31	,191	,491	97,135						
32	,177	,454	97,589						
33	,174	,445	98,035						
34	,156	,400	98,434						
35	,142	,363	98,797						
36	,134	,344	99,141						
37	,130	,333	99,474						
38	,106	,273	99,747						
39	,099	,253	100,000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
SR1					,776	
SR2					,696	
SR3					,732	

SR4						
OR1				,551		
OR2						
OR3			,585			
OR4			,667			
OR5			,705			
OR6			,618			
OR7			,696			
OR8			,692			
OR9			,591			
DR1				,655		
DR2				,669		
DR3				,748		
DR4				,692		
DR5				,613		
SOR1	,675					
SOR2	,645					
SOR3	,632					
SOR4	,682					
SOR5	,628					
SOR6	,654					
SOR7	,747					
SOR8	,791					
SOR9	,636					
ER1						,665
ER2						,727
ER3						,546
ER4		,543				
ER5		,684				
ER6		,707				
EVR1		,757				
EVR2		,734				
EVR3		,704				

EVR4		,769				
EVR5		,624				
EVR6		,567				

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 9 iterations.

Annex 6 – SPSS Data Processed (Explore Factor Analysis) – 2nd time

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,948
Bartlett's Test of Sphericity	Approx. Chi-Square	8463,472
	df	666
	Sig.	0,000

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	17,996	48,638	48,638	17,996	48,638	48,638	6,018	16,264	16,264
2	2,566	6,934	55,572	2,566	6,934	55,572	5,951	16,085	32,348
3	1,844	4,983	60,554	1,844	4,983	60,554	4,879	13,187	45,535
4	1,416	3,827	64,381	1,416	3,827	64,381	4,416	11,936	57,471
5	1,221	3,301	67,682	1,221	3,301	67,682	2,537	6,858	64,329
6	1,039	2,809	70,491	1,039	2,809	70,491	2,280	6,163	70,491
7	,790	2,135	72,626						
8	,747	2,020	74,646						
9	,700	1,893	76,539						
10	,643	1,737	78,276						
11	,601	1,625	79,901						
12	,582	1,572	81,472						
13	,528	1,428	82,901						
14	,525	1,420	84,321						
15	,477	1,290	85,610						

16	,464	1,255	86,865						
17	,408	1,102	87,967						
18	,368	,994	88,960						
19	,362	,978	89,938						
20	,332	,898	90,836						
21	,301	,814	91,650						
22	,290	,783	92,433						
23	,282	,763	93,196						
24	,256	,692	93,888						
25	,253	,683	94,571						
26	,238	,644	95,216						
27	,225	,609	95,825						
28	,210	,566	96,391						
29	,192	,518	96,909						
30	,183	,496	97,405						
31	,175	,473	97,878						
32	,158	,428	98,305						
33	,143	,386	98,691						
34	,141	,380	99,072						
35	,135	,366	99,437						
36	,108	,293	99,730						
37	,100	,270	100,000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
SR1					,789	
SR2					,706	
SR3					,699	
OR1				,578		
OR3			,593			

OR4			,678			
OR5			,714			
OR6			,629			
OR7			,697			
OR8			,701			
OR9			,600			
DR1				,666		
DR2				,690		
DR3				,743		
DR4				,686		
DR5				,616		
SOR1	,684					
SOR2	,654					
SOR3	,644					
SOR4	,679					
SOR5	,620					
SOR6	,637					
SOR7	,737					
SOR8	,785					
SOR9	,645					
ER1						,635
ER2						,735
ER3						,558
ER4		,536				
ER5		,681				
ER6		,702				
EVR1		,760				
EVR2		,732				
EVR3		,709				
EVR4		,767				
EVR5		,615				
EVR6		,557				

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

Annex 6 – Smart-PLS

SSCR-SCP – RQ1

Mean, STDEV, T-Values, P-Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
SR -> SCP	-0,183	-0,184	0,068	2,681	**0,007**
DR -> SCP	-0,238	-0,246	0,116	2,052	**0,040**
ER -> SCP	-0,317	-0,318	0,099	3,219	**0,001**

SSCR-SCP with SCRM Moderator – RQ2

	SR	DR	ER	Moderating Effect SR	Moderating Effect DR	Moderating Effect ER	SCP	SCRM
SR							-0,112	
DR							-0,150	
ER							-0,225	
Moderating Effect SR							-0,029	
Moderating Effect DR							0,267	
Moderating Effect ER							-0,109	
SCP								
SCRM							0,420	