How do third-party supply chain finance platforms deploy capabilities to improve the service performance: an interorganisational network perspective

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ABSTRACT

This study aims at exploring the role of third-party supply chain finance (SCF) platforms in SCF business in China. A novel perspective founded on inter-organisational network theory is adopted, arguing that platforms make use of SCF capability to improve SCF network characteristics, subsequently improving their overall SCF service performance. This research addresses the following research questions: (1) How do SCF capabilities affect SCF performance? (2) What is the role of SCF network characteristics in the relationship between SCF capabilities and performance? A multiple case study method was used and four representative SCF platforms were selected; 43 in-depth interviews were conducted with key personnel of each platform's SCF programme.

Theoretically, this research makes significant contributions to the SCF literature. First, this research provided a new categorisation of SCF platform providers based on respective roles and functions in the provision of SCF service. Second, the study enriches the understanding of SCF capability by refining the contents of SCF capabilities; four different capabilities located in three capability hierarchies are proposed. This study is one of the first to provide empirical evidence supporting SCF capabilities, building links among SCF capabilities, network characteristics, and service performance. Through developing a theoretical framework, this research emphasises SCF network's significant role in developing a more effective SCF services.

Managerially, this study identifies a hierarchy in SCF capabilities; platforms can use findings of this study to develop their SCF capabilities with pertinence. In addition, new entrants are offered valuable insights of the impact of well-structured SCF networks in Chinese SCF markets based on the successful experiences of four case study platforms in relation to SCF operation. Finally, this research summarises key resources held by each stakeholder, offering recommendations for their suitable roles in the SCF network, and providing a roadmap for stakeholders to engage in the Chinese SCF market.

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Author’s declaration

I declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as References.

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Acronym used in this thesis

B2B	Business-to-Business
CRCC	China Railway Construction Corporation
CRRC	China Railway Rolling Stock Corporation
CPIC	China Pacific Insurance Company
EDI	Electronic Data Interchange
FSP	Financial Service Providers
IoT	Internet of Things
KPI	Key Performance Indicator
LSP	Logistic Service Provider
NBFI	Non-Bank Financial Institutions
PICC	People's Insurance Company of China
SC	Supply chain
SCF	Supply chain finance
SCM	Supply chain management
SME	Small and medium enterprises
SIHC	Shenzhen Investment Holding Company
SASAC	State-owned Assets Supervision and Administration Commission

Chapter 1. Introduction

Supply chain finance (SCF) research has increased in popularity in an industrial and academic context over the past decade. From a practical perspective, following the financial crisis in 2008, focal companies and supply chain (SC) partners experienced shortage in working capital; weak suppliers and retailers related to focal companies found it difficult to obtain finance from banks (Klapper & Randall, 2011). SC actors began to adopt untraditional financial mechanisms, such as factoring and trade financing to ameliorate SC liquidity (Basu & Nair, 2012). The Covid-19 pandemic engendered financial disruption in SCs, destabilising small and medium enterprises (SMEs) (Moretto & Caniato, 2021; Gupta & Soni, 2021). Therefore, an increasing number of studies in recent years have stressed the importance of financial flow (Hofmann & Kotzab, 2010; Wuttke et al., 2013), linking it to material and information flow (Wang et al., 2020).

Financial flow is often related to working capital management. Focal companies often adopt measures intended to improve working capital status in financial flow (Caniato et al., 2016); nevertheless, these practices potentially hinder overall business performance in the SC (Jose et al., 1996; Wetzel & Hofmann, 2019). For example, extension of payment terms hampers the working capital status of suppliers, increasing financial risks in SCs (Caniato et al., 2016). Therefore, the concept of SCF is proposed to achieve the superior management of financial flow in SCs and mitigate for SME liquidity issues.

Reflecting an increased focus on SCF in the academics, a substantial amount of research exploring SCF has been published. Eight literature reviews of SCF between 2015 and 2020 are identified in this study. Xu et al. (2018) adopt a bibliometric method, identifying 348 papers addressing SCF between 1970 and 2016. Moreover, Bal et al. (2019) conduct a systematic literature review, identifying 243 papers between 1960 and 2017. According to the literature, SCF refers to a series of financing solutions provided by financial institutions or other financial service providers (FSP) (Silvestro & Lustrato, 2014; Gelsomino et al., 2016), which aim to optimise financial flows at an interorganisational level (Hofmann, 2005). As SCF facilitates alignment of financial, material, and information flows; it is regarded as an important approach which improves cash flow management and ensures stability in the financial flow of SCs from a SC perspective (Song et al., 2018), which can further improve the operational efficiency of an entire SC (Bal, 2019; Jia et al., 2020a).

1.1 Diversification of SCF providers

A number of researchers who have explored the role of various SCF providers in SCF business believe that FSP plays an essential role in successful implementation of SCF practices (Seifert & Seifert, 2011). For example, Silvestro and Lustrato (2014) highlight the role of banks in SCF business, demonstrating that banks can promote the coordination, collaboration, information sharing, and information visibility; as such, banks can facilitate the integration of physical and financial SCs in SCF businesses. Furthermore, Pant and Mahapatra (2018) explore the role of banks in a case study of financial supply chain management (SCM) in seven Indian firms. The study expands the role of banks from capital providers to more versatile mediators, noting additional functions such as identifying and qualifying capable suppliers and customers and monitoring the performance of exchange partners (Pant & Mahapatra, 2018).

Existing research tends to present SCF providers as considering commercial banks as major FSP, which is understandable as commercial banks are main players in traditional SCF businesses (Silvestro & Lustrato, 2014). However, Martin and Hofmann (2017) disclose shortcomings for banks in providing SCF services, contending banks finance for paper (invoice) rather than for the benefit of SCs, which means banks focus more on the financial aspect of SCF, instead of the SC aspect. Consequently, it is beyond the capability of banks to understand the needs of suppliers and buyers in SCF businesses (Martin & Hofmann, 2017). Li and Chen (2019) note that even when SMEs become involved in the SCs of qualified focal companies, banks are unwilling to lend money to them due to a lack of sufficient collateral to justify financing. Abor et al. (2014) contend that bank financing only satisfies 13.59% of SMEs requirement for financing. For an SME without adequate financing resources, informal and costly financing approaches become necessary, severely increasing the cost capital of SMEs (Fabbri & Klapper, 2009) and further decreasing capital efficiency in the SCs to which SMEs are subject (Marak & Pillai, 2019).

Considering the disadvantages of bank-centered SCF, Bal (2019) conceives of an SCF ecosystem, contending there are various alternative for SCF providers in the ecosystem; it is necessary to study the role of alternative SCF providers in future research. In existing literature, research focused on alternative SCF providers is often marginalised and can be disregarded (Chen et al., 2022). However, in a context of technological development in the SCF market, alternative SCF providers increasingly enter the market, serving as competitive SCF providers.

Alternative SCF providers are denoted as those other than commercial banks; for example, B2B (business-to-business) e-commerce platforms (Shi et al., 2015; Song et al., 2018; Wang et al., 2019); logistic service providers (LSP) (Chen & Cai, 2011; Li & Chen 2019); technology providers (Fellenz et al., 2009), and SC service providers (Hofmann & Zumsteg, 2015). Song et al. (2018) argue that SCF initiated by third-party SCF providers are different from those initiated by traditional banks, as the third-party platform (platform) is directly involved in the SC, experiencing extensive interaction with multiple SCF participants, including banks, focal companies, and SMEs both up and downstream; therefore, it is capable to synchronise flow of material, information, and finance. Furthermore, the adoption of emerging technology allows some platforms to better manage SC operation, improving information sharing and visibility in the SC, and consequently the reliability of provided SCF services (Silvestro & Lustrato, 2013; Wang et al., 2015).

Alternative SCF providers are usually labelled as financial service providers (FSP) in existing literature (Song et al., 2018). This category includes focal companies, as those with excess capital can also act as SCF providers, offering financial services in their SC. However, Seifert and Seifert (2011) contend that only 22% of focal companies who provide SCF services to suppliers and retailers adopting a win-win strategy, while those remaining adopt SCF solutions potentially imposing pressure on the cash-flow of SC partners. Therefore, this research excludes focal companies as SCF providers, only discussing alternative third-party SCF providers independent of focal. Therefore, we label these types of alternative SCF providers as third-party SCF platforms. Marak and Pillai (2019) consider SCF platforms as a form of innovative SCF service provider, facilitating networking of parties involved in SCF.

The rapid development of financial technology boosts the emergence of SCF service platform. After the financial crisis in 2008, SCF business in Western countries has been gradually led by the third-party platforms, while the number of bank-led and focal company-led SCF has decreased. Such platforms can provide technology application in SCF business and improve the coordination of finance, information, and the physical flows of a supply chain (Wuttke et al. 2013). In China, the development of SCF has entered the stage of platformisation; SCF platforms serve as independent SCF providers to optimise the flow of financial resources, information, and material in the supply chain (Chen et al., 2022). This study clarifies the definition of third-party SCF platforms as an assembly of alternative providers independent of focal companies and SMEs; they establish a platform that networks multiple SCF participants in their SCF programme and provide varied value-added SC services to focal companies and SMEs.

1.2 Research objectives

In existing studies exploring alternative SCF providers, a major argument relates to justification of the perceived necessity for involvement of providers (Silvestro & Lustrato, 2014; Martin & Hofmann, 2017); however, few studies explore the role of alternative SCF providers in SCF business, considering factors such as how providers interact with multiple SCF participants to improve SCF capability (Chen & Cai, 2011; Song et al., 2018; Li & Chen, 2019; Chen et al., 2019). Furthermore, research into SCF capability is scarce; the relationship between SCF capability and service performance represents a significant gap in existing research in this field. Only two studies explain how SCF capability potentially improves the performance of SCF providers in SCF. For example, Jia et al. (2020a) define contents of SCF capability, claiming SCF capability leads to financial SC integration. Furthermore, Song et al. (2018) confirm SCF providers that have better information acquisition, network structure, and process management are able to better service SMEs in SCF. This study adopts a novel perspective which is founded on interorganisational network theory, arguing platforms make use of SCF capability to improve SCF network characteristics, subsequently improving their overall SCF service performance.

Liu et al. (2015) contend that China's SCF market is different to that of western markets, as China is defined by a unique economic and social system. In recent years, SCF practices in the Chinese market have developed rapidly, yet a limited number of case studies explore SCF in a Chinese context (Liu et al., 2015; Zhou et al., 2018; Song et al., 2018), representing a significant and important gap in research. This study addresses this gap by exploring the capabilities and performance of Chinese SCF providers.

Gulati et al. (2011) proposed the interorganisational network theory, which has received attention from operation management scholars in the past few years (Falcone et al., 2019; do Canto et al., 2020). The theory suggests that organisational performance is dependent on a well-established inter-organisational network, and the network performance is affected by the network characteristics of reach, richness, and receptivity (Gulati et al., 2011). Hofmann (2005) defines SCF as a network of companies collaborating across traditional financial boundaries; the inter-organisational network is recognised as a factor determining the implementation of SCF (Alora & Barua, 2019). Therefore, in order to capture the dynamics of this phenomena successfully, inter-organisational network theory is adopted as a basis for inquiry in this study. Granovetter (1983) considers an inter-organisational network as denoting a combination of commercial relationships maintained between partners, supporting access to information, resources, markets, and innovation. Gulati et al. (1999) offer three types of embeddedness (relational, structural, and positional), which are able to enhance strategic alliances and support the

formation of the inter-organisational networks. Gulati et al. (2011) find network characteristics determine performance effects in an inter-organisational network. The characteristics of three-dimensional include network reach, richness, and receptivity. It is usually applied in inter-organisational networks in the field of SCM (Gulati et al., 2011). This theory provides insight in research exploring SCF, offering information supporting the analysis of how SCF providers utilise influence and capability to optimise financial flow in the network, consequently improving overall network performance (Dekkers et al., 2020). In this study, justification of the theoretical framework is presented to provide a valid and logical framing for analysis of mechanisms and discussion of how platform's SCF capabilities promote characteristics of the inter-organizational network, and how the promoted network characteristics lead to platform's superior SCF service performance.

Based on the identified gaps, this research explores the following research questions:

- RQ1. How do SCF capabilities affect SCF performance?
- RQ2. What is the role of SCF network characteristics in the relationship between SCF capabilities and performance?

This study makes significant contributions to SCF literature in the following ways:

First, this study is novel in adopting a panoramic view of SCF in the Chinese market, examining closely the role assumed by each SCF stakeholder in SCF solution provision; analysis here is especially concerned with the role of third-party SCF platforms in the SCF market. Research here proposes a new categorisation of SCF platform providers, offering two major types of platforms based on respective roles and functions in the provision of SCF service.

Second, this study enriches the understanding of SCF capabilities by proposing four different capabilities, reflected in three capability hierarchies. This study provides empirical evidence supporting the capability view of SCF, building links among SCF capabilities, SCF network characteristics, and SCF service performance.

Third, this research extends the application of inter-organisational network theory to the context of financial SC management; furthermore, this study recommends SCF providers establish the SCF network, allowing better provision of SCF services. Finally, a complete theoretical framework is developed, structuring constructs of SCF capabilities, network characteristics, and SCF service performance.

Methodologically, primary data was collected from four representative SCF platforms across multiple industries. The depth of each case (platform's SCF practices and related activities) provides a comprehensive view of the SCF network and represents a data corpus sufficient for in-depth analysis. Supported by the platform's collaborative banks (who also participated in interviews), each platform provides the study with full access to required data.

Managerially, this study identifies a hierarchy in SCF capabilities; platforms can use these findings to develop their SCF capabilities with pertinence. Second, based on the successful experience of the four case platforms in relation to SCF operation, new entrants are offered valuable insight here into the consequences of construction of well-structured SCF networks in Chinese SCF markets. Finally, the research summarises key resources held by each stakeholder, offering recommendations for their suitable roles in the SCF network. This work provides a roadmap for stakeholders to engage in the Chinese SCF market.

1.3 Structure of research

The structure of this study is illustrated in Figure 1-1. Following the introduction, the body of the thesis is structured as follows. **Chapter 2** offers an in-depth and comprehensive literature review, focused on the definitions, actors, capability, and service performance of SCF. At the end of the literature review, justification is offered for the theories which form the conceptual foundation of discussion, as well as an explanation of research questions. **Chapter 3** is focused on discussion of multiple case study methodologies adopted in this work, including research method justification, data collection, coding, and data analysis. In **Chapters 4 to 7**, based on the information collected from the four sample platforms, four case analysis are introduced respectively. **Chapter 8** offers an in-depth cross-case analysis with significant findings as a result of cross-case comparison from the cases. **Chapter 9** discusses the relationship among the identified constructs; three sets of propositions and a theoretical framework are developed based on cross-case analysis. In **Chapter 10**, the conclusions and findings of this research are discussed; theoretical and managerial contributions, as well as limitations and future research directions, are discussed in detail.

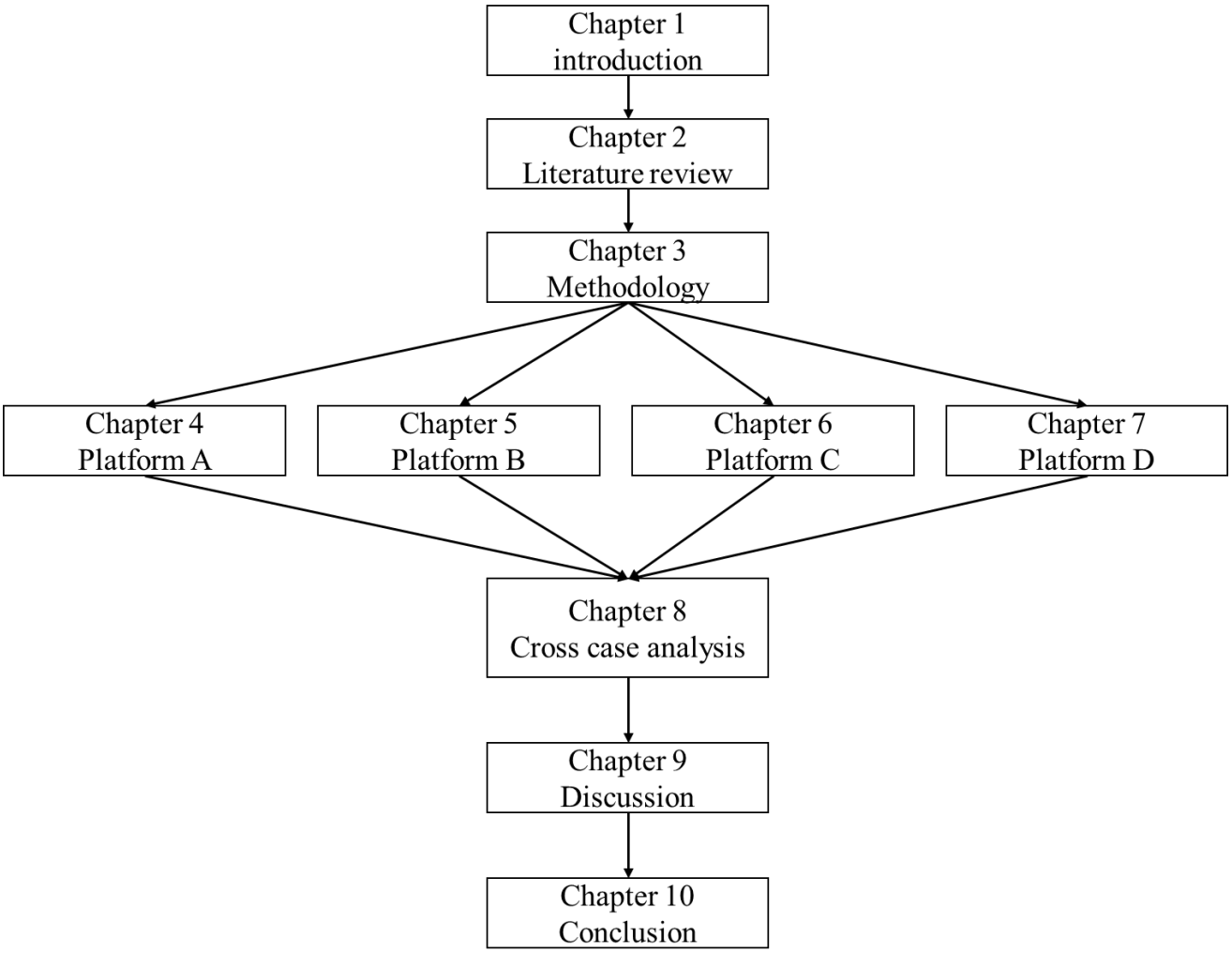

Figure 1-1. Structure of dissertation

Chapter 2. Literature review

The aim of this chapter is to identify research gaps in the current SCF literature and further develop a theoretical framework of how SCF capabilities affect the SCF service performance. This chapter begins by discussing the literature review method, before considering definitions of SCF and previous reviews of SCF literature. The body of the review is concerned with writing related to SCF actors, SCF capabilities, and SCF service performance respectively. Capability hierarchy and inter-organisational network theory are considered, offering justification which provides a theoretical underpinning for this research; writing related to this field is considered accordingly. At the end of this chapter, research gaps are concluded, and an initial conceptual framework is proposed,

2.1 Introduction to the literature review method

This literature review is conducted using a content analysis method, an effective method to systematically review previous work (Seuring & Gold, 2012). Content analysis is widely adopted in SCF literature reviews (Gelsomino et al., 2016; Jia et al., 2020a). To effectively capture all themes regarding SCF and SCF providers, this study identifies two major research streams. The first stream is related to SCF. Concluded from the previous systematic literature review of SCF, this research determines the final SCF-related streams as “SC financ*” OR “reverse factoring” OR “inventory finance*” OR “trade credit” OR “dynamic discounting” OR “working capital”. The second stream is related to the SCF providers. This research concluded all possible SCF providers and use them as the second search stream: bank* OR "focal" OR "platform" OR "logistic*" OR "fintech" OR "FSP" OR "financial service provider" OR "financial institution" OR stakeholder OR NBFI OR “non-banking financial institution”.

To effectively complete an initial literature collection, Scopus database is selected to identify the papers for review. Scopus database is one of the world’s largest literature databases. It covers a wide range of literature, and it is suitable to be adopted for paper

selection when conducting systematic literature review (Jia et al., 2019; Jia et al., 2020a). Two search strings are put together in the Scopus research database (one of the world's largest literature databases) in the “Article title”, “Abstract” and “Keywords” search fields. Language is limited to English and the document type to “article”. Furthermore, subject areas are limited to those most relevant. Given that over 90% of papers in the initial search results were published after 2000, this timespan in this literature review is set from January 2000 to November 2022 (as shown in Figure 2-1).

After setting these restrictions, 935 papers are identified in the initial research. In the first-round of literature selection, titles and abstracts are scanned, narrowing the number of papers to 227. In the second-round selection, more detailed inclusion and exclusion criteria are employed; after reading the full text of the 227 papers, 72 papers are finally selected for inclusion in the literature review of this study. Detailed review methodology is presented in Figure 2-1.

The literature review includes 8 sections: section 2.2 concludes the previous literature review of SCF. Section 2.3 concludes the SCF concept evolvement. The following section 2.4 reviews the major SCF actors. Sections 2.5 and 2.6 reviews the SCF capability and SCF service performance. Section 2.7 justifies the theory adopted in this research, reviewing the capability hierarchy and inter-organisational network theory. Section 2.8 combines the review constructs and proposes a theoretical framework based on the overall literature review.

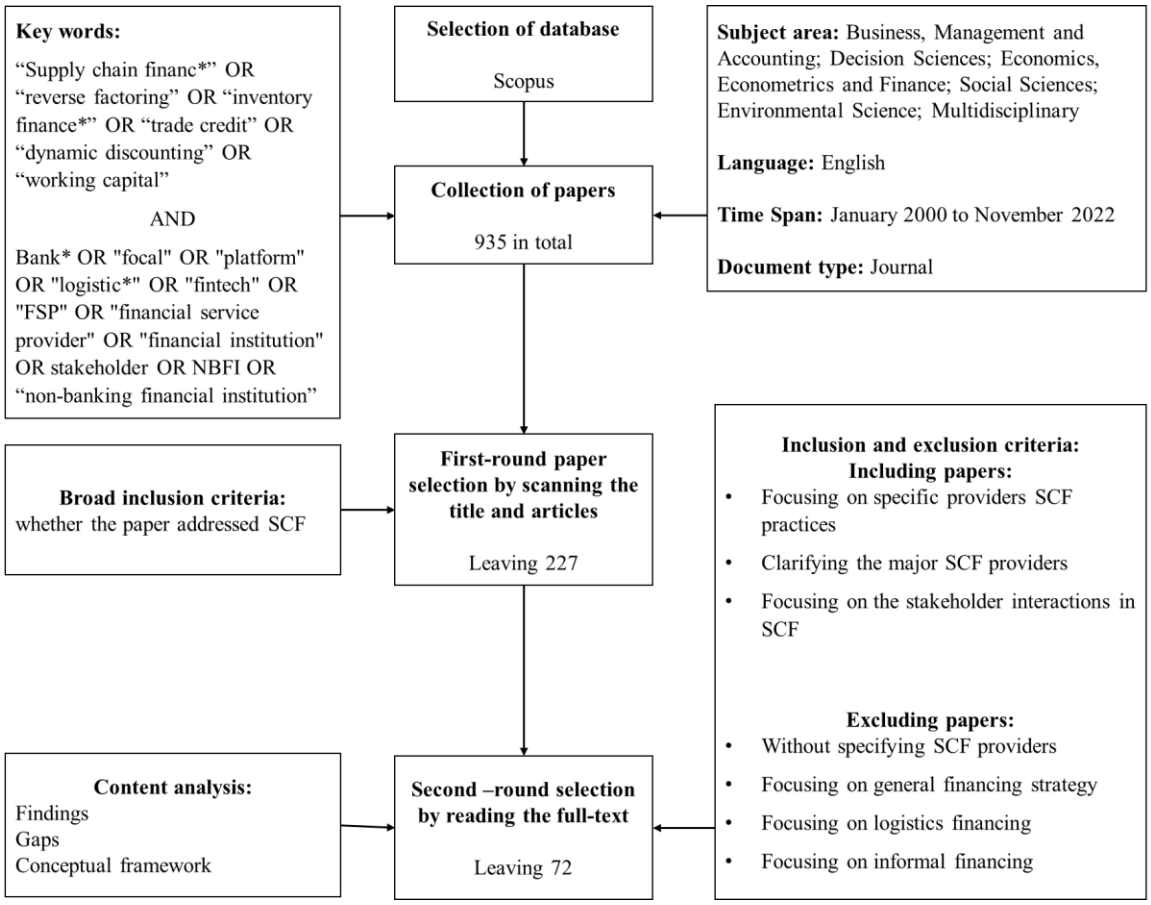

Figure 2-1. Literature review method

2.2 Definitions of SCF

Budin and Eapen (1970) proposed the concept of trade credit as an early conceptuliastion of SCF. The concept of SCF is defined by multiple studies; the first formal definition of SCF is proposed by Stemmler (2002), who found the essence of SCF is integration of financial into physical flow, highlighting the importance of SCF in SC management. Hofmann (2005) proposes additional conceptual insights regarding SCF, concluding by offering a more detailed definition of SCF: SCF is proposed as interdisciplinary research, involving logistics, SC management, and finance. The author defined SCF as an approach for two or more organisations in a SC, including external service providers, jointly creating value by planning, steering, and controlling, flow of financial resources at an inter-organisational level.

Pfohl and Gomm (2009) argue for the significance of SCF functions in creating value for SCF participants, defining SCF as a process of inter-organisational financing optimisation and financing integrations among customers, suppliers, and service providers, and increasing value for all participants. Gomm (2010) further demonstrates that SCF aims to optimise financing at an inter-organisational level, decreasing the cost of capital and increasing liquidity.

Lamoureux and Evans (2011) state that SCF is a combination of technological solutions and financial services, closely connecting global value chain anchors, suppliers, financial institutions, and technology service providers; they consider that SCF is designed to promote effectiveness of financial SCs by stabilising SC cost and improving visibility. Definitions proposed by Lamoureux and Evans (2011) firstly explicitly state technology and technology service providers as crucial to definitions of SCF. Wuttke et al. (2016) specify primary management activities in SCF, considering SCF as optimising the planning, managing, and controlling of SC cash flows to facilitate efficient SC material flows.

Gelsomino et al. (2016) conduct a systematic literature review, summarising existing definitions of SCF; based on these definitions, the study concludes two perspectives of the

SCF concept. Gelsomino et al. (2016) highlight the finance and SC-oriented aspects of SCF. In relation to the finance-oriented aspect, SCF is regarded as a series of financial solutions provided by financial institutions (normally banks); the SC-oriented aspect stresses collaboration among SC members. Furthermore, a second definition extends the role of SCF beyond simple financial solutions, considering inventories, SC processes, and collaborative solutions. Song et al. (2018) define SCF from a broad SC perspective, considering SCF as a process of integrative interactions between logistics, business, information flows, and financial flows, among involved parties, supporting capital flow visibility and accessibility, which in turn promotes transaction and logistics activity by effectively utilising capital (Song et al. 2018).

Zhao and Huchzermeier (2018) offer a conclusive definition of SCF, summarising three scopes of SCF. On a spectrum of broad to narrow, definitions of SCF can be categorised using three categories. Firstly, the broadest scope of SCF definition refers to financial SC management, usually denoting the management of monetary flow and financial processes in SCs. Secondly, SCF may be considered as a financial instrument in SC, describing a series of financial instruments enhancing efficiency of monetary flow in SC. Thirdly, the narrowest scope of SCF definition refers to SCF as supplier financing; it is a buyer-driven payable solution, usually referring to reverse factoring.

Comparing these definitions of SCF, concepts of the scope of SCF are expanded from a narrow financial SC to a broader SC perspective. The function of SCF is expanded from financial gain to a series of SC improvements. The involvement of participants is expanded from a buyer-supplier-bank triad structure to a more diversified network structure, including more participants such as technology service providers. Based on the discussion above, this research adopted the SCF definition with a broader SC perspective that SCF refers to a set of financing solutions offered by SCF providers that integrate financial flow, information flows, and physical flows along the SC to optimise the cash-flow and turnover rate of capital from the SC perspective (Wuttke et al., 2013).

2.3 Previous literature reviews of SCF

Compared with other topics that explore operation management, SCF remains an emerging topic that under researched (Gelsomino et al., 2016). Although the focus on this topic has increased in recent decades, there remains a deficit in reviews of SCF literature. Therefore, this section summarises these literature reviews to establish an informed basis for discussion which explores the role of platform in SCF.

Table 2-2 summarises the SCF literature review before the end of 2022. Major topics of exploration and relation to third-party SCF platforms in SCF are concluded. Over half of reviews are published in 2019 and 2020. The first comprehensive literature review of SCF was published in 2015; however, the focus of this review is limited to Chinese-written papers. The authors only review a small part of English literature for the purpose of comparison with SCF research in China. Gelsomino et al. (2016) conduct the first systematic literature review of SCF, identifying two perspectives of SCF. The first finance-oriented perspective focuses on short-term financing solutions; the second SC-oriented perspective focuses on long-term working capital optimisation. A majority of systematic reviews set parameters which included papers written post 2000s.

After scrutinising topics and foci of literature reviews, it appears evident that the scope of SCF literature reviews have expanded; previously centered on SCF participants, instruments, outcomes, and contextual factors that may influence implementation, research is increasingly concerned with the wider scope of related aspects in SCF, such as ecosystems. Furthermore, most literature reviews stress the lack of a sound theoretical basis for SCF research, encouraging a combination of applied management and finance theories to explain SCF. In existing literature reviews, Jia et al. (2020a) appears unique in proposing a conceptual framework combining information processing theory and SCF business from the perspectives of SCF service providers.

Additionally, there is no established term denoting third-party SCF platform in existing literature reviews. For example, Chakuu et al. (2019) use *NBFI and platform providers*; Jia

et al. (2020a) use *SC orchestrators*; Marak and Pillai (2019) use the term *online platform*. However, all refer to *alternative SCF service providers* as opposed to *commercial banks*, highlighting the independence from primary SC participants, such as focal companies and companies in upstream and downstream SCs.

Xu et al. (2018) state the positive role of SCF service providers in relation to SC coordination and value creation for multiple SC partners; however, they do not explicitly identify the type of service provider. The other 7 literature reviews clarify the profound role of third-party SCF platforms in SCF markets, stressing the necessity for future research which concentrates on the role of platforms in SCF businesses (Bal, 2019; Chakuu et al., 2019).

Based on the previous literature review, it is noticed that SCF service providers become more diversified, extending from banks to other alternative SCF providers, and there is a trend for the SCF research to pay more attention on the alternative SCF providers to examine their functions in the SCF business (Gelsomino et al., 2016; Jia et al., 2020a; Jia et al., 2020b). In addition, alternative SCF service providers are more diversified. Liu et al. (2015) only mentioned LSP as alternative SCF providers. The types of alternative SCF providers has expanded since 2019, covering NBFI, online platforms, and e-commerce platforms (Chakuu et al., 2019; Marak & Pillai, 2019; Jia et al., 2020a).

Table 2-1. A summary of previous SCF literature review papers

No.	Author	Title	Journal	No. of papers	Coverage	Main topic and relation to third-party platform
1	Liu et al. (2015)	SC finance in China: Business innovation and theory development	Sustainability (Switzerland)	151	2004–2014	Content analysis of Chinese-written literature and comparison of differences between SCF in China and mature markets. LSPs can provide value-added financial services other than traditional logistics service
2	Gelsomino et al. (2016)	SC finance: a literature review	International Journal of Physical Distribution and Logistics Management	106	2000-2014	General literature review on SCF research, identifies two perspectives in current SCF research: "finance oriented" perspective that focused on short-term solutions, and "SC" oriented perspective focusing on working capital optimisation in long-term. FSPs are not limited to commercial banks. Sometimes, in "SC" oriented SCF, financial institution is not involved.
3	Xu et al. (2018)	SC finance: A systematic literature review and bibliometric analysis	International Journal of Production Economics	348	1970-2016	A bibliometric analysis of SCF literature to determine major clusters in current research. Verifying the positive role of SC financing service providers in coordinating SCs or creating value for individual companies and the entire SC. However, types of service providers are not explicitly stated
4	Marak and Pillai (2019)	Factors, outcome, and the solutions of SC finance: review and the	Journal of Risk and Financial Management	70	N/A	Conclusive literature review on factors and solutions of SC finance. An online platform can facilitate in networking the parties

		future directions				involved in SCF
5	Chakuu et al. (2019)	Exploring the relationship between mechanisms, actors and instruments in SC finance: A systematic literature review	International Journal of Production Economics	114	N/A	Literature review analysing the relationship between actors, instruments, and contextual factors. The discussed service providers are categorised into traditional banks, LSPs, non-bank financial institutions (NBFIs) and platform providers. The role of platform providers is profound and they can collaborate with NBFI or traditional banks to initiate SCF service.
6	Bal (2019)	Toward a SC finance (SCF) ecosystem – Proposing a framework and agenda for future research	Journal of Purchasing and Supply Management	243	1960-2017	A systematic literature review of SCF that expands the scope of current SCF literature reviews and introduces the business ecosystem concept to the field of SCF. Highlighting the significance of involving alternative FSPs in SCF business to complete the ecosystem
7	Jia et al. (2020a)	Towards an integrated conceptual framework of SC finance: An information processing perspective	International Journal of Production Economics	71	2000-2018	Building links between information processing theory and SCF business from a SCF service provider perspective. SC orchestrators (e-commerce platform) can act as a third-party, initiating SCF services based on advantages in the SC, bridging the gap between SMEs with insufficient credit and financial institution
8	Jia et al. (2020b)	Sustainable SC Finance: Towards a research agenda	Journal of Cleaner Production	47	2003–2018	Based on the literature review of sustainable SCF related literature, the concept of sustainable SCF is justified. Alternative FSPs act as an active role of providing innovative SCF service.

2.4 SCF actors

Research into SCF providers and SCF actors represents a major theme in current literature (Chen et al., 2020). In a review conducted by Chakuu et al. (2019), SCF actors were shown to include primary actors (buyers and suppliers), and supportive actors (banks, non-bank financial institutions, logistics service providers and platform providers). Similarly, Moretto and Caniato (2021) identified different levels of actors in the SCF ecosystem, including physical SC actors, financial SC actors, and government agency actors. Physical SC actors are buyers, suppliers, and logistics service providers (LSPs); financial SC actors are commercial banks, fintech companies, and other FSPs. In this section, SCF actors are considered as per the categorisation proposed by Moretto and Caniato (2021). Table 2-2 illustrates literature that investigates primary SCF actors and their functions in SCF.

2.4.1 Physical SC actors

Physical SC actors refer to the SC trade participants in SCF (Moretto & Caniato, 2021). Common physical SC actors include buyers and suppliers and LSPs (Silvestro & Lustruto, 2014). Buyers and suppliers are the primary participants in SCF (Chakuu et al., 2019), and SCF business is generated based on the trading between buyers and suppliers. In the upstream SC, focal companies are buyers, while in downstream SC, focal companies become suppliers for downstream retailers. In a traditional SCF business, buyers and suppliers collaborate with FSPs to complete SCF processes. Focal companies make use of positive credit qualifications to strengthen credit for their suppliers and retailers, assisting them in accessing capital at reduced rates (Chakuu et al., 2019).

Another important physical SC actor is the LSPs, important supporters for SCF, providing logistic services in the SC trade (Yang et al., 2021). Pfohl and Gomm (2009) contend that logistics management includes financial flows; it is essential to effective SC visibility. Therefore, LSPs are well positioned to provide financing, making LSP both physical SC and financial SC actors, able to leverage their control over material flows and offer SCF through collaboration with financial institutions. If LSPs possess abundant capital, they may also provide SCF independently. Meanwhile, LSPs can offer value-added services to

banks, assisting their SCF service through collateral service and sharing inventory information; furthermore, LSPs may help SC companies manage inventory flow to achieve the maximisation of working capital for buyers and suppliers (Chakuu et al., 2019).

2.4.2 Financial SC actors

Financial SC actors also refer to SCF providers (Moretto & Caniato, 2021). This research category explores the role of different SCF providers in the SCF business. Chen et al. (2020) conclude that research into SCF providers is a primary direction in writing concerned with SCF actors, including banks, focal companies, and alternative FSPs.

2.4.2.1 Commercial banks

Firstly, the role of banks as SCF providers is widely discussed, considered as essential SCF providers in existing literature (Martin & Hofmann, 2017). For example, Silvestro and Lustrato (2014), as well as Pant and Mahapatra (2018), stress the essential role banks occupy in the SCF program.

Silvestro and Lustruto (2014) conduct a case study of two international banks, claiming it is appropriate for banks to provide SCF solutions, provided that their role in SCF is more than capital provider; however, they play an important role in promoting coordination, collaboration, information sharing, and information visibility. However, to fully realise such functions, banks should rely on close collaboration with internet-based trading platforms (Silvestro & Lustruto, 2014). Pant and Mahapatra (2018) collect primary data from seven Indian companies in their investigation of the function of banks in assisting management of corporate financial SCs. In this study, the role of banks is expanded from financial service providers in the common SCF program to more versatile mediators, able to identify and qualify capable suppliers and customers, monitor the performance of exchanging partners, and establish and maintain rules of order, dispatch, and payment (Pant & Mahapatra, 2018). Consequently, this work hypothesises that banks are likely to encourage adoption of SCF among their clients to reduce uncertainties in business and transactions (Pant & Mahapatra, 2018).

A weakness of banks in providing SCF services is also significant. As a result of banks' indirect involvement in SC trade, they suffer from information asymmetry with SC companies (Fiala. 2005); once focal companies and SMEs that share a financing need conspire in joint fraud, banks find it problematic to discriminate between fake information provided by companies, increasing the risk associated with providing SCF (Kadhim et al., 2019).

2.4.2.2 Focal companies

Although banks are considered primary SCF providers in a traditional SCF service, the weakness of banks in providing SCF is clarified in existing research (Martin & Hofmann, 2017; Chen et al., 2019a). These studies propose focal companies, the controllers of SC, act in the role of SCF providers, offering SCF services to suppliers and retailers. Blackman et al. (2013) focus on the case of Motorola, exploring the role of the focal company in managing global financial SCs; Motorola adopted a cooperative strategy and shared financial data with suppliers and financial institutions, resulting in a reduction in cost and increments of efficiency throughout the supply process. Caniato et al. (2016) studied 14 companies across multiple industries, identifying multiple objectives for focal company adoption of SCF, including inter-firm financial flow optimisation and SC risk reduction; the study demonstrated that levels of inter and intra-firm collaboration, trade process digitalisation, bargaining power, and financial strength of the focal company, all have an impact on the adoption of SCF in the SC.

However, Chen et al. (2019) in a case study of JD illustrate how a focal company can provide SCF services (factoring) for its platform users (mostly SMEs). Banks have difficulties providing financial services for platform users. First, when banks offer SCF to SMEs, SMEs are required to open an account with the designated bank. However, SCF users are located in various places, meaning it is inconvenient to open a bank account at the same place. Second, platform users usually have a short turnover and fast trade process, inappropriate for banks' ineffective loan approval processes. Third, banks find it problematic to confirm ownership of financial assets, as a result of their indirect involvement in SC trade. Conversely, JD as a focal company has direct access to data and

information collected from its platform and other service systems, such as their logistics system. Therefore, the focal company is able fully control the flow of capital, information, and goods, indicating they can successfully seize the essential nodes of risk management when providing SCF to SME suppliers and retailers.

The problems of the focal companies' SCF programme is noticed; for example, most focal companies cannot implement an SCF with a win-win outcome among the focal company and suppliers/relaters. Sometimes, focal companies leverage advantages on the SC in the SCF and further impose pressure on cash flow of their upstream/downstream partners (Seifert and Seifert, 2011).

2.4.2.3 Alternative financial service providers

In a context of development in SCF research, there appears a requirement for diversified research that explores SCF providers (Bal, 2019). Therefore, a growing number of recent studies focus on non-traditional FSPs, also known as alternative FSPs (Song et al., 2018). Categories of alternative FSPs are varied, including LSP, B2B platform/trade platforms, and technology service providers.

Among all alternative FSPs, LSPs are the topic of most widespread discussion. LSPs' involvement in SCF is not only related to the physical SC, but also the financial SC. Several studies explore how the SCF programme can be launched by LSPs; for example, Chen and Cai (2011) identify that, apart from the role of traditional logistics service providers, LSPs also offer the potential to function in a control role, providing financing services for cash-limited retailers. Li and Chen (2018) explore how LSPs can use SCF as an optional tool to satisfy customer needs, enhancing the benefits of their market exploitation practices; the study claims that when SMEs experience difficulty obtaining loans from traditional external financial support, banks are reluctant to offer money as a result of insufficient collateral. However, LSP can make use of full control over the logistics and corresponding information of SC transaction, providing SMEs with SCF that is able to negate liquidity issues.

Martin and Hofmann (2017) demonstrate that non-bank financial institutions (alternative FSPs) function in a financial intermediary role, positively improving SCF implementation. Pfhol and Gomm (2009) state that alternative FSPs act as financial intermediaries as well as active FSPs, enabling the completion of financial contracts. Chakuu et al. (2019) state that platform providers, including technology providers and trade platform providers (B2B), can also provide financial services; however, this process requires liaison with banks and focal companies.

Song et al. (2018) further explore the differences between bank-dominated SCF and alternative FSP-dominated SCF in relation to support for SMEs to obtain finance. Conducting case studies of three banks and three FSPs, all providing SCF services to the same SMEs, the study found the FSPs perform better in helping SMEs access financing in contrast with banks; this is because they have superior information acquisition, network structure, and process management, reducing information asymmetry throughout the transaction (Song et al., 2018).

Alternative FSPs are becoming an increasingly prominent focus in recent research; their important role in SCF is emphasised (Martin & Hofmann, 2017; Chaku et al., 2019). However, there remains questions about how and why platforms can provide better SCF services. Song et al. (2018) appears unique in explaining this question from an aspect of controlling information asymmetry during the SCF processes. However, other aspects of explanation are required to answer the question comprehensively. Jia et al. (2020a) adopt an aspect of information processing, stating the fit between information processing requirements and information processing capacity can improve SCF capability and further promote the integration of financial SCs. However, Jia et al. (2020a) fails to build links between SCF capability and SCF service performance. This study offers an important contribution by extending research by Jia et al. (2020a) and adopting the perspective of SCF capability, indicating platforms may possess superior SCF capability that increases SCF service performance.

Table 2-2. Summary of SCF actors

SCF actor		Functions	Key research
Physical SC actors	Buyer and supplier	-Primary SC trade participants; -Focal companies make use of their good credit qualifications to strengthen the credit of their suppliers in SCF	Silvestro & Lustruto, (2014); Wandfluh et al. (2016); Martin & Hofmann (2017); Chakuu et al. (2019); Liu et al. (2021)
	LSP	-Provide logistics services in the SC trade; -Control over the material flows and offer SCF through collaboration with financial institutions; -Offer value-added services to banks to assist banks' SCF service	Pfohl & Gomm (2009); Chen & Cai (2011); Li and Chen (2018); Yang et al. (2021); Chakuu et al. (2019)
Financial SC actors	Commercial banks	-Traditional SCF providers and major source of capital in SCF; -They can play an important role in promote the coordination, collaboration, information sharing, and information visibility; -Assist the management of the corporate financial SC	Martin & Hofmann (2017); Silvestro & Lustruto (2014); Pant & Mahapatra (2018)

	Focal company	-Adopt a cooperative strategy with suppliers and share financial data with suppliers and financial institutions, to reduce the cost and increase the efficiency throughout the supply; -Focal company's intra- and inter-firm collaboration, trade process and digitalisation, bargaining power, and financial strength impact the SCF adoption in SC. -In SCF, focal company has advantages in accessing data and controlling capital flow, information flow and goods.	Blackman et al. (2013); Caniato et al. (2016); Wandfluh et al. (2016); Chen et al. (2019a)
	Alternative financial service providers	-LSP can make use of their full control over the logistics and corresponding information of the SC transaction and therefore provide SMEs with SCF to deal with the liquidity issues. -Alternative FSPs can act as financial intermediaries' role and can positively improve SCF implementation. -Alternative FSPs can act as financial intermediaries and also can act actively in SCF to enable the completion of financial contracts. -FSPs can perform better in risk management in SCF owing to better information acquisition, network structuring and process management.	Pfhol and Gomm (2009) ; Chen & Cai (2011); Martin and Hofmann (2017); Song et al. (2018); Li and Chen (2018); Lin & Peng (2019)

2.5 SCF capability

SCF capability is largely absent as a focus of discussion in existing literature, with the notable exception of work by Blackman et al. (2013), Song et al. (2018), and Jia et al. (2020a). Blackman et al. (2013) adapt the SC model proposed by Lambert et al. (1998), offering a proposal of the financial SC strategy, defined by three inter-related constructs: financial business processes; financial and banking information systems; financial network structure. Song et al. (2018) adapt the construct used by Blackman et al. (2013), revising three constructs as, information acquisition, network structure, and process management, to describe SCF provider capability when they provide services to SMEs. The improvement of capabilities allows SCF providers to reduce information asymmetry throughout the SC transaction, enabling better control of pre, within, and post, transaction risk.

Jia et al. (2020a) adapt from the financial SC strategy construct proposed by Blackman et al. (2013) and firstly explicitly adopt the term "SCF capability" in their study. The work considers SCF capabilities as composed of three dimensions: mapping financial network structure; designing financial business processes; sharing financial information systems. Mapping financial network structures can improve operational integration and designing financial business processes can lead to process integration; sharing financial information systems promotes information integration in SCF. This study integrates the construct adopted by Song et al. (2018), and Jia et al. (2020a). As deducted from the literature, this study considers that the platform may possess better SCF capabilities in terms of information processing, financial network structuring, and managing the SCF process. SCF capabilities are illustrated in Table 2-3 in detail.

2.5.1 Information processing

The information related SCF capabilities of platforms as mentioned in previous research includes two evident aspects: (1) information acquisition, (2) information sharing. These two capabilities describe the way a platform deals with information flow during the SCF process. Therefore, these capabilities are defined as information processing capability.

The platform can acquire abundant operational and financial information about SMEs during the SCF as a result of direct engagement in the SC activities (Song et al., 2018; Li & Chen 2019). The platform is becoming involved in SC operations, such as ordering and distribution, and providing value-added service to suppliers, manufacturers, and retailers; as such, they have better access to abundant and reliable information, thereby improving lender confidence in providing capital for SMEs (Song et al., 2018). Using LSPs as an example, it is evident that they have full control over logistics in the SC they served. As a result, they have complete knowledge of information regarding each party of the products, enabling them to provide financial services to meet the actual needs of SMEs (Li & Chen 2019).

These advantages in obtaining information are echoed in work by Song et al. (2018), who compare the respective performance of SCFs initiated by commercial banks and platforms. In their investigation, it is shown that commercial banks evaluate financial statements, enterprise credit, and business history, in order to make judgements about solvency and financial status of financing enterprises (SMEs). Furthermore, banks highlight the importance of SME partners in the SC; for example, SME dependency on focal companies. However, a platform, involved in the trading in the SC, can access valuable SC operation knowledge or information, including production plans and inventory data. Therefore, they can lower default risks when conducting SCF. This fact is echoed by Shi et al. (2015), who studied the SCF provided by a third-party B2B e-commerce platform, showing the third-party e-commerce platform takes positional advantage in the SC to gain better accessibility to SME transaction information (Shi et al., 2015), reducing information asymmetry between borrower and lender, and avoiding "high-risk" financing (Song et al., 2021).

Information sharing is a further essential aspect of SCF provider information processing capability; it is frequently mentioned in literature discussing SCF. Wang et al. (2015) argue information sharing can strengthen information quality and organisational information processing capability. Marak and Pillai (2021) stress information sharing is essential for SCF practice; SCF participants should make information available and share it to ensure the transparency in the SCF business. The information to be shared in SCF includes data

such as inventory level, sale, forecasting, and order status. Jia et al. (2020a) propose SCF provider capability in sharing financial information systems, such as Enterprise Resource Planning (ERP) systems, or Electronic Data Interchange EDI systems, is a factor that can support effective information sharing between the SCF providers and subunits in the SC.

2.5.2 Financial network structuring

Platform network structuring capability describes how SCF providers arrange business relationships in the SCF (Blackman et al., 2013). Such capability is dependent on platform capability in relation to interconnectivity, the ability of the platform to attract and build links with multiple banks and companies to start the SCF business (More & Basu, 2013).

More and Basu (2013) stress the essential role of the platform in establishing and growing the SCF ecosystem. SCF platform providers can make use of platform features to build wider links with multiple manufacturers, suppliers, and retailers in the SC network (Chen & Cai, 2019). However, to maximise advantages allowed by interconnectivity with multiple SCF participants, a platform must ensure the attractiveness of its service quality, or platform capability, attracting more collaborative partners or clients using the platform (Ma et al., 2020). Therefore, with establishment of the platform, an increased number of financial institutions are involved, satisfying the requirement of the entire SC; more SC partners are able and willing to obtain financial services on the platform (More & Basu 2013). For example, compared with directly trade with manufacturers who have a strong financial position, SMEs can reduce capital costs by trading through LSP, as LSP can acquire payment delay arrangements from manufacturers, which can be partially extended to SME buyers (Chen & Cai, 2019). Therefore, the platform can attract an increased level of SME buyers to trade on their platform.

Omran et al. (2017) argue that SC finance services are only applicable to direct suppliers, while other multi-tier suppliers find it problematic to gain financing through SCF, because of their weak connection with the focal company. However, by adopting emerging technologies such as blockchain, a platform can leverage the full potential of SCF by applying blockchain technology in reverse factoring along the upstream SC, enabling the

reach of the SCF service to extend to multi-tier suppliers (Omran et al.,2017; Caniato et al., 2019). As a result, platform involvement can allow the interconnection of more suppliers and retailers in a SCF network.

Interconnectivity also describes the way platforms can attract more commercial banks to collaborate and provide capital for their SCF service. Although banks are not SCF providers in this business, they remain an important source of capital for financing services (Song et al., 2018). When providing SCF services, a platform can leverage its own fund, although this may result in financial pressure when the volume of business increases. Therefore, platforms should be willing to build strategic alliances with commercial banks and work collaboratively to finance supply (Lahkani et al., 2020).

Compared with traditional modes of SCF, in which banks initiate direct services with SMEs, models of collaboration with third-party providers in the finance of SCs can more fully satisfy bank requirements; in traditional modes of SCF, the establishment of mutual trust between banks and SMEs takes a long time to develop, requiring repeated interactions (Fiordelisi et al., 2014). However, in order to achieve collaboration with banks platforms share accumulative transaction data on the platform with banks, reducing the problematic influence of information asymmetry which has is a well-established issue in SC finance services (Fiordelisi et al., 2014). Based on information provided by the platform, trade authentication may be confirmed; therefore, risk in financing firms involved in the transaction is controlled to an acceptable level and consequently more banks are willing to provide capital for SCF services (Ma et al., 2020).

2.5.3 Managing SCF process

Managing the SCF process is considered as a third SCF capability for platforms; it describes the extent to which a platform can effectively arrange the business process in their SC and SCF services (Song et al., 2018). Good arrangement of the SCF process results in platforms becoming more specialised in SCF services, providing a more integrated SC service in their SCF business.

The SCF service provided by the platform is not limited to financing, offering an integrated SC service for companies that are part of the SC (Song et al.,2018; Chen & Cai, 2019). Involvement of an SCF platform enables integrated SC management through SCF. Chen and Cai (2019) illustrate that when an LSP provides SCF service to SMEs, the platform acts as an intermediary for both ordering and payments; they deliver products to buyers, from whom the platform collects purchase payments and logistics fees. Martin and Hofmann (2017) stress platforms can promote integrated management of SC flow using SCF practices; platforms can serve as intermediaries between business functions and SC partners.

The platform is also able to provide supplier management services using behaviour control (Song et al., 2018). For example, a platform can monitor the sustainable purchase behaviours of suppliers based on transactions carried out on the platform (Zhou et al., 2018). Song et al. (2018) propose that in order to ensure reduction in opportunistic behaviour (e.g. using the same invoice as collateral for multiple loans), platforms opt for rules which regulate behaviour of SMEs; any opportunistic behaviour results in SMEs being refused further collaboration with further SCF participants.

Platform management of SCF process capability is also supported by digitalisation and application of technology in SCF. More and Basu (2013) identify the way some corporations continue to rely on a paper-based manual approach to the processing of financial transactions, further undermining SC visibility in SCF. This view is echoed by Pandian (2013), who observes that paper-based systems for commercial documents such as purchase orders and invoices remain common in developed and developing countries; these companies are unable or unwilling to develop electronic systems. Sufficient digitalisation and technology capability in daily operation management excludes many SMEs, who would otherwise have access to abundant financing resources via their SC (Pandian, 2013). The importance of digitalisation among SCF participants is emphasised by Caniato et al. (2016), and Ali et al. (2018). Trade digitalisation is regarded as a basis for innovative SCF financial and collaborative SC solutions (Caniato et al., 2016).

Lahkani et al (2020) contend that platforms tend to have a employ a higher level of technological application, improving SCF process management capability; the study examines blockchain-based SC finance initiated by a B2B e-commerce platform, concluding that the involvement of a platform significantly promotes the application of blockchain technology in the SC; with the involvement of a platform in SCF, efficiency in logistics and digital documentation is shown to improve by 74% and 75% respectively, allowing faster payment speed and more reliable and transparent data transfer among SCF participants (Lahkani et al., 2020). Furthermore, big data analysis is largely adopted by the platform when providing SCF services (Zhou et al., 2018). In the context of agriculture SC finance led by e-commerce platforms, this specific platform makes use of its capability to conduct big data analysis. Big data analysis enables calculation and evaluation of individual credit levels, making rural financial services possible even within an imperfect credit system (Zhou et al., 2018; Li & Chen 2019).

Additionally, commercial banks, representing traditional interest in SCF, have realised the technical superiority of the platform (Lin & Peng, 2019) and now aim to develop collaborations with platforms to provide SCF services. Banks believe platforms such as B2B are able to better integrate emerging technologies in their SCF programme, making the SCF process visible and transparent, and reducing the probability of default risks in the provision of SCF (Lin & Peng, 2019).

2.5.4 Summary of SCF capabilities

After an extensive literature review of SCF capabilities, little research has systematically addressed the contents of SCF capabilities (Jia et al., 2020a). According to the literature review, the construct of SCF capability is identified, composing of information processing capability, financial network structuring capability, and managing SCF process capability (Song et al., 2018; Jia et al., 2020a). Although, some works illustrate the contents of SCF capability respectively (Chen & Cai, 2019; Lahkani et al, 2020), the contents of each capability are unclear and lack comprehensive conclusion. In addition, the identified construct and contents of SCF capability is conceptual in nature. For example, Jia et al.

(2020a) state that SCF capabilities are concluded from the reviews; it is considered as an outcome of fit between information processing requirements and capabilities. Therefore, it requires empirical data to for further verification. This research may provide sufficient empirical data to revise the SCF capability construct and clarify the SCF capability contents.

Table 2-3 Summary of SCF capabilities

SCF capability	Contents	Key research
Information processing	• Information processing capability is related to information acquisition and sharing. • Platforms can acquire abundant operational and financial information about SMEs during the SCF, as a result of their direct engagement in SC activities. • Information sharing is essential for the transparency of SCF practice. ERP and EDI systems are adopted for information sharing	Shi et al. (2015); Wong et al. (2015); Song et al. (2018); Li & Chen (2019); Jia et al. (2020a); Marak and Pillai (2021)
Financial network structuring	• A platform's financial network structuring capability describes how SCF providers can arrange business relationships in the SCF business; it is dependent on platform interconnectivity. • Platforms should ensure the attractiveness of service quality or platform capability as methods used to attract more collaborative partners (banks) or clients (SMEs) using the platform.	Blackman et al. (2013); More & Basu (2013); Fiordelisi et al. (2014); Omran et al. (2017);; Caniato et al. (2019); Chen & Cai (2019); Lahkani et al. (2020); Ma et al. (2020)
Managing SCF process	• This capability describes extent to which platforms can effectively arrange business processes in SC and SCF services • It is related to the SCF provider's specialisation and comprehensiveness of the SCF service • Platform's managing SCF process capability is also enabled by the digitalisation and technology application in SCF	Pandian (2013); Caniato et al. (2016); Martin & Hofmann (2017); Song et al. (2018); Zhou et al. (2018); Li & Chen (2019); Lin & Peng (2019); Chen & Cai (2019); Lahkani et al. (2020)

2.6 SCF service performance

SC performance is extensively investigated in existing studies (Beamon,1999; Gunasekaran et al., 2004); however, few studies focus on SCF performance evaluation. It represents an omitted topic in the literature review and a gap in writing (Chen et al., 2022). Evaluation of platform SCF performance is essential for SC parties (Chakuu et al., 2019). Previous literature is characterised by the discussion of performance in the context of SCF from a perspective of SCF adopters; for example, how adoption of SCF can improve financial and operational performance of suppliers and buyers (Ali et al., 2018; Alora & Barua, 2019).

However, in a context of rapid development in SCF during the past decade in China, competition in the SCF market is becoming increasingly intense. In order to maintain competitiveness in this market, SCF providers must be aware of factors that affect their SCF performance (Chen et al., 2020). Wang et al. (2020) offer an SCF adoption mechanism, further investigating three drivers of SCF adoption and their relative implications for SC performance (outcomes). The work shows that it remains problematic to evaluate SCF providers' SCF performance in current research. Chen et al. (2022) proposed a technology-recognition-organisation framework to evaluate the SCF performance of SCF platforms. Chen et al. (2022) categorise SCF platforms as bank-led, core enterprise-led, and technology company-led SCF platforms respectively.

Kennerley and Neely et al. (2002) define performance measurement as the process of quantifying the effectiveness and efficiency of past actions. Cho et al. (2012) identify six dimensions to comprehensively evaluate the service supply chain performance, including financial, competitiveness, quality of service, flexibility, resource utilisation, and innovation. SCF is an SC financial service (Gelsomino et al., 2016), and such dimensions should abide by to the above six dimensions. In the technology-recognition-organisation framework proposed by Chen et al. (2022), technology factors represent the dimension of flexibility and innovation as technology applications in SCF can accelerate the financial service speed (Fairchild, 2005) and it can be considered as innovation in SCF (Lahkani et al., 2020). The organisational factors are related to the financial dimension as these factors describe the financial performance of SCF service providers (Chen et al., 2022). Lastly, the recognitive factors are related to the quality of service, as the recognitive factors indicate how the customers are accepted the service, which is directly related to the quality of the SCF service (Chen et al., 2022). Therefore, this

study adopts the measurement framework of SCF service performance proposed by Chen et al. (2022) to evaluate the platform's SCF performance.

2.6.1 Technological factors

Building on the work of Chen et al. (2022), it is clear new technologies are developed and adopted to construct or upgrade SCF platforms. The authors consider technological aspects can be adopted to evaluate SCF platform performance; higher levels of innovative technology application in SCF, reflect better SCF performance. This approach is echoed by recent writing which argues for increased academic attention on technology application, such as blockchain, and the Internet of Things, in SCF (Du et al., 2020; Chen et al., 2020).

Fairchild (2005) indicates that automation is significant to the future of SCF service provision, as the efficiencies in automation require both human and computational intelligence. Silvestro and Lustrato (2014) highlight the way that technology and system integration issues are significant drivers influencing the slow response of banks to the demand of corporate clients for improved SC performance.

Wang et al. (2019) explore the effect of adoption of the Internet of Things (IoT) on SCF risk management, comparing expected loss value of inventory pledge financing modes based on the IoT with the operation risk of the traditional modes. The study concludes that SCF which incorporates the application of IoT technology effectively improves SCF service performance and reduces operational risks. Rijanto (2021) studies application of blockchain technologies in SCF, exploring 30 application cases in SCF; this work confirms that adopting blockchain technology enables the provision of automation solutions in SCF; smart contracts, transparency, and security of distributed ledger data features, all improve SCF service performance. Some papers clarify the way information technology innovation and application are important facets of intra and inter organisational information sharing in SCF (Blackman et al., 2013; Wandfluh et al., 2016).

In addition to technology, popularity is a factor that should be considered when evaluating systems and platforms (Tang et al., 2019). Chen et al., (2022) extend this dimension into consideration of the SCF platform, concluding two primary aspects of popularity in research: organisational and recognition.

2.6.2 Organisational factors

Organisational factors describe the financial performance of SCF service providers. This dimension considers a platform's SCF service profitability and the stability of the platform (Chen et al., 2022). In current research regarding financial performance, most studies focus on financial performance of SCF adopters, such as SMEs and focal companies (Ali et al., 2018; Carnovale et al., 2019). Chen et al. (2022) identified three firm-level measurements able to evaluate the financial ability of SCF platforms to provide SCF services, including company return, financial leverage, and cash holdings. Chen et al. (2022) also consider that number of employees as an influential factor affecting platform SCF services; this factor illustrates the extent to which a platform can satisfy manpower requirements in developing and operating SCF platforms.

2.6.3 Recognitive factors

Recognitive factors measure the extent to which SCF service providers are accepted by customers. Higher levels of customer acceptance indicate superior platform SCF service performance (Chen et al., 2022). Acceptance is primarily considered from the perspective of SMEs; if an SCF service is more available and affordable to SMEs, they tend to be more accepting of this SCF service, as it offers them the potential to solve liquidity issues.

In terms of availability, SMEs face strict lending standards when pursuing financing services from commercial banks (Cho et al., 2019). When banks offer loans to clients, they usually examine the financial status of a company, considering factors such as fixed assets able to be used as collateral. However, for SMEs which lack working capital or collateral assets, it is extremely hard to gain finance using bank credit financing, as they are regarded as enterprises with low credit and high bankruptcy risk (Gao et al., 2018). This situation makes SCF availability highly valued by SMEs, which in turn makes SCF availability essential to the measurement of SME acceptance of the SCF service.

In relation to affordability, SMEs with insufficient internal resources and access to bank financing, tend to be limited in their financing choice, relying on costly and informal sources of finance (Fabbri & Klapper, 2009). Furthermore, considering the higher risks associated with

providing finance to SMEs, when banks offer financial support interest rates are usually high, meaning SMEs attach great importance to affordability of the SCF they receive. Using platform capability to acquire information, develop network relationships, and complete post-loan controls, risk management mechanism adopted by platforms in SCF can effectively reduce information asymmetry and negate the moral hazard associated with financing, affecting risk premium (Song et al., 2018). From the perspective of SMEs, it is possible to finance at a low cost using SCF. Data from the investigation of Song et al. (2018) reveals the average annualised rate of commercial bank lending to SMEs is 10 %, while the annualised rate provided by the platform is 7-8%. Therefore, affordability significantly affects SMEs' acceptance of platform SCF services.

In addition to acceptance from SMEs, bank acceptance of platform SCF services is equally important. While banks are not SCF providers in the platform-led SCF programme, they remain essential capital providers for SCF services, requiring platforms to build collaborative relationships with them (Chakuu et al., 2019). Bank acceptance is usually related to the perceived levels of risk controllability in relation to the SCF.

Lahkani et al. (2020) state risk reduction when providing SCF services is achieved by the higher levels of digitalisation which is afforded by the platform. Lahkani et al. (2020) show financial chains remain largely dependent on physical signatures and printed documents, requiring the personal presence of personnel at various facilities to ensure continuity in operation. Paper operations reduce transparency and increase risk during periods of disruption, negating the ability of firms to respond quickly in changing circumstances. The involvement of SCF platforms promotes deployment of emerging technologies, such as blockchain, which are equipped to improve visibility and information sharing across SC partners (Chen et al., 2022). Consequently, this reduces levels of information asymmetry and the risks associated with providing SCF (Jia et al., 2020a). Furthermore, due to greater familiarity with SMEs applying for SCF services, platforms possess a better understanding of the operational and financial status of SMEs, reducing SCF risks (Li & Chen., 2019). Once the risks in SCF are well controlled by a platform, SCF programmes appear more acceptable to banks.

2.6.4 Summary of SCF service performance

According to the literature review, a technology-recognition-organisation framework is adopted to measure the SCF service performance considering the limited number of papers addressing the issues of SCF performance measurements. Chen et al. (2022) propose an instructive performance measurement model, which could be adopted to investigate the relationship between SCF capability and SCF service performance. However, the authors claim that the evaluation factors are summarised from the literature, and these are only tested through the quantitative method. Other methods are required to further justify the appropriateness of each factor or to further identify new constructs to supplement the measurement approaches (Chen et al., 2022). This research collected primary qualitative data collected from case companies to justify the factors in SCF practices and can find novel SCF performance measurement constructs to complement the measurement approach proposed by Chen et al. (2022).

2.7. Theory justification

This section aims to justify the theory adopted in this study. First, as the perspective of SCF capability is adopted in this study as a framework for investigation of the platform, the capability hierarchy offers a suitable framework for exploration of the superiority of, and the interrelationship among capabilities (Hine et al., 2014). Second, to explore the relationship between SCF capability and SCF service performance, an inter-organisational network theory is adopted in this study. Inter-organisational networks are determined by three network characteristics: reach, richness, and receptivity. Network characteristics are associated with specific organisational capabilities; the improvement of network characteristics can lead to better organisational performance (Gulati et al., 2011).

2.7.1 Justification of capability hierarchy

Hine et al. (2014) proposes the capability hierarchy, arguing for the existence of a three-tier hierarchy in organisational capability. First, at the top of the hierarchy is the dynamic learning capability; such capability relies on highly specialised resources and has high routine flexibility. Furthermore, it focuses on long-term strategy and knowledge exploration. Extended from the research of Hine et al. (2014), Verreynne et al. (2016) further provide a detailed measurement

scale of dynamic learning capability, including resources, patterning, competitive intent, and learning.

Second, at a middle level of the hierarchy is the dynamic functional capability. Compared with dynamic learning capability, dynamic functional capability relies on a lower degree of specialised resources; this capability requires routine that includes a certain degree of flexibility able to change with market demand fluctuations; however, rigidity is necessary to ensure reliable and repeated performance of firm activities (Hine et al., 2014). Furthermore, this capability includes a moderate focus on strategic intent, exploration, and exploitation learning (Hine et al., 2014). Mishra et al. (2013) provide a detailed division of dynamic functional capabilities, subdividing into higher-level functional capability, applied at a functional level, and lower-level functional capability, applied at the level of individual tasks.

Third, at the lowest level of the hierarchy is ordinary capability. Such capability maintains the daily operation of a company (Maijanen & Virta, 2017.). For example, the achievement of short-term success through the completion of daily tasks. Ordinary capability helps a company sustain the status quo. Hine et al. (2014), consider this capability as reliant on general resources and usually structured around a rigid routine; it has a short-term strategic focus and exploitation learning focus.

In existing literature, lower-level capabilities are shown to be developed from higher-level capabilities (Mishra et al., 2013). This relationship is observed further among SCF capabilities. Examples are evident in research by Ma et al. (2020), in which it is stated that information sharing increases collaborative relationships among partners. Therefore, this study assumes that SCF capabilities are compatible and comply with the capability hierarchy construct.

2.7.2 Justification of inter-organisational network theory

As identified in previous literature reviews that consider SCF, it is evident that a lack of theory application represents a significant research gap in current SCF research (Xu et al., 2018; Jia et al, 2020b; Dekkers et al. 2020). There are a small number of studies which conclude the adopted theories in current SCF research. Liu et al. (2015) review Chinese-written SCF research and mainstream SCM English literature, categorising theories applied in SCF research and noting mathematical testing as the most common method in theory building, to the neglect

of empirical verification. Jia et al (2020a) find theories adopted in SCF research can be categorsied as financial and organisational theories. Among adopted financial theories, the majority focus on specific financing targets and channels; the applied organisational theories mainly concentrate on inter-organisational relationships, intra-organisation issues, and the process of SCF adoption. Jia et al (2020a) found that resource-dependent and the agency theories are the most frequently employed in current research.

Dekkers et al. (2020) explain the emerging discipline of SCF using existing theoretical conceptualisations; the study reviews five theories, including transaction cost economics, agency theory, network theory, collaborative networks and social exchange theory, justifying the applicability of each theory in the context of SCF research. Dekkers et al. (2020) collate a group of practitioners working in the field of SCF, asking them to provide empirical data for theory evaluation; they finally demonstrate the feasibility of adopting agency, network, transaction cost economics, and social exchange theories as theoretical frameworks for future SCF research.

Network theory is a well-established theory widely adopted in the field of SC management. Thorelli (1986) considers network theory as describing a network as two or more organisations connected by relationships; the relationship among organisations is developed through multilateral interaction. Johanson and Mattsson (1987) consider interaction as consisting of exchange processes, including transactions, social exchange information exchange, and adaptation processes; organisations mutually affect and adapt to each other in terms of technology, logistics, and administration.

In this case, network theory contends that SCs are not simple linear systems, by which goods, information, and capital are exchanged, rather they are complex adaptive systems (Choi et al., 2001; Surana et al., 2005), in which interactions are dynamic and founded on collaboration, inter-organisational integration, and decentralisation in decision making (Dekkers & Bennett, 2010). Network theory emphasises the importance of establishing long-term and trust-based relationships with SC members; these relationships contribute to joint value creation, simplifying decision processes, and ensuring access to resources and activities in the SC (Dekkers et al., 2020).

In the context of network theory, Thorelli (1986) affirms the way power is a central concept in network analysis; power may relate to size, market position, technology capability, expertise, trust, or legitimacy. With these forms of power, organisations can obtain increasingly central positions in the network, building stronger relationships with key members in the SC, allowing organisations better access to resources and information and more control over coordination within the network.

The concept of network theory is implicitly mentioned in previous SCF research considering long-term development of relationships (More & Basu, 2013), intra-firm coordination (Randall & Farris II, 2009), information sharing (Song et al., 2015; Song et al., 2018) and administrative adaption (Wuttke et al., 2013). However, none of this writing refers to network theory, with the exception of Song et al. (2015) and Song et al. (2018).

Song et al. (2016) investigate how SMEs' credit quality is affected by their SC networks through information sharing. Song et al. (2018) compares capability of FSPs and banks in relation to the provision of SCF service to SMEs, arguing FSPs, such as various third-party platforms, can leverage advantages in SC networks to improve the capability to obtain information. Likewise, these two papers lack reference to the detailed network theory they adopted. As stated by Dekkers et al. (2020), network theory is implicitly adopted in SCF; however, these works insufficiently develop a cohesive theory.

Interestingly, even as early as Thorelli (1986), who proposes the concept of network, providing financing convenience to existing products and services is shown to result in repositioning to increase centrality in a network. Furthermore, Johanson and Mattsson (1987) consider how once members in the SC can financially adapt to each other, misfits in interorganisational relationships are reduced accordingly. These two statements form the foundation of a strong argument that supports the value of applying network theory in SCF research, as SCF represents an innovative financing method able to increase financial adaption among organisations (Dekkers et al., 2020).

Dekkers et al. (2020) offer the first paper to comprehensively review the feasibility of applying network theory in SCF research. This important work shows how that network theory has great potential as a powerful theoretical framework for SCF research, as it explains agent behaviour from a positional perspective in a network; consequently, trust and power in buyer-supplier

relationships are important. Network theory provides multiple dimensions able to evaluate the role of specific members in SCF business; based on analysis of relationships with other key members and relative position in SCF, it analyses comprehensively the position of a specific members in the SCF (Dekkers et al., 2020).

This research adopts interorganisational network theory based on its evident suitability to support exploration of how third-party SCF platforms contribute to the SCF business from a network perspective; this aspect of investigation is omitted in existing literature. SCF is an interorganisational activity heavily reliant on interaction among multiple SCF participants, including financial institutions, SCF service providers, focal companies, SMEs, and government (Hofmann, 2005). In the case of SCF service providers, it is assumed they have sufficient motivation to establish an interorganisational network, further promoting network performance in SCF business, and building a stronger relationship with key stakeholders in SCF that ensures centrality (position) in SCF business, resource flow within the network, and security and controllability of their SCF service. A well-connected network in SCF is assumed to result in improved SCF service performance provided by a platform.

Furthermore, considering measurement of improvement in interorganisational network performance, Gulati et al. (2011) offer an important contribution. The study explored fundamental mechanisms determining interorganisational network performance. Gulati et al. (2011) consider the ultimate object of establishing interorganisational networks as ensuring the integration and accessibility of network resources for partners. Attributes of network resources, such as variety, accessibility, and abundancy, can affect network performance (Gulati, 1999: Lavie, 2007). Gulati et al. (2011) propose three dimensions determining the attributes of network resources and further identify network characteristics that lead to difference in network performance, potentially affecting organisational performance (Falcone et al., 2019).

Gulati et al (2011) demonstrate how network characteristics can be described from three dimensions, reach, richness, and receptivity. Reach describes the scope of an organisation's network of connected diverse and distant partners. Richness represents the potential value of resources available to an organisation as a result of ties established with partners. Receptivity denotes the extent to which an organisation can access and channel network resources across interorganisational boundaries. Reach specifies how wide-ranging and heterogeneous organisation network connections are; richness characterises the value of combinations of

resources furnished by partners. Receptivity denotes how organisational capabilities and quality of ties with partners facilitate flow of network resources (Gulati et al., 2011; Falcone et al., 2019).

This research focuses on exploring the role of platforms in SCF, evaluated from the perspective of how platform SCF capabilities contribute to improvement of network characteristics in SCF business. Three dimensions of reach, richness and receptivity provide an appropriate measurement to evaluate platform influence on resources in the SCF network, allowing contributions to the SCF network to be assessed, leading to a more comprehensive understanding of the role of platforms in SCF.

2.8 The initial conceptual framework

After the justification of the theory to be adopted in this research, an initial conceptual framework is developed to link the constructs identified in the literature review through the capability hierarchy and inter-organisational network theory.

2.8.1 SCF capabilities and the network characteristics in SCF

Based on the literature review, three capabilities required in SCF are ascertained, including information processing capabilities, network structuring capabilities and process management capabilities. It is assumed SCF service providers with superior SCF capabilities are able to further improve reach, richness, and receptivity in their SCF network

2.8.1.1 Reach

First, reach defines the scope of an organisational network in a multi-dimensional way. Gulati et al. (2011) indicates that reach of the network is related to three dimensions; first, one level of reach indicates geographical distance among partners in a network (distance); second, reach measures the number of organisations with different attributes which are connected in a network (difference); third, reach considers diversity of the partners in a network (diversity). For example, if an organisation's network is characterised by extensive distance, the organisation tends to discover opportunities by collaborating with partners previously outside of their local network, increasing potentially available resources outside the immediate network

(Lavie & Rosenkopf, 2006). Based on a review of literature, reach in the SCF network is able to be promoted by a platform in terms of distance and diversity.

As better superior network structuring capability indicates greater interconnectivity on the part of a platform, platforms are able to jump out of the scope of serving one SC of one focal company. In this case, platforms can establish connections with multiple focal companies and their SMEs from both upstream and downstream SC (Chen & Cai, 2019). Network structuring also indicates platforms can begin collaboration with focal companies and SMEs; platforms can promote innovative blockchain-based SCF solutions, and with the adoption of blockchain technology, the credit of focal companies can be split, indicating that the credit of the focal company can flow to the upper SC (Chen et al., 2020a). In this case, the service scope of reverse factoring services can penetrate multi-tier suppliers who have been previously unable to gain financing via SCF. Furthermore, greater interconnectivity enables wider service scope of SCF services initiated by a platform. An example is offered in the form of an agriculture financing programme; the e-commerce platform relies on technology capability to build a financial targeted poverty alleviation platform and achieve accurate identification of poor households out of the service scope of traditional SCF services; consequently, network reach is promoted (Tallón-Ballesteros, 2020).

Additionally, platforms are able to attract more banks to take part in SCF programs. The platform usually holds extensive operational and transactional data on a platform, attracting banks to seek collaboration for SCF services. In this case, the platform with superior network structuring capability can attract more banks in the SCF network, improving the reach of the SCF network (Fiordelisi et al., 2014; Lahkani et al., 2020).

2.8.1.2 Richness

Secondly, richness is conceptualised as the inherent value of network resources available to an organisation; it is distinct from the matrix of connections in which it is embedded. Value depends on specific configurations and attributes of the resources available from organisational partners (Gulati et al., 2011). For example, an organisation may have an inferior network position, but ties with partners that hold rich physical or intellectual capital, making its network more valuable than that of a rival that may have superior network position but a relatively weak partner base (Koka & Prescott, 2002). The former enjoys an advantage based

on the high quality of resources it can make use of. Therefore, richness stems from inherent value of network resources available to an organisation, dependent in turn on quantity and quality of resources (Rothaermel, 2001); it encompasses the capacity to identify potential value-creation opportunities-based complementarity between internally owned and partner resources (Gulati et al., 2011).

As summarised in the literature review, in SCF business, operational information is an essential resource (Randall & Farris, 2009); it represents the liquidity status of financing enterprises (Elliot et al., 2020). Platform information processing capability enables greater access to operational information; meanwhile, platforms have a large amount of accumulated transactional information, especially in the case of some E-commerce platforms and trading platforms (Shi, et al., 2015). Supported by this depth of information, transaction authenticity is guaranteed. When banks collaborate with platforms, the platform enables the sharing of this information with banks (Lahkani et al., 2020), allowing banks to provide financing services with lower default risks (Shi et al., 2015). In this case, platforms can create value for banks in the SCF network, improving network richness.

Furthermore, platform process management creates value for SMEs and focal companies in the SCF network. Industries such as construction tend to have a low degree of digitalisation and continue to rely on paper-based processes to manage the SC business (More & Basu, 2013; Pandian, 2013). Platforms can make use of process management capability and increase digitalisation in the SC and SCF processes of focal companies as platforms can help them and their suppliers, and retailers, to develop an electronic system without investing excessive levels of capital and human resources (Martin & Hofmann, 2017). The electronic system allows better and more efficient SC management for focal companies (Jia et al., 2020a).

2.8.1.3 Receptivity

Third, receptivity is the extent to which an organisation can channel and leverage accessible network resources across inter-organizational boundaries. Receptivity denotes the extent to which an organisation is able to realise potential value of resources available by means of reach and richness of network resources. Receptivity is usually concerned with the quality relationships with partners. Gulati et al. (2011) contend that quality relationships depend on trust and commitment.

Platforms that have better information processing are able to ensure trust between banks and financing enterprises in the network (Son et al., 2017). The platform acts as a referral in the network, as it is independent from focal companies and SMEs, ensuring effective sharing of authenticated transactional and operational data (Martin & Hofmann 2017). Additionally, More and Basu (2013) identify a lack of SCF knowledge among SCF participants, and lack of general awareness among corporate professionals about SCF initiatives, as problematic to participant commitments in SCF. Platform network structuring capability increases SCF knowledge among stakeholders. When collaborating with banks and focal companies, platforms transfer professional knowledge to the participants (especially managers) supporting clarification of the benefits of adopting SCF for each party. When managers are fully aware of advantages offered by SCF, it is assumed the commitment to the partnership by managers for each side in relation to SCF is strengthened (Huang et al., 2022). Therefore, the trust and commitment among participants are improved and the receptivity of the SCF network is promoted accordingly. In conclusion, platform SCF capability is assumed to promote the SCF network in which it is located.

2.8.2 Network characteristics and SCF service performance

Gulati et al., (2011) conclude that the interaction of network characteristics eventually leads to improvement in organisational performance. Therefore, this study assumes that the improvement of SCF network characteristics promotes SCF service performance. Carnovale et al. (2019) apply network theory in studying the effect of firm network power and cohesion in financial performance in SCF; the author proposes that better network performance leads to higher efficiency and financial performance in SCF capabilities. Based on the findings of this research, this study assumes improved network characteristics leads to better financial performance for a platform, as improved network characteristics increase knowledge sharing among SCF participants. Therefore, better network characteristics promote the exchange of technical knowledge between key stakeholders, further improving overall technology application in the platform's SCF service.

As network characteristics are improved, a platform's SCF service reaches more SMEs, collaborates with more focal companies and banks in the SCF network, and increases availability of SCF services for SMEs. Enhanced receptivity indicates mutual trust and

commitment to partnership are established among partners, reducing the risk associated with the SCF, and increasing bank acceptance of the SCF service. Increased acceptance by banks and SMEs of platform SCF services represent superior recognition, indicating better SCF service performance (Chen et al., 2022).

As stated above, it is assumed the SCF platform can leverage SCF capabilities to improve network characteristics, in relation to reach, receptivity, and richness. According to inter-organisational network theory, enhanced network characteristics are essential for effective performance of actors involved (Knight, 2002); higher performance by SCF participants can reflect in the improvement of SCF service (Chen et al., 2019).

2.8.3 Conclusion and the development of the conceptual framework

After reviewing SCF literature and offering particular focus on SCF actors, capabilities, and service performance, this section summarises the findings and develops an initial conceptual framework.

Based on a comprehensive review of literature, platforms in SCF businesses are identified as important; however, they represent an under-researched topic in literature related to SC finance. The majority of current research regarding FSPs considers the role of commercial banks in SCF (Silvestro & Lustrato, 2014; Pant & Mahapatra, 2018). However alternative FSPs, especially platforms, are neglected in current research. Furthermore, it is difficult to agree as to whether commercial banks or platforms initiate more effective SCF programs. To address this question, this study adopts concepts of SCF capability and SCF service performance.

Furthermore, a different view may be observed in research by Song et al. (2018), Silvestro and Lustrato (2014), as well as Pant and Mahapatra (2018). Theory building is required in the field of SCF research, as a lack of research is one of the most common research gaps cited in literature (Gelsomino et al., 2016; Xu et al., 2017). In this study, a capability hierarchy is adopted and justified as a suitable framework in which to investigate SCF capability. Furthermore, an inter-organizational network is offered as an appropriate theoretical lens through which to build a link between SCF capability and service performance.

Based on the argument above, and as shown in Figure 2-5, research here proposes a conceptual model that supports exploration of the research questions which form the basis of this study. In the framework, it is assumed the SCF platform is able to make use of SCF capability and improve SCF network characteristics, in relation to reach, richness and receptivity, further improving SCF service performance.

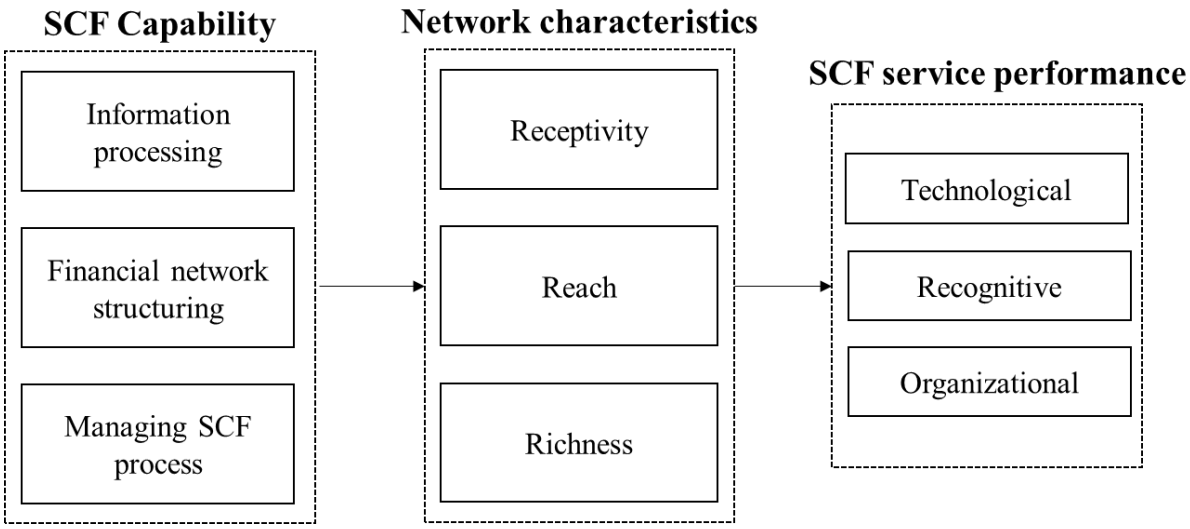

Figure 2-2. Relationship between SCF capabilities and SCF service performance-An initial conceptual framework

Chapter 3. Methodology

This chapter illustrates the research method employed in this research. The chapter is divided into several sub-sections: Section 3.1 includes a discussion of the research philosophy; Section 3.2 introduces and justifies the case study method; Section 3.3 outlines how the case companies were selected; the data collection process is presented in Section 3.4; Section 3.5 describes the process of coding and data analysis; and the criteria of judging the quality of case studies is illustrated in Section 3.6.

3.1 Research philosophy

Saunders et al. (2015) highlight that research methods chosen by researchers will be influenced by their personal beliefs and priorities. It is believed that philosophical issues are the core of research design concepts and have a significant impact on the quality of management research (Easterby-Smith et al., 2012). Therefore, is necessary to communicate these assumptions before engaging in any debate about methodology and methods (Morgan & Smircich, 1980).

3.1.1 The author's philosophical position

The existing philosophical perspectives are various, from the proposal of objectivist and subjectivist perspectives dominating as two major views on research (Morgan & Smircich, 1980) to the proposal of four research paradigms in qualitative research including positivism, post-positivism, critical theory, and constructivism (Guba & Lincoln, 1994). This study adheres to the classification of philosophical perspectives in business and management disciplines proposed by Saunders et al (2015). According to Saunders et al. (2015), the perspectives include positivism, critical realism, interpretivism, postmodernism, and pragmatism.

The research philosophy adopted by this study is based on pragmatism. Pragmatism seeks solutions that improve practices, while avoiding conflict around knowledge and reality, by focusing on the best ways to solve problems (Saunders et al., 2015). The researcher believes that academic research should balance the contribution to theory and managerial practice.

Academic researchers should conclude their understandings from real practice and combine these understandings with theories in existence in order to provide a better guidance for the practice. The researcher's philosophical preference is influenced by his educational experience and family background. The researcher selected "business English" as the undergraduate major and "international business" as his Masters. The selection of subjects reflects the researcher's philosophy and the belief that theoretical management knowledge should be eventually applied in real practice, contributing to managerial practice. Furthermore, most of the researcher's family members engage in management work, which highly values final performance measurement. Therefore, the researcher is being taught to be practical since childhood.

This idea is also aligned with the concept of pragmatism. As stated by Saunders et al. (2015), a pragmatist's goal of research is to provide practical solutions for future practice. During the researcher's master's degree, the researcher paid attention to China's SCF practices and the research questions are initially derived from the researcher's practical observations of China's SCF practices. The questions are finally determined as: *"RQ1. How do SCF capabilities affect SCF performance?* And *RQ2. What is the role of SCF network characteristics in this relation?"* The answer to these two questions could improve the SCF theory development; moreover, it may provide an insight into the SCF provider's SCF practices and further contributes to the promotion of SCF in China.

3.1.2 Approach to theory building

Theory application and theory development approaches are an essential aspect of research. As Ketokivi and Mantere (2010) note, deductive, inductive, and abductive are the three reasoning types of theory development. The authors indicate that deductive reasoning starts with a general statement or hypothesis, and then tests the possibility of drawing a specific logical conclusion. Inductive reasoning is the opposite of deductive reasoning; it is an inference process from knowing and studying individual things to summarising and generalising general rules. Finally, abductive reasoning usually refers to comparing hypothetical theory with experience to prove the correctness of the theory.

Saunders et al. (2015) further clarifies the concept of deductive, inductive, and abductive approaches. As per the authors, the deductive approach describes that research starts with theory, developed from reviewing literature, and the research strategy aims at testifying the theory. The inductive approach describes that research starts from data collection to explore a phenomenon and build a theory. Finally, the abductive approach describes that research starts from data collection to explore a phenomenon, identify themes, and explain patterns, to generate a new or modify an existing theory; the research then subsequently tests through additional data collection.

Based on the above consideration, this research combines the inductive and deductive approaches and adopted abductive approaches for theory building. According to Lynham (2002), it is a combined strategy of deducting an analytical framework from theory and induct images from data; the retroduction of analytical framework and images finally promote the building of a theory. This study starts from a systematic review of previous literature, which aims to deductively summarise theories during comprehensive reading. Meanwhile, theory inductively develops through data collection and data analysis by the fact that SCF capabilities, SCF network, and SCF service performance measurements are underdeveloped concepts. Miles et al. (2013) also support the retroductive research strategy, which involves the cyclical and iterative progression of logical reasoning, moving back and forth between the empirical data, literature, and theoretical framework through constant theorising with the aim of developing more refined analytic categories.

3.2 Case study method

According to Yin (2009), the case study is empirical. As a research method, the characteristic of a case study is to explore the current phenomenon in the real situation, and there is no obvious boundary between this phenomenon and the real situation. The case study can be applied to solve the open-ended questions of “how” or “why” (Eisenhardt, 1989). The case study method can go deep into the case situation, extensively excavate the details and stories from the case, and thus provide adequate grounds for theory construction and development (Yin, 2009). Voss et al. (2002) also stresses the significant role of the case study method in new theory development within operation management discipline.

Meredith (1998) claimed that the strengths of using the case study method are threefold. First, it provides a possibility to study the phenomenon in its natural setting with meaningful and relevant theory generated from the understandings acquired from actual practice. Second, the case study method enables researchers to answer what, why, and how questions with a relatively full understanding of the nature and complexity of the complete phenomenon. Third, the case study is usually applied in early and exploratory investigations, where the variables are still unknown, and the phenomenon is not at all understood. This argument is agreed by Ellram (1996), who argues that the case study method can provide depth and insight into the little-known phenomenon.

According to the discussion in Chapter 2, although the increasing number of third-party SCF platforms participate in the SCF market in practice, among the SCF research regarding SCF service providers, the role of these third-party platforms has been disregarded by most researchers. Therefore, the understanding is deficient of what role the platform assumes in SCF, and how the platform can deploy its capabilities to facilitate the service performance. Furthermore, the research on SCF capability, network and service performance is under-developed. Therefore, it is worth conducting research to explore the relationship between SCF capabilities and service performance from the perspective of the SCF network.

The case study method is considered as an appropriate research method for this study, as case study can solve the how and why questions when the theory is relatively new. According to the literature review, the research on third-party SCF providers is immature and the concepts of SCF capability, network, and service performance are rarely mentioned in previous literature. Moreover, through observing the platform's SCF practices, one can develop and extend the understanding of present theories, including capability hierarch and inter-organisational network theory.

Stuart et al. (2002) highlight several issues that might occur when operation management studies apply and criticised the case study method as a lack of rigor within the process. However, according to Barratt et al. (2011), an explicit discussion on justification and reasoning for case study research could be methodologically rigorous, as well as adequate

framing of the research, specification of the unit of analysis, sampling logic, data source triangulation, and within-case and cross-case analysis and presentation of findings. According to Voss et al. (2002), the depth of observation is associated with the number of cases, the lower the case number, the deeper the observation. On the contrary, more cases can enhance external validity and protect against observer bias. Therefore, to ensure the applicability and robustness of the findings, this research employed the multiple case study method to explore the how the platform's SCF capability can affect service performance through the lens of the SCF network.

3.3 Case Selection

Third-party SCF platforms in China are selected for this research. The Western SCF market has developed since the Mid-early 19th century, with nearly 20 years of development, the SCF market is mature and standardised. However, the Chinese SCF business emerged in the 1970s and the term SCF was officially proposed at the beginning of the 21st century (Liu et al., 2015). However, the SCF market in China has experienced rapid development in recent decades. The mode of SCF in China has transformed from the bank-centric mode of SCF 1.0 to the focal company-centric mode of SCF 2.0 and to the platform-centric mode of SCF 3.0. Many third-party platforms were established in the last decade and gradually became major participants in the Chinese SCF market. Currently, SCF platform is experiencing a rapid development in China.

Most Chinese literature focuses on the role of banks and focal companies in SCF. Recent SCF research focusing on the Chinese SCF market calls for more attention to the role of third-party platforms in business in China (Song et al., 2018). As such, this research targeted third-party SCF platforms in China, with a well-developed network that covers multiple SCs in one or more industries and operates a successful programme that makes contributions to the Chinese SCF development, either within product innovation or service mode innovation. Thus, the unit analysis of this research is an SCF programme initiated by a third-party platform, serving at least ten SCs.

The case selection abides by the following process. The first step is to determine a sample pool. Research cover letters (Appendix A) were sent to multiple platforms to explain the research purpose and objectives, and to identify their inclination to participate in this Ph.D. study. The pilot interviews mainly aim at interviewing operational staff to establish the platform's appropriacy of participation in the project, and whether the platform was actively building its SCF network and had innovative contributions to the SCF development in China. Once the platform was considered suitable for participants in the research, formal interviews were conducted with key personnel of the platform's SCF programme.

Thanks to bank A's proactive partnership with multiple third-party platforms to engage in the SCF services, and its great support to this Ph.D. project, bank A's third-party platform partners were chosen as the sample pool. Bank A is one of the banks in China that actively explores SCF innovation and development and has widely collaborated with multiple third-party SCF platforms to jointly explore the SCF market in China.

The selection of cases relies on both purposive sampling. Purposive sampling strategies are designed to enhance understandings of selected individuals or groups' experiences or for developing theories and concepts (Devers & Frankel, 2000). During the selection of the case platforms, this research employed the following criteria:

1. The platform initiated an SCF programme that contributes to the SCF development, in terms of product innovation or business model innovation.
2. The platform initiated an SCF programme with a well-established SCF network.
3. The complexity of the SCF network should at least cover ten SCs.

The first criterion is adopted because some of the platforms still act as supportive actors in the SCF programme. Platforms as the initiator of the SCF programme with innovative products and business model tend to have a better understanding of their SCF capabilities and SCF service performance measurements. The section criterion is set because the previous mode of SCF in China lacks the concept of an SCF network. Valuable information can only be collected from the platform to evaluate the role of network characteristics in the relationship between

SCF capability and performance if the platform has a well-established SCF network. The third criterion is set because the complexity of the network requires the platform to pay more attention to the management of the network and the effect of the network on the organisational performance would be more significant (Gulati et al., 2011), which can provide more convictive information to justify the function of network characteristics to the relationship between SCF capability and performance.

With the adoption of the abovementioned criteria, at first, six companies in total were approached for data collection; two of them were excluded after the pilot interviews with their operational staff. It is found that these two platforms are still dominated by a specific focal company and their SCF programme mainly serves the companies within the focal company's SC system. Therefore, the fourth selection criterion is set as:

4. The platform must be an independent third-party platform

The fourth criterion is set simply because this research study third-party platform's SCF programme. If the platform relies heavily on the focal company or banks, it will make no contribution to the answer to the research questions.

Four companies were included in the case study. The selected four platforms' SCF service scope covers both the upstream and downstream supply chain. Two of the platforms are state-owned and two of them are private, which covers the major company types in China. Platform A is an SCF platform that serves the industrial raw material industries, with an SCF network that covers hundreds of SCs in Jiangsu, Zhejiang, and Shanghai. It innovatively implements a credit selling mode of SCF in the downstream SC, mainly serving the petrochemical and plastic chemical industry. Platform B is an integrated SCM service platform providing services to SCs in various industries. The platform derives its SCF business based on its traditional SCM services and has one of the widest SC service networks in China. Platform C is an SCF platform that serves the upstream construction SC. It is SCF network covers the upstream construction SC of private construction companies in southeast China. It is one of the first platforms that provides online SCF service in the construction industry. Platform D is an online SCF platform, that innovatively creates an SCF product that can be used for multi-tier suppliers, which is the

prototype of many platforms' upstream SCF products. Its SCF network covers hundreds of state-owned focal companies and tens of thousands of multi-tier suppliers.

After the case platforms were selected, the interviewer (researcher) asked platforms to recommend suitable collaborated SCF partners to take part in the interview. Platform A manage to help researcher arrange face-to-face meetings with its suppliers and collaborated focal companies, however, the managers of suppliers and focal companies of the Platform A refuse to take part in the research. Platform B assisted the researcher to arrange meetings with its SCF partners (collaborative platform, a focal company, and a bank). Platforms C and D recommended their collaborated focal companies, suppliers, and banks to participate in the research. Although, suppliers and focal companies in platform A's network are missing in the interview process, it does not compromise the data collection as the participation of Bank A, who are the essential stakeholders of these Platform's SCF programme, provided interviewers with sufficient supplementary information to complete the data collection process. The basic information of the four selected platforms is listed below in Table 3-1.

Table 3-1. Selected SCF platforms

Company	Industry	Scope of SCF service	Ownership	Years of SCF operation
Platform A	Industrial raw material	Whole SC	Private	5
Platform B	Multiple	Whole SC	State-owned	12
Platform C	Construction	Upstream SC	Private	6
Platform D	Multiple	Upstream SC	State-owned	7

In this case, data collection was implemented within four platforms and some of their collaborated focal companies, SMEs, and banks. The number of selected cases was complied with the necessary case number proposed by Eisenhardt (1989), that four to ten cases were required for a case study. The number of cases within this scope can ensure the theory generalisation while avoiding difficulties in coping with the complexity and volume of data. The researcher submitted the application for ethical approval on the 4th of June 2020, and the ethics of research was approved by relevant committee on the 11th of January 2021.

3.4 Data collection

In order to collect primary data, this research adopted semi-structured interview method. It is believed that interviews are an efficient method to obtain abundant empirical data (Eisenhardt & Graebner, 2007). Multiple interviewees were interviewed with SCF operation knowledge from multiple perspective to minimise the respondent's bias. Chairman, chief executive officers, middle managers, operational staff of the platform were interviewed respectively, and platform's SCF partners such as suppliers, banks, and focal companies. Multiple sources of data enable this research to triangulate the collected information regarding SCF from different levels of personnel in different companies that participated in SCF.

An interview protocol was prepared in advance to guide the interviews (see Appendix B). According to Yin (2008), the reliability of case study research can be improved by a case study protocol. In total, over 50 formal interviews were conducted for the four platforms, and 42 qualified interviews were eventually adopted with a focus on the four SCF programmes. The remaining eight interviews were removed because of the information collected from the interviews has limited contributions to answering the research questions, mainly because of the information quality collected from the interview is poor, or the collected information is highly repetitive of the previous interviews. The selection of interviewees follows the criteria that (1) the interviewees must work in the case platform at least 4 years, and (2) the interviewees must directly participate in the operation or the management of the platform's SCF programme. Table 3-2 presents the summary of the interview list.

Table 3-2. Interviews list

No.	Company name	Position	Duration of interview (min)	Date	Round of interview
1	Platform A	Vice President 1	60	27/06/20	1
2	Platform A	Vice President 2	90	14/09/20	1
3	Platform A	Vice President 1	60	14/09/20	1
4	Platform A	Marketing Manager 1	70	19/04/21	2
5	Platform A	Chairman 1	70	23/04/21	2
6	Platform A	Vice President 3	50	26/04/21	2
7	Platform B	Financial Manager 1	60	27/07/20	1
8	Platform B	Financial Manager 1	60	07/09/20	1
9	Platform B	Business Manager 1	90	07/09/20	1

10	Platform B	Operation Manager 1	60	08/05/21	2
11	Platform B	Business Manager 2	80	10/05/21	2
12	Platform B	Business Manager 1	120	11/05/21	2
13	Company B	General Manager of Finance 1	110	03/07/20	1
14	Platform E	Risk & Control Manager 1	100	20/07/20	1
15	Platform C	Marketing Manager 2	30	28/06/20	1
16	Platform C	Vice President of Product 1	50	29/06/20	1
17	Platform C	Vice President of Executive 1	60	29/06/20	1
18	Platform C	Vice President 4	30	30/06/20	1
19	Platform C	Chairman 2	60	30/06/20	1
20	Platform C	Vice President 5	120	24/04/21	2
21	Platform C	Vice President 5	120	24/04/21	2
22	Platform C	Chairman 2	40	25/04/21	2
23	Platform C	Vice President of Product 1	90	25/04/21	2
24	Platform C	Vice President of Executive 1	60	25/04/21	2
25	Supplier C	President 1	80	02/07/21	2
26	Company C	Financial Manager 2	50	02/07/21	2
27	Platform D	Regional General Manager 1	100	14/09/20	1
28	Platform D	Project Manager 1	100	14/09/20	1
29	Platform D	Chief Technology Officer 1	40	22/09/20	1
30	Platform D	Regional General Manager 2	60	21/04/21	2
31	Platform D	Regional General Manager 1	60	27/04/21	2
32	Platform D	Project Manager 1	70	27/04/21	2
33	Platform D	Chief Product Officer 1	90	19/05/21	2
34	Platform D	Senior Vice President 1	80	10/06/21	2
35	Platform D	Regional General Manager 3	60	22/07/21	2
36	Supplier D	Vice General Manager 1	100	03/06/21	2
37	Company D	General manager of finance 1	110	03/06/21	2
38	Bank A	President 2	60	22/06/20	1
39	Bank A	Customer Manager 1	30	01/06/21	2
40	Bank A	Customer Manager 2	90	01/06/21	2
41	Bank A	President 2	90	24/06/21	2
42	Bank B	Manager of the Internet Banking Department 1	40	17/07/20	1
Aggregated time of interview: 3050					

Two rounds of data collection were conducted by the researcher in the process of data collection. The first round of data collection focused on interviewing the senior managers and

operational staff within each platform, and most of the interviews took place between June and September 2020. This round of data collection mainly focuses their general understanding of SCF and their perceptions towards the SCF capability and SCF service performance. The second round of data collection focused on interviewing the senior managers and operational staff within each platform and its collaborated companies and banks, and most of the interviews were implemented between April and July 2021. This round of data collection mainly focuses on investigating their opinions towards the SCF network. In the second, round if the interviewers participated in the first-round interview will only be asked the question related to SCF networks.

In total, 42 interviews were found relevant to the four SCF programme, 6 on Platform A, 8 on Platform B, 12 on Platform C, and 11 on Platform D. 4 interviews were conducted with the platforms' collaborated banks. All the interviews were conducted in Chinese and most were recorded. Only two of the interviewees did not agree to be recorded, therefore, detailed notes were taken during these two interviews to ensure that valuable information was collected. 39 face-to-face interviews were conducted, and owing to the Covid-19 issues, the remaining 4 were conducted online (Via Tencent Meeting or WeChat). When the researcher perceives that no additional information was collected in the new interviews to provide new insight to the research question, the interviews stopped, as it had reached a state of theoretical saturation (Eisenhardt, 1989). Apart from the primary data, interviewees also provided research with abundant archival data including news coverage of the platform or the platform's SCF programme, and internal company documents including project reports and road-show reports. Multiple sources of data supplementarily explained the background of each platform's SCF programme and complimented the data collected from the formal interviews.

3.5 Coding and Case Analysis

Once the primary data has been collected, data coding was conducted as the next step. The case analysis in this research was conducted with a sequence of within-case analysis and cross-case analysis. Senior managers of each platform would receive the within-case analysis results and provide comment for the results, to strengthen the validity of the analysis results and obtain ethical approval. Then, the research has iteratively discussed the cross-case analysis results

with his supervisors, who did not participate in the data collection process, thus assisting researchers to generate objective view.

3.5.1 Coding

Data coding was adopted to control the researcher's bias and conducted via an iterative process. Open coding was applied within the process. Attention was paid to the constructs identified in the literature review of SCF capability, network characteristics, and service performance. For example, SCF capabilities were coded into information processing, financial network structuring, managing relationships with multiple stakeholders, and managing SCF processes. The inter-organisational network was coded in terms of reach, richness, and receptivity to measure how the platform's SCF capability could promote the SCF network characteristics. The SCF service performance was coded based on the acceptance of SCF stakeholders to the platform's service, including acceptance to SMEs, focal companies, and to banks. Table 3-3 shows the coding schemes applied to code SCF capability, inter-organisational network in SCF, and service performance.

Table 3-3. The coding scheme for data analysis

Aggregate construct	Third order construct	Second order construct	First order concepts and definitions	References
SCF capabilities	Dynamic learning capability:	Information processing	• *Information acquisition: platform's capability in collecting information related to the SCF business.* • *Information analysis: information analysis refers to the platform's capability in analysing and interpreting the acquired information.* • *Information sharing: information sharing refers to the platform's capability in exchanging and transferring information among related SCF members in a secure and effective way.*	Song et al., (2018); Yu et al. (2021); Zhu et al. (2016); Guerar et al. (2020); Zhang et al. (2021)
	Higher-level functional capability	Financial network structuring	• *Interconnectivity: the platform's basic SCF business logic requires them to be able to connect with multiple banks and companies to start their SCF business.*	Lu et al. (2020); More and Basu (2013); Ma et al. (2020)
		Managing relations with multiple SCF participants	• *Relationship with banks: the platform's capability in managing relationships with banks indicates how they can reduce information asymmetry and the risks and the cost of information acquisition for banks in doing SCF to encourage banks to participate in the platforms' SCF service.* • *Relationship with focal company: platforms' capability in managing relationships with the focal company indicates how the platforms can provide more value-added SC service to deepen focal company's participation in the SCF service to obtain more SC information from the focal company.* • *Relationship with SMEs: the platforms' capabilities in managing relationships with SMEs indicate how they can provide financing services and SC services to deal with SMEs requirements of finance.* • *Relationship with government: the platform needs to well manage the relationship with government to obtain policy and financial support to develop the SCF business.*	Lu et al. (2020); More and Basu (2013); Wen et al. (2018); Beka Be Nguema et al. (2021); Silvestro and Lustrato, (2014);Tchamyou (2019); Sang, (2021); De Goeij et al. (2016); Kim and Rhee, (2012); Hofmann, 2005 Reza-Gharehbagh et al., 2021
	Lower-level functional capabilities	Managing SCF processes	• *SCF Service specialization: platforms tend to establish a set of process to standardize their SCF service. Combining with their advantages in information processing, platforms can further achieve their SCF service quality and efficiency.*	Chen et al. (2019); Song et al. (2021)
			• *Providing integrated SC service: some platforms are engaged in the SC transactions, especially when providing SCF services in the downstream SC. They can provide integration SC service to the SMEs,*	Song et al. (2021).

Inter-organisational network	Network mechanisms:	Reach	• *Finding partners in distance: in this paper, the concept of distance is twofold. First it refers to geographical distance, which indicates how platforms can find non-local companies and provide SCF services for them. Second, it refers to the distance in the SC, it denotes how platforms' SCF services can cover the SMEs in the multi-tier SC.*	Gulati et al. (2011); Coded from interview data
			• *Finding partners in diversity: diversity describes the types suitable partners that are involved in the platforms' SCF network.*	Song et al. (2018)
		Richness	• *Capturing value-creation opportunities: platforms need to have capacity to integrate their own resources into network partners resources to create synergies and mutual benefits among each party in SCF (Song et al., 2021).*	Song et al. (2021)
		Receptivity	• *Establishing mutual trust: the successful implementation of SCF relies on the mutual trust among parties. It is enhanced by the degree of information sharing among SCF participants*	Wandfluh et al. (2016); Gulati et al. (1999)
			• *Commitment to the partnership: it refers to the extent to which the leaders in each party can recognise the significance of the partnership and are willing to spend time and capital to maintain the relationship.*	Gulati et al. (2011); More and Basu (2013)
			• *Multiplexity: it indicates the extent to which the partnership is dependent on interaction between multiple individuals and units in each organisation.*	Gulati et al. (2011)
SCF performance	Acceptance-based measurement	Acceptance of SMEs	• *Availability: platforms SCF service admission criteria are lower and more flexible than the traditional financing method provided by banks.*	Lam et al. (2019)
			• *Affordability: without the platform's SCF service, SMEs tend to use financing resources from informal channels (Allen et al., 2019) or high interest loans from banks (Fabbri & Menichin, 2010).*	llen et al. (2019) Fabbri and Menichin (2010)
		Acceptance of banks	• *Risk controllability: platforms can leverage the advantages of engagement in SC activities and technology implementation to ensure the authentication of the collected information, and supervise the target financing SC in an effective way.*	Wen et al. (2019); Lahkani et al. (2020); Chen and Cai (2011)
		Acceptance of focal companies	• SC effectiveness: Platforms can integrate the network resources and further help focal companies reduce SC costs and improve SC efficiency.	Coded from interview data

3.5.2 Case analysis

This research adopts both within-case analysis and cross-case analysis. According to Eisenhardt (1989), the within-case analysis aims at objectively summarising the key data and structure of each case, leading to a better understanding of research questions in a single context, before the comparative analysis and summarising of the different cases. In this research, Chapters 4 to 7 are the within-case analyses, which are presented in a structured way. Each within-case analysis starts with the introduction of the platform's basic information and its SCF practices, and then its capabilities, network development, and SCF service performance measurements are provided, followed by a final summary.

Cross-case analysis is adopted to explore the similarity and differences of patterns across cases in-depth, seeking to increase the internal validity of the findings (Ragin 1987). As per Pagell and Wu (2009), categorisation and pattern matching are the fundamental approaches applied in cross-case analysis. This process is an iterative process, which requires repeated iterative analysis between different type of case data and literature. In the following Table 3-4, the case analysis techniques proposed by Ghauri (2004) are presented, and this research follows these techniques in cross-case analysis.

Table 3-4. Case study analysis techniques (Source: Ghauri, 2004)

Techniques for case analysis	Explanation	Representation
Chronologies	Narratives of the events that took place organised by date	Case diary and field notes
Coding	Sorting data according to concepts and themes	Coding list
Clustering	Categorising cases according to common characteristics (size, the best and worst)	Cluster contextual variables
Matrices	Explaining the interrelationship between identified factors	This has been employed in within and cross case analysis
Pattern matching	Comparison between a predicted and an empirically based pattern	This has been adopted in within and cross case analysis

Eisenhardt (1989) stressed that in a case study, the researcher should compare the case study finding with the literature, to find out the similarity and dissimilarity among them and explain why. The conclusion chapter comprehensively compares the findings of this research with existing literature.

3.6 Criteria for judging qualitative research design

In order to examine the quality of this study, as shown in Table 3-5, four validity tests (Yin 2008) are adopted. According to Yin (2008), four tests have been widely used for the establishment of the empirical social research quality. Construct validity refers to the formation of a set of correct and operable measurements for the concept being studies. Internal validity refers to establishing a casual relationships, providing that a specific condition will cause further specific results. External validity refers to whether the results of the case study can be generalised and applied to other case studies. Finally, reliability refers to that of later researchers, who conducted the same case studies again according to the steps described by previous researchers; they will get the same results and reach the same conclusions.

Table 3-5. Case study tactics for four designs (Source: Yin, 2008)

Tests	Application in this study
Construct validity	• Data is collected from semi-structured and secondary data to ensure multiple sources of evidence • A chain of evidence is formed through multiple informants in the third-party platform, as well as informants in focal companies, suppliers, and collaborated banks. • Some informants have reviewed the draft results and left comments.
Internal validity	• Structured data coding and analysis • Development of propositions based on a chain of evidence

External validity	• Purposive sampling approach • Descriptive data • Site visits to the platform's collaborated focal companies • Participation in meetings between the platform and its stakeholders (banks/insurance company/focal company)
Reliability	• Case study protocol is employed for the guidance of interview and case analysis. • Case study database is developed; each data based includes interview recordings, field notes, enterprise internal reports, and archival data. • Iterative discussion with senior academics who are not involved in the interview.

Chapter 4. Platform A: Providing innovative credit sale mode of SCF serving the downstream supply chain

This chapter introduces Platform A's SCF service in industrial raw material SC through its innovative credit sales mode. It begins with a background introduction of Platform A and its SCF business model. Then, the Platform A's SCF capability, and how the platform develops its SCF network is discussed respectively. The last session concludes the platform's SCF service performance measurements are concluded.

4.1 Introduction

In this session, the Platform A's basic information is first provided and how the platform developed and integrated the SCF service into their SC service is introduced. Second, the basic SCF business model of the Platform A is concluded.

4.1.1 Company background

Platform A is China's leading industrial e-commerce platform specialising in providing an Internet online trading service platform related to the industrial raw materials (e.g., crude oil, Polypropylene). This platform deconstructs and refines the key links of the offline trade mode of industrial raw material, combines the characteristics of the Internet platform and reorganises the business mode on the basis of considering user experience. The platform completes a brand-new and complete business mode and operation closed loop of industrial raw material trade consisting of eight steps: inquiry pending order, bargaining matching, negotiation and signing, deposit payment, capital freezing, goods delivery, and payment settlement. It has promoted the SC digitisation and formalised the industrial raw material SC, especially for petrochemical and plastic chemical products. The platform has taken full advantage of its platform and built links with multiple stakeholders in SCF, including focal enterprise, financial institutions, SMEs in both upstream and downstream SC and logistics service providers and governments.

Platform A was officially launched in May 2015 and signed a contract with PetroChina in July of the same year to become the developer and service provider of PetroChina's e-commerce platform. In December 2016, its GMV[1] exceeded 90 billion, making it one of the top 100 B2B e-commerce companies in China. In November 2017, the platform invested in the establishment of a professional SC management company and formally launched the SC platform business. In August 2018, the platform entered the field of the plastic chemical industry and soon became the primary business entity in China Plastics City (Yuyao, Zhejiang Province). In December 2020, the GMV exceeded 60 billion RMB (926 million USD) and the SC service amount exceeded 8.5 billion (1.31 billion USD) RMB.

4.1.2 SCF business model

The platform holds the belief that SCM is the foundation of SCF, and therefore, SCF service, especially in downstream, cannot separate from SCM service. Through establishing and completing the SCM platform, the platform has merged financing service into their traditional SC service. The revenues brought by SCF have strongly supported the platform development in the fiercely competitive B2B market. Concurrently, the platform have provided a reliable and stable channels base for various financial institutions to implement SCF services to platform uses. Meanwhile, the development of SCF service strengthened the service stickiness of the platform to its uses, enhanced and completed the function of the platform, and improved the efficiency of the platform. In this case, the platform mainly provided two major types of SCF service (As shown in Figure 4-1).

[1] Gross merchandise value (GMV) describes the sum of merchandise sold over a specific period through an e-commerce platform. It is a representative index to measure the growth of the business of an e-commerce platform

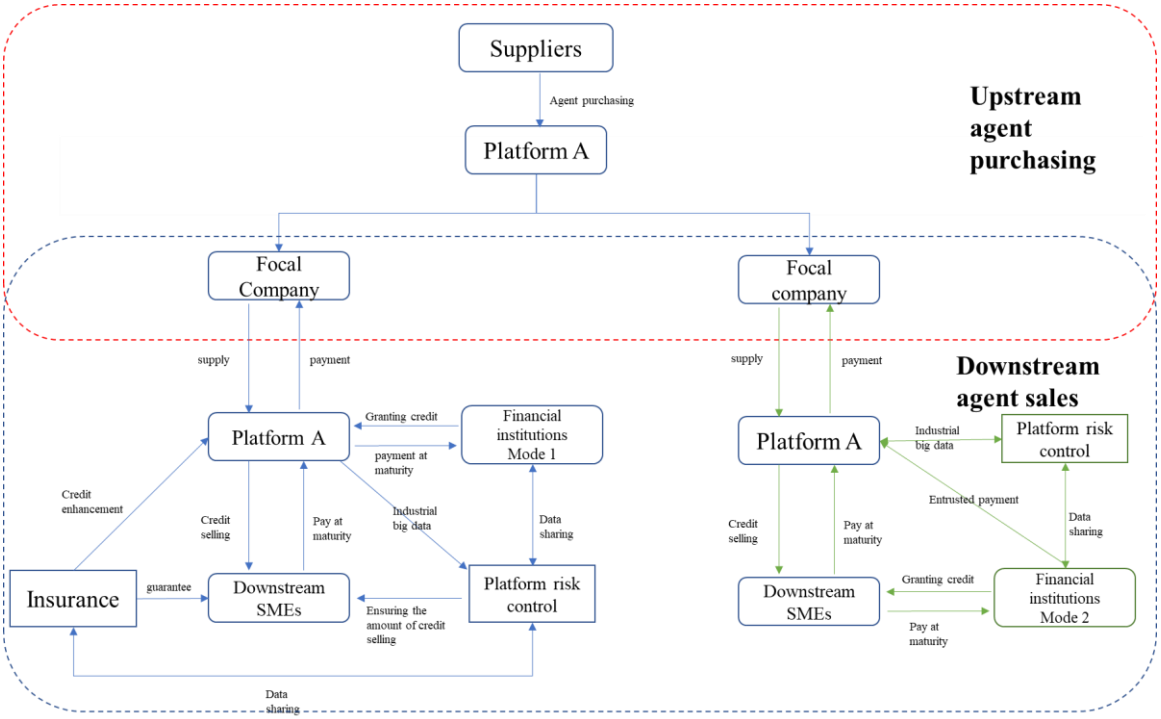

Figure 4-1. Platform A's SCF business mode

4.1.2.1 Upstream consignment purchasing

The first SCF service (as framed in red dashed square in Figure 4-1.) is provided at the beginning of the platform's SCF initiation. This service is targeted at serving focal enterprises, including some trade-oriented enterprises (mainly in petrochemical industry), and providing consignment purchase and sales of raw materials. This service mainly solves the asymmetric information between buyers and sellers and deals with focal enterprise's transactions habits that do not comply with market norms. Partially, this service can also satisfy focal requirement for capitals for both focal enterprise and its suppliers.

During the traditional purchasing process, the focal enterprise usually received raw materials from suppliers, and owing to the focal enterprise's advantages in the SC, the focal enterprise would negotiate a payment period with suppliers, which means suppliers cannot receive the payment for goods once they finish the supply; the liquidity of SMEs would

thus be affected. Therefore, these suppliers have pursuit in shortening focal enterprise's payment period.

In this case, the platform is involved in the upstream purchasing process. The platform will first sign a contract with focal enterprise to reach an agreement of consignment purchasing. Then, the platform will purchase raw materials from suppliers and finish the payment as soon as the focal enterprise checks and approves for the acceptance of the goods. Subsequently, the platform will sell the goods to focal enterprises and require focal enterprises to settle the payments for goods within a certain period. In this service mode, the platform must choose well-qualified focal enterprise to provide the consignment purchase and offer advance payment. This is because the SCF service involved in the consignment purchasing is based on focal enterprise's obligation to pay; consequently, the credit conditions of the focal enterprise are essential for the platform.

The consignment purchasing service is the platform's first step to transit from a trade platform to a SCM platform. The platform can directly get involved in the SC trade and make it a platform that specialises in the industrial raw material SC. Thus, the platform extends its service scope to the downstream SC and quickly develops this service mode as its core business.

4.1.2.2 Downstream credit sales

The second SCF service (as framed in blue square in Figure 4-1.) is targeted at serving production and processing SMEs (mainly in plastic industry) and providing raw material distribution and credit sales service for them. This service mainly satisfies the requirement of the shortening the SC of raw material procurement for the majority of SMEs and meeting the short-term capital demand of both the procurement side (focal enterprise) and demand side (downstream SMEs).

Specifically, when the downstream production and processing SMEs purchase material from a focal enterprise, in the industrial raw material industry, the focal enterprise would require the SMEs to fully finish the payments for goods before delivery. In this situation, due to their weak position in the SC, these SMEs are under great liquidity pressure. They must provide trade credit for their downstream to guarantee their market share, whilst they cannot get trade credit from their upstream large suppliers.

In the downstream SCF service, the platform is firstly responsible for purchasing for various downstream SMEs from focal enterprises and trading companies. SMEs must first place their order on the platform website: the platform will then fulfil SMEs' orders and purchase from focal enterprises and finish the payment directly. Next, based on the platform's risk evaluation process and previous transaction information with a specific SME, the platform will determine the amount and payment period of trade credit that the SME can enjoy. Usually at first, the amount of trade credit will not exceed 30% of the SME's total amount of purchase. Once the amount and payment period of trade credit is confirmed in this order, the platform will contact the collaborated third-party logistics providers and deliver the goods to SMEs' factories. On average, in the plastic industry, the amount of credit is 500 thousand, and the payment period of the credit usually within 20 days.

For the credit sales to the companies in the downstream SC, the platform derives two SCF models. In the different modes of SCF, the participants are different, and the role of the platform and financial institutions varies accordingly.

In the SCF mode A (as shown in the lower left in Figure 4-1), the bank directly evaluates and reviews the credit of the platform. The platform provides banks with the relevant transaction information and enterprise operational information of the enterprise who accept trade credit service. Based on the evaluation financial status of the platform and the information regarding the SC business provided by the platform, the banks will then

provide the platform with a business line of credit. Therefore, the platform can leverage its own capital and capital provided by banks to purchase raw material and then provide trade credit service for the platform customers. The enterprise that receives the trade credit service shall fulfil the payment to the platform for the goods sold on credit within the agreed payment period.

In the SCF mode A, the platform innovatively chooses to cooperate with insurance companies. The platform provides insurance companies with the trading information, enterprise information and the determined amount of trade credit to enterprises. Then, based on the information provided by the bank and insurance company's risk evaluation system, the insurance company can adjust the amount of provided credit to each enterprise. Once the amount of trade credit to each enterprise is agreed by both platform and the insurance company, the insurance company will provide insurance for the platform's accounts receivable in each trade credit business. If the accounts receivable covered by insurance have bad debts, the insurance company will pay part of the losses.

At present, the platform cooperates with People's Insurance Company of China, which provides short-term credit insurance of RMB 2 billion, and will cover 80% of the losses owing to the bad debt in the SC credit sales business. Additionally, the platform cooperates with Pacific Insurance, which provides short-term credit insurance with a total amount of 800 million yuan: 90% of losses owing to the bad debt in the SC credit sales business can be covered. However, up until December 2020, the platform had not claimed any indemnity from the insurance company.

As for the SCF mode B (loan facilitation, as show in the lower right in Figure 4-1), the bank no longer provides credit to the platform and the platform acts as an assistant role in banks providing finance to the enterprises in the downstream SC. In mode B, the platform recommends enterprise with financing needs and to share the transactional information and operational information of this enterprise with banks, and accordingly provide the banks

with recommending the amount of credit for the enterprise as a reference. The actual amount of credit offered to the enterprises is fully determined by the bank. Once the enterprise's financing application is approved by the bank, the bank would offer a certain number of capitals for the enterprise to purchase on the platform. This sum of capital would transfer to the platform's account for the financing enterprise's material procurement on the platform. The financing enterprise replays the credit to the bank at maturity; the platform only acts as the financial institution's entrusted payment unit and collection unit. Under mode B, the platform is responsible for integrating the flow of goods, information and capital in the SC and providing real business scenarios and data to ensure the trade authenticity of this SC business.

4.2 Platform A's SCF capabilities

This section illustrates the major SCF capabilities perceived by the Platform A. As stated by the interviewees in Platform A, the platform possesses four major capabilities in providing SCF service: information processing, network structuring, relationship management and process management. The following sections will introduce and justify each capability in detail.

4.2.1 Information processing capability

Platform A considered that one of the most important capabilities for platforms in providing SCF is the capability of **processing the large amount of information** in the SCF business. As stated by Vice President 1:

> *"Information processing capability is the core for our platform. The difference of information processing capability directly leads to the difference between platform SCF and traditional bank SCF. Our platform is deeply involved in the industrial raw material industry, and we have a lot of industrial information, so we can provide systematic supply chain financial services based on industrial data analysis in the supply chain, which is precisely what banks lack."*

When discussing the information processing capability, **Platform A believed that the capabilities of information acquisition, analysis, and sharing jointly determined Platform A's overall information processing capability.** The platform first stressed the capability of information acquisition. This capability is derived from their direct involvement in the SC business. Because the platform directly participates in the SC trade (procurement and retailing), Platform A has comprehensive information for the customers in SCF, such as company's SC structure (who are its upstream and downstream enterprises) and the company's internal operational information (e.g., production, logistics, and human resource). As for banks, the lack of industrial information greatly constrains their initiatives for SCF business. At present, the bank's loan business still largely relies on asset mortgage and guarantee.

This argument is confirmed by President 2 of Bank A, who stated that the main reason why banks are difficult to intervene in the financing of downstream SC is that downstream enterprises lack suitable mortgage assets to reduce the risks of banks in such business. However, the bank's understanding of industrial information only rest on the level of financial statements, and it is difficult for banks to go deep into the industry and obtain adequate operational information to support the financing.

The platform also valued the importance of information storage capacity when discussing the information acquisition capability. Information storage capacity ensures the effective collection of tremendous amounts of daily data generated from the SC trade on the platform. As stated by Vice President 1: *"Due to the large number of transactions occurring on the platform every day, it has great requirements for our data storage capacity. If the storage capacity is not enough, the daily data platform cannot be obtained effectively".*

Furthermore, the platform's direct involvement in SC trade indicated that the platform must be familiar with the industrial environment, making the platform more professional in

understanding the industry than banks, which provides the platform with better information analysis capability. As Chairman 1 notes:

> *"Our platform knows much more about petrochemical and plastic chemical industries than banks. Some people in banks may do industrial research, but our platform actually participates in the transactions in the industry. The understanding of the industry is not only based on research, but also depends on the accumulated experience in the trade process. This can reflect in the difference between our SCF and bank's SCF. Owing to our familiarity with the industry, our staff can screen out the uncommon transaction data provided by the SMEs."*

In the case of Platform A, information processing capability is largely supported by the technology adoption. Apart from equipping the traditional (EDI) system for multiple stakeholders, the platform also adopts the emerging technologies to guarantee that the financial information can be effectively and securely stored and shared among related parties. Especially for the financial institutions collaborated with Platform A, such as banks and insurance companies, effective sharing of reliable information makes the platform more reliable to financial institutions. In addition to the basic technologies for building the essential technical architecture of the B2B platform, the platform uses technologies such as big data, the Internet of Things and blockchain in the information acquisition, information analysis and information sharing in SCF service.

The big data system is not only the whole data storage and analysis system, but also an effective customer relationship management system. All user data is accumulated in the big data system. The processing and analysis of this data is the supporting point for the platform to engage in downstream SCF business. Simultaneously, the platform can share this data with insurance companies and banks to provide data support for financial institutions to participate in SCF.

Internet of Things and blockchain technologies can greatly support the platform's information acquisition and sharing capabilities. For example, in the logistics service for credit sales, the platform leverages the Internet of Things technology to confirm the transfer of goods' rights and creditor's rights (acquisition). Moreover, through employing blockchain technology, relevant transaction data, and accounts receivable assets are encrypted and certified to ensure the authenticity of the data. Collaborated banks and insurance companies can interact with the platform to access the data stored on the Chain.

In December 2020, for the further improvement of the information processing capability, Platform A built a service plan integrating the Internet of Things and blockchain (as shown in Figure 4-2.). As stated by Vice president 1:

> *'Through the Internet of Things technology, the platform can track and record the change information of goods rights, and this data is encrypted and stored in the blockchain, preventing the data from being tampered with. The platform can share the data with financial institutions participating in SCF to ensure the authenticity and security of transaction data, thus reducing the risk of financial services in the supply chain. Also, the data can be shared with cooperative focal enterprises, which can promote the visualisation of the supply chain and facilitate the focal enterprise's downstream supply chain management."*

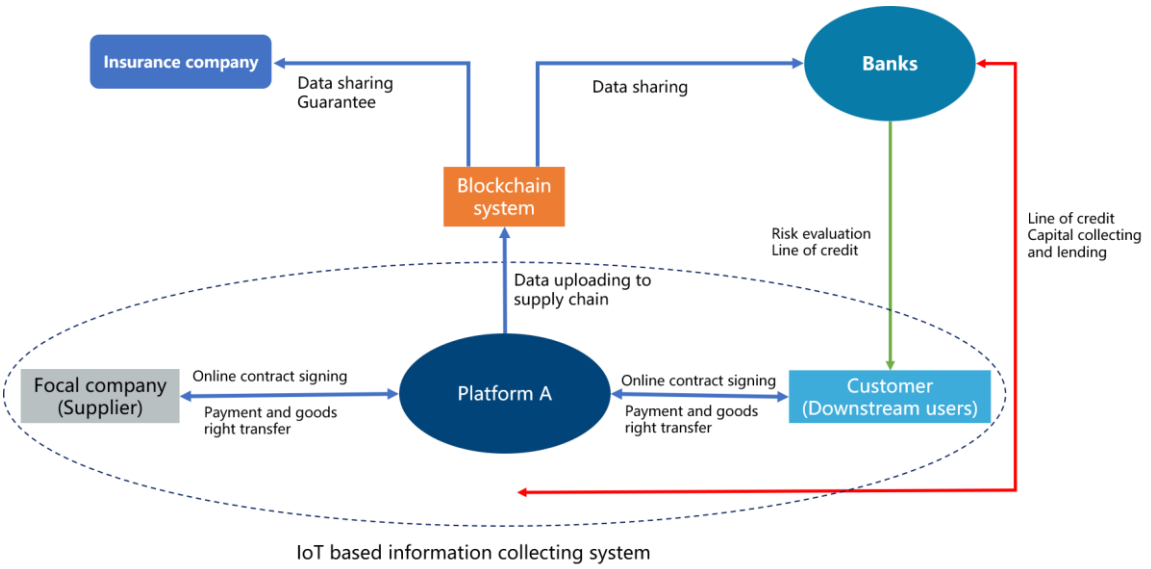

Figure 4-2. Platform A's IoT based information processing system

4.2.2 Financial network structuring capability

When providing SCF service, **Platform A considered how the platform builds up collaborative relationships and arranges business relationships with multiple stakeholders is also important.** In the interview, this capability is usually referred to as platform structuring or network structuring capability. This capability is usually reflected in how the platform can interconnect with multiple stakeholders. Platform A adopted the nature of the platform economy and realised the SCF model that simultaneously serves multiple banks, SMEs, and focal companies based on one single platform. The platform makes use of its interconnectivity attributes and gradually establishes its SCF ecosystem in the industrial raw material market.

According to the interviewees of Platform A, for the SCF in the downstream SC, the SCF dominated by focal enterprises can only serve the downstream enterprises in the focal enterprise's SC. SMEs that have not established trade relations with the focal enterprise cannot be offered SCF service. However, the market volume of industrial raw materials is colossal, and many well-qualified downstream enterprises with financing needs have not entered the SC of high-quality focal enterprises. The platform can include such SMEs in

their SCF service, as the platform can connect these SMEs to the focal enterprise's downstream SC, which is equivalent to integrating these enterprises into the downstream SC of focal enterprises. The platform can then offer them SCF (credit sales) services.

In addition, Vice president 1 stated that in order to increase the collaboration with more banks in their SCF programme, the platform needs to have attractions for banks. As for the platform, its information processing capability can pose a great attraction to the banks as they usually cannot access sufficient SC information to reduce the information asymmetry in SCF. Once a bank chooses to collaborate with the platform in SCF business and the platform is willing to share related information with the banks, in this case, increasing numbers of capital providers, service providers and focal enterprises, SMEs are thus attracted by the platform to participate in the SCF business of the industrial raw materials industry. As stated by Vice president 1:

> *"With the involvement of our platform in the industrial raw material industry, over 2,000 downstream SMEs are served by the platform's SCF service. Also, the platform's SCF business has attracted 8 banks to provide financial services to the industry through the platform. Previously, owing to the difficulties in risk control and information acquisition, these banks stayed away from this downstream SCF business in this industry."*

Interconnectivity also relies on the platform's digitalised SCF processes. The digitalised process makes it convenient for the participation of non-local SMEs in the platform's SCF programme. Vice President 3, who oversees the sub-platform in Shandong, quoted:

> *"The online platform makes our SCF services not limited to Jiangsu, Zhejiang, and Shanghai. If there are suitable users in other provinces, we can directly connect with them. They can trade directly on the platform, and we can directly provide SCF service to them accordingly. Therefore, our customers are not restricted by geographical distance. But under normal circumstances, we will set up independent*

branches in each strategic area. For example, in Shandong, the sub-platform we set up provides more convenient and efficient SCF services for local customers."

4.2.3 Relationship with multiple SCF stakeholders

As stated by the President 1, the platform builds collaboration relationship with related stakeholders in the first instance. The platform must manage maintaining the collaborative relationship with the multiple SCF stakeholders to ensure the stable operation of the SCF programme. Platform A identifies financial institutions, focal enterprises, and SMEs as the primary stakeholders. Additionally, the government is mentioned as an essential actor that supports the development of platform's SCF business.

4.2.3.1 Financial institutions

Providing financial service is not the core advantage of the platform. Financial institutions such as banks are indispensable partners for the platform to develop SCF business. Because the SCF market volume is vast and thus the demand for capital is significant, the platform cannot solely rely on self-owned capitals (capitals that enterprises often hold for production and operation activities and can control themselves without repayment) but must rely on banks' advantages in capitals. As the Marketing Manager 1 said:

"Only in the plastic manufacturing and process industry, there are about 350,000 manufacturing enterprises with financial needs. If calculated according to the average credit (500,000 RMB per customer) provided to the customers on the platform, the total demand for capital in the downstream SCF market exceeds 100 billion. If we cannot attract banks to provide funds for the platform, the development of the platform in the middle and later stages will be greatly limited by funds. At the same time, if we only depend on our funds, with the expansion of market volume, the platform itself will also face huge financial pressure."

To persuade banks to join the platform's SCF business, the platform analyses the obstacles of banks' SCF before discussing cooperation with banks. The main reason is that the business scene in the downstream SC is not transparent enough; the information between banks and enterprises with financial needs is asymmetric, and therefore the risk level of the business is difficult to meet the bank standard. However, in recent years, in order to support the development of SMEs, the Chinese government attaches importance to the development of financial inclusion (financial service to households and SMEs who are traditionally out of the service scope of the formal financial sector), and the business volume of financial inclusion has become one of the business assessment indicators of banks. Banks also hope to find suitable, secure, and reliable channels to provide financial support for SMEs.

Chairman 1 of Platform A, believes that the platform's understanding of the industry, its ability to control customers, and its ability to obtain and share information based on technologies such as the application of blockchain and the Internet of Things, can solve the problem of information asymmetry in banks' participation in SCF business. At the same time, banks can complete the task of financial inclusion by providing financial service to platform customers.

For better cooperation with banks, the platform designed the SCF service mode B. The platform can directly recommend suitable customers to banks, and banks choose whether to finance these customers based on the data shared by the platform and their risk assessment process. After the bank has reached a service agreement with customers, the capital obtained from financing will be directly transferred to the platform account by means of entrusted payment, which will be used for purchasing raw materials for these customers.

This mode breaks through the traditional customer acquisition mode of banks, and the customer acquisition mode of banks' corporate banking service is usually based on many

offline processes such as field visits. Through the platform, banks can conveniently obtain reliable enterprise information. It simplifies the banks' financing process for these enterprises to a certain extent. Moreover, banks can also obtain a vast quantity of customers through the platform. However, the scale of this SCF model is not large, and there is only less than 100 million business volume at present. This is because even when based on platform data, in the credit approval process, banks still must follow their internal compliance process step by step, hence the speed of bank's credit approval for these enterprises is still too slow. Therefore, the platform will only recommend bank customers with capital needs of over 1 million RMB.

At the same time, the platform is not willing to recommend too many customers to the bank, and the platform hopes that more customers will directly use the credit sales service through the platform (SCF mode A), so that the platform can earn more financing service fees. However, banks can also benefit from participating in mode A, for example, they can obtain large-scale credit business. The Customer Manager 2 of Bank A, said:

> *"For example, the platform can packaged 50 accounts receivable invoices of enterprises to their customers, and sent the data packages and related business information to us at one time. We can choose to directly provide financing for this part of the platform's accounts receivable. However, if we do this business of 50 enterprises by ourselves, first, some enterprises qualifications may not meet our financing requirements; second, we need to conduct the due diligence to each of the enterprises, but the average amount of financing required by these enterprises is 2 million RMB each. The cost-effectiveness is not suitable for banks."*

Moreover, in mode A, banks can obtain risk-free and higher financing income than financial inclusion services. Limited by the financial inclusion policy, the bank's loan interest rate for qualified SMEs is close to the benchmark interest rate (4-5%), which means banks can barely benefit from this service. But for the platform, the bank can raise the interest rate to 6-8%. Consequently, the income and scale of the bank's business on the

platform is much higher than that of directly serving downstream customers. Furthermore, in this business, the bank does not take any risks. If there is any bad debt in the platform's accounts receivables, the insurance company will cover 80-90% of the losses, and the remaining 10-20% risk exposure will be borne by the platform.

Platform A also innovatively collaborates with the insurance companies in SCF. Platform A collaborate with one of China's largest two insurance companies, People's Insurance Company of China (PICC) and China Pacific Insurance Company (CPIC) in SCF. Each SCF service is insured by either of these two companies, which indicates that once an SCF loan becomes a bad loan, the insurance company can help the platform cover up to 80% of the losses. Through the collaboration with insurance companies, the platform's credit is strengthened and further reduces banks' concerns of the risks in SCF. As stated by the Vice President 1:

> *"Insurance companies trust our risk control capability as we will timely share the related information. Before we make the SCF decision, the insurance company also helps the platform to evaluate the SMEs clients to be financed."*

4.2.3.2 Focal enterprises and SMEs

Focal enterprises and SMEs are the main customers of the platform. Focal enterprises are important sources of supply, while SMEs are the main users of SCF business.

Focal enterprises will pursue the direct sales rate (the rate at which the focal enterprise directly sell goods to end customers). So, they will reject the platform to a certain extent, resulting in a competitive relationship with the platform. However, the focal enterprise needs adequate cash to support its own production and sales. Relying on its dominant position in the SC, the focal enterprise is very punitive on its downstream payment terms. The purchase of goods from the focal enterprise needs to be paid in advance.

However, in the downstream SC, apart from the high-quality and large-scale distributors, many downstream production and processing enterprises are SMEs. They are usually cash-constrained, which indicates that it is difficult for SMEs to fully meet the payment requirement of the focal enterprise. Therefore, the focal enterprise cannot completely reject the platform. Focal enterprises can benefit from the collaboration with the platform in market expansion as multiple downstream SMEs previously outside the focal enterprise's SC can purchase from them through the platform. When purchasing through the platform, the platform will fully complete the payment to the focal enterprise which can improve their liquidity. Market manager 1 indicates that the platform tends to have a better collaboration with foreign-funded focal enterprises because these enterprises' competitiveness in the local area is insufficient as they need to rely on the platform to expand the local market.

The SMEs served by the platform are in a weak position in the SC, resulting in weakness in bargaining power and payment terms. SMEs' procurement can only come from traders. Their single procurement scale is small, the procurement channels are relatively single, and the average procurement frequency is high. Moreover, for most of them, insufficient scientific procurement management and information technology support lead to higher procurement costs and backward inventory management.

Concomitantly, because of SMEs' incomplete finances, they are unable to provide sufficient asset guarantees and lack effective credit records: the line of credit granted by banks is low and the time of credit approval is long. Financing difficulties is an unavoidable issue for SMEs. Even worse, some SMEs cannot obtain loans from banks resulting in missing credit records in the enterprise credit information system. Without good credit information records, it is even more difficult for SMEs to obtain financial support in other ways. However, the platform's SCF service provides these SMEs with an available and affordable financing channel.

Through SCF, SMEs can get 30% of the total purchase amount on credit in every purchase business. SMEs with tight financial pressure can reduce their financial pressure through this credit service. Moreover, the platform can assist SMEs to optimise their procurement. With the expansion of trading volume on the platform, the procurement cost for the platform to the focal enterprises can be reduced, and the price for SMEs to get goods from the platform will be reduced accordingly. Vice President 2 also stressed that:

> *"A lot of our SMEs clients tend to defer their payment to us. This phenomenon is common in the downstream supply chain in the industrial raw material industry. SMEs know that they owe money to our platform instead of banks, which means that their credit investigation results will not be affected if they slightly defer their repayment to the platform. To solve this issue, our platform value the cultivation of our SMEs' clients' awareness of timely obligation fulfilment. For example, we tend to assess the SME clients' repayment performance in SCF. As for the SMEs who pay off the credit within the specific time, we tend to encourage this behaviour through increasing the upper limit of the SCF support. By doing this, our platform hopes to cultivate SME's awareness of the timely obligation fulfilment, which I think will greatly promote the long-term collaboration between us."*

4.2.3.3 Government

The government has played an essential role in supporting the development of the platform, especially in SCF business. Vice President 2 claims that the development of SCF in China is closely related to the government's policy orientation and forming a positive cooperative relationship with the government has a far-reaching impact on the platform's capital acquisition and SCF business expansion. Government's macroeconomic policy orientation can also guide the platform's SCF development. Therefore, Platform A always adheres to close cooperation with the government in the process of SCF development. As Marketing Manager 1 said:

> *"Yuyao Development and Reform Commission is the largest single shareholder of Platform A's sub-platform in Yuyao, with a shareholding ratio of 30%. At the early stage of development, government agencies can recommend the platform to the*

appropriate banks, and the government's participation provide the platform with governmental credit endorsement, which can help the platform get more financing support from banks. At the same time, local governments will have preferential policies for local enterprises. Through cooperation with the government, the platform can ensure that preferential policies can be matched to the platform in prior."

When the platform develops sub-platforms and replicates the SCF business model in other places, it will also cooperate with the local government by means of government share participation, which supports the initial development of the platform in the local area. By cooperating with the government, the platform can promote the allocation of the Government Guidance Fund to the platform. Government Guidance Fund is a special fund funded by the government for investing in innovative enterprises through equity to support the development of such enterprises. Positive government relations can simplify the platform's process in business approval and taxation. In addition, Chairman 1 said:

"Due to the huge financial profits of SCF, the platform has to face a huge amount of tax payable. The tax support from the local platform can significantly stabilise the platform development and support the business expansion. For example, in 2020 the SCF related tax refund from the local government can reach 50% of local retained taxation."

Table 4-1 summarised the relationship between Platform A and other major SCF participants in their SCF business.

Table 4-1. Summary of the relationship between Platform A and SCF participants

SCF participants	Relationship with platform
Bank	-Platform must rely on banks' financial support to ensure the continuous development of the SCF business.

	-Banks cooperate with the platform to reduce the information asymmetry in SCF and to achieve the financial inclusion service with lower risks -Through collaboration with the platform, banks can break through their traditional customer acquisition mode. -Banks can obtain large-scale credit business. -Banks can obtain risk-free and higher financing income than financial inclusion services in SCF mode A.
Focal enterprise	-Focal enterprises can compete with the platform in trading raw materials to end-users. -The involvement of the platform can assist focal enterprises in market expansion and liquidity improvement.
SMEs	-The platform's SCF service provides these SMEs with an available and affordable financing channel. -The platform can optimise the SMEs' procurement and lower the procurement cost. -The platform focuses on the cultivation of SME's spirit of contract.
Government	- The Government can enact macro-level policies to boost the SCF market - The Government can provide the platform with governmental credit endorsement to facilitate the platform getting financing from banks. -Government preferential policies in local areas can stabilise the platform development and support the business expansion.

4.2.4 Managing SCF processes

Providing SCF service usually involves a series of complex services, therefore, Platform A considered that it must have a suitable capability to well-arrange the processes in SCF. Platform A believes that they must **appropriately manage both the financial process and physical process in SCF.**

As Platform A can directly participate in the SC trade and be involved in the SC business, the platform can store a large amount of historical transaction data and operation information of many enterprises that have provided trade credit service. Based on the accumulative information, the **pre-loan risk is reduced**; as such, the platform can quickly and accurately evaluate new customers, to some extent, reducing the time for the credit approval and improving the speed of providing SCF service. However, when banks provide

SCF services, they are limited by the bank's policy requirements, thus banks need to make detailed due diligence before they grant credit to enterprises that are without previous history of financing with the bank. As stated by Chairman 1:

> *"On the platform, the accumulated transaction data is also a great advantage of the platform in SCF. When the data of the platform reaches a certain scale, based on a large amount of historical data, the platform can generate a more accurate portrait of the enterprise and transaction behaviour for the newly admitted customers. Therefore, the platform can make the first loan to customers faster. Then the follow-up SCF business with this customer depends on the cooperation situation afterwards."*

Platform A also designed a set of **standardised operation processes** of their SCF product and clarified the responsibility of different parties in different processes of SCF business. Platform A's SCF service has a wider service scope and is relatively flexible, and the lending process can be flexibly adjusted according to the industrial situation. Also, Platform A provides a transaction platform for SMEs and focal companies; therefore, the SMEs' customer's transaction and payment are conducted on the platform, which forms a closed-loop business. In this case, SMEs repay the loan from the platform's SCF by selling the goods that purchasing in credit from the platform. Therefore, the platform can ensure the self-liquidation of the SCF business and reduce the default risks (post-loan risks) accordingly. Platform A's specialisation in managing the financial process is also reflected in their capabilities in controlling the SMEs' behaviour. As stated by Vice President 3:

> *"SMEs are very dependent on our platform. If they default on the platform, we will first terminate the cooperation with this enterprise. At the same time, we can use our influence in the industrial raw material market to minimise the market opportunities of this enterprise in this field, which may greatly affect their future procurement. Therefore, the default cost of SMEs is very high."*

Normally, the SCF providers only need to consider the financial processes. However, as Platform A is getting involved in the SC trade, **it is a direct participant in the process of procurement, logistics and retailing**. It means Platform A can provide a wider scope of SC service along with the SCF service. As Vice President 2 said:

> *"The platform has a stronger supply chain service capability, serving customers' supply chain needs in various nodes in the supply chain. For example, downstream enterprises can find stable and high-quality suppliers on the platform, and the platform can also provide distribution and warehousing services for enterprises, but banks cannot do this."*

Moreover, the platform's involvement in the actual SC transaction helps the downstream enterprises to conduct procurement. In this case, when there are enough similar demands from the downstream enterprises, the platform can therefore integrate the demands into a huge purchase order, by which the platform can make a bulk purchase from the upstream focal enterprise. The bulk purchase can improve the platform's bargaining power and may reduce the purchase price of the raw material from the focal company. Consequently, the platform is able to optimise downstream SMEs' procurement and reduce their procurement cost. As General Manager Assistant 1 stated:

> *"Sometimes, the platform's bargaining power in the supply chain can be represented in every node of the supply chain, such as procurement, logistics, and warehousing. When the demand is large enough, the platform's bargaining power over the service providers is thus enhanced, which can reduce the cost of each node in the enterprise supply chain. However, banks are separated from the supply chain business, which denotes that banks may find it impossible to achieve such service in their provision of SCF service."*

When providing the SCF service, Platform A also helps the companies in the industrial raw material industry increase the digitalisation in their SC, which can assist focal company's SCM. Chairman 1 said:

"All of our services are provided online, which assists the paperless office. In this case, the electronic signature contract, receipt, and delivery can all be operated online. We also developed a mobile phone appliance, and our customers can confirm the documents and complete the business on it. Under our assistance, the level of digitalisation of the focal company's supply chain is promoted and becomes more transparent and easier to manage than before."

4.2.5 Summary of the Platform A's SCF capability

Table 4-2 makes a summary and explanation on the advantages of Platform A in SCF service.

Table 4-2. Summary of Platform A's SCF capabilities

SCF capabilities	Contents of the capabilities
Information processing	-The platform's direct engagement in SC transactions allows them better access to sufficient SC information, and to have professionalism in analysing industrial data. -Big data system is used for data storage and analysis, as well as for effective customer relationship management. -Adopting IoT in information acquisition and blockchain technology/EDI for reliable and secure data sharing among related SCF stakeholders. -Collecting required information from the publicly disclosed and SMEs' provided information.
Network structuring/platform structuring	-Through the platform, more downstream enterprises outside the focal enterprise's SC can be supported by SCF service. -The platform ensures the risk is controllable in its SCF business and attracts more banks to participate in SCF. -Platform's digitalised SCF enables more non-local SMEs to participate in SCF.
Managing relationship with multiple stakeholders	-Platform B maintains a collaborative relationship with SMEs, focal enterprises and banks, and government in the SCF programme.
Managing SCF processes	-Accumulative information can simplify the platform's evaluation process of new customers and speed up the SCF service provision to such customers. -The platform can provide integrated SC service in their SCF service. -The platform can have bargaining power in different nodes of the SC.

4.3 Development of SCF network

Due to its high level of involvement in the SC trade, the platform is gradually in the central position in the SC network of industrial raw materials with the continuous expansion of platform volume. In the SCF business, Platform A is aware of the significance of building the SCF network for better SCF implementation and development. Chairman 1 said:

> *"The competition in the Chinese SCF market is evolved from the competition of the SCF capability of a single company to the competition of the integrated SCF network. As for our platform, our information processing capability and relationship management capability can largely impact the platform's relationship with the platform partners."*

This section demonstrates how Platform A makes use of its SCF capability to develop the SCF network through increasing the different network characteristics of reach, richness, and receptivity of the network.

4.3.1 Network reach

First, Platform A is a B2B trading platform, and therefore a large number of downstream enterprises conduct routine procurement on the platform. Among these platform users, initially, only some of these customers are qualified to use the credit sales service. However, based on the platform's understanding of these SME customers in the industry, platform A is familiar with these SMEs' operational and financial capability, and therefore can create an accurate portrait of them, which supports the platform to discover more suitable SCF clients. Also, Platform A's wider interconnectivity brought by the digitalised SCF also makes more non-local qualified SMEs use the platform's SCF service.

Compared with the SCF business network led by the focal enterprise and bank, platform-led SCF can greatly expand the original service scope of the traditional SCF in the industry. Thus, more SMEs, whose qualifications do not meet the standard of bank loans, are able to get financing through the platform's SCF service. Therefore, the platform increases the reach of the SCF network by expanding the number of downstream customers. Meanwhile, not only for the SMEs, Platform A's wider interconnectivity and better relationship management with banks also increases banks' willingness to collaborate with banks in SCF and increase the number of banks involved in its SCF programme, thus promoting the reach of the platform's SCF network.

Second, as the platform is deeply engaged in the industry, the platform has accumulated industrial information and transaction information of platform users in large quantities. The platform can use the accumulated information to attract more banks and other financial institutions to serve the industrial SCF and provide financial support for the platform's SCF service. For example, the platform has cooperated with insurance companies and innovatively brings insurance companies into the downstream SCF service system. Also, as Vice President 2 said: *"We choose to collaborate with large logistics service providers to strengthen our logistics service to our SCF customers. Also, we outsource some of the technology development workloads to third-party technology service providers. We combine the technical advantages of both the platform and technology company, to further secure our SCF service by means of accelerating the technology improvement."* Therefore, the platform increases the diversity of SCF partners to improve the reach of SCF networks.

4.3.2 Network richness

Platform A makes the utmost of its resource integration ability in SCF and engages in improving the synergy effect by exploring the potential value-creation opportunities with different SCF, so as to improve the richness of network characteristics.

For the focal enterprises and SMEs, the platform provides SCF service along with inventory management services. The platform's inventory management is based on the big

data of downstream users' purchasing behaviour collected by the platform. Based on the data, the platform can forecast the expected demand, order, and production plans for a certain period in the future. The platform can share these data with focal enterprises to reduce the uncertainties in SC transactions, which can optimise the inventories for both upstream and downstream companies. In addition, the platform is an important sales channel for the focal enterprises. The platform can use its extensive downstream customers to increase the focal enterprises' downstream sales.

Furthermore, from the perspective of cost management, the platform can optimise the SC by controlling the final cost of products. As stated by the Marketing Manager 1:

> *"The final cost refers to the total cost actually incurred when it reaches the customer, including the package expansion, purchase price, delivery cost and inventory cost. Because the platform has the advantages of bulk procurement and mass logistics in supply chain trade, it has strong bargaining power in these two links, so it can reduce costs."*

Establishing a better collaborative relationship with the focal enterprises in SCF, allows enterprises to enhance the data sharing of the platform and recommend high-quality downstream customers to the platform, thereby reducing the customer acquisition cost of the platform. Furthermore, assisted by the platform's SCF service, SMEs can have better access to financial resources within the SCF network, thus they are willing to form a cooperative relationship with the platform. In turn, the platform can increase SMEs' customer stickiness, thereby increasing the dependence of SMEs on the platform and reducing the default rate of SMEs to a certain extent. As a result, the platform can obtain a more stable and secure SCF service income from SMEs.

For banks and other financial institutions, once the collaboration is formally established, the platform can introduce more qualified platform customers to collaborative banks, thus

helping banks simplify their customer acquisition process and expanding their source of customers. By sharing the operational and transactional data with financial institutions, the platform can reduce the risk of financial institutions' participation in SCF and improve their income from SCF business. A stable cooperative relationship with financial institutions can enable the platform to obtain stable financial support from banks, and obtain risk guarantees to their SCF business from insurance companies, thus reducing the risks in the platform's SCF services.

4.3.3 Network receptiveness

With the platform A's superior information processing capability and relationship management capability with many SCF participants, Platform A can improve the effective flow of information resources and financial resources within the SCF network by building mutual trust and increasing stakeholders' commitment and the multiplexity to promote the receptiveness of the SCF network.

Initially, the platform promotes the sharing of information resources within the network. The platform possesses a large amount of accumulated transaction data and operation data of downstream enterprises. Data related to specific SCF services can be shared with core enterprises and banks participating in SCF more safely and conveniently through blockchain. As Vice President 1 claimed:

> *"The improvement of technology application promotes the sharing of information resources among SCF participants, and at the same time enhances the data-based mutual trust between SCF members, which in turn encourages the information sharing among members. It can eventually promote the trust chain in our SCF network."*

Subsequently, the platform can also promote the flow of financial resources within the network. Through the platform's influence on SMEs, the platform can better control the

behaviour of SMEs in a more effective way. Also, the platform pays attention to cultivating the contractual spirit of SMEs in SCF. Vice President 1 stated:

> *"At the beginning, the credit granted by the platform to an SME may only be 30%, in maximum, of its total purchase amount with a short payment period. However, in the long-term business contact with the SMEs in credit sales service, if the SME can settle the payment for credit the platform on time in every transaction, we will continuously extend the payment period and credit sales quota to the SME in future cooperation as an encouragement of their good performance."*

With the increasing number of high-quality SMEs cultivated by the platform, banks' trust in the customers recommended by the platform will also increase, which make these SMEs more conveniently obtain financial resources from banks.

Thereafter, through the collaboration with the focal companies and banks, platform A would frequently arrange formal discussions between essential departments of the platform and banks or focal companies. By doing this, the platform's professional knowledge of SCF concepts and operation are shared with them. Once banks and focal companies are fully aware of the advantages of the SCF, they are more willing to offer capital support to the platform's SCF programme. As stated by the Product Manager 1 of Bank A:

> *"For our banks, SCF is more of a financing tool, and our previous SCF service mainly focused on the financing aspect instead of the supply chain aspect. Our knowledge of the supply chain is insufficient. We know this clearly and that's why we seek collaboration with platforms that have more professionality in SCF to expand our SCF service. Also, before and after our collaboration is built, President Xu has arranged several meetings with us to illustrate their understanding of the SCF and its service mode, to clarify how banks can benefit from joining the platform's SCF programme. Through several multiple rounds of communication with the platform, our bank has a better understanding of the SC status in the raw material industry."*

Apart from the meetings between departments, some informal meetings between essential individuals of the platform and banks also take place occasionally, which is believed to be a significant social interaction to strengthen the collaboration between the platform and other stakeholders. President 1 said :

> *"In China, informal meetings with banks is inevitable yet also essential, especially at the stage when the number of SCF platforms is increasing rapidly. Maintaining a good social relationship with bank-related personnel can strengthen our collaboration and prioritise our platform in obtaining financial support from them."*

Following this, through the platform's collaboration with the local government, government can endorse the platform and in this case, when platform A seeks financial support, it can gain more trust from banks and other financial institutions, and the flow of financial resources in the SCF network is thus increased. *"Government can help us collaborate with banks. Government support is an endorsement to our platform, which can make banks prioritise granting credit to us when we need capital in SCF"*, said Marketing Manager 1.

4.3.4 Conclusion of the Platform A's SCF network development

Table 4-3 summarised the Platform A's contribution to the SCF network characteristics in terms of reach, richness, and receptivity.

Table 4-3. The Platform A's development of SCF network

Network characteristics	**Related platform capability**	**Contents of network development**
Reach	-Financial network structuring -Managing relationship with multiple stakeholders	-SCF service can include more qualified SMEs

		-Diversified network partners are included in the network, such as multiple financial institutions and logistics service providers.
Richness	-Managing relationship with multiple stakeholders -Managing SCF processes	-The platform provides advanced SC service to focal enterprises and SMEs, while focal company can reduce platform's customer acquisition costs, and the platform can obtain a more stable and secure SCF service income from SMEs. -The platform can reduce financial institutions' customer acquisition costs, reduce the risk, and increase the profit in SCF service, while financial institutions can provide financial support and risk guarantees for the platform.
Receptivity	-Information processing -Managing relationship with multiple stakeholders	-The platform ensures better sharing of information resources and to controlling SMEs' behaviour to develop the mutual trust with financial institutions. -Frequent formal and informal communication with banks can increase banks' commitment to the SCF partnership with the platform. -Government endorsement helps the platform gain more trust from banks.

In the following Figure 4-3, the structure of Platform A's SCF network structure is presented, in which the major SCF partners and the resources exchange between the platform and the partners is concluded.

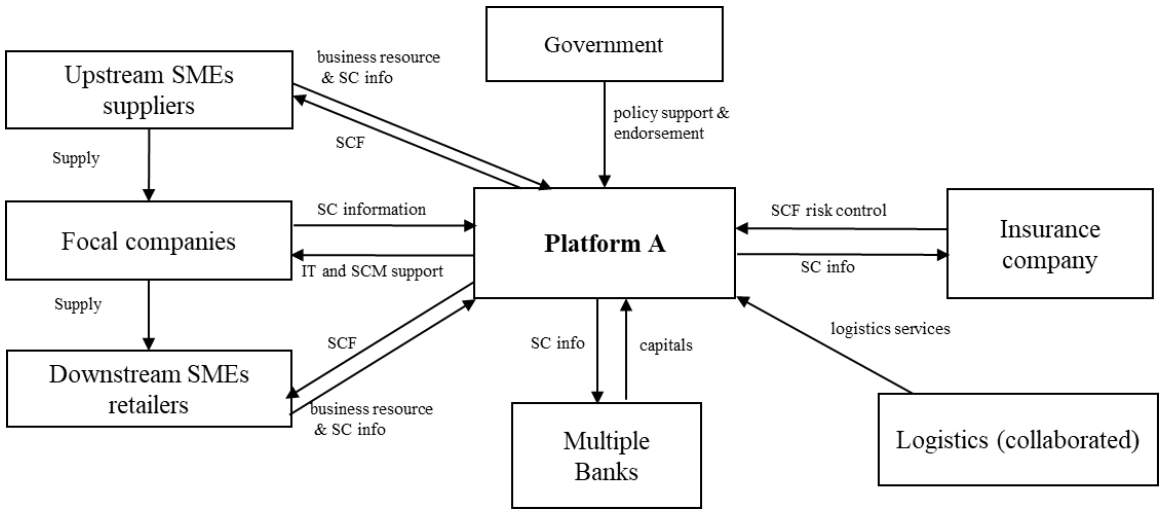

Figure 4-3. SCF network structure of Platform

4.4 SCF performance measurement

When asking about the measurement of their SCF performance, interviewees in platform A frequently mentioned SCF service scope, while scope is mainly determined by customers' stickiness and acceptance to the platform.

The technology factor is essential but is not the determining factor to evaluate a platform's SCF performance. Vice President 1 said:

> *"Technology cannot be separated from the SCF business mode. Technology is like a tree vine, while the SCF business mode is the tree. What technology application brings to our SCF business is better customer experience through improving the efficiency and security of our SCF services, to make our clients have more acceptance to our SCF service. However, the premise of all these is to have a client-acceptable SCF business mode."*

As for the financial factors, such as profitability, interviewees of platform A believed that this factor is also segmentary for the SCF performance measurements. This type of factor can reflect SCF service providers' financial capability; however, it does not mean the platform performs better in SCF. As stated by Vice President 2:

> *"The return period for developing a platform is long, especially for the private enterprise like our platform. Also, the characteristics of SCF are that the number of SMEs with financial needs is large, but the amount of each financing service is small. That's why we highly value the customer acceptance of our SCF service to measure our performance. Higher acceptance can often bring us larger business volume and potential profits."*

Therefore, platform A believes that the most determinant factor for platform A's SCF performance is customer stickiness. President 1 said that *"The acceptance of SMEs to our*

SCF service is vital. Higher acceptance of SMEs' clients can ensure our SCF service scope and the SCF market share." To ensure the SMEs' acceptance to the SCF service, Platform A makes their entrance threshold of SCF and overall interest rate lower than traditional financing methods.

Apart from the acceptance of SMEs, platform A tends to consider the acceptance of banks and focal companies to its SCF service to comprehensively measure its SCF service performance. Banks' acceptance is more related to the risk controllability of the SCF service, especially for platform A's downstream SCF service. Banks usually consider whether the platform can well employ the technologies such as blockchain, and IoT to control the risks. The platform's control of the SMEs' behaviour is another consideration for banks' acceptance to the platform SCF service. Banks also pay heed to what measures the platform would take after the risk occurs in SCF, for example, to what extent the risk is shared by a third-party company. As for the focal companies' acceptance to the SCF, they are more concerned about the benefits of the SCF adoption to their SC improvement. For example, if the platform's SCF service can include warehouse and logistics services to help them reduce the logistics costs and increase logistics efficiency.

4.5 Case Summary

After the provision of SCF in the raw industrial material SC, platform A has successfully transformed from a trading platform to an influential SC management platform in southeast China. The platform devotes itself to the establishment of its SCF network and provides SCF service to the downstream SMEs, who used to be out of the traditional SCF service scope owing to risk issues. It innovatively includes insurance companies into the SCF network to jointly manage the risks in the downstream SCF. This chapter presents Platform A's SCF business model and practices. The platform's SCF capabilities, how the platform develops the SCF network, and how they measure their SCF service performance is discussed respectively.

Platform A finds that the construct of SCF capability is composed of the capability of information processing, financial network structuring, managing relationship with multiple stakeholders and managing SCF processes.

First, Platform A believed that the capabilities of information acquisition, analysis, and sharing jointly determined Platform A's overall information processing capability. Information acquisition capability is derived from the platform's direct engagement in the SC activities (procurement and retailing). Information analysis relies on the platform's familiarization with the industry environment and the adoption of big data analysis, which enable the platform to generate accurate customer portrait. Information sharing effected by the platform's adoption of EDI and blockchain system. The second capability is financial network structuring, which is related to the platform's interconnectivity to the other SCF partners. The platform follow the logic of the platform economy and simultaneously serves multiple banks, SMEs, and focal companies based on one single platform. The platform also considers that interconnectivity is related to the digitalised SCF processes.

The third capability is managing relationship with multiple stakeholders, which emphasises the maintenance of the collaborative relationship with the stakeholders to ensure the table operation of the SCF programme, especially the relationship with banks (financial support), and focal companies (business support) government (policy support). Fourth, the platform considers that it is important to appropriately manage both the financial process and physical process in the supply chain to perform well in managing SCF processes.

The SCF network of Platform A is developed. Platform A is aware of the significance of building the SCF network for better SCF implementation and development, and the platform considers that the development of SCF capabilities can positively improve the network development, especially from the aspect of network reach, richness and receptivity.

As a leading platform, Platform A considers that customer acceptance is an appropriate measurement factors to comprehensively evaluate their SCF service performance, while criticising the partiality of adoption technological and organisational factors when evaluating SCF performance.

Chapter 5. Platform B, deriving SCF business from the integrated SCM services

This chapter introduces the Platform B's integrated SCM services and how the platform attached SCF to its traditional SCM services. It begins with a background introduction of Platform B and its SCF business model. Then, the Platform B's SCF capability and their SCF network development is concluded. The concluding segment discusses how the SCF service performance of Platform B is measured.

5.1 Introduction

This section first introduces the basic information of Platform B, followed by the conclusion of how Platform B developed SCF based on its integrated SCM service, and the basic SCF business mode of the platform. The following section introduces Platform C's SCF capability.

5.1.1 Company background

Platform B is the forerunner of SCM service in China and it is one of the earliest companies engaged in providing comprehensive SCM service to focal companies. In 2021, Platform C ranked 168th in Fortune China Top 500. Platform C established a decentralised SC platform based on its basic logistics service. It is an integrated operation service provider, dedicated to promoting the innovation and development of SC service and managed to assist its customers in expanding market share and enhancing their core competitiveness. As the pioneer in China's SC service industry, Platform B has created the basic service mode of SC in China. Platform B put forward the concept of SC outsourcing service. Platform B helps focal companies deal with the non-core business in the SC, from raw material procurement to product selling. Up to the present date, the platform's SC service network has covered more than 320 domestic markets.

Platform B was founded in 1997. At the beginning of its establishment, it mainly provided procurement, distribution, and other services for computer vendors throughout China, and initiated a preliminary attempt of providing SCM services in China. In 2002, Platform B cooperated with Cisco, a Fortune 500 company, and for the first time, Platform B provided non-core business outsourcing services for focal enterprises. Since 2005, Platform B has gradually expanded its service scope from IT to medical devices, chemicals, and textiles among others. In 2009, Platform B added the procurement and sales business to its SC service system, and merged SCF services in these processes. From 2014 to 2015, Platform B officially launched the SC ecosystem strategy to build a shared and win-win business platform for multiple SC stakeholders. However, due to the rapid expansion, the platform's capital occupation is too large; it is also affected by the tightening of China's macroeconomic policies. Platform B's financial expenses increased significantly in 2018, and there was a problem in its capital chain. In September 2018, Platform B signed a share transfer agreement with Shenzhen Investment Holding Company (SIHC). SIHC assisted the platform to develop integrated SC services and expanded the platform's access to banking resources and business resources. In 2021, Platform B achieved an operating income of 18.676 billion RMB.

5.1.2 SCF business model

Figure 5-1 presents Platform B's SCF business model. Platform B's core business is the integrated SCM services, and the SCF business is a value-added business derived from its SCM business. In the process of providing SCM service, the platform may consider various approaches to increase the overall efficiency of the SC, and SCF is considered as an effective method to promote the efficiency of financial flow in the SC, which can further lead to the improvement of the efficiency of the entire SC. Platform B involved itself in the SC trade through the procurement and distribution process and extends the SCF service on this basis. In this financing mode, Platform B is like a small bank that serves the SC. Platform B lends its funds with a low interest rate obtained from banks to their customers in a higher interest rate, through SCM services, through which, Platform B can earn interest margin from the SCM services.

Platform B's SCF service scope covers both upstream and downstream SC. The first mode of SCF applied in the upstream SC aims at serving the focal company's upstream SME suppliers. When trading with the focal company, SMEs usually cannot get paid directly, and usually issue them a commercial bill and guarantee them to complete the payment within a certain period. However, when Platform B helps the focal company to purchase from its SME suppliers, Platform B can help the focal company to directly pay the SMEs, making SMEs' suppliers quickly receive the payment for goods, as long as the supplied goods pass the focal company's quality inspection, and the focal company commits to finishing the payment to the platform within a certain period of time. This mode of financing is similar to the reverse factoring: SMEs discounting their account receivable from focal companies to the platform under the focal company's approval of the account receivable invoices. Focal companies will pay the platform when the invoice is at maturity.

The second mode of SCF serves the downstream SC, mainly providing financial support to the focal company's downstream distributors. Focal companies usually prefer their distributors to purchase more from them and ask them to complete the payment for goods within a short period of time, but distributors need time to transfer the goods to cash. In this case, the distributors' capital pressure is increased. Platform B assist SME distributors to advance the payments for goods. Platform B controls these goods as inventories in their warehouses, and distributors may pay the platform and take delivery of goods as they need. Focal companies will guarantee the platform to buyback the goods or help platform to adjust sales of goods if their distributors fail to take delivery of all the goods within the specified time.

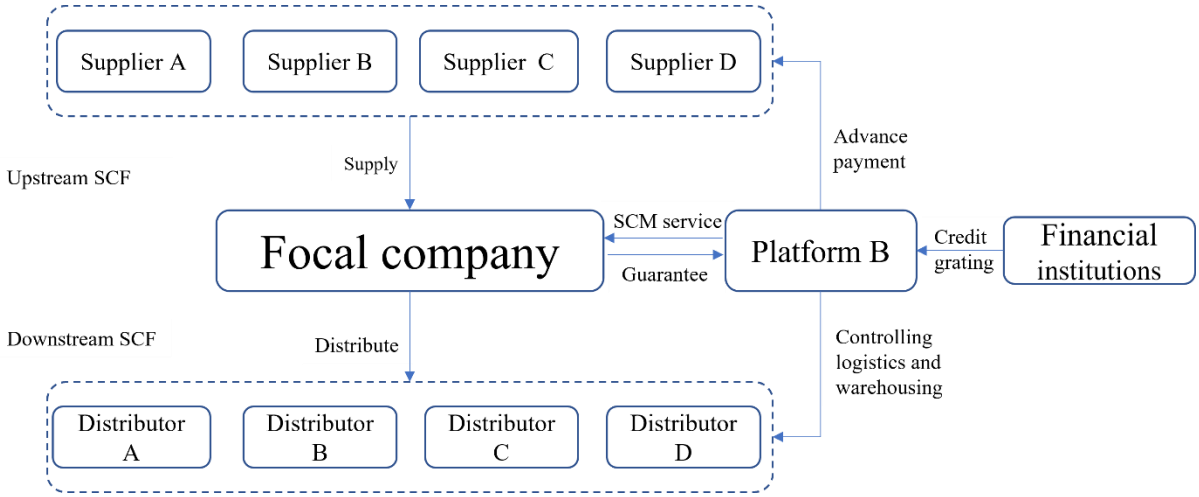

Figure 5-1. Platform B's SCF business mode

5.2 Platform B's SCF capability

In this section, the major SCF capabilities of Platform B are demonstrated. According to the interviewees in Platform B, there are four major capabilities that increase the platform's competitiveness in SCF market. The capabilities include information processing, network structuring, managing relationships with stakeholders, and managing SCF processes. The following sections present a discussion of each capability in detail.

5.2.1 Information processing capability

When discussing the information processing capability, Platform B first stressed information acquisition as an essential part of the information processing capability. Platform B can directly participate in the SC trade, which enables them to have direct access to corporate operational and transactional data. As stated by Business Manager 2:

> *"One of our biggest advantages in providing SCF is our better access to the SMEs' operational data. Normally, such information is not publicly disclosed, which makes banks hard to get the operational data. However, for our platform, we are one part of the supply chain transaction, and therefore, we can directly obtain such*

information when we purchase from upstream suppliers or conduct credit sales to downstream retailers."

Platform B has an independent logistics and warehousing system to support its SC services. When providing inventory financing, the platform uses its logistics and warehousing system to control the goods, which gives the platform better access to the logistics and warehousing information concerning the SC transaction. Moreover, in order to ensure efficient information acquisition in SCF, IoT technology is implemented in the systems, through which, the logistics data and warehousing data can be timely collected by the platform. As stated by the Business Manager 1:

"Our platform is a supply chain service platform, and logistics and warehousing services are one of our basic services. When we provide SCF business, we control the ownership of goods through our own logistics and warehousing system. Therefore, the logistics and warehousing information in SCF business is open and transparent to us. This is difficult for other SCF providers to do so because the cost of self-built warehousing and logistics system is very high, and requires professionalism. At the same time, we apply IoT technology to the logistics and warehousing system, which enables us to monitor the changes of goods data all the time and obtain the relevant information in SCF more efficiently."

Abundant information obtained in the SC transaction also supports the platform's information analysis capability which is the second aspect of its information processing capability. Based on the sufficient information collected on the platform, and the platform's operational experience in specific industries, Platform B conducts big data analysis to generate an accurate portrait of focal companies and SMEs in SCF. As stated by Operation Manager 1:

"After we collect a large amount of information during our SC service, we need to accurately analyse the information to evaluate the risks in SCF and help our SCF decisions. Our information analysis capability mainly relies on big data analysis

to systematically process the collected data. Also, our personnel's professional operational experience in SCM enables our platform to effectively verify the authenticity of the SC invoices provided by SMEs, which can help us to evaluate the risk when providing SCF service to them."

Information sharing is the third aspect of the platform's information processing capability. Platform B considers that effective information sharing ensures its SC service efficiency. Platform B values information sharing with focal companies and their SC partners. Therefore, when providing SC services to the focal companies, Platform B will promote the use of the EDI system to ensure effective information sharing. Blockchain technology is also adopted by the Platform in SCF. Blockchain can store the logistics and warehousing data collected by the IoT system, and securely share the data with related parties, which can reduce information asymmetry, and increase the communication efficiency among stakeholders.

5.2.2 Financial network structuring capability

In the SCF programme, **Platform B believes that how the platform can build links with multiple stakeholders in SCF is the second essential SCF capability**. This capability is usually reflected in the platform's interconnectivity in SCF. Financial Manager 1 said: *"Platform B firstly proposed the mode of N+1+N SCF service and promoted this SCF mode in China. In this mode, Platform B focuses on a single focal company to provide financial service to its upstream and downstream partners."*

However, the Platform's SCM service scope is not limited to a single focal company, a single SC, or even a single industry. Platform B started by serving the information technology industry and gradually extended its service scope to cover over 100 sub-sectors and collaborated with over 100 Fortune Global 500 companies in its SCF business.

Platform B's interconnectivity in SCF is derived from its traditional SCM service to its customers. Before the implementation of SCF, the platform already collaborated with large numbers of focal companies and SMEs in the SC business. Focal companies and SMEs are familiar with the platform, which makes the platform easy to interconnect with them in its SCF programme. Operation Manager 1 said:

> *"The foothold of our SCF service is our traditional SCM service. When providing SCF business, the customers we choose are often the enterprises that have previous cooperation with us in SC business. In this case, these enterprises have more recognition of our platform's SCM ability, and on the contrary, we also know more about the SC, operation, and financing condition of the enterprises. Therefore, we can better establish initial collaboration with them in SCF."*

5.2.3 Managing relationship with multiple SCF stakeholders

In the SCF service, Platform B believes that a **long-term and stabilised relationship with stakeholders is essential for the SCF development**, and it is also essential for the development of the platform's SC service. The platform must maintain a collaboration with multiple stakeholders to ensure that the platform's SCF programme is under the support of multiple stakeholders, such as banks, focal companies, SMEs, and governments.

5.2.3.1 Relations with banks

Platform B's reliance on banks in SCF service is lower. However, Platform B as a light-asset platform still needs banks' capital support to satisfy its SC clients' financial needs. In this collaborative mode with banks in SCF, banks do not directly participate in the SCF programme, while they only grant credit to the platform based on the platform's financial status and operational status. The platform will then allocate the bank's loan to offer SCF to SMEs in their SC service system. As stated by Financial Manager 1:

> *"Part of the capital used in SCF is our Platform's own fund, around 5 billion to 7 billion RMB. However, a large part of the capital used in our SCF service is from banks. After years of collaboration with banks, the banks in our cooperation have*

a clearer understanding of our business mode and have extended our line of credit, and it has greatly helped our SCF business expansion."

Platform B also seeks other collaboration modes with banks in SCF and manages to make banks directly participate in the platform's SCF programme. Platform B has developed a sub-platform focusing on fintech technologies and supports banks' participation in SCF. In this mode, Platform B will open the SC big data accumulated on the platform to banks and supports banks in SCF with their professionalism in SCM. As stated by Operation Manager 1:

"In this mode of SCF, our platform is not the capital provider, while banks replace our role in providing capital to SMEs. We can recommend qualified SMEs and provide banks with accurate client portraits of the SME or provide banks with professional logistics and warehouse management to assist them in controlling the SCF risks."

5.2.3.2 Relation with focal company and SMEs

Focal companies and SMEs are the major users of the platform's SCM services. Focal companies are the starting point of the platform's SC services. The platform's SC business must require the participation of a focal company, especially the SCF businesses. For example, in the upstream SCF, Platform C requires the focal company to provide approval of the invoices provided by SME suppliers with financing needs, while in the downstream SCF, focal companies need to guarantee for the downstream retailers in the process of inventory financing. Financial Manager 1 said: *"Maintaining a collaborative relationship with the focal companies is an effective method to control our risks in SCF."* On the contrary, focal companies can benefit from the collaboration with Platform B in SCF, which can improve their SC efficiency and reduce their SC cost. Platform B's SCF service is attached to its integrated SC service.

Platform B's SCF service can increase the focal company's capital turnover efficiency, which can further promote the efficiency of the focal company's financial SC. It can be seen in the example that through the platform's SCF programme, the focal company's SME suppliers can receive their payment in advance, and they can use this capital to invest in other production and operation activities. For the focal company's SME retailers, with the assistance of the platform's inventory financing approach, they can conduct bulk purchases from the focal company, without occupying a large amount of capital.

Apart from efficiency improvement, Platform B also helps focal companies to reduce their SC operation cost. Business Manager 1 said:

> *"Our SC service can greatly reduce the focal company's operation cost. Without our platform, focal companies need to develop systems to manage multiple SC partners in both upstream and downstream SC. Focal companies need to set up departments and allocate human resources to conduct the management of multiple suppliers and retailers. Our platform enables focal companies to outsource such non-core business to us and make them focus on the core business such as product development or market expansion."*

Platform B also helps focal companies to reduce the SC financial cost through the SCF service to SMEs. Financial Manager 1 said:

> *"After we implant the financial services in our SC services, we can effectively reduce the SMEs' capital occupation in the SC trade with focal companies. The lower level of capital occupation can decrease the SME's cash pressure. The interest rate of our SCF service is also lower than the average interest rate that the SMEs can get, which can lead to the decrease of the financial cost of the entire SC."*

Additionally, Platform B can share the accumulated information with the collaborated focal companies, which may reduce their market research cost. Such information is generated

when the platform conducts procurement and distribution services. Based on the information, the platform can equip focal companies with valuable information, such as which region has a high demand for a certain product or when the demand for a product is at a high point. As stated by Operation Manager 1:

> *"Our platform goes deep into the SC procurement and sales business, so we have accumulated a large amount of SC transaction data on the platform. Based on these data, we can have an accurate forecast of the market where our customers are located. For a focal enterprise, most of its market analysis comes from its own SC information, but for our platform, the platform integrates the information of many focal companies in a specific industry, so our market analysis is more accurate. We can also help core enterprises save the cost of market research."*

5.2.3.3 Relation with governments

Platform B identified the essential role of government support in the development SCF business, and therefore, the platform has actively sought collaboration with local government to jointly improve the local SC development and SCF business development. As shown in Figure 5-2, Platform B tend to co-construct a local SCM platform with local government. Platform B has control rights to the new platform and Platform B tends to share their SC service business mode and SCM experience with the local government, while the local government help Platform B in integrating the local business resource and enact preference policy to support Platform B's business. As stated by Business Manager 2:

> *"In order to respond to the central government's requirement of developing local supply chain, local governments have intentions to collaborate with our specialised supply chain companies to jointly establish a local platform, aiming at structuring and optimising the local supply chain. In this collaboration, we can combine the government's resources and influence with our expertise SCM approaches and experience to integrate the local businesses on the co-construction platform. Through this collaboration, we can help local government achieve the local supply chain construction and help local industries promote efficiencies."*

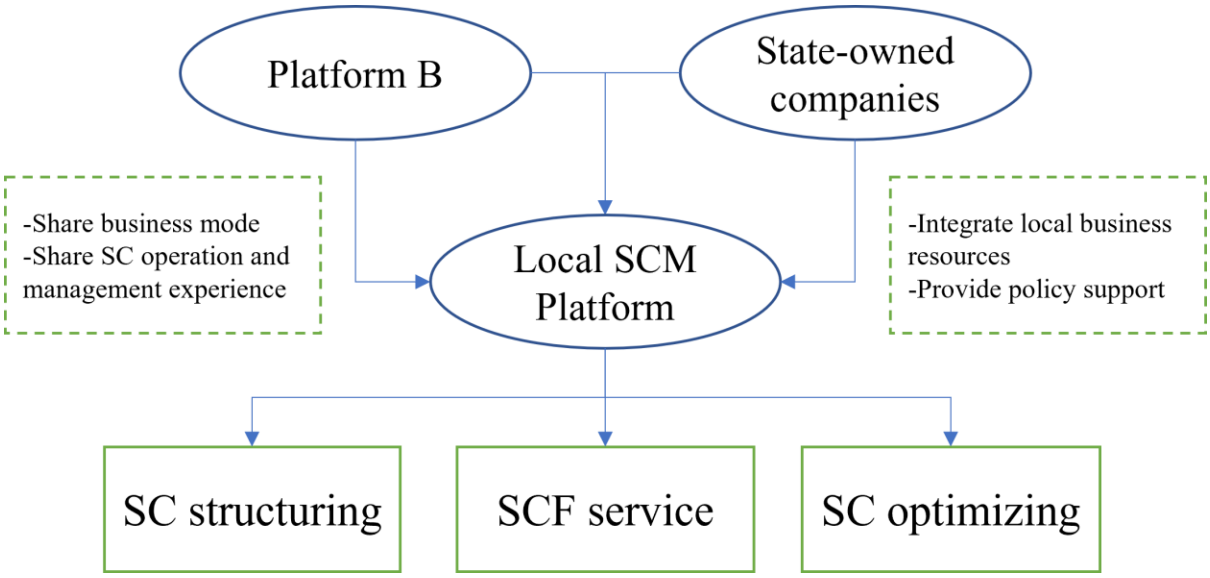

Figure 5-2. Platform B's collaboration mode with local government

Owing to the Platform B's rapid business expansion from 2008-2018, Platform B was heavily in debt in 2018. SIHC became the strategic shareholder of the platform. This government agency make use of its capital resources and bank resources, to effectively improve the platform B's credit rating and bank's credit line to the platform, which can reduce the platform's financial pressure. Meanwhile, SIHC also integrated its previous business resource with that of the platform, thus creating more business opportunities for the platform.

Table 5-1 summarised the relationship between Platform B and other major SCF participants in their SCF business.

Table 5-1. Summary of the relationship between Platform B and SCF participants

SCF participants	Relationship with platform
Bank	• The platform needs banks' capital support to satisfy its SC clients' financial needs. • Platform B has developed a sub-platform focusing on fintech technologies and supports banks' participation in SCF.

	• Banks have better access to the SC big data accumulated on the platform and can rely on platform's professionalism in SCM to provide SCF service.
Focal enterprise	• Platform B can help focal enterprises increase the capital turnover efficiency and reduce operational and financial cost. • Platform B needs focal company's assistance to control the overall risks in SCF.
SMEs	• The platform's SCF service provides these SMEs with an available and affordable financing channel.
Government	• Platform B co-constructs local SCM platforms with various local government to help local government to develop the local SC and SCF business. • Government preferential policies in local areas can stabilise the platform development and support the business expansion. • Platform B needs government's resources and policy support to develop its SC and SCF business.

5.2.4 Managing SCF process

The third capability frequently mentioned by the interviewees in Platform B is the capability of managing SCF processes. In an SCF business, SCF providers need to have capabilities to well manage the financial processes and operational processes. Financial process management mainly relies on the platform's specialisation in SCF operations. Operational processes include logistics, warehousing, and procurement among others. Platform B, as an integrated SC service provider and a leading platform in SCF, needs to govern both SCF processes.

In terms of the platform's capability of managing financial processes in SCF, Platform B believes that the good capability of financial process management must be based on a **standardised operation process design of its SCF services.** This capability is based on the platform's specialisation in SCF operation. For example, Platform B has a better familiarity with the SME's operational status owing to their direct involvement in SCF, which can make the loan process in SCF quicker than the traditional SCF. In the meantime, as the platform has its individual logistics and warehousing system, it can make use of these systems to conduct better post-loan control as the goods are controlled by the

platform. Once the SMEs default, the platform can liquidate the goods to cover the loss in SCF. As stated by Financial Manager 1:

> *"For example, in the factoring business, as we have fully controlled the flow of goods in SCF, we can provide SCF quicker than banks. We just need to sign the agreement of SCF service with focal companies and SMEs. Therefore, when SMEs trade with focal companies through our platform, we just need to approve this trading business and check if SME's financing amount is within the scope. This scope is stimulated in the agreement in advance. After that, we can provide loans to SMEs. The lending speed is very fast, which may be completed in one day."*

In terms of managing operational processes in SCF, Platform B can help focal companies to manage the logistics, warehousing, and procurement processes, which are the non-core business of focal companies. Especially in the logistics and warehousing management, Platform B has a strong logistics system, with distribution centres and warehouses in major capital cities of China, with more than 150 warehouses nationwide. There are no fewer than 10,000 vehicles available to use every day in the whole country. The platform strictly controls the delivery methods: one is to deliver the goods to the designated place, and the other is to pick up the goods at the designated place. In every SCF business relating to goods, the platform must ensure the delivery note and a receipt, complete the transference of property rights, to ensure the actual occurrence of business.

5.2.5 Summary of the Platform B's SCF capability

Table 5-2 makes a summary and explanation on the advantages of Platform B in SCF service.

Table 5-2. Summary of Platform B's SCF capabilities

SCF capabilities	Contents of the capabilities

Information processing	-The platform's direct engagement in SC transactions allows improved access to sufficient SC information. -The platform can collect information from its independent logistics and warehousing system. -The platform can conduct accurate information analysis based on the sufficient data collection and its operational experience. -EDI and blockchain system are adopted for information sharing.
Network structuring	-The platform's SCF mode connects multiple focal companies and SMEs in various SCs. -The platform's integrated SCM service to focal companies and SMEs make them more familiar with the platform, and therefore, the platform can easily interconnect with them in SCF.
Managing relationship with multiple stakeholders	-Platform B maintains a collaborative relationship with SMEs, focal enterprises and banks, and government in the SCF programme.
Managing SCF processes	-Platform B has a standardised operation process design on its SCF services. -Platform B can make the loan process in SCF quicker, because of their familiarity with SMEs resulting from their direct engagement in SCF. -Independent logistics and warehousing system can support the post-loan risk control -The platform's integrated SC service covers the logistics, warehousing, and procurement, which can assist the operational processes in SCF.

5.3 Development of SCF network

As an integrated SCM service provider, Platform B devoted itself to building up the SC service network by the platform. Platform B's SCF programme is operated within the network. As Financial Manager 1 said: *"Our platform plays an adhesive role in the SC or the SCF network. We orchestrate the resources in the network and manage to increase the scope of our network, in order to include more stakeholders in our network to enrich the overall potential network resources."* Platform B's development of its SCF network can be categorised into the development of the reach, richness, and receptivity of the network.

5.3.1 Network reach

Platform B can find suitable SCF partners based on their familiarity with the clients. Before Platform B's implementation of the SCF service to its clients, the platform usually collaborated with them in SC service and provided them with integrated SC service for a period of time. Therefore, the platform is familiar with the clients' operational and financial status. When they merge SCF service with its integrated SC service, it is straightforward to find suitable and qualified partners to collaborate with in the SCF business.

Platform B's superior financial network structuring indicates wider interconnectivity, which means the platform can build a wider link with diversified and distant partners in SCF, and consequently increase the reach of the SCF network. As Operation Manager 1 said:

> *"Our integrated SC service has covered over 320 large- and medium-sized cities and over 10 countries or regions such as Hongkong, Singapore, and the United States, and all our SC service clients and their qualified suppliers or retailers in these areas can leverage SCF to release their cash pressure situation."*

Wider network structuring capability also indicates that the platform's SCF service scope is wider than that of banks, which indicates that the platform's SCF network can include more SMEs, who are less qualified to join the bank's SCF network. As Business Manager 2 said:

> *"In terms of risk evaluation, banks have a strict rating standard that enterprises with different ratings have stipulated lending scales. For the platform, it will first analyse the SME's SC relations and its trading relations with the focal company, in order to analyse the possible risk points in the SCF business. Then we will consider how to avoid the risks in the SCF business and decide if we can directly provide SCF to the SMEs, or we need to cultivate the SMEs, and make them more qualified to be admitted to our SCF programme."*

5.3.2 Network richness

According to Financial Manager Zhu, the purpose of the platform-based SCF is to integrate resources. By integrating bank capital resources, business resources of enterprises, SC resources, and SC service capabilities of the platform, the platform can provide value-added services for different SCF network partners and create synergies with them in SCF.

Platform B can help focal companies conduct specialised SCM, which can improve the overall capital turnover in the SC, improve the SC operational efficiency and reduce SCM costs. Additionally, with the help of Platform B, focal companies can allocate more attention and human resources to the core business, while the other non-core business can be outsourced to Platform B, which can increase the focal companies' competitiveness in the market. As stated by Business Manager 1:

> *"We consider ourselves as an adhesive in the SC network. Through our platform, we have integrated resources from multiple parties and properly allocate the resource to the suitable partner. The focal company can benefit the most from the collaboration with us, as we can improve the capital turnover rate in the supply chain, improve logistics efficiency and reduce costs through SCF services and other additional supply chain services. The services provided by the platform help enterprises simplify their non-core business so that enterprises can devote more energy to the research and development of their products and the expansion of their channels. Also, we share our logistics and warehousing system with our collaborated focal companies, which means that they do not have to put heavy investment in the development of such system."*

As for the banks, Platform B can reduce the risk of information asymmetry caused by banks' inability to fully understand specific customers. According to the Internet Banking Department Manager 1 of Bank B, owing to the banks' indirect participation in SC, they are troubled by the problem of acquiring sufficient operation information with authenticity:

their main channels for obtaining information in SCF are based on the public disclosing financial information. However, SMEs accounts for the majority of SCF clients, whose financial statement is inaccurate and unreliable, which aggravates the banks' information asymmetry in SCF. On the contrary, Platform B is fully engaged in the SC trade, and it has great access to its clients' operational data, which enables them to have an accurate evaluation of the SME clients. The platform can share such data with banks, thus reducing their information asymmetry in SCF.

5.3.3 Network receptivity

Interviewees of Platform B assert that the platform's information processing capability and stakeholder relationship management capability can improve the mutual trust among the network partners and increase stakeholders' commitment to the SCF partnership, which can further promote network receptivity.

With stronger information processing capability, Platform B can collect large numbers of transactional data and operational data based on the integrated SC service. The platform can make use of its SC operation experience and big data analysis to extract valuable information from the accumulated data. The platform shares such information with the collaborated banks and assists banks in understanding the SCF business and the potential risks in SCF, which can increase the banks' trust in the platform in SCF. Also, Platform B as a specialised SC service provider has a better understanding of SCF than banks. When managing relationships with banks, Platform B will share its SCF concept and knowledge with banks to improve their awareness of the essence and benefits of SCF, ensuring that banks and the platform hold the same vision towards the SCF business, which can increase banks' commitment to the SCF partnership. As stated by Business Manager 2:

> *"When collaborating with banks, we need to reduce their concerns about the SCF risks in SCF. For this purpose, we tend to open our SC operation information to banks to make our SCF programme transparent to them to increase their trust in us. We also manage to correct their mindset in the traditional financing business.*

For example, banks focus on examining SMEs' financial status and their own repayment ability in the pre-lending auditing process. However, in SCF service, we have a broader view in the pre-lending auditing process and focus on the examination of the SC situation, in which the SMEs operated. We can share this type of experience and knowledge with banks, making them better understand the SCF service."

Furthermore, by maintaining a better relationship with government agencies, Platform B can leverage the government credit to improve the bank's trust in the platform and increase their commitment to the SCF partnership. As Financial Manager 1 said:

"After SICH becomes our biggest shareholder, our platform's identity has become a state-owned company, so our credibility has greatly improved. In this case, banks have more trust in our platform. At the same time, SICH also employs its government resources to help us expand bank resources and business resources, so that more state-owned focal companies can participate in our SC service system. These focal companies have more commitment to the partnership with us as we represent the interests of the government to a certain extent."

5.3.4 Conclusion of the Platform B's SCF network development.

Table 5-3 summarised the Platform B's contribution to the SCF network characteristics in terms of reach, richness, and receptivity.

Table 5-3. Platform B's development of SCF network

Network characteristics	**Related platform capability**	**Contents of network development**
Reach	-Financial network structuring -Managing relationship with multiple stakeholders	-Platform B can find suitable SCF partners based on their familiarity with the clients. -SCF service can include more qualified SMEs.

		-The platform can build a wider link with diversified and distant partners in SCF.
Richness	-Managing relationship with multiple stakeholders -Managing SCF processes	-Platform B can help focal companies conduct specialised SCM. -Platform B can reduce the risk of information asymmetry caused by banks' inability to fully understand specific customers.
Receptivity	-Information processing -Managing relationship with multiple stakeholders	-Platform B can share its processed SC information with banks to increase their trust in the platform. -Platform B will share its SCF concept and knowledge with banks to improve their awareness of the essence and benefits of SCF, ensuring that banks and the platform hold the same vision towards the SCF business, which can increase banks' commitment to the SCF. -Platform B can leverage the government credit to improve the bank's trust in the platform and increase their commitment to the SCF partnership.

Platform B's SCF network structure is demonstrated in the following Figure 5-6. This figure concludes the major SCF network partners and introduces the key resources held by each partner, and how the resources are exchanged within the SCF network.

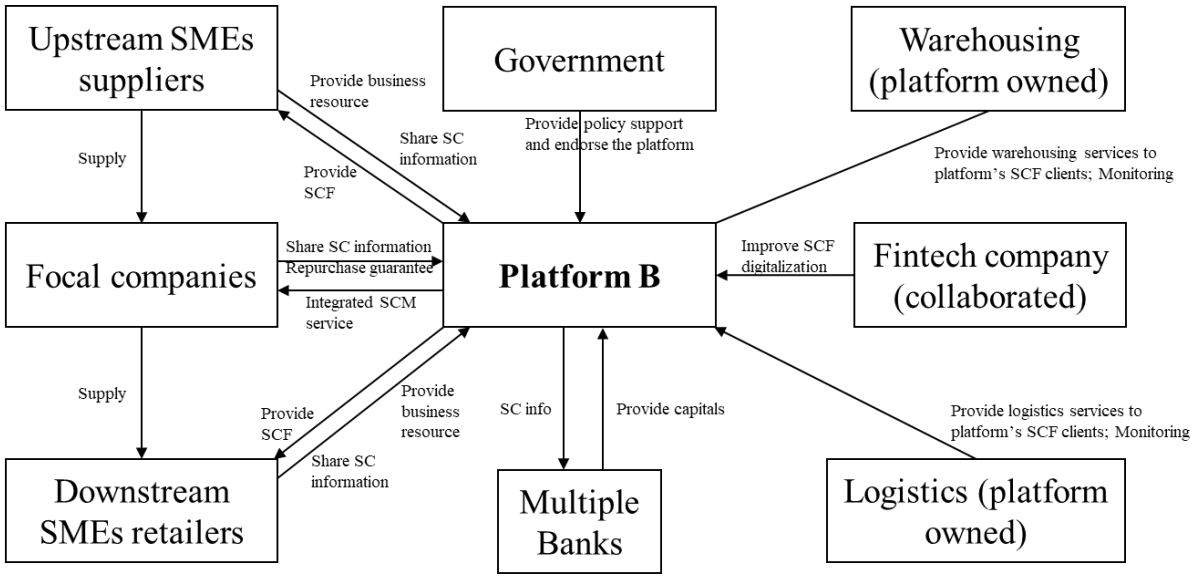

Figure 5-3. SCF network structure of Platform B

5.4 SCF service performance measurement

As platform B's SCF service is derived from its integrated SC services, the platform does not have a specific measurement of its SCF service performance. However, as Financial Manager 1 said: *"We consider SCF service as a branch of our integrated SC services, and therefore, as a type of service, customers' acceptance to our service is a representative indicator that reflects our SCF service performance."*

Platform B agrees with the acceptance-based measurement of their SCF service performance. The platform needs to ensure the banks' acceptance to ensure an adequate source of capital in SCF, and their acceptance is usually related to the risk controllability in SCF. Higher acceptance of focal companies can reduce the risks and improve the stability of the platform's SCF, and their acceptance is determined by the potential benefits of the platform's SCF to their SCM improvement. SMEs' acceptance to the SCF indicates the profitability of the SCF service, and their acceptance is related to the availability and affordability of the SCF service.

However, in the Platform's major mode of SCF, banks do not directly engage in the SCF programme. Banks' acceptance is still important to measure the platform's SCF service performance. Banks are the major source of capital in SCF; therefore, banks need to understand the platform's SCF business and evaluate whether the risks in SCF are well controlled by the platform through technological means, or if the collaborated focal companies are qualified enough to help the platform cover losses once SMEs default. According to Internet Banking Department Manager 1 of Bank B:

> *"The major factor affecting our acceptance to the platform's SCF is the risk controllability of its SCF service. We need to understand the platform's overall SCF business logic and ensure that the platform has adequate risk control methods to deal with the potential risks in SCF, especially in the downstream SCF business. In this case, we can ensure that the platform can repay the loan to us in time."*

When the risk control in the platform's SCF is insufficient, banks' acceptance to the platform's SCF will be greatly reduced. From 2015 to 2018, Platform B expanded rapidly, and the breadth of its SC services increased substantially, but the depth decreased, which means Platform B lacks an understanding of the SC it serves. Therefore, risk assessment of banks to the platform has increased, resulting in a decrease in financial support for the platform.

As for the focal companies, they tend to have more acceptance to the platform's SCF service once they have perceived the potential benefits of the SCF adoption to the SC effectiveness. For example, Platform B can offer integrated SC services, such as logistics, warehousing, procurement, and integrated SCM service, to help focal companies reduce SC costs and increase SC efficiency. The availability and affordability of the SCF determine the SMEs' acceptance of SMEs to the SCF service. According to Platform B, without the support of the platform, SMEs do not have sufficient collateral and complete financial statements, which makes them hard to access affordable financial resources from

banks. SMEs can accept Platform B's SCF as this service provides them with more opportunities to access affordable financial resources.

5.5 Case summary

As one of the most successful SC service companies in China, Platform B is the first group of companies to explore the SCF business in China, and its SCF service is closely interrelated with its integrated SC service. Platform B believes that the platform is the resource orchestrator in the SCF network, which integrated resources from multiple parties and relocated the resources into the network. In the view of Platform B, platforms will act as a leading role in the future SCF market in China, and to achieve this, third-party SCF platforms should engage in the expansion of their business volume in SCF, to capture more business resources from the focal companies and SMEs, which can increase platform's bargaining power to banks when they seek collaboration with them. This chapter first introduces Platform B's SCF business mode, wherein platform B's SCF capability, its SCF network development, and its measurements of its SCF service performance are discussed in detail.

The Platform B's SCF capabilities can be concluded as information processing, financial network structuring, managing relationship with multiple stakeholders and managing SCF processes. In terms of information processing, the platform specifies that there are three aspects of information processing. First, the platform stresses their strength in information acquisition owing to their direct engagement in the SC activities and technology application. Second, the platform believes that the adoption of big data analysis and its operational experience in specific industries enable them to accurately analyse the collected data. And the adoption of EDI system and blockchain technologies enable the data exchange among related parties securely and effectively.

Platform B believes that how the platform can build links with multiple stakeholders in SCF is the second essential SCF capability. This capability is derived from its traditional SCM service to its customers; therefore, the customers are familiar with the platform, which makes the platform easy to interact with them in its SCF programme.

The third identified capability is managing relationship with multiple stakeholders, as the platform believes that a long-term and stabilised collaborative relationship with stakeholders is essential for the SCF development. The platform emphasises the relationship with focal companies to share the risks in SCF and the relationship with governments to obtain policy support for the SCF development.

The fourth capability is managing SCF processes, the platform argues that financial process management must rely on the standardised operation process design of the SCF services. And the operational process management relies on the platform's provision of integrated SC service such as warehousing and logistics.

The platform D's network structure is identified, and the platform consider it acts as an adhesive in the SCF network, in which the platform orchestrates the resources in the network. The positive relationship between SCF capability and the improvement of the network characteristics of reach, richness and receptivity is confirmed.

For the SCF service performance measurement, because Platform B's SCF service is derived from its integrated SC services, the platform does not have a specific measurement of its SCF service performance. However, the platform agrees the acceptance-based measurements method, especially the acceptance of focal companies and SMEs are significant indicators of SCF service performance.

Chapter 6. Platform C: Reconstructing the upstream supply chain with SCF in the construction industry

This chapter illustrates Platform C's SCF practices in the construction SC in China. The first section introduces the basic information of Platform C and how the platform implements its SCF service in the upstream construction SC. The second section discusses Platform C's SCF capabilities, and the following section discusses the platform's SCF network development and SCF service performance measurements respectively.

6.1 Introduction

This section first introduces the basic information of Platform C and illustrates the platform's core businesses and how the platform develops its SCF service in the construction SC. The rest of this section presents Platform C's business model and introduces the platform's reverse factoring services.

6.1.1 Company background

Platform C is the largest B2B e-commerce platform in construction industry. This platform first proposed the SC strategy in the construction industry in China, empowering the modern construction industry with precise SCM and an ecological circle. This platform creatively adopts the mobile technology, live broadcast technology, artificial intelligence and blockchain to help the construction companies reduce costs, control risks, and improve the overall SCM, especially the procurement management.

Platform C was established in September 2014, and initially provided centralised procurement service for the special qualification[2] private-run construction companies and their upstream material suppliers. On November 29th 2016, Platform C collaborated with Ping An Banks and issued the first e-commercial bill with a limit of 200 million RMB in Chinese construction industry. This platform was the first to build SCF in the construction industry and devoted itself to the constant exploration of SC traceability technology to help financial institutions and make the SCF service truly service the SMEs enterprises in the construction industry. By the end of 2021, the accumulative transaction volume on the platform reached 150 billion RMB.

In 2017, Platform C upgraded its platform to be more specialised in SCF, aiming at strengthening the collaboration with financial institutions to jointly build the industry and finance ecosystem of the construction SC. The platform integrates the real SC transaction data of both buyers and suppliers and share such data to financial institutions to assist financial institutions to provide financial support to SME suppliers. With the help of the platform, SME suppliers can obtain payment in advance and reduce the amount of account receivable assets, which can significantly alleviate SMEs' capital pressure and improve the working capital turnover.

6.1.2 SCF business mode of upstream reverse factoring

As platform C serves material transaction in the construction SC, and material transaction usually takes place in the upstream SC, this means that Platform C's SCF service mainly focuses on the upstream SC.

Platform C serves for the construction company's procurement from the upstream supplier, matching the transaction between the construction enterprise and suppliers. In this process,

[2] Special qualification: it is a qualification measurement standard in the construction industry in China. As proposed by the Chinese construction industry association, by the end of 2021, there are 740 special qualification company in the construction industry, of which 308 are private-run company, accounting for 41.26% of the total

besides the management of bidding and purchasing, after signing the contract, the platform also helps construction companies manage their SC, for example, managing orders, warehousing, invoices, and contracts. From this management practice, Platform C finds that after bidding, contract, and receipt invoice, the construction companies usually would not pay their suppliers immediately, therefore, suppliers cannot collect the project payment and their days payable outstanding varies from half to one year.

However, the procurement between suppliers and construction companies takes place on the platform; the platform can witness the actual transaction between supplier and construction company, and therefore witness the process of account receivable (for suppliers) and account payable (for construction companies) formation between both parties. In this case, the platform can recommend focal companies to banks and provide the transaction information, account receivable, and payable information recorded on the platform to the collaborated financial institutions and further assist financial institutions in carrying out transaction background verification (such as the authenticity of the transaction). After the platform's recommendation, the bank will conduct due diligence to the recommended focal companies. Once the qualification of the focal company is accepted by the bank, the bank will provide the focal company with a number of special capitals, which will be used in the reverse factoring.

Banks can then decide whether to lend money to suppliers with financial needs and decide the interest rate after combining their own evaluations of both buyers and suppliers. Once the suppliers' quality passed the banks' audit process, suppliers can discount their account receivables from banks through the SCF method of reverse factoring. When the focal company needs to make a payment to its suppliers, it will open a commercial paper to the suppliers. If the supplier is cash-constrained, it can submit a financing application on the platform. The platform is responsible for first-round inspection, such as checking the authenticity of the transaction between the supplier and the focal company by matching the corresponding information flow of the SC transaction. Following this, the application will be submitted to the bank, and the bank will conduct the second-round inspection. After the

inspection, the bank can finance the supplier and the supplier transfers the focal company's commercial bill of account receivable to the bank. The focal company makes a payment to the bank when the bill is due. The following figure 6-1 presents the SCF mode of Platform C.

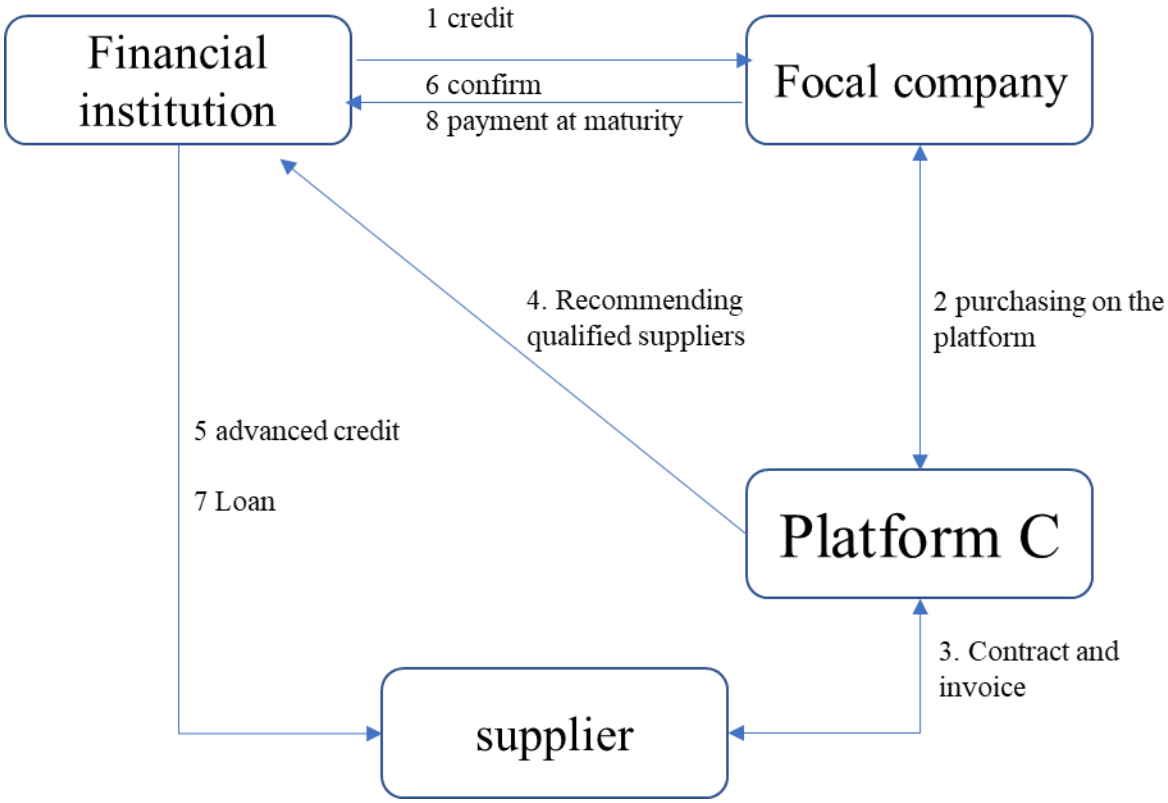

Figure 6-1. Platform C business mode

6.2 Platform C's SCF capabilities

This section introduces the most significant SCF capabilities required in the SCF service in the upstream construction SC. Concluded from the opinions of the interviewees in Platform C, the upstream SCF platform relies on their information management capability, financial network structuring, relationship management capability and process

management capability to provide qualified SCF service for their clients. The following sections tend to introduce and justify each capability in detail.

6.2.1 Information processing capability

As a platform focusing on the SCF services in the upstream SC, interviewees of Platform C frequently stressed their information management capabilities in SCF and believed that the **competition in the upstream SCF market largely relies on the SCF providers' information management capability**. As stated by Chairman 2:

> *"The upstream SCF market is large, and there are various SCF service providers. As the traditional service provider, banks are still affected by the problem of information asymmetry in the upstream SCF business. Most of the enterprises with financing needs in the upstream are SMEs. Their financial information is not complete, their credit records are few, and their collateral is insufficient. It is difficult for banks to make an accurate evaluation of these enterprises because they rely too much on financial data. But it's not that they don't want to get the operational data of SMEs, but because they do not participate in the supply chain. On the other hand, the procurement platform we built allows supply chain transactions to take place directly on our platform. We can* ***directly receive the relevant purchasing information and SMEs' operational information on the platform****."*

Information analysis is another essential aspect of information management capability. Before Platform C started the SCF business in the construction SC, it had already provided procurement services in the construction industry for years, which makes the platform more familiar with and have a better understanding of the industry. These benefits can improve the platform's information analysis in SCF. As stated by Vice President 4:

> *"If you want to do a good job in SCF, service providers must have a full understanding of supply chain and industry. In China's SCF market, the degree of segmentation is very high, so the specific situation of each industry is different, and*

the aspect of data analysis is also different. Based on our operating experience in the construction industry, the platform can discover more information that can support supply chain financial decisions from the existing data."

Platform C's **information analysis also relies on the adoption of big data analysis**. As the platform possesses massive transactional information, adopting big data analysis can help the platform generate an accurate portrait of the SMEs and conclude their trading habits. It can help the platform to have accurate recommendations of projects to the most suitable suppliers and in this case, the transaction occurrence rate on the platform is improved and the opportunities to provide SCF are thus increased.

Information management capability is also determined by how the platform can effectively and securely share information with related parties. Apart from equipping the traditional EDI system among related parties, Platform C builds an alliance chain system with collaborating banks. In the alliance chain, once the collaborated banks agree to participate in the platform's SCF service, they will be authorised in the chain and can access a series of information from bidding contracts to receipt invoices. Vice President of Products 1 said:

"Our blockchain system is only equipped for two years, and therefore, the historical transactional information stored on the chain is limited. However, after years of information accumulation on the chain, the value of this blockchain system can be reflected. The authenticated transactional information of SME suppliers with financing needs can be presented to the banks which can help banks to better evaluate the risks in providing capital to such company."

6.2.2 Financial network structuring capability

According to Chairman 2, how the platform properly structures the financial network in SCF is the very basic step for the platform to provide SCF service, and the **platform needs to be interconnected with multiple essential stakeholders and ensure their willingness**

to participate in its SCF programme. Platform C leverages the platform's interconnectivity attributes and seeks to build initial collaboration with various SCF stakeholders.

In traditional SCF service provided by banks, banks are the SCF service providers as well as the capital providers. One bank has a competitive relationship with other banks in SCF. Therefore, in a bank-initiated SCF, only one bank is involved in it. Furthermore, in the focal company-initiated SCF, the SCF service can only service the SC of a specific focal company, as a focal company usually have no interest in helping others to solve the SC issues. However, Platform C has changed this situation. As stated by Chairman 2:

> *"Platform-initiated SCF is what we called SCF 3.0 in China. In this mode of SCF, SCF is not limited to a single SC and does not rely on a single bank. Our platform makes use of our interconnectivity attribute to increase the number of SCF participants through the mode of N+N+N, which means that multiple SMEs, focal companies, and SMEs are serviced on the platform and are financed by multiple banks. We are now collaborated with eight banks and jointly serve a hundred focal companies and over 30,000 suppliers in the upstream construction SC."*

Network structuring capability emphasises the initial collaboration establishment in SCF. Platform C believes that the platform needs to possess attractive resources or capabilities to captivate stakeholders to initiate collaboration in SCF. As stated by President Wen:

> "*We integrated SC information and suppliers' financing need, which reduces banks' costs in due diligence and information acquisition. That's one of the major reasons for banks to start a collaboration with us in SCF. Also, for the focal companies, our positive assistance in their procurement management and SC management also pose great attractiveness for them to adopt our platform."*

6.2.3 Managing relationship with multiple SCF stakeholders

Stakeholder relationship management capability is also stressed by the interviewees of platform C. According to the interview data, relationship management capability is the extension of the network structuring capability. The former focuses on the initial relationship establishment with stakeholders, while the latter aims at maintaining the collaborative relationship with stakeholders.

6.2.3.1 Relation with financial institutions

As platform C is a light asset enterprise, for the successful operation of SCF service in the upstream SC, the platform **needs external financial support** to satisfy the large amount of capital needs of tens of thousands of SME suppliers. In this case, banks usually have sufficient capital reserves and are considered the primary source of capital in Platform C's SCF programme. Therefore, for Platform C, maintaining a stable collaboration relationship with banks is crucial.

The platform is a high-quality source of customers for banks. On the platform, over 400 construction companies and over 30,000 suppliers do business, and the turnover reaches 30 billion RMB. The platform can recommend high-quality suppliers and special qualification focal companies to banks, which can reduce the bank's customer acquisition cost.

Through the collaboration with Platform C, banks' participation in SCF is greatly simplified. Platform C helps banks clearly understand the SC transaction structure and transaction background in SCF and banks' information asymmetry in SCF. Successful SCF operation requires SCF service providers to well manage the SC. It is difficult for banks to control everything in the SC, and it can also generate a huge cost of human resources and technology investment. Vice President 5 said:

"Banks can do SCF by themselves. However, they are troubled by the issues of SC fraud, such as self-financing and self-guaranteeing, which may cause great losses to banks. Banks cannot well manage the large numbers of SMEs with financial needs in the upstream supply chain. Therefore, collaborating with us is a good option as we have professional human resources to help them ensure the authenticity of the SC trade and reduce the risks in SCF. We also have mature technology applications in SCF and collaborating with us means banks directly benefit from our technology capability."

As stated by Customer Manager 1 of Bank A: *"Our bank participates in SCF mainly for achieving the inclusive financing requirements and increase our profitability."* Inclusive financing aims at serving large numbers of SMEs with financial needs. Owing to the large quantities of SMEs in the upstream construction SC, banks do not have sufficient human resources to conduct detailed auditing of each SME. However, through Platform C's SCF programme, SMEs' credit is guaranteed by the qualified focal companies' credit and therefore banks do not need to be so meticulous when auditing the SMEs. Also, Platform C acts as the information channel that helps banks acquire the required information. Meanwhile, banks' profit structure is changing, and their profits can be increased through collaborating with Platform C. As indicated by Marketing Manager 2:

"For example, if a bank gives a credit of 200 million RMB to a focal company and designated that this fund must be applied to discount the accounts receivable of upstream suppliers, through factoring and discounting, the bank can split these 200 million RMB loans into several individual financing to upstream SME suppliers. Therefore, through our SCF programme, banks have actually completed three kinds of businesses: granting credit to focal companies, providing inclusive financing to SMEs, and increasing loaning income."

Platform C also includes guarantee companies in their SCF service to further control the potential risks in SCF. The guaranty company would guarantee the suppliers' discounted

commercial bill of account receivable, while the guarantee company requires the focal company to provide a counter-guarantee for the suppliers' discounted commercial bill of account receivable. Focal companies may provide collateral to the guarantee company, in case of possible uncontrollable risks from the focal company. After the guarantee company receive the letter of guarantee from the focal company, it will then inform banks to make loans to SMEs.

6.2.3.2 Relation with focal companies and SMEs

Focal companies and SMEs are primary users of the SCF platform. **In the upstream SCF, focal companies' participation is greatly important as the reverser factoring is executed based on the focal companies' credits.** Focal companies also need the platform to effectively implement SCF in the SC. As stated by Chairman 2:

> *"In order to successfully implement the SCF in the SC, focal companies need to have cheap financial resources and mature technology platforms. For most of the focal companies, it is difficult for them to possess these, except for the leading companies in the industry. Therefore, for focal companies, the most appropriate mode is to collaborate with the vertical specialised platform in SCF."*

When the focal company purchases from suppliers, they tend to guarantee a payment term of six months on average to the suppliers, which means that suppliers can only receive this payment at the minimum of six months after the signing of the supply contract with the focal company. Due to the informal business environment of the Chinese construction industry, SME suppliers have limited channels to get finance to solve their urgent capital needs: only those suppliers of high quality can be financed through banks, however at an average cost of 20%. For those SME suppliers, it is impossible to use bank finance. Once the suppliers have confronted liquidity issues, they usually choose to get financing through informal channels, which in turn can greatly increase their cost of capital. If the cost of capital for them is high, they tend to increase the bid price they offered to the focal company. President 1 of Supplier C, one of the largest supplier clients of the platform, said:

"Suppliers like us need to use our own capital to prepay the project payment owing to the existence of the payment term. This capital occupation has a negative influence on our business expansion. However, most of the upstream suppliers are SMEs, and they are usually short of working capital. Therefore, the capital occupation can cause severe effects on their daily operation, and even their survival."

Platform C found this issue in the construction SC and managed to use SCF to help the focal company control the overall cost of the SC. Chairman 2 said: *"With the use of SCF, suppliers can receive the project payment in advance at a discount rate of 8%-9%. Compared with the previous cost of capital of 20% on average, it can significantly lower the SMEs' cost of capital and increase their liquidity. The decreased cost of capital can eventually be reflected in the bidding price the supplier offered to the focal companies, and therefore can help to reduce the overall cost of the SC."*

Additionally, the turnover rate of SMEs can also be improved. Vice President of Products, 1 said: *"If there are 1 million RMB working capital available for a supplier and the turnover of this 1 million can make a profit of 100 thousand RMB, without the platform's SCF service, this amount of capital can be turned over every six months, with an annual profit of 200 thousand RMB. However, once the reverse factoring is adopted, this capital can be turned over ten times, and the SMEs' profits can also be increased ten times."*

As a result, with the help of the platform's SCF service, suppliers are more willing to do business with focal companies on the platform, and the relationship between the focal company and suppliers has enhanced accordingly.

Focal companies also rely on Platform C to have better control of their SC. For example, Marketing Manager 2 indicates that the focal company's purchasing cost accounts for over

60% of its overall cost. Therefore, focal companies need an integrated solution to solve the problem of internal control to manage contracts, invoices, and payments, among others. Platform C helps focal companies interact with suppliers and assists them to manage the procurement processes.

Once the focal company has collaborated with Platform C, its suppliers would be required to adopt the platform to complete business with the focal company. For suppliers, they are relatively passive due to a lack of understanding of platform functions at the initial stage, but they will find the expansion of business volume by using the platform.

For example, in the past, a supplier would have a stable business with limited numbers of focal companies. It has limited chances to start a business with other focal companies, as other focal companies have no previous transaction with the supplier and therefore, the focal company is not familiar with the supplier. Platform C has changed the situation. Once the suppliers are admitted to the platform, the operational and financial status of the suppliers is guaranteed by the platform. Through the platform, suppliers can have access to the business of other focal companies and get the opportunity to supply them. Executive Vice President of Executive 1 said:

> *"On the platform, as long as the focal company starts public bidding for its project through the platform, all the related suppliers who have adopted the platform can submit their bidding documents to the focal company. Once the supplier's qualification is accepted by the focal company, suppliers will be given a chance to supply, and if there is no problem in the first supply, the supplier can gradually expand its business by serving more focal companies."*

6.2.3.3 Relation with governments

Governments are also considered related stakeholders in Platform C's SCF business. Although platform admit that government engagement in SCF has a positive influence on

the SCF development, Platform C has limited interaction with local government; this is because Platform C's SCF service aims at serving the private focal company in the areas of Jiangsu and Shanghai. The large numbers of state-owned focal companies are out of Platform C's service scope. Governments are more interested in SCF platform serving the state-owned focal company.

Despite the limited interaction with the government, Platform C still confirm the positive role of government in promoting the SCF development. For example, Chairman 2 said: *"The rapid development of SCF in China is encouraged by the government. In 2017, Chinese central government issued a document that encouraged the innovation in SC and aimed to improve the SCF management system."* This could potentially encourage local governments to introduce more policies beneficial to the innovative SCF providers, such as the SCF platform. The improvement in the SCF management system also encouraged more banks to collaborate with platforms to initiate SCF service. As stated by Chairman 2:

> *"Banks' participation in SCF is largely affected by the macro-policy environment. Government plays a great role in policy guidance and behaviour guidance. Before 2017, the willingness of large banks to employ SCF is low. The primary participated banks are rural commercial banks and city commercial banks. However, after the Chinese government introduced the document in 2017, banks are now required to start inclusive financing to increase the financial support to SMEs. Our SCF service can help banks to achieve this goal; therefore after 2017, we find that it is easier to establish collaboration with the large banks."*

Platform C actively seeks opportunities to extend collaboration with government agencies to obtain more support from the governments. For example, Platform C plan to collaborate with Shanghai United Property Rights Exchange in managing the state-owned construction project. Platform C helps government to increase the transparency of the government's project through digitalised SC management method. However, Chairman 2 said: *"Reaching cooperation with the government would be time-consuming. The collaboration*

project with Shanghai United Property Rights Exchange has been established for a year owing to the Covid-19 pandemic."

Table 6-1 summarised the relationship between Platform B and other major SCF participants in their SCF business.

Table 6-1. Summary of the relationship between Platform C and SCF participants

SCF participants	Relationship with platform
Financial institutions	-The platform relies on banks' capital to provide SCF service, while the platform is a high-quality source of customers for banks. -Banks' participation in SCF is greatly simplified through the collaboration with Platform C. -Banks' profit structure is changing, and their profits can be increased through collaborating with Platform C. -Platform C can help banks in terms of inclusive financing business. -Platform C also includes guarantee companies in their SCF service to further control the potential risks in SCF.
Focal enterprise	-Platform relies on focal companies' credit to provide SCF service to SMEs, while focal companies need the platform to effectively implement SCF in the SC. -Platform C found this issue in the construction SC and managed to use SCF to help the focal company control the overall cost of the SC. -Focal companies rely on Platform C to have better control of their SC.
SMEs	-The platform's SCF service provides these SMEs with an available and affordable financing channel. -The platform can help SMEs expand their business volume.
Government	- The Government can enact macro-level policies to boost the SCF market -Platform C plan to collaborate with Shanghai United Property Rights Exchange in managing the state-owned construction project.

6.2.4 Managing SCF processes

The last SCF capability mentioned by the interviewees in Platform C is the capability of managing various SCF processes. The upstream SCF includes various financial processes and each process requires different stakeholders' participation. In order to be more

specialised in SCF, Platform C has proposed **a set of standardised operation processes** to increase their proficiency in SCF operation. Vice President of Products 1 said:

> "*Our SCF service has a set of standardised operation processes. It clearly stipulates the interests and obligations of each participant in different nodes of business. The standardised operation process improves the landing speed of SCF projects and the service efficiency and quality of SCF.*

Platform C's specialisation in SCF is believed to have a great effect on the process management capability, especially for the pre-loan risk control. Vice President of Executive 1 said:

> *"Our understanding of the construction industry is better than that of banks. Banks only look at financial data, but they do not know whether the amount of material purchasing is reasonable. For example, if the amount of raw material purchased for a small construction is beyond the normal amount, the platform can realise the abnormality of this purchasing, and will conduct a deeper inspection of this company, in order to ensure the authentication of the transaction. Also, the pre-loan risks are reduced accordingly. However, banks may not know the irrationality of this information."*

Platform's process management capability is also related to the platform's comprehensiveness of the SCF service. Higher comprehensiveness of the SC indicates that the platform can have better control of both the financial processes and related physical processes in SCF. Platform C has greatly improved the SC digitalisation of the construction SC. Before the platform entering the construction SC, the SC is loose-jointed, and the digitalisation level is low. As quoted by the Vice president 4:

> *"When we first served the construction companies, we surprisingly found that these focal companies only have OA and financial software and there is no digital office system. Focal companies don't even know how many contracts they have signed,*

because each contract is scattered in various projects departments or branches. Focal company tend to pay the project payment every month. Focal company will send out a number of forms for the projects department to fill in, and then the branches summarise these forms to the group, and then the group knows how much to pay and where to pay. It is a very traditional and time-consuming management method. However, through the platform APP, focal companies can conveniently know the number of contracts, accounts payable and the number of bidding document, which can greatly improve the focal company SC management efficiency."

6.2.5 Summary of the Platform C's SCF capability

Table 6-2 makes a summary and explanation on the advantages of Platform C in SCF service.

Table 6-2. Summary of Platform C's SCF capabilities

SCF capabilities	Contents of the capabilities
Information processing	-The platform can directly collect relevant purchasing information and SMEs' operational information on the platform. -Adoption of big data analysis and Platform C's better understanding of construction industry improve its information analysis in SCF. -EDI and blockchain system are adopted for effective and secure information sharing.
Network structuring	-The platform's N+N+N SCF mode connects multiple focal companies and SMEs in the construction SC. -The platform has attractive capabilities to build links with banks and focal companies.
Managing relationship with multiple stakeholders	-Platform C maintains a collaborative relationship with SMEs, focal enterprises and banks, and government in the SCF programme.
Managing SCF processes	-Platform C has proposed a set of standardised operation processes to increase their proficiency in SCF operation. -Platform C's specialisation in SCF is believed to have great effect on the process management capability, especially for the pre-loan risk control. -Platform C has greatly improved the SC digitalisation of the construction SC.

6.3 Development of SCF network

As the SCF providers, platform C considers its role in SCF as a supportive actor, to support banks to acquire adequate information in SCF, to aid in SMEs getting financed, and for the focal company to conduct SCM. Most importantly, Platform C promotes the SCF network in the construction SC. Vice President 5 said: *"We assume that our platform is more of a supportive actor in SCF. It is because we only provide an online trading platform for focal companies and SMEs, the goods do not pass through our platform, and therefore we actually do not participate in SC trade. Also, we do not provide capitals in the SCF service, at least not for now. The real value of our platform lies in our contribution to the formation of SCF network in the construction SC."* Platform C's development of SCF network can be examined through the aspect of reach, richness, and receptivity of the network.

6.3.1 Network reach

Platform C has greatly improved the number and variety of participants in the SCF network through its network structuring capability. With greater network structuring capability, Platform C's SCF break through the limitation of a single capital provider and single SC in a traditional SCF network. The N+N+N SCF mode makes the platform able to interconnect with increasing numbers of focal companies and financial institutions and attract them in the SCF programme. Platform C has also improved the variety of the network partners: for example, guarantee company are included in the SCF network.

Platform C also includes more SMEs in its SCF programme. These SMEs are less qualified for banks to get financed through the traditional SCF method. Before Platform C provides SCF service in the construction industry, it had engaged in the SCM services for years in this industry. If the supplier is an old user of the platform, Platform C can have a better understanding of this supplier's transactional and operational information. Therefore, when examining the qualification of the supplier, the platform tends to pay more attention to the supplier's transactional and operational information, instead of the supplier's financial status, thus making the platform's SCF admission threshold lower than that of banks.

Eventually, through Platform C, more SME suppliers get involved in the SCF network. As stated by Vice President of Executive 1:

> *"Our platform has a great understanding of the ecosystem in the construction industry and knows construction companies and SME suppliers better than banks. In reverse factoring, the qualification examination mainly focuses on the focal companies as they are the final payer in upstream SCF. As for the SMEs, we do not require them to provide any collaterals, and they just need to update the transactional information and related documents on the platform. Once our platform has verified the authenticity of the provided information and documents, SMEs can use our SCF service."*

6.3.2 Richness

As a supportive actor, Platform C promotes the integration of essential resources possessed by different SCF stakeholders, aiming at exploring potential value-creation opportunities for different stakeholders, which lead to the generation of synergy effect and thereby improve the richness of the network.

Platform C assists focal companies in forming a better SC relationship with SMEs, increasing the control to the upstream suppliers. Through the SCF programme, suppliers can share the focal company's credits to reduce the financing cost, while the focal company enjoys the lower purchasing cost and increased SC efficiency. Platform C can make use of focal company's credit resources to ensure the successful operation of its SCF programme.

The adoption of SCF can increase the capital turnover in the upstream SC and make suppliers have a close relationship with the focal company. As stated by President 1 of supplier A: *"Our company are supplying several focal companies. However, the goods are limited, and our capital is also limited. Therefore, we may give priority to the focal company with favourable payment terms."* Such a closed relationship with suppliers may

benefit the focal company in terms of improving supply efficiency. The Financial Manager 2 of Company C, which is one of the focal companies collaborating with Platform C, said:

> *"Through the adoption of the SCF, we can offer our suppliers a preferential payment term, which makes the suppliers more willing to do business with us. Once our suppliers can get paid in time through SCF, they can better fulfill their obligation of supplying us and tend to actively respond to our requirements. In this case, the risk of project shutdown because of inefficient supply will be reduced. "*

While SCF can enable focal companies to offer preferential payment terms to suppliers, SMEs' cost of capital is reduced as they can leverage the SCF service to solve their liquidity issues instead of using the informal financing method that has a very high interest rate. Once the suppliers can lower the cost of capital, they tend to reduce their bidding price to the focal companies. As stated by Marketing Manager 2:

> *"Suppliers are more willing to do business with a focal company who gives them preferential payment terms and to maintain a close collaboration with such focal company. Because when supplying such focal company, SMEs can get paid faster and therefore reduce the financing cost. Also, their turnover rate of capital is increasing, which can bring more profits to them. When realising these benefits, SMEs tend to lower their bidding price in the next supply to the focal company. In this case, the focal company's purchasing cost is reduced."*

As for banks, Platform C can significantly reduce banks' customer acquisition costs. The platform can directly recommend qualified focal companies and SMEs to the collaborated banks. In this case, banks do not waste time and human resources to search for suitable customers, especially SME customers. It can effectively decrease banks' difficulty in providing inclusive financing to complete the government's requirements. President 2 of Banks A confirmed that through the collaboration with Platform C, Bank A has overfulfilled the task of inclusive financing tasks assigned by the government and made considerable profits from it. Meanwhile, Platform C shares the accumulative transactional

information on the platform with collaborated banks and reduces their risks in SCF. Vice President 5 said: *"With our help, the accumulative loans from banks to SMEs reach 1.6 billion RMB, of which no bad debt and overdue has occurred."*

6.3.3 Receptivity

Platform C can leverage its information processing capability and stakeholder relationship management capability to improve the mutual trust among network partners, and increase the stakeholder's commitment to the SCF partnership and multiplexity to promote network receptivity.

Platform C emphasises the importance of trust building in the development of the SCF network. The platform needs to cultivate more trust with network partners, especially with financial institutions. Because the platform is a complete third-party in the SCF, they do not provide capital and do not participate in the SC transaction; banks lack trust in the platform and tend to question the platform's credibility in SCF. This problem is not unique to platform C, but also trouble all the other third-party platforms, especially for SCF platform providing upstream SCF services. In this case, Platform C first successfully implemented the first SCF service in construction SC with Bank B, who are the first mover of SCF in China. Platform then leverage the successful collaboration experience to obtain more trust from other banks.

Moreover, as a third-party platform, Platform C has low motivation to participate in SCF fraud, as the fraud cost is extremely high for the platform. This attribute can help the platform obtain trust from banks. Chairman 2 said:

> *"If a bank finds that there is a problem with the data of the company recommended by us, it can make other collaborated banks be suspicious of the data provided by our platform. Our reputation can be seriously damaged. Normally, if we suspect that the focal company and its supplier provide fraudulent documents, we will not*

recommend these companies to banks until we complete the verification of the transaction authenticity. As a third-party platform, we hope to provide the truest information to financial institutions, and let banks decide whether to provide financing or not. What we want is to continuously expand our business volume, and we will not affect the development of the platform in order to make profits for individual enterprises."

With the information processing capability, the platform can promote information sharing among the stakeholders, which can significantly improve the mutual trust among network partners. The platform's accurate information acquisition and effective information sharing ensure transparency in the SCF business. Vice President of Product 1 said:

"On our platform, any account receivable can be traced back to the materials of the specific construction site. In this case, our platform can help banks to better control the flow of capital provided by banks, and if the bank has questions about any account receivables for financing, we can explain to them which SME applies for the funds, which focal company this SME serves and which specific construction project this fund is used for."

Therefore, as platform C ensure collaborated banks are well informed in the SCF, they can thus increase their trust to the platform and companies with financing needs.

In the construction industry, to some extent, reaching collaboration with focal company relies on the intrapersonal relationship. If the platform's manager has a close relationship with that of the focal company, the company is inclined to have a close collaboration with the platform. This is the same when platform manage to reach collaboration with banks. As stated by Vice President 5:

"We will hold meetings to invite key departments in our cooperative banks. On the meeting, we will introduce them to our development plan and SCF product design

and discuss opportunities to strengthen our collaboration. Also, personally, I oftentimes contact the presidents of our cooperative banks in private to discuss our view of SCF development: it can ensure the smooth cooperation between banks and our platform."

6.3.4 Conclusion of the Platform C's SCF network development.

Table 6-3 summarised the Platform C's contribution to the SCF network characteristics in terms of reach, richness, and receptivity.

Table 6-3. The Platform C's development of SCF network

Network characteristics	**Related platform capability**	**Contents of network development**
Reach	-Financial network structuring -Managing relationship with multiple stakeholders	-Platform C has improved the variety of the network partners: for example, guarantee company are included in the SCF network. -The Platform's SCF service can include more qualified SMEs. -The platform can build links with more banks and focal companies based on its N+N+N SCF mode.
Richness	-Managing relationships with multiple stakeholders -Managing SCF processes	-Platform C assists focal companies in forming a better SC relationship with SMEs, increasing the control to the upstream suppliers. -The adoption of SCF can increase the capital turnover in the upstream SC and make suppliers have a close relationship with the focal company. -Platform C can significantly reduce banks' customer acquisition costs and effectively decrease banks' difficulty in providing inclusive financing to complete the government's requirements. -Platform C shares the accumulative transactional information on the platform with collaborated banks and reduces their risks in SCF.

Receptivity	-Information processing -Managing relationship with multiple stakeholders	-The platform stressed the significance of cultivating more trust with network partners, especially with financial institutions. - Platform C has low motivation to participate in SCF fraud, as the fraud cost is extremely high for the platform, thus helping the platform obtain trust from banks. -The platform can promote information sharing among the stakeholders, which can significantly improve the mutual trust among network partners. -Individual and departmental meetings between platforms and stakeholders are held occasionally.

In the following Figure 6-5, the structure of Platform C's SCF network structure is presented, in which the major SCF partners and the resources exchange between the platform and the partners is concluded.

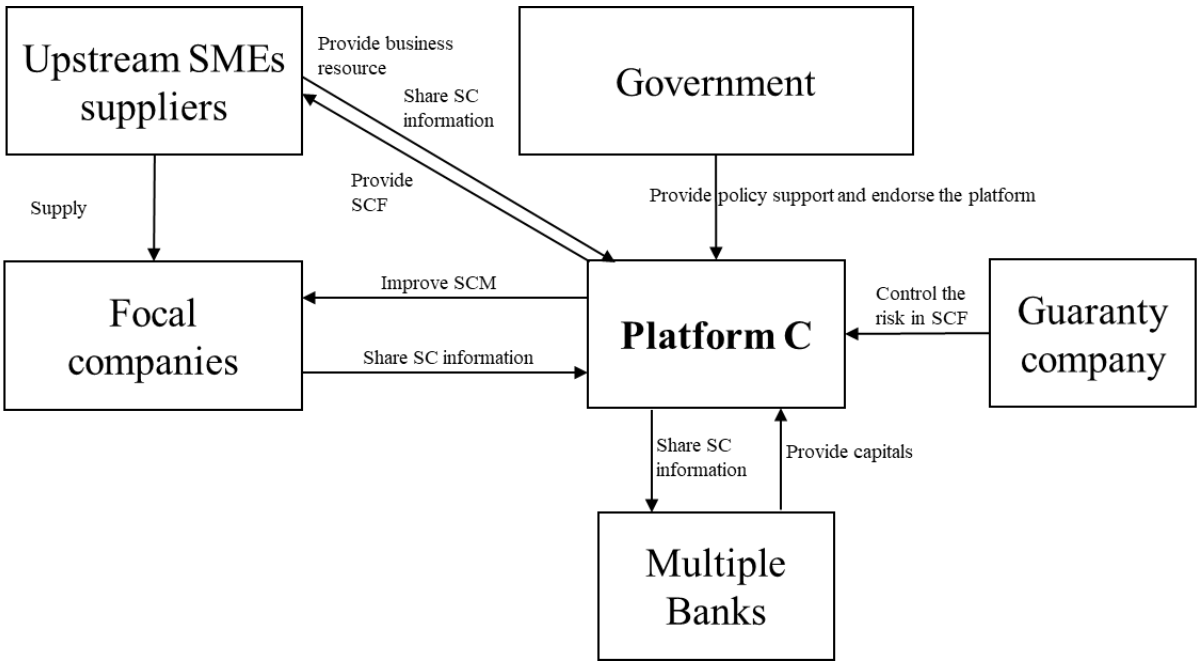

Figure 6-2. SCF network structure of Platform C

6.4 SCF service performance measurement

When asking the measurements of the SCF service performance, interviewees in platform C believed that the platform's **SCF service performance is greatly related to the acceptance of the major stakeholders.** Stakeholders' higher acceptance usually indicates their more willingness to participate in the platform SCF service. Higher banks' acceptance ensures the sufficient source of capital in the SCF service; higher focal company's acceptance improve the stability of the upstream SC, and higher SMEs' acceptance indicates a more profitable SCF service.

The acceptance of banks to the SCF is mainly determined by the extent of risk control of this SCF programme. Banks need to ascertain any potential risks in SCF, and which party would cover the risks once the risks occurred. As stated by Customer Manager 1:

> *"It usually takes us six months to one year to officially start the SCF business with the Platform C. Our bank has a very strict risk auditing of the new business, and therefore we can provide capital to the platform's SCF service, only if the platform can assure the risk is highly controllable and have sufficient risk reply measures in the SCF."*

The acceptance of focal company to the platform's SCF is determined by the extent to which the SCF can benefit its SCM practice. As focal companies can provide SCF by themselves, before they accept platform's SCF, they need to clearly understand how the platform can provide better SCF service than they can. Financial Manager 1 of Company A said:

> *"The development of Platform C is under our support; we believe that a specialised SCF team can perform better than us in SCF service. We first allowed the platform to start trial operation in our company. We do enjoy the benefits of cost reduction and supply chain stabilisation by using platform's SCF service, and we then fully accept the platform's SCF service."*

The acceptance of the SMEs is mainly determined by the availability and affordability of the SCF to them. SMEs have insufficient collateral and lacks credit qualification, which makes it difficult in their obtaining cheap financial resources from banks. Therefore, without the platform's SCF service, when encountering the liquidity issues, the SMEs' suppliers mainly use the private financing method with an average annual interest rate above 20%. The platform can help them get financing with an annual rate slightly higher than banks' loans but far lower than the private financing.

6.5 Case summary

After Platform C's provision of SCF service in the construction industry, the construction SC is restructured by the platform. The platform has greatly improved the digitalisation of the construction SC and thus makes the SC more standardised and transparent. Platform C has successfully built up an SCF network in the upstream construction SC, in which the platform partners with multiple financial institutions and private construction companies in southeast China, and jointly improve the SCF service in the construction SC. This chapter presents Platform C's SCF business model and practices. The platform's SCF capabilities, how the platform develops the SCF network, and how they measure their SCF service performance are discussed respectively.

The case of platform C finds that the most recognised SCF capabilities for the supportive platform are capabilities of information processing, financial network structuring, managing relationship with multiple stakeholders and managing SCF processes. As a supportive platform, Platform C stresses its advantages in information acquisition, analysis and sharing. Platform C believes that financial network structuring capability is determined by the platform's interconnectivity with multiple stakeholders to ensure their willingness to participate in their SCF programme. The platform considers this capability highlights the initial collaboration establishment with SCF partners, which requires the platform to possess necessary resources to attract stakeholder's initial collaboration. However,

managing relationship with stakeholders moves to the second step of collaborative relationship management, aiming at maintaining the collaborative relationship with stakeholders. Platform C stresses the relationship with banks, as they need bank's financial support to serve the upstream SCF market with great volume. Also, the relationship with focal companies is also stressed as the platform's reverse factoring business is based on the focal companies credits. As for the relationship with government, Platform C confirms the positive function of government in SCF development; however, their collaboration with government is limited. Platform C confirms that their capability of managing SCF processes is related to the standardised operation processes and their specialisation in SCF operation.

The network structure of Platform C is concluded, and the platform confirms the positive relationship between the SCF capability and the improvement of the network characteristics. Platform C has included diversified network partners (guarantee company) and serves more qualified SMEs and builds link with more banks and focal companies, thus promoting the network reach. The integration of essential resources possess by different network partners is promoted by Platform C, which facilitates the exploration of potential value-creation opportunities for different parties, leading to the increase of network richness. However, Platform C can make use of its information processing capability and stakeholder relationship management capability to strengthen the mutual trust among network partners and promote the partners commitment and multiplexity, which increase the network receptivity.

As for the SCF performance measurements, the platform prefers to user acceptance of the major stakeholders to evaluate their service performance as higher acceptance usually indicates stakeholders' more willingness to participate in the SCF, which can ensure the superior SCF service performance.

Chapter 7. Platform D: Innovating SCF product to transcend first-tier supplier financing

This chapter introduces the Platform D's SCF service and its innovative approach to extend the SCF service to multi-tier SC. This section first introduces the background introduction of Platform D and its SCF business model. Then the platform D's SCF capability are concluded. The following presents how the platform develops their SCF network and how it measures its SCF service performance.

7.1 Introduction

This section first concludes the basic information about Platform D and the development process of the platform. Following this, the platform's SCF service mode is introduced, focusing on the explanation of the application of its primary SCF Product Y.

7.1.1 Company background

Platform D is an Internet-based SC financial service platform jointly established by several China's central enterprises. The platform relies on the resource advantages of many focal companies to provide innovative financing services for upstream multi-level suppliers. Approved by the State Council of China, Platform D was founded in 2015. It is a state-owned mixed-ownership enterprise established by China Railway Rolling Stock Corporation (CRRC), China Railway Construction Corporation (CRCC), and other seven central enterprises, Industrial and Commercial Bank of China, Agricultural Bank of China, and other four financial institutions, four local state-owned assets, and six private enterprises. Platform D has industry-leading financial technology innovation capability, relying on comprehensive industry partner resources and rich business service experience, and has built an "N+N+N" SCF platform model. It aims at effectively revitalising the high-quality credit of large state-owned focal enterprises, helping enterprises in the industrial chain clean up debt chains among enterprises, and solving the financing problems of SMEs.

Platform D has practiced the national inclusive financing policy and promoted the industrial chain to achieve cost reduction and efficiency increment.

In October 2015, Platform D cooperated with China Postal Savings Bank, and landed the first SCF on the platform. In August 2016, Platform D appeared in the Central Enterprise Innovation Lecture Hall held by the State-owned Assets Supervision and Administration Commission (SASAC) of the State Council, and the platform SC financial business began to be fully promoted in the state-owned enterprise system. After years of sustained development, Platform D has helped SMEs to raise funds over 400 billion RMB.

7.1.2 SCF business mode of Product Y

The platform created an SCF product: Product Y. It is a product that can be circulated in the platform D system, which plays a role similar to commercial paper, but it is more flexible than commercial paper and can be split. In essence, it is a kind of standardised accounts receivable confirmed by the focal company (i.e., focal company's credits).

Product Y is an innovative SCF product. Platform D transformed large state-owned enterprise groups' qualified credits into a transferable and flexible SCF product, which can be used for financing. Adopting Product Y in SCF is secure and effective. SMEs in the industrial chain can transfer and discount Y through the platform or hold their Y to maturity. It provides a brand-new debt clearing tool for enterprises in the Platform D SCF network, which not only greatly improves the efficiency of debt clearing, but also provides a convenient and low-cost financing channel for SMEs. Product Y is an important customer acquisition channel of the platform, and it is also the flagship product of Platform D. When SMEs discount their Product Y, the platform only charges 0.1-0.2% of the channel financing service fee. Platform D uses Product Y to extend its SCF market and accumulate the number of platform users. The reason why the platform adheres to low financing fees is to effectively solve the problem of expensive financing for SMEs. If the platform charges excessively, the capital cost will still be borne by the SMEs, which can reduce their

willingness to adopt Product Y. At present, the Product Y on the platform has reached 80 billion RMB, with a financing rate of 70%.

In the process of financing with Product Y, the bank will first give credit to the focal companies and determine the total amount of Product Y that can be issued by the focal company. The bank will sign a tripartite agreement with Platform D and focal companies to accept the Product Y financing method. After the agreement is signed, the focal company can pay Product Y to suppliers for trade settlement, and the Product Y can be held, split, or transferred among suppliers at all levels. If the supplier has financing needs, the supplier shall apply for financing based on their holding Product Y. The bank quotes for Product Y on platform D, and if the supplier accepts the quotation, the bank will initiate the financing to SMEs. Once the financing is initiated, the platform will review the accounts receivable of this financing online. After the platform's auditing, the bank will conduct secondary approval and lend money to suppliers on the same day. After Product Y expires, the focal company pays the principal and interest to the bank to take Product Y back to the enterprise. The following Figure 7-1 presents the process of Product Y financing on the platform.

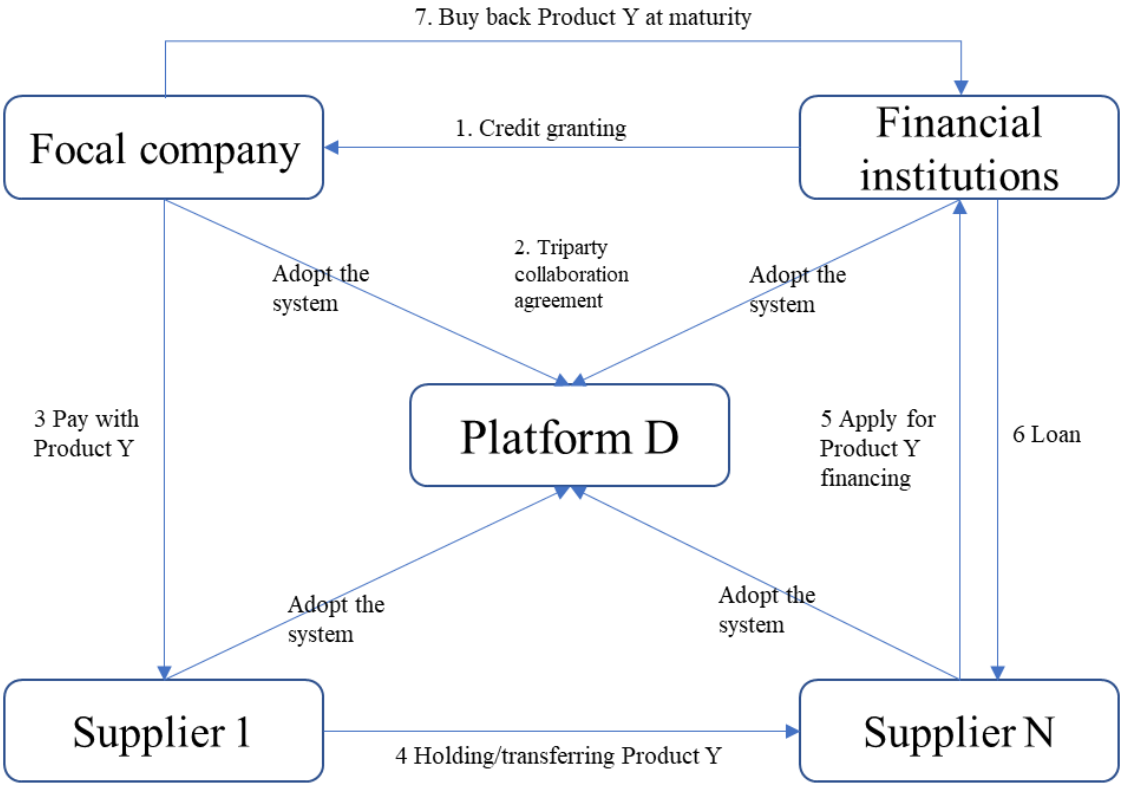

Figure 7-1. SCF network structure of Platform D

7.2 Platform D's SCF capabilities

This section concludes the competitive capabilities of Platform D in providing SCF and competing with other SCF providers. The SCF capability of Platform D can be categorised as information processing, financial network structuring, managing relationships with stakeholders, and managing SCF processes. The following sections elaborate the content of each capability.

7.2.1 Information processing capability

As a supportive actor in the upstream SCF market, **Platform has superior capabilities to effectively manage the information flow on the SC**. When SMEs initiate a finance request on the platform, the platform tends to share the related information with banks and let banks decide whether to provide finance. Therefore, Platform D emphasises its

functions in promoting effective, secure, and accurate information sharing to related partners.

To achieve this, Platform D has widely adopted the EDI system among focal companies and banks. Platform D assists them to interconnect their system with that of banks. Therefore, SC information can be effectively transferred from focal companies to the platform. When SMEs apply for finance on the platform, Platform D will then screen out the SC information and transactional information related to this financing and share the information with banks.

In order to promote the security, efficiency, and accuracy of information sharing, Platform D has developed a blockchain system with banks and focal companies. The blockchain system records complete initial data and keeps all data modification records according to different timestamps and provides complete data traceability. As stated by Senior Vice President 1:

> *"We have built an alliance chain with relevant banks, insurance companies, and focal companies. If business stakeholders want to extract relevant information, they can apply for permission from the platform to view business-related information in the blockchain. It makes the information sharing among stakeholders smooth and safe."*

Through the interconnection between the platform with the national tax system, personal credit information system, and ERP system of focal companies, the platform can obtain a large amount of enterprise operation information, which enables the platform to conduct a comprehensive analysis of the obtained enterprise information through big data analysis, in order to conclude an accurate customer portrait of focal companies and reduce the risk of providing SCF for core enterprises. As Chief Technology Officer 1 said: *"Our*

platform's big data analysis can assess the risks of our SCF services provided for focal companies based on their corporate portraits and transaction portraits."

7.2.2 Financial network structuring capability

Platform D as an Internet-based SCF platform fully makes use of the platform advantages to widely build up collaborative relationships and arrange business relationships with multiple stakeholders in SCF. Project Manager 1 said: *"Establishing collaborative relationships is essential and fundamental for our SCF implementation, as the platform needs to rely on banks' capital support and focal companies' engagement to realise the value of our Product Y."*

Platform D stressed the SCF's service mode of N+N+N, which refers to the SCF service mode that simultaneously contains multiple banks and focal companies and provides SMEs with SCF service on one platform. To achieve this, the platform needs to ensure its **interconnectivity** in SCF.

According to Chief Technology Officer 1, the platform's interconnectivity is largely based on the digitalised business mode in SCF. Digitalised business mode reduces the paper-based process in SCF, thus simplifying the traditional SCF process, which means SMEs can apply SCF in a convenient way. Also, the digitalised business mode enables more non-local SMEs to efficiently apply SCF. Meanwhile, the digitalised SCF product also increases the platform's interconnectivity with SMEs. Chief Product Officer 1 said: *"The circulation of this product in a focal company's SC not only enables the first-tier suppliers to finance through the product, but the other multi-tier suppliers to enjoy the benefits of SCF."*

Also, the **digitalised business mode in SCF** can attract more banks and focal companies to participate in the platform's SCF programme. Chief Technology Officer 1 said:

"Our well-developed platform structure and digitalised business transfer the offline processes to online, and effectively solve the issues of complexity and the time taken in the traditional SCF approaches, which can increase the SCF operation efficiency. Focal companies and banks can enjoy these benefits if they collaborate with us."

Achieving higher interconnectivity with banks and focal companies requires the platform to possess unique resources and capabilities that can attract their participation in SCF. Senior Vice President 1 said: *"Building collaboration with banks needs to let banks realise the benefits of collaborating with our platform. Therefore, our platform needs to have certain market influence and sufficient customer resources to fully convince banks to participate in it. Meanwhile, our specialisation in SCF service and operation, as well as our specialised human resources, can pose great attraction to banks' participation, as we can help them to deal with a number of labour-intensive tasks in SCF, such as supply chain document authenticity verification. So far, we have interconnected with eighteen Chinese joint-stock banks and over 2000 local banks."* As for focal companies, they are interested in the potential benefits of adopting SCF to conduct better SCM to reduce the SC cost and increase the SC efficiency. Platform D has interconnected with 1500 focal companies in its SCF network.

7.2.3 Managing relationships with multiple SCF stakeholders

The necessity of **maintaining a collaborative relationship with key stakeholders** has been emphasised by each of the interviewees of platform D. In the platform D's SCF programme, the platform offers the SCF business mode design and SCF product design. However, for the stable SCF operation, platform needs to maintain collaboration with banks to ensure the sufficient fund supply in SCF. The collaborative relationship with focal company is also important as the implementation of upstream SCF is based on the focal companies' credit. Platform D also claims that governments play a significant role in the platform development and require proper relationship management with it.

7.2.3.1 Relations with banks

As a third-party SCF platform, relationship management with banks is highly valued by Platform D as it needs to rely on the bank's **capital support** to ensure the adequate fund supply in its SCF service. Banks also hope to collaborate with the platform to perform better in SCF.

At first, banks thought that platform D was competing with them for customers in the reverse factoring market, as each bank would have its own reverse factoring products, so they believed that the products of the platform would compete with those of the banks. However, once banks started to collaborate with platform D, they found that the platform could solve many problems of banks in SCF. For example, the issues of verifying the authenticity of the SC document can be solved by the Platform's closed-loop SCF business mode.

Platform D considers that reverse factoring is a low-risk business, but it requires the high qualification of the focal company's credit. Therefore, the benefit of reverse factoring is derived from higher business efficiency. But for banks, the number of SMEs they service is not big enough and the cost of conducting due diligence on a large company is equal to that of SMEs, however, the potential profits from serving a large company are much higher than that from SMEs. Therefore, banks tend to choose enterprises with large business volumes. However, the most prominent feature of SCF business is that the number of SMEs with financial needs is huge, while the amount of each financing is in small volume, and the offline SCF operation is complex and difficult. Platform D can help banks simplify the due diligence process and enable them to examine SC documents online, which improves their efficiency in serving SMEs.

Although banks are also building their own SCF service platforms, most of the bank-initiated platforms lack convenience, which leads to poor customer experience. At the same

time, banks build the platforms, consuming a lot of labour costs and time costs. Banks also lack human resources in the promotion of SCF products. Chief Product Officer 1 said:

> *"If banks provide SCF service by itself, the investment cost is high, and the occupation of human resource is high. Therefore, banks lack the motivation to do SCF. For example, on our platform, about 300 suppliers apply for financing every month, with a total amount of 30 billion, with an average of 1 million per order. This SCF business volume is very heavy for banks, but this business volume is sparse and common for us."*

Platform D considers that the relationship between the platform and banks is more of a **collaborative relationship**; Platform D can act as the **outsourcing service team** of banks. As stated by Regional Manager 3:

> *"Bank's customer managers do not have enough time and willingness to examine large quantities of SC documents. However, our specialised human resources can help them complete this. On our platform, usually, one focal company is linked with over 30-50 suppliers throughout its upstream supply chain. This workload is too heavy for a customer manager."*

7.2.3.2 Relation with focal companies and SMEs

Platform D highly value the collaborative relationship with focal companies. Chief Product Officer 1 said:

> *"The primary business logic of our major SCF product Y is based on the transferring of the focal company's idle credit to suppliers at all levels in the upstream supply chain. Forming a better relationship with focal companies can increase their willingness to participate in our SCF programme. Focal company's participation is the foundation of our SCF business development."*

Platform D believes that most state-owned companies **lack the concept of the SC**, while they only emphasise the supply and demand relationship, which makes focal companies only focus on the first-tier supplier management while neglecting other multi-tier suppliers in the upstream SC. Owing to the weak connection between the multi-tier suppliers and the focal company, those SMEs with limited credit find it extremely hard to get financed through bank financing. The adoption of Product Y can effectively solve this problem. As stated by Project Manager 1:

> *"Once the focal company accepted our Product Y as their payment method to their suppliers, Product Y can be circulated in the SC, which means their first-tier suppliers can also use it to pay their upper suppliers. In this case, more upstream suppliers can make use of Product Y to solve their solvency issues."*

Platform D can also **make the financing process more convenient**. Currently, the discounting of commercial bills is difficult owing to the business circumstances, while the process of applying bank paper for SC payment is sophisticated for focal company. However, once the Product Y is adopted, the payment process can be effectively improved. The issuing of Product Y is simple and effective, as all the process can be completed on the platform online. The platform can also help focal enterprises integrate the whole industrial chain through the adoption of Product Y. Regional General Manager 2 said:

> *"For focal company, especially state-owned focal company, owing to the tremendous numbers of suppliers, it would be beneficial if they could manage up to the second-tier suppliers; it is difficult for them to have good management of multi-tier suppliers in the upstream SC. Our platform can help focal enterprises to improve the visualisation of SC. Every time the upstream suppliers discount the Product Y they hold, the platform will inform the focal enterprises, which can help the enterprises better understand the suppliers' financial capacity and the supply chain condition."*

For focal enterprises, Platform D's SCF service **can effectively help focal companies to reduce procurement costs**. The focal company tends to use commercial bills to pay the suppliers. It makes suppliers bear the financial cost before the maturity of the bill, with an interest rate of about 15%. However, if focal companies adopted Product Y to pay the suppliers, they could reduce suppliers' financial costs under the same payment period, which may reduce the supplier's quotation to the focal companies in the next supply, thus reducing the focal companies' procurement cost. It may also benefit the improvement of the collaborative relationship between focal companies and suppliers, as the payment term becomes more flexible for suppliers. Suppliers may choose to hold Product Y to maturity if their cash flow is sufficient, otherwise they can directly discount Product Y on the platform at expense of some financing cost. As stated by Senior Vice President 1:

> *"If the focal enterprises pay suppliers in cash, the fund occupation for focal companies is high. If they use the commercial bill to pay, the first-tier suppliers are reluctant to accept it, as the commercial bill is difficult to discount. Especially in the construction industry, suppliers need to use their own funds to cover the cost of supply because they cannot receive the project payment in time. The capital cost needs to be borne by SMEs themselves. However, the supplier will include this capital cost in the quotation to the focal enterprises. Our Product Y can solve this problem. By using Product Y, suppliers can discount Product Y they hold in advance if liquidity issues occur. The financing interest rate of Y products is generally around 5%. Compared with the previous interest rate of SMEs in obtaining financing, which is 15%, the interest rate of Product Y is much lower. If focal enterprises adopt the new payment method, they can require the supplier to re-quote the supply. According to our statistics, in the manufacturing industry, the supplier's quotation can be reduced by up to 12%. Meanwhile, as the capital cost of suppliers decreases, suppliers will improve the supply efficiency and quality when supplying, which is also conducive to the harmonious and stable development of supply chains."*

7.2.3.3 Relation with governments

Platform D believed that **governments play a significant role in the SCF market development and platform development**. At the beginning of the platform establishment, SASAC held Central Enterprise Innovation Lecture Hall and invited platform D to join and help the platform promote its SCF mode to multiple state-owned focal enterprises and banks. As stated by Regional General Manager, 1:

> *"Being invited by the SASAC to the Lecture Hall indicates that the central government recognises our SCF business mode. In this case, the government endorses our platform, which makes it easier for us to seek collaboration with focal companies and banks. Also, SASAC has invited numbers of top managers of state-owned focal companies and banks to join the lecture, which provides us with great opportunities to share our concept and SCF business mode with them. "*

The government's call for SCF has a great influence on the development of the platform. The macro-policy formulated by the government has raised SCF to the national strategic level. In this case, banks at all levels have a KPI (Key Performance Indicator) evaluation index for serving SMEs, which can be achieved through SCF. Therefore, banks are more motivated to do SCF and will be more active in seeking collaboration with specialised SCF platforms. At the same time, the Chinese government requires to reduce the ratio of accounts receivable and inventory, and encourage focal enterprises to accept new payment methods, thus creating opportunities for the promotion of platform SCF products in focal companies' SC.

The platform helps the government to implement the policy of supporting SMEs. In order to support the SMEs, the government opened up government procurement to SMEs to help them expand businesses. However, before SMEs are able to get the government order, they usually are already cash-constrained. As the number of orders increased, if they wanted to get more orders, SMEs with production capability would face a more serious problem of cash flow shortage. The platform launched an SCF governmental procurement project, and

greatly solved the SMEs' capital shortage and helped them to get paid early. As stated by Regional Manager 2:

> *"Through our platform, the supplier who wins the tender can obtain credit financing without the requirement of collateral and guarantee by virtue of the government procurement contract, and the supplier can receive the payment within 7 days. We have achieved the online operation of the entire business processes, in which the supplier can complete enterprise information authentication, financing application, and online withdrawal, which can shorten the business processing time and simplify the business processes. Therefore, we can help SMEs effectively improve SMEs' efficiency in obtaining finance."*

Table 7-1 summarised the relationship between Platform B and other major SCF participants in their SCF business.

Table 7-1. Summary of the relationship between Platform C and SCF participants

SCF participants	**Relationship with platform**
Banks	-Platform D assists banks in verifying the authenticity of the SC document. -Platform D can help banks simplify the due diligence process and enable them to examine SC documents online, which improves their efficiency in serving SMEs. -Banks are the major source of capital of the platform's SCF programme.
Focal enterprise	-Focal company's participation is the foundation of the platform's SCF business development. -Platform D's SCF service can effectively help focal companies to reduce procurement costs.
SMEs	-The platform's SCF service provides these SMEs with an available and affordable financing channel. -Multi-tier suppliers can adopt SCF in the platform's SCF programme in a convenient way.
Government	-Government agencies help the platform promote its SCF mode to multiple state-owned focal enterprises and banks. -The government's call for SCF has a great influence on the development of the platform. The macro-policy formulated by the government has raised SCF to the national strategic level. -The platform helps the government to implement the policy of supporting SMEs.

7.2.4 Managing SCF processes

Platform D considers that the core SCF capability for the platform is the process management capability. As a supportive actor, the platform needs sufficient expertise to deal with the problems in each process of SCF. This requires the platform to standardise the products and the SCF business processes, make clear the possible problems in each SCF node, and prepare countermeasures in advance. To achieve this, the platform needs professional teams.

According to the interviewees of Platform D, at present, the types of SCF products in upstream SC in China are various, but different products are not interlinked. Platform D pays attention to **standardisation in product design**. In this case, focal companies and SMEs only need to connect their system with that of the platform, while banks only need to make their system adapt to the platform's system when participating in the platform's SCF programme. Standardised product design enables the platform to manage the SCF business process more conveniently and assists the platform to conduct reasonable human resources allocation in the SCF process. Standardised product design is the basis of the platform's process management.

For platform D, its process management capability primarily relies on its **professional service team** and the platform's operation experience. Platform D has to interact with large numbers of SMEs during the process of SCF service. Such enterprises usually have a simple department setup and lack knowledge about SCF, which leads to many problems when they apply Platform D's SCF products, such as how to use the products Y, and how to register online. As stated by Chief Product Officer 1:

> *"The platform has sufficient human resources in the document auditing team and customer service team. We have service teams in every province throughout China, including the remote area. The distribution of SMEs is scattered in the upstream supply chain, and their financial knowledge is insufficient. Therefore, our professional service team can respond quickly when SMEs encounter problems in*

SCF, which is difficult for any focal companies and banks when they provide SCF service. We can see in the example of banks' SCF service, for the banks' customer managers, apart from the SCF business service, have to deal with other corporate banking services with a large business volume, such as corporate deposits and loans. Compared with the SC business, these corporate businesses have a larger amount and the number of enterprises to be served in the service is small. Therefore, the banks' customer managers will not put much of their energy into the SCF service, as the input-output ratio is inappropriate for them. However, our platform is different. We have a dedicated team to provide specialised services to SMEs so that platforms are able to quickly respond and provide effective solutions to the SMEs' problems in SCF. This is also the core competitiveness of our platform in providing SCF service, especially in the development stage."

7.2.5 Summary of the Platform D's SCF capability

Table 7-2 offers a summary and explanation on the advantages of Platform D in SCF service.

Table 7-2. Summary of Platform D's SCF capabilities

SCF capabilities	Contents of the capabilities
Information processing	-Platform D has connected with multiple information inquiry system and focal company's ERP system to support the conclusion of an accurate portrait of a focal company. -EDI and blockchain system are adopted for effective and secure information sharing.
Network structuring	-The platform's N+N+N SCF mode connects multiple focal companies and SMEs in its SCF programme. -Digitalised business mode enables more non-local SMEs to efficiently apply SCF and increases the platform's interconnectivity with SMEs. -Platform's sufficient customer resources and specialisation in SCF service and operation can attract more banks.
Managing relationship with multiple stakeholders	-Platform D maintains a collaborative relationship with SMEs, focal enterprises and banks, and government in the SCF programme.

Managing SCF processes	-Platform D pays attention to product standardisation in product design, and standardised product design is the basis of the platform's process management. -Platform D's professional service team and the platform's operation experience can ensure the swift response and provision of effective solutions to the SMEs' problems in SCF.

7.3 Development of SCF network

Platform D believes SCF is led by the governments and focal companies, as they are the major source of credits in SCF. The role of the platform is supportive, and the major supportive function is to promote the development of the SCF network. The network is inclusive, in which increasing numbers of SMEs can adopt SCF to improve their operation (reach). Through the combination of multiple resources of various SCF partners, platform can help to create more value for each partner (richness). Also, with the network, the platform may improve the flow of financial resources and credit resources among SMEs, focal companies, and banks (receptivity).

7.3.1 Network reach

Platform D has **enabled the SCF network to connect with more partners in distance and variety**. Platform D's SCF service is more inclusive, as it includes more SMEs in the SCF network who previously were less qualified to use SCF provided by banks. Also, the digitalised service mode makes it possible for non-local SMEs to get involved in the SCF network, which can increase the distance of the network partners. Because of the platform's superior network structuring capability, it can build links with multiple banks and focal companies in the SCF network, which increases the diversity of the network partners. As stated by the Regional General Manager 1:

> *"The previous mode of SCF provided by enterprises or banks has a ceiling: the maximum business volume of its SCF service. For bank-initiated SCF, the overall capital available in the SCF is limited to a single bank as other banks are less likely to collaborate with their SCF market competitors. For the focal company-initiated SCF, this type of SCF mainly serves a single industry, even a single supply chain.*

Our platform has broken this limitation of the capital amount and industry type. On our platform, we have over 200 collaborated banks and our collaborated focal companies are scattered in various industries, including construction, machinery building, and the automobile industry. Therefore, the business ceiling of our SCF can be maximised."

Platform D has i**nnovatively enlarged the SCF service scope to multi-tier suppliers through its Product Y**. Once a focal company adopts Product Y as their SC payment method, Product Y can circulate in the SC. In this case, the first and second-tier suppliers can hold Product Y and they can also use Product Y to pay their further upstream suppliers, thus enabling multi-tier suppliers to benefit from SCF. Chief Product Officer 1 said:

"In general, Product Y can circulate to the fifth-tier suppliers and in the CRRC supply chain, our product has penetrated to the seventeenth-tier suppliers. Product Y represents the focal company's credit, therefore, whomever holds Product Y can initiate a discounting application on our platform. The focal company will buy back Product Y in circulation when the product is at maturity."

Senior Vice President Song also provided another example of Product Y adoption in CRRC Zhuzhou. The company use Product Y in its supply chain and help its multi-tier suppliers, up to the eighth-tier, solve the financing issues. In total, 245 SMEs are becoming involved in the SCF service programme.

7.3.2 Network richness

Platform D can **increase resource integration and orchestration in the SCF network.** Platform D is a third-party actor in SCF, and it aims at breaking the barrier of information asymmetry in SCF, thus realising the interaction of multi-party information and resources in SCF. As stated by the Regional General Manager 3:

"Through the integration of resources of various SCF partners in our network, we can satisfy the demand of different platform users, for example, focal companies'

demand for the effective payment method and the improved SCM, bank's demand for enlarging their loaning business, and SME's demand for accessing financial resources."

The platform coordinates the intricate resources of all parties in the SCF network and integrates the SC of many focal companies. The platform takes one specific focal company as the starting point of its SCF service to the SC and gradually develops a cooperative relationship with its multi-tier suppliers in the upstream SC. In this case, the platform can integrate the financing needs of enterprises. Meanwhile, Platform D collaborates with a large number of banks, which integrates the financing resources on the bank side, and thus has a good understanding of banks' customer preferences and financing capabilities. Therefore, the platform can better match the financing resource with the financing needs in SCF. In this process, suppliers have obtained efficient and convenient financing services, and the focal enterprises have reduced the cost and increased the efficiency of the SC by changing the payment methods to suppliers, while banks have expanded their service scale for SMEs. In addition to resource integration, the platform adheres to the service concept of sharing, emphasising the important function of resource sharing in SCF. Platform D shares its professional human resources and technical resources with banks to jointly serve different SCF processes, thus improving the service efficiency of banks. As Chief Product Officer 1 said:

"Banks do not have enough energy to allocate SCF to serve a large number of SMEs. Our platform can help them to deal with the operational issues in SCF and allow banks to focus on providing financing. Through the collaboration with us, banks can allocate their human resources to provide service for large companies, and they can expand the financing market of SMEs in the meantime."

Chief Technology Officer 1 also emphasised resource sharing between the platform and banks. Platform D shares its technical resources with the collaborated banks and realises

the online operation of the entire SCF processes, thus simplifying the SCF processes and saving time and human cost. As Chief Technology Officer 1 said:

> *"Take the approval process as an example: the previous focal company's invoice approval is mostly offline, and banks' personnel are required to be on site. However, the use of electronic signature on the platform has greatly made the invoice approval process convenient and effective, as each party can fully complete the task online."*

7.3.3 Network receptivity

Platform D's effective information sharing has reduced the banks' information asymmetry in SCF, and therefore improved the **mutual trust** between banks and companies. To fully utilise the resources of multiple partners, especially the focal companies and banks, the platform makes use of its capability of relationship management to improve multiplexity and stakeholders' commitment to the SCF partnership through introducing the SCF concept and the potential benefits of adopting SCF to network partners.

Platform D considers that the establishment of the trust chain on the platform is the basis of developing SCF, and the establishment of the trust chain depends on transparency and traceability of information in the platform's SCF programme. The biggest obstacle to the development of SCF is the information asymmetry between banks and SMEs. Through the establishment of the trust chain, the information transparency in SCF can be maximised, which can solve the financing difficulty of SMEs to a great extent. The information sharing capability of the platform can promote the establishment of the trust chain in the SCF network. The platform applies blockchain technology to realise information sharing; focal companies' approved invoices are registered on the blockchain platform. When applying for financing, SMEs' transactional information will be recorded on the blockchain synchronously, and the partner banks of the platform have the right to view the corresponding information on the blockchain. As stated by Chief Technology Officer 1:

"Blockchain technology has raised the bank's one-dimensional trust to our platform to the dual-dimensional trust and our blockchain technology. The application of blockchain technology has greatly reduced the information barriers of companies to banks and improved the enthusiasm of banks to participate in our SCF programme."

When managing relationships with multiple stakeholders, Platform D tends to **actively arrange departmental communication among the platform and focal companies and banks.** Platform D manages to transfer its knowledge and operational experience to focal companies and banks, in order to increase their understanding of SCF and increase their commitment to the partnership with Platform D in SCF. As stated by Senior Vice President 1:

"Lack of willingness of focal enterprises is the biggest obstacle to participation in SCF. Through the platform's explanation and training, and several rounds of negotiations, enterprises are gradually guided to accept this new business model. The application of SCF requires the focal enterprises to change the original payment methods. For the new method, they are not clear about the business logic and risk points in SCF. By explaining the professional knowledge of SCF, related risk points, and potential benefits of SCF adoption, we can clarify the risk points to them and help them understand how their company and their supply chain can benefit from SCF adoption. Moreover, we will invite them to communicate with other focal enterprises, which have successfully adopted our SCF services, to allow them to better understand our SCF services and products."

As for banks, Chief Product Officer 1 said*: "Banks' top managers also lack SCF knowledge, especially for the local banks. Our product is an SCF innovation, and we also need to elaborate on how our Product Y works. Before we formally launched our product, we held many meetings with banks' top managers and managers responsible for SCF."*

7.3.4 Conclusion of the Platform D's SCF network development.

Table 7-3 summarised the Platform D's contribution to the SCF network characteristics in terms of reach, richness, and receptivity.

Table 7-3. The Platform D's development of SCF network

Network characteristics	**Related platform capability**	**Contents of network development**
Reach	-Financial network structuring -Managing relationship with multiple stakeholders	-The digitalised service mode makes it possible for non-local SMEs to get involved in the SCF network. -Platform D has innovatively enlarged the SCF service scope to multi-tier suppliers through its Product Y.
Richness	-Managing relationship with multiple stakeholders -Managing SCF processes	- The platform coordinates the intricate resources of all parties in the SCF network and integrates the SC of many focal companies. -The platform adheres to the service concept of sharing, emphasising the important function of resource sharing in SCF.
Receptivity	-Information processing -Managing relationship with multiple stakeholders	-Platform D's effective information sharing has reduced the banks' information asymmetry in SCF, and therefore improved the mutual trust between banks and companies. -Platform D tends to actively arrange departmental communication among the platform and focal companies and banks. -Platform D manages to transfer its knowledge and operational experience to focal companies and banks, to increase their understanding of SCF and increase their commitment to the partnership with Platform D in SCF.

In the following Figure 7-2, the structure of Platform D's SCF network structure is presented, in which the major SCF partners and the resources exchange between the platform and the partners is concluded.

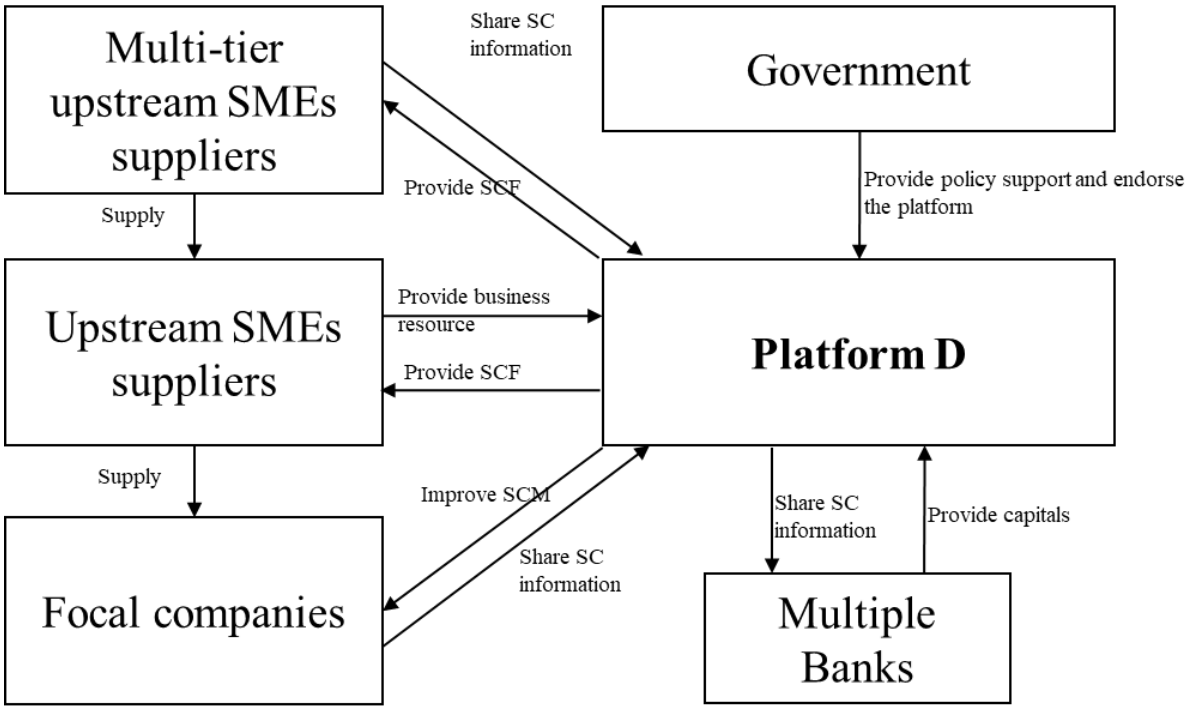

Figure 7-2. SCF network structure of Platform D

7.4 SCF service performance measurements

Platform D considers the most significant factor for its SCF service performance measurements is market acceptance. Market acceptance is jointly determined by the acceptance of major stakeholders to the SCF, including SMEs, focal companies, and banks. Higher market acceptance can reflect the SCF service performance in multi-dimensions. Higher acceptance of banks indicates that the Platform's SCF's risk is well-controlled. Higher acceptance of focal companies indicates that the SCF service can bring benefits to their SCM practices and higher acceptance of SMEs reveals that SCF can effectively satisfy their financing demands. As stated by Regional General Manager 1:

> *"Market acceptance represents to what extent the SCF stakeholders are willing to use our SCF products. Although our platform has possessed a substantial amount of enterprise resources, governmental resources, and banks' resources, we must ensure our SCF service is satisfied with our major stakeholders to realise the value*

of our resources. Therefore, we think market acceptance is a reasonable and comprehensive factor to evaluate our SCF service performance."

As for the upstream SCF service, the bank's acceptance of it is mainly determined by the risk controllability of this service. Banks usually consider two aspects to evaluate the risk of the platform's SCF programme. First, banks tend to ensure the platform's collaborated focal companies qualification and evaluate their commitment to the SCF partnership with the platform, as focal companies are the final source of repayment. Second, banks may consider the technology application of the platform to evaluate if the platform can share the technology capability with them to increase the information transparency in SCF and control the operational risks in SCF.

The acceptance of focal companies relies on the SCF benefits to their SC effectiveness improvement. Once focal companies adopted Platform D's SCF service, they must change their previous payment method and use the platform's Product Y to pay their suppliers. Therefore, focal companies need to be clear about the benefits of this change. The SME suppliers' acceptance to SCF lies in the availability and affordability of the SCF service. SME suppliers above the second tier in the SC usually have a weak relationship with the focal company, and they are excluded in the traditional SCF service. Also, owing to their poor credit qualification and lack of collateral make it difficult for them to obtain cheap financing from banks. The platform's Product Y means multi-tier suppliers can benefit from SCF with a lower interest rate. Regional General Manager 3 of Platform D said that *"normally, before the adoption of our Product Y, these SMEs' cost of capital is 15% annually; our SCF service has significantly lowered the cost of capital to 5% annually."*

Apart from customer acceptance, Platform D also indicates some factors for the measurement of SCF service performance, such as technological factors, and financial factors. However, Platform D considers these factors can only be used as a reference, instead of the determinant factor of the SCF service performance. As stated by the Chief

Technology Officer 1: *"Technology is a tool to realise our business mode. However, if the business mode is not accepted by the stakeholders, the technology will have no practical significance."*

As for the financial factor, interviewees in Platform D believe that this factor has limitations for SCF service performance measurement. Platform development needs a large initial investment and needs continuous investment in human resources and technology. However, Platform D only charges a 1%-2% usage fee, making the profitability of the platform weak at this stage. As stated by Chief Product Officer 1:

> *"We do not want to charge too much for our Product Y, as this part of the cost is ultimately borne by the SMEs, which reduces the effectiveness of our SCF in helping SMEs decrease the cost of capital. We believe that the SCF profits come from the platform's overall business volume instead of from serving a single SME or SC. That's why we stress the acceptance of focal companies and SMEs, as their higher acceptance determines the potential profits of our SCF service. As for the financial factors, such as the profitability of the platform, I do not think it is a reasonable measurement factor for the SCF service performance. Take our platform as an example, in the first four years of development, we did not make a profit. It did not indicate that our SCF service performance is poor; it is because we are in the development stage, the investment is large and the market share at that stage is not wide enough to generate sufficient revenue to cover the cost."*

7.5 Case summary

Platform D has innovatively created a new SCF product, which extends the SCF service scope on the SC, enabling multi-tier SMEs' suppliers can leverage SCF to conveniently obtain cheap financial resources, while assisting focal companies to increase their SC effectiveness. Platform D believes the upstream SCF market is wide enough, and the platform cannot fully satisfy this market demand. Therefore, Platform D collaborates or

shares its SCF knowledge, operational experience, and their product design with other SCF providers, including banks and other third-party SCF platforms, in order to promote the rapid SCF development in China. This chapter presents Platform D's SCF business model and practices. The platform's SCF capabilities, how the platform develops the SCF network, and how they measure their SCF service performance are discussed respectively.

The case of Platform D finds that supportive platform identifies four major SCF capabilities, including information processing capability, financial network structuring, managing relationship with multiple stakeholders and managing SCF processes. Platform D stress their advantages in information analysis and information sharing when processing the SCF related information. Financial network structing capability is related to the platform's interconnectivity and higher interconnectivity is achieved through the platform's possession of attractive resources to banks and focal companies. Supportive platform highlights the importance of maintaining collaborative relationship with multiple stakeholders, especially for banks and focal companies. Additionally, supportive platform can perform well in managing SCF process through standardised product design and specialised human resources and its SCF operational experience.

The network structure of the platform D is concluded, and Platform D confirms that its SCF capability can enable the development of their network in terms of reach, richness and receptivity. As for the network reach, the platform enabled the SCF network to connect with more partners in distance and variety. Also, Platform D has innovatively enlarged the SCF service scope to multi-tier suppliers through its Product Y. for the network richness, the platform increases resource integration and orchestration in the SCF network, while the network receptivity is improved through the improvement of mutual trust between banks and companies, and increasing the commitment of banks and focal companies to the SCF partnership with Platform D.

Supportive platform considers SCF performance should be measured through the market acceptance, which is jointly determined by the acceptance of major stakeholders to the SCF service. Platform D considers the most of the acceptance of banks, focal companies and SMEs when evaluating its SCF performance.

Chapter 8 Cross-case analysis

This chapter conducts cross-case analysis of the four cases and offers discussion of the findings from within and cross-case analyses against existing literature. Similarities and differences of the four case platforms are initially discussed in a consideration of the types of platform, platform SCF capabilities, and SCF service performance. Second, platform contribution to the SCF network characteristics of reach, richness, and receptivity is discussed. Furthermore, the work discusses the relationship between constructs, as well as the relationship within constructs, leading to the development of three sets of propositions. Based on the propositions, a revised theoretical framework is summarised at the end of this chapter.

8.1 Types of third party SCF platform

The role of SCF service providers can be clarified according to specific functions in SCF service. In existing research, SCF service is usually provided by banks or focal companies such as the focal service provider; the other stakeholders such as logistics and technology platforms are sub-tier service suppliers, providing equipment, material, or service to the focal service supplier.

Song et al. (2018) propose that some platforms also play the leading role in SCF; for example, third-party logistics platforms or e-commerce business platforms usually have close engagement with SC activities, allowing them to better control physical, financial, and information flow in the SCF service. Platforms are responsible for overall SCF product design, process, and risk management. Therefore, these platforms have determinantal impacts on implementation of SCF, assuming the primary risks associated with the SCF

service. However, most SCF research considers platforms as supportive actors in the SCF business; they usually provide supportive functional services, such as logistics and information technology services, in SCF programme initiated by banks or focal companies (Fellenz et al., 2009; Bal & Pawlicka, 2021). In this research, four case platforms are categorised as two types based on functions in relation to SCF service: the first is the leading platform and the second the supportive platform (as shown in Table 8-1). The leading and supportive platforms are different in terms of SCF capabilities, as discussed in detail in section 8.2.

Leading platforms (Platform A and Platform B) are usually business-to-business platforms, or integrated SCM platforms; these types of platforms tend to have a deep engagement in SC activities, including procurement, retail, distribution, and other integrated SC services, allowing the platform to acquire multiple sources of SCF related information with high levels of authenticity. Most notably, this type of information is not only financial, relative to SMEs with financing needs, but it also includes SME operating information which reflects SME operating conditions. Engagement in SC activity and information advantage enables the leading platform to extend SCF service scope, without heavy reliance on focal companies; their SCF service reaches both the upstream (advanced payment) and downstream SC (credit selling and inventory financing). Risks of providing SCF services to SMEs downstream in the SC are usually more pronounced than upstream; leading platforms are usually the primary risk takers in SCF, while collaborative banks take limited risks in SCF services.

Contrary to existing research, in which supportive platforms are generally responsible for minimal functional activities, such as logistics and information technology services (Fellenz et al., 2009), the supportive platforms (Platform C and Platform D) identified in this research are launchers of the SCF service. They design the SCF product and operational process of the product but do not take risks in the SCF service. Capital providers, such as banks, in this type of SCF service are the major risk-takers. Supportive platforms help capital providers to identify and control financial risks using a technical method and specialised operation capability allowed by the SCF. The service scope of the

supportive platform is confined to upstream in the SC (reverse factoring), in which the SCF service is largely based on credit of the focal company. In this case, the SCF programme launched by the supportive platform is largely reliant on participation of the focal company, and financial institutions successfully ensuring sources of focal company credit and capital.

Table 8-1. Comparison of four platforms

	Platform A	**Platform B**	**Platform C**	**Platform D**
Types of platforms	Leading platform	Leading platform	Supportive platform	Supportive platform
Ownership	Private company	State-owned company	Private company	State-owned company
Degree of engagement in SC activities	High engagement in both upstream and downstream SC	High engagement in both upstream and downstream SC	Medium engagement in upstream SC	Low engagement in upstream SC
Major SCF activities	Downstream credit selling	Downstream credit selling/inventory financing	Upstream reverse factoring/dynamic discounting	Upstream reverse factoring/dynamic discounting
Primary risk-taker(s) in the SCF service	Platform and insurance company	Platform	Collaborative banks and other financial institutions	Collaborative banks

8.2 Third-party platform's SCF capability

After introducing two major forms of platform, this section of discussion focuses on identifying and comparing major capabilities of each based on the capability hierarchy model. SCF is usually discussed from an adopter perspective; it is considered a valuable organisational resource, contributing to organisational capabilities. This in turn improves organisational financial and operational performance (Beka Be Nguema et al., 2021). In relation to research focused on SCF providers, the majority of the argument relates to the way provider SCF services benefit multiple parties in the SCF business (Hofmann & Zumsteg, 2015). Minimal research considers provider capabilities in the SCF service (Song et al., 2018; Jia et al., 2020a).

Song et al. (2018) proposes information acquisition, process management, and network structure as three relevant capabilities for platforms in providing SCF with a lower associated risk. Jia et al. (2020a) conceptually synthesise SCF capability, proposing mapping financial network structure, designing financial business processes, and sharing financial information systems as component aspects. This research builds on the work of Song et al. (2018) and Jia et al. (2020a), extending the SCF capabilities of platforms in relation to four aspects. The following sub-sections introduce identified SCF capabilities in case studies, considering sequence of information processing, network structuring, managing relationship with multiple stakeholders, and managing SCF processes. These are further compared with each platform in terms of SCF capability in comparison to traditional SCF service providers.

8.2.1 Information processing

There is consensus among leading and supportive platforms that information processing is an essential capability in the provision of SCF services. Song et al. (2018) highlight the role of information acquisition capability in ensuring authenticity of transactions among SC partners, further reducing SCF risks for providers. Jia et al. (2020a) stress the way sharing financial information systems are important capabilities for SCF providers in the promotion of information sharing and integration in the SCF business. Information

acquisition and sharing represent one aspect of information processing in SCF services; each of them is mentioned by the interviewees in all four cases.

However, acquired information is usually significant in volume; platforms must properly analyse acquired information to extract the most supportive and valuable aspects, prior to sharing information with collaborative partners. Interviewees use the term information processing to describe capabilities of acquiring, sharing, and analysing the SCF related information. Therefore, this research considers information acquisition, analysis, and sharing, as dimensions of platform information processing capability when providing SCF service.

Table 8-2, based on the case study, divides SCF providers' information processing capability as threefold, including capabilities of information acquisition, analysis, and sharing.

8.2.1.1 Information acquisition

In relation to information acquisition, acquired information could be represented as structured information, such as financial and credit records; furthermore, it could be unstructured operational information, such as SC structure and detailed transactional information, as well as the actual operational status of SMEs (Yip et al., 2015).

In terms of structured information, similar with bank information acquisition in SCF, both leading and supportive platforms collect structured information based on public disclosed information and that provided by companies. Providing SCF services relying on structured information is acceptable in upstream SCF services. In the upstream reverse factoring service, major risks in the upstream are from focal companies, who have completed financial information and credit records. In this case, SCF service providers usually pay more attention, ensuring the focal company is financially healthy, and able to repay account receivables that SCF providers collect from suppliers. However, downstream in the SC, major risks originate from SMEs; they usually have imperfect credit information, making structured information less reliable. In unstructured information acquisition, leading and

supportive platforms demonstrate significantly different capabilities, owing to different SCF products provided and extent to which they engage in the SC transaction.

Leading platforms directly engage in the SC transaction, enabling them to be more active in this process, as they have direct access to operational information related to the SMEs, such as SC structure and transaction activities in the SC. Also, the leading platform usually provides logistics or warehouse services in the SCF of credit selling and inventory financing; leading platforms usually adopt IoT technology to effectively monitoring status of the goods and acquire real-time information related to goods.

Owing to different modes of SCF service, supportive platforms usually indirectly engage in SC transactions. In reverse factoring services, SC transactions directly occur between suppliers and focal companies, providing supportive platforms fewer opportunities to engage in SC activities. In the example of Platform C and D, Platform C represents a platform able to facilitate a transaction, while platform D designs a SCF product able to be used in payment by SC partners. Although Platform B does not engage in actual SC transaction, it provides a platform that enables digitalisation trading processes between focal companies and suppliers, subsequently providing Platform C with opportunities to accumulate and acquire SC transactional information on the platform.

Platform D is passive in information acquisition at the beginning of their SCF service. However, platform D can accumulate transactional data in the multi-tier upstream SC, using the circulation of Product Y in the SC; when focal companies adopt Y as a payment method for suppliers, suppliers can further use Y to pay their suppliers in the upstream SC. Once focal companies have chosen Y as a payment method for their SC transaction, Platform D can acquire more SC information related to the focal companies, such as supply relationships and transaction volume.

Based on discussion above, platform acquisition of structured information is similar to banks in relation to SCF. However, platforms can be more effective in the acquisition of

unstructured information than banks, denoting platform information acquisition capability is stronger than that of banks.

8.2.1.2 Information analysis

After structured and unstructured information is collected, platforms then analyse and interpret collected information in order to support decision-making and control risks in the SCF service (Yu et al., 2021). Yu et al. (2021) propose that in the SCF service, a multitude of transaction and financial data is quickly generated in large volume, variety, velocity, veracity, and value. Therefore, effective information analysis in SCF is heavily determined by use of big data analytics. This research supports the essential role of big data analytics in SCF information analysis; all platforms announced big data analysis as able to effectively facilitate platforms when making decisions to provide SCF services to a specific customer.

Big data analysis capability is usually represented by platform capability to generate accurate customer enterprise portraits, transaction portraits, and SC portraits, based on structured and unstructured information; this approach allows comprehensive evaluation of the potential risks for platforms providing SCF services to a company, especially in the case of new customers, and their SCs. For both leading and supportive platforms, generating multi-dimensional portraits of customers relies on the adoption of big data analysis. Owing to differences in their major SCF service, risk subjects in SCF are distinct: leading platforms tend to focus on portraits of downstream SMEs, while supportive platforms focus on portraits of the focal company.

When banks provide SCF services, they also adopt big data analysis to evaluate the potential risks of clients. However, as concluded in the previous section, a platform can collect more unstructured information, allowing the platform to generate a more accurate and comprehensive portrait of new customers, especially for SMEs with insufficiently available and reliably structured information; this indicates platform capability in big data-enabled information analysis is better than banks.

However, existing research excessively emphasises big data-enabled information analysis in SCF. The most prominent feature of SCF services is that SCF serves a multitude of SMEs with a small volume of financing in the SC. Therefore, once the SCF is implemented in the SC, SCF service providers tend to face large numbers of business invoices and contracts related to the SC transaction. To minimise the risk of moral hazard in the SCF service, such as that related to invoice and contract fraud, SCF service providers must allocate sufficient human resources to conduct verification and confirm authenticity of invoices and documents; this process cannot be completed using big data analysis. Manual-based information analysis capability relies on operational staff professional knowledge and management experience in SCF, supporting the argument offered by More and Basu (2013), in that skilled personnel are essential for SCF implementation.

Owing to indirect engagement in SC transactions, supportive platforms highlight the role of staff information analysis capability. For example, in the construction industry, risk control staff in Platform C make use of experience in construction SC s to understand the reasonable scale of raw material procurement in relation to specific construction projects; they can judge whether transaction data shown on the invoice is reasonable, considering issues such as whether the quantity of steel purchased by a construction site is reasonably matched with construction scale. Also, platform D has a specialised group of staff devoted to verifying authenticity of documents and invoices related to SC transactions.

In the context of banks in China, core business is to serve large enterprises. Therefore, in the SCF service, they do not have adequate human resources to concentrate on manual-based information analysis. Furthermore, compared with platforms devoted to a specific industry (Platform A and B), Chinese bank staff knowledge of specific industries is insufficient, weakening their manual-based information analysis capability. Platforms tend to possess more effective big data-enabled information analysis, and manual-based information analysis, systems in SCF services in comparison with banks.

8.2.1.3 Information sharing

After collected information is analysed, platforms need to share related information with collaborative partners in the SC. Information sharing capability is represented by the extent to which a platform can share information regarding specific SCF services with related SCF participants in an effective and secure way.

In order to ensure effective information sharing among SCF participants, platforms promote EDI among participants in their SCF services. Platforms A and C promote digitalisation in the SC related to industrial raw material and construction industries respectively. Platforms B and D enable focal companies and SMEs to share electronic data on the platform; in this case, redundant paper-based documents and invoices are transferred into electronic form, able to be effectively shared when the platform requires customers to upload this information in the SCF service.

With the exception of Platform B, which has a relatively low reliance on bank capital in the SCF, the other platforms stress information sharing of SCF information between platform and banks as crucial; they need banks' financial resources to support their SCF services. Effective information sharing reduces information asymmetry between banks and SMEs with financial needs, increasing bank willingness to participate in platform SCF services. Usually, platforms directly connect their systems with banks, sharing the information banks require to control risks when participating in platform SCF services.

Furthermore, blockchain technology is considered a more secure method of information sharing; the potential value and benefits stressed by all platforms consider the way information can be securely recorded and transferred on the chain; recorded information cannot be tampered with by specific actors. Each platform announced blockchain technology is adopted as an information sharing method. Supportive platforms have more need for blockchain technology. as they need to leverage emerging technologies to promote information sharing between platforms and banks, attracting bank interests, and lowering their associated risks when participating in platforms SCF business. Both Platform C and

D have established an alliance chain [3] with collaborative banks and other SCF participants. Once the banks participate in platforms' reverse factoring services, they can have a private key to the chain to check documents, such as bidding contracts and invoices, related to a specific SCF service.

Although each platform adopts blockchain to different degrees, all platforms state the way adopting blockchain in SCF in the context of China is far from maturity, due to the challenges associated with privacy protection and security governance. Platform information sharing capability is similar with banks; bank SCF services also EDI system and blockchain technologies to ensure information can be shared between relevant stakeholders effectively and securely. Information sharing is highly related to levels of technology adoption in SCF. With the exception of several large state-owned banks, most of those involved in China's information sharing system have insufficient resources to deal with large quantities of SCF related information (most are SME transactional information), as their development is focused on expanding financing business to large and qualified enterprises, as part of which advanced information sharing capabilities are not as necessary as in SCF businesses. Based on this discussion, it is concluded that leading and supportive platforms have stronger information processing capabilities in the context of SCF services.

[3] Alliance chain is one type of blockchain. It is co-initiated and maintained by multiple SCF participants and is only accessible to specific group of members. The participants of the alliance chain are designated or pre-screened members.

Table 8-2. Comparison of platform's information processing capabilities

Information processing capability	Platform A	Platform B	Platform C	Platform D	Bank A
Information acquisition	-Participate in SC activities such as procurement and retailing to acquire SMEs' operational information (unstructured); -Adopt IoT technology to collect information in the logistics process (unstructured); -Collecting data from the public disclosed information and information provided by SMEs with financial needs (structured).	-Participate in SC activities such as procurement, retailing and logistics to acquire SMEs' operational information (unstructured) -Adopt IoT technology to effectively collect the information of goods in warehouse and logistics (unstructured); - Collecting data from the public disclosed information and information provided focal companies by	-Collect transactional data from the digitalised trading process between focal companies and suppliers on the platform (unstructured); - Collecting data from the public disclosed information and information by the focal companies and SMEs with financial needs (structured);	-Collecting transactional data through the adoption of SCF product (unstructured); - Collecting data from the public disclosed information and information provided by the focal companies and SMEs with financial needs (structured).	- Collecting data from the public disclosed information and information provided by the focal companies and SMEs with financial needs (structured).

		SMEs with financial needs (structured).			
Information analysis	- Adopt big data analysis to provide comprehensive portraits of SMEs; -Personnel's professional knowledge to the industry can identify the uncommon transactional data provided by the SMEs.	-Adopt big data analysis to provide comprehensive portraits of focal companies and SMEs; -Personnel's specialised capability in verifying the authenticity of the invoices provided by the SMEs.	-Adopt big data analysis to provide comprehensive portraits of focal companies; -Personnel's professional knowledge to the industry can identify the uncommon transactional data provided by the SMEs.	-Adopt big data analysis to provide comprehensive portraits of focal companies; -Personnel's specialised capability in verifying the authenticity of the invoices provided by the SMEs.	-Adopt big data analysis to provide comprehensive portraits of focal companies
Information sharing	-Promote EDI with collaborated SCF partners -Adopt blockchain technology	-Promote EDI system with collaborated SCF partners; -Adopt blockchain technology	-Promote EDI system with collaborated SCF partners; -Build up alliance chain with partners	-Promote EDI system with collaborated SCF partners -Build up alliance chain with partners	-Promote EDI system with collaborated SCF partners

					-Build up alliance chain with partners -Information sharing capability is insufficient to deal with large information related to SCF business.

8.2.2 Financial network structuring

This capability is adapted from the mapping financial network structure proposed by Jia et al. (2020a) and the SCF network structure proposed by Song et al. (2018). Jia et al. (2020a) defines mapping financial network structure as SCF provider capability to arrange the business relationship in SCF. Song et al. (2018) consider SCF network structure as the linkage between platforms, SMEs, and financial institutions. This research concludes platform financial network structuring capability denotes the extent to which a platform can make use of resource to build links with multiple SCF stakeholders; it emphasises initial relationship establishment with multiple stakeholders. Based on the case study, platform financial network structuring capability is related to interconnectivity of the platform in the SCF service.

8.2.2.1 Interconnectivity

Both leading and supportive platforms consider interconnectivity as an essential attribute for platforms, enabling the financial network structuring in their SCF service. Higher interconnectivity denotes the way platforms build wider links among multiple stakeholders. Platform business models of SCF services is N+N+N, unlike bank SCF services; platform SCF services are not limited to a single SC related to a specific focal company with limited banks as capital providers. However, platform SCF services usually involve multiple banks (the first N) to provide financial service to various focal companies (the second N) and SMEs (the third N) in multiple SCs.

In addition, the interconnectivity is affected by the platform's digitalisation ability (Caniato et al., 2019). As shown in the example of Platform A and C, these two platforms have significantly improved the digitalisation level in the industry, building a wider link with non-local SME customers and making it more convenient for them to participate in the SCF programme. Additionally, in the case of Platform D, the platform's digitalised SCF product makes the platform interconnect with multi-tier suppliers.

SCF providers must possess attractive resources or capabilities that can potentially benefits the SCF participants (Ma et al., 2020), through which SCF providers can attract more

collaborative partners or potential clients to participate in their SCF programme (Fiordelisi et al., 2014). Each platform also confirmed that for successful implementation of the N+N+N business model, platforms require attractive resources or capabilities, as well as public credibility that ensures stakeholder willingness for initial participation with platform SCF services. For example, platform advantages in obtaining various information in the SC is attractive for banks engaging in the SCF service; banks believe platforms can reduce information asymmetry between banks and SMEs. Information asymmetry is a major cause of moral hazard risks in SCF services (Zha et al., 2019), greatly negating bank willingness to engage in SCF services (Li & Chen 2019). Furthermore, platforms consider sources of capital in SCF as not limited to a single bank; however, they have a wider access to various financial resources (multiple banks, trust companies), ensuring platforms can satisfy client financial requirements at any point in the year; this point is particularly important in the upstream SCF service, where business volume is usually significant in China. As shown by Platform D, the amount of SCF exceed 400 billion RMB. With abundant financial resources in SCF, platforms can attract focal companies to initially participate in SCF programmes.

In relation to banks, SCF services are usually limited to a single bank. Collaboration between different banks in SCF is rare in China, as banks consider other banks as competitors in the SCF market. Furthermore, preconditioned by strict risk management systems, bank SCF services exclude less qualified SMEs, especially in the downstream SCF service (Duan et al., 2009). Therefore, interconnectivity of banks in the SCF service is weaker than platforms, indicating the way platforms have better financial network structuring capabilities than banks.

8.2.3 Managing relationship with multiple stakeholders

Lam et al. (2018) show SCF service providers should provide updated services regularly to strengthen relationships between service providers and SCF users; they emphasise the necessity for SCF providers to maintain good relationships among SCF participants. Previous research into relationship management tends to discuss how to build links with

stakeholders in SCF; however, there is a lack of discussion into how to properly manage relationships with stakeholders (Song et al., 2018; Jia et al., 2018).

This research contends financial network structuring capability is an important initial step in relationship management involving multiple stakeholders; this capability ensures stakeholder initial participation in SCF services but cannot guarantee participation in the long term. In this case, to enhance relationships with multiple stakeholders, platforms highlight capability to manage relationships with multiple stakeholders by providing continuous benefits for them; each platform states the essential stakeholders in their SCF service are banks (major capital providers), focal companies and SMEs (SCF users), and government (policy makers).

8.2.3.1 Managing relationship with banks

Banks represent an essential source of finance supporting platform SCF activities (Silvestro & Lustrato, 2014; Hofmann & Zumsteg, 2015). For the supporting platform, sources of capital in SCF services are heavily reliant on collaborative banks. Although leading platforms have less reliance on banks in major SCF services, they also require financial support from banks to extend the upper limits of their SCF service.

In China, bank participation in the SCF service is driven by government requirement for inclusive financing. Inclusive financing requires banks to provide more financial support to SMEs. Therefore, banks are driven to expand financing services to SMEs. Nevertheless, risks to financing SMEs usually exceed accepted risk control standards; banks do not engage in SC activities, they are not familiar with the SME customers, increasing customer-obtaining cost and information asymmetry in SCF.

However, in SCF programmes platforms provide banks with varied information regarding SMEs, supporting banks in management of risks when financing SMEs. With increased access to operational information of SMEs, risk control logic in SCF business is optimised with the assistance of platforms. Platforms can directly recommend qualified SMEs to

banks, reducing customer-obtaining costs and that of information acquisition in SCF. Driven by these benefits, banks prefer long-term collaboration relationships with platforms.

8.2.3.2 Relationship with focal companies and SMEs

Focal companies and SMEs are major customers for platform SCF services. First, building a cooperative relationship with focal companies is highlighted by platforms, especially supportive platforms, as their major SCF services are reverse factoring, requiring the platform to work closely with focal companies (De Goeij et al., 2016). Furthermore, leading platforms seek the active participation of focal companies to acquire more information about their SC and share risks.

Focal company intentions to participate in platform SCF services are reduction of cost and improvement to SC efficiency. In this case, to ensure long-term collaborative relationships with focal companies, platforms provide focal companies with more value-added SC services. Both supportive and leading platform SCF services can help focal companies improve SCM; in the case of A and C, platforms promote digital transaction; therefore, they facilitate focal companies in constructing digitalised SCs, making the SC more visible and transparent. Meanwhile, implementation of reverse factoring in the SC can lower supplier capital costs, lowering supplier quotations for the focal companies.

Moreover, leading platforms can render integrated SC services to focal companies, allowing focal companies to outsource both financial and SC operations to a platform; this means the focal company can concentrate on activities such as product development and channel expansion, enhancing their competitive advantage. These benefits related to platform service ensures a purposeful long-term collaborative relationship with focal companies.

Second, SMEs intend to enhance cash flow and enjoy better access to financial resources provided by SCF services; however, platforms can provide financing services and SC services, which accommodate SME requirements for finance. The relationship management capability is different for leading and supportive platforms. As the supportive

platform's primary SCF service is reverse factoring, serving the upstream SC, relationship management with SMEs is straightforward; if the SME is the supplier or even multi-tier supplier of a qualified focal company, they can discount account receivables on the platform, improving cash flow in a very short period. SMEs greatly rely on effective SCF services by supportive platforms to satisfy financing needs. Furthermore, the supportive platform consistently supervises overall SC activities between financed SMEs and focal companies on the platform, making SME hard to disguise information in front of the platform.

However, credit selling or inventory financing provided by a leading platform in the downstream SC usually entails a higher risk. In this case, for leading platforms, relationship management is not merely reliant on creating continuous benefit for SMEs; in order to control risk in SCF services, leading platforms highlight the necessity for communication, assessment, and monitoring, in order to reduce SMEs default risks in SCF, building a long-term collaborative relationship. This finding is similar to that of Song et al. (2018), in which the authors confirm the way platforms can better manage relationships with SMEs by controlling behaviour of the SMEs. A good relationship with an SME is one of the important guarantees for SMEs to fulfil obligations in SCF.

In the downstream SCF services, platforms provide logistics services for SMEs through the platform. Furthermore, the settlement of SC transactions is completed on the platform; in this case, platforms are able to monitor all information regarding SMEs in the SCF service. Offline communication and investigation are also adopted by platforms in order to allow better monitoring of SME operational status. For example, in offline communication, if an SME is a manufacturing company, Platform C will check the SMEs electricity and water consumption, establishing whether their factory is operating normally. Apart from the behaviour controlling method, a leading platform may use SME assessment to promote relationships; Platform A regularly assesses SMEs performance in SCF. For SMEs paying the refund in time within certain period, the platform will encourage this behaviour, enlarging the amount of available credit in SCF, or extending payment terms in SCF to

cultivate SME awareness of timely fulfilment of obligations in SCF, helpful in constructing a long-term collaborative relationship with SMEs.

8.2.3.3 Relationship with government

Government is an indispensable stakeholder for platforms in China. Government intervention policies positively impact platform SCF mechanisms. Government intervention policies provide financial support for platform operations, encouraging broader stakeholder participation in platform SCF businesses (Bal, 2019; Reza-Gharehbagh et al., 2021).

In recent years, Chinese government started to attach importance to SC and SCF. A series of government reports was released to encourage innovative financing methods and strengthen financial support for SMEs. Platform SCF initiatives are in line with government regulations; government acts as a driving force in initial development of each platform, providing platforms with government endorsement to facilitate development. In this case, platforms can well-manage relationships with multiple government agencies in the SCF business.

Compared with platform relationship management capabilities, bank capability appears lower. In bank-sponsored SCF services, banks are independent of each other competing in the SCF market, meaning banks are unable to maintain good relationships with other banks in SCF services. As banks are not engaged in SC activities, they are unable to provide focal companies additional SC services except for financing. Furthermore, insufficient engagement in the SC makes reduces transaction frequency between banks and SMEs, making them unbale to effectively restrict SME behaviour (Song et al., 2018). Also, limited by overall risk control standards, bank SCF service scope is narrower than that of the platform, indicating that a large number of less qualified SMEs are not covered by bank SCF services. Additionally, as the majority of bank business serves companies at a large scale, SCF services are not a core business. Therefore, in terms of SCF business, government tends to provide additional support to platforms dedicated to the SCF service.

8.2.4 Managing SCF processes

Managing SCF processes capability refers to the extent to which a platform can effectively arrange business processes and related risks in their SCF service (Song et al., 2018). With a well-arranged SCF process, platforms can be more specialised in SCF services, providing more integrated SC services in their SCF business (Chen & Cai, 2019). SCF process contains financial business and SC operational processes (Blackmen et al., 2013). Financial process describes a series of activities related to the coordination of financial transactions among SCF participants to standardise SCF service processes. The financial business process included invoices, settlement, and payments (Ma et al., 2020). Platform capability to manage financial processes relies on SCF service specialisation.

The financial process synchronises with SC operational processes, including manufacturing and logistical processes (Jia et al., 2020a). As platforms are usually involved in SC activities, some are responsible for processes such as procurement, logistics, retailing, and risk control, when providing SCF services (Song et al., 2021). The capability to manage operational processes is related to the extent to which a platform can provide integrated SC services for customers. Table 8-3 illustrates the way platforms and banks perform in SCF process management.

8.2.4.1 SCF service specialisation

This research finds platform SCF specialisation is reflected by platform efficiency in financing SMEs. Platforms faster service originates from the design of standardised operation processes, analysis of accumulated transactional and operational data on the platform, and specialised SCF human resources.

Before SCF service implementation, each platform designed a set of standardised operation processes related to their SCF product; this standardised process stipulates interest and obligation of each participant in different node of business, promoting effective adoption of SCF services among stakeholders. Also, both leading and supportive platforms can directly and indirectly engage in SC activities; platforms can accumulate various SMEs transactional and operational information, and this accumulated information provides

platforms with abundant information bases, informing analysis of their new customers and generating more accurate corporate and transaction behaviour portraits for new customers, avoiding complex investigation processes. Therefore, platforms can provide initial SCF services to new customers more efficiently.

In relation to SCF human resources, all platforms state they have highly specialised SCF human resources as a means of dealing with operation of the SCF service. However, it is found supportive platforms highlight the role of specialised human resources in promoting SCF service efficiency. In the supportive platform, they usually have professional teams with abundant human resources, working on auditing large numbers of SC transaction invoices. In this case, platforms can efficiently complete examination and verification of invoices related to multiple SME suppliers. Once authenticity and validity of invoices is verified, matching specific historical SC transactions, SMEs can discount invoices on the platform. Abundant SCF human resources enable the platform to solve SME issues when using an SCF product.

Another aspect of SCF specialisation is related to platform risk control. With abundant information support and accurate SME portrait, platforms can be specialized in pre-loan risk control. The specialised human resource also increases platform pre-loan risk control. However, the leading platform performs better in post-loan risk control; leading platform's SME customer transactions and payments are conducted on the platform, forming a closed-loop business, ensuring self-liquidation of the SCF business and reducing default risks. Furthermore, as a considerable volume of SME's business relies on the platform, once the SME default, platforms can terminate collaboration with SMEs, significantly increasing the cost of default and reducing SME possibility of default. Additionally, leading platforms provide logistics and warehouse services along with the SCF service, allowing them to better control post-loan risks and reduce SME default risks.

In the context of banks, insufficient understanding of SCs makes banks less specialised in standardising SCF service processes; a lack of transactional and operational information related to SMEs leads to the necessity for a sophisticated and time-consuming process to

assess SMEs before they provide SCF services to SMEs; this indicates that bank SCF services are less efficient than platforms'. Additionally, SCF services are not banks core business; human resources allocated to SCF services is insufficient to deal with verification of significant volumes of SC transaction invoices and contracts. In terms of risk control, as a result of banks' lack of SCF human resources, insufficient information support, and low engagement in SC activities, they usually find it difficult to control SME pre and post-loan risks.

8.2.4.3 Providing integrated SC services

This study considers the extent to which platforms can provide integrated SC services for customers; this reflects platform capability to manage operational processes in SCF. Owing to the direct engagement in SC activities, leading platforms outperform supportive platforms in providing integrated SC services to customers.

When providing SCF services to downstream retailers, the service scope of leading platforms is not limited to providing financial support but is also able to provide integrated SC services to SMEs. For example, platforms purchase commodities from focal companies, before distributing and selling the commodities in credit to downstream SMEs. Leading platforms can provide integrated SCM services, including customs clearance, warehousing and inventory management, logistics, settlement, and payment collection, as well as information services. However, supportive platforms are not directly engaged in SC activities, yet they can offer supplier management services by upgrading SCs to become more visible and digitalised. Information of multi-tier supplier transactional behaviour is recorded on a platform; supportive platforms share the information with focal companies to assist supplier management; one common aspect between leading and supportive platforms is observed in the cases of A and C, in which platforms state that improvement of digitalization in the industrial SC promotes focal company SCM. This is mainly due to characteristics of the industry in which the platform is located. These two platforms work in industries (raw industrial material industry and construction material industry) that involve relatively immature SCM practices, such as deficient procurement management.

In this case, digitalisation engendered by a platform can significantly facilitate focal company SCM.

Table 8-3. Comparison of platform process management capabilities

Process management capability	Platform A	Platform B	Platform C	Platform D	Bank A
SCF specialization	-Platform has designed a set of standardised operation processes of their SCF product. -Platform's accumulative information provides it with opportunity to conduct accurate and fast new customer admission. -Platform can form a close-loop business to ensure the self-liquidation and reduce SME's default risk (post-loan risk control).	-Platform has designed a set of standardised operation processes of their SCF product. -Platform's familiarity with the SME's operational status makes the loan process in SCF quicker. -Platform can use logistics and warehouse monitoring to reduce SME's default risk (post-loan risk control).	-Platform has designed a set of standardised operation processes of their SCF product. -Platform is more specialised in inspecting the authority of the SC invoice (pre-loan risk control).	-Platform has designed a set of standardised operation processes of their SCF product. -Platform has specialised human resource to conduct efficient auditing of the SC invoice (pre-loan risk control) and solving SME's issues encountered in using the SCF product.	-Bank has insufficient understanding of the SC makes banks less specialised in standardise the SCF service process. -Bank usually has difficulties in controlling the SME's pre-loan and post-loan risk

Integrated SCF service	-Platform provides purchasing and logistics service. -Platform improves the digitalisation of the industrial SC, thus promoting the focal company's SCM.	-Platform provides purchasing, warehousing and logistics service (focal company's non-core business).	-Platform improves the digitalisation of the industrial SC, thus promoting the focal company's SCM.	-Platform's product Y can increase the visibility of the SC and help focal company conduct supplier management service.	-Banks' SCF service usually focuses on financial service and do not include other SC service.

8.2.5 SCF capability hierarchy

When scrutinising organisational capabilities, an evident hierarchy ranging from lower-order capability to higher-order capabilities is apparent (Verreynne et al., 2016). Based on a capability hierarchy proposed by Hine et al., (2014), organisational capability is categorised into three levels: (1) high-level dynamic learning capability; (2) middle-level dynamic functional capability; (3) low-level ordinary capability. Mishra et al. (2013) subdivides dynamic functional capability as higher-level functional capability, applied at the function level, and lower-level functional capability, applied at individual task level. Capability hierarchical structure is adopted in this research and adapted from the capability hierarchy proposed by Mishra et al. (2013) and Verreynne et al. (2016). Information processing capability is considered the highest-level dynamic learning capability; financial network structuring, relationship management, and SCF process management, are considered as dynamic functional capabilities at different levels. The first two are categorised as higher-level functional capabilities, and SCF process management is considered as a lower-level functional capability.

The following discussion focuses on justification for the categorisation of SCF capabilities and illustrates the inter-relationships between three types of hierarchical capability in SCF.

8.2.5.1 Dynamic learning capabilities

According to Hine et al. (2014), dynamic learning capability has the following features. This capability relies on highly specialised resources and requires high routine flexibility; it usually has a long-term strategic and knowledge exploration focus. Verreynne et al. (2016) extended research by Hine et al. (2014), providing a measurement scale of dynamic learning capability, including resources, patterning, competitive intent, and learning. This study considers this measurement, inferring information processing capability as defined by dynamic learning capabilities, which is in the top of the capability hierarchy.

First, Hine et al. (2014) consider dynamic learning capability as reliant on highly specialised resources and knowledge; highly specialised knowledge includes managerial knowledge and technical knowledge. In the content of SCF capability, platforms highly

value professional knowledge of industries involved in the SCF service, as well as managerial knowledge in information processing capabilities; specifically in the manual-based information analysis, platforms require personnel extensive expertise to analyse collected data and provide more comprehensive and supportive evidence which assists risk control and promotes customer admission in SCF.

Each platform believes information processing capability relies on platform technical knowledge in relation to implementing information technology in information processing. For example, big data analysis is widely adopted in information analysis processing, and information acquisition may be completed using IoT technologies; information sharing also highlights the essential role occupied by blockchain technologies.

Second, the indication of dynamic learning capability reflects high routine flexibility allowing routine changeability. Higher routine flexibility refers to low repetition patterning, a major characteristic in dynamic learning capabilities (Hine et al., 2014; Verreynne et al., 2016). Platform information processing capability complies with the characteristic of dynamic learning capability.

Currently, technology is widely adopted in the SCF market to complete the process of information acquisition, analysis, and sharing. However, development of technology is fast, and technology iteration can impact approaches to processing information in SCF. Therefore, both leading and supportive platforms agree there is no constant repetitive pattern for platforms when processing SCF related information, as patterns vary in the context of ongoing technology development.

Third, Hine et al. (2014) agree dynamic learning capability should have a long-term strategic focus on sustainable competitiveness. In the context of SCF, service providers consider information advantages as a primary source of competitive advantages, as information advantages minimise information asymmetry between SCF service providers, capital providers, and SCF adopters. Reduced information asymmetry further decreases risks of the service, especially for service and capital providers (Silvestro & Lustrato, 2014).

This research finds that improvement of information processing capability provides platforms with advantages in terms of information acquisition and information sharing, reducing information asymmetry between SMEs and other service providers in platform SCF services. All interviewed platforms announced the reduced information asymmetry among SCF participants makes them perform better when controlling SCF risks, in turn providing long-term competitiveness in the SCF market. Moreover, Platforms A and C consider better information processing capability indicates the way a platform performs better when analysing information, providing direct support which informs strategic decisions and provides a reasonable amount of finance services for specific customers.

Fourth, the final indication of dynamic learning capability is a focus on explorative learning (Hine et al., 2014). According to Zoll and Winter (2002), exploration learning activities are related to variation, scanning, creativity, pathbreaking, and recombination. Verreynne et al. (2016) provide several indications of exploration of learning, as reflected in dynamic learning capability; for example, exploration of new goods, opportunities, ideas, channels, approaches, markets and knowledges. In the context of SCF, leveraging the information processing capability allows SCF platforms to explore new ideas, opportunities, and approaches, refining current service and business modes. For example, Platform A considers their information analysis capability is focused on explorative learning; information analysis is usually used for SCF risk control, and information analysis dimensions for risk control are continuously informed by former experience in serving multiple SMEs, gradually optimising risk control. Platforms C and D also consider information analysis as essential to update knowledge and evaluate the environment of a specific industry, adjusting SCF products accordingly.

8.2.5.2 Dynamic functional capability

In the capability hierarchy proposed by Hine et al. (2014), dynamic functional capability is the secondary capability in the hierarchy structure. Functional capabilities relate to the production and distribution of existing products and services, usually representing the efficiency and effectiveness of the organisation in performing various functions (Mishra et al., 2013). Dynamic functional capability is subdivided into higher and lower-level

functional capability. Mishra et al. (2013) study dynamic functional capability in the context of procurement management, announcing that higher-level functional capability represents operational capability applied by a firm in the procurement process to synthesise internal requirements and external relationships; the lower-level functional capability signifies a task-level capability, in which firms can accomplish specific tasks in the procurement process.

Based on this definition, research extends the categorisation of dynamic functional capability in the SCF research. First, both network structuring capability and relationship management capability are related to establishing and maintaining good relationships with major stakeholders in SCF; platforms consider relationship management as highly related to SCF operation, as when establishing and managing the relationship with multiple stakeholders, platforms synthesise internal resources and requirement with stakeholder external resources and requirements. Platforms are aware of the available resources offered by potential collaborative partners, and the way that resources contribute to platform SCF implementation and operation. Both network structuring and relationship management capability suggest platforms can match internal knowledge and resources regarding SCF to external relationships with SCF participants who require SCF services and desirable resources in order to promote implementation and operation of SCF programmes (Martin & Hofmann, 2019). Therefore, in this research, these two capabilities are considered as higher-level functional capabilities in SCF. Platforms consider process management capability as representing how well a platform performs in a single SCF task, as based on resources brought by capabilities of information processing, network structuring, and relationship management. Task-specific capability is categorised as a lower-level functional capability in this research.

8.2.6 Conclusion about platform SCF capabilities

The SCF capabilities identified in this study augment previous discussion about SCF capabilities, concluding determinant factors of each capability. Both leading and supportive platforms recognise information processing, financial network structuring, relationships management, and SCF processes management, as primary SCF capabilities.

In terms of platform information processing capability in relation to SCF, previous research considers information acquisition or sharing in SCF (Song et al., 2018; Jia et al., 2020). However, this study finds information processing capability in SCF is an aggregate capability of information acquisition, analysis, and sharing capability; from a capability hierarchy perspective, information processing capability is regarded as a dynamic learning capability, the uppermost capability for SCF service providers. This study clarifies the relationship management capability in SCF by dividing into financial network structuring capability, emphasising initial relationship establishment with stakeholders, and stakeholder relationship management, focused on long-term collaborative relationship maintenance. These two capabilities compose higher-level functional capabilities, located in the middle level of the SCF capability hierarchy. Process management capability is extended from risk control (Song et al., 2018) to include both financial and physical process management in SCF. It is a task-level capability and deemed as a lower-level functional capability in the hierarchy of SCF capability.

The identified SCF capabilities are compared between platforms and banks. This research finds platform SCF capabilities are better than that of banks, resulting in superior SCF performance. In the context of China, except for a few banks that have decades of SCF operational experience, the role of most in relation to SCF has gradually turned into purely capital provision. As emphasised by all sampled platforms, more specialised divisions of labour are likely to be observed in future SCF markets in China; each participant will only be responsible for their most specialised section. For example, platforms are responsible for information processing that mitigates the overall risks of SCF; banks are responsible for efficiently providing sufficient capital to platform SCF services; focal companies are responsible for underwriting SME suppliers to support them in obtaining loans. This finding contradicts that of Silvestro and Lustrato (2014), who demonstrate that bank SCF promotes coordination, collaboration, information sharing, and information visibility, facilitating the integration of physical and financial SCs in SCF business. However, in their case study, bank SCF services are supported by an internet-based trade platform (Similar to Platform A and C in this study); the platform can automatically link information flows

along the physical SC with money supply, facilitating the automated purchase of buyer-accepted invoices at attractive rates.

In this research, banks fully engaging in providing SCF service must understand SCF solutions and operations. Banks must have core competencies in SCF, such as sufficient information processing capability which allows analysis of sophisticated SC information generated by extensive transactions generating information that supports decision making. Banks require significant network structuring capability in order to extend business scope in their SCF services. Additionally, banks must perform well in relation to SCF process management, requiring them to have sufficient specialised human resources that ensure efficiency and proficiency in SCF services; it also requires banks to enrich service scale of the SCF, providing financing services and offering clients more optional value-added SC services. However, in the Chinese SCF market, most banks do not possess these competency skill sets; they lack the expendable human resources necessary to ensure development of such competencies. This is especially true for small and regional banks that must work with partners to engage in SCF services in China.

8.3 Inter-organisational SCF network

According to the four case studies, different inter-organisational network structures are observed among platforms; structural differences render varieties in network characteristics in relation to aspects of reach, richness, and receptivity.

First, reach refers to the extent which organisational networks connect to distant and diverse partners. It indicates broadness of a network (Gulati et al., 2011). Figure 8-1 presents the four platform SCF networks each platform has, prioritising a dispersed network with higher reachability. Benefiting from digitalisation, platform customer base for SMEs is not limited to local area; digitalisation transforms offline paper-based SCF processes into online digital-based SCF processes. SMEs do not have to conduct redundant offline processes; they are able to finish financing processes online on a platform, meaning platform SCF services reach more non-local SMEs. Especially in the case of Platform D,

with the application of its SCF product Y, its SCF service penetrates first-tier suppliers and makes SCF available for multi-tier suppliers in the SC.

With extended geographical SCs, and a greater number of SMEs reached in the SCF network, platforms will possess larger customers bases, ensuring potential SCF business volume on the platform, making services profitable. All platforms hold the belief that profitability of SCF services is not dependent on a single business; on the contrary, it relies on an amount of accumulative business volume; normally business volume of a single SCF service is usually minimal.

In platform SCF networks, platforms seek partners with different and complementary activities and resources to provide SCF services. Unlike traditional SCF service modes, which usually include one bank, one focal company, and SMEs in the SC. Platforms get in touch with multiple banks to ensure adequate sources of capital for SCF services and SCF networks usually link with multiple focal companies to acquire SC information and make use of focal company credit, supporting the SCF service. The SCF network of the leading platform includes fintech companies and logistics and warehousing service providers, who provide non-financing aspects of their SCF service. Platforms contact non-traditional SCF participants, including government, insurance companies, and guaranty company, facilitating the implementation of SCF programmes. In this case, involvement of a platform in SCF increases the reachability of an SCF network.

Second, richness refers to the potential value inherent in network resources available to an organisation (Gulatiet al., 2011). Such potential value is derived from accessibility to rare resource and multilateral combination of the resources of network partners. Compared with traditional SCF networks, platform SCF networks outperform in terms of richness of the SCF network. Platforms manage to create benefits for multiple SCF participants through collaboration with SCF; for example, platforms leverage their network to access rare information resources, such as transactional data and SMEs operational information, normally hard to obtain for traditional SCF service providers such as banks. Such information resource requires accumulation and long-term collaboration with network

partners such as SMEs and focal companies; however, this poses barriers to new entrants, as leading platforms are usually directly involved in SC activities, they have better access to operational data, resulting in better richness in terms of accessing rare information resources in SCF.

Multilateral combination of various actor resources is observed in each of platform network. Platforms consider their role in the SCF network as service providers and coordinators, familiar with industry environment and benefiting from adequate professionalised personnel who engage in SCF; therefore, the platform can allocate resources among participants. For example, each platform affirms ability to facilitate simultaneous direct exchange of SCF-related information and knowledge among SMEs, focal companies, and banks. During this process, platforms coordinate bank financial resources, company business resources, SC resources, platform information and technology resources, and government policy resources. In this case, using the platform SCF network, SMEs have better access to financial resources, whereas banks have more control over SCF risks because of abundant information and technology resources allowed by the platform. Focal companies achieve improvement in SC effectiveness with lower monetary costs and operational costs by way of collaboration with platforms.

Third, receptivity indicates the extent to which an organisation can channel and leverage accessible network resources across interorganisational boundaries (Gulati et al., 2011); it is related to mutual trust among partners, commitment to partnership, and multiplexity. The receptivity of platform SCF networks is superior to traditional forms; it can be seen from the fact stakeholders of each platform demonstrate trust in the platform in relation to the aspect of SCF service. SMEs trust platform SCF service efficiency and quality; banks trust effective and secure sharing of SCF-related information and corresponding risk control; focal companies trust platform SCM and effective improvements. There is significant commitment in each SCF network among banks, focal companies, and platforms; this results from the bank and focal company long-term collaborative relationship with platforms and increasing awareness of the importance of SCF to business expansion (for banks) and SCM (for focal companies).

In terms of tie multiplexity, in the Chinese SCF market each platform values individual interaction and institutional interaction with banks and focal companies. Institutional interaction provides opportunity for platforms to share views about development and operation of SCF in China, engaging with vital and varied stakeholders. Frequent individual interaction, especially between platforms and banks, increases trust in the platform, further promoting approval of lines of credit to platforms.

Following comparison of the structure of four platforms, an integrated SCF network structure centre by the platform is illustrated in Figure 8-2. The following figure illustrates the relationship between platform and key stakeholders, demonstrating the essential resources they possess in SCF. Platforms are the core of the SCF network, possessing the information, technology and human resources, ensuring successful implementation and operation of the SCF programme. Banks are major capital providers and possess financial resources; focal companies are the essential sources of credit for the SCF provider, especially for supportive platforms engaging in reverse factoring services; SMEs are the primary customers and possess SCF business resources. Abundant business resources are a prerequisite of platform SCF profitability. Government are policy makers and can provide policy resources to support platform SCF development, encouraging bank participation in platform SCF programmes. Other functional stakeholders are usually supportive institutions who assist platforms in the control of SCF risks, or collaborative, or self-owned logistics, warehousing, or fintech companies, who work with the platform to monitor SME behaviour in SCF together.

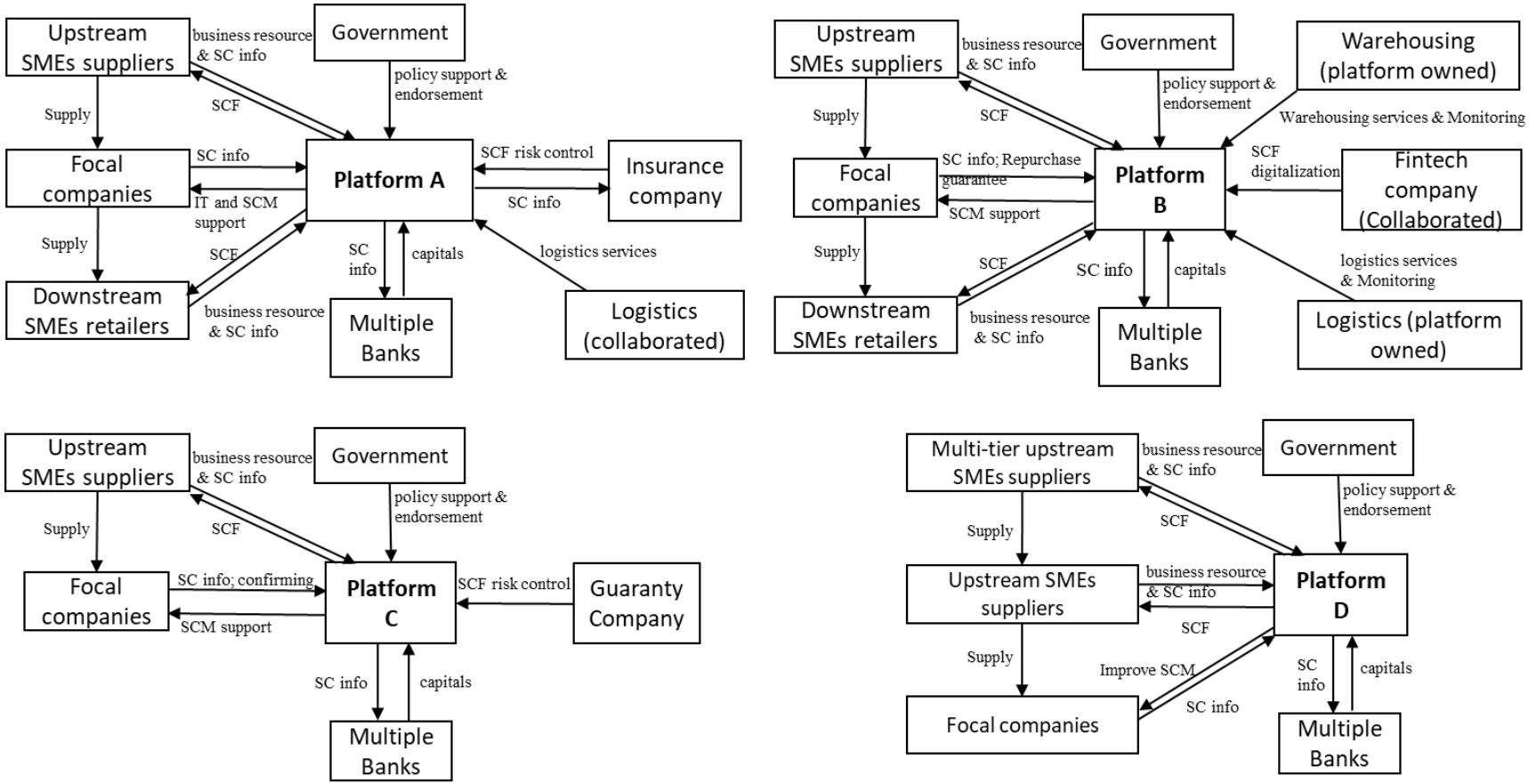

Figure 8-1. Comparison of structures of four platform' SCF network

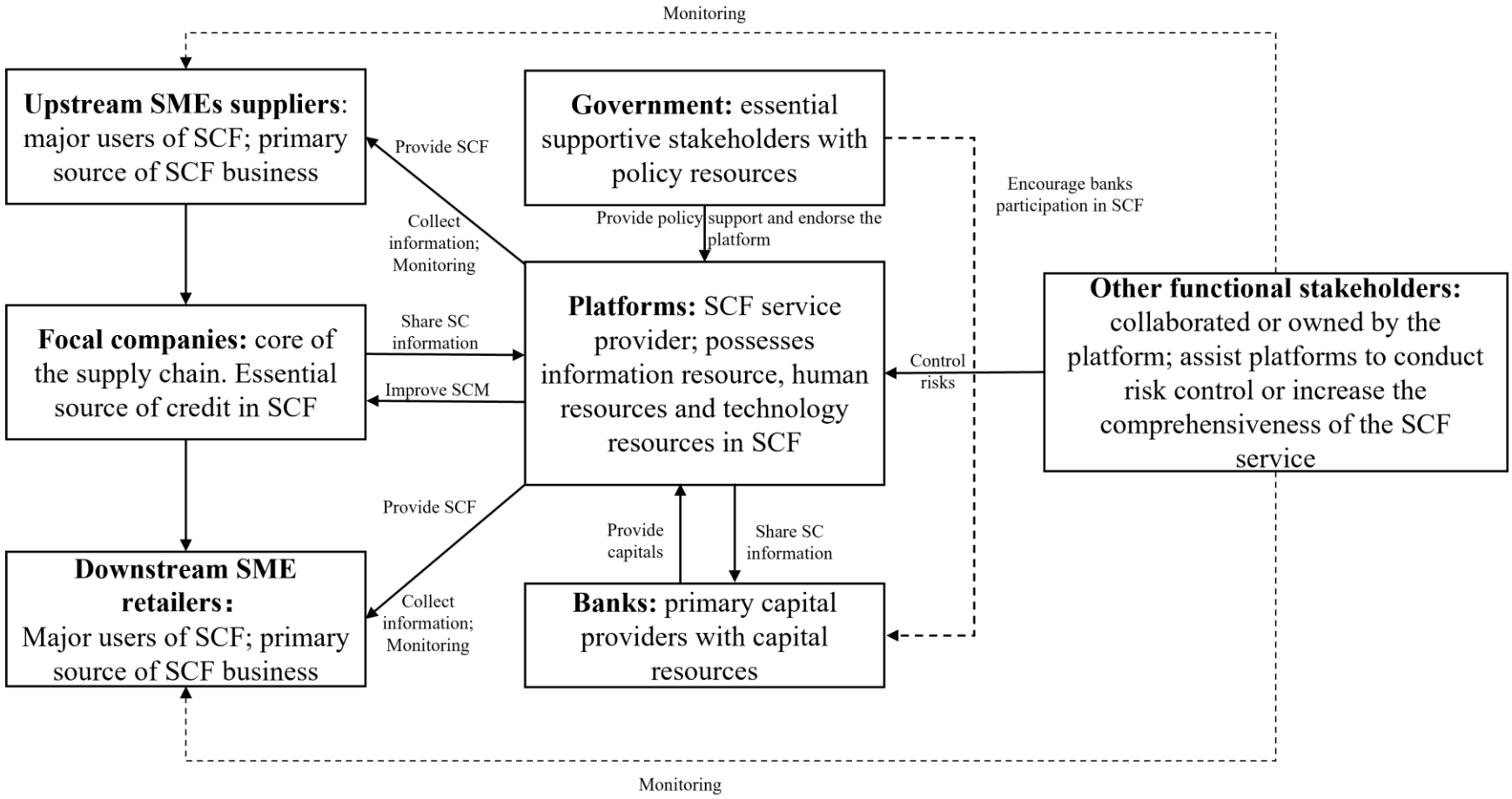

Figure 8-2. Integrated structure of platform's SCF network

8.4 SCF service performance

In existing SCF literature, the term “performance” is usually adopted to describe the extent to which adoption of SCF can improve financial performance of SMEs or operational performance of focal companies (Ali et al., 2018; Alora & Barua, 2019). The lack of measurement of SCF service performance of SCF service providers makes it difficult to establish a proper benchmark able to comprehensively evaluate SCF service performance (Liu et al., 2015). Chen et al. (2022) propose a framework to evaluate SCF platform performance with dimensions of technology, recognition, and organisation. Technology dimension represents the degree of technology application in platform SCF. Recognition dimension describes the extent to which a platform is accepted by customers; organisation dimension simply denotes financial performance of the platform.

Applying the evaluation framework in this case study research, interviewers’ express disagreement regarding the three dimensions. First in the technology dimension, platforms tend to categorise technologies as fundamental and emerging. Fundamental technology is usually a structure that supports normal operation of the platform; emerging technology refers to innovative technology adoption able to ameliorate platform SCF business. Although they affirm the positive effect of technology adoption to SCF performance, evaluating the SCF performance based on technology application is unreasonable, as they do not recognise a direct relationship between technology application and superior SCF performance. The example seen in Platforms A C and D, shows interviewees on each platform consider technology improves effective data collection and transmission, relatively reducing SCF risks. However, the positive effect of technology application on SCF performance is based on a well-designed SCF business model, accepted by essential stakeholders in SCF.

Second in relation to an organisational dimension, namely financial performance (Chen et al., 2022), the profitability of platform SCF services appears evident. However, financial performance is not considered as a prior evaluation factor for SCF performance; it is not suitable for a third-party SCF platform, especially when the platform is in an expanding

stage, such as with Platform D. All sampled platforms believe profitability is based on scope; business volume of the SCF service. Generally, the SCF service is provided to many SMEs; each with a relatively small amount of capital needs. Their SCF service needs to be accepted by an adequate numbers of SME clients to guarantee business volume of SCF service to achieve profitability.

Thirdly, in relation to recognition, Chen et al. (2022) consider recognition measures as the degree of acceptance of platform service by customers; higher acceptance results in better SCF performance and this is supported by evidence in this research. However, the scope of customers should be expanded in the context of SCF initiated by third-party SCF platform.

Platforms believe SCF is a multilateral business; measuring SCF service performance is a task with high complexity. Results would be partial if SCF service performance were measured from acceptance of a single party; for example, only considering SMEs. To comprehensively evaluate SCF performance, platforms fully consider platform clients, SCF service, and measurement of platform SCF performance based on extent to which service is accepted by various clients, including banks, SMEs, and focal companies. Therefore, based on inductively coding of the case study and findings offered by Chen et al. (2022), acceptance-based measurement is proposed as a method to evaluate platform SCF service performance (as shown in Table 8-4).

First, considering bank perspectives, there are several considerations necessary in relation to SCF service. One the one hand, they wish to acquire more SMEs customers from platforms to satisfy government requirements to finance and diversify business models. However, banks are concerned about whether the risk in SCF services can be well controlled. Therefore, platforms tend to evaluate bank acceptance of platform SCF through risk controllability of SCF service. Once risks are well controlled, bank acceptance of SCF services is increased accordingly, indicating a good performance in platform SCF services. Technology application is agreed as an essential factor impacting on risk controllability of platform SCF services, both for leading and supportive platforms. However, because of

different attributes in the provided SCF service, leading platform control of SMEs, degrees of SME business dependency on a platform, is an influential factor affecting SCF risk controllability. For supportive platforms, SCF risk is mainly related to quality and commitment of the collaborated focal company.

Among the four platforms, two of them (A and C) are private companies; the other two (B and D) are state-owned. Compared with state-own platforms, private platforms assert the importance of involving third-party in the SCF programme to share banks' risk. For example, including insurance companies (Platform A), and guarantor companies (Platform C) in the SCF programme can share banks' risks in SCF participation. For state-owned platforms, Platform D's SCF focus is on the reverse factoring in upstream SCs; the collaborated focal company is state-owned, and these companies have strong sources of credit and represent the source of repayment in SCF. Therefore, risk controllability of platform D' SCF service is high. Conversely, Platform B's SCF service scope reaches the downstream SC, such as inventory financing, and the source of repayment in the SCF service is from downstream SMEs. However, considering the state-owned attribute, when SMEs fails to take all goods within an agreed period, Platform B's collaborative focal companies agree to repurchase inventory or support the platform to liquate inventory; this reduces the risk of Platform B's SCF service, making the risk more controllable. Platform A collaborates with a third-party insurance company, as unlike the state-owned Platform B, Platform A lacks credibility and strength to bear risk in the case of SME default. For the supportive platform, Platform C's collaborative focal companies are usually private, holding relatively higher risks compared with state-owned focal companies. Based on discussion above, Figure 8-3 illustrates the relationship between platform ownership, types of platforms, and SCF risk controllability.

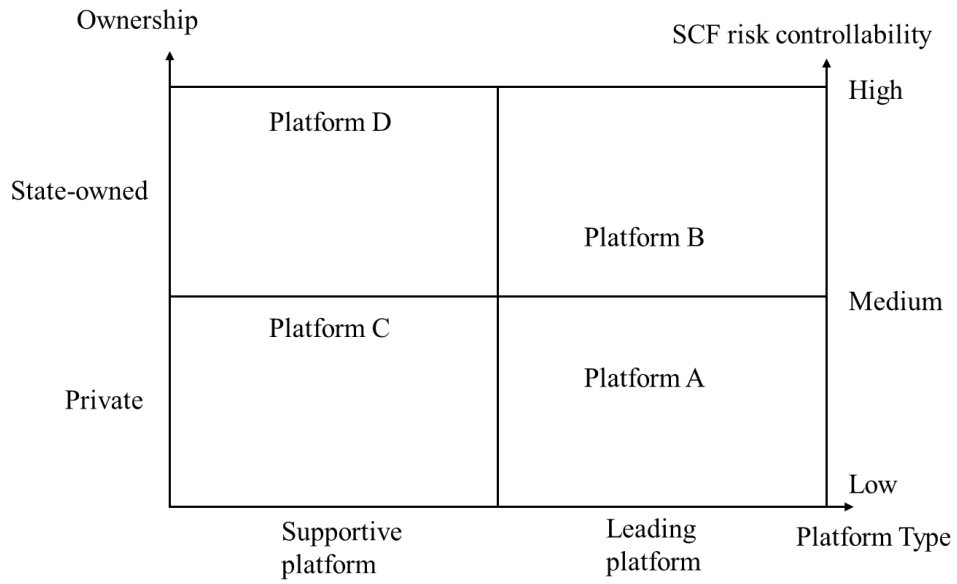

Figure 8-3. Matrix of ownership, platform types and SCF risk controllability

Second, SME platforms reach an agreement that SME acceptance of SCF service depends on the extent to which SCF service can solve liquidity issues. Platforms tend to use affordability and availability to measure SME's acceptance. Affordability describes whether the price of an SCF service is lower than the financing service previously adopted by SMEs. Availability refers to whether entry threshold of an SCF service is lower than ordinary financing service.

Third, focal company acceptance of platform SCF service is determined by perceived improvement in SC effectiveness; it is mainly reflected in SC efficiency improvement and cost reduction. Leading platforms focus on operational cost reduction and efficiency improvement, while supporting platforms emphasise reduction of focal company purchasing cost; the difference is derived from different major SCF services provided to focal companies.

Table 8-4. Comparison of platform's SCF performance evaluation

		Platform A	**Platform B**	**Platform C**	**Platform D**
Acceptance of banks	Risk controllability	-Whether the risk in SCF can be controlled by the platform through technology application and platform's control to the SMEs -Whether the risk in SCF can be shared by the third-party companies, such as insurance companies or focal company's repurchase guarantee	-Whether the risk in SCF can be controlled by the platform through technology application and platform's control to SMEs -Whether the collaborated focal company is qualified and have enough commitment in SCF collaboration	-Whether the risk in SCF can be controlled by the platform through technology application -Whether the risk in SCF can be shared by the third-party companies, such as guaranty company	-Whether the risk in SCF can be controlled by the platform through technology application -Whether the collaborated focal company is qualified and have enough commitment in SCF collaboration
Acceptance of SMEs	Availability	-Whether the entry threshold of the SCF service is lower than ordinary financing service.	-Whether the entry threshold of the SCF service is lower than ordinary financing service	-Whether the entry threshold of the SCF service is lower than ordinary financing service	-Whether the entry threshold of the SCF service is lower than ordinary financing service
	Affordability	-Whether the price of the SCF service is much lower than the financing service	-Whether the price of the SCF service is much lower than the financing service	-Whether the price of the SCF service is much lower than the financing service	-Whether the price of the SCF service is much lower than the financing service

		that previously adopted by the SMEs.	that previously adopted by the SMEs.	that previously adopted by the SMEs.	that previously adopted by the SMEs.
Acceptance of focal company	SC effectiveness	-Whether platform can provide warehouse and logistics service along with the SCF service, to reduce the shipping cost. -Whether platform can provide integrated the logistics services of multiple focal company to generate scale effect, which can reduce the logistics cost of each company.	-Whether platform can provide warehouse and logistics service along with the SCF service, to reduce the shipping cost.	-Whether the SCF service can help focal company reduce the purchase cost -Whether the platform can increase the SC digitalisation through the application of emerging technologies in SCF.	-Whether the SCF service can help focal company reduce the purchase cost

Chapter 9 Discussion

This section discusses the relationships between constructs in the cross-case analysis, namely SCF capabilities and performance. The interrelation among three types of SCF capability are investigated, reaching a conclusion about how platform SCF capabilities lead to different SCF service performance improvements, informed by analysis of how SCF capabilities contribute to SCF network characteristics.

There is a capability hierarchy among SCF capabilities. Higher-level capabilities improve lower-level capabilities, while improvement of the lower-level capabilities strengthens the former, resulting in a virtuous circle. The improvement of three types of SCF capability jointly contribute to SCF network improvement by enhancing network reach, richness, and receptivity. Finally, improved SCF network characteristics eventually lead to superior SCF service performance.

This section is composed of four parts: Section 9.1 discusses the interrelationship among identified SCF capabilities; Section 9.2 discusses the relationship between SCF capabilities and SCF network characteristics; Section 9.3 discusses the relationship between network characteristics and improvement in SCF service performance. Section 9.4 answers the research questions and developed a revised theoretical framework.

9.1 Interrelation among SCF capabilities

This research finds information processing capability promotes the capability of network structuring, relationship management, and SCF process management. This complies with the conclusion of capability hierarchy, suggesting that dynamic learning capability (information processing capability) leads to the development of dynamic functional capability (the other three SCF capabilities) (Hine et al., 2014).

First, in terms of network structuring capability, all platforms assert that strong information processing capability is attractive to other potential SCF participants, increasing the

possibility of establishing initial collaboration with these participants. Sufficient information processing capability allows platforms to obtain large quantities of accumulated data related to SME transactional and operational behaviours, especially for platforms directly engaging in SC activities (Platforms A and B). Such accumulated data suggests platforms have advantages in decision-making as part of the SCF business (Shi et al., 2015); these advantages can also be extended to other participants, including, banks, guarantors, and insurance companies, by using effective information sharing capabilities, reducing information asymmetry between participants and SMEs, and further increasing their willingness to collaborate with platforms in SCF.

Second, in terms of relationship management capability, platforms believe superior information processing capability helps to maintain collaborative relationships with other key stakeholders such as banks and focal companies. This is especially true in relation to the way information sharing capability exerts a significant impact on maintaining collaborative relationships; this finding echoes findings by Shi et al. (2015), who demonstrate that SC collaboration level is related to the extent of information shared among participants.

In a single SCF business, information processing capabilities promote effective sharing of valuable information related to SC transactions, including trading, financial, and strategic SC information (logistics), which facilitates the integration of physical, informational, and financial flow in the SCF business. The sharing of integrated information increases decision synchronisation among partners in relation to specific SCF activities, improving the collaborative relationship among partners (Ma et al., 2020). As such, the following propositions is proposed:

> **P1a:** Information processing capability enables network structuring and relationship management capability.

Findings also suggest process management capability relies on information processing. For example, Platform A's fast admission of new clients is dependent on an accurate portrait

of new clients based on data analysis of large quantities of information collected on the platform. Furthermore, platform specialised human resources, allowing the audit of SC invoices, is reliant on platform information analysis capability. Therefore, the following is proposed:

> **P1b:** Information processing capability enables SCF process management capability.

The findings indicate that the capability of network structuring and relationship management affects information processing capability. As discussed in section 8.2.2, more effective network structuring capability enables the interconnectivity of the platform to be promoted accordingly. Higher interconnectivity indicates a higher number of SMEs, focal companies, and banks participating in platform SCF services, providing platforms with more sources of information. Meanwhile, better relationship management capability allows platforms to become capable of maintaining a collaborative relationship with key SCF participants. This relationship increases willingness to share information with platforms, forming a reliable and effective information source able to support SCF decisions (Song et al., 2021). Therefore, based on the discussions, the following proposition is proposed:

> **P1c:** Better network structuring and relationship management can facilitate the improvement of information processing capabilities.

This interrelationship is observed between higher-level functional and lower-level functional capabilities. The findings suggest process management capabilities derive from network structuring and relationship management capabilities; specific SCF processes emerge for platforms when a collaborative relationship is established. As platforms build complex business relationships with many banks, SMEs, and focal companies, process management capabilities become essential to effectively deal with operational issues in SCF service (More & Basu, 2013).

On the other hand, process management capability can enhance collaborative relationships with stakeholders in SCF. Better financial process management capability allows platforms to have better control of pre and post-loan risk, attracting more bank participation in SCF (Song et al., 2018). In addition, with better operational process management capabilities, platforms are able to provide a series of value-added services for focal companies, including purchasing, warehousing, logistics, and improving SC digitalisation. Focal companies are willing to strengthen collaboration with the platform in SCF when they can enjoy potential benefits for their SC operation from platform SCF programs (Hofmann & Zumsteg, 2015). Based on this discussion, the following propositions are proposed:

P1d: SCF process management capability is derived from network structuring and relationship management capability.

P1e: More effective SCF process management capability can improve the network structuring and relationship management capabilities.

9.2 The relationship between SCF capability and network characteristics

Network characteristics vary by platform type, which may be caused by a difference in terms of platform primary service scope in SCs (upstream and downstream), or attributes (state-owned or private). However, network characteristics are determined by the three dimensions of reach, richness, and receptivity; each dimension is affected by multiple factors (Gulati et al., 2013; Johnson et a., 2018). This research empirically establishes the relationship between platform SCF capability and inter-organisational characteristics.

9.2.1 SCF capability and network receptivity

According to Gulati et al. (2011), receptivity describes the way organisations channel and leverage network resources across organisations in a network; the strength of receptivity is related to quality ties among organisations, while quality ties are correlated with mutual trust, commitment, and multiplexity.

For mutual trust, this research finds the superior information processing capabilities of platforms enables the collection of comprehensive information during SCF business and effectively sharing such information with related parties. Consequently, banks can avoid information asymmetry in SCF during their collaboration with platforms; they are able to acquire more unstructured information related to SME detailed operational data, reducing bank risk of repeated and empty pledges caused by asymmetric information (Du et al., 2020). As a result, SC visibility is improved and banks' pre-loan risks are reduced, thereby improving a bank's trust in the platform (Du et al., 2020).

Furthermore, when sharing information, platforms often adopt emerging technologies, such as blockchain and IoT technology. This facilitates effective, reliable and accurate sharing of traceable information between platforms and banks, making the platform more trusted by banks (Saberi et al., 2019). In this case, banks can rely on SCF-related information provided by platforms to provide capital for platform SCF services; moreover, platforms can leverage banks financial support to provide SCF services for SMEs customers.

Commitment and multiplexity are enhanced by platform network structuring and relationship management capability. Wuttke et al. (2013) state that a lack of top management commitment hinders enterprise adoption of SCF. In this research, it is shown that banks lack top management commitment which mitigates engagement with SCF. The lack of commitment can be explained by insufficient awareness about SCF initiatives and lack of familiarity with SCF knowledge, making them unclear about the potential benefits of adopting SCF (More & Basu, 2013).

This research finds the commitment of top management in focal companies and banks can be promoted by platform relationship management capability; when managing relationships with focal companies and banks, platforms share specialised SCF knowledge and understanding towards SCF concept with them, promoting establishment of a common vision of the SCF partnership. Platforms make it clear that SCF is not merely a financing tool but also an effective approach able to improve SC efficiency for focal companies and

a feasible means of diversifying bank business, helping them accomplish inclusive financing objectives. Once stakeholders have in-depth knowledge and equivalent understanding of SCF, potential benefits are easier to perceived, which increases the overall commitment to SCF partnership (Hofmann & Zumsteg, 2015).

Furthermore, platforms should maintain a strong relationship with government to increase bank commitment to SCF partnerships with platforms. The government endorses a platform through equity participation, making the platform more trustful and increasing bank commitment to platform SCF partnership. Platform D also states maintaining a good relationship with local government facilitates SCF service promotion to banks. In the case of Platform D, local government held several seminars involving top managers from the platform, banks, and focal companies, providing the platform with an opportunity to increase bank understanding of platform SCF services.

Multiplexity is also promoted by network structuring and relationship management capability. These two capabilities denote different stages of relationship maintenance. However, at each stage interviewees on each platform emphasise the importance of frequent communication between the platform and stakeholder key departments in SCF business; for example, Platform C and D arrange meetings with focal company finance and SC department, as well as bank internet financing departments.

At an interpersonal level, each platform states that their top managers have close communication with key managers in banks and focal companies, sharing viewpoints and perceived opportunities in SCF business. Platforms A and C are private enterprises, thus they rely on close and frequent interpersonal interaction with banks to ensure willingness to engage in SCF programmes. The increased multiplexity leads to closed interpersonal and inter-organisational ties, providing platforms with access to banks' financial resources and focal companies' information and SC resources (Song et al., 2018), increasing receptivity of the SCF network.

Based on the discussion above, the following propositions are proposed:

P2a: Platforms with greater information processing capability tend to perform better in terms of information acquisition, analysis, and sharing. This allows them to strengthen quality ties through enhancing the mutual trust among SCF participants, improving receptivity in the SCF network.

P2b: Platforms with higher capabilities of network structuring and relationship management can strengthen quality ties by increasing stakeholder commitment to the partnership in SCF and multiplexity in the network, improving receptivity in the SCF network.

9.2.2 SCF capability and network reach

Reach indicates the structural broadness of relationships in the network (do Canto et al., 2020), demonstrating how an organisation network builds ties with distant and diverse partners, with relevant network resources, adequate reliability, and trustworthiness (Gulati et al., 2011). This research finds financial network structuring capability enables platforms to build links with distant and various partners, increasing the reach of the SCF network.

As previously discussed, financial network structuring capability is determined by platform interconnectivity, attractiveness to potential partners, and familiarity with partners and industry. The latter can enable platforms to identify appropriate partners with suitable resources in the SCF network.

The SCF network structure of Platforms A, B, and C is derived from previous business networks; their initial business is related to SC trading or physical SCM services, making the platforms familiar with their industrial environment. Additionally, platforms tend to have a better understanding of enterprise clients who have previous collaborated with the platform in SC services. In this case, platforms are aware of desired resources held by potential partners (Gulati et al., 2011), enabling them to screen out suitable and reliable partners in future SCF collaboration.

Financial network structuring capability enables a platform to build links with distant and different partners. Firstly, increased network structuring capability entails better attractiveness for various potential partners; platforms have information advantages as they are able to attract banks to collaborate. Platforms' SCF service proficiency attracts focal companies and SMEs in the SC to participate in SCF services to ameliorate SC efficiency in relation to both physical and financial. Therefore, improvement in network structuring capability promotes platform linkage with diverse partners in SCF, increasing the reach of the SCF network.

Second, connection with partners at a distance can be increased by network structuring capability involving higher interconnectivity. Interconnectivity entails a higher level of digitalisation in the SCF process, as shown in the case of platform A, C and D, transforming the manual-based into a technology-based process (Silvestro & Lustrato, 2014), expanding service scope from local enterprise to others in various fields.

In addition to financial network structuring capability, this research proves relationship management capability expands the reach of platforms to serve more SMEs at distance. A healthy collaborative relationship between platform and focal companies facilitates the participation of focal company SME suppliers or retailers. Especially in the reverse factoring service, SCF services are based on focal company credit, providing financial services to SMEs suppliers; such relationships make it easier for platforms to make use of focal company credit and promote SCF products among upstream SCs. As shown by Platform D, product Y can circulate in the collaborative focal company SC, making the reverse factoring service reach multi-tier SCs, increasing the distance of the SCF network.

Based on the discussion, the following proposition is offered:

> **P2c:** Platforms with higher capabilities of network structuring and relationship management are more likely to build a close collaborative relationship with stakeholders; therefore, they are more familiar with SC and conditions in which the SCF operates, enabling the platform to find

appropriate partners in SCF and improve reach of the SCF network.

9.2.3 SCF capability and network richness

In addition to the effect on network reach, network structuring and relationship management capability increase SCF network richness. Gulati et al. (2011) consider richness as deriving from the value of available network resources to the organisations, which is related to the quantity and quality of resources.

Based on the case study, essential resources for successful SCF service are considered as sevenfold: information resource, human resources, technology resources (possessed by platforms), credit resource (possessed by focal companies), business resource (possessed by SMEs), capital resources (possessed by financial institutions), and policy resource (possessed by governments). In a platform initiated SCF programme, each resource is provided by different stakeholders; platform network structuring capability guarantees a wider link with diverse partners, such as banks, focal companies and SMEs, increasing the quantity of resources available in the SCF network.

However, in terms of the quality of resources, platform capability to maintain a collaborative relationship with multiple stakeholders in SCF ensures quality of available resources provided by SCF partners in the network. In this case, synergies and mutual benefits are created among stakeholders, as a result of extensive collaboration between platform and stakeholders (Lam et al., 2019), as well as orchestration of resources in the network.

This research finds the platform significant role in orchestrating resources in the SCF service, supporting the argument alternative SCF providers (i.e., platform) act as SC orchestrators in SCF (Bals, 2019). However, previous research considers the platform orchestration role in terms of bridging a gap between SMEs and banks (Jia et al., 2020a). This research finds the scale of platform orchestration is wider; the extensive orchestration role of the platform relies on platform capabilities of network structuring and relationship management but also SCF process management capability.

Process management capability provides platforms with increased levels of competitive resources at an SCF operational level; for example, abundant specialised human resources and SCF operational knowledge. Platforms in this study also stress the way superior process management capability reflects a strength in providing more comprehensive SC service to clients, especially focal companies and SMEs. As shown in the example of platform B, leading platforms usually include procurement, logistics, and warehousing in their SCF services, helping focal companies complete non-core business at a lower price. Supportive platforms help focal companies increase the digitalisation in their industrial SC, such as the construction SC. Therefore, leading platforms can provide focal companies with more digitalised and visible SCs, making it easier and more effective for them to conduct SCM (Ali et al., 2018).

Therefore, with better capabilities in network structuring, relationship management, and SCF process management, platforms can better orchestrate essential resources in SCF, creating synergies for multiple parties involved in SCF. Chairman 1, of platform A, concludes that platforms can ensure successful implementation of low-risk (banks and platforms), high efficiency (focal companies and SMEs), and affordable (SMEs) SCF services. Additionally, successful implementation of the SCF programme is considered a financial innovation in China, potentially increasing political achievements of local governments.

Based on the discussion, the following propositions are proposed:

> **P2d:** Platforms with higher capabilities in network structuring and relationship management have a better understanding of the stakeholder resources, orchestrating resources in SCF to create mutual benefits and synergies for each party, resulting in a promoted richness in the SCF network.
>
> **P2e:** Platforms with higher SCF process management capabilities can provide more competitive resources at an SCF operational level, increasing

their competencies in creating synergies for multiple SCF participants, leading to an increment in the richness of the SCF network.

9.3 Relationship between interorganisational network characteristics and SCF service performance

Existing research into interorganisational network theory contends the improvement of reach, richness, and receptivity, in the network leads to better organisational performance (Gulati et al., 2011; Falcone et al., 2019; do Canto et al., 2020). This research supports this argument in the context of SCF, in that increased network characteristics can increase platform SCF service performance. However, specific improvement in organisational performance is not specified, except in the case of Falcone et al. (2019), who roughly describe how improved characteristics promote financial and operational performance in E-commerce. Based on this case study, the research refines the relationship between network characteristics and performance in the context of SCF.

9.3.1 Network receptivity and SCF performance

This research argues that increased SCF network receptivity leads to better SCF performance by increasing acceptance among banks and SMEs in relation to platform SCF service. As discussed in section 8.4.2, involvement of platforms in SCF increases network receptivity, meaning platforms and their partners can rely on each other in order to fulfil mutual obligations, behave predictably, negotiate, and act in good faith (Gulati et al., 2011). Enhanced interorganisational trust promotes resource and knowledge exchange within a network among partners, contributing to organisational performance improvement (Uzzi, 1997). Furthermore, given the higher network receptivity platforms achieve improved leverage and allocate resources to the appropriate partners in the SCF business. In this case, platforms can leverage information resources acquired from SMEs and focal companies to banks, who in turn provide capital for platform SCF programmes, reducing bank information asymmetry in SCF; platforms tend to share technology resources with banks to conduct the pre and post-loan investigation, co-monitoring operational status of financing SMEs, and reducing default risks of SMEs. Reducing information asymmetry

and SME default risk increases banks risk controllability in SCF, increasing bank acceptance of platform SCF services. This finding supports conclusions generated by Chen et al. (2019b), in that banks benefit from application of the platform in providing SCF business. With the assistance of a digital platform, banks can integrate operations and finances in SCM, solving bank issues in relation to information asymmetry and monitoring collateral or the operational and financial status of financing subjects (Chen et al., 2019b). However, discussion is limited to SCF in the agriculture industry. This paper generalised Chen et al. (2019b) and applied to multiple industries, including construction, manufacturing, and industrial raw materials. Based on discussion, the following proposition **P3a** is proposed.

> **P3a:** Superior receptivity of the SCF network increases platform SCF performance by increasing bank acceptance of platform SCF service and endowing banks with greater risk controllability in relation to SCF.

Furthermore, higher SCF network receptivity makes risks associated with SCF more controllable in relation to both platform and banks; risk premium is lower for capital providers providing financial support to platform SME clients. A lower risk premium usually represents lower interest rates offered to SMEs, making the SCF service more affordable for SMEs with relatively weak financial and liquid status (Song et al., 2018). As shown in data from this research, the average annualised rate for the platform's SCF service is 10% lower than previous financing methods. Lower interest rates make SCF services more affordable for SMEs; this increases SME acceptance of SCF services. Additionally, enhanced inter-organisational trust between platform and SME enables platforms to lower the financing threshold, becoming less strict than banks. In this case, SMEs, who do not meet the standard of bank loans, can utilise platform financial support. Consequently, with increased receptivity, an increased number of SMEs can access SCF service, increasing the availability of platform SCF services to SMEs. Based on this discussion, the following proposition is proposed:

> **P3b:** Superior receptivity in the SCF network increases platform SCF

performance by increasing SME acceptance of SCF services by increasing access to affordable financial resources.

9.3.2 Network reach and SCF performance

Network reach describes penetration of the network; the extent to which the network can connect distance and diverse partners. Wider network reach is considered as positively related to better firm performance (Gulati et al., 2011; do Canto et al., 2020). This research finds higher network reach in SCF increases platform SCF service performance.

Platforms have motives to seek remote SMEs, involving them in their SCF network, as a sufficient level of SME participation in the SCF ensures profitability in the SCF service. With involvement of the platform, an increased number of distance partners are connected to the SCF partners; for example, remote SMEs or multi-tier SMEs in the SC. Those SMEs have poor financial indicators, such as relatively short operation history and incomplete financial information, resulting in difficulties obtaining financial resources from banks using traditional means (Ali et al., 2019). Although banks also initiate their own SCF programme, aiming to provide more financial support to SMEs using innovative method, they have less SCF operational experience in certain industries, making it difficult for them to ensure SME default risks with insufficient collateral. Conversely, the involvement of platforms extends the reach of the SCF network in light of their application of technology and abundant operation experience in specific industries. In this case, when examining SMEs' access to SCF services, platforms focus more on SMEs' dynamic operational indicators, not merely static financial indicators; they do not require as much collateral as banks. Therefore, SMEs included in the SCF network enjoy better access to financial resources using the platform's SCF programme, increasing acceptance of platform SCF services.

This research concludes higher levels of SME inclusion in the SCF service will result in increased SC effectiveness for focal companies. As shown in the example offered by Platforms C and D, in the upstream SC, once SMEs can make use of SCF to reduce the period of account receivable collection, cost of capital in the shortened period will not take

place. Once SME capital cost is reduced, they are willing to lower quotations when providing goods to focal companies. As a result, focal company purchasing cost is reduced.

Higher degrees of network reach indicate that platforms connect diverse partners with complementary resources that complete the comprehensive SCF service. Especially in the example of platforms serving the downstream SC, they tend to develop partnerships with logistics and warehouse companies to provide increasingly integrated SCF services for focal companies. Once focal companies participate in platform SCF programmes, they can outsource warehouse and logistics to the platform, reducing focal company operational costs and supporting competitive advantage (Aktas et al., 2011). Based on the discussion, the following propositions are proposed:

> **P3c:** Increased reach of the SCF network leads to better SCF performance by increasing small and SME acceptance of the platform SCF service by allowing better access to financial resources.
> **P3d:** Increased reach of the SCF network leads to better SCF performance by increasing focal company acceptance to the platform SCF service by promoting focal company SC effectiveness.

9.3.3 Network richness and SCF performance

Gulati et al. (2013) contend an essential effect of network richness on firm performance, as richness limits maximised value an organisation can extract from a network, through a combination of organisational internal resources and network partner resources. This effect is also observed in the SCF network; higher richness in platform SCF network indicates platforms can extract more value from the network by coordinating resources of multiple participants and appropriately allocating resources to each party, generating benefits for each participant while also acquiring essential resources to support platform SCF services (Hofmann & Zumsteg, 2015); this in turn is able to improve SCF service performance.

Platforms integrate technology resources and information resources with bank financial resources. Platforms provide technical support to collaborative banks, ensuring effective

information sharing and credit granting in SCF. Adoption of emerging technologies, such as blockchain and IoT, as well as greater access to increased levels of information resources in SCF, enables banks better control of SME default risks. Therefore, facilitating collaboration with platforms, allows banks to make quicker decisions when providing capital to platform SCF programmes, or when directly financing SMEs recommended by the platform. Either way, platform SME clients can gain effective financial support; from the perspective of the focal company, this increases financing efficiency and SC effectiveness. Based on this discussion, the following proposition is proposed:

> **P3e:** Higher degrees of SCF network richness allow platforms better SCF performance, increasing acceptance of platform SCF services among banks, SMEs, and focal companies.

9.4 Conclusion

This chapter discuss the findings against the existing literature and proposed 15 propositions. Finally, a revised theoretical framework is developed in Figure 9-1. The answers to the research questions are also clarified in this section.

In Chapter one, two research questions were developed:

- RQ1. How do SCF capabilities affect SCF performance?
- RQ2. What is the role of SCF network characteristics in the relationship between SCF capabilities and performance?

According to the discussion and propositions, the research questions are answered. Through the adoption of the inter-organisational network theory, SCF capabilities do not affect SCF service performance directly, but rather indirectly through the mediator of SCF network characteristics. To clarify this relationship, this research clearly defines the SCF capabilities as four types: (1) information processing capability; (2) financial network structuring capability; (3) relationship management capability; (4) process management capability. These capabilities can be categorised into three hierarchies based on the

capability hierarchy proposed by Hine et al. and Mishra et al. (2013). In the context of SCF, information processing capability is considered as dynamic learning capability; it is highest in the hierarchy. Secondly, financial network structuring and relationship management capabilities are considered as a higher-level functional capability, located at the middle tier of the hierarchy. Thirdly, capability of managing SCF processes is regarded as the lower-level functional capability; it is lowest in the hierarchy.

Meanwhile, interrelations among the three capability hierarchies are observed in this research. Information processing capability enables the network structuring capability, relationship management capability, and process management capability (supported by **P1a** and **P1b**), while network structuring and relationship management capability improve information processing capabilities and SCF process management capability (supported by **P1c** and **P1d**). Also, better SCF process management capability improves structuring and relationship management capabilities (supported by **P1e**).

This research finds the mediating role of the SCF network characteristics in relationship between SCF capabilities and performance, which is represented in the revised framework (Figure 9-1). A major iteration between literature and data is represented in differences between the initial and the revised framework. In the revised framework a capability hierarchy is identified and adopted to categorise SCF capabilities. Meanwhile, a detailed relationship between SCF capabilities, network characteristics, and SCF service performance, is confirmed in the revised framework. In the initial framework, such a relationship is simply illustrated, while the revised framework demonstrates how improvement in information processing capability improves network receptivity (supported by **P2a**). Furthermore, better network structuring and relationship management capabilities promote reach, richness, and receptivity of an SCF network (supported by **P2b**, **P2c**, **P2d**); superior SCF process management leads to increased network richness (supported by **P2e**).

Furthermore, in the revised framework, the way improved network characteristics increase SCF service performance is illustrated in detail. Improved network receptivity increases

degrees of risk control for banks and affordability and availability of SCF for SMEs (supported by **P3a**, **P3b**). Improved network reach increases availability of SCF to SMEs, increasing focal company SCM (supported by **P3c**, **P3d**); increased network richness benefits focal companies by improving SCM (supported by **P3e**).

Based on interview data, the initial conceptual framework (Figure 2-5) is greatly enriched and expanded. Contents of SCF capabilities and SCF service performance measurement are amended in the revised framework. Contents of SCF capabilities are more sophisticated. An acceptance-based framework is developed, able to measure SCF service performance. Additionally, the relationship between SCF capability and performance as well as the mediating role of network characteristics in such relationship is identified.

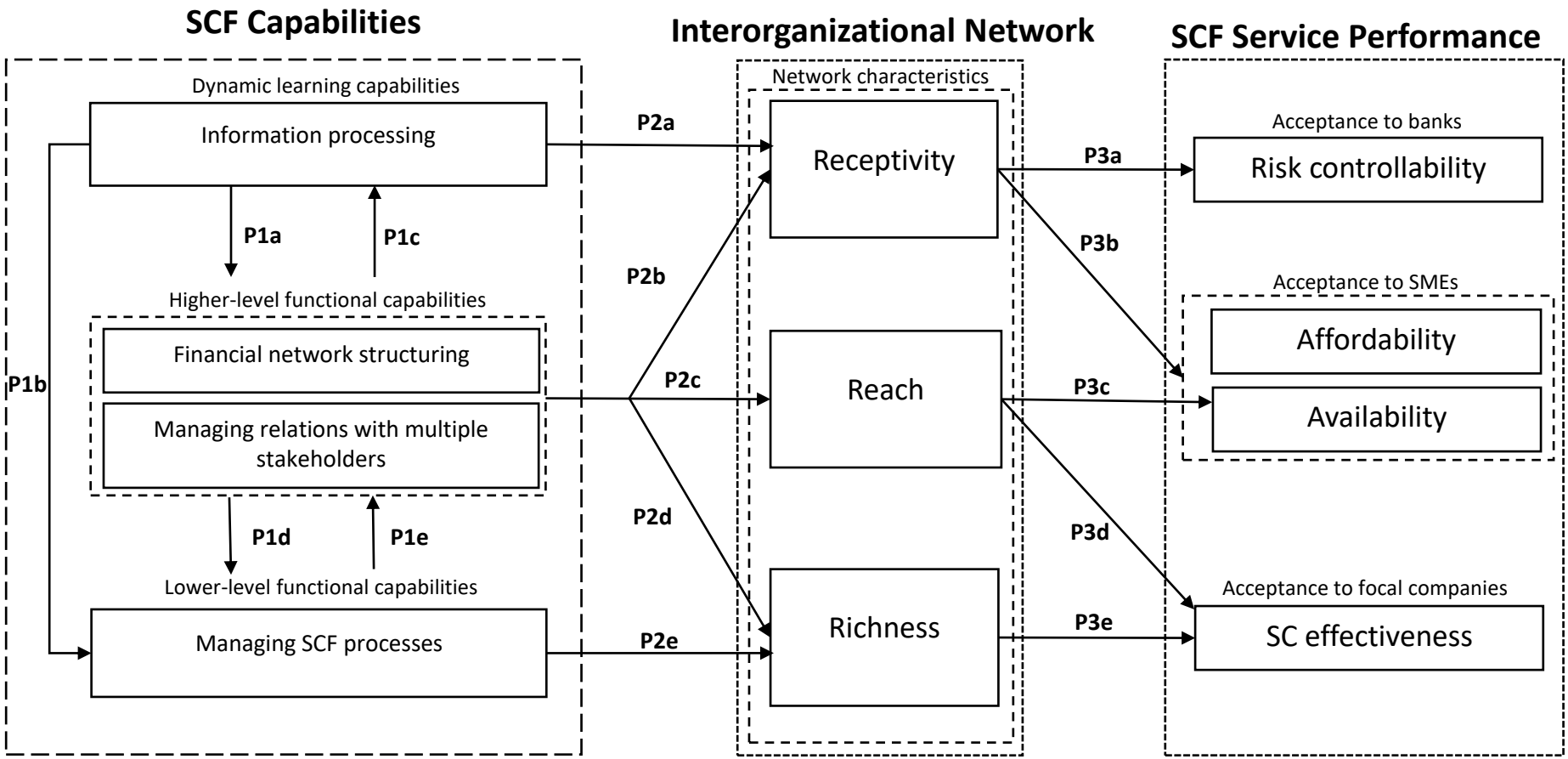

Figure 9-1. Proposed framework for platform's SCF capabilities, SCF network and SCF service performance

Chapter 10. Conclusion

This chapter offers a conclusion to research. First, the theoretical and managerial contributions of this research is demonstrated before the limitations and future research direction are discussed at the end of the chapter. This study is composed of nine chapters: the first chapter illustrated the research background, focusing on how the third-party SCF platform performs in the modern Chinese SCF market. The second chapter conducted a systematic literature review of SCF, identifying themes of definitions, SCF actors, SCF capabilities, and SCF performance; justification of inter-organisational network theory and capability hierarchy as the theoretical lens is also provided in this chapter. The third chapter justified qualitative multiple case study method and specified the research design process. Chapter 4 to chapter 7 presented the within-case analysis of the platform's SCF practices following the same analytical framework containing the SCF capabilities, SCF network development, and SCF service performance. Chapter 8 conducted a cross-case analysis of four platforms and the following Chapter 9 focused on the discussion of relationship of the construct and by applying inter-organisational network theory and capability hierarchy. Finally, a theoretical framework and, three sets of research propositions, 15 in total, are developed at the end of this chapter. Finally, this chapter provides a conclusion of the whole Ph.D. project.

10.1 Theoretical contributions

In recent years, researchers have illustrated the importance of properly managing the financial SC to stabilise SC and increase overall SC efficiency; when compared with other topics in SCM, despite the recent rapid development of SCF literature, SCF research remains at an initial and emergent stage (Gelsomino et al., 2016). The following paragraph summarises the theoretical contributions of this research to SCM literature, especially in relation to the SCF, SCF network, capability hierarchy, and interorganisational network theory respectively.

10.1.1 The contribution to SCF stakeholder research

Bal (2019) calls for a more diversified research perspective toward SCF stakeholders, especially from the perspective of financial institutions and solution providers. This study is unique in adopting a panoramic view of SCF, examining the role assumed by each of stakeholders in SCF solution provision, and specifying the role of third-party SCF platforms in the SCF market.

In existing literature, alternative financial service providers, such as B2B e-commerce platform are considered (Shi et al., 2015; Song et al., 2018; Wang et al., 2019); as well as logistic service providers (Chen & Cai, 2011; Li & Chen 2019); technology providers (Fellenz et al., 2009); and SC service providers (Hofmann & Zumsteg, 2015). This research extends beyond investigation of these forms of alternative financial service providers from a mono-perspective, i.e., banks, focal firms, or logistics service providers, and instead focuses on the under-researched SCF provider and labels them third-party SCF platforms for the first time.

This research proposes a new categorisation for such platforms according to different roles and functions in SCF services. Platforms are categorised as leading and supportive platforms in this study. Section 8.1 provides a more detailed discussion of features of these two types of platforms and their respective differences.

This research challenges the role of banks in SCF. In previous SCF research, banks are considered as essential SCF service providers (Silvestro & Lustrato 2014 & Chen et al., 2019). Silvestro and Lustrato (2014) claim that banks have additional functions in SCF, such as coordinating SCs; this research rejects this argument, limiting the bank's role in providing capital in SCF and co-monitoring the SCF risk with platforms. In this research a more specialised labour division is observed in the Chinese SCF market; stakeholders tend to collaborate with each other and are responsible for their respective strengths in SCF. For example, banks have abundant capital resources, and they can perform better in maintaining capital provision within the SCF programme; while platforms have better SCF capability and SCF operation experience, rich technology resources, and information

resources (as discussed in section 8.2), therefore, they are more specialised in SCM and providing SCF services.

This research also considers who should act as the orchestrator in SCF, promoting the digitalisation proposed by Bal (2019). The orchestration role of platforms in SCF has been identified and platforms usually have strong technology resources and usually collaborate with professional fintech companies to jointly develop digitalisation and automation levels in SCF, especially in the construction and industrial raw material industries, in which SCM levels are rudimentary.

10.1.2 Contribution to SCF capability literature

This study adopts a capability hierarchy perspective, investigating SCF performance implications of SCF capabilities; a key novelty of this research is the way it provides empirical evidence to support a capability view of SCF, arguing that SCF capabilities don't affect SCF performance directly, but rather indirectly through the mediator of SCF network characteristics.

Reviewing previous literature, SCF capability is rarely discussed in the previous literature. Jia et al. (2020a) first adopt the term SCF capability to describe required competencies for SCF service providers aiming to achieve financial SC integration. The authors state that SCF capability includes mapping financial network structure, designing financial business processes, and sharing financial information systems. This research adopts the SCF capability structure proposed by Jia et al. (2020a) further enriching the contents of SCF capabilities.

First, for the map financial network structure. Jia et al. (2020a) consider it an arrangement of business relationships, connecting the SCF providers with other SCF partners; however, their study is conceptual in nature. This research provides empirical evidence, extending this capability view of SCF from a map financial network structure to a more generalised capability called financial network structuring capability. This capability illustrates how the platform can build a business relationship in SCF and it is emphasized the relationship

establishment. This research develops a further SCF capability, managing the relationship with multiple stakeholders; this relationship management capability is the extension of network structuring capability, mainly referring to maintenance of collaborative relationships with multiple SCF stakeholders after the relationship is established in SCF.

This is the first study to refer to relationship management capability as an SCF capability. In existing research, relationship management into SCF is usually focused on buyer-supplier relationships, exploring how relationships can affect SCF application in the focal company's (buyers) SC (Martin & Hofmann, 2019). In the case of platform-initiated SCF, the requirement for relationship management is higher than bank-initiated or focal company-initiated SCF; platforms are independent third parties in the SCF, and their SCF implementation relies on close collaboration among key stakeholders, including banks, SMEs, focal companies, government, and other functional stakeholders. Platforms should allocate resources and benefits among stakeholders to acquire necessary resources from multiple stakeholders.

Second, designing the financial business process refers to coordination of financial transactions within and between SCF providers and other participants (Jia et al., 2020a). This research suggests the financial process design is the basic capability in SCF process management; SCF process management capability describes how SCF providers can manage the financial process and SC operational process in SCF services. Financial process management relies on specialisation in SCF, and operational processes is related to the extent to which a platform can provide integrated SC services to customers.

Third, in the framework proposed by Jia et al. (2020a), the third SCF capability is share financial information system capability. In this research, it is proven as insufficient to describe SCF provider capabilities in relation to information processing in SCF. The term "information processing capability" is frequently adopted by interviewees during interviews for this research. Interviewees used the term to comprehensively describe the ability to deal with massive information in SCF. This study finds SCF providers'

information processing capabilities are threefold, including information acquisition, analysis, and sharing.

10.1.3 Contribution to SCF service performance

SCF service performance is a neglected topic in existing literature. Usually, literature discussing performance in SCF concentrates on perspectives of SCF adopters. However, with the exception of Chen et al. (2020) none have focused on SCF provider perspectives to evaluate SCF service performance. Chen et al. (2022) proposes a framework to evaluate the SCF performance of the platform with dimensions of technology, recognition, and organisation. This research contradicts the three dimensions proposed by Chen et al. (2022).

First, in relation to the technology dimension, this research does not recognise a direct relationship between SCF provider technology application and superior SCF performance. Although technology application can improve effective data collection and transmission, the positive effect of technology application is based on a well-designed and widely approved business model; therefore, evaluating SCF performance based on technology application is inappropriate. Second, the organisational dimension describes platform SCF profitability according to Chen et al. (2022). However, this research finds financial performance is not a prior evaluation factor for SCF performance, especially not suitable for a platform while in the expanding stage.

Third, the recognition dimension considers degrees of acceptance of a platform's service among customers. Higher acceptance indicates better SCF performance; this dimension is supported and further expanded by this research; however, acceptance of customers is expanded from SMEs to banks, focal companies, and SMEs, and factors that influence individual stakeholder acceptance are concluded. This research revises Chen et al. (2022)'s evaluation model, proposing an acceptance-based measurement of SCF service performance based on interview data. This study finds that SCF provider service performance can be measured by key stakeholder acceptance of SCF services. Bank's acceptance is mostly determined by risk controllability in the SCF; the SME's acceptance is related to the affordability and availability of the SCF service; the focal company

acceptance depends on the extent to which SCF programmes can benefit from SCM improvement.

10.1.4 Contribution to capability hierarchy theory

This research is the first to adopt a capability hierarchy in SCF research. This research finds that SCF capabilities comply with the capability hierarchy. The information processing capability is considered as highest among the dynamic learning capabilities in the hierarchy. Capabilities of network structuring and relationship management combine into higher-level functional capability, while SCF process management capability is a lower-level functional capability.

According to Mishra et al., (2013) and Hine et al. (2014), hierarchal lower-level capability is derived from higher-level capability. Such a relationship is observed among the SCF capabilities. Information processing capability, as the highest-level dynamic learning capability, develops capabilities of network structuring and relationship management and SCF process management capability. However, a factor negated in existing capability hierarchy research relates to lower-level capability which in turn promotes higher-level capability.

First, higher-level functional capability promotes dynamic learning capability. In SCF capability, increased network structuring and relationship management capability indicate a closer collaborative relationship between platform and stakeholders. This relationship improvement increases stakeholder willingness to share information, increasing information acquisition, and further promoting information processing capability. Secondly, lower-level functional capability promotes higher-level functional capability. For example, platforms with better SCF process management provide a series of value-added services for focal companies and SMEs, including purchasing, warehousing, logistics, and improved SC digitalisation, making SMEs and focal companies more willing to maintain collaborative relationships with a platform, promoting relationship management capability.

This research also establishes novel links between capability hierarchy and interorganisational network characteristics. Based on the four case studies, it is concluded that in a context of SCF, higher-level functional capabilities contribute most to the improvement of SCF network characteristics; it simultaneously promotes reach, richness, and receptivity, in the network. However, the dynamic learning capability only increases network receptivity; lower-level functional capabilities only develop network richness.

10.1.5 Contribution to SCF network

Dekkers et al. (2020) propose that network theory can be potentially applied in SCF research; some research has implicitly adopted network-related theories for SCF (Randall & Farris II, 2009; Song et al., 2016; Song et al., 2018). This research explicitly adopts the inter-organisational network theory in SCF research. It may be the first to extend inter-organisational network theory to the level of financial SCM. Also, this research is the first to propose a necessity to build an SCF network for SCF providers. This research finds SCF provider capability does not directly impact SCF service performance; improvement of SCF service performance requires an SCF network. Through the network, SCF providers make use of their superior SCF capabilities, strengthening network characteristics, and eventually achieving improvement in SCF service performance.

This research determines key network resources possessed by each stakeholder, clarifying their responsibility in the SCF network. Platforms, as SCF service providers, have technology, human, and information, resources. In general, they are responsible for appropriate integration of multiple stakeholder resources and creation of mutual benefits for each participant. Specifically, platforms should leverage technology resources and human resources to reduce SCF operation risks, using information and technology resources to reduce information asymmetry among stakeholders. Banks are major capital providers and possess financial resources; their responsibility in the platform centric SCF network is to maintain sufficient capital support for the SCF programme. SMEs are the major platform's SCF clients; they are essential business resources for the platform. Platform profitability is directly related to service scales for SMEs. Focal companies are owners of the SC and credit resources, which are fundamental resources for platform SCF

services, especially for supportive platforms who are heavily reliant on focal company credit in SCF service.

This research includes the government in the SCF network; the role of government and policy resources are rarely discussed in existing literature. Studies by More and Basu (2013) consider the challenges of implementing SCF initiatives brought by government laws and regulations. However, in this study, the role of government in SCF is deemed as positive and government support is essential to the development of SCF platforms in the early stages of expansion.

10.2 Managerial contributions

In addition to theoretical contributions, this research provides significant managerial contributions for SCF platform, focal companies, SMEs, and banks. The revised framework serves as an overview of the model of platform initiated SCF for different stakeholders, providing guidance for engaging in SCF. This section summarises the managerial contributions to platforms and other major SCF participants.

10.2.1 Implications for SCF platforms

For platforms intending to build their own SCF network and initiate SCF services, they should learn from case company practices. This study provides third-party platforms with detailed information regarding SCF capability development, network construction, and service performance evaluation. This research is the first to discuss SCF capabilities in depth and link them with network characteristics, providing managers with a detailed explanation as to how SCF capability improvement increases network characteristics and further improves SCF service performance. Details are discussed as follows:

First, the platform should follow the capability hierarchy to develop its SCF capabilities with pertinence. Platforms should pay attention to developing information processing capabilities from the aspect of information acquisition, analysis, and sharing. This capability allows the foundations for network structuring and relationship management

capability. This research concludes case platform activities should maintain a collaborative relationship with essential SCF stakeholders, providing an example for new entrants. In terms of SCF process management, platforms should expand focus from financial in SCF to a wider process including SC operational process in SCF, increasing competitiveness in the SCF market.

Second, using the exemplar of SCF operation illustrated by the four case platforms, new entrants should be mindful of the necessity for constructing SCF networks in China's SCF market. With the help of this framework, platforms can learn how to make use of SCF capabilities to construct SCF networks with effective characteristics which have superior SCF service performance. In the four cases, platforms agree to measure their SCF performance as determined by acceptance of the stakeholders of SCF services. This research proposes an acceptance-based measurement of SCF service performance, providing platforms with a benchmark to evaluate performance in SCF. Platforms can evaluate weaknesses in the SCF service based on a measurement model; platforms can improve specific SCF capabilities and network characteristics to address weakness in SCF service performance.

10.2.2 Implications for other stakeholders

The research provides suggestions relevant to various SCF stakeholders, including banks, focal companies, and SMEs, providing a roadmap for engagement in the SCF programme in China.

Considering platform professionalism in SCF services, banks can strengthen collaboration with platforms to become more involved in the SCF market. The four case studies here show banks need to transfer roles from SCF service providers to capital service providers, maintaining an open mind in relation to third-party platforms, to be competitive in the SCF market. This is especially true for local banks with relatively small business scale, or large banks that started SCF service in recent years. The SCF market in China is huge; collaborating with platforms will allow banks benefit from the market while saving considerable costs in human resources and technology development in SCF.

Most of China's banks and enterprises consider SCF as a financing tool able to solve short-term financial needs. Banks and other SC enterprises can learn from this research that SCF is more than a financing tool, it is a SCM tool able to improve SC efficiency and reduce SC cost, resulting in economic benefits for society. This research defines key resources possessed by each stakeholder and recommends their suitable roles in the SCF network.

This research considers government as essential partners in the platform's SCF network; it illustrates the government's responsibility and possessed resources in the network. Therefore, this research may help the government to understand their role in SCF market and further enable them to realise the important role of the platform in SCF, which would be helpful when governments enact preferential policies for facilitating the platform's SCF business development.

10.3 Limitations and future research

This research is not free from limitations. First, interviews conducted as part of research are mainly target at SCF platforms. Minimal focal companies and SMEs are included in the research. In addition, because all four platforms are introduced to the interviewer by Bank A, there may be some biases embedded in the answers provided by the participants. Participants tend to provide positive information to the interviewer as they may believe that the interviewer works with Bank A, or that the information will be shared with Bank A. Therefore, as essential platform's network partners, focal companies and SMEs can provide valuable information, which is helpful to generate more comprehensive and unbiased evaluation of the platform role in SCF and the way platforms perform in SCF services and network development.

Second, the case study method is adopted; four in-depth case studies are conducted in this research. However, case study methodology limits sample size; it is impossible to sample an exhaustive representation of all types of SCF programme initiated by third-party

platforms, which limits the representative and generalisable aspect of research. Future research should adopt alternative methods able to extend sample size and test propositions made in this study.

Third, the cases selected are all Chinese companies. During interviews, some respondents indicate that there are some successful SCF platforms operating in the western countries. Owing to different social and economic systems, SCF capabilities identified in the context of China may not be applicable abroad. Future research should explore SCF capabilities of western SCF platforms, exploring the differences and similarities of contents between the SCF capabilities.

Fourth, cases selected are located in the tier-1 cities[4], including Beijing, Shanghai, and Shenzhen. However, according to interviewees in selected cases, some platforms in second-tier cities also engage in the development of SCF networks. However, regional economic and policy differences influence the SCF operation, for example, different local financial policies may pose different effect on the platform SCF operation and development (Reza-Gharehbagh et al., 2021). Future research should select platforms in these types of cities to explore practices in SCF network development.

Finally, SCF development in China has a trend of being industry-specialisation, indicating that the depth of SCF service is improved. This research chooses two platforms with specific industry focuses, industrial raw material and construction, and two with a wider industry focus, manufacturing, and construction. Therefore, overall research into industry in this study remains limited; future research should extend this scope into other industries such as agriculture, textile, and pharmaceutical.

[4] Chinese city tier system: it is an unofficial hierarchical classification of Chinese cities in China. There are 4 tier-1 cities including Beijing, Shanghai, Guangzhou and Shenzhen; fifteen new tier-1 cities, thirty tier-2 cities and seventy one tier-3 cities (Zhang et al., 2019).

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Appendices

Appendix A Cover letter for case Platforms

How do third-party SCF platforms deploy SCF capabilities to improve the SCF service performance: an interorganisational network perspective

Research background

The Covid-19 pandemic engendered financial disruption in supply chains, destabilising small and medium enterprises, which makes people realise the importance of supply chain finance (SCF). The traditional providers, such as banks and focal companies, have exposed their weakness in providing SCF services to SMEs. Therefore, the emerging third-party SCF platforms have become one of the major SCF providers in the SCF market in China. In practice, major SCF platforms in China have actively initiated SCF programme and seek to collaborate with banks and focal companies, and government agencies to build up the SCF network to fully deploy their capabilities in providing SCF service in order to improve their SCF service performance and their competitive advantages in the SCF market in China.

I aim to explore how the platform can deploy SCF capabilities to improve its SCF service performance, from an interorganisational network perspective, to answer the following questions.

- RQ1. How do SCF capabilities affect SCF performance?
- RQ2. What is the role of SCF network characteristics in the relationship between SCF capabilities and performance?

Interview format

Face to face/online one-on-one interview with key individuals involved in SCF programme.

Time scale

Each interview will last about 1 hour.

Project contact and interviewer

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Mr Tianyu Zhang (Zack) is a PhD student focusing on the research of supply chain finance at the University of York. He has research experiences in supply chain management for 2 years. He obtained his Master in International Business from Bristol in 2017, and holds dual bachelor degree in Business English and Financing from Shandong University of Finance and Economics. Zack has abundant supply chain research experience, and has published 6 papers in multiple journals, including *International Journal of Production and Economics*, *Business Strategy and the Environment*, and *Journal of Cleaner Production.*

Sample questions:

- What are the platform advantages in providing SCF service?
- How does your platform measure your SCF performance?
- How does your platform collaborate with banks and focal companies in SCF?
- What role do you think the government plays in SCF development in China?
- Does your platform emphasise the establishment of the network in your SCF programme? If yes, how does your network affect your SCF service?

Appendix B Interview protocol

Interview protocol for SCF platform

1. 您能详细的介绍一下贵公司的供应链金融项目吗？平台在该供应链金融项目中主要的作用是什么？

   Could you introduce your SCF programme in detail? What is the major role of your platform in this SCF programme?

2. 相比于传统的供应链金融模式，您认为贵公司的供应链金融产品/服务创新点在哪里？

   Compared with the traditional SCF mode, What do you think is the innovation of your company's SCF products/services?

3. 您认为平台提供供应链金融服务的优势在哪里？（信息处理方面/流程管理方面）

   Comparing with the traditional SCF providers, what do you think are your platform's advantages in providing SCF? (from the aspect of information processing/SCF process management)

4. 您认为银行与核心企业为什么选择与平台合作开展供应链金融服务？

   Why do you think banks and core enterprises choose to cooperate with platforms to provide SCF services?

5. 在贵公司的供应链金融项目中，您认为银行和核心企业起到了什么作用，贵公司是如何维系与这些权益相关者的关系的？请举例说明。

In your platform's SCF programme, what role do you think banks and core enterprises play? How does your company maintain the relationship with these stakeholders? Please specify with examples.

6. 您认为政府在供应链金融中扮演了什么作用，平台如何维系与政府的关系？请举例说明。

What role do you think the government plays in SCF, and how does your platform maintain the relationship with the government? Please specify with examples.

7. 平台通过何种方式控制供应链金融金融中的风险？请举例说明。

In what way does the platform control the risks in SCF? Please specify with examples.

8. 您认为平台在供应链金融中的数字化能力如何？请举例说明。

What do you think of the digital capability of the platform in supply chain finance? Please specify with examples.

9. 平台如何去衡量供应链服务绩效？您认为技术应用/财务指标/客户接受度是衡量标准吗？

How do you measure your SCF service performance measurement? Do you think technological/factor/financial factor/recognitive factor (customer acceptance) matters?

10. 您认为影响供应链金融服务绩效的因素是什么？

What factors do you think can affect the platform’s SCF service performance?

(Question 11, and 12 are new questions in the second-round interview. If the interviewer attended the first-round interview, they will only be asked the following two questions related to SCF network)

11. 请您详细描述一下贵公司是从那些角度构建并发展供应链金融网络，您认为平台的供应链金融能力对于供应链金融网络建设有什么作用？

Please describe in detail from what aspects does your platform establish and develop the SCF network. What role do you think the platform's SCF capability plays in the development of SCF network?

12. 您认为建立供应链金融网络的对供应链金融服务绩效是否有影响？如果有影响，请具体说明。

Do you think the development of the SCF network can positively impact the SCF service performance? If so, please explain how the development of the SCF network affects the SCF service performance

After the interview, ask:

Could you help me arrange interviews with your major network partners, such as banks, focal companies and SMEs?

Interview protocol for banks

1. 请介绍一下贵行是如何参与平台X的供应链金融项目的，贵行在其中主要扮演什么样的角色？

   Please introduce how your bank participated in the SCF programme of Platform X, and what role does your bank play in it?

2. 您认为作为一个供应链金融服务提供商，那些能力是提供供应链金融的核心能力？

   As an SCF service provider, what capabilities do you think are the core capabilities in providing SCF service?

3. 贵行为什么选择与第三方平台在在供应链金融领域展开合作？

   Why does your bank choose to cooperate with third-party platforms in the field of SCF?

4. 您认为银行目前从事供应链金融最大的阻碍是什么？

   What do you think is the biggest obstacle for banks to engage in SCF at present?

5. 您认为影响银行对于平台供应链金融服务接受的因素是什么？

   What factors do you think can affect banks' acceptance of platform supply chain financial services?

6. 作为平台供应链金融网络中的重要合作伙伴，您认为平台X在构建供应链金融网络方面的表现如何（网络的广度，网络资源的丰富性以及网络资源的可获得性），请具体举例说明。

   As an essential cooperative partner for the platform in its SCF network, what do you think of Platform X's performance in building an SCF network (the breadth of the network, the richness and, accessibility of network resources)? Please specify with examples.

7. 相比于传统的供应链金融网络，平台所构建的网络体系对于银行在供应链金融业务方面带来了那些提升？

   Compared with the traditional SCF network, what improvement has the network built by the platform brought to banks in the SCF business?

Interview protocol for focal companies

1. 请介绍一下公司如何参与平台X的供应链金融项目的，贵公司在其中主要扮演什么样的角色？

   Please introduce how your company participated in the SCF programme of Platform X, and what role does your company play in it?

2. 贵公司为什么选择与第三方平台在供应链金融领域展开合作？

   Why does your company choose to cooperate with third-party platforms in the field of SCF?

3. 您认为作为一个供应链金融服务提供商，那些能力是提供供应链金融的核心能力？

   As an SCF service provider, what capabilities do you think are the core capabilities in providing SCF service?

4. 您认为影响核心企业对于平台供应链金融服务接受度的因素是什么？

   What factors do you think can affect the focal company’s acceptance of platform SCF services?

5. 作为平台供应链金融网络中的重要合作伙伴，您认为平台X在构建供应链金融网络方面的表现如何（网络的广度，网络资源的丰富性以及网络资源的可获得性），请具体举例说明。

As an essential cooperative partner for the platform in its SCF network, what do you think of Platform X's performance in building an SCF network (the breadth of the network, the richness, and accessibility of network resources)? Please specify with examples.

6. 相比于传统的供应链金融网络，平台所构建的网络体系对于银行在供应链金融业务方面带来了哪方面的提升？

   Compared with the traditional SCF network, what improvement has the network built by the platform brought to the focal company in the SCF business?

Interview protocol for SMEs

1. 请您介绍一下公司如何参与平台X的供应链金融项目的？

   Please introduce how your company participated in the SCF programme of Platform X.

2. 您认为平台的供应链金融项目对于贵公司带来的收益是什么

   How does your company benefit from the Platform X's SCF programme?

3. 在供应链金融业务中，平台如何管理与贵公司的关系？

   How the platform manage relationship with your company in SCF business?

4. 您认为影响中小微企业对于平台供应链金融服务接受度的因素是什么？

   What factors do you think can affect the focal company's acceptance of

platform SCF services?

5. 您认为平台X在构建供应链金融网络方面的表现如何（网络的广度，网络资源的丰富性以及网络资源的可获得性），请具体举例说明。

   As the major customer of the platform's SCF service, what do you think of Platform X's performance in building an SCF network (the breadth of the network, the richness, and accessibility of network resources)? Please specify with example

Appendix C Sample interview

Round of Interview: 1

Interviewee: Vice President 2

Number of Interview: 13

Interview location: Shanghai

Case company: Platform: A

Interview questions and concluded answers

1. 您能详细的介绍一下贵公司的供应链金融项目吗？平台在该供应链金融项目中主要的作用是什么？

Q: Could you introduce your SCF programme in detail? What is the major role of your platform in this SCF programme?

A: Overall SCF business is divided into two categories. First, the service of purchasing for the focal company, the credit basis of purchasing is that the focal company has the obligation to pay, and the credit conditions of the focal company area good price. In this case, the platform gives them a certain payment period, such as three-month payment, which is highly secure, and the focal company will take the initiative to pay it back. When we conduct the procurement for the focal company in the upstream supply chain, the upstream enterprises are generally SMEs, and they want to get cash earlier. In this process of supply chain, if the upstream enterprises supply directly to the focal company, the focal company will sell on credit and delay payment, thus the upstream suppliers have liquidity problems. With the involvement of our platform, we let upstream enterprises directly obtain cash for production and operation through bills and discounts. This is the business of consignment purchasing. I can give you an example of Sinopec. In general, the account period is very short, 3 to 5 days on average, even if the account period is short, as the rate of return is considerable, and the capital efficiency of upstream enterprises is still improved.

For consignment selling business, the platform is responsible for purchasing for downstream SMEs. In their purchasing process, if cash is required, especially

in petrochemical industry, the focal companies tend to require full payment, and then delivery. Or SMEs is required to pay part of deposit to locks the source of goods, and delivery is made after full payment. The platform gives these SMEs a certain amount of credit sales through risk evaluation and other means. The platform directly pays cash to upstream focal companies, and at the same time gives downstream enterprises a certain account period. The platform provides goods and raw materials, and the payment can be paid to us after a certain period of time. For downstream enterprises, the SMEs' capital occupied is reduced. For the platform, if SMEs take the credit selling, we will receive corresponding income in the price of goods and supply chain services.

2. 相比于传统的供应链金融模式，您认为贵公司的供应链金融产品/服务创新点在哪里？

Q: Compared with the traditional SCF mode, what do you think is the innovation of your company's SCF products/services?

A: Compared with the traditional SCF model, we think that our innovation lies in the business model innovation. Because the downstream SCF services are less controllable and thus have higher risk coefficient than in downstream SCF service, we innovatively launch the SCF model of credit sales + insurance.

We will insure the SMEs that receive our SCF services. For each SME customer, the insurance company gives us the right to self-confirm insurance premium. Premiums of less than 500,000 RMB can be directly issued and effective in the insurance system. At the beginning of our cooperation, this amount was only 300,000 RMB and now it has risen to 500,000 RMB, because insurance companies gradually believe in the risk control capability of our platform. For the contract over 500,000 RMB, the exposure part of credit sales will be reported to the insurance company on the platform, and the insurance company will evaluate how

much credit sales can be given to customers.

3. 您认为平台提供供应链金融服务的优势在哪里？（信息处理方面/流程管理方面）

Q: Comparing with the traditional SCF providers, what do you think are your platform's advantages in providing SCF? (from the aspect of information processing/SCF process management)

A: First, the biggest difference between the platform and financial institutions is that the platform is more professional in processing information in SCF. We can perform better in information acquisition and information analysis in SCF, as we are familiar with the petrochemical, and more familiar with the upstream and downstream supply chain, as well as the upstream and downstream of customers, internal operations, costs, and optimization of their own supply chain nodes. We are directly get involved in the supply chain trade. Our customers must trade via our platform and directly purchase goods from us. Therefore, we can obtain a large number of transactional data. With our specialised human resources and big data analysis, we can make use of this data to generate an accurate portrait of our customers. In China, however, banks are relatively extensive financial service institutions, and it is difficult for them to go deep into the industry and deeply engage in the supply chain service. Therefore, they are weak in obtaining sufficient industrial information to support their SCF service. Without this industrial information, it is difficult for banks to make a systematic supply chain based on industrial data analysis. The advantage of the bank is that the money is cheap. Platform supply chain finance must rely on financial institutions.

Moreover, unless the bank is very forward-looking, it can make a breakthrough in fintech development. When there are more and more customers, there will be more and more customer behaviours and transaction history. It is difficult for

banks to improve the application of data analysis. When the data of the platform has accumulated to a certain extent, based on data analysis and a large number of enterprise characteristics and trading experiences experienced in the past, the platform can complete the first loan relatively quickly.

Second, the platform can perform well in managing the SCF process, we not only specialised in the financial process but also the operational process, for example, platform can help focal companies to find suitable suppliers and help downstream retailers find stable and high-quality supplierss and provide them with distribution, logistics, and warehousing service so that the raw materials can be delivered to the factory as soon as possible. Banks generally don't do this. The platform cooperates with many domestic carrier platforms, and these third-party logistics plan the routes and transportation capacity and provide plans to the platform, and the platform further provides the service to customers.

Third, our platform has better external structuring capability or we can say the interconnectivity of the platform is stronger, as the platform can build collaboration with multiple parties in SCF service. We focus on the N+N+N model. The basis of this model is to ensure that our platform has an attraction to different participants in SCF. For example, our advantage in obtaining information in the supply chain can make banks interested in cooperating with our SCF programme. Now we have landed SCF cooperation projects with 8 local banks.

4. 您认为银行与核心企业为什么选择与平台合作开展供应链金融服务？

Q: Why do you think banks and core enterprises choose to cooperate with platforms to provide SCF services?

A: Banks are mainly interested in our information advantages and operation advantages. If the bank participates in our SCF programme, we will disclose the accumulated transaction data and SME customer’s operation data to the

collaborative banks, which are difficult for the banks to obtain. Previously, they generally used public disclosed data to assess SCF risks, and this kind of non-public data is difficult to obtain. Our professional service is also the main consideration of banks. There is a trend of specialization in China's SCF market, with those who can operate specialized in operations and those who have funds specialized in providing capital. What we are good at in SCF is the SCF operation and SC management, therefore, our SCF process is much more flexible and efficient than banks in the lending process.

Another key point for banks to choose our platform is that every bank in China now has a business index of inclusive finance. Some banks are even losing money to make inclusive finance in order to achieve the target. However, our collaborative banks can rely on our platform, and banks can accomplish this task relatively easily, and they can also get some benefits from it.

The focal companies mainly value our channel expansion ability and supply chain service ability. In terms of channel expansion, our platform can expand the customer base of focal companies, so that downstream enterprises that were not originally in its supply chain system can also become their customers. This is because, we buy goods directly from the core enterprises, and then sell the goods to the appropriate downstream customers through the credit sales mode. As for supply chain services, The platform has a stronger supply chain service capability, serving customers' supply chain needs in various nodes in the supply chain. For example, downstream enterprises can find stable and high-quality suppliers on the platform, and the platform can also provide distribution and warehousing services for enterprises, but banks cannot do this.

5. 在贵公司的供应链金融项目中，您认为银行和核心企业起到了什么作用，贵公司是如何维系与这些权益相关者的关系的？请举例说明。

Q: In your platform's SCF programme, what role do you think banks and core enterprises play? How does your company maintain the relationship with these stakeholders? Please specify with examples.

A: The focal enterprise is the source of credit of the SCF business, and the business logic of any SCF products is based on the credit of the focal company. We need to maintain a good cooperative relationship with the focal companies to ensure that they can actively participate in our SCF project. While banks are our main capital providers, SCF platforms are all light assets with limited self-owned funds, but the supply chain financial market we serve is huge. If we only talk about the plastic and chemical industry in Zhejiang, the business volume in this area will be one trillion if the SCF market is well-developed. Such fund supply platform can only be done by banks. The platform's own capitals are limited, and banks are an important source of capital for our SCF services. Maintaining a good cooperative relationship with banks is crucial to the expansion of our SCF business scale. Therefore, we are committed to building an N+N+N SCF model.

The key to maintaining the cooperative relationship between banks and focal companies is that we should let them see what the benefits of joining this SCF programme are, whether it will bring high economic returns or high operational efficiency. The main pain spot for banks to do SCF is the information asymmetry. We will open the information accumulated on the platform to banks. We rely on our own analytical ability to help banks interpret the data and reduce their risk of participating in SCF. At the same time, our customer pool can also be shared with banks, which can greatly reduce the cost of acquiring SME customers. Our customer resources can be directly shared with them. For the focal companies, we are more about improving their operation efficiency. Platform's SCF service optimizes their financial supply chain, helps upstream and downstream enterprises to solve liquidity problems and ensure their financial stability, thus affecting the overall supply chain stability of focal companies. We can also help focal companies to expand sales. Before there is no credit business, a downstream enterprise can only buy 100 million RMB of goods if it has 100 million RMB, but

if we provide them with a 30% credit limit, downstream enterprises can buy 130 million RMB of goods from focal companies. Focal company's sales volume is increased, while downstream enterprises can obtain more raw materials, thus expanding their production.

6. 您认为政府在供应链金融中扮演了什么作用，平台如何维系与政府的关系？请举例说明。

Q: What role do you think the government plays in SCF, and how does your platform maintain the relationship with the government? Please specify with examples.

A: The development of platform supply chain finance needs to conform to the government's policy orientation, and the prosperity of supply chain finance is related to the policy orientation. Conforming to the local government's financial innovation and development needs is a guarantee for the rapid and stable development of our supply chain finance platform. The government's policy support plays an important role in the platform development, especially in the early stage of the platform development. For example, the government's preferential tax policies for the platform and other financial support can effectively alleviate the economic pressure of the initial development of the platform. If the government can participate in our supply chain finance programme, we can rely on the government's credit as an endorsement to enhance the trust of banks, core enterprises and SMEs in our platform. For example, our plastic and chemical trading platform, in which Yuyao government takes a 30% share, the government uses its influence to help us find suitable cooperative banks, and we can use government endorsement to obtain financing from banks more easily.

7. 平台通过何种方式控制供应链金融金融中的风险？请举例说明。

Q: In what way does the platform control the risks in SCF? Please specify with examples.

A: Our risk control methods are basically divided into three steps, that is, the pre-loan, within-loan and post-loan step. First, in the pre-loan stage, we pay attention to customer admission. Through the access of big data system, we build a corporate credit evaluation system. First, we exclude blacklisted customers, all of whom are sued or have arrears. Our customer list is divided into three categories: blacklist, whitelist, and gray list. We will never do business with companies in the blacklist. Other companies that firstly cooperate with us will be on the gray list. After entering our platform system, we will follow the information provided by customers to verify the authenticity and inspect the overall situation of their supply chain. We will comprehensively judge the SCF amount and account period that the enterprise can enjoy according to the specific business situation and capital situation. Once the company is admitted, we will enter within-loan step, and the credit sales business starts. This process is a process of enterprise data precipitation and credit accumulation. If the company collaborate well with us in one year, we will correspondingly increase the SCF limit and extend the account period. Our salesmen will also visit the factory offline. Each salesman's control radius is about 20 households, and they can get information (such as layoffs and other information that reflects operational capability) through off-line communication and site visiting in order to comprehensively evaluate the enterprises operating conditions and adjust their account period in the SCF programme. Such information also enters the evaluation of the system. Finally, it is the post-lending stage. In this stage, if bad debts occur, our platform will choose the way of litigation or settlement of claims, or whether the insurance company is in danger. Because we cooperate with the insurance company, they can bear 80% of the losses in our SCF business.

In our industry, a lot of our SMEs clients tend to defer their payment to us. This phenomenon is common in the downstream supply chain in the industrial raw

material industry. SMEs know that they owe money to our platform instead of banks, which means that their credit investigation results will not be affected if they slightly defer their repayment to the platform. To solve this issue, our platform value the cultivation of our SMEs' clients' awareness of timely obligation fulfilment. For example, we tend to assess the SME clients' repayment performance in SCF. As for the SMEs who pay off the credit within the specific time, we tend to encourage this behaviour through increasing the upper limit of the SCF support. By doing this, our platform hopes to cultivate SME's awareness of the timely obligation fulfilment, which I think will greatly promote the long-term collaboration between us.

8. 您认为平台在供应链金融中的数字化能力如何？请举例说明。

Q: What do you think of the digital capability of the platform in supply chain finance? Please specify with examples.

A: Big data analysis, blockchain, Internet of Things and other technologies are widely used in our SCF business. A large amount of transaction data and business operation data will be accumulated on the platform, and we rely on big data analysis to make accurate behavioral portraits. We are also trying to apply blockchain technology, but it is still in the initial stage. We will soon launch an integrated SCF service scheme of blockchain-Internet of Things at the end of 2020. In this new service scheme, we can record the change of cargo rights in real time through the Internet of Things technology and store the information in the blockchain in time. Cooperative banks can obtain permission to view relevant information on the blockchain.

9. 平台如何去衡量供应链服务绩效？您认为技术应用/财务指标/客户接受度是衡量标准吗？

Q: How do you measure your SCF service performance measurement? Do you think technological/factor/financial factor/recognitive factor (customer acceptance) matters?

A: The measurement of SCF service performance is a multi-faceted, so it is difficult for us to comprehensively measure SCF service performance with one indicator. As far as our platform is concerned, we emphasize the importance of customer stickiness. The stronger the customer stickiness, the higher the customer's acceptance of our service, which also reflects the quality of our service performance, because they will only accept the service that they satisfied. The return period for developing a platform is long, especially for the private enterprise like our platform. Also, the characteristics of SCF are that the number of SMEs with financial needs is large, but the amount of each financing service is small. That's why we highly value the customer acceptance of our SCF service to measure our performance. Higher acceptance can often bring us larger business volume and potential profits.

As for the financial and technical factors, first I think it is one-sided to measure SCF performance with the financial indicators of the platform, especially for our SCF platform in the developing stage. The initial investment of the platform is large, moreover, the single business return of SCF is small, so it is one-sided to measure the service performance of an SCF service provider simply from the financial indicators. Second, for technical factors, I think the application of technology is the icing on the cake for supply chain financial services. I don't think simply using technical indicators can be used as a minimal standard to measure supply chain finance. Technology is attached to products and services. First, your product design and business model need to be accepted by customers, and then technology application is to improve their user experience on the basis of customers' acceptance of both. Therefore, in essence, it is more appropriate to measure the performance of supply chain financial services with customer

acceptance.

10. 您认为影响供应链金融服务绩效的因素是什么？

Q: What factors do you think can affect the platform's SCF service performance?

A: For our platform, in the era of platformization, the performance of SCF depends not only on the service providers themselves, but also on what we call an SCF ecological network. As the leader in our network, our platform initiates the SCF services. We need to integrate the network resources we own and explore and allocate the resources needed by the business in different service nodes. Therefore, I think for the platform, especially in the SCF 3.0 stage in China, the performance of SCF services, that is, the customer's acceptance of our services, is largely determined by the SCF network we built. For example, the coverage of our network ensures the acceptance of our services by SMEs. Or we can mobilize the network resources and share the our information resources with the network partners in need, especially banks, which reduces their information asymmetry in SCF, increases the controllability of our SCF, and thus improves the acceptance of our SCF by banks. We are also constantly enriching the types of partners in our network. For example, we choose to collaborate with large logistics service providers to strengthen our logistics service to our SCF customers. Also, we outsource some of the technology development workloads to third-party technology service providers. We combine the technical advantages of both the platform and technology company, to further secure our SCF service by means of accelerating the technology improvement.

Appendix D Coding table

Aggregate construct	Third order construct	Second order construct and definition	First order concepts	Representative Quotes
SCF capabilities	Dynamic learning capability: Dynamic learning capabilities refer to capabilities that are highly flexible and rely on highly specialised resources. These capabilities usually focus on the exploration of knowledge and have a long-term strategic focus (Hine et al., 2014).	Information processing: The information processing capability refers to the SCF service providers' capability to process and learn from the SCF business-related information based on its information technology, professional knowledge, and management experience in SCF (Song et al, 2018). It is an essential capability supporting the establishment of mutual trust, alignment, and collaboration among multiple stakeholders in SCF (Wandfluh et	*Information acquisition: information acquisition refers to the platform's capability in collecting information related to the SCF business (Song et al., 2018). The platform usually relies on their engagement in SC trading to acquire multiple information in a direct way (Li & Chen, 2019). Automation and digitalisation are the prerequisite of the sufficient information acquisition capability (Ali et al., 2018). It relates to the adoption of fintech, such as the Internet of Things and big data to capture relevant information (both structured or unstructured) in the flow of capital and goods throughout the SC (Yu et al., 2021).*	"Due to the large number of transactions occurring on the platform every day, it has great requirements for our data storage capacity. If the storage capacity is not enough, the daily data platform cannot be obtained effectively". (Vice President 1, Platform A) "Since our platform is directly involved in supply chain trade, we can directly obtain real trade information, as well as the operational capability and other related information of financing enterprises. Also, the application of Internet of Things enables us to obtain real-time data in logistics and warehousing, ensuring that the logistics information is real and can be transferred effective." (Financial Manager 1, Platform B) "Our platform has promoted the digitalisation of the construction industry and transplanted the previous offline trading activities to the platform, so that suppliers and buyers can directly complete the bidding online. In this way, every transaction data will be left on the platform and we can collect them directly." (Vice President of Product 1, Platform C)

		al., 2016). It is reflected in three dimensions, including information acquisition, analysis and sharing (Jia et al, 2020a).	*Information analysis: information analysis refers to the platform's capability in analysing and interpreting the acquired information (Yu et al., 2021). The platform information analysis is usually completed through technical means including AI and machine learning to predict risks of SMEs in SCF (Zhu et al., 2016). The platform's information analysis capability is also determined by the operational staff's professional knowledge and management experience in SCF to excavate more valuable information from the information analysis results provided by the technical means.*	"As an e-commerce platform, we use AI and machine learning technologies to continuously learn in the information matching between buyers and sellers, to improve the efficiency of facilitating supply chain transactions, and increase opportunities for providing SCF services." (Chairman 1, Platform A) "Supported by the big data analysis and based on their understanding of industry data, our risk control personnel will know what the reasonable scale of raw material procurement for a specific construction project is. Therefore, the platform can judge whether the transaction data is reasonable. For example, whether the quantity of steel purchased by a construction site is reasonably matched with its construction scale." (Vice President of product 1, Platform C) "Our platform's big data analysis can assess the risks of our SCF services provided for SMEs based on their corporate portraits and transaction portraits." (Chief Technology Officer 1, Platform D)
			Information sharing: information sharing refers to the platform's capability in exchanging and transferring information among related SCF members in a secure and effective way (Guerar et al., 2020; Zhang et al., 2021). It is dependent on the	"The platform pays great attention to the ability of direct connection between the platform and other participants' systems, especially banks and focal companies. In this way, we can ensure the efficiency of information sharing among key stakeholders." (Vice President 4, Platform C) "We have built an alliance chain with relevant banks, insurance companies and focal companies. If business stakeholders want to extract relevant information, they can apply for permission from the platform to view business-related information in the blockchain. It makes the

			platform's capacity for information technology and transmission technology (Hu et al., 2018), for example setting up an EDI system or alliance chain among related SCF members (Fellenz et al., 2009; Chen et al., 2019).	information sharing among stakeholders smooth and safe." (Senior Vice President 1, Platform D)
	Higher-level functional capability: Higher-level functional capability refers to the capabilities that are related to external relationship knowledge. It is presented in the extent to which the organisation can manage the relationship with multiple stakeholders in	Financial network structuring: Financial network structuring capability denotes the platform's capability in the organisational arrangement of business relationships in the SCF business (Blackman et al., 2013). It is dependent on platform's capability of interconnectivity (Chen & Cai, 2019) and emphasises the initial relationship between multiple stakeholders.	*Interconnectivity: the platform's basic SCF business logic requires them to be able to connect with multiple banks and companies to start their SCF business (Lu et al., 2020). The platform needs to have attractive resources and capabilities to various entities to ensure their participation in platforms SCF business (More & Basu 2013; Ma et al., 2020).*	"We are committed to building an N+N+N SCF model. The basis of this model is to ensure that our platform has attraction to different participants in SCF. For example, our advantage in obtaining information in the supply chain can make banks interested in cooperating with our SCF programme. Now we have landed SCF cooperation projects with 8 local banks." (Vice president 2, Platform A) "Platform's reverse factoring service helps upstream suppliers shorten the accounts receivable cycle. SMEs are hard to enjoy this financing service before we intervene in the construction industry. It is the main factor for SMEs to participate in SCF projects of the platform." (Chairman 2, Platform C) "Our SCF products can help enterprises solve the triangular debt problem. The debt arrears among enterprises can be solved through SCF, therefore, increasing the liquidity in supply chain. This is the point that our platform SCF service initially attracted multiple focal companies." (Chief Products Officer 1, Platform D)

	the business (Mishra et al., 2013).	Managing relations with multiple SCF participants: Relationship management with multiple SCF participants is to manage and maintain the collaborative relationship with multiple stakeholders in the long-term (Moretto et al., 2019). It emphasises relationship enhancement with multiple stakeholders to create more value for each party through SCF (Abdel-Basset et al., 2020). Better relationship management capability facilitates the implementation of platform's SCF service in the supply chain (Wuttke et al., 2013).	*Relationship with banks: the platform's capability in managing relationships with banks indicates how they can reduce information asymmetry and the risks and the cost of information acquisition for banks in doing SCF to encourage banks to participate in the platforms' SCF service (Wen et al., 2018; Beka Be Nguema et al., 2021). Banks are an essential source of financing that supports platforms' supply chain management activities (Silvestro & Lustrato, 2014; Hofmann & Zumsteg, 2015).*	"The platform's own capitals are limited, and banks are an important source of capital for our SCF services. Maintaining a good cooperative relationship with banks is crucial to the expansion of our SCF business scale." (Vice President 2, Platform A) "As an asset-light company, the platform needs to rely on bank's granting credit so that the platform can have sufficient capitals to embed financial services such as advance payment in their traditional supply chain services." (Business Manager 1, Platform B) "The platform can provide banks with more industry data and operation data of financing SMEs. It alleviates the problem of information asymmetric of banks to financing SMEs in traditional SCF and optimise banks' risk control logic in SCF business." (Marketing Manager 2, Platform C)
			Relationship with focal company: platforms' capability in managing relationships with the focal company indicates how the platforms can provide more value-added SC service to deepen focal company's participation in the SCF service to obtain more SC information from the focal company (Tchamyou, 2019). The focal company's	"Establishing a good cooperative relationship between our platform and the focal companies can reduce our risk in providing supply chain financial services to the SMEs in the downstream supply chain. Once the downstream SMEs fail to perform the contract to redeem all inventories from us, the focal company will buy back the unsold inventories from our platform or help us adjust the unsold inventories to other sale channels to reduce our losses." (Business Manager 2, Platform B) "Focal companies that have a good cooperation relationship with us are willing to recommend their high-quality suppliers to the platform and let the platform provide supply chain financial services for them, thus

			credit is the fundamental part of providing SCF service and it enables the feasibility of SCF service (Sang, 2021), especially in the upstream SCF service (i.e., reverse factoring) (De Goeij et al., 2016).	reducing our customer acquisition costs." (Vice President 5, Platform C) "The primary business logic of our major SCF product Y is based on the transferring of the focal company's idle credit to suppliers at all levels in the upstream supply chain. Forming a better relationship with focal companies can increase their willingness to participate in our SCF programme. Focal company's participation is the foundation of our SCF business development." (Chief Product Officer 1, Platform D)
			Relationship with SMEs: the platforms' capabilities in managing relationships with SMEs indicate how they can provide financing services and SC services to deal with SMEs requirements of finance. SMEs are major customers in the SCF service. Platforms can enhance their relationship with SMEs through communication, assessment, and monitoring (Kim & Rhee, 2012) to increase SMEs connection to the platforms' service.	"Based on the SMEs' transactions on our platform, we can provide SMEs with supply chain financial services with a maximum service amount of less than 30% of this transaction." (Marketing Manager 1, Platform A) "Offline communication is an important means for the platform to enhance its relationship with SMEs. Through offline communication and investigation, the platform can better understand SMEs' operational status. A good relationship with SME is also one of the important guarantees for SMEs to fulfil their obligations in SCF." (Business Manager 1, Platform B) "Through our SCF product Y, small and medium suppliers can obtain financing by discounting their accounts receivable directly on the platform." (Project Manager 1, Platform D)
			Relationship with government: government agencies are essential stakeholders in platforms' SCF business (Hofmann, 2005) and government's	"The government's tax policy makes the platform's tax refund amount reach 50% of the local retention amount in 2020. Tax policy support has significantly supported our SCF business expansion." (Chairman 1, Platform A) "At the beginning of the platform development, State-owned Assets Supervision and Administration

			intervention policies can positively pose great impact on platforms' SCF mechanism. Government's intervention policies can provide financial support for the platforms operation and encourage other stakeholders to participate in the platforms SCF business (Reza-Gharehbagh et al., 2021)	Commission of the State Council and other government departments gathered various financial institutions and state-owned focal companies nationwide in the form of lecture halls to help us promote our SCF business and provide the us with opportunities to explain our business model, which greatly supported the initial promotion of our platform's SCF service." (Senior Vice President 1, Platform D)

	Lower-level functional capabilities: Lower-level functional capabilities are task-level capabilities which enable the organisation to fulfill specific tasks such as distribution, logistics and marketing (Mishra et al., 2013).	Managing SCF processes: Platforms' capabilities in managing SCF processes refer to how the platform can arrange the business processes in their SC and SCF service (Song et al., 2018). With a well-arranged SCF process, platforms can be more specialised in SCF services and provide more integrated SC services in their business (Chen & Cai, 2019). SCF processes contain financial business	*SCF Service specialization: platforms tend to establish a set of process to standardize their SCF service (Chen et al., 2019). Combining with their advantages in information processing, platforms can further achieve their SCF service quality and efficiency (Song et al., 2021).*	"In our service to SMEs, we can integrate the needs of SMEs and help SMEs purchase raw materials in bulk from focal companies. We also provide logistics services and credit sales services to them." (Market Manager 1, Platform A) "Our SCF service is one of the links of the platform's one-stop supply chain management service. Supported by our supply chain service, companies can focus on activities that enhancing their core competitiveness such as product development. The non-core business can be satisfied by our one-stop supply chain management service, for example, customs clearance, warehousing and inventory management, logistics, settlement and payment collection, and information services." (Operation Manager 1, Platform B)

		and SC operational processes (Blackmen et al., 2013). Financial processes relate to a series of activities regarding the coordination of financial transactions among SCF participants to standardise the SCF service process. The financial business process may include invoices, settlement, and payments (Ma et al., 2020). The financial process synchronises with the SC operational process, such as manufacturing and logistical processes (Jia et al., 2020a). As platforms are usually involved in SC activities, some platforms are responsible for processes such as procurement, logistics, retailing and risk control during their SCF	*Providing integrated SC service: some platforms are engaged in the SC transactions, especially when providing SCF services in the downstream SC. They can provide integration SC service to the SMEs, for example, the platforms purchase commodities from focal companies, distribute the commodities and sell the commodities in credit to the downstream SMEs (Song et al., 2021).*	"Our platform moves lots of supply chain activities from offline to online and promotes the level of digitalisation in the construction supply chain. In this case, comparing with the traditional SCF service, our SCF service break through the restriction of geographical distance to a certain extent and makes more non-local suppliers participate in SCF." (Vice President 5, Platform C) "Based on our knowledge to the SCF business, we design product Y, which can be used as a settlement method in the supply chain. Once the focal company implement our product Y in the supply chain, the circulation of our SCF products can break through the first-level suppliers and continue to flow to the far end of the upstream supply chain. All upstream SMEs receiving product Y are our customers. (Chief Product Officer 1, Platform D)

		service (Song et al., 2021).		
Inter-organisational network	Network mechanisms: According to Gulati et al. (2011), network mechanism is composed of three fundamental	Reach: It defines the scope of an organisation's network connection in a multi-dimensional way (Gulati et al., 2011). The scope of network connection is determined by how	*Finding partners in distance: in this paper, the concept of distance is twofold. First it refers to geographical distance, which indicates how platforms can find non-local companies and provide SCF services for them. Second, it refers to*	"Our platform moves lots of supply chain activities from offline to online and promotes the level of digitalisation in the construction supply chain. In this case, comparing with the traditional SCF service, our SCF service break through the restriction of geographical distance to a certain extent and makes more non-local suppliers participate in SCF." (Vice President 5, Platform C) "Based on our knowledge to the SCF business, we design product Y, which can be used as a settlement method in the supply chain. Once the focal company implement our

	mechanisms including reach, richness, and receptivity. The benefits for organisations of the network is determined by these mechanisms. Reach and richness are the decisive factors of the potential value of the network, while receptivity makes sure the potential value can be achieved in the network (Gulati et al., 2011).	the network connects partners in distance and in diversity. To enhance the reach of the network, organisations need to be able to find various partners with relevant network resources, adequate reliability and trustworthiness (Gulati et al., 2011).	*the distance in the SC, it denotes how platforms' SCF services can cover the SMEs in the multi-tier SC. Platforms can make use of their interconnection capabilities to extend their SCF services scope in terms of geographical distance. Platforms can also leverage their specialisation in SCF service to extend their SCF service scope in multi-tier SC.*	product Y in the supply chain, the circulation of our SCF products can break through the first-level suppliers and continue to flow to the far end of the upstream supply chain. All upstream SMEs receiving product Y are our customers. (Chief Product Officer 1, Platform D)
			Finding partners in diversity: diversity describes the types of suitable partners that are involved in the platforms' SCF network. Usually, platforms are familiar with the industry environment and potential partners. Thus, they can find and establish ties to various suitable SCF partners to extend the reach of the network (Song et al., 2018).	"We have been engaging in the industrial raw materials industry for many years, and many downstream SMEs with financing needs usually have long-term historical trade on the platform. This makes it possible for us to find suitable clients swiftly and accurately in our SCF business." (Chairman 1, Platform A) "Since our inception, we have been engaged in matchmaking transactions in the construction industry. In this case, we have served numbers of high-quality construction enterprises in Jiangsu, Zhejiang and Shanghai before we launch SCF service. Therefore, when we decided to develop SCF business, it is easy for us to find suitable focal companies who are willing to implement SCF in their supply chain." (Chairman 2, Platform C) "With the increase of the number of served companies in our platform, the business scale of SCF is also expanding. The SCF business scale has great attraction for banks that want to engage in SCF, and banks will actively seek cooperation with the platform, which also enables the

				platform to include more banks in our SCF network." (Chief Product Officer 1, Platform D)"
		Richness: Richness is determined by the intrinsic value of the network resources available to an organisation (Gulati et al., 2011; Falcone et al., 2019). The intrinsic value of network resources usually depends on the quantity and quality of resources. It requires organisations to capture potential value-creation opportunities based on the orchestration of internal resources and partners' resources (Gulati et al., 2011).	*Capturing value-creation opportunities: platforms need to have capacity to integrate their own resources into network partners resources to create synergies and mutual benefits among each party in SCF (Song et al., 2021).*	"By introducing high-quality customers on the platform to financial institutions such as cooperative banks, our platform can help financial institutions simplify their customer acquisition process and help them expand their customer base." (Vice President 1, Platform A) "One of the central roles of the platform in SCF is to integrate resources. By integrating financial resources of banks, business resources of companies and supply chain information resources possessed by the platform and supply chain service capabilities of the platform, we can provide value-added services for different participants in the SCF business." (Business Manager 1, Platform B) "We help SMEs shorten their account receivables collection periods and reduce their financing costs through SCF. Once SMEs enjoy the reduction of financing costs, they can further reduce their supply price charged for focal companies. The supply price can be reduced by 12% on average." (Senior Vice President 1, Platform D)
		Receptivity: Receptivity refers to the extent to which an organisation can	*Establishing mutual trust: the successful implementation of SCF relies on the mutual trust*	"By sharing platform collected transaction data with banks, to some extent, we can solve the problem of information asymmetry between banks and SMEs with

		channel and leverage its accessible network resources across interorganisational boundaries. It is related to the qualities of ties among organisations in the network (Gulati et al., 2011). The better the quality related to the enhanced mutual trust among parties (Zaheer et al., 1998), the better the commitment to the partnership (Gulati et al., 1994) and multiplexity in the network (Dyer & Singh, 1998).	*among parties. It is enhanced by the degree of information sharing among SCF participants (Wandfluh et al., 2016). Mutual trust can also be enhanced by the involvement of a trustful third-party in the network (Gulati et al., 1999).*	financing needs in SCF business." (Vice President 3, Platform A) "Comparing with companies, banks believed that we are more trustworthy in SCF. Because as a third-party platform, we have served over 26,000 companies on the platform. Therefore, we will not help a specific company to make financial fraud to meet its financing needs. Compared with companies, we do not have enough interests to drive us to do so." (Chairman 1, Platform C) "Bank's trust in us is also related to our matured technology application. The application of blockchain ensures the timeliness and accuracy of banks' access to SCF-related information, which increase banks' trust in our SCF business." (Chief Technology Officer 1, Platform D)
			Commitment to the partnership: it refers to the extent to which the leaders in each party can recognise the significance of the partnership and are willing to spend time and capital to maintain the relationship (Gulati et al., 2011). In SCF the commitment to the partnership is usually related to each party's knowledge of SCF and potential benefits in participating SCF (More & Basu, 2013).	"The platform's understanding of the construction industry is better than the banks. Banks are primarily concerned about the company's financial data. However, whether the number of materials purchased by a specific construction site is reasonable, and whether the purchase price in this transaction is the fair market price, banks have difficulties in comprehensively understanding such information. We can make up for these issues in the SCF business." (Vice President of product 1, Platform C) "The lack of understanding of SCF is one of the leading causes that restrict the participation of focal companies and banks in SCF. We make effort to promote the concept of SCF so that banks and focal companies can make clear the operation mode of SCF and their vested interests in participating in our SCF programme, which can increase their commitment in the collaboration with us in SCF." (Senior Vice President 1, Platform D)

			Multiplexity: it indicates the extent to which the partnership is dependent on interaction between multiple individuals and units in each organisation (Gulati et al., 2011). In the SCF network, multiplexity is determined by the interaction among collaborative parties from an individual or organisational level, to facilitate platforms' ability in appropriately channeling resource in the network.	"Our managers and business personnel occasionally have social interaction with banks, so that our platform can better understand the business demands and risk tolerance of banks. Thus, we can better match the suitable SMEs with financing needs with banks that are willing to serve such SMEs." (Vice President 3, Platform A) "We will hold meetings to invite key department in our cooperative banks. On the meeting, we will introduce them to our development plan and SCF product design and discuss opportunities to strengthen our collaboration. Also, personally, I sometimes contact the presidents of our cooperative banks in private to discuss our view of SCF development. It can ensure the smooth cooperation between banks and our platform" (Vice President 5, Platform C) "The stable cooperative relationship with focal companies and banks in SCF enables our platform to better allocate financial resources to SMEs with acute financing needs in the supply chain." (Regional General Manager 1, Platform D)
SCF performance	Acceptance-based measurement: Higher customer's acceptance usually indicates a superior platform's SCF service performance	Acceptance of SMEs: Higher SMEs' acceptance indicates the greater availability and affordability of the SCF service.	*Availability: platforms SCF service admission criteria are lower and more flexible than the traditional financing method provided by banks (Lam et al., 2019). Therefore, more SMEs can easily make use of the platform's SCF services to solve their liquidity issues.*	"Our managers and business personnel occasionally have social interaction with banks, so that our platform can better understand the business demands and risk tolerance of banks. Thus, we can better match the suitable SMEs with financing needs with banks that are willing to serve such SMEs." (Vice President 3, Platform A) "We will hold meetings to invite key department in our cooperative banks. On the meeting, we will introduce them to our development plan and SCF product design and discuss opportunities to strengthen our collaboration. Also, personally, I sometimes contact the presidents of our cooperative banks in private to discuss our view of SCF development. It can ensure the smooth cooperation

	(Chen et al., 2022).			between banks and our platform" (Vice President 5, Platform C) "The stable cooperative relationship with focal companies and banks in SCF enables our platform to better allocate financial resources to SMEs with acute financing needs in the supply chain." (Regional General Manager 1, Platform D)
			Affordability: without the platform's SCF service, SMEs tend to use financing resources from informal channels (Allen et al., 2019) or high interest loans from banks (Fabbri & Menichin, 2010). The interest rate charged by the platform SCF service is higher than banks however, much lower than the informal financing.	"The criteria of our SCF service are mainly concerning the operation status of customers. Our SCF service does not have mandatory requirement for collateral, so that more SMEs have opportunities to use SCF to partly satisfy their financial needs." (Vice President 1, Platform A) "As our platform actually participates in supply chain trade, we know more information about SMEs' operation status and their supply chain. Therefore, comparing with banks, our financial service has a more convenient process, and the access standard is lower. It makes our financial service more flexible and more available for SMEs." (Financial Manager 1, Platform B)
		Acceptance of banks: higher acceptance of banks refers to the higher level of risk control of the SCF service.	*Risk controllability: platforms can leverage the advantages of engagement in SC activities and technology implementation to ensure the authentication of the collected information and supervise the target financing SC in an effective way. (Wen et al., 2019). With the better relationship among SCF participants and the use of blockchain technology, the information*	"Supply chain transactions are achieved through the platform, so that we can ensure the authenticity of collected transaction data on the platform. Combined with our strict SMEs management mechanism, the risk in our SCF business is lower compared with traditional SCF." (Vice President 1, Platform A) "We record transactional information related to SCF business on the blockchain. Banks can check the specific information of supply chain trade corresponding to this financing service on the blockchain. Banks can know what construction project this financing is used for and what materials it is used to purchase, even the delivery time of this batch of goods to the construction site. Therefore, banks have a better understanding of the capital flow in

			regarding SCF is transparent and shared (Lahkani et al., 2020), Therefore, the risks of SCF provided by the platform is more controllable than the traditional SCF (Chen & Cai, 2011).	SCF, which reduces their risk of participating in our SCF." (Vice President 5, Platform C) "We only select state-owned focal companies and provide SCF service to their supply chain. When our collaborative banks providing account receivables discounting service to upstream suppliers, this service is guaranteed by the credit of qualified state-owned focal companies, which reduce the risk of banks participating in platform SCF programme." (Regional General Manager 3, Platform D).
		Acceptance of focal companies: Higher acceptance of focal companies indicates the extent to which the SCF service can benefit the focal companies' SC effectiveness.	SC effectiveness: Platforms can integrate the network resources and further help focal companies reduce SC costs and improve SC efficiency.	"The development of Platform C is under our support, we believe that a specialised SCF team can perform better than us in SCF services. We first allowed the platform to start trial operation in our company. We do enjoy the benefits of cost reduction and supply chain stabilisation by using platform's SCF service, and we then fully accept the platform's SCF service." (Financial Manager 2, Company C)

Appendix E Published papers during my PhD

(1) Chen, L., Jia, F., Li, T. and **Zhang, T.**, 2021. Supply chain leadership and firm performance: A meta-analysis. *International Journal of Production Economics*, *235*, pp. 108082. (**Co-first author; ESI Highly Cited Paper**)

(2) Jia, F., **Zhang, T.** and Chen, L., 2020. Sustainable supply chain Finance: Towards a research agenda. *Journal of Cleaner Production*, *243*, pp. 118680.

(3) Jia, F., Hubbard, M., **Zhang, T.** and Chen, L., 2019. Water stewardship in agricultural supply chains. *Journal of Cleaner Production*, *235*, pp. 1170-1188.

(4) Chen, X., **Zhang, T.** and Jia, F., 2020. Industry convergence as a strategy for achieving sustainable development of agricultural complex: The case of Sandun-Lanli in China. *Business Strategy and the Environment*, *29*(6), pp. 2679-2694.

(5) Yang, X.S., Zheng, X.X., **Zhang, T.Y.**, Du, Y. and Long, F., 2021. Waste Electrical and Electronic Fund Policy: Current Status and Evaluation of Implementation in China. *International Journal of Environmental Research and Public Health*, *18*(24), pp. 12945. (**Co-corresponding author**)

(6) Zhang, H., You, J., Haiyirete, X. and **Zhang, T.**, 2020. Measuring logistics efficiency in China considering technology heterogeneity and carbon emission through a meta-frontier model. *Sustainability*, *12*(19), pp. 8157.