How to balance sustainability and risk in supply chain management: a manufacturing perspective

Ying Li
Cardiff University

Zhiduan Xu
Xiamen University

Helen Walker
Cardiff University

Jon Gosling
Cardiff University

Ying Kei Tse
Cardiff University

Summary: After the pandemic, risk and sustainability have received greater attention from business managers, government policy makers, experts and scholars in the supply chain field. For many companies, the simultaneous avoidance of risk and pursuit of sustainability are emerging as interconnected business goals, and have become increasingly entangled and complex. How to evaluate and balance the nexus between risk and sustainability in company strategic decision-making has become an urgent problem to be solved. This study aims to investigate the implementation of risk initiatives and sustainability initiatives in companies, and their impact on corporate performance. In order to assess how companies are approaching sustainability and risk in supply chain management, this study conducts a cross-sectional study of Chinese manufacturing companies. Interviews and a survey are conducted to explore how sustainability and risk practices may be related, and impact on corporate performance.

Keywords: Supply chain risk management, Sustainable supply chain management, Supply chain performance.

Submission category: Working paper

Introduction

> 'Inequalities keep growing. The climate crisis continues to escalate. Biodiversity loss is accelerating. Progress towards gender equality remains disappointing. And conflicts in Ukraine, Gaza, Sudan and beyond have left an unprecedented 120 million forcibly displaced people worldwide'.
>
> --António Guterres (UN, 2024)

According to The Sustainable Development Goals Report 2024 released by the United Nations (UN), only 17% of the Sustainable Development Goals（SDGs）are on track, geopolitical tensions and growing climate chaos are impacting global sustainable development (UN, 2024). From the UN's perspective, the earth's environment and all mankind's development are facing multiple crises, and it is urgent to achieve the 17 SDGs. However, from the perspective of governments, the political demands of countries and individuals also need to be considered. The same is true for companies that are regulated by national laws and regulations. Companies need to consider the requirements of laws, regulations and public opinion for sustainable development, but they also need to consider their own interests.

In recent years, manufacturing globalization has gradually occurred, and during this process, the scale and scope of supply chains of many companies have been expanding (Kumar et al., 2018). Larger, more complex supply chain systems will inevitably bring a variety of risks, which will affect the operational continuity of the organization and the supply stability of goods and services (Jordan & Bak, 2016), and ultimately affect the profitability and development of the company itself.

For companies, risks in supply chains arise for different reasons, recent examples at the macro level include geopolitical crises (Bednarski et al., 2023), or diseases and epidemics (Kumar et al., 2021; Majumdar et al., 2020; Soyer et al., 2023). In order to deal with these different risks, companies often need to develop a systematic risk management system to reduce the impact of risks on the achievement of business objectives. Often corporate risk and sustainability initiatives tend to go hand in hand. For example, large companies must undertake certain sustainability initiatives to meet legal and regulatory requirements, which may also lead to increased risks for the company. How to balance the coupling relationship between sustainable and risk initiatives within the company seems to have become an urgent problem to be solved.

SSCM and SCRM research have developed as two independent research fields, and more recently studies are emerging that investigate their intersection (Fattahi et al., 2021; He et al., 2021; Mukherjee et al., 2023; Rajesh, 2019). This study contributes to this nascent body of research by drawing on the concepts of the triple bottom and risk management to better understand how sustainability and risk initiatives might impact on one another. The study explores how the strategic decision makers of companies view sustainability and risk management, and what practices are adopted by companies to achieve SDGs. In this study, the research questions are as follows:

- How do manufacturing firms use sustainability initiatives to implement supply chain performance objectives?
- How do manufacturing firms use supply chain risk initiatives to implement supply chain performance objectives?
- How do manufacturing firms balance supply chain risk measures and sustainable development measures in practice?

To address the aforementioned research questions, this study conducted semi-structured interviews with strategic decision-makers from 21 manufacturing firms

spanning diverse industries, scales, types, and positions within the supply chain. The interview data were coded and qualitatively analyzed using NVivo. The research findings will elucidate the prevailing perspectives of supply chain decision-makers in the manufacturing sector regarding sustainability and risk management. Through a comprehensive analysis of the interview data, thematic discussions will be conducted on supply chain performance, sustainability initiatives, risk initiatives, and factors influencing supply chain strategies (such as company size, product supply, etc.). The research results will elaborate on how risk initiatives and sustainability initiatives in manufacturing firms contribute to supply chain performance, as well as the coupling phenomenon between the two within the supply chain. Furthermore, the findings will illustrate how manufacturing firms balance the relationship between sustainability and risk in the supply chain. The research outcomes will provide insights and recommendations for corporate decision-makers in formulating robust sustainable development strategies.

Literature review

In contemporary supply chain management, sustainability has become an unavoidable topic. Since Elkington introduced the concept of the Triple Bottom Line (TBL) (Elkington, 2004), the perception of sustainability among firms has begun to shift. Economic sustainability is no longer the sole criterion for measuring corporate success; social and environmental performance have been integrated into the standards for evaluating corporate development (Wang et al., 2024). To achieve sustainable business operations, firms have adopted various initiatives to enhance their performance in supply chain management. At the social and environmental levels, proactive social initiatives (such as ensuring worker safety) and environmental initiatives (such as reducing carbon emissions) can effectively improve supply chain performance(Dangelico & Pujari, 2010; Lin, 2023).

For corporate supply chain performance, the role of risk management is equally critical. Supply chain risk management is defined as "the coordinated approach among supply chain members to identify potential risk sources and implement appropriate strategies to reduce the vulnerability of the supply chain" (Christopher, 2003). By adopting measures such as risk identification, assessment, mitigation, and control within the supply chain, firms can effectively reduce the likelihood and impact of risks during business operations (Tummala et al., 2011). In market competition, firms with well-established risk management systems often possess greater market competitiveness compared to those without such systems. This also increases the likelihood that firms implementing risk management initiatives will achieve growth in economic performance.

For the manufacturing industry, particularly for manufacturing firms of a certain scale, relying solely on a single initiative is often insufficient to address the increasingly complex business environment. However, adopting multiple initiatives does not

guarantee that each initiative will be mutually compatible or positively impact supply chain performance. On one hand, Sustainable Supply Chain Management (SSCM) encompasses various initiatives, some of which contain conflicting elements that may hinder operational performance, while others exhibit complementary elements that enhance it (Sharma et al., 2023). Understanding the interrelationships among these elements and achieving Pareto optimality in supply chain performance has become a pressing practical issue. On the other hand, sustainability and risk are not mutually opposing or entirely independent within firms. Certain sustainability initiatives, such as energy conservation, carbon emission reduction, and pollution prevention, can effectively improve a company's risk performance (Wang et al., 2024). Similarly, implementing effective risk initiatives can yield positive outcomes for a company's sustainable development (Ngo et al., 2023). Therefore, how firms balance the relationship between sustainability initiatives and risk initiatives has significant practical implications.

Methods

This study aims to conduct a qualitative multi-case study, using a sample of large manufacturing companies in China for data collection and analysis. Twenty-one supply chain managers from Chinese manufacturing companies have been invited to participate in semi-structured interviews. These interviews explore sustainable development and risk management in the supply chain. The interview data in this study will be recorded and stored in accordance with relevant data protection regulations to ensure the security of participants' information. The interview recordings are then transcribed into text files, and summaries are offered to participants to enhance reliability and validity (Halldorsson & Aastrup, 2003). The transcripts are then coded, and subject to abductive thematic analysis using NVivo, simultaneously adopting codes from the literature and allowing codes to emerge from the data. The analysis process will be iterative, until there is a saturation of themes (Bowen, 2008; Francis et al., 2010).

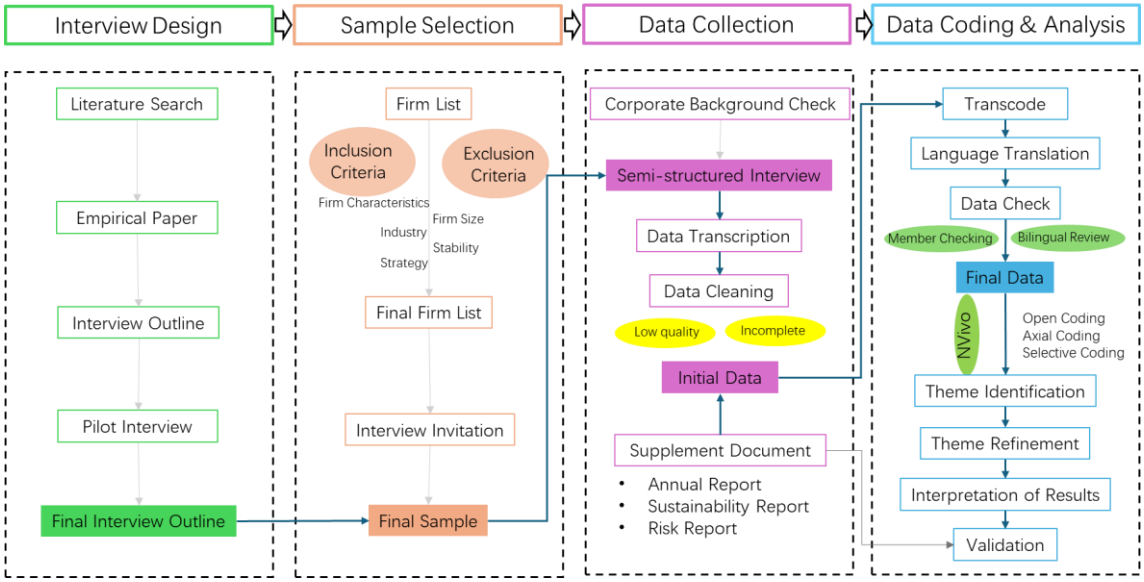

Figure1- Research Methods Flowchart

Sample Definition

Sample selection is often a critical factor in determining the persuasiveness of research findings. A well-considered sample can significantly enhance the credibility of the results. Since this study primarily explores the relationship between sustainability initiatives and risk initiatives within firms, as well as their impact on the supply chain performance, not all organizations are suitable as samples. The firms of interest in this study must simultaneously implement both sustainability initiatives and risk initiatives in their operations, which necessitates that they meet a certain scale of operations. Smaller firms may not fulfill the interview requirements of this research. Furthermore, as this study aims to discuss the influence of sustainability initiatives and risk initiatives on the supply chain performance, the selected samples must possess an independent supply chain system (including procurement, production, and sales departments), professional decision-makers, stable supply chain strategies, and a long-established, mature system for sustainability and risk management. In summary, the inclusion and exclusion criteria for sample selection in this study are as follows:

Inclusion criteria:

- The nature of the enterprise is manufacturing enterprise.
- The size of the enterprise should be large.

Exclusion criteria:

- Excluding non-physical product manufacturing firms.
- Excluding firms without logistics departments such as purchasing and distribution.
- Exclude firms that have no personnel specialized in supply chain strategy formulation.
- Exclude businesses that do not pursue sustainable development.
- Excluding companies that are less than 5 years old and do not have mature experience or strategies to solve risk problems.

In the sample selection process, the primary objective of this study is to gain a comprehensive understanding of the sustainability and risk initiatives adopted by the manufacturing sector within the supply chain, as well as the factors that corporate decision-makers must consider when formulating strategies. Consequently, while all selected samples are manufacturing firms, they encompass a diverse range of industries, ownership types, organizational forms, and stages within the supply chain. This diversity is intended to provide a more holistic perspective on the manufacturing sector, enabling the study to explore how sustainability and risk influence strategic decision-making within firms from this broader viewpoint.

Data collection

This study extensively references empirical research in the field, summarizing the question design of semi-structured interviews used in such studies, and based on this, has designed the survey question for this research. Prior to commencing the interviews, the study first selected five supply chain managers for pilot interviews. The interview questions were then revised based on the process and outcomes of these pilot interviews

to eliminate any potential biases in the interview content, ensuring that the interviews conducted in this study are aligned with the topics the research aims to explore.

During the data collection process, this study conducted interviews with decision-makers from 23 firms. However, after considering factors such as enterprise relevance and interview quality, data from 21 interviews were ultimately utilized for this research. Additionally, the study collected annual reports, sustainability reports, and risk management reports from these firms. By employing triangulation with these diverse types of data, the study aims to gain a more comprehensive and accurate understanding of the manufacturing sector's genuine perspectives on sustainability and risk.

Table 1- Demographics Information of Samples

Code	Job Title	Job Functions	Years of Working	Educational Background	Number of Employees	Average Annual Sales
1	Manager	Manufacturing/operations	2–5 years	Master Degree/MBA/EMBA	>10000	>U.S.$10 billion
2	Director	Supply chain management	>10 years	Bachelor's Degree	>10000	>U.S.$10 billion
3	Others	Manufacturing/operations	2–5 years	Master Degree/MBA/EMBA	>10000	>U.S.$10 billion
4	Manager	Purchasing	2–5 years	Master Degree/MBA/EMBA	>10000	>U.S.$10 billion
5	Manager	Manufacturing/operations	2–5 years	Master Degree/MBA/EMBA	501-1000	U.S.$100–U.S.$1 billion
6	Director	Purchasing	>10 years	Master Degree/MBA/EMBA	1000-5000	U.S.$100–U.S.$1 billion
7	Manager	Manufacturing/operations	2–5 years	Master Degree/MBA/EMBA	>10000	>U.S.$10 billion
8	Director	Purchasing	>10 years	Bachelor's Degree	5000-10000	U.S.$1–U.S.$5 billion
9	Director	Purchasing	>10 years	Bachelor's Degree	>10000	U.S.$1–U.S.$5 billion
10	Manager	Transportation	>10 years	Bachelor's Degree	1000-5000	U.S.$100–U.S.$1 billion
11	Manager	Purchasing and manufacturing	>10 years	Master Degree/MBA/EMBA	5000-10000	U.S.$100–U.S.$1 billion
12	CEO/President	Operation	>10 years	Master Degree/MBA/EMBA	101-500	<U.S.$100 million
13	Director	Purchasing	6–10 years	Master Degree/MBA/EMBA	101-500	U.S.$100–U.S.$1 billion
14	Manager	Purchasing and manufacturing	2–5 years	Master Degree/MBA/EMBA	>10000	>U.S.$10 billion
15	Director	Operation	>10 years	Master Degree/MBA/EMBA	501-1000	U.S.$100–U.S.$1 billion
16	Director	Purchasing	>10 years	Master Degree/MBA/EMBA	101-500	U.S.$100–U.S.$1 billion
17	Director	Supply chain management	>10 years	Master Degree/MBA/EMBA	101-500	U.S.$100–U.S.$1 billion
18	Manager	Purchasing	>10 years	Bachelor's Degree	501-1000	U.S.$100–U.S.$1 billion
19	Manager	Supply chain management	>10 years	Master Degree/MBA/EMBA	1000-5000	U.S.$5–U.S.$10 billion
20	CEO/President	Supply chain management	>10 years	Master Degree/MBA/EMBA	101-500	U.S.$100–U.S.$1 billion
21	Manager	Manufacturing/operations	6–10 years	Bachelor's Degree	>10000	U.S.$5–U.S.$10 billion

The interviews were primarily conducted in Chinese and carried out by two to three researchers either through online video calls or on-site visits. The entire interview process was recorded in audio or video format, and upon completion, all interview data were stored in compliance with relevant data protection regulations. The semi-structured interview questions and written records of the interview process were reviewed and verified by two scholars proficient in both Chinese and English to prevent biases and

misunderstandings arising from inappropriate language translation, thereby preserving the objectivity, authenticity, and accuracy of the interview data to the greatest extent. This method has been widely utilized in cross-linguistic research and is therefore considered reliable.

Data coding and analysis

After the interviews, this study transcoded the audio and video files from the semi-structured interviews. All interview content was first transcoded into Chinese documents and then translated into English documents for coding purposes. NVivo, a professional qualitative data analysis tool, was utilized to assist in structured coding and analysis. The coding process for this study was conducted in NVivo and divided into three stages. The first stage involved open coding to create initial codes. This step entailed manually reading the interview transcodes, identifying keywords, concepts, and patterns within the text, and establishing initial nodes. The second stage was axial coding, where the extracted codes were organized, and their relationships were delineated to construct a common framework among different codes. This step facilitated the identification of the logical relationships between sustainability and risk initiatives within the supply chain. The final stage was selective coding, which aimed to identify the key themes of this study, namely, how firms balance their investments in sustainable development and risk management.

Findings

Corporate Supply Chain Performance

The interview results of this study indicate that in the manufacturing sector, economic performance remains a critical factor in measuring corporate development levels and a primary component of supply chain performance. However, environmental and social performance are increasingly gaining significance in supply chain performance. Several interviewees affirmed the substantial influence of economic factors on corporate decision-making.

"I believe economic objectives should take precedence because only through profitability can a company continue to survive and create more value for society." (Code 13, Procurement Director)

This finding aligns with previous research on the impact of supply chain management practices on organizational performance (Li et al., 2006) , underscoring the importance of economic factors in corporate strategic decision-making.

Sustainability Initiatives

The interview results reveal that corporate sustainability initiatives primarily focus on social and environmental dimensions. On the social front, labor rights protection, community welfare activities, and improving working conditions are the main activities undertaken by manufacturing firms to fulfill their social responsibilities.

"On the social level, our primary focus is on establishing a robust employee welfare

system and creating a favorable working environment. Additionally, we donate funds and materials to charitable organizations to build a positive corporate image and shoulder our social responsibilities."(Code 20, CEO)

On the environmental front, firms achieve environmental sustainability mainly through waste reduction, carbon emission reduction, and pollution control. However, beyond social and environmental initiatives, some firms have also incorporated operational and technological dimensions into their sustainability framework, thereby enriching the dimension of corporate sustainable development.

Risk Initiatives

For firms, risks can impact operations across multiple dimensions. For most firms, economic loss is the primary metric for quantifying the impact of risks. Since economic performance is also a core element in measuring supply chain performance, this indirectly confirms that the occurrence of risk events can significantly negatively affect corporate supply chain performance.

Another finding from the interviews is that almost all manufacturing firms adopt a risk-averse attitude, with very few willing to take risks.

" Firms tend to be conservative, preferring to avoid risks rather than actively take them. Especially for risks that could bring disruptive impacts, we strive to avoid them because such risks are difficult to predict and may pose significant challenges to the survival of the company."(Code 12, General Manager)

Furthermore, most firms have established comprehensive risk management systems to address the impact of risks, encompassing identification, assessment, mitigation, and control. Various risk management tools are employed, but decisions regarding risk management are primarily based on the experience of decision-makers.

"For risk control, we rely more on the judgment of managers regarding risks."(Code 10, Supply Chain Manager)

However, decision-making tools such as AI have begun to play a role in corporate supply chains and are gradually gaining more prominence. This indicates that new technologies are increasingly important in corporate risk management, a finding that points to the future development model of risk management frameworks.

The Link Between Sustainability and Risk

The interview results of this study indicate that most corporate decision-makers believe that adopting sustainability initiatives under a long-term orientation can have direct or indirect positive impacts on the enterprise, although it may lead to increased risks in the short term. However, overall, the benefits outweigh the drawbacks. Additionally, this study found that risk management initiatives taken by firms can, to some extent, also help achieve sustainable development goals.

"When a company faces risks, it will inevitably interfere with its sustainable development. To achieve sustainable development, the prerequisite is to identify and control risks."(Code 11, Procurement Director)

In summary, the findings of this study demonstrate that in the manufacturing supply

chain, sustainability and risk are not independent domains; rather, there exists a coupling relationship between the two. These findings, through exploring the relationship between sustainability and risk, can effectively promote the development of more multidimensional risk management approaches.

Discussion

How do manufacturing firms use sustainability initiatives to implement supply chain performance objectives?

This study, through interviews with decision-makers from manufacturing firms, has outlined the driving factors and external manifestations of corporate sustainability initiatives and identified how these initiatives enhance supply chain performance. Currently, the primary drivers for manufacturing firms to adopt sustainability initiatives in their operations are twofold. The first is the enterprise's intrinsic demand for sustainable development. For instance, contributions to social charity can help establish a responsible corporate image, thereby building a stable supply chain system, while investments in employee welfare can enhance employee loyalty, thereby reducing labor costs. The ultimate outcome of these initiatives is to help the company reduce costs and increase profits. The second driving factor stems from government legislation on environmental protection and labor rights, which transforms some actions originally taken out of social responsibility into actions that firms must undertake to avoid violating laws and regulations, such as measures to reduce carbon emissions.

In summary, although the adoption of sustainability initiatives by firms is not entirely voluntary due to differing intrinsic motivations, these initiatives can indeed directly or indirectly help firms better achieve their supply chain performance goals.

How do manufacturing firms use supply chain risk initiatives to implement supply chain performance objectives?

In manufacturing firms, the impact of risks is primarily measured through their effect on supply chain performance objectives, with economic performance being the core element of these objectives. Consequently, economic loss is often used as a quantitative indicator to gauge the magnitude of risks. In manufacturing firms, due to factors such as industry and scale, the sources of risks are diverse. Firms adopt two main strategies to address these risks. The first involves implementing a series of risk management measures before risk events occur to enhance the robustness of the supply chain, such as developing multiple sourcing suppliers and improving inventory strategies, thereby reducing the frequency and impact of risk events. The second strategy involves taking specific measures in response to particular risks after they occur, such as quickly adjusting market strategies in response to policy changes. Both strategies essentially increase the structural flexibility of the enterprise, thereby enhancing its agility in facing risks and helping to mitigate the impact of risk events.

How do manufacturing firms balance supply chain risk measures and sustainable

development measures in practice?

Previous research has largely overlooked the coupling relationship between sustainability and risk in the supply chain. The findings of this study indicate that sustainability initiatives in manufacturing firms, when guided by a long-term orientation, can effectively enhance the robustness of the supply chain and reduce the frequency and impact of risks. Similarly, the establishment of a risk management system plays a positive role in achieving corporate sustainable development, particularly in economic and operational dimensions. However, this conclusion applies to most scenarios rather than all. For instance, when firms focus solely on short-term supply chain performance, investing substantial resources in environmental protection or social charity can lead to increased operational costs and a decline in economic performance in the short term, thereby affecting supply chain performance. Additionally, the stage of corporate development can influence this relationship. For example, if a company invests heavily in environmental protection at its inception while neglecting its profitability needs, it often results in a decline in supply chain performance. Therefore, firms need to identify their supply chain orientation and have a clear understanding of their development stage. Moreover, advancements in artificial intelligence and smart devices can serve as lubricants in corporate sustainable development and risk management, enhancing decision-making agility and helping decision-makers balance the relationship between the two.

Conclusions

Theoretical implications

Both SSCM and SCRM as important research fields have been widely used in the daily operation and supply chain management process of companies. But the intersection between the two has received limited attention to date. Therefore, this study will attempt to fill the research gap in this area and improve the consistency between risk management goals and SDGs. This study will help stakeholders to better understand the challenges facing companies. It will provide supply chain managers with insights into more sustainable and robust strategies, and which specific practices could be adopted in the future to meet sustainability goals, reduce supply chain risk and internal friction, and improve competitiveness and performance.

Practice/Managerial implications

The findings of this study provide actionable insights for supply chain decision-makers in manufacturing firms. Firstly, the core objective of supply chain operations is to achieve supply chain performance, and both sustainability initiatives and risk management initiatives can help firms attain this goal. However, the long-term orientation and benefits of performance objectives must be considered during the decision-making process. Secondly, firms should clearly recognize their developmental stage and adjust the proportion of investments in economic, environmental, and social initiatives accordingly, as the return on investment varies for firms at different stages of development. Lastly,

artificial intelligence tools play a significant positive role in the identification, assessment, mitigation, and control of risks, enhancing the agility of firms in adapting supply chain strategies and helping to balance the relationship between risk and sustainability.

Limitations and conclusions

Firstly, while this study considered factors such as the scale, industry, and type of manufacturing firms in its sample selection, the limited sample size made it challenging to compare samples with different characteristics when views from samples with a particular trait showed high convergence. Therefore, future research could consider targeted exploration of samples with diverse characteristics. Additionally, although this study primarily explored the relationship between sustainability, risk, and supply chain performance, future research could focus on developing integrated supply chain management methods that consider both sustainability and risk to enhance corporate supply chain performance.

Indicative references

Bednarski, L., Roscoe, S., Blome, C., & Schleper, M. C. (2023). Geopolitical disruptions in global supply chains: a state-of-the-art literature review. *Production Planning & Control*, 1-27. https://doi.org/10.1080/09537287.2023.2286283

Bowen, G. (2008). Naturalistic inquiry and the saturation concept: a research note. *Qualitative Research*, *8*(1), 137-152.

Christopher, M. a. P., H and Rutherford, C and Juttner, U. (2003). Understanding supply chain risk: A self-assessment workbook. *Department for Transport, Cranfield University, Cranfield*.

Dangelico, R., & Pujari, D. (2010). Mainstreaming Green Product Innovation: Why and How Companies Integrate Environmental Sustainability. *Journal of Business Ethics*, *95*(3), 471-486. https://doi.org/10.1007/s10551-010-0434-0

Elkington, J., Adrian Henriques, and Julie Richardson. (2004). *"The Triple Bottom Line: does it all add up." Adressing the Sustainability of Business and CSR*. New York City: Earthscan.

Fattahi, M., Govindan, K., & Farhadkhani, M. (2021). Sustainable supply chain planning for biomass-based power generation with environmental risk and supply uncertainty considerations: a real-life case study [Article]. *International Journal of Production Research*, *59*(10), 3084-3108. https://doi.org/10.1080/00207543.2020.1746427

Francis, J. J., Johnston, M., Robertson, C., Glidewell, L., Entwistle, V., Eccles, M. P., & Grimshaw, J. M. (2010). What is an adequate sample size? Operationalising data saturation for theory-based interview studies. *Psychology & Health*, *25*(10), 1229-1245, Article Pii 916180756. https://doi.org/10.1080/08870440903194015

Halldorsson, A., & Aastrup, J. (2003). Quality criteria for qualitative inquiries in logistics. *European Journal of Operational Research*, *144*, 321-332.

He, L., Wu, Z., Xiang, W., Goh, M., Xu, Z., Song, W., Ming, X., & Wu, X. (2021). A novel Kano-QFD-DEMATEL approach to optimise the risk resilience solution for

sustainable supply chain [Article]. *International Journal of Production Research*, *59*(6), 1714-1735. https://doi.org/10.1080/00207543.2020.1724343

Jordan, C., & Bak, O. (2016). The growing scale and scope of the supply chain: a reflection on supply chain graduate skills. *Supply Chain Management: An International Journal*, *21*(5), 610-626. https://doi.org/10.1108/scm-02-2016-0059

Kumar, A., Mangla, S. K., Kumar, P., & Song, M. L. (2021). Mitigate risks in perishable food supply chains: Learning from COVID-19. *Technological Forecasting and Social Change*, *166*, Article 120643. https://doi.org/10.1016/j.techfore.2021.120643

Kumar, V., Bak, O., Guo, R., Shaw, S. L., Colicchia, C., Garza-Reyes, J. A., & Kumari, A. (2018). An empirical analysis of supply and manufacturing risk and business performance: a Chinese manufacturing supply chain perspective. *Supply Chain Management: An International Journal*, *23*(6), 461-479. https://doi.org/10.1108/scm-10-2017-0319

Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., & Subba Rao, S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance. *Omega*, *34*(2), 107-124. https://doi.org/10.1016/j.omega.2004.08.002

Lin, W. L. (2023). Corporate social responsibility and irresponsibility: Effects on supply chain performance in the automotive industry under environmental turbulence. *Journal of Cleaner Production*, *428*. https://doi.org/10.1016/j.jclepro.2023.139033

Majumdar, A., Sinha, S. K., Shaw, M., & Mathiyazhagan, K. (2020). Analysing the vulnerability of green clothing supply chains in South and Southeast Asia using fuzzy analytic hierarchy process. *International Journal of Production Research*, *59*(3), 752-771. https://doi.org/10.1080/00207543.2019.1708988

Mukherjee, S., Padhi, S. S., & Jayaram, J. (2023). Designing socially optimal rates of tax and rebate structures in directing migration of risk-averse suppliers towards sustainable products [Article]. *International Journal of Production Research*, *61*(19), 6485-6500. https://doi.org/10.1080/00207543.2022.2131925

Ngo, V. M., Quang, H. T., Hoang, T. G., & Binh, A. D. T. (2023). Sustainability-related supply chain risks and supply chain performances: The moderating effects of dynamic supply chain management practices. *Business Strategy and the Environment*, *33*(2), 839-857. https://doi.org/10.1002/bse.3512

Rajesh, R. (2019). Social and environmental risk management in resilient supply chains: A periodical study by the Grey-Verhulst model [Article]. *International Journal of Production Research*, *57*(11), 3748-3765. https://doi.org/10.1080/00207543.2019.1566656

Sharma, V., Vijayaraghavan, T. A. S., & Raghu Ram, T. L. (2023). Resolving operational paradox of sustainable supply chain: A decision framework approach. *Socio-Economic Planning Sciences*, *87*. https://doi.org/10.1016/j.seps.2023.101565

Soyer, A., Bozdag, E., Kadaifci, C., Asan, U., & Serdarasan, S. (2023). A hesitant approach to sustainable supply chain risk assessment. *Journal of Cleaner*

Production, *418*. https://doi.org/10.1016/j.jclepro.2023.138103

Tummala, R., Xie, C., & Schoenherr, T. (2011). Assessing and managing risks using the Supply Chain Risk Management Process (SCRMP). *Supply Chain Management: An International Journal*, *16*(6), 474-483. https://doi.org/10.1108/13598541111171165

UN. (2024). *The Sustainable Development Goals Report 2024*. https://unstats.un.org/sdgs/report/2024/?_gl=1*1ac4dek*_ga*MTcwNDk1ODg2Mi4xNzI5MDY2NjE0*_ga_TK9BQL5X7Z*MTcyOTA2NjYxNC4xLjEuMTcyOTA2NzMzNi4wLjAuMA..

Wang, Y., Peng, Y., & Yang, C. (2024). Decoding ESG Report Narratives: Unveiling Sustainable Supply Chain Insights and Impacts Through Textual Analysis. *Corporate Social Responsibility and Environmental Management*. https://doi.org/10.1002/csr.3079