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Supply Chain Financeand Innovation Performance: A Systematic Liter ature Review and research implications

Wei Zhu [1], Guanghui Chen [2], Khai Wah Khaw [3*]

1 *School of Management University Sains Malaysia，Malaysia*

2 *Rajabhat Maha Sarakham University, Maha Sarakham，Thailand*

3 *School of Management University Sains Malaysia，Malaysia*

ABSTRACT

This systematic literature review investigates the relationship between supply chain finance (SCF) and innovation performance, aiming to synthesize current knowledge, identify the current status of research and changes in research themes, and reveal future research directions in this rapidly evolving field. The study reviewed 58 high-quality articles published in Web of Science and Scopus, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. A content analysis by keywords was employed for publication trends and topic analysis. Three primary research themes emerged: (1) SCF as a Driver of Innovation Performance, (2) Green and Sustainable SCF, and (3) Digitalization and FinTech-Enabled Supply Chain Innovation. It is limited by database scope, language restrictions, and potential selection bias. Future studies should broaden data sources and incorporate empirical validation to enhance the robustness of the findings. The findings provide practitioners with strategic guidance for the implementation of SCF, emphasizing the importance of digital transformation and green innovation orientation. For policymakers, the results highlight the critical role of institutional environment quality in moderating SCF effectiveness and the need for supportive regulatory frameworks. The review synthesizes the two fields of SCF and innovation performance. It makes a contribution to the field by revealing the thematic evolution and proposing a future research agenda aligned with sustainability imperatives and digital transformation.

Keywords: SCF, innovation performance, systematic literature review, PRISMA

1.Introduction

In the context of global economic digital transformation and supply chain restructuring, SCF has emerged as a critical bridge connecting financial innovation with operational management, increasingly attracting widespread attention from both academic and business communities regarding its impact mechanisms on enterprise innovation performance. SCF is a financial model that provides financing and settlement services to companies in the supply chain. These services are based on supply chain relationships, through the credit and information sharing of core enterprises. The purpose of this financial model is to optimize capital flow, reduce financing costs and improve the overall efficiency of the supply chain [1]. According to Global Growth Insights [2], the global SCF market is projected to grow from USD 8. 68 billion in 2024 to USD 18.99 billion by 2033, representing a compound annual growth rate of 9.08% during 2025–2033. Simultaneously, with the advancement of the Paris Agreement and various national “dual carbon” goals, green innovation has become a key driver for enterprises to maintain competitive advantage, further highlighting the importance of understanding the relationship between SCF and innovation performance. The European Commission ’ s

*Corresponding author

E-mail addresses:zhuwei@student.usm.my(WeiZhu), sak8080@126.com(GuanghuiChen), khaiwah@usm.my(KhaiWahKhaw)

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"Sustainable Finance Taxonomy" also emphasizes the critical role of financial instruments in promoting green innovation [3]. In addition, a growing body of literature has examined SCF from operational and financial perspectives.

Nevertheless, the extant research on the relationship between SCF and innovation performance remains fragmented. Earlier studies focused primarily on single mechanisms, such as trade credit, factoring, or reverse factoring. These were often treated as isolated financing tools without embedding them in the broader supply chain context [4, 5]. Recent studies have emphasized the capacity of SCF to enhance firms' innovation capabilities by mitigating financial limitations and promoting inter-organization collaboration [6]. In current studies, a significant proportion of them on this subject remains descriptive or limited to case studies, and comprehensive reviews systematically tracing the evolution, scope, and implications of SCF for innovation performance are still scarce [4]. Furthermore, extant research has a tendency to focus either on financial outcomes or operational efficiency, frequently overlooking the multidimensional pathways through which SCF can enable or constrain innovation [7].

Therefore, this paper aims to explore the following overarching research question: How does SCF affect firm innovation performance? To answer this question, this study explores three interrelated sub-questions: (1) What is the current status of academic research on the impact of SCF on innovation performance? (2) What are the research topics on the impact of SCF on innovation performance in existing research? (3) What future research directions can be proposed to gain a more comprehensive understanding of SCF and innovation performance?

In order to address the aforementioned research questions, the present study conducts a systematic literature review to provide a comprehensive understanding of the relationship between SCF and innovation performance. Specifically, this study aims to: (1) analyze the current state of research on the impact of SCF on innovation performance, summarizing key publication trends, the most influential authors, etc.; (2) identify and categorize the main research themes emerging from prior studies to clarify how scholars have conceptualized and examined this relationship; and (3) propose future research directions to deepen understanding of SCF ' s role in fostering innovation .

This study makes several key contributions. Theoretically, it bridges financial and innovation perspectives within supply chain management, revealing how SCF mechanisms foster innovation. Practically, it offers actionable insights for SMEs and policymakers to leverage SCF for sustainable growth. Methodologically, it employs a PRISMA-based SLR approach integrating bibliometric and content analysis to ensure rigor and transparency.

The remainder of this paper is structured as follows: Section 2 outlines the review methodology; Section 3 reports descriptive and thematic findings; Section 4 presents discussion and conclusion with implications, limitations, and future research directions.

2 Literature Review

2.1 Introduction of PRISMA

PRISMA is a set of reporting guidelines for systematic literature reviews that have been designed to enhance transparency, reproducibility, and scholarly quality [8]. The methodology encompasses several key elements, including the meticulous registration of protocol, the establishment of rigorous inclusion and exclusion criteria, the formulation of a comprehensive search strategy encompassing databases, registries, and grey literature, the independent screening and data extraction by two researchers, the systematic assessment of risk of bias, and the comprehensive reporting in accordance with the PRISMA 2020 checklist. Utilizing a standardized flow chart enables researchers to meticulously illustrate the literature selection process, the synthesis of data, and the reliability of their findings [9].

The importance of PRISMA lies in its provision of a unified quality benchmark for systematic reviews, thus helping authors to avoid selective reporting and omissions of information, thereby enhancing the credibility and verifiability of research. Furthermore, it enables journals and reviewers to more efficiently assess the rigor of reviews, thereby promoting standardized scholarly communication and the reliable dissemination of research findings [10].

2.2 Supply Chain Finance

SCF can be defined as a financial service system that collaboratively optimizes the flow of capital, information, and logistics between upstream and downstream enterprises in the supply chain [11]. The objective of this initiative is to enhance the overall competitiveness of the supply chain by reducing financing costs and improving capital utilization efficiency [12]. In the nascent stages of research, the emphasis was placed on establishing a comprehensive definition and classification framework for SCF. This framework delineated a distinction between a "finance-oriented" perspective, which centered on the short-term financing of accounts receivable and accounts payable provided by financial institutions, and a "supply chain-oriented" perspective, which focused on the optimization of working capital across the entire supply chain [13]. Subsequent reviews of SCF research topics and methodologies by scholars identified three primary research dimensions. 1. The following entities are to be considered: banking institutions, core enterprises, suppliers, and others as deemed relevant [14]. The following financial instruments are to be considered: factoring, reverse factoring, advance payment financing, and blockchain platforms [15]. The present study explores the relationship between supply chain processes (i.e., procurement, production, and logistics) and performance.

In recent years, the relationship between SCF and corporate innovation performance has become a subject of considerable interest [16]. Empirical research has demonstrated that SCF services can significantly improve a company's overall innovation efficiency, technological innovation efficiency, and organizational innovation efficiency [17]. Furthermore, firm size and profitability have been shown to play a positive moderating role in this process. Moreover, blockchain technology is regarded as a pivotal innovation pathway for enhancing SCF transparency and reducing transaction costs [18]. A growing body of research suggests that its implementation in SCF can address the information asymmetry and credit risk issues that are inherent to traditional SCF. This suggests the potential for a novel value creation mechanism for supply chain innovation [19].

Presently, the scope of SCF research has expanded beyond the realm of conceptual frameworks, encompassing empirical validation, technological innovation (e.g., blockchain), and its repercussions on innovation performance [20] . A growing body of research is examining the variations in SCF models across various industrial chains and regions, as well as their systemic influence on corporate innovation ecosystems within the context of digital transformation [21].

2.3 Innovation Performance

Innovation performance is defined as the comprehensive performance of an enterprise's novelty, value creation, and competitive advantage in technology, products, processes, and business models [22]. It is a pivotal metric for evaluating the efficacy of a company's innovation endeavors. Its assessment encompasses various dimensions, including financial performance, market share, the number of patents held, and the rate of technology diffusion [23].

Innovation capability is the core resource that drives innovation performance. Enterprises are able to transform potential innovation into measurable performance indicators through investments in research and development (R& D), knowledge management, and organizational learning [24]. Additionally, the relationship between innovation and performance is not a unidirectional, deterministic phenomenon; it is influenced by multiple factors, including industry , competitive intensity, and knowledge absorption capacity [25]. Innovation performance is reflected not only in the number of patents or speed to market for new products, but also in technological innovation efficiency, organizational innovation efficiency, and the overall quality of innovation output [26].

Concurrently, the methods employed to assess innovation performance are undergoing a period of marked diversification [27]. A number of researchers have advanced a proposal to subdivide the innovation process into seven dimensions: input, management, strategy, organizational culture, project portfolio, and commercialization [28]. The researchers have also provided specific metrics for each dimension, enabling a comprehensive assessment of innovation management [28]. Furthermore, some scholars posit that the evaluation of innovation performance should also consider time lags and industry characteristics, thereby avoiding the one-sided interpretation of a single financial indicator.

In general, research on innovation performance has transitioned from a focus on single-effect analysis to a systemic framework, underscoring the interactive effects of knowledge management, organizational learning, and innovation capabilities. This has also achieved breakthroughs in process-oriented and dimensional measurement methods [29].

2.4 SCF and Innovation Performance

SCF is a strategic approach that aims to optimize capital flows within and outside the supply chain. This approach has been shown to reduce financing costs and enhance capital efficiency, contributing to enhanced overall business performance [30]. Recent empirical research indicates that SCF exerts a substantial positive influence on corporate innovation performance, particularly in contexts characterized by high supply chain concentration. The potential exists for the enhancement of innovation output through the improvement of supply chain collaboration and resource sharing [31].

Specifically, the SCF has been shown to provide small and medium-sized enterprises with more flexible financing channels, thereby enabling them to increase investment in R&D, introduce advanced technologies, and accelerate new product development [32]. Furthermore, the SCF fosters the dissemination of knowledge and technological collaboration among supply chain members, while concurrently providing financial support for the development of an innovation ecosystem [33].

The degree to which innovation performance is achieved is contingent upon the synergy of internal innovation capabilities, organizational learning, and digital platforms [24]. SCF, conceptualized as an external financial mechanism, has been demonstrated to alleviate capital constraints and enhance supply chain integration, thereby providing a crucial resource guarantee and collaborative platform for corporate innovation activities [33]. This integrated viewpoint illuminates the nexus between finance and innovation, a nexus that holds considerable research significance from both theoretical and practical standpoints [33].

3 Research Methodology

3.1 Research Design

This study employed a systematic literature review methodology, designed and conducted in strict accordance with the PRISMA 2020 guidelines. The PRISMA 2020 guidelines are widely recognized standards for systematic review reporting, ensuring scientific rigor, transparency, and reproducibility [34].

The core objective of this study was to comprehensively examine and analyze the current state of research, development trends, and future directions in the field of innovation and SCF through a systematic literature review approach combined with a mixed-methods design combining bibliometrics and content analysis, thereby laying a solid academic foundation for theoretical development and practical application in this field [35, 36].

3.2 Search Strategy

3.2.1 Database Selection

This study selected two premier international academic databases for literature retrieval: WoS: As the primary search database, covering high-quality SSCI and SCI journals and Scopus: As a supplementary search database, ensuring comprehensive coverage [37, 38].

These database selections were based on the following considerations: 1. Broad coverage including top-tier journals in management, economics, finance, and related fields 2. Complete citation indexing facilitating subsequent citation analysis 3. High data quality with rigorous journal selection criteria 4. High international recognition, widely used in academic research.

3.2.2 Data Selection

The formulation of the search strategy for this article combines the keyword summary of previous literature with classic review studies in related fields [39, 40]. The final search string (see Table 1) combines multiple keyword clusters through Boolean logic to maximize the coverage of relevant research. The literature search was conducted on 28 June 2025, and no time limit was imposed in order to comprehensively present the development context of SCF research. In order to ensure the quality and language consistency of the literature, this study exclusively includes academic journal articles published in English. Conference papers, reports, book chapters, dissertations and other non -peer-reviewed results are excluded. A total of 236 articles were retrieved from the WoS database, along with 58 articles from the Scopus database.

The deduplication of all search results was conducted using literature management software, resulting in the identification of eight articles. These left articles were then subjected to a two-stage screening process. In the initial phase, titles and abstracts were reviewed to ascertain their relevance to the research theme. This process resulted in the exclusion of 38 articles from WoS and 21 articles from Scopus. In the subsequent stage, the full-text articles were subjected to rigorous screening to ensure that they met the established inclusion criteria. Following a systematic screening process, 37 relevant articles from WoS and 21 from Scopus were retained for analysis, yielding a total of 58 articles. The comprehensive search and screening process is delineated in the PRISMA Flow Summary of Literature Selection Process (Table 2). This systematic screening process was implemented to ensure the principles of transparency and reproducibility were adhered to, as well as to guarantee the representativeness and academic quality of the included articles.

The specific inclusion and exclusion criteria are as follows: Initially, the inclusion criteria encompass the following: The following criteria must be met by the research content: firstly, it must involve both the core concepts of SCF and innovation; secondly, the research type is limited to empirical research, theoretical research, or case studies; thirdly, only formal papers published in peer-reviewed academic journals are to be included; fourthly, the research language is to be English, and the full text is to be available; fifthly, the paper must have a clear research method, reliable data sources, and evidence-based conclusions. Furthermore, the following exclusion criteria have been established: The research is limited in scope, as it exclusively focuses on supply chain management or financial performance, excluding an innovation perspective. The research method is unclear and lacks theoretical support or empirical basis. Additionally, non-academic results, such as conference papers, technical reports, book chapters, or review articles, are included. Finally, duplicate records or research for which the full text is not available are excluded.

Table 1 The search string.

Database	Search string
WoS	(TS=("Working Capital Management") OR TS=("supply chain" NEAR/5 financ*) or TS=(“supply chain financ*”) OR TS=(“financ* supply chains”) OR TS=(“trade finance”) OR TS=(“reverse factoring”) or TS=((“working capital” OR "trade credit" OR "bank credit" OR "early payment" OR "dela* payment" OR "advanc* payment" OR "capital constraint" OR "financial constraint") AND ("supply chain" OR "value chain" OR "logistics"))) AND (TS=(“innovation performance”) OR TS=(“innovation outcomes”) OR TS=(“R&D performance”) OR TS=(“innovation success”) or TS=(" innovation efficacy") or TS=(" innovation efficiency") or TS=("performance" AND "innovation"))
Scopus	TITLE-ABS-KEY ("Working Capital Management" OR ("supply" AND "chain" W/ 5 financ*) OR "supply chain financ*" OR "financ* supply chains" OR "trade finance" OR "reverse factoring" OR (("working capital" OR "trade credit" OR "bank credit" OR "early payment" OR "dela* payment" OR "advanc* payment" OR "capital constraint" OR "financial constraint") AND ("supply chain" OR "value chain" OR "logistics"))) AND TITLE-ABS-KEY ("innovation performance" OR "innovation outcomes" OR "R&D performance" OR "innovation success" OR "innovation efficacy" OR "innovation efficiency" OR (" performance" AND "innovation")) AND DOCTYPE (ar)

Table 2. PRISMA Flow Summary of Literature Selection Process

Stage	Process Description	Number of Records (n)	Notes/Reasons for Exclusion
Identification	Records identified throughdatabase searching	294	Initial search results across two databases (WoS：236 + scopus：58)
	Records after deduplication	286	Duplicates removed between databases（8）
Screening	Records excluded after title and abstract relevance review	59	Excluded due to lack of relevance to SCF and innovation topics (227)
Eligibility	Full-text articles assessed for eligibility	58	Excluded due to incomplete content（1）
Included	Total studies included in the final synthesis	58	

Source: Adapted from PRISMA Statement (Page et al., 2021)

4 Findings

4.1 Descriptive analysis

The 58 included studies demonstrate substantial academic impact, with an average citation count of 21.05 (range: 0-216). The study with the highest number of citations was that of Wuttke et al. (2013), which received 216 citations. This study examined the knowledge gap between product- and information-flow-oriented innovation and SCF through a study of six European companies. The temporal distribution of research activity reveals a marked increase, particularly in the post-2020 period, indicating the growing significance of research into SCF and innovation performance.

Publication timeline：The publication trend demonstrates a clear evolutionary trajectory. During the early phase (2013–2019), research output remained limited, averaging approximately one paper per year. The growth phase (2020–2021) witnessed a moderate increase to around four publications annually, followed by a rapid acceleration (2022–2023) with about ten papers per year. In the consolidation phase (2024), the output stabilized at nine publications, while a projected surge in 2025 indicates a potential peak, with seventeen papers published within the first half of the year, reflecting growing scholarly attention to the topic (see Figure 1).

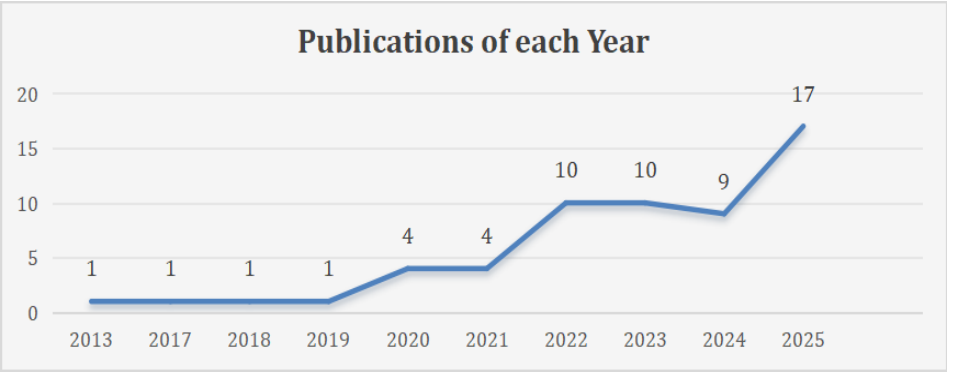


Figure 1：Publications of each year

Cited by: Figure 2 below shows that the annual number of citations for this research exhibits significant fluctuations and phased characteristics between 2013 and 2025. Citations were low and unstable in the early stages (2013–2019), reaching a low of 8 in 2019. Starting in 2020, citations increased significantly, peaking at 359 in 2022, de monstrating the widespread scholarly attention this field received during this period. Although citations declined slight ly in the following two years (2023–2024), they remained at high levels (207 and 80), indicating a gradual stabilization of research interest. With 35 citations already in the first half of 2025, the research is expected to maintain a moderate l evel of citations throughout the year. The overall trend suggests that this research topic has entered a period of steady development after experiencing rapid growth.

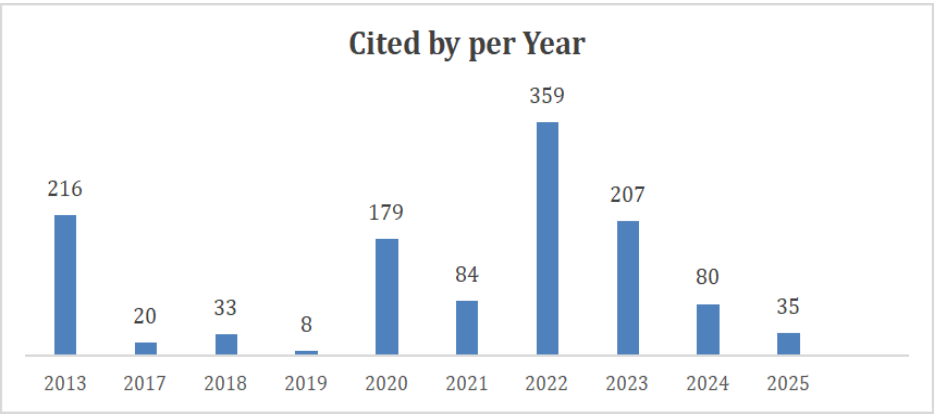


Figure 2：Cited by per year

Top 10 Citation: Within the top 10 most cited studies, Wuttke, Blome [41], published in the Journal of Business Logistics, ranked first with 216 citations. This study employed a multi-case exploratory approach to analyse the adoption process of SCF among European companies, thereby revealing the differences and interactions between companies and their suppliers in SCF adoption. The proposal further encompasses the expansion of an SCF adoption framework, thereby establishing a theoretical foundation for subsequent scholars to comprehend supply chain innovation from a capital flow perspective. Secondly, Soni, Kumar [42], published in Technological Forecasting and Social Change, received 146 citations and thus ranked second. The present study focuses on sustainable SCF in the context of Industry 4.0, proposing a technology selection framework based on hesitant fuzzy methods. The study emphasizes the key role of the Internet of Things, cloud computing, and big data analytics in improving financing efficiency and innovation performance for SMEs. In essence, the two aforementioned studies signify the academic progression of SCF from the examination of conventional adoption mechanisms to the exploration of innovations that are centred on digitalization, intelligence, and sustainable development.

Table 3: Top 10 cited publications

Author	Publication Year	Source Title	Cited by
[41]	2013	JOURNAL OF BUSINESS LOGISTICS	216
[42]	2022	TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE	146
[43]	2020	JOURNAL OF OPERATIONS MANAGEMENT	97
[44]	2023	JOURNAL OF INNOVATION: TECHNOLOGY , MARKET, AND COMPLEXITY	78
[45]	2020	INDUSTRIAL MANAGEMENT & DATA SYSTEMS	63
[46]	2022	JOURNAL OF INDUSTRIAL INFORMATION INTEGRATION	52
[47]	2023	JOURNAL OF ENGINEERING DESIGN AND TECHNOLOGY	39
[48]	2022	CORPORATE SOCIAL RESPONSIBLITY AND ENVIRONMENTAL MANAGEMENT	35
[49]	2024	INTERNATIONAL JOURNAL OF OPERATIONS & PRODUCTION MANAGEMENT	34
[50]	2018	JOURNAL OF ENGINEERING AND TECHNOLOGY MANAGEMENT	33

Journal Distribution: As illustrated in Table 4, the distribution of publications across academic journals is presented. The results indicate a relatively dispersed publication pattern, with Managerial and Decision Economics leading at three papers, followed by several journals such as Industrial Management & Data Systems, International Journal of Logistics—Research and Applications, and International Journal of Operations & Production Management, each contributing two papers. The remaining journals, constituting the majority, published a single article each. This distribution indicates that research on SCF and innovation performance is multidisciplinary and dispersed across a variety of publication outlets.

Table 4: Journals and its publications

Rank	Source Title	NO. of publications
1	MANAGERIAL AND DECISION ECONOMICS	3
2	INDUSTRIAL MANAGEMENT & DATA SYSTEMS	2
3	INTERNATIONAL JOURNAL OF LOGISTICS-RESEARCH AND APPLICATIONS	2
4	INTERNATIONAL JOURNAL OF OPERATIONS & PRODUCTION MANAGEMENT	2
5	INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS	2
6	INTERNATIONAL REVIEW OF FINANCIAL ANALYSIS	2
7	SUSTAINABILITY	2
8-50	Other journals (one publication each)	1
	Total	58

Geographic Distribution: the geographical distribution of publications indicates a substantial concentration in China , which accounts for the majority of studies (38 out of 58). It is evident that a number of other contributing countries, including Italy, India and Turkey, demonstrate moderate engagement. In contrast, the remaining nations – namely Belgium, Germany, the United States and the United Kingdom – each contribute a single publication. This finding suggests that research on SCF and innovation performance is predominantly driven by Chinese scholars, reflecting the country's growing emphasis on supply chain and financial innovation research. The aforementioned point is demonstrated in Figure 3.

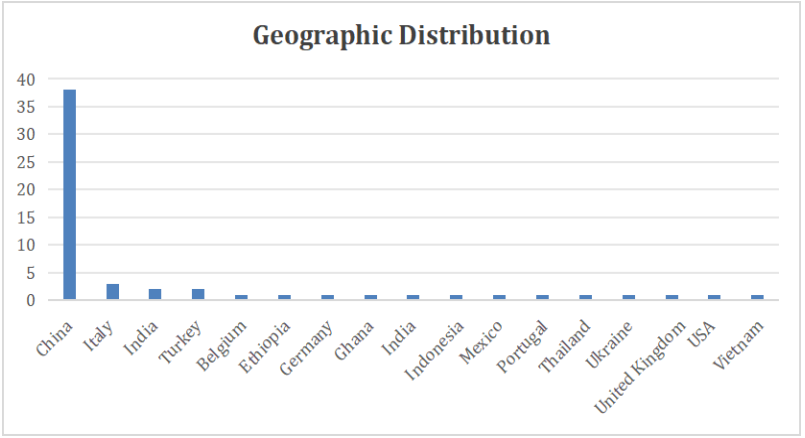


Figure3. Geographic Distribution

4.2 Thematic Analysis

A content analysis of 58 studies was conducted, leading to the identification of three predominant research themes. These themes reflect an evolving scholarly focus on the intersection of SCF and innovation performance.

Theme 1: SCF as a Driver of Innovation Performance

A significant body of research examines how SCF mechanisms enable firms to innovate by mitigating financing constraints and enhancing resource allocation efficiency [50, 51]. Research within this theme has indicated that trade credit and cash flow play a mediating role in facilitating innovation, particularly among SMEs. The extant literature on the subject is in agreement that effective SCF practices provide liquidity support in addition to fostering inter-firm trust and collaborative innovation across the supply chain.

Theme 2: Green and Sustainable SCF on Innovation Performance

The second theme focuses on the role of SCF in promoting green innovation and sustainable development [44, 50, 52, 53]. It is important to note that scholars have placed significant emphasis on the integration of environmental considerations into financial decision-making. Indeed, there has been much exploration of how green credit, sustainability-linked loans and eco-finance instruments can drive firms' environmental performance. This stream extends the SCF discourse beyond the confines of economic efficiency, establishing it as a strategic instrument for achieving both innovation and sustainability objectives.

Theme 3: Digitalization and FinTech-Enabled SCF on Innovation Performance

The third theme focuses on the digital transformation of SCF, driven by advancements in financial technology [42, 44, 52]. This cluster of research examines the manner in which digital platforms, blockchain, and big data analytics enhance financing accessibility, transparency, and innovation efficiency along the supply chain. The extant literature reveals an emerging paradigm in which digital SCF systems act as catalysts for business process innovation and the reconfiguration of value networks.

Collectively, these themes illustrate a clear research trajectory from traditional SCF mechanisms toward sustainability-oriented and digitally enabled financial ecosystems. The extant literature increasingly recognizes SCF not merely as a financing instrument, but as a strategic enabler of innovation and resilience in dynamic market environments.

5 Discussion and Conclusion

5.1 Discussion

The subject of SCF and innovation performance was first systematically explored by Wuttke, Blome [41], whose pioneering study laid the foundation for understanding financial flow innovations within supply chains and remains the most influential work in this field. It is evident that research interest has grown substantially over time, particularly after 2020. A sharp increase in publications was observed in 2025, which reflects the rising academic recognition of SCF as a crucial enabler of innovation. It is noteworthy that the majority of studies have been conducted in China, thus emphasizing its active engagement in SCF research and practical adoption. In contrast, contributions from other countries remain limited. A comprehensive review of the extant literature reveals three primary research themes: first,

the role of SCF as a driver of innovation performance, with a focus on how SCF mitigates financing constraints and stimulates firms' innovation capabilities; second, the focus on Green and Sustainable SCF, examining how SCF mechanisms promote environmentally responsible innovation and sustainability practices; and third, the examination of Digitalization and FinTech-Enabled Supply Chain Innovation, with a focus on how technologies such as blockchain, IoT, and big data enhance the efficiency and inclusiveness of SCF systems [42]. Collectively, these themes illustrate the progression of SCF research from its inception as a foundation for theoretical exploration to its current manifestation as multidimensional, technology-driven applications that integrate innovation, sustainability, and digital transformation.

5.2 Theoretical Implications

This review offers several theoretical contributions to research at the intersection of SCF, innovation performance, and digital transformation. These contributions are categorized into four key areas.

Firstly, it advances the conceptualization of SCF, moving beyond a mere financial coordination mechanism to a strategic enabler of innovation capabilities. This study integrates perspectives from supply chain management, corporate finance, and innovation theory to demonstrate how SCF alleviates financing constraints and creates value by improving resource allocation and risk sharing [50, 51]. In doing so, it links cash flow management with innovation performance.

Secondly, it draws upon extant research to reveal the role of digital technologies and FinTech in transforming traditional SCF systems into innovation-oriented and data-driven ecosystems [42]. This theoretical framework provides a foundation for understanding the co-evolution of financial and technological capabilities within the Industry 4.0 paradigm.

Thirdly, the findings contribute to understanding SCF from an institutional and sustainability perspective. The mounting emphasis on the integration of environmental, social, and governance (ESG) factors, along with the increasing focus on sustainable SCF (sustainable capital formation), underscores the role of SCF as a pivotal mechanism for fostering sustainable value creation and risk management [54]. This development unveils novel theoretical pathways for integrating financial innovation with sustainability transformation and organizational resilience.

Lastly, this study contributes to the methodological foundation for future SCF research by combining a systematic literature review with content analysis. It provides a meta-theoretical perspective that allows scholars to track the field's intellectual evolution, thematic clusters, and citation dynamics.

5.3 Practical and Social Implications

From a management and policy perspective, this research provides practical insights for enhancing innovation through the integration of finance and technology across supply chains.

The findings indicate that managers who adopt SCF practices supported by digital technologies, such as blockchain, the Internet of Things, and big data, can achieve substantial improvements in liquidity management, reduce transaction costs, and strengthen supplier relationships [42]. The strategic integration of SCF into innovation management processes has been demonstrated to enhance operational resilience and innovation performance in businesses, particularly SMEs.

The findings underscore the imperative for policymakers and financial institutions to devise regulatory frameworks and digital financial infrastructure that are conducive to the broader adoption of SCF, particularly among SMEs operating in developing economies. The promotion of Fintech-based SCF solutions has the potential to reduce financing asymmetries, stimulate technological upgrading, and support inclusive industrial development.

From a societal perspective, SCF and its sustainable development variants play a vital role in promoting equitable growth and financial inclusion. By facilitating enhanced access to financial resources for SMEs, these mechanisms contribute to the dissemination of innovation and the fortification of local supply networks. In the broader societal context, SCF innovations are aligned with global development goals by promoting the sustainability, transparency, and economic resilience of interconnected value chains.

5.4 Limitations and Suggestions for Future Research

Despite the fact that this review complies with the PRISMA protocol and integrates bibliometric and content analyses to ensure systematic rigor, there are several limitations that open avenues for future inquiry.

Firstly, it is important to note that the review encompasses exclusively English-language journal articles that have been indexed in Web of Science and Scopus. This may potentially result in the exclusion of valuable insights from non-English or regional publications, particularly those that focus on emerging economies. Future studies could broaden the linguistic and database scope to include Chinese, Spanish, and other regional databases (e.g., CNKI, SciELO) to capture more context-specific perspectives [55, 56].

Secondly, the current research landscape is heavily concentrated in China, reflecting both the country's rapid development in digital finance and its strong manufacturing-based supply chain ecosystem. However, there is a notable absence of cross-country comparative studies that examine the institutional, cultural, and regulatory factors shaping the adoption and impact of SCF in other regions, such as Southeast Asia, Africa, Latin America, and Europe. It is recommended that future research explore these diverse contexts in order to ascertain how regional differences influence SCF mechanisms and innovation outcomes.

Thirdly, extant studies predominantly concentrate on firm-level effects, neglecting the network-level and ecosystem-level dynamics of SCF. It is recommended that future research adopts a multi-tier or supply network perspective in order to examine how inter-organizational relationships, trust structures, and digital platforms collectively affect innovation diffusion.

Fourthly, methodological limitations persist. The majority of studies utilize cross-sectional or case-based designs, which constrain causal inference and temporal analysis. It is recommended that future research employ longitudinal datasets, panel methods, and mixed-method approaches (e.g., combining bibliometric mapping, structural modelling, and qualitative comparative analysis) to capture the dynamic interactions among SCF, technological adoption, and innovation capability over time.

In conclusion, as sustainability and digitalization increasingly converge, it is imperative that scholars further investigate the integration of ESG principles, green finance mechanisms, and digital platforms within SCF systems. A theoretical and policy investigation into the potential of sustainable SCF to facilitate circular economy transitions and inclusive growth in SMEs could yield significant theoretical and policy insights for both emerging and developed economies.

5.5 Conclusion

This systematic literature review reveals that SCF plays a crucial role in bridging financial and innovation ecosystems, particularly through the adoption of digital technologies and sustainability-oriented practices. The field has evolved from exploratory conceptualizations toward more empirically grounded and technologically enriched models. In the context of increasingly uncertain global supply chains, SCF has the potential to become a fundamental element of financial resilience and innovation-driven growth. It is imperative that ongoing interdisciplinary collaboration and methodological diversification are employed in order to fully realize the theoretical and practical potential of the subject.

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