What Literature Has to Say about Supply Chain Finance (SCF): A Bibliometric Review of Supply Chain Finance

Hassan Javed
National University of Modern Languages, Islamabad, Pakistan
International Islamic University, Islamabad, Pakistan
hassan.javed@iiu.edu.pk

Muhammad Wasim
National University of Modern Languages, Islamabad, Pakistan
Corresponding Email: muhammad.wasim@numl.edu.pk

ABSTRACT

Purpose: The current research aims at reviewing Supply Chain Finance (SCF) which is an advanced domain of supply chain management receiving extensive attention in research nowadays.

Design/Methodology: Comprising an in-depth analysis of different concepts, approaches, and methodologies being used in the domain of SCF, the present evaluation is based on a review of 58 research articles published in the domain of SCF at various times. Comprehensive data regarding the utilization of SCF has been gathered from earlier and more recent studies.

Findings: The study identifies the areas and domains of supply chain finance which have hitherto received limited attention. The findings show that there is still much left for future researchers to investigate in the area of SCF.

Originality: The present review also maps and identifies possible directions for future research. Future researchers may investigate the novel areas identified within SCF. The research provides insights into the supply chain finance field with possible future workings.

Keywords: supply chain finance, organizational factors, industrial factors, bibliometric review

Paper type: Review Paper

INTRODUCTION

As the world has transformed into a global village, industries have become geographically dispersed across different regions and countries. Companies are becoming increasingly cost-efficient in order to increase their profit margin. They are
now acquiring the cheapest possible raw material as well as labor from around the world to achieve cost-efficiency. As a result, supply chain finance (SCM) has gained considerable importance in SCM in relation to the significance of the payment process among supply chain partners. Supply chain finance is briefly described as a solution to enhance payment terms between supply chain partners and enhance the cash flow of the business. It is a type of financing solution that manages, coordinates, and regulates all financial flows among supply chain partners, thereby improving working capital (More, D., & Basu, P., 2013). The empirical investigation of supply chain finance was initiated in the initial twenty-first era (Marak & Pillai, 2019). It has evolved to be an effective solution for temporary financing to mitigate an SC’s monetary constraints from the Global Financial Crisis of 2008 (Nienhuis et al., 2013; Ali et al., 2019; Jia et al., 2020). Simultaneously, as supply chain finance (SCF) has become a crucial aspect of SCM, the contribution of financial institutes is also growing. Hence, in the face of the present dynamic business environment, a supply chain manager’s effort is directed towards devising a finance strategy that maximizes the company’s cash flow without disrupting its SC processes.

Supply chain finance (SCF) delivers a variety of monetary, technical, and administrative tools to enhance the organization of the working capital and release the liquidness locked in SC measures and dealings (Caniato et al., 2016; BAFT et al. 2016). Conflicts might arise between the goals and interests of suppliers and buyers. SCF can solve this conflict by enhancing the strength of their affiliation. The target of buyers is usually to negotiate payment terms that are less costly for them’ however, in contrast, suppliers may prefer to increase the payment for their products. This can result in the dominance of strong firms with bigger orders, thereby imposing pressure on small firms with long payment terms, although small firms or weak suppliers may continue to struggle for required resources in order to enhance their working capital despite bearing higher costs. Hence, this generates disorganizations and hazards in the SC in the long run, which also affects the stronger firms. In such cases, supply chain finance can provide instant financing to help suppliers with their payment by extending the payment to buyers. This is achieved by utilizing the strong credit rating of the buyer. Working capital reduction is another way out for firms in such cases, but this eventually lowers the firm financial performance (Hofmann et al. 2018). In literature, various supply chain finance solutions have also been discussed (e.g. Caniato et al., 2016).

SCF encompasses the application of scientific principles in business and finance that links numerous entities engaged in the dealings of sale/procurement and also the finances of the organization to boost a firm’s financial performance. SCF provides a solution to both the supplier and buyer by extending the payment terms to the buyer which results in the acquisition of payment by suppliers. The resulting situation is a mutual benefit for both the buyer and the supplier as working capital is enhanced for the supplier, and the risk is reduced for the buyer. Through supply chain finance, the core firm can efficiently manage an interconnected network of value chain partners by effectively controlling finance, logistics, and information investment flow (Danny
et al., 2010). Banks can help in optimizing the capital flow within the value chain (Lamoureux & Evans, 2011; Camerinelli, 2009), while homogeneity with the maintained balance of product flow and capital flow can improve the management of available resources or means (Wuttke et al., 2013a). In addition, by working closely with value chain partners, effectively allotment of resources from other lenders to different companies in SC, particularly SMEs can be achieved, thereby enhancing the competitiveness of the entire SC.

The Cash Conversion Cycle (CCC) is a common instrument used to assess SCF. The CCC is a systematic process which in the context of a business organization starts with the inflow of cash to begin manufacture or service delivery and concludes with payment assortment from clients or accounts receivables, payment to suppliers and accounts payables, and ultimately the procurement of cash for the following operative cycle. The CCC is defined by Keown et al. (2003) as the sum of the average period of collection (in days) and the number of days needed to sell the completed product inventory less the time needed to settle account payables. In this context, SCF is also known as the funding necessary to support the Cash Conversion Cycle (CCC) in a company group (Chand et al., 2020). Ali (2021) used secondary data from the financial accounts of several well-known Indian pharmaceutical companies in his study. Its goal was to look into how size factors affected the SCFs and their relationship to one another. The analysis was based on the respective orders of accounts receivable days, accounts payable days, and inventory days as well as the rank of size determinants. Additionally, the link among the ranking of scope predictors and the ranks of CCC elements was determined using the Spearman correlation. The findings showed that while working capital (WC), which makes up the components of CCC, had a direct impact on the CCC, size predictors had a favorable but modest impact. Hence, the study recommended reducing the CCC by concentrating on size determining factor of working capital, particularly accounts payables in Indian pharmaceutical firms.

Researchers have previously utilized various tools and techniques for designing their research on supply chain finance (SCF) (Jia et al., 2020; Chakuu, et al., 2019; Jia, et al., 2020; Du, et al., 2020). However, there is a dearth in metanalysis of research designs and models presently being utilized in supply chain finance (SCF). To cover this existing gap of combined knowledge availability regarding supply chain finance (SCF), the current research has been carried out. The present study, thus, intends to provide an evaluation of the scholarly work on SCF with its uses in both organizational and industrial research. It also explores the constructs being studied with supply chain finance (SCF) in both finance and SCM domains.

Research Methodology

Research methodology and descriptive data analysis

Tranfield et al., (2003) state that scholarly work on a specific topic or area is reviewed and studied to assess the amount of work done on that topic and the potential gaps that the area evidences. When conducting a literature review, a structured one requires the selection of adequate and suitable words that can probe the relevant area
information from the literature (Saunders et al., 2009). When a proper scan of literature is conducted to extract relevant material and help establish a mind map with a bibliography, the review is known as a structured review (Rowley, J., & Slack, F., 2004). A systematic review of literature is conducted in the current investigation with the bibliometric analysis for extracting the best possible information on supply chain finance.

**Defining the appropriate search terms**

Finance and supply chain management are two different or diverse domains of management sciences and their joint venture in scholarly language is known to be as supply chain finance. To cover both domains of the topic keywords are adopted including both domains and the associated factors with SCF. The keywords include SCF and organizational factors, SCF and Industrial factors, Supply Chain Finance and SMEs, Theories associated with SCF, Supply Chain Management and SCF, Finance and SCF, Industries and SCF, and lastly, Instrumentations, and Reviews on Supply Chain Finance. The above-mentioned terms associated with Supply Chain Finance are extracted by viewing prior research, the author’s understanding of the scholarly work, and recommendations from the relevant field experts.

**Search results**

The present study was conducted using a two-step process. In the very first step, the author searched for the relevant factors studied in supply chain finance. Eight major factors were extracted. These were considered to be the most studied domains of supply chain finance. The literature was extracted from the year 2004 to the year 2023. In the very second step, the author selected research articles primarily focusing on these areas from the year 2004 to the year 2023 from Google Scholar. The authors again reviewed the material and again short-listed the relevant research by studying their full texts. Out of the total, a number of 58 relevant articles in the selected areas were extracted and reviewed by the authors. These 58 articles were available through Google Scholar. All other articles not available through Google Scholar were excluded.

**Literature Review**

Supply chain finance has been an interesting domain for researchers and practitioners in the last decade. As per the report of World Supply Chain 2022 a momentous change has been seen in the sizes of SCM. Also, the report mentions that software-based firms have also now started to adopt SCF. The report states that the SCF has increased by a figure of 38% making it to a total of 41% in use. As per the work of Allied Market Research globally produced SCF in 2021 is $6 billion and this may be enhanced to $13.4 billion by 2031. According to Sadlovska, V. (2007) a survey in 2007 by Aberdeen showed that 15% of firms assessed were utilizing supply chain finance, 18% were preparing to improve their SCF and its management and 40% were exploring SCF implementation options. Another study estimated a 65% increase in SCF volume from 2006 to 2007 (Demica, 2008).
Businesses and Supply Chain Finance

According to 2008 research, by April 2008, 14% of businesses had adopted SCF, and another 24% were looking into implementing one for their suppliers (Kerle, 2008). In 2013, Cavenaghi (2013) predicted that the deployment and usage of SCF would increase by double digits (Cavenaghi, 2013). SCF development rates in advanced nations range from 10 to 30 percent, while they are 20 to 25 percent a year in developing nations (Bryant & Camerinelli, 2014). Global SCF volume increased by 36% in 2016 compared to 2015. (BCR, 2017). Additionally, according to Sommer and O’Kelly (2017), SCF increased from 42% to 57% of the global trade finance revenue stream between 2010 and 2016.

Literature and Supply Chain Finance

SCF literature has developed along two strands. First, the financial hardship sees SCF as a temporary, short-term funding option (Jia, et al., 2020). It is regarded as a significant financial innovation that connects businesses in need of funding to bank loans and aids in managing the SC through techniques like reverse factoring (E Hofmann, UM Strewe, N Bosia, 2017). Additionally, it can successfully increase capital use during credit shortages (Polak et al., 2012). It increases supply chain efficiency by lowering transaction costs and failure risks, particularly for smaller and medium-sized businesses (SMEs) (Ali et al., 2019). The SC tension, on the contrary, is focused on improving the entire supply chain structure (D Ivanov, 2018). It sees SCF as a method to create a framework and help with risk management in particular industries (Hofmann, 2011). Given that it blends the financial needs of customers, suppliers, distributors, and manufacturers as well as the fusion of material, informational, and capital flows, it views SCF as the best way to improve the SC’s performance (Y Yuan, W Li, 2022).

Supply Chain Finance and Organizational Factors

Previous studies on supply chain finance (SCF) have not extensively explored organizational factors associated with SCF. However, a scarce number of studies have explored the association between SCF and certain organizational factors. While investigating the effect of SCF on firm performance, Z Ali, B Gongbing, A Mehreen (2018) reported a significant impact of supply chain finance on firm performance. A Ali (2021) examined the impact of firm size on SCF using a cash conversion cycle. The components of CCC were utilized as a tool to measure SCF. The study found a positive impact of firm size on the cash conversion cycle, thus modifying supply chain finance. In their study, Pan A. et. al., (2020) evaluated the effect of SCF on a firm’s cash holding. It was found that supply chain finance (SCF) positively and significantly affects a company’s cash holdings. Bui, T., & Doan, T. (2020) investigated the influence of firm size, firm performability, and firm leverage as predictors of supply chain finance (SCF). The results revealed that all three factors negatively and significantly contribute to SCF. W Yu, et al., (2021) reported big data analytics, as an organizational factor, to be a predictor of SCF.
Supply Chain Finance and Industrial Factors

Other than organizational factors, the association between industrial factors and SCF has also been examined by scholars. Ali, Z., et al., (2018) have studied trade digitization as a moderating variable with SCF. Further, A Moretto & F Caniato (2021) examined the contribution of supply chain finance in the situation of COVID-19 by investigating how SCF can reduce the financial disruption caused by the outbreak of coronavirus. The study was conducted through focus groups and the results revealed that SCM had more long-term effects compared to short-term effects. Another study investigated the relationship of SCF with economic growth as an indicator and reported a positive relationship between the two (T Bui & T Doan, 2020). One of the studies on SCF by D Nguyen, et al., (2022) has incorporated interindustry factors including supply chain risk, resilience, and performance.

Theories Associated with Supply Chain Finance

C Bals (2019) presented a business ecosystem model in the framework of supply chain finance (SCF). It identified seven dimensions and a contextual perspective of SCF through the review of existing literature. Further, R. Pellegrino et al (2018) contributed to the emerging theoretical argument by applying the real options model to SCF. The model is useful for creating Supply Chain Risk Management (SCRM) approaches in modifying CPV. While discussing network theory in their research with SCF, S Carnovale, et al., (2019) found that system control and unity lead to an enhanced ability of the firm to acquire financial reserves, thus, boosting firms’ performance. Moreover, J Martin & E Hofmann (2019) in their research work linked the contingency theory to SCF. SET, TCE, and PAT are used in the contingency method to generate criteria for choosing certain procedures. The findings also take into account
contextual circumstances that allow the fusion of various techniques, leading to diversified approaches and taking into account three categories of motivations (finances, cash flow-related, and relational) for suppliers’ devotion to SCF. In addition, game theory has been explained in a supply chain context previously by H Li, et al., (2019). It considers the interaction of supplier and buyer and suggests dynamic credit terms over several periods to be appropriate for complicated and adaptive practical decision-making. Lastly, stakeholder theory has also been addressed in the domain of SCF by A Moretto, et al., (2019). It was considered that all the stakeholders are necessary to be involved in supply chain credit rating to determine their willingness to participate and the potential value that they could obtain. Their paper, the theory of planned behavior which is initially given by Ajzen (1991) has been further explored by Ahmad et al., (2018). The latter explore the theory of planned behavior by Ajzen (1991) and the theory of acceptance model which was initially given by Davis (1989) in their paper. According to these beliefs, attitudes about SCF, normative beliefs, perceived behavioral control, apparent worth, and apparent comfort of usage all have an impact on people's intentions to embrace SCF. The study’s main hypothesis was that salient beliefs, perceived utility, and perceived usability all influence attitudes toward SCF, which in turn influences adoption intentions. Understanding these belief components and how they affect SCF is therefore essential if we are to comprehend the preferences for SCF. To assess consumers’ attitudes in the framework of SCF, the suggested conceptual framework contains key belief components, such as knowledge and awareness of cost advantages, business support, and repute in the TPB model, as well as perceived utility and performance expectancy of use in the TAM.

Supply Chain Finance and Small Medium Enterprises

Businesses frequently misjudge their ability to give suppliers longer payment terms. Instead, they should concentrate on financing options that could raise the company’s worth. Small and medium-sized businesses (SMEs) frequently don’t know how to make the most of their working capital. SCF makes it possible for SMEs to manage their working capital both internally and externally. A significant corpus of research is being done on SCF as an alternative financing option for SMEs and its potential to help them achieve their objectives through improved working capital. Tang (2005) investigated the idea of SCF and several financing options for SMEs. Short-term supply chain management was researched by Guillen et al. (2007) who found that good supply chain management can boost overall revenue and enhance business processes and finances. SCF was one of the new ideas and frameworks that Berger and Udell (2006) offered for financing SMEs. Söderberg, L., & Bengtsson, L. (2010) showed a significant correlation between SMEs’ performance and supply chain maturity, and it was further hypothesized that this correlation also exists among supply chain maturity and financial condition. It was stressed that SMEs can improve their monetary and operative performance by raising the maturity of their SCs.
Supply Chain Finance and Supply Chain

Few academics offer insights to better define SCF techniques for the supply side. Caniato et al. (2016) contrasted conventional and cutting-edge financing strategies and supply chain collaboration solutions. Additionally, Wuttke et al. (2013) differentiated pre- and post-shipment finance strategies based on timing. Pre-shipment financing is provided through or former to shipment, while post-shipment financing takes place after the items have been supplied and acknowledged by the buyer. Last but not least, Templar et al. (2016) made a distinction between inside and outside supply chain sources of funding based on whether the strategy contains a second funder or uses the purchaser’s self-finances. For buyers, the final strategy increases working capital.

Supply Side Supply Chain Finance

Many of the prior research studies have focused their attention on supply chain finance from the buyer’s side but only a little has paid attention to supplier-side supply chain finance solutions. For instance, Martin, J., & Hofmann, E. (2019) discussed supply chain finance practices by suppliers. Using the case study technique Martin, J., & Hofmann, E. (2019) evaluated eight buyer-supplier financial service providers. Using a contingency approach, they evaluated suppliers’ approaches to supply chain financing in different contexts. Further, Moretto, A. et. al., (2019) empirically investigated the SC credit rating in SCF. This is again a supplier-side investigation in SCF research. Further, Pellegrino, R. et. al., (2019) studied commodity risk and price volatility in the supply chain with supply chain finance. Another research by Li, H. et. al., (2019) studied the credit terms decision made by suppliers with SCF.

Buyer Side Supply Chain Finance

The major focus of prior scholarly work on SCF is from the buyer’s perspective. These studies include the work of Lekkakos, S. D., & Serrano, A. (2016), Wuttke et al., 2016, and many others. Lekkakos, S. D., & Serrano, A. (2016) studied SCF with reverse factoring in small and medium enterprises. However, Wuttke et al., 2016 investigated the introductory and adoption decisions by buyers of supply chain finance. Further, Omran, Y. et. al., (2017) studied blockchain technology applicability in SCF using reverse factoring and dynamic discounting instruments. A recent investigation by Lu, Q. et al., (2022) discussed the buyer’s cooperation with suppliers in supply chain finance availability and its effect on SMEs using transaction cost theory. The findings declared contractual governance superior to relationship governance, both being positively effective on interaction effect.
Supply Chain Finance and Finance

Five major concepts that have been used with supply chain finance (SCF) from the finance side include trade credit, firm performance, firm size, firm leverage, and firm cash holding. S An, et al. (2021) studied trade credit with supply chain finance (SCF) in their research. N Yan & X He (2020) and Q Lin, et al. (2021) also studied trade credit with supply chain finance (SCF). Many researchers including T Bui (2020), Z Ali, et al. (2020), T Doan & T Bui (2020), and others have studied firm performance with supply chain finance (SCF). Whereas, A Ali (2021) and H Younis & B Sundarakani (2020) with many others studied firm size with SCF. Financial leverage has also been studied by T Bui (2020) and F Caniato, et al. (2016) with supply chain finance (SCF).

Industries Studied with Supply Chain Finance

The contribution of supply chain finance has been studied in various industrial sectors. Z Ali, et al., (2018) studied SCF in the textile sector of Pakistan. A Ali (2021) studied SCF in the pharmaceutical industry. A Pan, et al. (2020) also directed an investigation into SC finance. The researcher studied supply chain finance (SCF) with firm cash holding in the information and network sector of China. The data was collected from 344 firms from the Shanghai and Shenzhen Stock Exchanges for a tenure of seven years (2011-2017) by the investigators. T Bui (2020) also conducted research to study the effects of supply chain finance on firm performance in the construction industry of Vietnam. The data was collected from 30 construction companies in Vietnam from 2015 to 2018 and the researcher found that supply chain finance enhances a firm’s performance. In their study, T Bui & T Doan (2020) investigated the effect of firm size, firm performability, and firm leverage as predictors of SCF in Vietnam’s real estate sector by adopting panel data regression. GMM estimation was applied to the study.
Instrumentation of Supply Chain Finance

Many instruments have been previously utilized by researchers to measure supply chain finance (SCF). Reverse factoring is mostly used by researchers to measure SCF (BAFT et al., 2016; Wandfluh et al., 2016; BAFT et al., 2016, etc). Factoring is another common tool used to measure SCF (Popa, 2013; Moritz et al., 2016; Klapper, 2006; etc). Captive factoring was utilized as an instrument to measure SCF by Caniato et al (2016). Inventory financing, warehouse financing, and fixed asset-based financing are a few other instruments utilized by researchers to estimate SCF (Chod, 2015; Martin and Hofmann, 2017; BAFT et al., 2016; Camerinelli, 2014; GBI, 2016; Buzacott & Zhang, 2004; etc). Raw material financing, purchase order financing, and distribution financing are among other instruments being utilized to evaluate or assess SCF (Liu et al., 2015; Basu & Nair, 2012; Yan et al., 2016; de Meijer & de Bruijn, 2013; Yan et al., 2016, etc).

Reviews on Supply Chain Finance

Some researchers have reviewed literature on SCF which papers have been published in different years. For instance, Gelsomino, L. M. et. al., (2016) discussed the scholarly work on supply chain finance with only two themes, including, financial SCM and buyer-oriented SCM. Moreover, the review discussed the possible expected benefits of SCF. However, the review lacked a discussion of possible outcomes of supply chain finance under both themes. Chakuu, S., Masi, D., & Godsell, J. (2017) reviewed the processes and instrumentation of SCF. Further, the review by Marak, Z. R., & Pillai, D. (2018) discusses the possible outcomes of SCF with its factors and solutions. A bibliometric review by Xu et al. (2018) reviews all material 2018 available on supply chain finance by establishing research clusters to summarize that material. However, their review lacked material on outcomes, factors, and the latest material after 2018. Huang, C., Chan, F. T., & Chung, S. H. (2022) discussed and summarized the theoretical and practical agendas of different supply chain research. However, their findings lack integration of the latest research of 2022-2023. The current research review has covered these deficiencies. The current investigation contributes to the literature by identifying the gaps in the literature regarding SCF from SC, finance, and methodological point of view. Moreover, the current bibliometric review of SCF discussed material on SCF up till 2023.

Directions for Future Research

Z Ali, et al. (2018) recommended that future researchers can study supply chain finance (SCF) using longitudinal study. The research studied SCF in the context of SMEs and suggested future researchers test the same model at larger-scale organizations. In their study, A Ali (2021) studied firm size with supply chain finance using secondary data of Indian pharmaceutical companies for a tenure of six years (2013-2018) and suggested the construct be in a different time frame to avoid frequency error. Moreover, it was recommended that qualitative factors of firms can be incorporated into the study for more accurate results. T Bui (2020) while studying
the effect of SCF on firm performance suggested incorporating control variables like inflation, liquidity, and firm management ability for more accurate results. T Bui & T Doan are of the view that the role of technology and a firm’s eagerness to participate in SCF must be incorporated as contributing factors. Lastly, W Yu, et al. (2021) studied big data analytics with SCF. It was suggested by the authors that the relationship between organizational assets and capabilities and SCF must also be investigated. Furthermore, it was also recommended to study environmental factors with SCF. Previously, Jia et al (2020) studied competitive and uncertain environments with SCF.

**Conclusion**

The current investigation was aimed at summarizing the scholarly work on supply chain finance with all the possible gaps left within the area. The current research focuses on the importance of SCF with the scholarly work that explains it. The study summarizes the areas and domains of supply chain finance which have hitherto received limited attention. Moreover, the research provides insights into the supply chain finance field with possible future workings. For this purpose, a number of 58 articles were extracted from Google Scholar year 2004 to year 2023. Future directions show that there is still much left for future researchers to investigate in the area of SCF. There are some studies in the academic literature that emphasize particular SCF solutions (such as factoring, trade credit, and VMI; Claassen et al., 2008; Klapper, 2006; Klapper and Randall, 2011) which are based on empirical data. However, there are not many that deal with SCF from a more comprehensive perspective (e.g. indication of the art/adoption stage of various SCF solutions). Pfohl and Gomm (2009) suggest that empirical investigations could present models and assumptions and supply information for a still-uncertain analysis of the SCF method’s dissemination and many uses. Current empirical research needs to meet these identified needs.

**REFERENCES**


