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Supply chain management practices of SMEs in developing countries: Bibliometric and systematic reviews

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Abstract: This study explores the ways in which small and medium enterprises (SMEs) have successfully implemented global supply chain management procedures that make the necessary adjustments to the realities of the specific problem, such as resource constraints, regulatory complexity, and supplier issues. It demonstrates how developing cooperation with partners grows the sustainability of the institutions. Another point highlights that government support and advancements in IT are enabling SMEs to streamline business processes and expand into new markets. Moreover, recommendations are supplied to the policymakers and practitioners, thereby instigating the SME's growth in developed countries. SMEs are using more creative and localised supply chain strategies to address these issues; frequently, the SMEs actors do this by working with regional suppliers and utilising government aid initiatives. SMEs can increase productivity, save costs, and enter new markets by streamlining operations, utilising technology, and adapting global supply chain management principles to local requirements. This study offers insights for policymakers, industry practitioners, and academics to design supportive policies for SMEs in developing countries. It highlights the importance of innovation, sustainability, strategic partnerships, and external support for SMEs' sustainable growth and inclusive economic development.

Keywords: distribution network; logistics network; operations network; small businesses; small firms; business processes; value chain

PRELIMINARY

Global supply chain management practices play a vital role in streamlining the flow of goods, services, information, and finances worldwide (Vu et al. 2022). These practices encompass strategic planning, execution, and optimization of interconnected activities like sourcing, production, transportation, distribution, and inventory management (Kamariotou et al. 2022). With the increasing complexity of global supply chains, various aspects such as supplier relationship management, logistics, risk management, and sustainability have become crucial (Kot et al. 2020; Babu et al. 2021; Oyegoke et al. 2024).

Small and medium enterprises (SMEs) which have the appropriate supply chain logistics and services can execute the operational capabilities up to the maximum potential by optimising costs and lessening burdensome regulations. Nevertheless, constrained resources and a plethora of regulations are the most common problems in these types of business ventures. The main strategies for these businesses include supporting the development of local startups and encouraging collaboration between companies, thereby creating the necessary conditions that are key to success in the global world (Singh and Kumar 2020; Bhardwaj et al. 2021; Reardon et al. 2021).

Government support for SMEs in developing countries remains insufficient, such as the lack of mone-

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tary assistance and the absence of technical training programs specifically tailored to supply chain needs. This gap hinders SMEs ability to enhance competitiveness and integrate into the global supply chain effectively (Hilal et al. 2020; Choong et al. 2023). This situation highlights a serious policy gap, calling for targeted measures to help SMEs contribute more productively to the economy and thrive in a globalised environment.

Consequently, the adaptation and innovation of supply chain strategies have become essential for SMEs in these countries. Strategies such as strategic collaboration with local suppliers and the use of cost-effective technology can help SMEs navigate uncertainties in the market and optimize operations (Zaridis et al. 2021; Kamariotou et al. 2022). By:

(*i*) Identifying the main obstacles SMEs in developing countries face when implementing global supply chain practices,

(*ii*) investigating the effects of government assistance and strategic partnerships on SMEs' operational effectiveness and resilience, and

(*iii*) assessing how innovation and technology adaptation can boost SMEs' competitiveness and potential for long-term growth, this study seeks to close these gaps.

Governments worldwide offer tailored assistance programs, such as grants, subsidised loans and capacity-building initiatives, to support SMEs and drive innovation in the supply chain sector. However, the inconsistent implementation and poor availability of these programs, particularly in less developed countries, make it difficult to grow (Ghadge et al. 2017). By optimising operations and embracing technology, SMEs could enhance efficiency, reduce costs, and increase profitability. This enables SMEs to compete globally, attract investments, and explore new markets, contributing to the resilience and long-term success (Valdez-Juárez et al. 2018; Lu et al. 2020).

By understanding how SMEs could adopt and adapt global supply chain management (SCM) practices to meet local needs, this research provides valuable insights for policymakers, business practitioners, and academics in designing strategies that support growth and competitiveness for SMEs in developing countries. The study emphasizes the value of cross-sector cooperation, sustainable partnerships, and innovation in tackling the particular difficulties encountered by SMEs, promoting inclusive economic growth, and bolstering long-term sustainability.

Supply chain practices

Understanding SCM requires familiarization with main definitions and objectives (Liu et al. 2021). SCM emphasizes systematically organising and managing supply chain activities to enhance customer convenience and create competitive advantages. This is obtained through the efficient collection, processing, and distribution of information (Schulze-Ehlers et al. 2014). However, SMEs in developing countries face serious problems, such as limited access to information and communication technology, financial constraints, and a lack of adequate resources. These limitations hinder innovation and operational efficiency (Zaridis et al. 2021; Alshahrani and Salam 2022). Furthermore, trade barriers and inefficiencies in distribution networks exacerbate difficulties in access to global markets (Vu et al. 2022).

Adhering to local and international regulations is usually a costly affair, which, oftentimes, most SMEs struggle to surpass (Hauser 2022). These problems create complexities for the SMEs in the developing regions, thus it is difficult for the SMEs to successfully compete and hence to grow (Khalil et al. 2019). Additionally, SMEs focus on minimising cost while delivering maximum value to customers, a strategy commonly employed by sellers to ensure success and sustainability in business (Wicaksono and Illés 2022).

The implementation of SCM strategies by SME is significantly impacted by regional differences across developing countries. Asian SMEs often benefit from relatively more government support and infrastructure than their African counterparts, where a lack of infrastructure poses major logistical challenges (Vu et al. 2022; Oyegoke et al. 2024). The range of legal frameworks and the availability of technology exacerbate these inequities. In Southeast Asian countries such as Malaysia and Indonesia, SCM practices have improved due to targeted government initiatives and enhanced digital capabilities (Zaridis et al. 2021; Kamariotou et al. 2022).

Conversely, Sub-Saharan African SMEs have more substantial obstacles, such as unstable transportation systems and restricted access to cutting-edge technology (Hilal et al. 2020; Reardon et al. 2021). Due to structural constraints, certain regions are able to effectively adapt and implement innovative SCM processes, while others are unable to perform so.

Latin American SMEs represent a different scenario in which economic volatility and changeable trade policies generate an unstable business climate (Lu et al. 2020). To reduce risks despite these obstacles, many SMEs in this area have established strong local al-

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liances and varied sourcing techniques. These strategies emphasize the importance of regional context in developing SCM practices, emphasising that a one-size-fits-all solution is not feasible (Valdez-Juárez et al. 2018).

Policymakers and business executives must be aware of these regional variations when creating assistance initiatives that address the particular requirements of SMEs in various developing countries (Sukati et al. 2023). Improved SME performance and more efficient SCM procedures can result from customised approaches that take into account regional infrastructure, financial circumstances, and technology availability.

Adaptation strategies are key for SMEs in developing countries to overcome various challenges (Khalil et al. 2019; Sukati et al. 2023). One form of SME adaptation is implementing local innovation as a strategy to face challenges in order to survive and compete in the market (Kot et al. 2020). Strengthening collaboration with suppliers is a key strategy to increase supply chain resilience to disruptions and ensure smooth operations (Zaridis et al. 2021). Information technology is no less important in increasing operational efficiency (Sorger et al. 2021). By adopting technology-based systems and tools, SMEs could optimize business processes, reduce costs, and increase the speed and quality of service to customers (Kamariotou et al. 2022). Through this adaptation strategy, SMEs in developing countries are capable of overcoming obstacles, taking advantage of new opportunities, and strengthening their position in the global market (Baral et al. 2023).

SME managers can efficiently apply SCM methods by taking the following steps:

i) Using digital tools: To increase productivity and streamline processes, implement reasonably priced technological solutions, such as cloud-based inventory management systems (Kamariotou et al. 2022).

ii) Creating strategic alliances: To improve supply chain resilience and responsiveness to market fluctuations, cultivate solid ties with bond domestik and foreign suppliers (Zaridis et al. 2021).

iii) Training investation: Train employees on digital technologies and contemporary SCM methods to improve skills (Dubihlela and Omoruyi 2014).

iv) Proactive risk management: To be ready for interruptions, put risk assessment techniques and backup plans into action (Hilal et al. 2020).

v) Leveraging external support: To obtain more resources and support, make use of international initiatives and government help (Sukati et al. 2023).

In order to improve SCM procedures, emerging technologies are becoming increasingly crucial, especially for SMEs in developing countries. Utilising technology-based tools is crucial for increasing service speed and quality, reducing costs, and streamlining processes (Sorger et al. 2021; Kamariotou et al. 2022). SMEs may improve visibility, expedite decision-making, and manage complicated supply chains better through technologies such as data analytics, automated systems, and cloud-based platforms. For instance, digital solutions promote improved supply chain integration and risk management by assisting SMEs in quickly adjusting to market changes and being resilient during disruptions (Khalil et al. 2019; Baral et al. 2023).

However, due to restricted funding and limited access to technical competence, SMEs frequently encounter various difficulties utilising these technologies (Singh and Kumar 2020; Bhardwaj et al. 2021). To help SMEs overcome these obstacles and improve the supply chain capabilities, strategic collaboration and focused training might be helpful (Dubihlela and Omoruyi 2014; Hilal et al. 2020).

By integrating innovative technologies, SMEs can cimprove efficiency and broaden market reach, positioning competitiveness in the global market (Valdez-Juárez et al. 2018; Zaridis et al. 2021). By using these techniques, SMEs can handle obstacles and adapt to the changing needs of global marketplaces, which promotes sustainable growth and operational flexibility (Lu et al. 2020; Sukati et al. 2023).

Governments play a crucial role in helping SMEs grow and succeed by creating a supportive business environment. This can include the construction of infrastructure, the reform of regulations and ensuring financial support that is tailored to the businesses' demand (Kandil and Aziz 2021). However, in a large number of developing countries, inconsistent policy implementation and inadequate funding have appeared to be obstacles to delivering meaningful results. In confronting these issues, the government should focus on practical solutions, such as providing supply chain training programs and simplifying bureaucratic processes. These targeted actions equip SMEs with essential tools to increase competitiveness and achieve sustainable growth in global markets (Mattevi and Jones 2016).

Training is one of the important programs to increase the capacity of SMEs, strengthening managerial and technical skills essential for effective supply chain management (Dubihlela and Omoruyi 2014). Government support is crucial in helping SMEs overcome challenges, increase competitiveness, and encourage economic growth. In many developing countries, government support for SMEs is often inadequate. A persistent lack

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of access to financial aid or technical training tailored to supply chain demands hampers SMEs' attempts to boost competitiveness (Hilal et al. 2020; Choong et al. 2023). This situation highlights a serious policy gap, calling for targeted measures to help SMEs contribute more productively to the economy and thrive in a globalised environment (Hilal et al. 2020; Choong et al. 2023).

Effective implementation of SCM has a significant positive impact on SMEs in developing countries (Dubihlela and Omoruyi 2014; Singh and Kumar 2020). Implementation of SCM practices has been challenging, leading to the need for ad-hoc solutions (Aloini et al. 2012). In developing economies, barriers such as lack of economies of scale, poor organisational structures, and technological challenges have been identified. Awareness of these barriers is important for SMEs managers to implement strategies that minimize challenges and enhance competitive strength (Dubihlela and Omoruyi 2014). Good implementation of SCM results in increased operational efficiency, which allows SMEs to reduce costs and increase service speed (Kot et al. 2020).

As a result, SMEs have a stronger competitive position in the market and are better equipped to take on bigger, more established companies (Fatmawati et al. 2022; Games and Roliza 2019; Mainardes et al. 2021). Effective SCM practices contribute to overall economic growth (Mishra and Sharma 2015). This increase in productivity results in business expansion and the creation of new job opportunities (Sukati et al. 2023). Efficient implementation of SCM not only benefits individual SMEs but also supports broader economic progress in developing countries (Yaakub and Mustafa 2015).

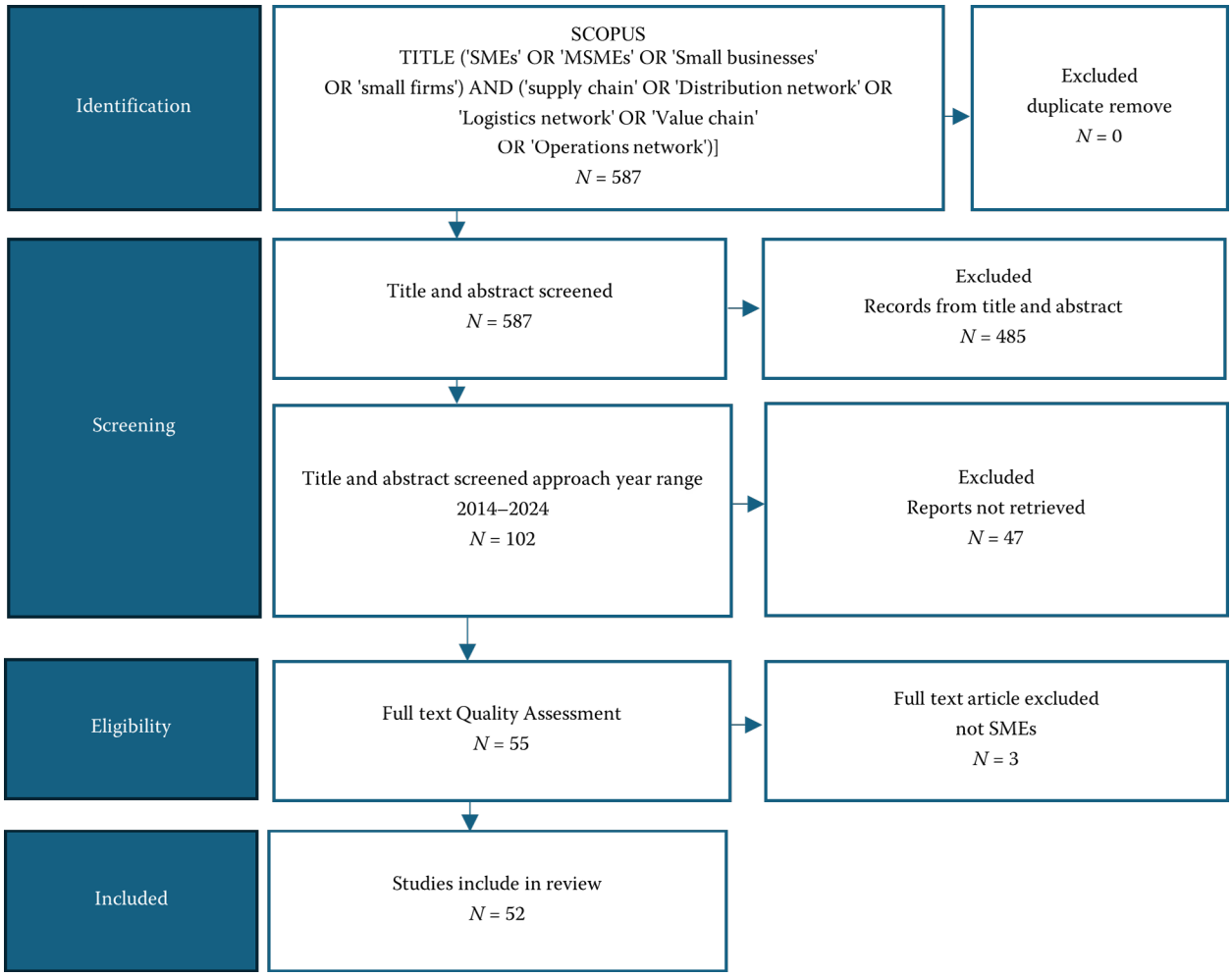

Figure 1. PRISMA flowchart screening process for systematic literature review

SMEs – Small and medium-sized enterprises; MSMEs – Micro, small and medium enterprises
Source: Author's own calculation

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MATERIAL AND METHODS

The bibliometric analysis in this study will examine annual scientific production, deploy a source relevance index, analyse author production over time, and assess country scientific production on the topic of supply chain management practices in SMEs in developing countries.

A literature search was carried out on the Scopus.com database using the keyword string TITLE ('SMEs' OR 'MSMEs' OR 'Small Businesses' OR 'Small firms') AND ('Supply chain' OR 'Distribution Network' OR 'Logistics Network' OR 'Value Chain' OR 'Operations Network'). AND PUBYEAR>2013 AND PUBYEAR<2025 AND (LIMIT-TO (DOCTYPE,'ar') AND (LIMIT-TO (LANGUAGE, 'English'). The inclusion criteria for this study were limited to research articles published between 2014 and 2024 and only in English. Data extraction was carried out to find answers to research questions in terms of training education, collaboration networks, use of technology, entrepreneurship, and public policy.

The systematic literature review (SLR) process begins with defining a clear and specific research question, followed by the development of a structured search strategy to identify relevant literature in the database. Following the implementation of the search method, the articles' titles and abstracts were reviewed to ascertain the applicability of the study topics. The next step involved applying more detailed inclusion and exclusion criteria to the selected articles to ensure that only the most relevant studies were included in the review. A full-text review of articles meeting the criteria was performed for the extraction of essential data and the quality assessment of each study. The extracted data is then analysed and synthesised to identify key findings, patterns, and new insights. This process ends with the writing of a comprehensive SLR report, which summarizes the methodology, results, and conclusions of the review before the findings are finally published to contribute to the relevant research field. Contextually, this illustration can be seen in Figure 1.

RESULTS AND DISCUSSION

The initial search found 587 documents, which were subsequently filtered to 102 documents. Further screening of title and abstract within 2014 to 2024 narrowed the selection to 55 articles. Finally, 52 articles were included in the review. The following results from Scopus metadata are presented below.

In Figure 2, a graph depicts the number of scientific documents per year. The graph explains the fluctuation of supply chain management practice research relevant to this study from 2014 to 2024 with the number of related documents for each year, starting from 17 documents in 2014 to 20 documents in 2024. The highest peak was seen in 2023 with around 83 documents, followed by a sharp decline in 2024 back to 20 documents. The sharp decline in 2024 is due to this study being taken in February 2024.

Figure 3 shows the number of scientific documents by country or region. The table on the left displays a list of countries along with the number of documents produced by each country. Based on the graph in Figure 3, Indonesia leads with the largest number of documents, followed by China, India, and Malaysia. The graph is used to compare the production of scientific docu-

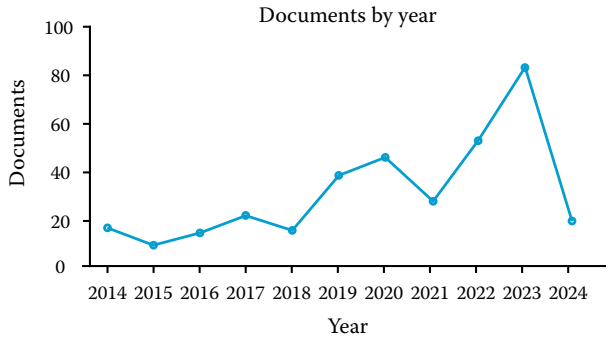

Figure 2. Number of scientific documents relevant to supply chain management practices in SMEs in developing countries

SMEs – Small and medium-sized enterprises
Source: Author's own calculation

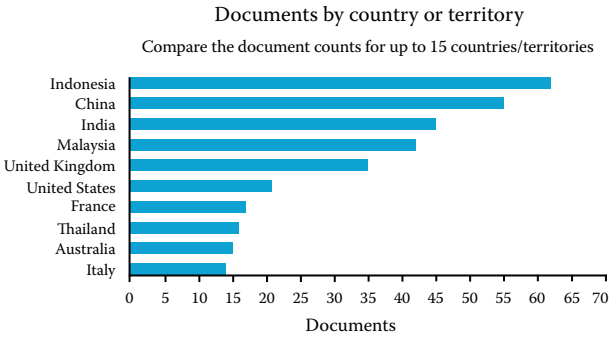

Figure 3. Articles relevant to supply chain management practices in SMEs in developing countries by country

SMEs – Small and medium-sized enterprises
Source: Author's own calculation

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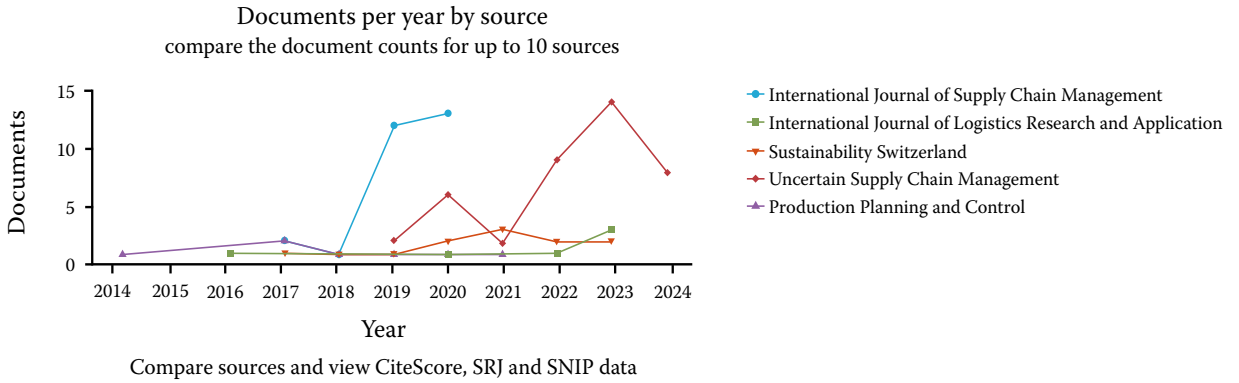

Figure 4. Scientific journal sources based on journal sources per year

SRJ – SCImago Journal Rank; SNIP – Source Normalised Impact per Paper
Source: Author's own calculation

ments between different countries or regions, which could provide relevant insights into supply chain management practices in SMEs in developing countries.

Figure 4 shows a list of sources (scientific journals) along with the number of documents published by each source. The highest is 'Uncertain Supply Chain Management' with 41 documents, followed by 'International Journal of Supply Chain Management' with 28 documents, as well as several other sources with lower numbers. The graph in Figure 4 represents the number of documents per year from several selected sources, starting from 2014 to 2024. Overall, this figure provides a comparative analysis of the publishing productivity of various scientific journals from year to year.

Figure 5 depicts the number of scientific documents produced by various authors. The figure on the left contains the names of authors along with the number of related documents. Based on the image, 'Lu, Q.' has the highest number of documents, namely 8 documents. Other authors such as 'Bourlakis, M.', 'Ducruet, S.', 'Kuo, S.', 'Sukati, I.', and 'Sugianto, D.' each have four documents. The authors under the names 'Ali, Z.' and 'Gonzalez-Rojas, A.' each have three documents, while 'Jemni-Ben Ayed, K.' and 'Kumar, S.' each have one document. This graph provides a quick and easy-to-understand visual representation of author productivity in terms of the number of publications.

Figure 6 displays the number of scientific documents by affiliation or institution. University Utara Malaysia has the highest number of documents, with a total of 11 documents. Followed by Beijing Technology and Business University with 8 documents, and slightly different from Renmin University of China with 7 documents. Several other institutions, such as the National Research and Innovation Agency, Beijing University of Science and Technology, Islamic University of Indonesia, Suan Sunandha Rajabhat University, and Ho Chi Minh City University of Economics, are also listed with a number of documents ranging from 5 to 7. For network visualisation, over-

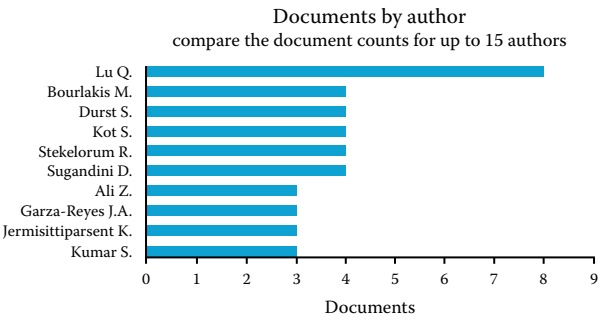

Figure 5. Number of documents by author

Source: Author's own calculation

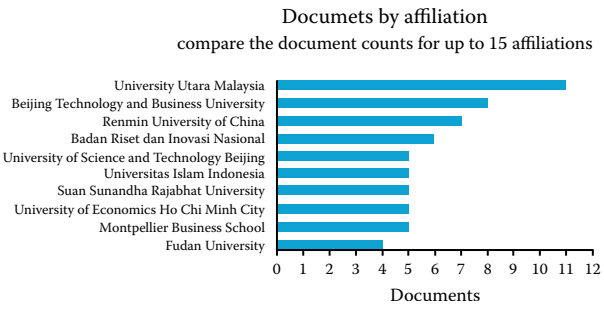

Figure 6. Documents by institution

Source: Author's own calculation

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lay visualisation and density visualisation will be displayed in Figures 6–8 below.

Figure 7 displays the relationship between various terms that often appear together in academic literature relating to research on SMEs. In this network visualisation, each term is represented by a node, with varying node sizes, indicating the frequency of occurrence or relative importance of the term. Lines connecting nodes show the relationship of terms in the same document or literature. Different colours of lines or nodes indicate different groups or clusters, illustrating related sub-topics or themes in the research. Some terms seen in the visualisation include 'Indonesian SMES', 'UK SMES', 'business', 'framework', 'barrier', 'approach', 'Indian SMES', 'analysis', 'manufacturing SMES', and 'medium-sized enterprise'. The visualisation shows a strong research focus on SMEs in various countries, with an emphasis on the analysis, frameworks, and barriers faced by SMEs in business and manufacturing contexts. The relationships between these terms could reveal research trends, key issues, and gaps in the existing literature. This network visualisation could be depicted as follows.

In Figure 8, nodes of varying colours and sizes are connected in patterns that show how topics relate to each other. Some terms seen are 'Indonesian SMS,' 'business,' 'UK SMS,' 'framework,' 'barrier,' 'approach,' 'Indian SMS,' 'analysis,' 'manufacturing SMS,' and 'medium-sized enterprise.' This shows the existence of scientific discussions related to SMEs (small and medium enterprises) in various countries, with a focus on aspects such as business performance, obstacles, and frameworks for analysis and approaches in business practice. The colours in the nodes depict different clusters or groups of topics, indicating sub-themes or areas of focus within the broader research. This visualisation is useful for analysing trends, relationships, and structures in the research literature, allowing researchers to see how various concepts are related to each other and to identify areas that may require further research. The visualisation of Figure 8 can be seen as follows.

Figure 9 is a tool for visualising bibliometric data. It shows the frequency and relationship between different terms appearing in a dataset of scientific publications or titles for which a bibliometric analysis has been carried out.

In this visualisation, different colours indicate the level of density or concentration of certain terms in the data set. Lighter or yellow-green areas indicate higher density, which means the term appears more frequently or is highly relevant in the related literature. On the other hand, darker areas (usually blue) indicate a lower density. Terms such as 'Indonesian SMES,' 'business,' 'UK SMES,' 'framework,' 'barrier,' 'approach,' 'Indian SMES,' 'analysis,' 'manufacturing SMES,' and 'medium-sized enterprise' appear scattered in the visualisation, with some terms standing out due to brighter colour intensity, indicating that those are important topics or main focus in the analysed data set. This visualisation is very useful for determining key focus areas within a research field as well as for identifying potential research gaps that may not have been adequately covered. On the other hand, this visualisation allows researchers to depict the interrelationships of various subfields, identify trends and ensure depth of exploration within each aspect related to supply chain management.

Based on relevant literature on supply chain management practices, the following indicators were obtained relating to supply chain management practices in SMEs in developing countries (Figure 10).

Extraction data

i) What challenges do SMEs face in accessing technology and financial resources?

SMEs face challenges in accessing financial and technological resources due to barriers such as financial constraints, supply chain inefficiencies, and limited access to information and communications technology (ICT) (Rasit et al. 2019; Yang et al. 2019; Garg and Kashav 2021). Based on the results obtained through the best-worst method (BWM) approach, in short, 'financial barriers' are the main challenge for SMEs to de-

Figure 7. Network visualisation

Source: Author's own visualisation

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Figure 8. Overlay visualisation

Source: Author's own visualisation

velop. Therefore, this requires special attention from top management (Garg and Kashav 2021). Improving the external financial environment for SMEs could provide benefits to the entire supply chain, thereby facilitating sustainable development and growth of SMEs (Yang et al. 2019).

SMEs tend to be less likely to engage in environmental practices compared to large organisations (Rasit et al. 2019). Key policy recommendations to support further SME growth include a focus on infrastructure investment, particularly in wholesale markets and high streets; a reduction of policy-related obstacles such as excessive bureaucracy; and regulations for food safety and good commercial practices (Reardon et al. 2021). The food supply chain (FSC) in Greece is dominated by SMEs, which face several challenges in implementing environmentally friendly practices (Ghadge et al. 2017). That is why this model makes a strategic contribution to SSCM: to develop greater long-term resilience focused on agri-food and its supply chains (López-Santos et al. 2020). Apart from unique data sets at the enterprise level, analysis of the interactions between external and internal factors driving digital supply chain (SC) transformation can provide important managerial implications for SMEs to survive major disruptions, such as those caused by the COVID-19 pandemic (Ngo et al. 2023).

Sector-specific challenges in SMEs

SMEs in developed countries confront a wide range of difficulties depending on the industry. For instance, SMEs frequently face restricted access to raw materials in the manufacturing sector because of import limitations or high pricing, which affects production uniformity and efficiency (Kamariotou et al. 2022). Furthermore, a lack of advantage technology hinders the ability to simplify operations and implement effective production procedures (Alshahrani and Salam 2022).

Geographical and infrastructure constraints present particular logistics and distribution issues for

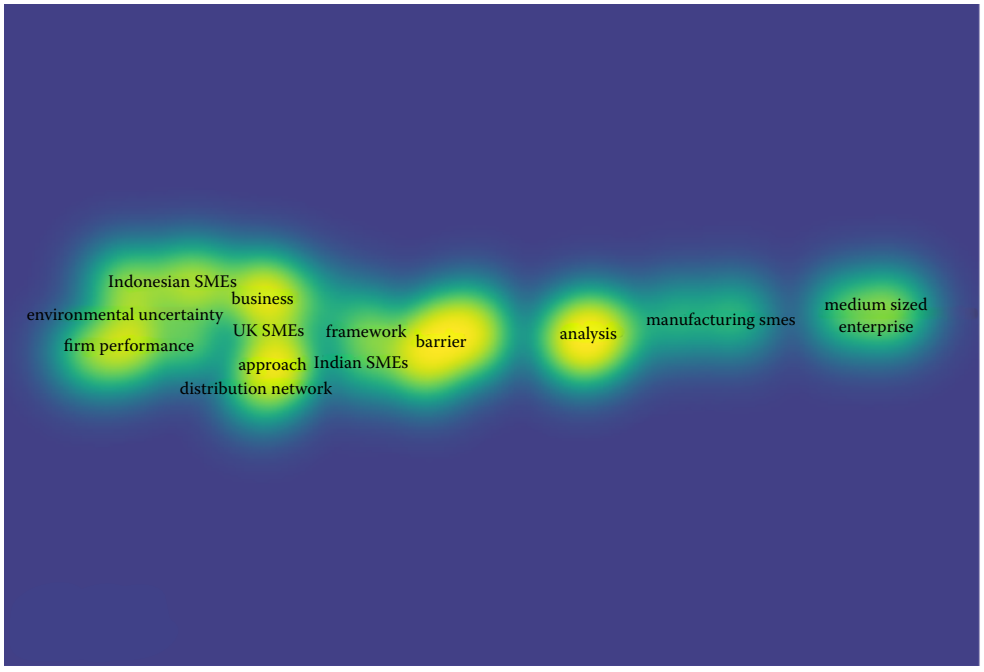

Figure 9. Density visualisation

SMEs – Small and medium-sized enterprises

Source: Author's own visualisation

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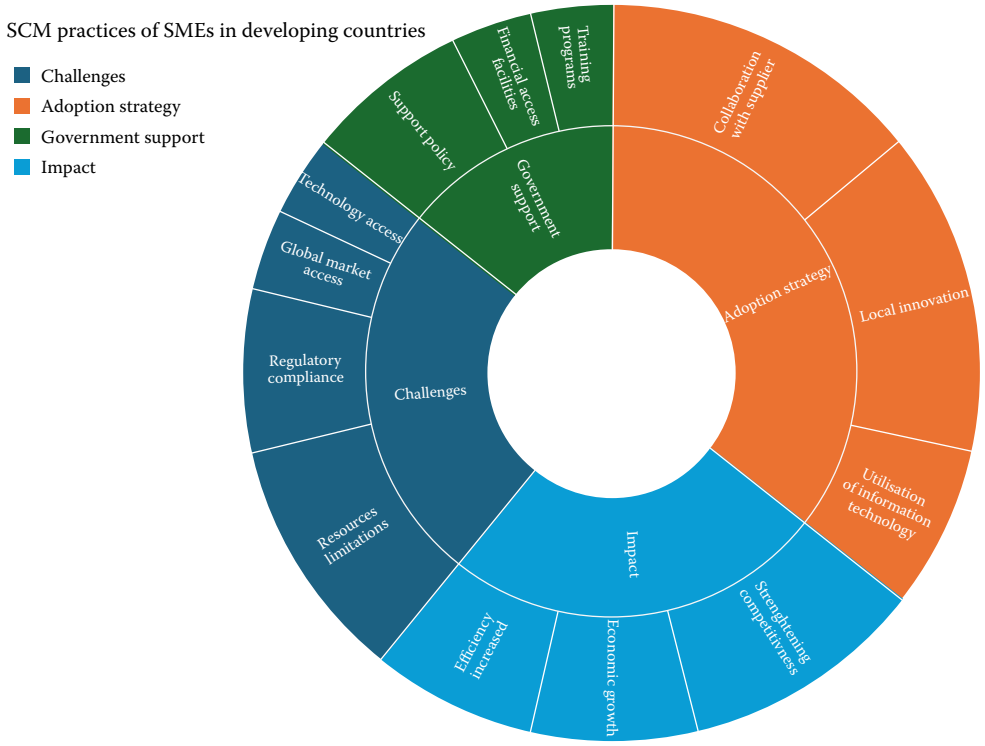

Figure 10. SCM practices of SMEs in developing countries

SCM – Supply chain management; SMEs – Small and medium-sized enterprises

Source: Author's own diagram

SMEs in the agriculture sector. Due to unpredictability in weather patterns and changes in market demand, supply chain planning and risk management are essential but difficult for the many SMEs in this sector that rely on seasonal crops (Ghadge et al. 2017; López-Santos et al. 2020). Additionally, agricultural SMEs frequently have to comply with more stringent quality and safety standards, which demand more resources and raise operating expenses (Rasit et al. 2019).

For the retail sector, SCM challenges frequently involve managing demand variability and ensuring timely delivery amidst limited warehousing and transportation capabilities. This sector heavily relies on effective inventory management and customer satisfaction, yet SMEs often lack the technological resources and skilled labour to optimise these processes (Singh and Kumar 2020; Oyegoke et al. 2024). These restrictions become much more severe at busy times of the year, resulting in shortages or surplus inventory, both of which affect profitability.

By identifying sector-specific challenges, this study points out the diverse needs of SMEs and underlines the importance of tailored supply chain strategies for each sector, helping policymakers and practitioners better support SMEs in overcoming these obstacles.

ii) How do local policies and infrastructure limitations affect SMEs?

Policy and infrastructure limitations have a major and ongoing impact on SMEs, with business actors often facing challenges in complying with local regulations, such as licensing requirements, which can cause increased costs and administrative burdens, as well as limit the ability of SMEs to engage in sustainable supply chain collaboration. Inadequate infrastructure, such as poor transportation networks or unreliable utilities, hinders SMEs' ability to access markets and deliver goods efficiently (Ghadge et al. 2017; López-Santos et al. 2020; Reardon et al. 2021). These limitations not only affect competitiveness but also limit growth potential widely.

On the other hand, limited access to technology is due to infrastructure constraints, which further exacerbate the challenges faced by SMEs in adopting digital tools and platforms to simplify operations and reach customers. In short, regional policies and limited infrastructure hinder SMEs from developing and contributing to economic growth. This problem is serious enough to be addressed immediately in order to create an environment that supports the development and sustainability of SMEs (Valdez-Juárez et al. 2018; Lu et al. 2020; Singh and Kumar 2020; Bhardwaj et al. 2021; Reardon et al. 2021). Both problems could be mitigated by infrastructure investment, reducing regulatory barriers, and supporting digital transforma-

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tion, which are recommended policy measures to overcome these challenges and facilitate the growth and resilience of SMEs (López-Santos et al. 2020; Reardon et al. 2021; Ngo et al. 2023).

iii) How do SMEs innovate and localize SCM practices, and what role do strategic collaborations with local suppliers?

In this case, the discussion will focus on aspects aiding SME managers in identifying aras requiring improvement in SCM practices (Tripathy et al. 2016). These results imply that Malaysian SMEs mostly adopt GSCM practices through eco-friendly design and strong cooperation between departments in dealing with environmental issues (Rasit et al. 2019). In this context, this research highlights the need to understand the practices, processes implemented, and relationships between specific internal functions and SME suppliers (Viale et al. 2022). The findings show that SME strategy moderates the supply chain collaboration-SME performance relationship. This study provides evidence that agricultural SMEs can strategise supply chain collaboration by eliminating scale constraints (Zaridis et al. 2021).

SMEs innovate and localise SCM practices through strategic collaboration with local suppliers to improve performance and competitiveness. This involves integrating technology (Tripathy et al. 2016). Implement environmentally friendly supply chain management practices (Rasit et al. 2019) and adopt open innovation (Viale et al. 2022). Strategic collaboration with local suppliers is essential for SMEs to overcome scale constraints (Zaridis et al. 2021), improve financial performance (Liu et al. 2021), and reduce financing constraints (Yang et al. 2019). Additionally, this collaboration helps improve supply chain integration (Kanyoma et al. 2018), promote sustainability (Wilujeng et al. 2022), and build supply chain resilience (Sun 2023).

Several studies show that implementing SCF improves operational performance by helping SMEs obtain short-term financing, thereby increasing working capital and income and mitigating supply chain risks (Liu et al. 2021). The framework highlights how SMEs in the supply chain can improve survival and facilitate development through appropriate strategies to improve business performance and manage credit risk (Yang et al. 2019). This highlights the need to develop trust, eradicate corruption, overcome organisational barriers, encourage greater commitment from SC partners, and encourage greater investment, including strategies in corporate resource capabilities, to both increase SCI among SMEs and strengthen supply chain resilience, especially in the new normal era (Kanyoma et al. 2018; Banerjee et al. 2023).

This shows that supply chain management can be a strategy to create better SME performance and can even be used to achieve competitive advantage (Wilujeng et al. 2022). Internal integration (INI), customer integration (CI), and supplier integration (SI), supply chain risk management (SCRM), and supply chain resilience (SCRE), with the impact of disruption (DI) as a moderator, among small and medium enterprises (SMEs).

Design, methodology, and approach: 271 usable data were collected from Chinese SMEs to test the research model with two statistical approaches, namely PLS-SEM and ANN analysis (Sun 2023). Supply chains must operate with the right balance between centralisation and localisation, establish the right mix of quality and quantity, assign ownership and responsibility, and have resource risk coverage throughout the supply chain (Banerjee et al. 2023).

iv) What kind of external support, such as government assistance and international development programs, is available to SMEs?

External support for SMEs, such as government aid and international development programs, plays an important role in sustainable development and growth. This needs to be done to improve the external financial environment of SMEs so that it can provide benefits to the entire supply chain, thereby facilitating sustainable development and the dominant growth of SMEs (Yang et al. 2019).

Key policy recommendations to support further SME growth include a focus on infrastructure investment, particularly in wholesale markets and high streets; a reduction of policy-related obstacles such as excessive bureaucracy; and regulations for food safety and good commercial practices (Reardon et al. 2021). However, government attention in many countries towards SMEs is still lacking, and various kinds of support need to be provided (Sukati et al. 2023). SMEs could benefit from alliances established with large companies to achieve sustainable growth, thus requiring an initial evaluation of potential partners' exploration capabilities to achieve successful collaboration (Lee et al. 2017).

v) How do improved efficiency and productivity, broader market access, and enhanced global competitiveness impact SMEs?

When supply chain collaboration helps SMEs overcome financial, efficiency, or innovation constraints, SME performance will improve. This is due to the opening of wider market access for SMEs, which can

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trigger global competitiveness to have a significant impact (Zaridis et al. 2021). Managerially, this research recommends that SMEs strategically integrate technology practically into supply chain management practices to achieve increased efficiency and market competitiveness (Purwaningsih 2024). Thus, SMEs can strive to improve engagement with suppliers and cost management practices to survive in the face of globalisation, technological advances, and intense competition. This is due to the significant and varied growth of technology, which can adaptively support market globalisation, meet diverse customer needs, and increase the competitiveness of SMEs (Jafaripour et al. 2022).

Innovation capabilities enable SMEs to gain competitive advantages and increase productivity and profit margins (Lu et al. 2020). The results show that supply chain financial services have a strong positive impact on comprehensive innovation efficiency, technological innovation efficiency, and organisational innovation efficiency in manufacturing SMEs (Wang et al. 2023).

Currently, SMEs are under great pressure to achieve competitive advantage in the supply chain; therefore, SMEs are trying to improve operational and logistics effectiveness while remaining responsive to market demand (Tripathy et al. 2016). Thus, adaptation to technology, especially electronic data interchange (EDI), is a necessity for SMEs to be able to improve the quality of information, reduce costs and transactions, reduce inventory levels, increase forecasting, and increase cash flow, all of which refer to increased operational efficiency and customer service for SMEs (Tatoğlu et al. 2015).

To sum up the discussion above, this thing could happen because adoption strategy is so relevant to various fields, impacts and challenges, including technology, business, healthcare, and education. Those are common topics in contemporary publications. Organisations must constantly innovate and adapt in response to the rapid growth of technology, shifts in consumer behaviour, and changing market conditions. As a result, adoption strategies are essential for companies to stay competitive and current in the marketplace. In short, this complexity could be depicted in a radar, which shows that the most current articles are mostly discussing adoption strategies (Figure 11).

On the other hand, the presence of a strategy needs to be supported by policies or support from the government. Currently, this is often ignored or rarely discussed in the context of supply chain management at the SME level, especially in developing countries. The facts in Table 1 show that there are still many SMEs

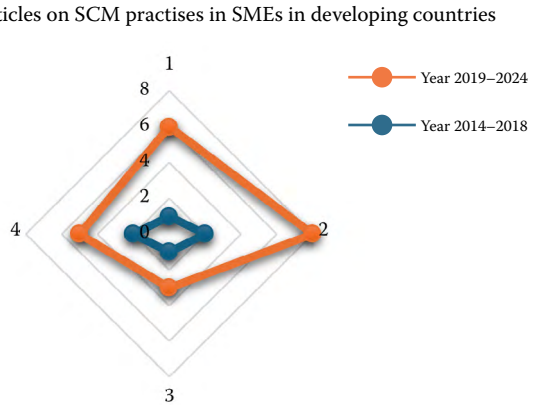

Figure 11. Articles on SCM practices in SMEs in developing countries by year range

SCM – Supply chain management; SMEs – Small and medium-sized enterprises

Source: Author's own radar based on calculation

in other countries, including developing countries, that do not receive enough government support to develop supply chain management practices.

Based on the filtered data extraction, there are 15 countries, or 29%, that have received government support collectively. Other data identified as focusing on other aspects, such as strategy adoption, challenges, and impact, had a minimum total count of 77% as minimal as strategy adoption.

Furthermore, in order for enterprises to stay ahead of the curve, new tools, procedures, and business models must be adopted due to the swift digitalisation of industries and the rise of disruptive technology. Successful implementation depends on an understanding of the elements impacting innovation adoption, such as company culture, leadership support, and user approval. Additionally, adoption strategies are frequently examined in academic studies to offer guidance on best practices.

CONCLUSION

This study emphasizes the importance of addressing the challenges faced by SMEs in accessing technology and financial resources. It highlights the need for strategic collaborations with local suppliers, innovation in supply chain management practices, and the adoption of environmentally friendly practices to improve performance and competitiveness. Additionally, the paper underscores the significance of external support, such as government assistance and interna-

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Table 1. Pivot data comparison of government support and strategy adoption toward SMEs' supply chain management practices

Countries	Count	Government support	Impact	Challenges	Strategy adoption
Developing	27	5	27	26	21
Developed	25	10	25	25	19
Grand total	52	15	52	51	40

SMEs – Small and medium sized enterprises
Source: Author's own calculation

tional development programs, in facilitating sustainable growth for SMEs. Overall, the findings suggest that overcoming financial constraints, enhancing efficiency and productivity, and broadening market access are crucial for SMEs to thrive in a competitive global landscape.

Future trends and challenges in SCM for SMEs

Future trends and difficulties in SCM are expected to include the following as SMEs in developing countries continue to adjust to a changing global landscape:

i) Adopting digital tools: SME supply chain management is about to change because of cutting-edge technology such as blockchain, AI, and the IoT. Better data management and real-time tracking are promised by these developments, yet these solutions also have drawbacks, such as high prices and the requirement for specialised knowledge (Sorger et al. 2021; Kamariotou et al. 2022).

ii) Future sustainability: SMEs will face pressure to implement more environmentally friendly processes as environmental concerns gain international attention. This transformation is necessary to remain relevant. However, it involves balancing environmental efforts with economic efficiency (Valdez-Juárez et al. 2018).

iii) Maintaining resilience in the face of disruptions: History has demonstrated that situations such as pandemics and climate change could lead supply chains to abruptly disintegrate down. SMEs should diversify suppliers and plan for unexpected events (Baral et al. 2023).

iv) Managing regulatory changes: SMEs need to be proactive in staying up to date with the ever-changing trade policies. For enterprises without specialised teams, this could be particularly difficult, making compliance a major challenge (Hilal et al. 2020).

v) Working together as a lifeline: Close collaboration with bigger organisations and government organisations could contribute to the sharing of resources and expertise. However, maintaining these alliances involves effort and trust-building (Zaridis et al. 2021).

These are important, to not only survive but prosper, SMEs must harness technology, prioritise sustainability, and create strong networks. It's also crucial to remain ahead of changes to regulations and be ready for disruptions. Supportive policies and stakeholder collaboration will assist SMEs in overcoming these obstacles and capitalising on future opportunities.

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