

Supply Chain Financing System Factors, Solutions, and Benefits: A Systematic Literature Review

Daud Fahmi Adhim

Management Science, School of Business and Management,
Institut Teknologi Bandung, Bandung, Indonesia
Email: daud_fahmi@sbm-itb.ac.id (*Corresponding Author*)

Nur Budi Mulyono

Digital Operations and Supply Chain Management, School of Business and Management,
Institut Teknologi Bandung, Bandung, Indonesia
Email: nurbudi@sbm-itb.ac.id

ABSTRACT

Supply Chain Finance (SCF) improves the business efficiency and effectiveness of suppliers, distributors, buyers, and financial institutions within supply chain collaboration. SCF implementation has risen to prominence worldwide, smoothing physical, product, and information flows within the supply chain as a means of maximizing profits. Due to a lack of research into SCF-related factors, solutions and benefits, this paper utilizes a systematic literature review methodology and content analysis to examine 56 papers drawn from major academic databases. The findings incorporate theoretical framework reviews which help to explain how SCF solutions can leverage enhanced supply chain (SC) performance by demonstrating the potential application of SCF to assist facilitators, reduce obstacles to sustained SC performance and develop an integrated conceptual framework illustrating how SCF accelerated overall supply chain performance.

Keywords: *financial flows, SCF, supply chain financing system, systematic literature review*

1. INTRODUCTION

Supply chain-related financial activities have become critical factors in improving business efficiency. The supply chain has specific business processes and technology to achieve its profit objective. Within the financial arrangements covering debt, equity, or the boosting of overall financial performance, at least two supply chain partners have financial contracts which the focal company implements (Steeman, 2014). Finance and Supply Chain Management (SCM) must collaborate closely to manage volatile market supply and demand effectively (Dooley *et al.*, 2010; Olson, 2010). SCF involves the application of three levers: supply chain collaboration, supply chain technology, and supply chain financing (financial and funding aspects) (Templar *et al.*, 2016).

Competitive pressure is intensifying in the rapidly changing contemporary commercial environment. In order to establish and maintain advantage, the effectiveness and efficiency of the entire SC must be considered (Hang and Tung, 2019). However, the SC's financial aspect has yet to receive sufficient attention in comparison to that afforded it during the previous decade (Pfohl and Gomm, 2009). Since

then, the issue of SCF has continued to attract ever-increasing interest from both scholars and practitioners, as evidenced by the number of recently published textbooks (Coyle, 2003; Seifert, 2009; Tate, 2019; Templar, 2016). Until recently, research into SCF, its integration with logistics, and its internal information flow has been largely ignored (Caniato *et al.*, 2016; Lekkakos and Serrano, 2016; Pfohl *et al.*, 2003; Sanders and Wagner, 2011; Vickery *et al.*, 2003; Wuttke *et al.*, 2016).

As a result of extensive coverage in financial magazines and banking training courses, SCF has become one of the most widely covered SCM-related topics (Zhang *et al.*, 2015). The SCF concept is at the epicenter of the interface between SCM and trade finance. Due to the impact of the global financial crisis and recession, numerous companies are facing liquidity problems to the extent of being at risk of significant financial shortages. Moreover, small and medium enterprises (SMEs) are usually the first to experience the effects of economic crises, such as the financial distress wrought by the COVID-19 pandemic (Caniato *et al.*, 2020). While suppliers encourage their customers to pay in advance, buyers are extending their payment terms. Commercial banking SCF solutions are becoming increasingly popular among SMEs and their house banks, as they support businesses (buyers) and their suppliers to improve payment terms and reduce working capital costs (Zhang *et al.*, 2015).

In recent years, SCF has developed rapidly and SMEs have made a significant contribution to the global economy. However, the capital constraints caused by the poor creditworthiness of companies remains unresolved. This is how SCF supports companies to raise funds from banks. At the same time, SCF can promote the expansion of commercial banks' customer bases. Therefore, numerous such institutions have established specialized SME business departments to expand their provision of various SCF services.

SCF faces contrasting challenges around the world. Individuals and businesses in developing countries face different obstacles to those of affluent western countries, be they a general lack of seed capital, overly restrictive regulations, or political instability. SMEs face far more numerous barriers in developing countries than in developed

economies, including limited access to raw materials, financing, and production resources (London *et al.*, 2010). SMEs typically lack sufficient capital to absorb large financial losses in comparison to large companies. Consequently, SMEs experience greater difficulty in identifying external funding such as loans and venture capital which would support an increase in their production capacity and sales (Chen and Zhang, 2021). This study, therefore, focuses on SCF implementation since it represents just one of numerous interconnected challenges countries face in managing general supply chain-related financial issues, while generating more profits on an equitable basis for all supply chain members.

Previous research on this topic has focused predominantly on SCF actors, instruments, and contextual factors, while largely ignoring the interconnection between the factors, solutions and benefits of SCF implementation (Bals, 2019; Huang and Chung, 2022; Jia *et al.*, 2020; Liu *et al.*, 2015; Marak and Pillai, 2018; Xu *et al.*, 2018). Therefore, further investigation which elaborates on the factors of SCF implementation, in addition to the type of solutions and benefits is required. Moreover, it is necessary to develop systematic knowledge based on the current literature which includes theoretical development and creative applications such as agricultural uniqueness in developing countries and technological advancements in the field of SCF. To fulfil the objectives of this academic paper, namely: systematizing SCF and elaborating on future research opportunities, while distinguishing it from other studies, we conducted a comprehensive and systematic literature review (SLR) which identified 56 relevant papers published between January 2000 and March 2022. By subsequently reviewing the content of these publications, we undertook a content analysis based on journal characteristics to produce a deep content analysis which collated detailed information. The findings provide a robust roadmap of an integrated conceptual framework demonstrating how SCF accelerates across an entire supply chain.

2. THEORETICAL PERSPECTIVE

SCF was defined as a method for two or more organizations within an existing SC to create value by controlling, planning, and steering the flow of financial resources on an inter-organizational level to optimize capital usage within the SC (Hofmann, 2005; Pfohl and Gomm, 2009; Vallet-Bellmunt *et al.*, 2011). Consequently, the efficiency of product movement, information provision, and currency, among other factors, may be improved (Silvestro and Lustrato, 2014; Song and Chen, 2016; Yang and Song, 2017).

Another perspective regards SCF as a financial tool and a technological solution (He and Tang, 2012) since it is a trade financing hybrid and a technology platform that selectively connects trading partners and financial institutions (Aberdeen, 2011). Orders and invoices will be checked and issued utilizing a technological platform based on this technique. According to Steeman (2014), SCF focuses on providing both pre- and post- shipping liquidity to SCs. SCF may support organizations in extending their payment schedules by selecting which invoices to pay when cash is limited or economize by resorting to early payment programs during prosperous times. As a result, SCF impacts

all elements of working capital which is calculating on the basis of the difference between current assets and liabilities (Aberdeen, 2011).

Camerinelli (2009) suggests that SCF can accelerate the integration of financial, informational and physical flows within the SC, thereby facilitating SC collaboration. One of the most promising features of SCF concerns the management of capital flows. SCF impacts working capital management (WCM) which, in turn, directly impacts the performance of SC members.

One traditional means of measuring a company's WCM is that of its Cash Conversion Cycle (CCC) which has been employed in several articles to analyze the benefits of SCF (Gelsomino *et al.*, 2016; Hofmann and Kotzab, 2010; Lamoureux and Evans, 2011; Randall and Farris 2009), and is a traditional key operating efficiency performance indicator of working capital management (Farris and Hutchison, 2002). Farris and Hutchison (2002) identified a higher net cash flow present value which ensures that a shorter CCC provides sufficient liquidity and, therefore, has a positive impact on the performance of individual companies.

The CCC also constitutes a bridge connecting the operational and trading activities of suppliers and customers. From a supply chain perspective, Randall and Farris (2009), building on the research undertaken by Hofmann and Kotzab (2010) and Lamoureux and Evans (2011), present ideas for traditional ways to optimize CCC which may constitute sub-optimal strategies for enhancing the financial management practices of SC companies. Therefore, CCC management which extends the payment period, while shortening the collection period, underpins the optimal strategy for SC members.

From another perspective, commercial banker S. H. Yang described "supply chain finance" as a new financing strategy geared to the needs of SMEs. It effectively integrated funding flow into SC management, thereby providing trade finance business services to companies and new loan financing services to disadvantaged SC companies (Yang, 2005). According to Y. F. Hu, SC finance uses future cash flows as a direct funding source for banks based on their actual trading background while also employing key corporate credit SC levels based on product-specific repayments. This constitutes the financing model for Corporate Trade Practices (Hu, 2007). J. H. Yan described how, in Europe and the United States, SCF refers to the banks and third-party logistic service providers within the SC which provide clients with a comprehensive clearing and financial services process (Yan and Xu, 2007).

Traditional lending involves lenders and borrowers, whereas SCF consists of a network of interconnected and coordinated entities that confront similar adaptive problems and produce mutual value via an exchange of services (Ketchen *et al.*, 2014; Lusch *et al.*, 2016). SCF has been described as a key SC management innovation, given the evidence of increasing momentum, in solving the worsening SC funding problem (Stemmler, 2002). The general SCF concept includes a set of financial practices that create value by integrating financial flows between SC members and third parties into the physical SC (Hofmann, 2005; Timme & Williams-Timme, 2000).

SCF represents a bridge between financial institutions/focal companies and financially constrained SC

members (Liu *et al.*, 2015). Traditional corporate finance theory and SCF theoretical insights show that the financing difficulties confronting SC members can be alleviated by SCF solutions (Hofmann, 2005; Klapper, 2006; Liu *et al.* 2015; Randall and Farris, 2009; Stemmler, 2002). The purpose of SCF practice is to establish a win-win situation in the SC (Lambert and Cooper, 2000) and promote the long-term sustainable SC development. Larger buyers of SCF solutions (usually focal companies) can provide working capital to suppliers and customers which enables them to negotiate more commercially favorable terms with their partners (Klapper, 2006).

SCF's objective is to reduce the total cost of capital, accelerate cash flow and improve SC reliability. With improved cash flow and creditworthiness, buyers can benefit from extended payment terms by receiving credit from financial service providers and settling payments with suppliers. In this situation, the supplier may also choose to receive early payment at a discounted price or pay the original (full) price before the normal payment deadline (Shaoyu, 2009).

Therefore, based on elaborated knowledge focusing on SCF, this paper reviews factors considered important in implementing SCF, the range of potential solutions offered by SCF within diverse circumstances, and the benefits of implementing SCF. This review is required to provide scholars and practitioners with systematic insights into SCF's progress over the past couple of years in coping with the rapidly-evolving business environment which includes unexpected turbulence. It also gives these interested parties an opportunity to identify any forms of SCF in other industries or countries on the basis of their unique characteristics, regulations, similarities and differences.

3. RESEARCH METHODOLOGY AND DESCRIPTIVE ANALYSIS

3.1 Research Methodology

This study aims to review recent research on the development of factors, solutions, and benefits relating to SCF implementation. This paper employs the systematic literature review approach proposed by Marrak and Pillai (2018) to broaden the scope and identify articles relating to SCF within the aforementioned context.

To include all of the topics in SCF, we first determined all of the potential combinations of ('supply chain financing' OR 'supply chain finance' OR 'SCF' OR 'SCFS' and ('model' OR 'SME' OR 'SMEs' OR 'loan' OR 'loans' OR 'credit' OR 'credits' OR 'factor' OR 'factors' OR 'solution' OR 'solutions' OR 'benefit' OR 'benefits')). All three strings were subsequently combined in a single search to produce preliminary findings. The keywords related to SC or finance are drawn from Xu *et al.* (2018), while those related to factors, solutions, and benefits appear in Marrak and Pillai (2018).

The initial searches in the 'Keywords' fields were conducted using the Scopus research database in accordance with the following procedure. The language of publication was limited to English, the document types to 'article,' 'conference paper,' and 'review', and the research focus to the most pertinent subject matter (see **Figure 1**).

Given that over 90% of the publications in the initial search results were published after 2000, it was decided to restrict the research to the period between January 2000 and March 2022. Following the application of these constraints, the initial search yielded 241 results which were then scanned for titles and abstracts using three broad inclusion criteria (see **Figure 1**). This process identified 131 documents to be included in the second round of selection which applied more specific inclusion and exclusion criteria (see **Figure 1**). Forty seven papers were selected for inclusion in the review after the full texts of these 131 papers had been read. The references in the publications were also checked to confirm the review's scope. If significant references were cited, the original sources were taken into account in the final evaluation. From among these sources, eight additional papers meriting investigation were identified. As a result, 56 papers were reviewed as part of the content analysis. **Figure 1** depicts the detailed review methodology employed.

3.2 Descriptive Analysis

Figure 2 contains the number of SCF-related papers published between 2000 and 2022 which fall within three distinct phases. During this first phase covering the period 2008 to 2011 an extremely limited number of articles (i.e., one or two) were published on the subject. In each year between 2008 and 2011, a total of five articles were published. Stage 2 spans the years from 2013 to 2018. By 2018, the number of articles released annually had increased to four, expanding the number of publications published during each phase (2019 to 2022). During Stage 2, a total of eight papers were published, while Stage 3 (2021), witnessed a significant rise in the number of articles published. In 2021, 16 papers were published on SCF, a figure representing more than a quarter of the total number included in this

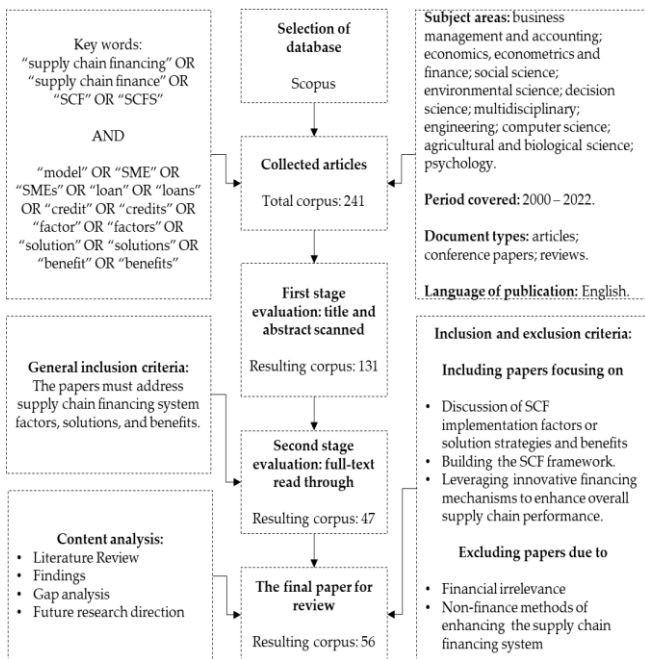


Figure 1 Research methodology

literature review (56). Given the annual distribution of publications, SCF is gaining in popularity and, consequently, further publications are expected to appear in the future.

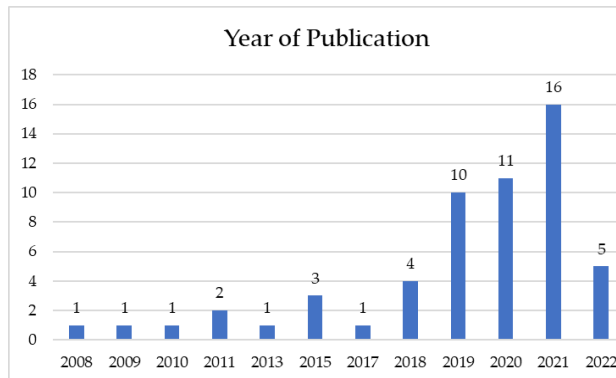


Figure 2 Number of articles published in each publishing year

Sources that have published at least two articles on this subject are shown in **Figure 3**, with the majority of papers being provided by the *Annals of Operations Research* and *International Journal of Production Research* (5), followed by the *Computers and Industrial Engineering* and *International Journal of Production Economics* (4 each), *Procedia Computer Science* (3), *Uncertain Supply Chain Management*, *International Transactions in Operational Research*, *Journal of Purchasing and Supply Management*, and *International Journal of Physical Distribution and Logistics Management*. During the period that the research for this article was conducted, two editions of each journal were published. More than 60% of the articles reviewed appeared in these nine journals, indicating their significant influence on SCF research. The journal distribution also reveals that SCF constitutes a prominent subject for study in a variety of publications. Our review of the research methodologies employed in the literature confirmed that the modeling method is that most commonly used to analyze SCF, accounting for 66.07 percent of the study, while the empirical method (i.e., survey or secondary-data analysis) ranks second, accounting for 23.22 percent. In the current study, the qualitative method is the least frequently employed (10.71 percent).

We observed that the majority of articles covering this issue provided a broad background without the application of a specific research context, regardless of whether the study focused on regional or industrial issues. Only five papers focused on a single industry, including agriculture (Belhadi *et al.*, 2021; Chen *et al.*, 2018; Liang *et al.*, 2021; Song *et al.*, 2020; Ye, 2021), logistics (Guo *et al.*, 2019; Lacono *et al.*, 2015; Ma *et al.*, 2020), manufacturing (Abbasi *et al.*, 2019; Babich and Kouvelis, 2018; Dong *et al.*, 2021; Jin *et al.*, 2021; Li *et al.*, 2019; Lin and Xiao, 2018; Nigro *et al.*, 2021; Shen *et al.*, 2019; Tang *et al.*, 2021; Xu *et al.*, 2021; Yan and Sun, 2013), dairy (Huang *et al.*, 2019), and construction (Min and He, 2019). Twenty-one research studies investigated SCF within the context of a particular region, predominantly China. These regions included Italy (Moretto *et al.*, 2019), India (Marrak and Pilai, 2021), Pakistan (Ali *et al.*, 2020), the US (Chen *et al.*, 2018), Vietnam (Hang and Tung, 2019; Nguyen *et al.*, 2022; Vu *et al.*, 2021), and China (Amankwah-Amoah *et al.*, 2019; Fangchun and Xiaoyun, 2010; Hanwu and Weijiao, 2011; Liu *et al.*, 2019, 2021; Ma

et al., 2021; Pei *et al.*, 2022; Qu and Ma, 2011; Shaoyu, 2009; Song *et al.*, 2016; Wang *et al.*, 2020; Xin and Tingjie, 2008; Yan, 2017; Zhang *et al.*, 2021).

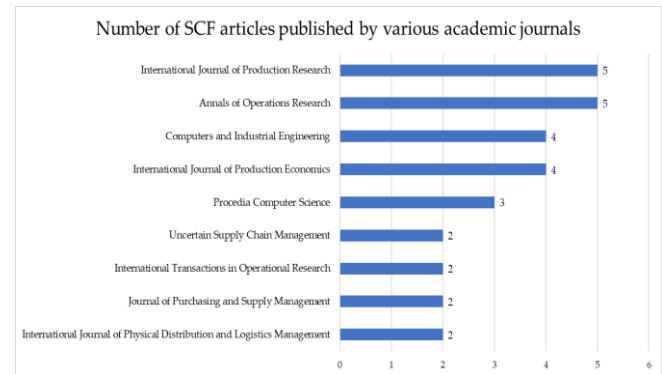


Figure 3 Number of SCF articles published by various journals.

4. FINDINGS AND DISCUSSION

4.1 SCF Factors

Inductively, the reviewed literature on connecting factors in financing mechanisms lists four distinct motivations for SCF implementation: (1) the global crisis, (2) financial constraints, (3) industrial landscapes, and (4) technology adoption. **Figure 4** depicts the comprehensive, integrated conceptual framework based on the research findings.

4.1.1 Global Crisis

We identified three major global crisis themes, the first of which is stakeholder needs. When stakeholders learn about the harmful environmental and social equality implications of multinational companies' SCs, they demand that these commercial entities demonstrate higher levels of corporate social responsibility. This increases the demand for more effective management of SC environmental and social performance (Carter and Easton, 2011). According to Zhou *et al.* (2018), companies are seeking innovative methods of reducing the environmental and social impacts of their SC as a means of meeting their stakeholders' demands. Tseng *et al.* (2018) also stated that stakeholder satisfaction with long-term corporate performance might help organizations improve their brand perception and consumer loyalty which would enable them to maintain their competitive advantage (Markley and Davis, 2007), thereby providing a significant incentive for SCF implementation.

The second global crisis driver is the urgent need to address social issues in developing countries. In order to minimize overall production costs, companies seek to outsource certain manufacturing processes to developing nations with lower labor and/or raw material prices (Mani *et al.*, 2018). However, in general, developing regions' lack of adequate regulatory regimes precipitates major societal challenges such as sweatshop manufacturing and the use of child labor (Awaysheh and Klassen, 2010). This need for regulation has motivated businesses to investigate innovative methods for improved control of their suppliers' behavior, which has pushed corporations to implement SCF solutions as a new approach to improving SC performance in terms of addressing social concerns (Tseng *et al.*, 2018) and social inequality (Zhou *et al.*, 2018).

The third global crisis driver is the COVID-19 outbreak. We allude to the findings of Karmaker *et al.*,

(2021) regarding the necessity for the financial support of SC partners in coping with pandemic-related issues. Companies are experiencing greater difficulty in obtaining bank financing because of a lack of collateral and the fragility of their commercial enterprises. Inventory liquidity limits represent a significant issue that might initiate a negative spiral due to less inventory, fewer sold items, reduced profit, and, even, lower liquidity. The service sector has experienced the most dramatic revenue decline, followed by industry and construction. In contrast, agriculture, forestry, and fishing businesses have experienced the smallest reduction in revenue (Le *et al.*, 2019; Tran *et al.*, 2020). SCF has significantly improved SME business performance and capital mobilization efficiency (Wuttke *et al.*, 2019), mainly within the context of the current Covid-19 pandemic.

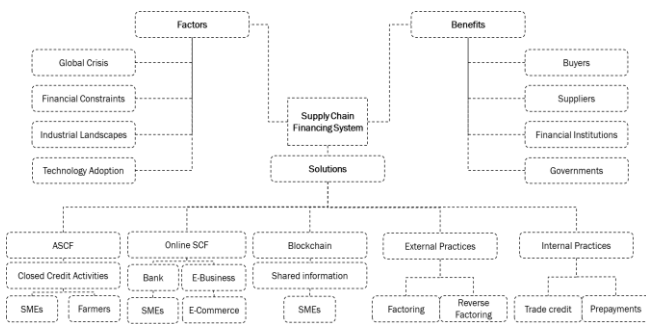


Figure 4 Thematic findings

4.1.2 Financial Constraints

The controller for accounts payable (A/P) and accounts receivable (A/R), the cash management treasurer, outstanding sales, promotional and procurement activity, and SC and manufacturing for inventory planning are all included in the full view of SCF. These elements focus on various functional groups but may also report to different executives. The emphasis of comprehensive SCF should be on engagement at the executive level to guarantee that all elements are collaborating in the achieving of a single objective, rather than individual goals which, when aggregated, produce a less desirable result.

In the opinion of Raghavan and Mishra (2011) a lender providing finance to a manufacturer is also incentivized to fund a retailer. These authors divided the decision-making process of lenders into two categories: one involving loans provided to two enterprises agreed upon independently of each other and another entailing a joint decision. According to their numerical analysis, a shared decision favors both the lender and the debtor enterprise if either the retailer or manufacturer has appropriately poor cash flow.

Significant challenges to the banking industry have impeded the rapid growth of SCF since the participation of the banking sector has been limited and it rarely collaborates with logistics enterprises. For example, the credit rating system which underpins the viability of the banking industry demonstrates various shortcomings. However, the banking industry experiences significant credit risk due to inadequate market risk warning and management competence in the field of access regulations relating to SMEs (Qu and Ma, 2011).

4.1.3 Industrial Landscapes

The growth of China's agricultural business is impeded by insufficient financial support, making it difficult and expensive for agricultural SMEs and farmers to obtain funding (Miller and Jones, 2010, Zhu *et al.*, 2016). Commercial banks, rural-based credit cooperatives, and other financial institutions are often reluctant to lend to those active in agriculture due to their low credit scores, high need for cash, extended production cycles, and considerable credit risks.

The logistics industry should progress due to more robust logistics enterprises having been attracted. The basis for the growth of SCF is sufficiently sound following the formation of the logistics sector and a plethora of worldwide standard logistics enterprises having been established (Qu and Ma, 2011).

According to Abbasi *et al.* (2019), the manufacturing industry requires a more scientific approach to assessing financial credit and developing a more precise method of measuring the SC's existing financial risk using the Internet of Things which has exacerbated the economic dilemma of SMEs. When commercial banks provide credit to SMEs active in the SC, the likelihood of failure rooted in SMEs' own deficiencies or environmental repercussions will cause them financial losses.

4.1.4 Technology Adoption

Traditional loans, the primary form of microcredit extended to farmers, are insufficient to meet the industrialized development requirements of the agricultural sector (Li *et al.*, 2013). Large loans are rarely granted to these new farmer groupings, a fact which jeopardizes their development. A collaborative credit-granting system might be constructed using bank e-commerce platform-based network governance through organizational innovation in the SC. This would also involve a collaborative debt enforcement mechanism to achieve complete incentive compatibility, lower agricultural loan risks, and, therefore, the elimination of credit rationing among farmers (Chen *et al.*, 2018).

It is necessary to strengthen both the social credit system and the trading platform for banks and enterprises. SCF engagement in the inner banking business is inadequate, while the credit rating system suffers from certain drawbacks. Despite several efforts by bank officials, the mechanism for creating SCF in this region remains flawed. Because the social credit system is not ideal, an effective information platform has yet to be developed (Qu and Ma, 2011).

Information asymmetry represents another critical issue in SME funding. SMEs can easily receive working capital from financial institutions if relevant information is accessible. However, where trustworthy information is available, a particularly unusual scenario in the case of start-ups, this leads to the considerable risks surrounding the operation of SMEs (Berger and Udell, 2006). Brealey *et al.* (1977) noted that: "Where major information asymmetries exist, and the supply of poor initiatives is large relative to the supply of good projects, venture capital markets may fail to exist."

4.2 SCF Solutions

Trade credit, prepayment, factoring, and reverse factoring are all examples of SCF solutions. As a result, this study will evaluate SCF-oriented practice that violates standard corporate finance theory by using an expanding total range of SCF solutions, such as trade credit, and prepayment, as novel SCF proxies. This study aims to investigate the tension between SCF-oriented practice and standard corporate finance theory and to address the following questions: "Will SCF improve supply chain performance?" and, should this be the case, "What forms of SCF solution would prove most beneficial?"

4.2.1 Agricultural Supply Chain Financing

Credit guarantees from core agricultural enterprises underpin their SC activities, as do logistics integration, capital flows, and information flows for the purchase of raw materials, agricultural production links (planting and breeding), and agricultural product processing-distribution-consumption links. Each SC stage has the potential to help close the financial gap between SMEs and farmers by increasing the trust that banks have in their agricultural clients, lowering credit risks for SMEs and farmers, and delivering a win-win solution for commercial banks, agricultural enterprises, and farmers (Gelsomino, 2016). Furthermore, the ASCF may increase agricultural production, accelerate agricultural modernization, industrialization, intensification, and rural urbanization, while also promoting long-term rural finance and agricultural development (Silvestro and Lustrato, 2014). As a result of SMEs' limited repayment capacity and their reluctance to repay debt, commercial banks may experience losses resulting in ASCF credit risk (Lekkakos and Serrano, 2016).

It has been revealed that certain commercial banks prefer to blindly operate a SCF business, thereby potentially exposing themselves to unforeseeable risk (Gelsomino, 2016). As a result, while commercial banks can profit financially from using SCFs, they must be fully aware of, identify, and analyze the underlying ASCF credit risks, while devising financial risk mitigation measures for the agricultural SC.

For example, China's agriculture SCF model is problematic since SC companies are interdependent. Both upstream and downstream supply chain SMEs are less risk-averse and, therefore, more sensitive to volatility which can exert a domino effect on regular operations across the SC. Consequently, this potential default risk significantly impedes development throughout the whole industrial chain, exacerbating bank loss risks and eventually affecting the development of a sustainable agricultural business (Yun and Jingrong, 2019).

4.2.2 Online Supply Chain Financing

Three types of online SC financing exist: bank SC finance, e-business SC finance, and bank SC finance based on the e-Business platform (Lekkakos and Serrano 2016) as shown in the points below:

1. Commercial bank SC financing constitutes a predominantly web-based version of the classic concept whose primary purpose is to integrate each participant's information on the SC platform to enable

data to be visualized by all other participants. The information on the platform regarding SMEs enables the provision of effective and convenient financing services. The online SC finance model is shorter than its traditional counterpart (Chang *et al.*, 2016).

2. Scholars have, to date, undertaken minimal study of SC finance for e-commerce. Microfinance institutions constitute the vast majority of fund suppliers. Internet users represent the primary group engaged in e-commerce who manage their own credit transactions and, depending on the platform, might be categorized as B2B or B2C (Gonsalvez and Inman, 2016).
3. With SCF using an e-commerce platform to better serve SMEs, commercial banks cooperate with e-Business platforms to expand their SCF services. Consequently, a bank SCF based on an e-Business platform has emerged. This financial solution may meet the financing requirements of network merchants, while also increasing the area of operations (Muhammad *et al.*, 2018).

Reza-Gharehbagh *et al.* (2019) undertook numerical research and argued that the government's direct intervention program generates a greater return for local SCs when financed through an online P2P financing platform. In contrast, the share exchange ratio in EF is a key component in selecting the preferred intervention policy for the local SC. These researchers discovered that when the share exchange ratio is sufficiently high the local SC favors the government's indirect participation.

According to Abbasi *et al.* (2019), the credit risk assessment model within the Internet of Things-based SC financial model delivers high accuracy for SMEs, providing solid assurance of the rapid expansion of SCF security. It has been shown that SCF based on the Internet of Things has supported SMEs in solving their financial problems.

4.2.3 Technology of Supply Chain Financing

The introduction and rapid development of Blockchain technology has provided significant technological assistance in tackling the two fundamental challenges (information asymmetry and business communication) confronting SME finance. Blockchain is a data system that organizes information chronologically. The distributed ledger system is a novel application model for networked data storage, point-to-point transmission, a consensus process, an encryption algorithm, and other computer technologies. Centralized data storage across numerous independent devices, referred to as distributed data storage, enhances the reliability and security of this activity. Each node applies a consensus process to secure the accuracy of the data in the chain and the consistency of the data stored. A consensus mechanism is a technology used in blockchain transactions to achieve widespread consensus. A fundamental component of blockchain technology is establishing uniform and transparent rules for each node in order to maintain the distributed network's data status. The asymmetric encryption technology enhances system security by validating blockchain data updates (Zhang *et al.*, 2020).

Yao *et al.* (2020) employ blockchain benefits to represent, both objectively and authentically, the entire SC's business logic, monitor the entire SC process, effectively ease the SC credit crisis, and support the growth of the SCF company. However, blockchain infrastructure development

is still in its initial phase, and technological challenges exist to connecting the Internet to the blockchain network whose limited capacity and poor transaction speed will inhibit the widespread adoption of blockchain technology.

Zhang *et al.* (2021) studied both the traditional and smart contracts of the present SC to continue blockchain technology research. Blockchain technology's unique decentralization and transparency can genuinely materialize smart contracts and address the lack of trust, traceability challenges, and privacy protection created in actual SC management by information asymmetry and opacity between supply and demand parties. This process involves tokenizing asset rights digital encryption, widening the scope of credit radiation and addressing the financing issues relating to SMEs.

4.2.4 Supply Chain Financing Practices

SCF practices provide various options, including factoring, reverse factoring, trade credit, and prepayment (Hofmann, 2005; Klapper, 2006; Pfohl and Gomm, 2009). Chen and Wang (2012) showed that a trade credit contract might provide value to a SC involving a single supplier and retailer, while also assisting SC coordination. Because this research analyzes the SC at three levels (supplier, focal company, and customer), the influence of providing company performance-based SCF has been evaluated separately within the contexts of upstream and downstream SCs.

One of the primary reasons SC members seek loans is inadequate cash flow. SCF frequently uses bank credit and trade credit financing (Xu *et al.*, 2018; Zhao and Huchzermeier, 2015). According to Cai *et al.* (2014), merchants prefer trade credit financing when the trade credit market is more competitive than the bank credit market (i.e., the prevailing interest rate in the trade credit market is lower than that in the bank credit market). In the absence of any retail competition, manufacturers prefer to use trade credit financing (bank credit financing) when the retailer's interest rate is suitably low.

Lin and Xiao (2018) conducted a study in which they developed a SC involving an SME producer and a creditworthy retailer. The manufacturing procedure is time-consuming and the producer has just one production opportunity before the selling season. The merchant can place orders with the manufacturer under push and pull contracts. According to the findings, the retailer expects increased revenue from the pull contract, and the bank will raise interest rates to prevent and control risks associated with this form of contract. A retailer's profit under a pull contract is higher than under a push contract.

Moretto *et al.* (2019) studied the potential for creating a SC credit rating by combining typical financial ratings produced by financial institutions with vendor ratings (used by purchasers to monitor their suppliers). They have demonstrated empirically that the buyer vendor rating of important suppliers (i.e., on-time delivery, quality, responsiveness, flexibility) has a high potential value when paired with financial data to generate a higher credit rating.

In their study, Nigro *et al.* (2021) concluded that the retailer's attempts to boost market demand leverage order quantity and, hence, the supplier's profit. Consequently, if earlier research indicated that trade credit improves SC efficiency and if the retailer's efforts persuade suppliers to

finance his buyer, they conclude that this new factor merits further investigation.

Activity	3PL Role	SCF "organizer"	Financial Services Provider
Goods	Delivery transportation, logistics, and supply chain services – i.e., transport the goods.	N/A	N/A
Information	Collect and provide information regarding the distribution of goods among customers, organizers, and financial services providers.	Verify data transfer; aggregate, analyze, manipulate, and provide data; authorize financial transactions.	Receive data from organizer in order to authorize financial transactions.
Funds	N/A	Participate in funding of transaction and assume a proportionate share of the risk.	Participate in funding for transaction and assume a proportionate share of the risk.
Sales & Marketing	Identify prospects, participate in sales calls, and stem commoditization.	Identify prospects, market SCF, participate in sales calls, identify financial risks, assist in structuring credit solutions.	Identify prospects, participate in sales calls, assist in structuring credit solutions.
Financial Benefits	Transportation-related revenue, deeper relationship with customer and organizer.	Interest income, fee income, deeper relationship with customers, financial services providers, and logistics/transportation providers.	Interest income, deeper relationship with customers, organizer, and logistics/transportation providers.

Figure 5 3PL role in collaboration with SCF

Zhang *et al.* (2008) elaborated the role of third-party logistics (3PL) in collaboration with SCF (see Figure 5), physical and informational controls being key to a SCF solution. Logistics providers and financial services companies must collaborate to develop accurate visualization tools that provide SC managers with the necessary data and lenders with the security required to deliver capital. Once a robust information-based system is in place, trading partners, logistics companies and banks need to be able to access information quickly and efficiently.

The starting point for information about transported goods must be the entity that transports them (SC service provider, carrier, and/or logistics partner). These are the entities that physically manage the goods within the SC. Access to this information is essential from a demand planning perspective. Financial services providers know where their goods are located, enabling them to more securely raise funds at various SC milestones.

4.3 Benefits of SCF

SCF serves as a connection between financial institutions/focal enterprises and financially constrained SC members (Liu *et al.*, 2015). Both traditional corporate finance theory and SCF theoretical findings imply that SCF solutions help reduce the financial challenges of SC participants (Hofmann, 2005; Klapper, 2006; Liu *et al.*, 2015; Randall and Farris, 2009; Stemmler, 2002). According to some experts, SCF encourages long-term SC growth since it can provide suppliers and/or consumers with working capital. Additionally, significant buyers of SCF solutions can negotiate more favorable terms with their partners (Klapper, 2006). Based on earlier SCF research findings, several conceptual additions have been proposed. The advantages of SCF adoption for customers, suppliers, financial institutions, and governments are discussed further below.

4.3.1 Buyers

The first benefit of SCF for buyers is that they may expect longer payment periods from suppliers without incurring higher costs (Aberdeen, 2011). The prospect of resolving time issues and automating processes is the second advantage. Because SCF is built on technological platforms,

businesses may minimize paperwork and expedite information processing (He and Tang, 2012). Furthermore, by effecting payment on invoice maturity, purchasers may benefit from early settlement discounts which contribute directly to profits (Vliet *et al.*, 2015; Wuttke *et al.*, 2016).

According to Yan (2017), SCF benefits the leading company by allowing it to grow its operations and strengthen its position within the SC. Firstly, it promotes commercial expansion by increasing the scope of purchases and sales. Secondly, it contributes to a considerable reduction in the collection and purchase cycle and improved financial and operational efficiency. Thirdly, it lowers the cost of capital by reducing cash utilization. Finally, it contributes to reducing the gap between the leader and SC members, thereby consolidating its position within the SC.

SCF's role is to maximize capital availability and cost within a particular buyer-supplier SC. Lenders can reduce financial risk within the SC by combining information and physical control. Reduced risk allows for more capital to be accessed, more money to be available at an earlier stage, or capital to be raised at lower interest rates (Shaoyu, 2009).

4.3.2 Suppliers

In addition to the advantages for buyers, SCF provides numerous benefits for suppliers. On the basis of previous studies, these can be listed as follows:

1. Lower trade receivables and higher cash position: As SCF extends buyers' DPO, Accounts Payable (AP) rise, signaling that buyers have more cash to support their value-creation operations (Aberdeen, 2011; Rogers *et al.* 2016). Buyers may extend their payment terms under these circumstances, suppliers may receive payments earlier, and financial institutions may profit from charging a discounted rate (Aberdeen, 2011).

2. Under acceptable payment delay conditions, SCF is an impawn finance pricing model which takes into account both backorders and backlogs, as well as any discount (Yang, 2013). Finance may be provided by suppliers, core businesses, or distributors, depending on the present economic condition and the financial strength of the SC partner (He and Tang, 2012).

3. Increased cooperation with the purchasing company offers a competitive advantage: businesses are urged to interact and subsequently collaborate with an external partner and another which is internal to a SC with which they have a strong relationship. This mutual trust will result in a long-term commercial partnership (Hofmann, 2005; Aberdeen, 2011).

4. Transparency: internal and external information is transferred when two financial institutions or companies within an SC utilize a technological platform to execute financial transactions. Consequently, sharing events between actors within an SC becomes apparent, thereby lowering risk (Rogers *et al.*, 2016; He and Tang, 2012).

5. Controlling: businesses may predict possible issues and develop actions/solutions to ensure compliance with internal and external standards (Hofmann, 2010). Numerous companies also enable their partners to make payments after a specific time with no requirements as a means of enticing them to place an order that may exceed their financial capacity with less risk. In some cases, customers are eager to settle their account more quickly in order to benefit from trade credit (Thangam and Uthayakumar, 2009).

6. Prediction: using automation to complete financial transactions and provide information will enable companies to access various data and analytical sources. The management team can then estimate future demand (Aberdeen, 2011).

7. Faster cash conversion: historically, commercial credit policy has affected the cash cycles of a SC. Because some cash is typically trapped in non-value creation activities, an opportunity exists to free up this additional cash and improve financial flows within the SCs (Hofmann, 2010).

Yan (2017) also noted how SCF handles the problem of capital limits and maximizes their payment, financing, settlement, and other demands for participating companies. Firstly, it enables them to access previously unavailable finance and expand their buying or production capacity. Secondly, the finance is inexpensive. Thirdly, it enhances settlement efficiency by facilitating online loans, repayment, and settlement. Finally, it contributes to the growth of the credit score of the financial system's follower companies.

4.3.3 Financial Institutions

Apart from the benefits to buyers and suppliers, SCF paves the way for financial institutions to reap numerous benefits which, according to previous research, include the following advantages.

SCF enables the financial institution to investigate new funding requirements and more properly assess credit options. Firstly, it promotes better understanding of the credit status of SC follower companies and enhances the credit evaluation procedure. Secondly, it facilitates the commercial entity's expansion to support numerous small and medium-sized following companies that could not previously acquire financing. Thirdly, using electronic transaction data to assess credit is advantageous (Yan, 2017).

However, the SCF "organizer", the company with experience in logistics/transportation and financial services, is absent from this equation. The organizer is the subject matter expert, bringing all parties (transportation and logistics, banks, buyers and sellers) to the table and being aware of their respective needs (Shaoyu, 2009).

Financial SC services may significantly improve a bank's reputation and influence. Consequently, banks will be able to offer additional financial products to raise loan interest income. Furthermore, SCF services have the potential to enhance existing SC processes and reduce the dependency of companies or SCs on banks. This leads to banks being the principal clearing institutions for SCs (Hanwu and Weijiao, 2011).

4.3.4 Governments

In addition to the benefits to buyers, suppliers, and financial institutions, SCF paves the way for governments to reap numerous benefits which previous research suggests are as follows.

Governments and politicians are expected to act financially and assist the entrepreneurial movement by opening up formerly closed industries (e.g., banking and finance) and exploiting the expertise of MNEs as economic development stimulants (Wu and Jia, 2018).

From a public policy perspective, the government must enhance the business environment, while legal and financial institutions must eliminate barriers to accessing financing

and create favorable circumstances for small enterprises to expand (Zhou *et al.*, 2014). Furthermore, SCF requires the government's encouragement and cooperation to promote and support SME access to SCF products, thereby enhancing market competitiveness (Nguyen *et al.*, 2022; Vu *et al.*, 2022).

In addition to corporate businesses, the government should consider certain calibrated policies, laws, and regulations to support SCF adoption (Pei *et al.*, 2022). They must focus on building information infrastructure and developing rules to support enterprises that have made progress in their adoption of SCF, notably financial institutions, that directly generate SCF products. The SME currently has greater SCF access because of government legislation (Yan *et al.*, 2021). Furthermore, a legislative framework should be designed to ensure smooth SCF operations and the rights of all interested parties to enhance national income. This might, in turn, support SMEs and encourage national economic development (Hang and Tung, 2019; Liu *et al.*, 2020).

4.4 Integrated Conceptual Framework

This research provides an integrated conceptual SCF framework based on the previous thematic findings and discussion (see **Figure 6**). SCF factors are shown on the left side of the framework, where SC actors are classified into four types based on their distinct characteristics. All flows (information, financial, and product) are expected to be transparent and integrated within a region/industry-implemented technology. In general, business processes flow from supplier to producer, through distributor to retailer, culminating in the consumer who purchases the product. All these actors and activities are recorded in a technological space with the result that an actor can collaborate with any financial institution without fear of being exploited. Financial institutions have the right to access all actors' transaction data across the industry/region in order to monitor the loan burden they should ideally assume in order to further develop their business. Finally, the collaboration of actors, financial institutions, and the market was expected to produce a win-win solution which would benefit business, government, and society. Compared to conceptual frameworks proposed in previous research (Belhadi *et al.*, 2021; Lin and Xiao, 2018; Liu *et al.*, 2021; Ma *et al.*, 2021; Pei *et al.*, 2022; Song *et al.*, 2018; Wang *et al.*, 2020; Xu *et al.*, 2015; Yan, 2017; Yao *et al.*, (2020); Zhang *et al.*, 2009; Zhang *et al.*, 2020), our study provides a more robust connective framework between SC actors, third party logistics and financial institutions through SC financing systems, explaining how products, information and finance flow throughout the SC. We also suggest that process/technological advancements improve SCF performance (e.g., risks and credit rating, blockchain technology implementation) to produce more seamlessly collaborative shared information between actors and financial institutions resulting in higher profits.

Notes: Order of events with examples: (1) information, product and financial integration in a platform (Demand, Supply and Goods Movement recorded seamlessly in order that all actors involved can obtain information whenever and wherever required), contract initially drawn up between Financial Institutions (FI) and actors; (2) suppliers deliver

*raw materials to manufacturers using 3PL services requested through the SCFS platform with profits and fees enclosed; (3) manufacturers deliver Finished Goods to Distributors using 3PL services requested through the SCFS platform with profit and fees enclosed; (4) distributors deliver the goods to retailers using 3PL services requested through the SCFS platform with profit and fees enclosed; (5) retailers sell the products to end-customers, earning profits as recorded in the SCF platform; (6) end customers purchase the products with payments and profits distributed among the actors; (7) financial institutions monitor contract loans and await payments for each actor, for example, suppliers for maintaining material-producing machines and 3PL Services; manufacturers for operational costs and 3PL Services; distributors for thematic regional and operational costs, also 3PL; (8) further technological advancement in a platform, for example Blockchain, could benefit the SCF operation in general; (9) 3PL contributed to all delivery services throughout SC members recorded all in SCF platform; (10) in every period, FI may conduct financial evaluation of all SC members. Furthermore, it is recommended that FI enter into a partnership with an insurance company to manage defaulted payments (Ma *et al.*, 2022; Song *et al.*, 2018).*

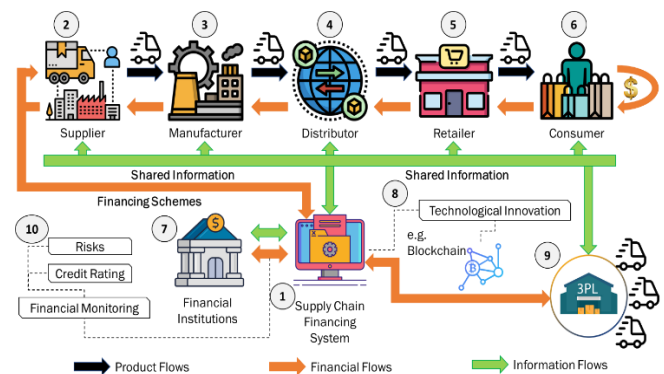


Figure 6 Integrated conceptual framework

5. RESEARCH GAPS AND PROSPECTIVE RESEARCH DIRECTIONS

Despite academic debate on SCF, relatively few publications in the reviewed literature directly establish an end-to-end elaboration of factors, solutions and SCF benefits. Therefore, further research should be conducted on this area of growing academic interest. This paper identified several gaps in the literature on SCF through a review and suggests solutions for each identified shortfall.

A fundamental omission in this systematic literature review is the lack of field research on SCF practice. Discussions of SCF often center on financial and operational improvements, while SCF implementation is not addressed. Recent SCF research has centred on the motives for implementing SCF and its results, with only a limited number of studies (Zhan *et al.*, 2018; Zhou *et al.*, 2018) elaborating on how SCF leveraged throughout the whole SC. As a result, research in this area should focus on empirically proven SCF's solutions.

Secondly, SCF implementation lacks a theoretical framework. All of the selected academic papers elaborated on the evolution of SCF, yet none developed any theoretical basis for SCF implementation, demonstrating that the issue is still in its infancy. Study of SCF should integrate and formulate important hypotheses in the future.

Thirdly, a key hurdle to the adoption of SCF by commercial agriculture is insufficient financial resources for SMEs and individual suppliers. This lack of access limits their capacity and inclination to engage in environmentally friendly behavior (Ye, 2021; Liang *et al.*, 2021; Song *et al.*, 2020; Chen *et al.*, 2018). As a result, future research, particularly that conducted in developing countries, should focus on providing evidence to justify the use of SCF in agricultural SCs.

Fourthly, current SCF research lacks a sufficiently strong regional focus. Future studies can investigate SCF in a variety of locations with a range of economic features in emerging countries (e.g., medium high income, medium low income, and low income). The expansion of corporate operations worldwide has considerably influenced society, resulting in several severe societal challenges (Olaniyi *et al.*, 2014). Consequently, future studies should examine how SCF might support improvements in social sustainability in developing countries.

6. CONCLUSION

This review examined the end-to-end implementation of SCF in terms of factors, solutions, and benefits. A total of 56 publications dating from the period between January 2000 and March 2022 were reviewed. Thematic results explored the theoretical evolution of SCF, in addition to its factors, solutions, and benefits. To further investigate the possible application of SCF in developing nations, this study elaborated the solution of SCF in resolving the financial obstacles affecting the SC. The review then merged topic findings and debate outcomes into an integrated conceptual framework. Finally, based on the findings and discussion, the study identified various gaps in existing research and offered possible approaches to future investigation.

This review contributes significantly to the theoretical significance of the literature on SCF. It is, to the best of our knowledge, the first study to perform a comprehensive evaluation of all literature on SCF factors, solutions, and benefits. Previous works on SCF issues tend to evaluate them individually, failing to integrate the three research concepts, therefore restricting its contribution to the evolution of the concept of SCF. This paper presents a theoretical framework describing how SCF solutions may be leveraged to improve SC. This evaluation also supported overall development of the SCF concept by identifying research gaps and suggesting future research topics.

Secondly, based on the findings of the literature research, this review established, for the first time, the concept of SCF and proposed a framework defining the connection and collaboration between financial institutions and SC actors. It also examined the role of SCF in promoting SC sustainability, more specifically how SCF solutions may enhance financial activities and overcome financing obstacles within the SC. Certain material in the framework (for example, SCF practice) was drawn from previously conducted case studies and business reports. This lends

management value to the study, as businesses may utilize its conclusions to better understand SCF and implement SCF solutions in their SCs, thereby enhancing financial performance.

We also recognize the limitations of this study. Firstly, the evaluated material was selected solely from the Scopus research database. Therefore, enriching the search scope to include other databases may produce additional results. Secondly, this study covered only journal articles written in English, omitting content created in other languages that may have further informed it.

DECLARATION OF COMPETING INTEREST

The authors declare that no competing financial interests or personal relationships have been identified that could influence the research findings reported in this paper.

ACKNOWLEDGEMENTS

This research was supported by the Norwegian Programme for Capacity Development in Higher Education and Research for Development (NORHED). NORHED is organized in thematic sub-programmes that reflect important priorities of Norwegian Government development policies and its 2030 Agenda for Sustainable Development.

REFERENCES

- Aberdeen Group. (2011). Supply Chain Finance: Gaining Control in the Face of Uncertainty. pp. 1–23.
- Baker, R., Clements, Jim., Gido, J. (2018). *Successful Project Management*. 7th Edition, Wiley, New Jersey.
- Bals, Cristof. (2019). Toward a Supply Chain Finance (SCF) Ecosystem – Proposing a Framework and Agenda for Future Research. *Journal of Purchasing and Supply Management*, 25(5), pp. 105 – 117.
- Berger, A.N., Udell, G.F. (2006). A More Complete Conceptual Framework for SME Finance. *Journal of Banking and Finance*, 30(11), pp. 2945 – 2966.
- Braun, V., Clarke, V. (2021). *Thematic Analysis: A Practical Guide*, SAGE, California.
- Brealey, R., Leland, H.E., Pyle, D.H. (1977). Informational Asymmetries, Financial Structure, and Financial Intermediation. *The Journal of Finance* 32(2), pp. 371 – 387.
- Camerinelli, E. (2009). Supply Chain Finance. *Journal of Payments Strategy & Systems*, 3(2), pp. 114 – 128.
- Caniato, F., Moretto, A., Rice Jr, J.B. (2020). A Financial Crisis is Looming for Smaller Suppliers. Accessed March 25 2022, <https://hbr.org/2020/08/afinancial-crisis-is-looming-for-smaller-suppliers>.
- Castillo-Montoya, M. (2016). Preparing for Interview Research: The Interview Protocol Refinement Framework. *The Qualitative Report*, 21(5), pp. 811 – 831.
- Chang, W., Ellinger, AE., Kim, K., Franke, GR. (2016). Supply Chain Integration and Firm Financial Performance: A Meta-Analysis of Positional Advantage Mediation and Moderating Factors. *European Management Journal*, 34(3), pp. 282 – 295.
- Chase., Charles, W. (2016). *Next Generation Demand Management: People, Process, Analytics and Technology*. Wiley, New Jersey.
- Chen, Z., Zhang, R. (2021). A Multi-Period Multi-Product Stochastic Inventory Problem with Order-Based Loan. *International Journal of Production Research*, DOI: 10.1080/00207543.2021.2006818.

- Coyle, J.E. (2003). *The Management of Business Logistics — A Supply Chain Perspective*. Mason.
- Dooley, K.J., Yan, T., Mohan, S., Gopalakrishnan, M. (2010). Inventory Management and the Bullwhip Effect during the 2007-2009 Recession: Evidence from the Manufacturing Sector. *Journal of Supply Chain Management*, 46(1), pp. 12 – 18.
- Farris, T.I.I., Hutchison, P. D. (2002). Cash-to-Cash: The New Supply Chain Management Metric. *International Journal of Physical Distribution & Logistics Management*, 32(4), 288–298.
- Fu, J., Blome, C., Sun, H., Yang, Y., Zhie, B. (2020). Towards an Integrated Conceptual Framework of Supply Chain Finance: An Information Processing Perspective. *International Journal of Production Economics*, 219(C), pp. 18 – 30.
- Gelsomino, L.M. (2016). Supply Chain Finance: A Literature Review. *International Journal of Physical Distribution & Logistics Management*, 46(4), pp. 348 – 366.
- Gomm, M.L. (2010). Supply Chain Finance: Applying Finance Theory to Supply Chain Management to Enhance Finance in Supply Chains. *International Journal of Logistics: Research and Applications*, 13(2), pp. 133 – 142.
- Gonsalvez, D.J.A., Inman, R.R. (2016). Supply Chain Shared Risk Self-Financing for Incremental Sales. *The Engineering Economist*, 61(1), pp. 23 – 43.
- Gosain, S. (2004). Enterprise Information Systems as Objects and Carriers of Institutional Forces: The New Iron Cage? *Journal of the Association for Information Systems*, 5(4), pp. 151 – 182.
- Gulati, R., and Sych, M. (2007). Dependence Asymmetry and Joint Dependence in Interorganizational Relationships: Effects of Embeddedness on a Manufacturer's Performance in Procurement Relationships. *Administrative Science Quarterly*, 52(1), pp. 32 – 69.
- H, J., X, Yan., Xu, Q. (2007). The Analysis of SME Financing Mode Based on Supply Chain Finance. *Shanghai Finance. China*, 2(1), pp. 14 – 16.
- Hang, L.T.M., Tung, N.S. (2019). Supply Chain Finance for SMEs – Case in Danang City. *Operations and Supply Chain Management*, 12(4), pp. 237 – 244.
- He, X., Tang, L. (2012). Exploration on Building of Visualization Platform to Innovate Business Operation Pattern of Supply Chain Finance. *Physics Procedia*, 33(2012), pp. 1886 – 1893.
- Heilig, L., Schwarze, S., Voss, S. (2017). An Analysis of Digital Transformation in the History and Future of Modern Ports. *Hawaii International Conference on System Sciences. Waikoloa Beach, HICSS 50(2017)*, pp. 1341 – 1350.
- Hess, T., Matt, C., Benlian, A., Wiesböck, F. (2016). Options for Formulating a Digital Transformation Strategy. *MIS Quarterly Executive*, 15(2), pp. 123 – 139.
- Hobsbawm, J. (2020). The Simplicity Principle: Six Steps Towards Clarity in a Complex World, Kogan Page, London.
- Hofmann, E. (2005). Supply Chain Finance: Some Conceptual Insights. In: *Logistik Management - Innovative Logistikkonzepte*, 1(2005), pp. 203 – 214.
- Hofmann, E., Belin, O. (2011), *Supply Chain Finance Solutions*, Springer Berlin, Heidelberg.
- Hofmann, E., and Kotzab, H. (2010). A Supply Chain-Oriented Approach of Working Capital Management. *Journal of Business Logistics*, 31(2), pp. 305 – 330.
- Hu, Y. F. (2007). Supply Chain Finance - A New Area of Great Potential. *Financial View (Bank & Customer)*, 22(2), pp. 38 – 39.
- Huang, C., Chan, F.T.S., and Chung, S.H. (2022). Recent Contributions to Supply Chain Finance: Towards a Theoretical and Practical Research Agenda. *International Journal of Production Research*, 60(2), pp. 493 – 516.
- Juran., M, J., Feo, D., A, J. (2010). *Juran's Quality Handbook: The Complete Guide to Performance Excellence*. 6th Edition, McGrawHill, New York.
- Ketchen, D.J., Crook, T.R., Craighead, C.W. (2014). From Supply Chains to Supply Ecosystems: Implications for Strategic Sourcing Research and Practice. *Journal of Business Logistics*, 35(3), pp. 165 – 171.
- Klapper, L.F. (2006). The Role of Factoring for Financing Small and Medium Enterprises. *Journal of Banking & Finance*, 30(11), pp. 3111 – 3130.
- Lambert, D.M., Cooper, M.C. (2000). Issues in Supply Chain Management. *Industrial Marketing Management*, 29(1), pp. 65 – 83.
- Lamoureux, J.F., Evans, T.A. (2011). Supply Chain Finance: A New Means to Support the Competitiveness and Resilience of Global Value Chains, Working Paper No. 2179944, Social Science Research Network, Rochester, NY.
- Lekkakos, S.D., Serrano, A. (2016). Supply Chain Finance for Small and Medium-sized Enterprises: The Case of Reverse Factoring. *International Journal of Physical Distribution & Logistics Management*, 46(4), pp. 367 – 392.
- Liu, X., Zhou, L., Wu, Y.J. (2015). Supply Chain Finance in China: Business Innovation and Theory Development, *Sustainability*, 7(11), pp. 14689 – 14709.
- London, T., Anupindi, R., Sheth, S. (2010). Creating Mutual Value: Lessons Learned from Ventures Serving Base of the Pyramid Producers. *Journal of Business Research*, 63(6), pp. 582 – 594.
- Low, J. (2000). The Value Creation Index. *Journal of Intellectual Capital*, 1(3), pp. 252 – 262.
- Lusch, R.F., Vargo, S.L., Gustafsson, A. (2016). Fostering a Transdisciplinary Perspective of Service Ecosystems. *Journal of Business Research*, 69(8), pp. 2957 – 2963.
- Ma, H.L., Leung, L.C., Chung, S.H. (2022). Insurance Incentive to Shippers by a Container Port: Issues of Risk Management in Supply Chain Finance. *Annals of Operations Research*, 1(2022), pp. 1 – 20.
- Marak, Z.R., Pillai, D. (2019). Factors, Outcome, and the Solutions of Supply Chain Finance: Review and the Future Directions. *Journal of Risk and Financial Management*, 12(1), pp. 3 – 23.
- Matt, C., Hess, T., Benlian, A. (2015). Digital Transformation Strategies, *Business and Information Systems Engineering*, 57(5), pp. 339 – 343.
- Miller, C., Jones, L. (2010). Agricultural Value Chain Finance: Tools and Lessons. Food and Agriculture Organization of the United Nations and Practical Action.
- Muhammad, S.S., Dey, B.L., Weerakkody, V. (2018). Analysis of Factors that Influence Customers' Willingness to Leave Big Data Digital Footprints on Social Media: A Systematic Review of Literature. *Information Systems Frontiers*, 20(3), pp. 559 – 576.
- Neuman, W.L. (2006). *Social Research Methods: Qualitative and Quantitative Approaches*. Sixth Edition. International Edition. Pearson.
- Olson, E.G. (2010). Supply Chain Opportunity in an Uncertain Economic Recovery. *Supply Chain Management*, 15(6), pp. 488 – 492.
- Olaniyi, O. N., Thaker, M. A. B. M. T., Thaker, H. M. T., & Pitchay, A. A. (2014). The Financing Problems Facing the Agricultural Sector in Nigeria and The Prospect of Waqf-Muzara'ah-Supply Chain Model (WMSCM). *Global Review of Islamic Economics and Business*, 2(1), pp. 001 – 014.
- Pei, Q.F., Zhang, T., Chan, H.K. (2019). Benefits of Supply Chain Finance Providing Enterprises. The 20th Asia Pacific Industrial Engineering and Management Systems 2019. Japan: Kanazawa.
- Pfohl, H.C., Gomm, M. (2009). Supply Chain Finance: Optimizing Financial Flows in Supply Chains. *Logistics Research*, 1(34), pp. 149–161.
- Randall, W., Farris, T.I.I. (2009). Supply Chain Financing: Using Cash-to-Cash Variables to Strengthen the Supply Chain. *International Journal of Physical Distribution & Logistics Management*, 39(8), pp. 669 – 689.

- Reza-Gharehbagh, R., Hafezalkotob, A., Asian, S., Makui, A., Zhang, A.N. (2019). Peer-to-peer Financing Choice of SME Entrepreneurs in the Re-emergence of Supply Chain Localization. *International Transactions in Operational Research*, 27(5), pp. 2534 – 2558.
- Sanders., Nada, R. (2018). *Supply Chain Management: A Global Perspective*. 2nd Edition, Wiley, New Jersey.
- Seifert, R.E. (2009). *Supply Chain Finance – What Is It Worth?* IMD. Lausanne (CH): IMD.
- Shaoyu, X. (2009). Study on Supply Chain Finance in E-business Circumstances. *International Forum on Computer Science-Technology and Applications*, 1(2009), pp. 322 – 325.
- Silvestro, R., Lustrato, P. (2014). Integrating Financial and Physical Supply Chains: The Role of Banks in Enabling Supply Chain Integration. *International journal of operations & production management*, 34(3), pp. 298 – 324.
- Song, H., Chen, S. (2016). Development of Supply Chain Finance and Internet Supply Chain Finance: A Theoretical Framework. *Journal of Renmin University of China*, 5(1), pp. 95 – 104.
- Song, H., Yu, K., Lu, Q. (2018). Financial Service Providers and Banks' Role in Helping SMEs to Access Finance. *International Journal of Physical Distribution & Logistics Management*, 48(1), pp. 69 – 92.
- Steeman, M. (2014). *The Power of Supply Chain Finance*. Zwolle: Windesheim.
- Stemmler, L. (2002). The Role of Finance in Supply Chain Management. *Cost management in supply chains*, 1(2002), pp. 165 – 176.
- Stewart, D.W., Shamdasani, P.N. (1990). *Focus Groups: Theory and Practice*. Thousand Oaks, California: Sage Publications.
- Taguchi, G., Chowdhury, S., Wu, Y. (2005). *Taguchi's Quality Engineering Handbook*, Wiley, New Jersey.
- Tate, W.E. (2019). *Supply Chain Finance - Risk Management, Resilience and Supplier Management*. London (UK): Kogan Page.
- Templar, S., Findlay, C., Hofmann., E. (2016). *Financing the End-to-End Supply Chain*. London (UK): Kogan Page.
- Timme, S., Williams-Timme, C. (2000). The Financial-SCM Connection. *Supply Chain Management Review*, 4(2), pp. 33 – 40.
- Vallet-Bellmunt, T., Martines-Fernandes, T., Capo-Vicedo, J. (2011). Supply Chain Management: A Multidisciplinary Content Analysis of Vertical Relations Between Companies, 1997–2006. *Industrial Marketing Management*, 40(8), pp. 1347 – 1367.
- Wuttke, D.A., Blome, C., Heese, H.S., Protopappa-Sieke, M. (2016). Supply Chain Finance: Optimal Introduction and Adoption Decisions. *International Journal of Production Economics* 178(1), pp. 72 – 81.
- Wuttke, D.A., Rosenzweig, E.D., Heese, H.S. (2019). An Empirical Analysis of Supply Chain Finance Adoption. *Journal of Operations Management*, 65(3), pp. 242 – 261.
- Xu, X., Chen, X., Jia, F., Brown, S., Gong, Y., Xu, Y. (2018). Supply Chain Finance: A Systematic Literature Review and Bibliometric Analysis. *International Journal of Production Economics*, 204(1), pp. 160 – 173.
- Yan, J., Xu, X. (2007). An Analysis Based on the Supply Chain Financial Channels of SMEs. *Shanghai Finance*, 2(1), pp. 38 – 40.
- Yang, S. H. (2005). From Commercial Banking Business Model to See the Supply Chain Financing Services. *Logistics Technology, China*, 5(1), pp. 179 – 182.
- Yang, X., Song, H., (2017). Supply Chain Finance, Supply Chain Capability, and Competitive Performance: A Multi-case Study. *Journal of Management Case Study* 10(5), pp. 491 – 507.
- Yun, S., Jingrong, L. (2019). Research on the Mechanism of Financial Credit Risk Prevention and Control in Agricultural Supply Chain under the Background of Rural Revitalization. *Finance and Economy* 2(1), pp. 46 – 53.
- Zhang, L., Hu, H., Zhang, D., (2015). A Credit Risk Assessment Model Based on SVM for Small and Medium Enterprises in Supply Chain Finance. *Financial Innovation*, 14(2015) pp. 1-14.
- Zhu, Y., Xie, C., Wang, G.-J., Yan, X.-G (2016). Predicting China's SME Credit Risk in Supply Chain Finance Based on Machine Learning Methods. *Entropy*, 18(5), pp. 195
- Zhang, Z., Liu, X., Zha, M., Lv, T. (2008). Research on Supply Chain Finance Based on E-commerce. *2008 4th International Conference on Wireless Communications, Networking and Mobile Computing*, 1(2008), pp. 1 – 5.

Daud Fahmi Adhim is serving as a Postgraduate Student in Management Science, School of Business and Management, Bandung Institute of Technology (ITB), Bandung, Indonesia. Mr. Adhim has published one article in top accredited Indonesian journal (SINTA 2), International Journal of Applied Business Research. He is also an IT Experts specialized in enterprise planning, budgeting, forecasting and financial consolidation software, SAP BPC.

Dr. Eng. Nur Budi Mulyono is serving as associate professor on the area of Digital Operations and Supply Chain Management at Bandung Institute of Technology, Indonesia. He holds an engineering doctoral degree from Toyohashi University of Technology with a dissertation on self-organized network of relief logistic and inventory. In the School of Business and Management ITB, he is responsible for teaching several subjects: Operations Management, Supply Chain Management, Performance Management, Industry 4.0, and Business Analytic. He is starting a research career in humanitarian supply chain management and economic sharing development. He is recently involved in emerging research on the logistic solution for increasing transparency and control such as logistic industry mapping and monitoring, the business process modeling, pricing and financing scheme, risk management, and network design for logistic optimization. His research interests include artificial intelligence, industry 4.0 implementation, humanitarian supply chain, inventory models, operations management, business continuity, and economic sharing. Besides teaching, his professional expertise focuses on the development and optimization of factory operation and preparation for industry 4.0 implementation. The results of his research had been published in reputable international journals and international conferences.