Linking supply chain risk management to financial performance of SMEs: can supply chain collaboration moderate?

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Abstract

While supply chain risk management is widely recognised for mitigating disruptions and enhancing operational efficiency, its impact on the financial performance of manufacturing small and medium-sized enterprises remains underexplored, particularly when considering the moderating effect of supply chain collaboration. Based on the resource-based view and relational view, this study analysed the relationship between supply chain risk management and the financial performance of manufacturing small and medium enterprises. The moderating effect of supply chain collaboration was also investigated. The study used a cross-sectional design and data were collected from 162 manufacturing small and medium-sized enterprises in Dar es Salaam, Tanzania. A partial least squares structural equation modeling was employed to analyse the effect of supply chain risk management on financial performance and the moderating effect of supply chain collaboration. The findings unveil that supply chain risk management positively and significantly affects financial performance. Initially, this study hypothesised that supply chain collaboration significantly strengthens the effect of supply chain risk management in achieving manufacturing small and medium enterprises' financial performance. Despite the fact that the study's findings show that supply chain collaboration does not significantly moderate the relationship between supply chain risk management and financial performance, supply chain collaboration has a positive direct effect on financial performance. Thus, small and medium-sized enterprises should implement supply chain risk management and supply chain collaboration practices as they have positive impact on financial performance. While there may not be a significant interaction effect, the financial performance can still be enhanced by utilising each practice independently.

Received
6 April 2025
Received in revised form
3 June 2025
13 August 2025
9 October 2025
Accepted
28 October 2025

Keywords:
Supply chain
Risk management
Collaboration
Financial performance
SMEs

1. Introduction

Small and medium-sized enterprises (SMEs) are vital engines for economic development (Changalima et al., 2025; Msechu et al., 2024; Nkwabi & Mboya, 2019). They act as drivers of growth through employment and innovation, particularly in both developed and developing countries (Mchopa et al., 2024; Ndibalema et al. 2024; Ringo et al., 2023; Syzdykova & Azretbergenova, 2025). However, the financial stability of some of these enterprises become weakened because of supply chain vulnerability and disruptions (Bak et al., 2020; Nakandala, 2025; Nkwabi, 2019). One of the recent occasions that prompted the need to manage supply chain disruptions, is the emergence and spread of the COVID-19 in different sectors (Bhuiyan et al. 2024; Changalima, 2023; Kahveci et al. 2025; Makona et al., 2023). Based on the previous disruptions such as COVID-19, which pose some challenges for SMEs in enhancing operational performance in a competitive manner, effective supply chain risk management strategies have become relevant (Ivanov, 2021). To survive in the supply chain disruptions, some enterprises diverge towards proactive supply chain risk management practices and supply chain collaboration as vital strategies. In this regard, supplier diversification for broadening supplier bases and partnerships has become a relevant practice for manufacturing enterprises (Kimario & Mwagike, 2024). Such practices are relevant for enhancing financial stability of firms and handling supply chain disruptions (Foli et al., 2024; Uwamahoro et al., 2025).

Risks which are uncertainties, especially financial and supply chain risks remain dominant concerns in various sectors across organisations in the world (Mwaiseje et al., 2025; Temba et al., 2024; Wieland, 2021). In the context of SMEs, supply chain risks may take different forms related to price fluctuations, supplier failure and other unforeseen events that disrupt the normal operations of supply chains. In the same way, a number of SMEs, particularly those

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https://doi.org/10.58548/2025abmj32.1932

operating in hostile areas, have been experiencing uncertainties (Althaqafi, 2024; Charpin, 2022; Kotcharin & Jantadej, 2024; Krykavskyy et al., 2023). Experience from Tanzania shows that SMEs that engage in manufacturing operations repeatedly face supply chain challenges (Ismail et al. 2023; Ringo et al. 2022; Rutainurwa et al. 2024). High freight costs and frequent delivery delays are amongst the pressing challenges for SMEs resulting from insufficient logistics infrastructure, poor road conditions, port congestion and unreliable transport systems (Hamisi, 2011). Such obstacles hinder market accessibility and escalate the cost of doing business for SMEs. In the financial perspective, high interest rates, restricted access to credit, and pose difficulties to SMEs in accessing loans, thus restraining their ability to capitalise on supply chain improvements and disruption prevention. On the other hand, Rutainurwa et al. (2024) and Rutatola et al. (2024) claim that operational inefficiencies among SMEs are aggravated by several factors, including inadequate adoption of modern technologies and inadequate supply chain coordination. This is attributed to the fact that SMEs lack essential digitalisation skills and systems to implement and achieve effective supply chain integration. All these risks hinder the growth and weaken the competitiveness of manufacturing SMEs.

Consequently, such exposure to disruption and other uncertainties has triggered vigorous supply chain risk management practices (Vanderfold, 2024). In this regard, SMEs may survive supply chain disruptions through implementing various strategies in supply chain risk management including supplier diversification, and flexible inventory management operations (Bhuiyan et al., 2024; Vanderfold, 2024). Research on supply chain risk management has received attention, especially in the context of SMEs. However, the gap remains in exploring the influence of supply chain risk management on manufacturing SMEs' financial performance, particularly in developing countries like Tanzania. In this region SMEs are facing significant challenges like insufficient capital, and other bottlenecks linked to infrastructure and business operations. These challenges, combined with trade disruptions along the global supply chains have necessitated for adopting and implementing proactive supply chain risk management strategies to allow for SMEs to flourish and overcome risks (Dausen, 2024). Therefore, the current study focuses on bridging this gap through analysing the influence of supply chain risk management on financial performance of manufacturing SMEs. The study extends further by analysing the moderating effect of supply chain collaboration on the link between supply chain risk management and financial performance.

2. Literature review and hypothesis development

This section presents the adopted theories and empirical literature review which are relevant for hypothesis development.

2.1 Theoretical underpinnings

2.1.1 Resource-based view

In the context of this study, the resource-based view (RBV) (Barney, 1991) is adopted as a key theory. The theory considers achievement of competitive advantage based on the existence of resources that the firm possesses (Lavie, 2006). Therefore, supply chain risk management is a collection of intangibles, firm-specific resources, notably including risk prevention, detection, response, and recovery capabilities, which satisfy the valuable, rare, inimitable, and non-substitutable (VRIN) criteria (Jerome et al., 2024; Sun et al., 2023). The capability of organisations to proactively identify and mitigate disruptions, provide a competitive advantage in supply environments that are not stable. In this regard, unique competencies in the firm can be developed through effective risk recovery processes that are integrated in organisational routines (Tukamuhabwa, 2023). Based on the RBV, the study considers supply chain risk management as crucial resource for enhancing firm performance of SMEs (Ba Awain et al., 2025).

2.1.2 Relational view

The study employed the relational view as another theory that consider the variable, supply chain collaboration. In the current study, this theory complements the RBV as the study posits that supply chain collaboration is important in firm performance. The relational view centres on dyads of networks that are responsible for firm performance (Dyer & Singh, 1998). The networks include collaborative practices such as joint knowledge creation, coordinated risk response, and mutual trust-building. These are important for firm's operations as supply chain partners enables SMEs to access complementary resources and skills that are somehow difficult to possess (Jidda et al., 2025). Collaborative strategies improve knowledge integration, facilitate joint problem-solving in uncertain conditions, and strengthen the beneficial impact of supply chain risk management capabilities on financial performance (Safari et al., 2024). Accordingly, this theory builds as a strong theoretical framework for analysing the role of supply chain collaboration in performance of SMEs.

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2.2 Hypothesis development

2.2.1 Supply chain risk management and financial performance of SMEs

Managing supply chain risks is crucial in the context of SMEs so as to have uninterrupted supply chain operations. In this study, supply chain risk management is defined as an organised approach to safeguarding supply chain operations by early risk detection, risk response through cost-effective contingency measures, avoiding disruptions, and risk recovery (Kauppi et al., 2016). SMEs are more likely to be vulnerable to financial problems compared to their counterparts, large firms (Kaur et al., 2023). This is due to their size that affect their financial strength in business environments. In a similar manner, they are exposed to problems such as price fluctuations and supply disruptions which form a largely part of supply chain risks. The fact that many of the SMEs are limited in size further complicates the situation by making them more prone to disruption, particularly from market volatility and inefficient material procurement. The financial constraints and insufficient alternatives when it come to the number of suppliers deepen the impact of disruptions (Felix et al., 2025; Notteboom et al., 2021). Thus, highlighting the need for effective supply chain risk management strategies to increase SMEs' resilience and guarantee continuity and stability in uncertain situations.

Research has shown that there is a direct link between supply chain risk management and the financial success of small businesses. For example, Sun et al. (2025) show that SMEs that implement supply chain risk management activities like proactive risk identification, collaborative risk mitigation, and contingency planning as a permanent part of their operations see big increases in their financial performance. This study showed that supply chain risk management not only reduced problems but also made it easier for SMEs to get supply chain financing, which made their finances stronger. Similarly, Qiao and Zhao (2023) stress that supply chain risk management skills can go beyond reducing risk and can also change how outsiders see a company's finances. Their results show that SMEs that are good at supply chain risk management have easier access to credit lines and better financing rates, which make them more likely to spend and have more cash on hand. This financial benefit comes from the fact that companies with organised risk management skills are seen as less risky and more trustworthy, increasing their perceived value.

Also, Jidda et al. (2025) study how the strength of an organisation impacts the link between supply chain risk management and business success. According to their study, supply chain risk management driven resilience skills like adaptability, flexibility, and a focus on learning, make it much easier for small businesses to deal with and recover from supply chain problems. This, in turn, leads to better long-term financial performance. Furthermore, previous studies that are focusing on financial performance in the context of supply chains, especially in Africa present relevant effects of factors such as internal green supply chain, green HRM practices, green supply chain management, and green logistics on financial performance (Chuwa et al. 2025). On the other hand, research shows that the way supply chain risk management contributes to business success can be affected by some conditions such as supply chain complexity, business stability, and market conditions (Mafini & Muposhi, 2017). Despite these findings from previous studies, the specific contribution of supply chain risk management to the financial performance of SMEs still remains relevant. Therefore, the current study hypothesises the following:-

H1: Supply chain risk management positively affects financial performance of SMEs

2.2.2 The moderating role of supply chain collaboration

Supply chain collaboration has surfaced as a significant strategy for refining and strengthening supply chain resilience and financial performance (Tukamuhabwa et al., 2017). In the context of this study, supply chain collaboration is defined as a strategic alliance where SMEs align with trusted and reliable partners to equitably share costs and benefits, build partnerships based on trust and long-term obligations, jointly implement low-cost, high-impact operational improvements such as shared warehousing, and synchronize efforts in inventory management and demand forecasting to reduce stock imbalances (Baah et al., 2022). Collaboration and alliance among the key supply chain stakeholders (suppliers, manufacturers, and distributors) fosters healthier relationships through joint decision-making, sharing of information, and dividing the risk hence minimising the adversative consequences of disruptions in supply chains (Foli et al., 2024; Ralston et al., 2015).

Existing research supports that supply chain collaboration significantly enhances supply initiatives in managing supply chain risks. For instance, information integration among supply chain practices enhance the capabilities of supply chain risk management in improving organisational outcomes (Qiao & Zhao, 2023). Therefore, SMEs that are exposed in strategic collaborations are more likely to achieve desired financial outcomes with reduction in financial risks. The current study posits that collaboration is important in explaining conditions under which supply chain risk management relates to financial performance of SMEs. This is because collaboration enhances the adaptive capacities

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of SMEs in turbulent environments, as it allows them to access critical external knowledge and resources which include supply chain risk management. Based on this discussion, the following hypotheses are formulated:-

H2: Supply chain collaboration positively affects financial performance of SMEs

H3: Supply chain collaboration strengthens the relationship between supply chain risk management and financial performance of SMEs.

2.3 The conceptual framework

Figure 1 presents the conceptual framework of the current study. The figure demonstrates that supply chain risk management is the predicting variable, supply chain collaboration is the moderating variable and financial performance is the dependent variable. The figure also presents study's hypotheses which are H1, H2 and H3 from which the hypotheses are established on the ground of the reviewed literature as presented in this study.

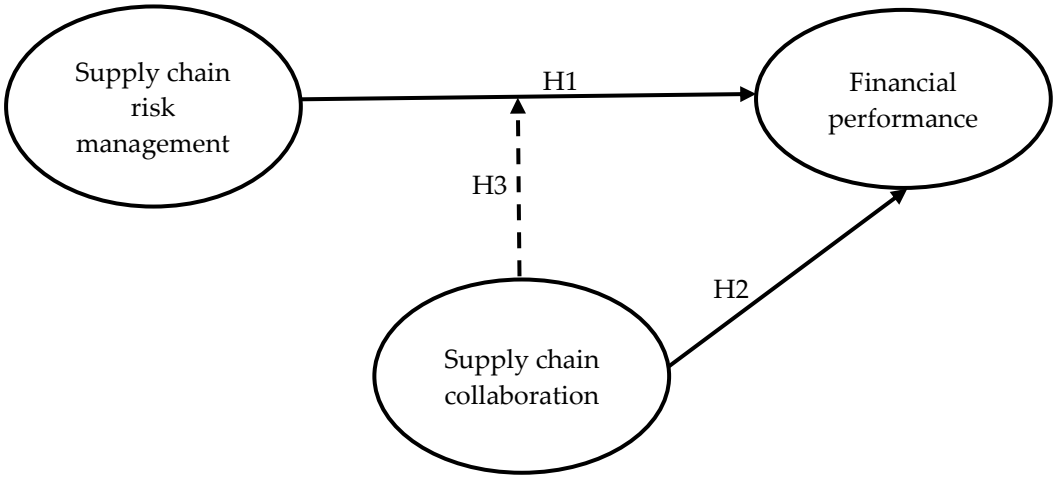

Figure 1. The conceptual model
Source: Figure by authors

3. Methodology

3.1 Research approach and design

This study employed a quantitative research approach. This is relevant as the focus is on examining the hypothesised relationships as presented in Figure 1. The approach allowed for analysing relationship between the independent variable (supply chain risk management), moderating variable (supply chain collaboration), and dependent variable (financial performance). The approach involved primary data and quantitative analysis (Creswell & Creswell, 2017). Additionally, the study collected data only once at a single point in time from SMEs, hence cross-sectional design was employed (Bell et al., 2022; Saunders et al., 2019). This design is relevant for giving a snapshot of the relationships between study's variables, especially in business and management research (Bell et al., 2022).

3.2 Sample and data collection

The study targeted SMEs located in Dar es Salaam region, Tanzania. Because Dar es Salaam has the largest number of SMEs in Tanzania, it was designated as the study's location, guaranteeing a varied and distinctive sample of businesses vigorously involved in supply chain management. Specifically, data was collected from SMEs located in Dar es Salaam, which accounts for 11.8% (25,935) of all establishments in Tanzania [National Bureau of Statistics (NBS), 2024]. Despite the existence of several SMEs in different sectors, the study focused on manufacturing SMEs as the manufacturing sector accounts for more than 17,463 establishments that are engaged in manufacturing activities (NBS, 2024). The study involved supply chain managers as the primary unit of inquiry for data collection. These managers were involved in the supply chain activities of their specific enterprises. Therefore, managers were selected owing to their participation in supply chain risk management, supply chain collaboration with other supply chain partners, and other operational activities of the enterprise.

Based on the nature of SMEs' operations and the list obtained from the relevant authorities the study employed a simple random sampling technique to obtain the representative sample. Simple random sampling procedure is relevant in reducing bias as every member of the target population has an equal chance of being included in the final sample of the study (Bell et al., 2022). The final sample size constituted of 162 manufacturing SMEs. To ensure that the final sample size is enough, the study employed a G*power software to conduct a post-hoc analysis to check whether the final sample size achieved satisfactory statistical power for quantitative analysis. Based on this sample size, the

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desired statistical power of 0.99, greater than 0.8 was achieved. Therefore, it was concluded that the sample of 162 manufacturing SMEs was adequate for final analysis.

3.3 Questionnaire and measurements

The study included managers of respective SMEs as unit of inquiry. Therefore, structured questionnaires were administered to them to obtain the relevant data. Based on the recommendations of Hair et al. (2020), the current study utilised the standardised questionnaire so as to have consistent and reliable responses for quantitative analysis. Specifically, the study utilised measurements of variables from existing research, that had been previously validated in order to ensure accuracy and reliability. Supply chain risk management had four items that were adapted from Kauppi et al. (2016). The measures were used because they consider the firm's efforts in recent years to detect, predict, or reduce the impacts of supply chain disruptions and defaults. The measures were relevant in the field as Shou et al. (2018), Chaudhuri et al. (2018), and Munir et al. (2020) utilised the same measures. Also, supply chain collaboration was measured using four items as adapted from a study conducted by Baah et al. (2022). Lastly, financial performance was measured using three items as used by Chi and Gursoy (2009). These measures were employed because they focus on key aspects of financial performance which include profitability, return on investment, and net profit in comparison to its competitors. All measurement items in the questionnaire as presented in Table 1 were rated on a five-point Likert scale, which ranged from 1 ("strongly disagree") to 5 ("strongly agree").

Table 1. Measurement model assessment results

Constructs/items	VIF	Outer loadings
Supply chain risk management (Cronbach's alpha = 0.900, Composite reliability = 0.930, AVE = 0.770)		
• Preventing operations risk (e.g. select a more reliable supplier, use clear safety procedures, preventive maintenance) (SCRM 1)	2.904	0.899
• Detecting operations risks (e.g. internal or supplier monitoring, inspection, tracking) (SCRM 2)	2.584	0.869
• Responding to operations risks (e.g. backup suppliers, extra capacity, alternative transportation modes) (SCRM 3)	2.842	0.881
• Recovering from operations risks (e.g. task forces, contingency plans, clear responsibility) (SCRM 4)	2.543	0.859
Supply chain collaboration (Cronbach's alpha = 0.851, Composite reliability = 0.900, AVE = 0.693)		
• Our firm and supply chain partners share benefits and costs (e.g. inventory cost savings and loss on order changes) (SCC1)	3.258	0.857
• Our firm and supply chain partners jointly search, acquire, assimilate and apply relevant knowledge (SCC2)	1.653	0.761
• Our firm and supply chain partners have agreements on the relevance of improvements that benefit the whole supply network (SCC3)	3.962	0.914
• Our firm and supply chain partners collaboratively manage inventory and demand forecasts (SCC4)	1.770	0.789
Financial performance (Cronbach's alpha = 0.730, Composite reliability = 0.848, AVE = 0.650)		
• Our profitability has increased in recent years compared to our major competitors (FP1)	1.473	0.819
• Our return on investment has increased in recent years compared to our major competitors (FP2)	1.485	0.813
• Our net profit has increased in recent years compared to our major competitors (FP3)	1.379	0.785

Source: Table by authors

3.4 Data analysis

The study employed partial least squares structural equation modeling (PLS-SEM) as the main quantitative technique for analysing the collected data. The study utilised SmartPLS 4 (Ringle et al., 2024), as a main software for conducting PLS-SEM. The technique was used in this study due to its capability to handle both latent and observed variables and hence, makes it relevant for estimating complex relationships (Hair et al., 2013). Therefore, PLS-SEM is relevant for exploring models that include multiple relationships with latent and observed variables. Additionally, PLS-SEM is capable of analysing data from small sample sizes, with the consideration of the current study, the sample was small and hence, PLS-SEM was relevant (Hair et al., 2019).

3.5 Common method variance

The study involved a single respondent (manager) from each SME as a unit of inquiry. This may result into a probable bias. Therefore, the study checked on the common method variance (CMV) by using two statistical measures which

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are Harman's single-factor analysis (Harman, 1967), and collinearity tests (Kock, 2015). The Harman single-factor analysis revealed that only 38.07% of variance is explained by a single factor. This indicates that CMV did not pose a significant problem in this study as the value is less than 50% (Podsakoff et al., 2003). On the other hand, variance inflation factor (VIF) values were under 3.3, further confirming that CMV did not present a substantial problem in this study (Kock, 2015).

4. Results and discussion

4.1 Measurement model assessment

Initially, the analysis involved the assessment of the measurement model to establish the reliability and validity of measures applied in the study. The VIF values for all indicators are below 5 (See Table 1), implying the absence of collinearity concerns. Similarly, the reliability of indicators was realised as all loadings were above 0.708, and the Cronbach's alpha values are above 0.7, which confirms internal consistency (Cronbach, 1951; Santos, 1999). Additionally, the composite reliability values as presented in Table 1 support the study findings as they are all above 0.7 (Chan & Lay, 2018). Also, average variance extracted (AVE) values (See Table 1) are all above 0.5, signifying the achievement of convergent validity (Hair et al., 2022) and indicating that more than half of the variance in the examined measures is explained by their respective hypothesis.

Three common established techniques were applied in this study to assess discriminant validity, guaranteeing that the constructs are independent. This is contributed by the fact that in PLS-SEM it is imperative to ensure that the formed indicators for different hypotheses do not unintentionally reflect the same primary measures (Franke & Sarstedt, 2019). Findings in Table 2 and 3 demonstrate that discriminant validity was realised based on three techniques, namely, Fornell-Larcker criterion, Heterotrait-Monotrait ration (HTMT) and cross-loadings.

Table 2. Fornell-Larcker criterion and cross-loadings

Fornell-Larcker Criterion				
Construct	**Financial performance**		**Supply chain collaboration**	**Supply chain risk management**
Financial performance	*0.806*			
Supply chain collaboration	0.494		*0.833*	
Supply chain risk management	0.463		0.539	*0.877*
Cross loadings				
Items	**Financial performance**	**Supply chain collaboration**	**Supply chain risk management**	**Supply chain risk management*Supply chain collaboration**
FP1	**0.819**	0.427	0.369	-0.129
FP2	**0.813**	0.386	0.379	-0.095
FP3	**0.785**	0.382	0.373	-0.137
SCC1	0.414	**0.857**	0.371	-0.345
SCC2	0.341	**0.761**	0.466	-0.323
SCC3	0.469	**0.914**	0.483	-0.438
SCC4	0.410	**0.789**	0.482	-0.401
SCRM1	0.454	0.497	**0.899**	-0.350
SCRM2	0.416	0.456	**0.869**	-0.378
SCRM3	0.375	0.488	**0.881**	-0.326
SCRM4	0.372	0.450	**0.859**	-0.278
SCRM*SCC	-0.149	-0.456	-0.381	**1.000**

Source: Table by authors

Table 2 indicates that discriminant validity is achieved as the Fornell-Larcker criterion and assumptions of cross-loadings were met. Specifically, diagonal values as presented by italicised values in Table 2 denote the square root of AVE. The values are larger than the correlations amid constructs (Fornell & Larcker, 1981). Therefore, discriminant validity was realised. On the other hand, cross-loadings analysis in Table 2 reveals that items load more strongly on their corresponding constructs compared to other constructs (Hair et al., 2022; Henseler et al., 2009), suggesting supplementary evidence for the distinctiveness of the constructs. Furthermore, the results in Table 3 present HTMT values that are below 0.85, signifying that the correlations amid constructs are within the recommended limit (Ringle et al., 2023). All three techniques confirm the achievement of discriminant validity.

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Table 3. HTMT matrix

HTMT matrix			
Construct	**Financial performance**	**Supply chain collaboration**	**Supply chain risk management**
Financial performance			
Supply chain collaboration	0.623		
Supply chain risk management	0.568	0.619	
Supply chain collaboration*Supply chain risk management	0.175	0.491	0.400

Source: Table by authors

4.2 Structural model assessment

Following the achievement of consistency and validity as presented in the measurement model results, the structural model assessment was done. Critical facets remained under consideration in presenting the structural model results including collinearity assessment, path coefficients, significance of relationships, and predictive relevance, as suggested in PLS-SEM literature (Hair et al., 2019; Ringle et al., 2023). Specifically, Table 4 presents VIF values in the inner model which are 1.457, 1.572, and 1.305 for the relationships between supply chain risk management and financial performance, supply chain collaboration and financial performance, and the moderating effect of supply chain collaboration on the relationship between supply chain risk management and financial performance, respectively. These findings validate the view of no multicollinearity concerns that might affect the results (Hair et al., 2019). The Q^2 value for assessing the model's predictive relevance was 0.230 (see Table 4). This value signifies that the model attained predictive relevance in the final model as the value is above zero (Hair et al., 2019).

Table 4. Collinearity, effect size, explained and predictive relevance

Relationships	**VIF**	**f^2**	**R^2**	**Q^2**
H1: Supply chain risk management → Financial performance	1.457	0.094	0.316	0.230
H2: Supply chain collaboration → Financial performance	1.572	0.147		
H3: SCRM*SCC → Financial performance	1.305	0.025		

Note(s): SCRM*SCC denotes Supply chain risk management*Supply chain collaboration

Source: Table by authors

Additionally, the structural model suggests that all indicators applied in the study are relevant as justified by their statistical significance that was realised through bootstrapping procedures (Henseler et al., 2016). SmartPLS 4 was used to conduct bootstrapping procedures whereby the results of the hypothesised model were analysed to evaluate the relationships and assess the effect size (f^2) for each relationship. Therefore, findings were presented by examining p-values, beta coefficients, t-statistics, and f^2 (Ringle et al., 2023). The study presents findings using three main relationships. First, the direct effect, the effect of the moderating variable and the moderating effect in the structural model as presented in Figure 2. It is vital to note that the R^2 supports the adequacy of the model predictive power with the existing predictive variables. The R^2 value of 0.316 presented in Figure 2 and Table 4 implies a variance of about 31.6% in the outcome variable (financial performance). The variance results from supply chain risk management, supply chain collaboration, and the interaction effect (supply chain risk management*supply chain collaboration) in the structural model.

The results for H1 in Table 5 specify that there is a positive and significant relationship between supply chain risk management and financial performance ($\beta = 0.306$, $p = 0.001$, $t = 3.275$) with a small effect size ($f^2 = 0.094$). Therefore, these findings support H1. This implies that supply chain risk management is important in determining financial performance of SMEs. While the effect size is small ($f^2 = 0.094$), it remains meaningful, particularly within the multifaceted and resource-constrained setting in which many Tanzanian SMEs run. The study's results suggest that being proactive through implementing risk management strategies permits SMEs to proactively respond to supply chain disruptions, hence overcoming probable losses and sustaining steadiness in operations. Moreover, the risk management capabilities pinpointed in the study (risk detection, prevention, response, and recovery) can significantly improve financial stability and performance for Tanzanian SMEs. In this regard, supply chain risk management can be used as a relevant tool for enhancing SMEs to perform more in unpredictable markets and be a defensive tool against risks occurring in supply chains. Therefore, the existing positive relationship supports the view that effective supply chain risk management is a vital element for SMEs' success in terms of achieving desired financial performance. The study highlights the necessity for SMEs to capitalise risk management capabilities as part of wider performance

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improvement initiatives. Through committing to risk management practices within supply chain operations, SMEs can increase their flexibility, lessen vulnerability, and eventually, realise better financial outcomes.

These findings align with those of Singh (2020) and Foli et al. (2024) who discovered that effective supply chain risk management boosts firm performance by mitigating disruptions and improving operational efficiency. These two previous studies backed up the view that supply chain risk management not only offers protective measures but also enhances firms' performance. The two enlightened the mechanism through which supply chain risk management can enhance financial performance, by disclosing the fact that proactive risk management done through early risk identification and adoption of structured risk management practices can significantly reduce and prevent financial losses.

Table 5 presents results for H2 which revealed that supply chain collaboration is crucial in influencing the SMEs' financial performance. It is observed that there is a positive and significant relationship between supply chain collaboration and financial performance ($\beta = 0.397$, $p < 0.001$, $t = 4.223$), with effect size (f^2) of 0.147. This moderate effect suggests that supply chain collaboration has a moderate and meaningful effect on explaining the variance of SMEs' financial performance. These findings stress that supply chain collaboration is key in enhancing the financial performance of SMEs. This confirms the significance of collaboration among partners in the supply chain in promoting a favourable environment for financial success among SMEs. By continuously collaborating and partnering, SMEs can eventually ensure their financial performance. In a Tanzanian setting where numerous SMEs often work in disjointed supply chains, these findings are quite relevant as under such circumstances, supply chain collaboration, which in this study were addressed as costs and benefits sharing, joint information sharing, joint performance improvement, collaborative inventory management, and demand forecasting, can significantly address a variety of financial setbacks facing Tanzanian SMEs.

These results align with Mafini and Muposhi (2017), Um and Kim (2019), Shafique et al. (2024), and Issah et al. (2025) who discovered that supply chain collaboration affect performance. These studies suggested that promoting open, trust-based relationships, collaborative practices, technological integration, and exchange of information among partners can result in significant performance improvements for SMEs operating in challenging and competitive markets. Similarly, they argued that businesses that practice supplier integration and joint decision-making experienced better cost management and customer satisfaction. Such consistency of results across diverse scholars and settings reinforces the legitimacy and generalizability of the existing results, particularly in the Tanzanian SME landscape. Therefore, collaborative supply chain practices boost operational efficiency for SMEs by promoting trust and shared goals among partners (Kimario & Kira, 2024).

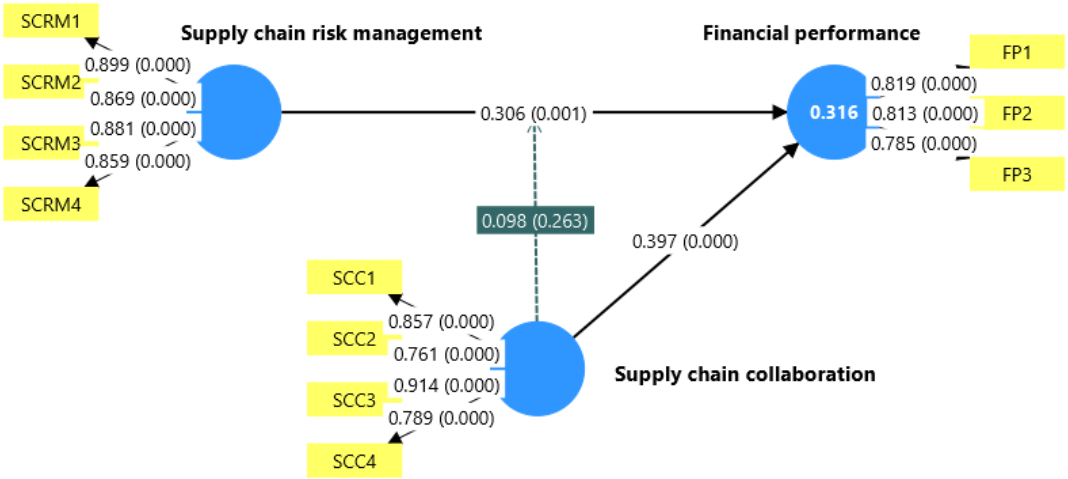

Figure 2. The structural model
Source: Figure by authors

Finally, H3 was also tested, which proposed that supply chain collaboration strengthens the relationship between supply chain risk management and the SMEs' financial performance. The findings as presented in Table 5 show that the moderating effect is positive and statistically insignificant ($\beta = 0.098$, $p = 0.263$, $t = 1.120$). This indicates that the study did not confirm the significant moderating effect of supply chain collaboration, hence H3 is not supported. Even though the moderating effect is positive, the p-value exceeds 0.05. The insignificant moderating effect calls for further investigation into the specific conditions under which supply chain risk management and financial performance are related. Results from this study contradict the previous studies which informed a significant moderating role of

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collaboration on various relationships (Ruiz-Alba et al., 2024). The insignificant effects could be attributed to several aspects such as differences in businesses, geographical context, and methodological approaches that consider the sample sizes. Another likely justification is the nature of Tanzanian manufacturing SMEs, where collaboration may still be at the infant stage, informal, and non-existent for some SMEs. Various SMEs may participate in partial or ad-hoc collaboration that may not meaningfully bring benefit in managing supply chain risks.

Table 5. Structural model assessment results

Hypotheses	Original sample	Sample mean	Standard deviation	T statistics	p-values
H1: Supply chain risk management → Financial performance	0.306	0.314	0.093	3.275	0.001
H2: Supply chain collaboration → Financial performance	0.397	0.397	0.094	4.223	0.000
H3: SCRM*SCC → Financial performance	0.098	0.086	0.087	1.120	0.263

Note(s): SCRM*SCC denotes Supply chain risk management*Supply chain collaboration
Source: Table by authors

Figure 3 presents a slope plot that illustrates how supply chain collaboration moderates the relationship between supply chain risk management and the SMEs' financial performance. Diverse patterns are revealed whereby, when supply chain collaboration is low (represented by the red line), supply chain risk management has only a weak impact on the SMEs' financial performance. This suggests that without strong collaborative efforts amongst SMEs, risk management practices alone yield limited financial outcomes. Therefore, isolated efforts by SMEs in managing risks are insufficient to bring substantial financial growth. The green line displays high levels of supply chain collaboration, amplifying the effect of supply chain risk management on SME's financial performance. These results position supply chain collaboration as a positive moderator of the relationship. However, the moderating effect was found to be statistically insignificant, as presented in Table 5.

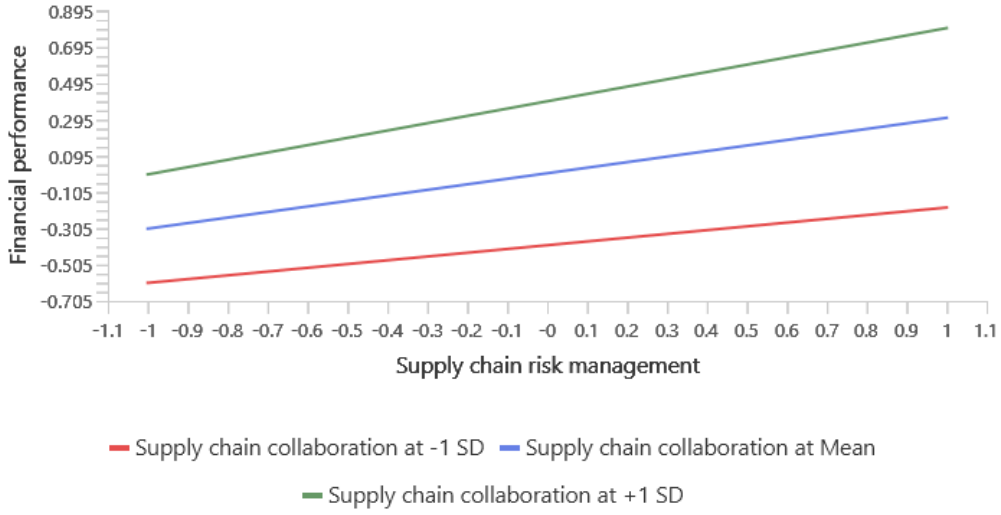

Figure 3. Slope plotting
Source: Figure by authors

5. Conclusion and study's implications

5.1 Conclusion

This research established and empirically examined a research model that determines the relationship between supply chain risk management and the financial performance of SMEs in Tanzania, considering supply chain collaboration as a moderating variable. Two key facts are pinpointed from the findings: First, supply chain risk management and supply chain collaboration are substantially important in complementing SMEs' financial performance. Second, although a positive moderating effect was spotted, supply chain collaboration does not appear to be a significant moderator of the relationship. Primarily, the study assumed that SMEs are likely to realise greater financial performance from risk management efforts within supply chains when implemented along with collaborative practices. The study's findings unveiled that supply chain risk management and supply chain collaboration independently improve financial performance of SMEs. This calls for further research in the relationship between supply chain risk management and the financial performance of SMEs. Since supply chain risk management and supply chain collaboration individually contribute to financial performance, the study stresses that SMEs in Tanzania

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can increase their financial performance by adopting and implementing proactive risk management practices and encouraging collaborative supply chain relationships.

5.2 Theoretical implications

The theoretical foundations for this research were RBV and the Relational View. According to the results, there is a slight variation in terms of contribution made by each theory whereby RBV position shows that supply chain risk management constitutes valuable, rare, and inimitable resources that boost the SMEs financial performance. This is confirmed by the fact that RBV's core principles for competitive advantage are internal capabilities which in this study were represented by supply chain risk management. Additionally, the Relational View focuses on the role of collaborative networks which are relevant for SMEs in enhancing their business outcomes. Jointly, the combination of RBV and Relational View deduces internal capabilities (supply chain risk management) and external relationships (supply chain collaboration) as the two drivers of financial performance in SMEs. This widens the applicability of the theoretical perspective by empirically indicating the contribution of supply chain risk management and supply chain collaboration in enhancing the SMEs' financial performance, particularly in developing economies like Tanzania.

5.3 Practical implications

This study established that improvement of SMEs' financial performance is the result of implementing independently both supply chain collaboration practices and supply chain risk management practices. This implies that supply chain risk management practices particularly supplier diversification and contingency planning and supply chain collaboration practices such as trusted partnerships and joint resource-sharing initiatives, explain the heightening of financial benefits. SMEs in Tanzania can significantly improve financial performance by considering these two factors separately and hence implementing risk mitigation strategies and leveraging on a strong culture of informal business networks and cooperative relationships is crucial for achieving desired metrics of financial performance.

5.4 Policy implications

This study presents some policy insights as it has been discovered that both supply chain risk management and supply chain collaboration maximize the SMEs' financial performance. Currently, there are different ongoing initiatives geared towards improving SMEs' financial performance in Tanzania. Such initiatives are led by both the government and private sector through different organs. For SMEs to realise higher financial performance, this study supports the stated efforts by calling for policy write-ups that foster knowledge and applicability of supply chain risk management and supply chain collaboration among SMEs. Therefore, SMEs can jointly engage in risk mitigation training programs, especially those related to financial risks, while encouraging trust-based partnerships among supply chain partners. Policymakers can identify SME clusters and develop shared risk-management resources. Additionally, tailored credit products such as soft loans can be devised by financial institutions to incentivize SMEs to adopt both supply chain risk management and supply chain collaboration practices. Considering the existing landscape of informal business networks in Tanzania, implementing supply chain risk management and supply chain collaboration practices through appropriate policies will transform SMEs into a formal structure that is more likely to ensure sustainable financial growth.

6. Limitations and future research

This research is built on the foundation of data gathered from manufacturing SMEs in the Dar es Salaam region in Tanzania. Therefore, it is important to recall that for generalizability and absolute representativeness to be achieved, sampling may need to be expanded by accommodating SMEs from other regions and other sectors, particularly in Tanzania and other countries. This will broaden the geographical coverage and more SMEs from different industries hence maximising representativeness. Additionally, the cross-sectional approach adopted provided valuable insights. However, temporal variations in the financial performance of SMEs may also be revealed through longitudinal data. The conceptual model points to supply chain collaboration as a sole moderator; however, the findings unveil that supply chain collaboration is not a significant moderating variable on the relationship between supply chain risk management and the financial performance of SMEs. Therefore, other factors should be considered for moderation on the relationship between supply chain risk management and the financial performance of SMEs. In this regard, future studies may consider other factors such as institutional support based on government policies and interventions, digitalisation, and culture which may be derived from other theoretical foundations to shed light on the conditions under which supply chain risk management and financial performance of SMEs are related.

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