

Article

Supply Chain Risk Management in a Digital Era: Evidence from SMEs of Clothing Retailers in Australia

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Abstract: With the increased globalisation and disruptions faced by businesses in this digital era and the occurrence of natural disasters such as floods and disease outbreaks in the world, supply chain risks and management of those risks are major challenges for businesses, especially for SMEs of clothing retailers in Australia. This study, hence, is carried out using an exploratory case study research method, and the data have been collected through semi-structured face-to-face interviews with key informants from managerial levels of 20 Australian SMEs of clothing retailing businesses to identify various supply chain risks and their management processes. This study finds five supply chain risks, namely supply risk, demand risk, financial risk, environmental risk, and operational risk, that the SMEs of clothing retailers mostly face in the supply chain. This study also finds that most of the investigated retailers lack a formal risk identification approach, though they informally use the reactive and proactive methods of risk identification. Furthermore, the assessment methods are not well established in most of the participating firms, and supplier monitoring receives more attention compared to their own performance to deal with their supply chain risks. This study contributes to the body of knowledge by being one of the first empirical studies to explore the SMEs of clothing retailers' supply chain risks and their management processes in the Australian business context, which can add value in guiding supply chain design decisions for SMEs in other sectors.



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1. Introduction

Small and medium-sized enterprises (SMEs) play an important role in world economies as they comprise about 90% of businesses and offer more than 50% of employment globally (The World Bank 2019), making an enormous contribution to the gross domestic product (GDP), entrepreneurship, and employment. However, SMEs, compared to larger firms, are less structured, have a small management group, are improperly organised, and are informal in risk management in this digital era (Lavastre et al. 2012; Bucher et al. 2016). Moreover, SMEs are comparatively less prepared than larger firms to respond and cope with disruptions in supply chains due to resource constraints (Ballesteros and Domingo 2015). While supply chain risk management processes in larger firms have been broadly studied, SMEs have not received similar attention. Moreover, studies on SMEs' supply chain risk management are limited and treated SMEs mostly from the viewpoint of larger firms (Chopra and Meindl 2004; Kitchot et al. 2020).

In recent years, the increased competition, usage of technologies, complexity, and interrelation in the supply chain networks have made the supply chains susceptible to risks (Lavastre et al. 2014; Shin and Park 2019). Authors such as Juttner et al. (2003) describe supply chain risk as any risks for the information, material, and product flow from original suppliers to the delivery of the final product for the end-user, and Goh et al. (2007) express supply chain risk management (SCRM) as the identification and management of risks within the supply chain network through a coordinated approach amongst supply chain members to reduce supply chain vulnerability. Hence, to recognise, control, and

mitigate the risks in the SMEs' supply chains, this study focuses on Australia, where SMEs are the backbone of this country's economy as they produce around seven million jobs and contribute to 57% of Australia's GDP (NAB 2017). Among the Australian SMEs, the clothing retailing SMEs also play an important role in this country's development, which contributed around AUD 16 billion to the economy, with over 13,552 clothing retailing businesses in 2020 (Statista 2022). However, clothing retailing businesses, which purchase goods in sizeable quantities from manufacturers directly or through wholesalers and then sell in lesser quantities to consumers, are highly vulnerable to supply chain disruptions. In a study, KPMG (2021) found that around 34.12% of the entire Australian retailing businesses struggled with the disruptions in supply chains in 2020. Likewise, the COVID-19 pandemic caused disruptions in the supply chains and adversely affected the clothing supply in Australia as well as many other countries in the world. Since the available literature and existing knowledge about the Australian clothing retailers' supply chain risk management processes are unknown, this present study uses SMEs of the clothing retailers' supply chains in Australia to fill out the knowledge gaps in the existing literature. Hence, the purpose of this study is to address the following two research questions (RQs): (i) what are the major supply chain risks experienced by SMEs of clothing retailers in Australia? and (ii) how do the SMEs of clothing retailers in Australia manage their supply chain risks?

In order to address the aforesaid questions, the rest of the paper is organised as follows: Section 2 discusses the relevant literature; Section 3 outlines the research methodology; Section 4 derives research findings and outlines managerial implications; and concluding comments, limitations, and avenues for further research are made in Section 5.

2. Literature Review

2.1. Supply Chain Risk

Supply chain risk is known as the risky event that occurs in the supply chain operation (Chen et al. 2013). Ellis et al. (2010) outlined supply chain risk as an individual's perception of the total potential loss associated with the disruption of supply of a particular purchased item from a particular supplier. Manuj and Mentzer (2008) mentioned four categories of risks along with supply chains such as supply, demand, operational, and security risks. Christopher et al. (2011) identified various supply chain risks as environmental risks, supply risks, demand risks, and process and control risks. Likewise, Samvedi et al. (2013) identified major supply chain risks as supply, demand, process, and environmental risks. Christopher and Peck (2004) and Dadfar et al. (2012) indicated two major supply chain risks. Firstly, financial risks, such as inventory costs, which can be very high due to stock-outs, late deliveries, damaged or lost goods, rework of goods, obsolescence, and penalties for non-deliverable items. Secondly, market risks, such as failing to capture market opportunities, and challenges from competitors. From the perishable product of the Australian SMEs context, Ali et al. (2017) found transportation risks, financial risks, climatic risks, and supply-demand mismatch as the major supply chain risks. Ganeshan et al. (2018) identified supply chain risks in different contexts, such as information flows, product or material flows, cost flows, and their impacts on the overall supply chain performance. Thus, risks disrupt the upstream and downstream of the supply chain in an organisation (Badea et al. 2014), which have increased in an unprecedented manner in recent years with globalisation, outsourcing, rapid technological development, enhanced service or product complexity, and collaboration of supply networks across borders (Spiegler et al. 2012; Chen et al. 2013). Hence, based on the aforementioned risks and their negative impacts on firms' performance and operations, firms need supply chain risk management capabilities to evade and slash the impacts of disruptions in supply chains (Johnson et al. 2013; Urciuoli et al. 2014; Dohale et al. 2022).

2.2. Supply Chain Risk Management

Within the supply chain risk (SCR) literature, supply chain risk management (SCRM) has become a key area of interest. The notion of supply chain risk management is to

recognise the likelihood of risks in the supply chain and implement the action plan to reduce the risks and avoid supply chain failures (Juttner et al. 2003; Breuer et al. 2013). Fan and Stevenson (2018, p. 211) have outlined a holistic view of SCRM and stated it as “the identification, assessment, treatment, and monitoring of supply chain risks, with the aid of the internal implementation of tools, techniques and strategies and of external coordination and collaboration with supply chain members so as to reduce vulnerability and ensure continuity coupled with profitability, leading to competitive advantage”. A number of researchers (e.g., Tummala and Schoenherr 2011; Ho et al. 2015; Fan and Stevenson 2018) have, thus, focused on risk identification, risk assessment, risk mitigation, and risk monitoring as the SCRM methods to manage risks in the supply chain.

Risk identification is the first step in the SCRM approach, and it is challenging to develop a mitigation plan to reduce the impact of risks without identifying such risks (Breuer et al. 2013). Risk sources can be considered as internal and external risks. Internal risks are linked with decisions made and actions taken within a firm and include production risk, development risk, planning risk, and information risk (Lin and Zhou 2011), while external risks are outside the scope of control of a firm and include supply risk and delivery risk (Lockamy 2011). Generally, firms employ different methods, such as reactive and proactive methods, to identify risks. Reactive methods identify risks only after they have occurred, while proactive methods identify risks before they occur (Scholten et al. 2014).

After identifying risks, the possibility and impacts of such risks on a firm are determined in the risk assessment phase (Amundson et al. 2013). Risk possibility is an important consideration that determines the likelihood of a risk occurring (Lockamy 2014). The impacts of risks are determined through their impacts on a firm’s performance indicators, and examples of the effects of risks include low-quality products, poor delivery performance, and delivery of raw materials with wrong specifications (Vedel and Ellegaard 2013; Ghadge et al. 2013). With risks’ possibilities and impacts, firms can weigh each risk to determine the most damaging ones (Kumar et al. 2014). It is also essential to assess whether a risk has a high or low possibility of occurrence as well as a high or low effect on a firm. Products with higher impact and higher possibility of risk occurrence, such as raw materials supplied by one supplier, need to increase safety stock to mitigate the possibility of risks (Kumar et al. 2014). Each risk, therefore, needs an independent assessment to find a viable strategy to avoid a supply chain’s failure (Sharma and Bhat 2014).

In the risk mitigation phase, relevant strategies are developed following a risk assessment. Risk mitigation strategies reduce the possibilities of risk occurrences and their negative impacts on firms, which, therefore, require managers to select an applicable mitigation strategy for each risk (Sodhi et al. 2012; Liu et al. 2014). Curkovic et al. (2013) have outlined three mitigation responses to risks, such as accepting, reducing, and sharing the risks with other supply chain members. Authors such as Thun and Hoenig (2011) and Scholten et al. (2014) have categorised risk mitigation responses as proactive or reactive. Proactive strategies decrease the possibility of a risk that may occur in the supply chain, while reactive strategies reduce the impact of a risk after it has occurred. Examples of proactive strategies include improved tracing tools and selecting first-rate suppliers, while reactive strategies include safety stocks and multiple sourcing (Thun and Hoenig 2011; Sharma and Bhat 2014). Diehl and Spinler (2013) and Sharma and Bhat (2014) have, therefore, suggested evaluating each risk against the mitigation strategies available to the firm before selecting a risk mitigation strategy and undertaking a cost-benefit analysis.

After developing risk mitigation strategies, firms also need to monitor risks to complete their SCRM approach. Through risk monitoring, firms are able to find out the progress of risk mitigation strategies, adjust deviations, identify new preventative actions, and foresee possible risks (Saghafian and Oyen 2012). Firms, therefore, require considering which supply chain members and risks need more priority regarding risk monitoring. Some of the activities, such as supplier monitoring, include regular visits to supplier sites and evaluation of suppliers’ performance through capacity reviews, benchmarking, supplier questionnaires, and financial risk assessments (Scannell et al. 2013; Curkovic et al. 2013).

Tummala and Schoenherr (2011) and Charkhab et al. (2014) have, therefore, suggested that supply chain partners should be vigilant and regularly monitor risks with today's ever-changing risks and turbulent business environment.

2.3. SCRM in SMEs

Though it is recognised that the significant role of SMEs in economic growth (Bucher et al. 2016), SMEs face a variety of challenges in handling their business, and the challenges come in different forms, including access to finance, technology adoption, market access, human capital development, and infrastructure (Zuraimi et al. 2013; Ballesteros and Domingo 2015). The challenges, however, may arise due to SMEs' poor creditworthiness and lack of collateral to obtain external funds, having unskilled and inexperienced workers, low level of technological capabilities, failure to read market opportunities, and misinterpreting market demands (Ahmad and Seet 2009; Onyango and Achieng 2013). Furthermore, SMEs find it challenging to develop redundancy or safety stock, and they have lesser capacities to collaborate with or influence the behaviour of other supply chain partners due to their size, product volume, and resources (Ali et al. 2017; Polyviou et al. 2019).

Authors such as Christopher et al. (2011) and Ballesteros and Domingo (2015) have highlighted that there is a lack of knowledge in the application of SCRM in SMEs. SMEs are usually not well organised to deal with disruption and often characterised by casualness, which limits their capability to adopt risk management tools (Ballesteros and Domingo 2015). Despite several advances, the recent literature, however, clearly shows the scarcity of research on the phenomenon of SCRM in SMEs (Yaakub and Mustafa 2015). Sunjka and Emwanu (2013) have, thus, suggested carrying out more extensive research on SCRM in SMEs due to the limited studies in this area. In the Australian SMEs context, the current literature also shows the scarcity of empirical studies on the clothing retailing SMEs' supply chain risks and management practices, despite the importance of those SMEs to the Australian economy. Since the available literature and existing knowledge about the Australian clothing retailers' supply chain risk management processes are unknown, this study, therefore, focuses on the clothing retailers' supply chains in Australia to fill out the research gaps in the existing literature and identifies various supply chain risks and their management processes in clothing retailing SMEs in Australia.

3. Methodology

Consistent with the purpose of this study, an exploratory case study method has been used to answer the research questions as it is regarded as an appropriate approach to attain an in-depth insight into a specific phenomenon in a real-life context and acquire insights by assessing and comparing findings within and across cases (Yin 2009; Barratt et al. 2011).

3.1. Sampling and Data Collection

As mentioned earlier, this study focuses on SMEs of clothing retailers in Australia. In Australia, there is no uniform legislative definition of an SME (Commonwealth of Australia 2018). Trewin (2002) defines a small business as a business that employs less than 20 employees or, if the business is a manufacturing business, the business employs less than 100 employees, and a medium business ranges up to 200 employees. Baron (1995) and Wiesner et al. (2007) have classified SMEs in their studies as those businesses that employ between 20 and 200 employees. SMEs with a workforce within the range between 20 and 200 are likely to have a management structure, whereas smaller businesses tend to have informal organisational formations and management practices (Wiesner et al. 2007). The present study, therefore, considers businesses with a workforce of between 20 and 200, and the unit of analysis for this study is the clothing retailing business in Australia. Homogenous sampling has been used in this study where resembling individuals and sites have been selected based on their capacity to provide meaningful information and have strategic and operational knowledge of the business's supply chain and willingness

to share openly on supply chain risks and management strategies used in the business to assist in understanding the studied topic.

The data were collected through in-depth semi-structured face-to-face interviews. An interview protocol was developed following Creswell (2013), which had a standard set of questions that were arranged under the main topic, open-ended questions, and probes to implant detailed information on SCRM. The questionnaire was also pilot-tested with two industry practitioners to confirm the appropriateness of the questions. The interviews were conducted between January and March 2020 with the local businesses in Campbelltown City, as it is the economic heart of the South-Western region of Sydney in Australia. Campbelltown City Council maintains a database of businesses in the region, and contacts of participants were collected from there. All contacts were pooled, and knowledgeable respondents were selected using the purposive (expert) sampling method as of Creswell (2013). A total of twenty face-to-face semi-structured interviews were conducted to obtain useful insights with twenty participants from SMEs of clothing retailing businesses who agreed to participate. The respondents included six owner-managers who owned and managed the businesses, six managers, five sales managers, and three store managers of SMEs that have more than one clothing retailing outlet. The sample size was chosen based on the guidelines of Guest et al. (2006), who assert that 6–12 interviews are adequate for the development of meaningful themes, valuable interpretations, and the occurrence of saturation in the data. All interviews were recorded except for seven, where the participants were unwilling to be recorded; hence, extensive notes were taken as suggested by Creswell (2013).

3.2. Data Analysis

The interviews were transcribed fully verbatim, and primary exploratory analysis was conducted by way of listening to the digital recordings and matching them against the transcripts to be familiar with the data and generate codes (Strauss and Corbin 1990; Creswell 2013). Hence, a content analysis was carried out to analyse the data collected in this study, and NVivo 11 software was used to conduct the analysis. To achieve the credibility and transferability of the analysis and findings, following the principles of Guba (1981) and Guba and Lincoln (1994), the participants were requested to review the interview transcripts and provide feedback on any oversights or misunderstandings, and diverse participants were selected to represent variations in the type of job responsibilities and positions.

4. Research Findings and Discussion

The analyses of interview data address the research questions and unravel the major supply chain risks experienced by SMEs of clothing retailers in Australia and how those SMEs of clothing retailers manage their supply chain risks.

4.1. Supply Chain Risks

Based on the interviewees' responses and data analysis, this study identifies the following five risks that the SMEs of clothing retailers mostly encounter in their supply chains, namely (1) supply risks, (2) demand risks, (3) financial risks, (4) environmental risks, and (5) operational risks, though other supply chain risks such as transportation risks, market risks, reputational risks, geopolitical risks, and risks associated with the global economy and labour shortages are also identified.

Supply risks are those that disrupt supply and are related to adverse events in inbound supply that impact the ability of a firm to meet customer demand and impede the sale within the anticipated costs and time (Diehl and Spinler 2013). Supply risks comprise suppliers' performance, markets and shipments that disrupt production, projections and delivery plans, quality failures, and transit time variability (Manuj and Mentzer 2008; Christopher et al. 2011). Similar to the findings of Christopher et al. (2011) and Samvedi et al. (2013), most of the participants (14 of the 20 interviewees) in this study mentioned that

they encountered a variety of supply risks and the followings are the illustrative examples of their supply risks: quality failures such as a shipment of products that do not conform to specification, delivery failures or late delivery, supplies that are out of stock when they need them, price increases, supplier out of business, incompetent supplier selection, and a sudden drop in supply due to unexpected events such as environmental calamity and labour dispute.

Demand risks, which are caused by unpredictable or misunderstood customer or end-customer demand, have affected 13 of the 20 participants in this study, and the following quote from the sales manager of Firm 16 highlights their risk: *“You know, it’s an incredibly volatile retailing business that depends on customers’ purchasing powers and moods, interest rates and their mortgage payments, weather changes, pricing discounts, promotions, which all cause volatility in the demand. So, we can’t make an accurate forecast that we can plug into our planning to procure our sales items”*. Similar to this study’s findings, [Tummala and Schoenherr \(2011\)](#), [Christopher et al. \(2011\)](#), and [Samvedi et al. \(2013\)](#) have identified that demand risks are among the major risks in a supply chain.

Financial risks, which are caused by various factors such as the high cost of doing business, price volatility, difficulties in obtaining financing from financial institutions due to SMEs’ high-risk profiles, and a supplier’s financial capacity or sale of a supplier’s business, have been described by 12 of the interviewees as among the major risks in the supply chain. On a similar note, [Cavinato \(2004\)](#), [Tang and Musa \(2011\)](#), and [Dadfar et al. \(2012\)](#) have highlighted that the financial limitations of SMEs restrict them from accessing international markets, which makes them heavily reliant on local markets and makes them less competitive and resistant to disruptions.

Environmental risks, which are arisen from outside the supply chain and are usually related to social, economic, and natural disasters such as storms, floods, droughts, and disease outbreaks, have been reported by 12 participants as the major risks in the supply chains. In line with the findings of this study, authors such as [Kumar et al. \(2010\)](#) and [Samvedi et al. \(2013\)](#) have outlined environmental risks as a firm’s external risks to the supply chain networks, which affect a firm enormously from outside the supply chain.

Operational risks, which are caused by inadequate assessments and planning that make ineffective management, have been reported by seven interviewees in this study who informed that they had not been given the authority to participate in substantive decisions and communicate new ideas, which hindered the ability to be proactive for changes and attain adaptability to disruptions and businesses operations. Authors such as [Tang \(2006\)](#), [Manuj and Mentzer \(2008\)](#) and [Christopher et al. \(2011\)](#) have also identified that operational risks are among the major risks that SMEs encounter in their supply chains. The following Figure 1 shows the Australian clothing retailers’ responses to their supply chain risks.

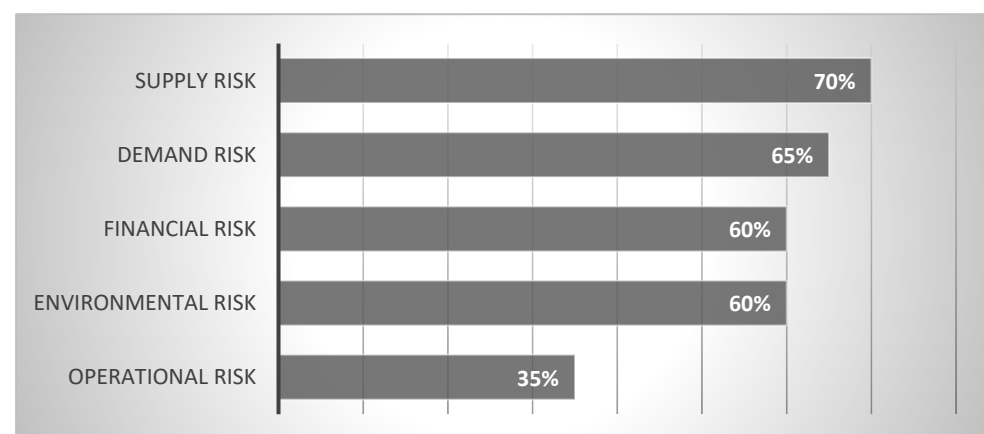


Figure 1. Australian clothing retailers’ responses to SCR.

4.2. Supply Chain Risk Management Processes

Considering researchers' (Tummala and Schoenherr 2011; Ho et al. 2015; Fan and Stevenson 2018) suggested SCRM methods such as risk identification, risk assessment, risk mitigation, and risk monitoring, this study finds that most of the investigated clothing retailers lacked a formal risk identification approach such as reactive and proactive methods. The reactive method identifies risks only after they have occurred, while the proactive method identifies risks before they occur (Scholten et al. 2014). Most of the interviewees indicated that they used the reactive method to risks, and the proactive method, which consisted of observation, feedback, brainstorming, and audits, was considered by nine of the 20 participants. Uses of observations and feedback as proactive methods, for example, are illustrated in the following quote from the participant of Firm 11: *"We get continuous feedback from our customers, observe their buying patterns and other incoming risks. We try to develop contingency plans ahead of time and we expect our suppliers to do the same"*.

Authors such as Bandaly et al. (2012) and Amundson et al. (2013) highlight that the assessment of risks supports a firm to rank and categorise risks based on likelihood, frequency, and impact. Firms usually use risk assessment scales and risk assessment tools to assess the risks. In this study, most of the retailers (12 of the 20 participants) said that they used two scales, namely risk likelihood and risk impact, to assess the risks. For example, one of the owner-managers of the participating firms made the following comments: *"We are always mindful of inherent risks, and we assess risks based on their likelihoods and impacts. We use these approaches right through our business, whether it's financial or operational, we always look at the inherent risks, low or high probabilities, and what are the financial impacts of those"*. These scales are in line with the study of Lockamy (2014) and Kumar et al. (2014), where risk likelihood and risk impact are mentioned as the standard risk prioritisation scales. In this study, the participating firms also used risk assessment tools and categorised them as internal and external assessments. Internal assessments focused on the firm's operations, while external assessments focused on the external supply chain partners such as suppliers and customers. Key performance indicators and scorecards were used to measure the level of inventory, on-time delivery, filling rate, and so on as internal assessment tools, and supplier audits and benchmarking were used as external assessment tools. However, most of the participants in this study highlighted that the assessment methods were not well established in their firms and that they should formalise the methods, though some of the participants asserted that those informal methods worked for them. These findings are consistent with the industry report presented by the Global Supply Chain Institute (2014).

Sodhi et al. (2012) and Liu et al. (2014) assert that risk mitigation strategies focus on formulating plans that decrease the risk likelihood and risk impact or both. In this study, 14 of the 20 participants reported that they selected high-quality suppliers as proactive strategies to decrease the possibility of a risk that may occur in their supply chain, and as reactive strategies, 12 participants said that they followed a flexibility approach such as using of multiple sourcing, and eight participants said that they followed a redundant approach such as the keeping of strategic stock and safety stocks to reduce the impact of a risk after it has occurred. The use of first-rate suppliers and flexibility and redundant approaches in slashing the likelihood and impact of risks are also supported by Wieland (2013) and Kumar et al. (2014).

Tummala and Schoenherr (2011) and Saghafian and Oyen (2012) highlight the importance of risk monitoring and assert that it weighs the effectiveness of risk mitigation approaches, seeks to correct deviations, and finds new strategies that reduce risks. In this study, most of the participants said that they used supplier reviews, benchmarking, and market and financial risk analysis approaches to monitor the risks, though seven of the 20 participants said that their monitoring approach covered their own activities as well. The risk monitoring tools identified in this study are also similar to those identified by Scannell et al. (2013) and Curkovic et al. (2013).

4.3. Managerial Implications

Being a member of complex supply chain networks, SMEs, which have limited resources compared to larger firms, require their managers to identify and manage the supply chain risks to slash the effect of uncertainty and vulnerability in their firms and supply chains. This study informs that most of the investigated retailers lack a formal risk identification approach, though they informally use the reactive and proactive methods of risk identification. A structured approach would benefit the firms and managers to have a similar basis of discussion and cooperation in risk mitigation. This study also informs that the assessment methods are not well established in most of the participating firms, which is crucial to allocate resources to reduce the highest impact of risks and the likelihood of risks. Furthermore, supplier monitoring receives more attention in most of the firms, while their own performance receives less attention to deal with their supply chain risks. This study, thus, identifies various supply chain risks in SMEs of clothing retailers in Australia and shares retailers' practices on how they manage the supply chain risks, which will provide an opportunity for SME managers in other sectors to review their current approaches and adopt more robust strategies to build resilience in their supply chains.

5. Conclusions, Limitations, and Future Research

The purpose of this paper is to identify various supply chain risks and their management processes in SMEs of clothing retailing businesses in Australia. The study has been carried out using a descriptive qualitative research design through 20 face-to-face semi-structured interviews. Responding to the two research questions, the findings of this paper present several significant contributions to the existing literature. First, addressing RQ1, this study identifies five supply chain risks, namely supply risks, demand risks, financial risks, environmental risks, and operational risks, that the SMEs of clothing retailers mostly face in the supply chains. Second, addressing RQ2 on how the SMEs of clothing retailers manage their supply chain risks, this study finds that most of the investigated retailers lack a formal risk identification approach, though they informally use the reactive and proactive methods of risk identification. This study also finds that the assessment methods are not well established in most of the participating firms, and supplier monitoring receives more attention compared to their own performance in dealing with their supply chain risks. Finally, this study contributes to the body of knowledge by being one of the first empirical studies to explore the SMEs of clothing retailers' supply chain risks and their management processes in the Australian business context, which can add valuable insights for academics and practitioners in guiding supply chain design decisions for the SMEs.

Despite this study's practical implications, it has some limitations, and special cautions are needed to generalise the findings of this study due to its sampling and geographical limitations. The results may consist of biases due to the personal opinions of the experts expressed during the interview process. Hence, whilst this study explores several supply chain risks and their management processes in SMEs of Australian clothing retailers, it can be explored through large-scale quantitative analysis. Different retailers of consumer goods can also be focused on in future research, such as electronics, grocery, or household goods. Furthermore, it would be interesting to see whether similar findings are found if the study is to be replicated in other countries with similar economies.

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