Financial supply chain management practices for the supply side: Classification, contingencies, and implications

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Judith Martin

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Germany

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Prof. Dr. Wolfgang Stölzle

and

Prof. Dr. Klaus Möller

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The President:

Prof. Dr. Thomas Bieger

Vorwort

Die vorliegende Dissertation entstand im Rahmen meiner Forschungstätigkeit am Lehrstuhl für Logistikmanagement der Universität St. Gallen (LOG-HSG). Der spezifische Themenfokus auf die Schnittstelle von Supply Chain Management und Finance ergab sich dabei durch meine Arbeit am „Supply Chain Finance-Lab“ der Schweizerischen Post an der Universität St. Gallen. Das erfolgreiche Gelingen der Arbeit wäre jedoch nicht ohne die umfassende Unterstützung vieler Personen möglich gewesen, an die sich mein Dank richtet.

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St. Gallen, im Juli 2017 Judith Martin

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List of Abbreviations

CEO	Chief executive officer
CFO	Chief financial officer
ERP	Enterprise-resource-planning
FSCM	Financial supply chain management
FSP	Financial service provider
IT	Information technology
KPI	Key performance indicator
LSP	Logistics service provider
OM	Operations management
P	Proposition
RQ	Research question
SCM	Supply chain management
SET	Social exchange theory
SME	Small and medium-sized enterprise
TCE	Transaction cost economics
USA	United States of America
UK	United Kingdom
VIF	Variance inflation factor
WCM	Working capital management

Abstract

In recent years, a growing number of financially strong buyers has started to offer financing alternatives for their suppliers. These financing alternatives are known as financial supply chain management (FSCM) practices for the supply side. Buyers thereby grant their suppliers access to their own credit rating and low financing costs. They themselves intend to reduce financial risks in their upstream supply chain and to achieve financial advantages in return for the provision of funding sources to their suppliers. Despite the increasing relevance, these practices often fail to meet expectations. Guidance is needed on contextual factors capable of explaining when to offer financing alternatives for the supply side and why to prioritize different types of practices. Providing such guidance, however, becomes complex, since FSCM practices for the supply side presuppose buyers and suppliers' commitment. Furthermore, financial service providers (FSPs) are frequently involved and, thus, influence buyers and suppliers' commitment levels. Therefore, the present thesis aims to identify contextual preconditions for the application of FSCM practices for the supply side in relation to the buyer-supplier-FSP triad.

Three studies are conducted to address the overall research objective. The first study employs an explorative case study design to understand the application of different practices on the basis of contingencies in the described triad. The remaining two studies combine quantitative and qualitative approaches for the applied methodologies to enhance these findings, and they focus explicitly on supplier-related and FSP-related contingency variables. The contingency approach builds the underlying structure for the present research project. Transaction cost economics and social exchange theory provide the explanatory power to strengthen the generalizability of derived conclusions.

The findings highlight preconditions for the provision of financing alternatives for the supply side. The identification of endogenous, relationship-related, and exogenous contingencies within the buyer-supplier-FSP triad constitutes a distinct characteristic of this thesis. It enables the differentiation of types of supplier commitment related to the dimensions trust, supplier dependence, and access to external funding, and it results in the definition of explicit service requirements for FSPs involved in an FSCM context. Furthermore, the present research includes a classification of FSCM practices for the supply side according to the "time of financing" (post-shipment versus pre-shipment) and the "source of funds" (supply chain-internal versus supply chain-external). Building on this classification, it identifies differentiation criteria that can guide the selection of specific FSCM practices for the supply side.

Zusammenfassung

In den letzten Jahren hat eine wachsende Anzahl an finanzstarken Abnehmern damit begonnen seinen Lieferanten Finanzierungsalternativen anzubieten. Sie ermöglichen den Lieferanten dadurch einen direkten Zugang zu den eigenen günstigen Finanzierungsbedingungen. Die Abnehmer selbst erhoffen sich neben einer finanziellen Stärkung der Lieferanten auch unmittelbare finanzielle Vorteile im Gegenzug für das Finanzierungsangebot. Es fehlt jedoch sowohl in Praxis und Theorie an einer Anleitung, wann die Anwendung der beschriebenen Finanzierungsalternativen den erhofften Mehrwert bringt und welche Verfahren dafür gewählt werden sollten. Denn die Anwendung hängt nicht nur von den Abnehmern alleine ab. Lieferanten müssen die Finanzierungsalternative annehmen. Hinzu kommt, dass zumeist Finanzdienstleister eingebunden werden, um deren Anwendung erst zu ermöglichen. Die vorliegende Dissertation verfolgt deshalb das übergeordnete Ziel, Einflussfaktoren in der Triade von Abnehmer, Lieferant und Finanzdienstleiter zu ermitteln, welche die Anwendung von Finanzierungsalternativen für die Beschaffungsseite erklären.

Um diese Zielsetzung zu erreichen, werden drei empirische Studien durchgeführt. Die erste Studie ermittelt im Rahmen einer explorativen Fallstudienuntersuchung relevante Einflussfaktoren für die Anwendung von Finanzierungsalternativen für die Beschaffungsseite innerhalb der beschriebenen Triade. Die beiden anschliessenden Studien vertiefen die gewonnen Ergebnisse und fokussieren dabei auf Faktoren im Umfeld des Lieferanten und des Finanzdienstleisters. Der situative Ansatz dient als strukturierende Grundlage für die Studien. Die Transaktionskostentheorie und die Social Exchange Theorie werden ergänzend hinzugezogen, um den Erklärungsbeitrag der gewonnen Erkenntnisse zu stärken.

Die Ergebnisse identifizieren Voraussetzungen für die Anwendung von Finanzierungsalternativen für die Beschaffungsseite. Eine wesentliche Besonderheit der Arbeit ist dabei die Berücksichtigung von Einflussfaktoren nicht nur im Umfeld des Anbieters selbst, sondern auch innerhalb der Triade von Anbieter, Lieferant und Finanzdienstleister. Zudem wird eine Klassifizierung vorgenommen, die eine Unterscheidung von vier Typen an Finanzierungsalternativen entlang der Dimensionen „Zeitpunkt der Finanzierung“ und „Finanzierungsquelle“ ermöglicht. Eine darauf aufbauende Analyse leitet ebenfalls innerhalb der Triade Kriterien ab, die zur Auswahl von Finanzierungsalternativen für die Beschaffungsseite dienen.

1 Introduction

In recent years, both practitioners and researchers have increasingly emphasized the activities that buyers undertake to offer financing alternatives to their suppliers. These undertakings are known as financial supply chain management (FSCM) practices for the supply side[1]. They are distinct from the specific techniques that buyers employ to implement such FSCM practices. For instance, approved payables and purchase order financing both constitute particular techniques for offering financing alternatives to suppliers (e.g., Bryant and Camerinelli, 2014; Liebl et al., 2016; Tanrisever et al., 2012). Further exploring this initial understanding, the subsequent sections of this thesis elaborate on the managerial (Section 1.1) and theoretical (Section 1.2) relevance of FSCM practices for the supply side. Section 1.3 presents the research questions, which seek to fill gaps in the literature, while Section 1.4 outlines the remainder of the thesis.

1.1 Managerial relevance

Today's supply chain networks are characterized by a division of labor.[2] The reasons that companies outsource activities to supply chain partners are diverse (Holcomb and Hitt, 2007; Williamson, 2008). Among other reasons, buying companies benefit from external resources and enhance the flexibility of their cost structures (Jiang and Qureshi, 2006). At the same time, suppliers must source and produce in advance if they are to respond to buying companies' demands, resulting in a time gap between cash inflows and outflows.[3] Trade credits further delay cash inflows for suppliers. Thus, suppliers provide credits free of charge for buying companies by offering deferred payment as an option (Emery, 1984; Petersen and Rajan, 1997). Trade credits represent a common source of short-term financing for buying companies, and in value, they vastly exceed the short-term credit offered by banks (De Blasio, 2005; Seifert et al., 2013). Studies have underscored that 80-90% of global trade flows depend on trade credit (Asmundson et al., 2011; Chauffour and Malouche, 2011). Trade credits vary in term length from a few days to several months, depending on the type of industry and the country of origin

[1] Section 2.2.1 explicitly defines the term "FSCM practices for the supply side" in relation to related terms, such as "FSCM techniques," "FSCM instruments," and "FSCM concepts." Furthermore, Appendix A.7 includes an explanation of the FSCM techniques that correspond to different types of FSCM practices.
[2] Section 1.1 relates to the managerial relevance of studies A-C as described in Sections A.1, B.1, and C.1.
[3] With make-to-order production or services, suppliers do not necessarily produce in advance. However, they need to have the capacity to respond to customer demands.

(Seifert et al., 2013). Overall, suppliers have to secure sufficient funding to pre-finance the time gap between cash inflows and cash outflows.

Yet, suppliers are not always able or willing to deploy the required funds, which has negative consequences in terms of material flows in supply chains. The financial crisis of 2008/2009 revealed such damaging effects (Blome and Schoenherr, 2011; Hofmann et al., 2011; Love, 2011). The worldwide economic downturn increased bankruptcy rates and, thus, the level of financial risk in supply chains (Fabbri and Menichini, 2011; Jüttner and Maklan, 2011). Supply chain members significantly reduced their own working capital to release cash and ensure sufficient liquidity (Enqvist et al., 2014; Randall and Farris, 2009). In order to achieve these reductions of working capital, they applied the following approaches[4]:

- Efficient management of inventories and avoidance of excess capacities.
- Optimization of the provision and receipt of trade credits through decreased receivables and extended payables.

In particular, large corporations introduced six- to nine-month payment terms for their suppliers (Asmundson et al., 2011; Loten, 2012). These buyer-focused working-capital upgrades exerted financial pressure on suppliers, who were themselves struggling with the fallout of the economic downturn. In consequence of the suppliers' struggle during the recession, supplier bankruptcies increased and caused delivery disruptions (Chen et al., 2013b; Jüttner and Maklan, 2011). Other suppliers responded by increasing their prices or lowering their investments in inventory, capacity, quality, and innovation, and both of these responses had negative effects on buyers (Hofmann and Belin, 2011; Klapper and Randall, 2011).

As a response, large buying companies started to provide financing alternatives for their suppliers through FSCM practices targeted at them. Initially, buyers primarily offered financing alternatives after delivery once an invoice had been approved to reduce the associated risks (Bryant and Camerinelli, 2014; Dyckman, 2011). Under this sort of arrangement, the buyer involves a financial service provider (FSP), which offers early payments towards the supplier. The buyer itself pays the invoice in accordance with the agreed-upon payment terms to the FSP (Lamoureux and Evans, 2011). The FSP finances the time gap between outgoing payments to the supplier and incoming payments from the buyer in exchange for a discount on the invoice. The amount of the discount is based

[4] These key approaches are relevant for most, but not all, industries. For instance, telecommunication services are partly paid for in advance (prepaid carts). In such cases, firms have enough liquidity and employ working capital management to achieve alternative objectives (e.g., efficiency improvements).

on the buyer's credit rating, and the supplier pays for it. Hence, buyers can prolong the payment terms without bringing about an increase in their suppliers' working capital. In recent years, buyers have started to use their own liquidity to finance early payments to suppliers in return for dynamic discounts on invoices (Beck, 2011). Many multinational corporations (e.g., Philipps, Roche, Bayer, and Siemens) have implemented such FSCM practices, thus strengthening their suppliers' financial positions (Locker and Grosse-Ruyken, 2015). Furthermore, some buyers have introduced financing alternatives that even take effect prior to delivery, and these are based on purchase orders or inventories. All of the described practices promise numerous qualitative (e.g., less financial risk along the supply chain) and quantitative (e.g., cost and/or working-capital reductions) benefits for both buyers and suppliers (Templar et al., 2016). Recent studies have projected that the market for supply side-focused FSCM practices will grow by around 15% annually until 2020 (Demica 2014; Herath, 2015). Furthermore, government programs in the USA, UK, and the Netherlands have encouraged financing alternatives for the supply side to strengthen small and medium-sized enterprises (SMEs; (Bryant and Camerinelli, 2014). Despite this increasing relevance, FSCM practices for the supply side often fail to meet expectations, which has restricted their universal applicability (Seifert and Seifert, 2011; Wuttke et al., 2016).

A workshop[5] on FSCM practices for the supply side, which brought together 12 finance and procurement representatives employed at 10 firms, provided additional insights. All participants described differences in financing volumes and supplier numbers across their business units. For instance, several companies stressed that they had achieved great results for one business unit but had abandoned the initiative in others, due to limited effects. During the discussions, the question arose as to whether the low financing volumes and limited supplier numbers were caused by *a general lack of applicability or the selection of an inadequate practice*. Practitioners revealed a need for contextual guidance capable of explaining when to apply different FSCM practices for the supply side. Providing such guidance, however, requires complex knowledge and expertise. The relevant context not only involves buyers but also suppliers and FSPs. All workshop participants emphasized the importance of analyzing the supplier base prior to applying FSCM practices for the supply side. As one buyer expressed it, "The application does not make any sense to us without the commitment of our suppliers, since they determine the financing volume and, hence, our achievable benefits. We need

[5] Workshop information (workshop date: January 27, 2017 at the University of St. Gallen): The participating companies were all large multinational corporates based in Switzerland or Germany (sales volume above 3 billion euros). They were all involved in FSCM practices for the supply side, since they themselves offered, or planned to offer, financing alternatives for their suppliers.

to better understand drivers of their commitment to derive implications for us, when to apply which type of practice."[6] An additional discussion revealed a need for FSPs to provide both funding and a linked information technology (IT) infrastructure. Still, most of the participating companies had involved their existing partner banks without assessing alternative providers or formulating explicit requirements.

The variety of FSPs, which range from technology start-ups to traditional logistics service providers (LSPs) to banks, makes it difficult to compare the services they offer (Fellenz et al., 2009; Hofmann, 2009; Silvestro and Lustrato, 2014). Explicit and generalizable service requirements are needed if firms are to apply FSCM practices for the supply side. Therefore, the present thesis addresses the following *challenges*:

- Additional insights are required as regards *the provision of financing alternatives for the supply side within different contexts.*
- Practitioners reveal a need for guidance regarding how to *prioritize different types* of FSCM practices for the supply side.
- The context in which FSCM practices for the supply side take place involves the *buyer-supplier-FSP triad*. Nevertheless, little is known about the factors that play a key role in the context of suppliers and FSPs.

1.2 Theoretical relevance

Research on FSCM expands the supply chain management (SCM) literature by incorporating insights from the field of finance.[7] Thus, this thesis integrates literature from the well-established fields of SCM and finance, as well as from the evolving field of FSCM. Inter-organizational perspectives of SCM and FSCM on financial flows (e.g., Eßig et al., 2013; Gelsomino et al., 2016) are combined with insights from the finance literature concerning how individual firms manage their funding sources (Brealey et al., 2011; Clayman et al., 2012). In this way, the present thesis brings together three key strands of the literature.

The *SCM literature* addresses the inter-organizational management of supply chain flows (Cooper et al., 1997; Eßig et al., 2013; Lambert et al., 1998). Several scholars have considered financial flows as an element of SCM (e.g., Chopra and Meindl, 2013; Mentzer et al., 2001). Thus, financial flows comprise financial data (e.g., invoices and guarantees), as well as the transfer, storage, and provision of current and fixed assets

[6] The head of the treasury department at a Swiss corporation focused on transportation systems made this comment during the above-mentioned workshop (statement made: January 27, 2017).
[7] Section 1.2 relates to the theoretical relevance of studies A-C as described in Sections A.1, B.1, and C.1.

(e.g., cash, inventories, and machinery; Blount, 2008; Pfohl and Gomm, 2009; Smith, 2010). Yet, previous SCM studies have focused on the integrated management of material and information flows, neglecting financial flows in supply chains (Templar et al., 2016). The SCM literature only indirectly provides insights on volumes and transfers of tied-up assets and financial information in supply chains (e.g., Billington et al., 2002; Johnson and Templar, 2011). For instance, findings on facilitating information exchanges (e.g., through automation) are applicable to financial flows. Moreover, previous studies have provided in-depth evaluations of how to manage inventories along supply chains (Claassen et al., 2008; Kauremaa et al., 2009). Analytical models have calculated how financial restrictions and capital costs (e.g., inventory holding costs) impact supply chain decisions (e.g., Ahmed and Sultana, 2014; Käki et al., 2015). Nevertheless, the SCM research has not captured the funding sources needed for financing current and fixed assets. The supply chain risk literature has demonstrated that a lack of financing at individual supply chain stages has negative consequences for the entire supply chain (e.g., Chopra and Sodhi, 2004; Pfohl et al., 2010; Wagner and Bode, 2008). Still, approaches to mitigate such financial risks have not explained how supply chain members can manage both funding sources and financing costs in supply chains (Pfohl and Gomm, 2009; Wandfluh et al., 2016). Consequently, the present research explicitly addresses the integrated management of funding sources in supply chains.

The *finance literature* has shed light on funding decisions, but with a focus on individual companies (e.g., Brealey et al., 2011; Casey and O'Toole, 2014; Qian and Yeung, 2015; Saunders, 2010). Scholars have distinguished between internal and external sources of funding and have analyzed companies' funding structures (Almeida and Campello, 2010; Myers, 1977; Stiglitz, 1969). They have differentiated between the financing of current assets and the financing of fixed assets, due to their varying maturity levels (Spremann and Gantenbein, 2014). In particular, the financing of current assets is closely linked to supply chain flows (Huff and Rogers, 2015). Studies have analyzed *working capital management (WCM)* as a means of releasing funds and strengthening internal financing (e.g., Chiou et al., 2006; Erasmus, 2010; Singh and Kumar, 2014). In that way, companies can reduce their accounts receivables, as well as their inventories, while extending accounts payables to their suppliers (Boisjoly and Izzo, 2009). Yet, Hofmann and Kotzab (2010) have emphasized that company-focused WCM improvements have negative consequences for supply chain members, since they often pursue contradictory objectives. For instance, while the buying company tries to extend payment terms, the supplier simultaneously attempts to reduce accounts receivables. Thus, what is needed is an inter-organizational approach to managing funding sources.

The *trade finance literature* has taken the first steps towards developing such an inter-organizational perspective on funding sources (Casterman, 2012; Klapper et al., 2012; Petersen and Rajan, 1997). Several researchers have studied the reasons that suppliers provide trade credits to buying companies through extended payment terms, and boosting sales has been cited as one possible justification (e.g., Atanasova, 2012; García-Teruel et al., 2014; Seifert et al., 2013). Buyers certainly consider their suppliers' financial situation when defining payment terms (Ng et al., 1999; Wilner, 2000). Still, the trade finance literature has remained focused on financing alternatives for the demand side, neglecting the supply side. Furthermore, trade credits solely involve invoice-based financing. Thus, the present thesis emphasizes the provision of financing alternatives for the supply side, with a general focus on current assets.[8]

In recent years, *FSCM* has emerged as a new field of research, situated at the intersection of the SCM and finance literature, and it emphasizes the inter-organizational management of financial flows in supply chains (Gomm, 2010; Hofmann and Johnson, 2016; Rogers and Leuschner, 2015). In previous studies, the level of abstraction has varied substantially. Most scholars have sought to either develop a general concept of FSCM or analyze specific FSCM techniques (e.g., Gelsomino et al., 2016; Wandfluh et al., 2016). Conceptual studies have contained little empirical data or solely used such data in descriptive case studies. First analytical models have evaluated specific techniques, but they also do not include empirical data (e.g., Hofmann and Zumsteg, 2015; Iacono et al., 2015). For instance, van der Vliet et al. (2015) modeled how a supplier's financing costs can influence the outcomes of approved payables financing. Moreover, case studies have enhanced analytical models, enriching them with empirical data and providing insights into the successful implementation of specific techniques (e.g., Liebl et al. 2016; Wuttke et al. 2013a). Still, empirical FSCM studies have remained scarce. They have not created guidelines regarding when to offer financing alternatives to suppliers and why to select different FSCM techniques. Formulating such guidelines on the basis of FSCM techniques is difficult, since they are too individualized to generate generalizable results (Sousa and Voss, 2002). FSCM practices are more abstract and employ common constructs, thus improving the comparability of different practices. Therefore, the present thesis focuses on empirical insights explaining how FSCM practices for the supply side should be applied in different contextual situations.

[8] The financing of fixed assets differs from the financing of current assets in terms of the term, associated risks, and funding level (Brealey et al., 2011). As the finance literature has demonstrated, these characteristics strongly influence a company's choice of financing approaches. Studying both asset types together would reduce the validity of the results.

The fact that FSCM practices expand beyond corporate boundaries makes it more difficult to determine implications for their application than in related fields of literature. For instance, operations management (OM) research has evaluated the antecedents of the application of company-internal quality practices on the basis of an individual organization's commitment (Sousa and Voss, 2008). Yet, applying FSCM practices for the supply side presupposes the commitment[9] of buyers and suppliers (e.g., Wuttke et al., 2013b; van der Vliet et al., 2015).[10] Moreover, Seifert and Seifert (2011) have stressed that FSPs and their service offerings are capable of affecting buyers and suppliers' commitment levels. Providing guidance on how to apply FSCM practices for the supply side in different contextual situations therefore requires an understanding of why buyers and suppliers commit to such practices. Knowledge regarding FSPs' service requirements is also necessary. The implications of the application of FSCM practices for the supply side can be determined on the basis of knowledge about all involved actors. Nevertheless, existing studies have primarily relied on buyer-oriented data, demonstrating the need for empirical analyses of suppliers and FSPs (Wandfluh et al., 2016). Consequently, the present thesis treats the buyer-supplier-FSP triad as the relevant context for FSCM practices for the supply side. In sum, it helps to address the following *research gaps*:

- The SCM and finance literature lacks insight into the integrated management of financial flows in supply chains. In particular, the inter-organizational management of funding sources has been neglected. Trade finance research constitutes an exception, but it has focused on funding in terms of invoices and the demand side. Together, these two fields of research point towards the need to study the *provision of financing alternatives* for current assets with a *focus on the supply side*.
- Moreover, FSCM emphasizes the need for an integrated approach to managing financial flows. Previous research has focused on either FSCM as a general concept or specific FSCM techniques. This highlights *a lack of empirical analyses* explaining *when and why to apply different FSCM practices for the supply side*.

[9] Commitment describes buyers and suppliers' willingness to make efforts necessary for the application of FSCM practices for the supply side (Ganesan and Hess, 1997; Morgan and Hunt, 1994). Buyers need to be willing to offer financing alternatives including investments in technology, organizational changes, etc. Suppliers need to be willing to accept them including potential discounts on their invoices, organizational and process changes, etc. See Section 2.2.3 for further information on buyers and suppliers' commitment.

[10] Current FSCM practices for the supply side primarily focus on the buyer-supplier dyad within the physical supply chain, and, thus, define the focus of the present research project. Section 2.2.3 provides additional information on the actors involved in FSCM practices for the supply side.

- Providing guidance on FSCM is a complex task, since the *relevant context for FSCM practices comprises the buyer-supplier-FSP triad*. Existing studies have primarily examined buyer-oriented data.

1.3 Research questions

The present thesis seeks to provide guidance when and why to apply FSCM practices for the supply side in different contexts. As previously mentioned, the relevant context comprises the buyer-supplier-FSP triad, since the application of FSCM practices presupposes commitment on the part of buyers and suppliers, as well as on the part of FSPs, which serve as enablers. Figure 1 presents the identified research gaps and summarizes the managerial and theoretical relevance of this research.

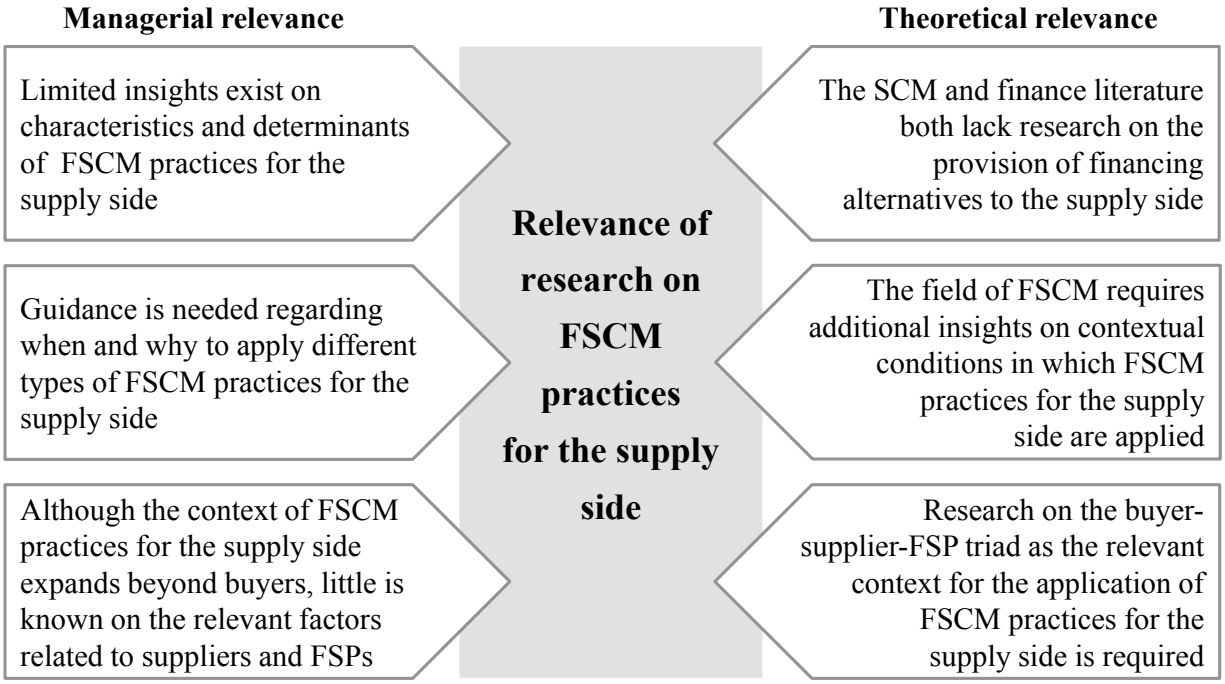

Figure 1: Managerial and theoretical relevance of research on FSCM practices for the supply side

In accordance with these research gaps, the overall research question (RQ) is as follows:

RQ: *Which implications can be derived for the application of FSCM practices for the supply side on the basis of contingencies in the buyer-supplier-FSP triad?*

To answer the primary research question, this thesis addresses three sub-questions. The first of these sub-questions is closely related to the primary research question, and the answers to the remaining two sub-questions rely upon it. As aforementioned, previous empirical studies have emphasized individual FSCM techniques (e.g., Wuttke et al., 2013b; Liebl et al., 2016). Yet, they have not been able to explain when to apply inter-organizational financing activities for the supply side and why to utilize different types

of practices. Therefore, the first sub-question seeks to determine contingencies for both applying FSCM practices for the supply side and selecting specific practices. The contingency approach serves as a structural framework, differentiating among endogenous, relationship-related, and exogenous variables within the buyer-supplier-FSP triad (Kajüter and Kulmala, 2005).

RQ1: *Why are FSCM practices applied for the supply side, and how can differences between these practices be explained in relation to the buyer-supplier-FSP triad?*

The second sub-question explicitly relates to suppliers as one central actor involved in FSCM practices for the supply side. It builds upon the previous sub question's findings and studies the supplier's context in further detail. As explained in Sections 1.1 and 1.2, FSCM practices for the supply side assume suppliers' commitment, although the existing literature has only drawn on limited supplier-oriented data (Gelsomino et al., 2016). The second sub-question thus aims to explain suppliers' commitment and then to determine implications for the application of FSCM practices for the supply side. Transaction cost economics and social exchange theory form the theoretical basis for the predictors and outcomes (Ambrose et al., 2010).

RQ2: *What are predictors and outcomes of a supplier's commitment to FSCM practices for the supply side, and how do they affect the application of these practices?*

Similar to the second sub-question, the final sub-question expands on the findings for the first sub-question, except it explores contingencies related to FSPs, rather than contingencies related to suppliers. Scholars have acknowledged FSPs as a key enabler of FSCM practices for the supply side, but they provide little further insights (e.g., Seifert and Seifert, 2011; Silvestro and Lustrato, 2014). First, previous research has provided only limited explanations regarding the reasons that FSPs play a role in FSCM practices for the supply side. Second, previous studies have not determined distinct FSP service requirements that permit the application of practices. On the basis of transaction cost economics and social exchange theory's idea of objective conflicts (Molm and Cook, 1995; Spremann and Gantenbein, 2014; Williamson, 2008), the third sub-question addresses both gaps in the previous literature and identifies the FSP service requirements that facilitate the application of FSCM practices for the supply side.

RQ3: *Why are FSPs involved in FSCM practices for the supply side, and how do their service offerings enhance the application of these practices?*

The application of FSCM practices for the supply side constitutes a largely unexplored research area. Using the answers to the presented research questions as a foundation, the thesis makes recommendations for managers and derives valuable theoretical

implications. Therefore, it fulfills descriptive, theoretical, and pragmatic research objectives related to FSCM practices for the supply side (Schnell et al., 2013). It aims to describe relevant observations and provide explanations for them. Finally, it also discusses the practical implications of applying FSCM practices for the supply side. In that manner, the findings help to develop theoretical knowledge in the emerging field of FSCM, relying on an integrated inductive-deductive research approach (Kovács and Spens, 2005; Kubicek, 1977). The explorative, empirical examination of FSCM practices for the supply side serve as a basis for inductively deriving both theoretical propositions and managerial recommendations. In addition, the thesis' analytical, theory-based evaluation means that its findings are more scientifically rigorous.

1.4 Outline of the thesis

The thesis is divided into five chapters, as illustrated in Figure 2:

Chapter 1 introduces the research on FSCM practices for the supply side from both managerial (Section 1.1) and theoretical (Section 1.2) perspectives. The identified research gaps specify the overall research objective and guide the related research questions (Section 1.3).

Chapter 2 provides the conceptual background on FSCM practices for the supply side, reviewing the existing literature. Section 2.1 begins by discussing FSCM's general characteristics, as described in the SCM, finance, and FSCM literature. Next, Section 2.2 defines and classifies FSCM practices for the supply side, explores how such practices are applied, and introduces the key actors involved.

Chapter 3 theoretically positions research on FSCM practices for the supply side. It determines criteria for selecting theoretical lenses and analyzes various theories in terms of their applicability (Section 3.1). Moving on, Section 3.2 examines the selected theories (the contingency approach, transaction cost economics, and social exchange theory) on the basis of their contributions to the present research.

Chapter 4 introduces a theoretical framework integrating the research objectives with both conceptual and theoretical perspectives (Section 4.1). Afterwards, Sections 4.2 to 4.4 describe the research designs and key findings of three empirical studies, labeled studies A, B, and C. In accordance, Appendices A-C contain the full text of these studies.

Chapter 5 summarizes the managerial (Section 5.1) and theoretical (Section 5.2) implications of the empirical studies and links them to the overall research objective, thus shedding light on the application of various FSCM practices for the supply side.

Finally, Section 5.3 points out the limitations of this thesis and makes recommendations for future research.

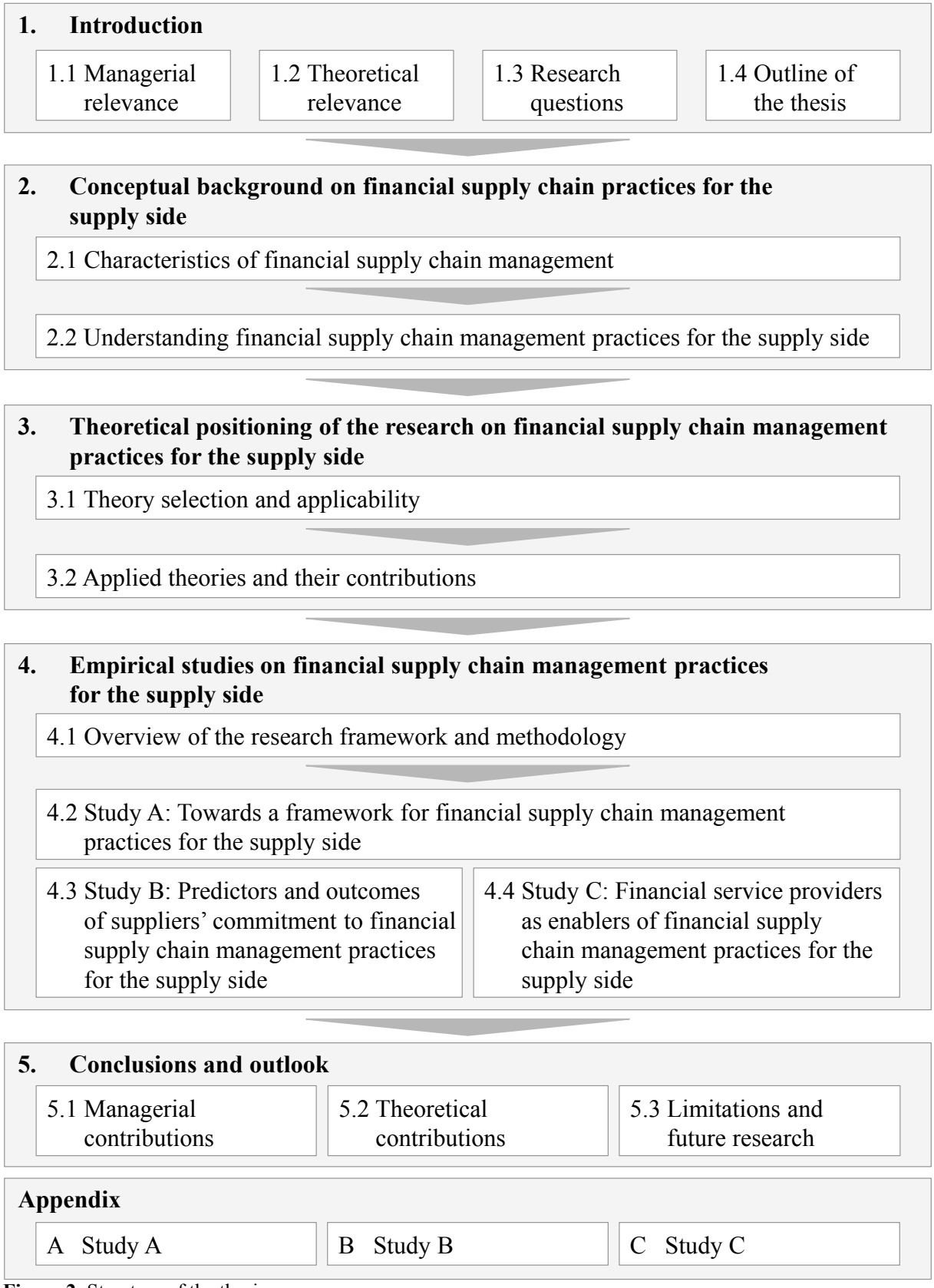

Figure 2: Structure of the thesis

2 Conceptual background on financial supply chain management practices for the supply side

This thesis focuses on the inter-organizational management of funding sources through FSCM practices for the supply side.[11] It draws on previous literature on SCM, finance, and FSCM. Findings from these three research areas are combined to shed light on FSCM's characteristics (Section 2.1). Building on those conclusions, Section 2.2 discusses FSCM practices for the supply side.

2.1 Characteristics of financial supply chain management

Financial flows run parallel to material flows and information flows in supply chains (Blount, 2008; Smith, 2010). Previous findings on the management of financial flows are limited in the SCM and finance literature. Only recently has FSCM emerged as a research stream integrating insights from the SCM and finance literature to explicitly address financial flows in supply chains. Nevertheless, FSCM lacks a clear definition and established terminology. Sections 2.1.1 and 2.1.2 highlight key insights from the SCM and finance literature and use these to outline FSCM's characteristics. The existing FSCM literature is subsequently integrated, creating a more complete picture and helping to identify the management layers involved in financial flows in supply chains (Section 2.1.3).

2.1.1 Financial aspects of supply chain management

The SCM literature has a long tradition of studying the *integrated management of supply chain flows,* emphasizing a cross-functional and inter-organizational orientation (Chen and Paulraj, 2004; Chopra and Meindl, 2013; Cohen and Roussel, 2013; Hines, 2013; Lambert and Cooper, 2000; Mentzer, 2001). Due to its cross-functional character, various disciplines (e.g., marketing and logistics) have provided valuable insights on SCM. This input from a variety of sources has resulted in a lack of a common terminology for discussing SCM and associated supply chain flows (Eßig et al., 2013; Pfohl and Gomm, 2009). Previous definitions have agreed in that supply chain flows capture flow of materials, services, and information. Several authors have explicitly included financial flows as an element of the supply chain. Mentzer et al. (2001, p. 5)

[11] Chapter 2 relates to the conceptual background of studies A-C described in Sections A.2, B.2, and C.2.

have differentiated "flows of products, services, finances, and information from a source to a customer." Stock and Boyer (2009, p. 706) analyzed 173 definitions of SCM and incorporated financial flows into their final comprehensive definition:

SCM is "the management of a network of relationships within a firm and between interdependent organizations and business units […] that facilitate the forward and reverse flow of materials, services, finances and information from the original producer to final customer […]."

In accordance with this definition, the present thesis views financial flows as an explicit component of SCM and financial flows are composed of the following elements:

- *Cash or payments* are transferred between supply chain members in exchange for items such raw materials, services, and machinery (Cohen and Roussel, 2013; Keebler, 2001).
- Supply chain members exchange *financial information* in the form of, for example, invoices, purchase orders, or guarantees (Blount, 2008).
- *Capital costs* emerge for capital tied up in material flows (e.g., inventories and infrastructure). The volume and duration of tied-up capital are multiplied by the capital cost rate (e.g., inventory holding costs) to determine the overall cost of capital (Chandra and Grabis, 2007; Pfohl and Gomm, 2009).

Figure 3 offers an example of financial flows in relation to material and information flows. In that figure, the transfer of title between the supplier and the buyer initiates payments and determines the assignment of inventory holding costs.[12]

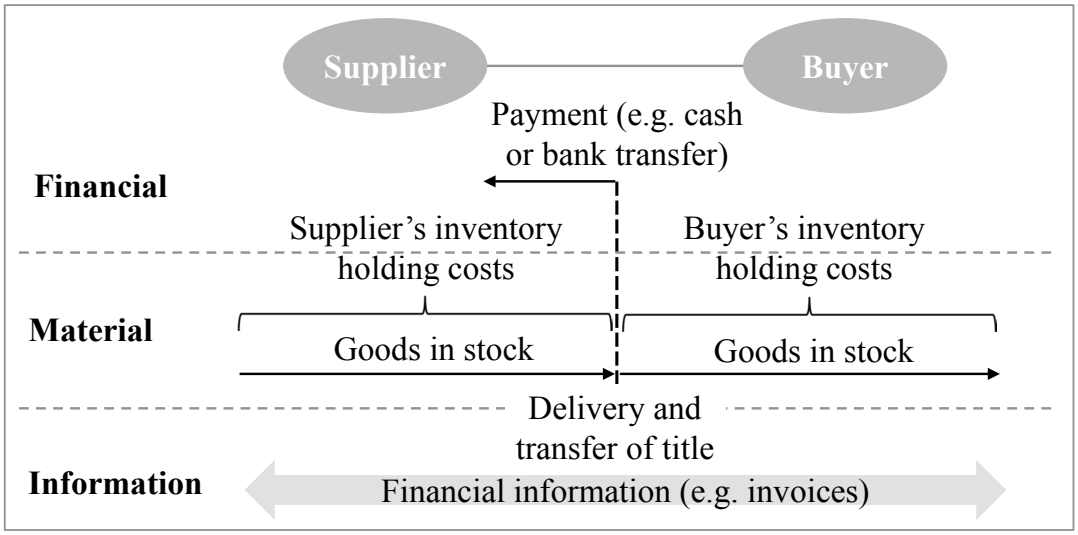

Figure 3: Example of financial flows in relation to flows of material and information

[12] The example assumes direct payment and excludes delays due to, for example, payment terms for simplicity's sake. The moment at which the transfer of title occurs can vary depending on Incoterms.

Based on these three elements, Table 1 differentiates five dimensions so as to initially outline the structure of financial flows.

Dimension	Description
How?	The first dimension describes how financial information (e.g., invoices) and cash transfers move between supply chain members (Blount, 2008).
What?	Financial flows can take the form of payments, cash, and financial information, as well as of the capital tied up in material (e.g., inventory, infrastructure, and machinery) flows (Keebler, 2001).
How much?	Volume is the main means of determining the amount of tied-up capital, cash, payments, and financial information transferred (Comelli et al., 2008).
How long?	Duration adds a time dimension to financial flows and describes the time needed to transfer tied-up capital, cash, payments, and financial information within supply chains (Pfohl et al., 2009).
Which capital cost rate?	The capital cost rate determines the cost of the capital "flowing" in supply chains. For tied-up capital, the volume, duration, and capital cost rate are multiplied to determine the overall capital cost (Gomm, 2010).

Table 1: Dimensions of financial flows

Although the SCM literature has *described and structured financial flows*, existing studies have emphasized the management of material and information flows (Eßig et al., 2013). Nevertheless, previous studies have indirectly enabled researchers to draw conclusions regarding how to manage financial flows.

The process of transferring financial information, cash, and payments is closely related to the *exchange of information,* which the SCM literature has already examined (e.g., Abdullah and Musa, 2014; Hudnurkar et al., 2014; Kwon and Suh, 2004; Ozer et al., 2011). Findings on the relevance of information exchanges between supply chain members are applicable to financial flows in supply chains, as are findings on the automated transfer and digitalization of information. Furthermore, Steinmüller (2007) described LSPs' value-added services in relation to financial transfers (e.g., payments, invoices, and customs declarations). In addition to the mere transfer of information, the SCM literature has demonstrated how information exchanges between supply chain members reduce the efforts they must make to coordinate (Li et al., 2006). Various scholars have analyzed how sharing information can reduce inventory levels and lower the level of uncertainty (e.g., Claassen et al., 2008; Wang et al., 2016).

Furthermore, *supply chain structures predefine supply chain flows and, thus, financial flows*. To that end, SCM studies have examined the activities, extent of integration, and the number of actors at each stage of the supply chain, and they have also assessed the overall length of supply chains (Cooper et al., 1997; Delfmann and Klaas-Wissing, 2007; Eßig et al., 2013; Schönsleben, 2011). Supply chain structures influence the level of capital tied up at each stage (Carnovale and Yeniyurt, 2015). For instance, when manufacturing firms decide to outsource operations, the result is machinery and infrastructure transfer to suppliers, including the involved costs of capital. In return, buyers need to keep the outsourced materials in stock, thus increasing their inventory holding costs.[13]

To capture these interrelations between material and financial flows, several researchers have integrated *financial factors into their evaluations of supply chain decisions* (Comelli et al., 2008; D'Avanzo et al., 2003; Ellram and Liu, 2002; Zott and Amit, 2008). Meyer (2006a) included capital costs and capital productivity as factors with an effect on site selection. Rodrique (2012, p. 1) pointed out how customs and tax costs affect "the geography of global supply chains." Other scholars have included financial factors (e.g., payment terms and advance payments) in their quantitative models for calculating economic order quantities or inventory levels (Käki et al., 2015; Seifert et al., 2013; Zhang et al., 2014). Still, these studies have primarily treated financial factors as an additional type of cost or restriction and have neglected measures to actively manage them along supply chains.

Subsequently, researchers began to employ *financial performance models* (e.g., the Du Pont model and the net present value model) to more comprehensively compute SCM's financial impact (Cohen and Roussel, 2013; Keebler, 2001; Meyer, 2006b). Wessely (2011) examined the effect of supply chain initiatives on shareholder value, while Billington et al. (2002) explored the application of real options techniques in an SCM context to mitigate supply chain risks. Johnson and Templar (2011, p. 93) developed a "supply chain proxy" to link supply chain and firm performance through cash generation and asset efficiency. Other studies applied financial models to analyze how LSPs reduce capital commitment levels for individual supply chain members (Hofmann, 2009; Steinmüller, 2003; Stenzel, 2003). For example, Hofmann and Freichel (2010) analyzed three logistics services operator models with regard to free cash flow performance effects. These models offer two valuable insights regarding the management of financial

[13] The exception is when buyers do not store materials themselves (e.g., for just-in-time/just-in-sequence deliveries).

flows in supply chains: First, they enable a specification of the content of financial flows ("what"-dimension of financial flows; see Table 1) in terms of fixed (e.g., infrastructure, machinery) and current (e.g., cash, inventories) assets. Second, they directly link the integrated management of material and information flows to the financial flows. For instance, inventory reductions release capital tied up in current assets and thus reduce overall capital costs. However, Keebler (2001) and Flynn et al. (2010) have emphasized that such financial models represent an as-of-yet unexploited opportunity for SCM and that the interface between SCM and finance remains weak.

Overall, the SCM literature points towards dimensions that can be employed to describe and structure financial flows and that underscore the interrelations between supply chain flows. The findings of previous studies have three main implications for the management of financial flows: *First*, findings regarding information transfers are applicable to transfers of financial information, payments or cash. *Second*, previous SCM studies have treated financial factors as an additional type of cost or restriction that must be factored into supply chain decisions regarding material flows. *Third*, financial models have revealed how the inter-organizational management of information and material flows along supply chains influences financial flows in terms of asset type (current or fixed), volume, and duration.

Until now, the SCM literature has barely examined the availability of funds needed to finance assets in material flows. Capital costs and liquidity restrictions have been considered as fixed variables rather than as levers to be managed along supply chains (Gomm, 2010; Hofmann and Kotzab, 2010; Pfohl and Gomm, 2009). Accordingly, studies have not addressed the inter-organizational management of financing costs and funding sources. *The supply chain risk literature* constitutes an exception, since it has analyzed financial risks and identified how a lack of funds affects the overall supply chain (Blome and Schoenherr, 2011; Chopra and Sodhi, 2004; Colicchia and Strozzi, 2012). Nevertheless, Wandfluh et al. (2016) have emphasized that measures to mitigate financial risks have primarily taken the form of monitoring techniques that rely on past data, neglecting a more proactive, inter-organizational approach to managing funding. Hence, insights from the finance literature are needed to specify the management layers connected to financial flows in supply chains.

2.1.2 Supply chain orientation in finance

The finance literature has a long research tradition. It unites the real economy and the financial economy (Brealey et al., 2011; Clayman et al., 2012; Spremann and

Gantenbein, 2014). *The real economy* captures material flows in supply chains in terms of the resources needed to produce and distribute goods and services (Spremann, 2010). Balance sheets describe the real economy in terms of the application of funds and differentiate between fixed assets and current assets (Spremann and Gantenbein, 2014). The exchange of goods between supply chain members affects the distribution of assets across firms' balance sheets. For instance, the delivery of goods to a buyer reduces inventories and increases accounts receivables on the supplier's balance sheet.[14] Once the buyer pays the outstanding invoice, the supplier's accounts receivables are replaced with the inflow of cash. Thus, assets can play a role in describing financial flows between supply chain members.

The financial economy encompasses the money and capital needed for the real economy. Money facilitates the exchange of goods and services (Mitchell, 1916), while capital permits investments in resources (e.g., materials and machinery) to produce goods and services (McKinnon, 1973; Rogers, 1989; Taylor, 2010). At the same time, investments introduce a time element into the financial economy, which leads to the concept of credit. McMillan (2014, p. 4) described how "credit is used for deferred payment. With credit, the payment of money and the transfer of goods and services take place at different points of time." Thus, the finance literature has addressed two main questions: How should one evaluate and select investments in real assets, and how can financial assets finance these investments? The first question addresses the *application of funds* and questions how much (volume) capital is tied up in each type of real asset and for how long (duration). The second question seeks to identify and compare available *funding sources* for these assets, and is intimately connected to the concept of credit.[15]

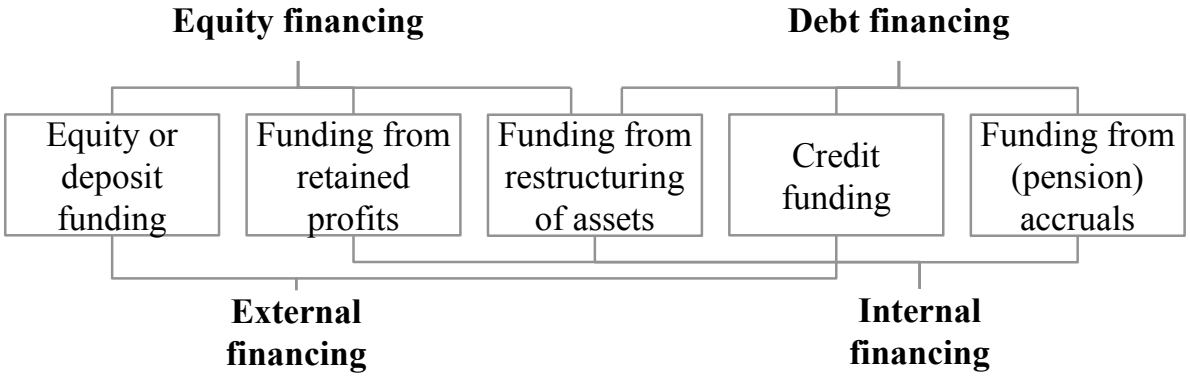

Figure 4: Types of funding[16]

[14] Assumption: Goods are purchased on account and not paid directly or in advance.
[15] The application of financial models to assess supply chain decisions has already been described in Section 2.1.1. Therefore, Section 2.1.2 focuses on sources of funding.
[16] Adapted from Spremann and Gantenbein (2014, p. 22).

Scholars have distinguished four main types of financing (see Figure 4). *Equity and debt financing* describe two forms of a company's financial capital (Brealey et al., 2011; Myers, 1977). Equity financing gives investors certain property rights in exchange for their financing. The financial contract itself has an unlimited term and usually stipulates the provision of dividend payments in exchange for the investment.[17] In contrast, debt financing comprises those financing contracts with fixed maturity dates for repayment and periodical interest payments. Furthermore, *internal and external financing* are also means of classifying financing types (Almeida and Campello, 2010; Rahaman, 2011). For instance, equity financing represents an external source of funding when additional owners are involved. It can also constitute an internal source of financing when profits remain within a firm and are not paid out as dividends.

The finance literature has developed different theories and concepts to explain a company's decisions regarding its *funding structure* (e.g., Agliardi et al., 2016; Jensen and Meckling, 1976; de Jong et al., 2011; Qian and Yeung, 2015; Stiglitz, 1969). For instance, Myers and Majluf (1984) described the advantages of internal sources of financing, since these prevent financial distress and dependence on external stakeholders. Yet, internal sources of financing are usually not sufficient to fund all necessary investments (Fama and French, 2002). In addition, tax advantages encourage firms to choose debt financing (Shyam-Sunder and Myers, 1999). This discussion serves as a starting point for structuring financing sources within supply chains. Still, finance researchers have remained focused on analyzing capital structures from the firm perspective.

Besides analyzing capital structures, the finance literature has also identified alternative approaches, limiting dependence on external equity or bank credit financing (Klapper, 2006; Palia and Sopranzetti, 2004; Soufani, 2002). Within this context, *WCM* seeks to reduce the amount of capital tied up in current assets with the goal of making internal funding available (e.g., Boisjoly and Izzo, 2009; Hofmann, 2010; Jose et al., 1996; Singh and Kumar, 2014). Net working capital[18] has three central elements: accounts receivables, inventories, and accounts payables. Scholars have analyzed how companies accelerate payment entries and inventory turnover and extend accounts payables towards suppliers to decrease their net working capital (Almeida and Campello, 2010;

[17] Investors cannot determine the level of dividend payments. Rather, they can only determine whether the firm pays out profits as dividends or not (Spremann and Gantenbein, 2014).

[18] Net working capital refers to the ratio of current assets to current liabilities (Heesen, 2013). Accounts receivables and inventories constitute the central elements of current assets that the WCM literature has addressed. As such, this thesis focuses on them as well, combined with current liabilities. See Bhalla (2007) for a further explanation of net working capital.

Heesen, 2013). Thus, WCM demonstrates how the management of supply chain flows influences the funding sources employed by the actors involved. Nevertheless, the WCM literature has focused on optimizing capital structures for individual companies, neglecting the negative consequences for other supply chain members (Hofmann and Kotzab, 2010).

The *trade finance* research constitutes an exception, since it examines suppliers' provision of trade credit to their buyers via deferred payments (Casey and O'Toole, 2014; Casterman, 2012; García-Teruel et al., 2014; Soni et al., 2010). Trade credit theory has expanded the WCM literature's focus towards the buyer-supplier dyad, explaining the motives of the actors involved (Emery, 1984; Petersen and Rajan, 1997; Seifert et al., 2013). Petersen and Rajan (1997) described trade credit as one way that suppliers can introduce price discrimination and promote sales. Ng et al. (1999) defined the determinants of specific credit terms (e.g., product quality or transaction frequency). Other researchers have identified why buyers prioritize trade credit over alternative sources of financing (Atanasova, 2012; García-Teruel et al., 2014). The trade financing literature has generated initial insights into how supply chain members can become a funding source for one another. Yet, it has focused on the downstream supply chain, without explicitly addressing financing alternatives for suppliers (Ng et al., 1999; Wilner, 2000).

Furthermore, studies have indicated how inter-organizational financing reduces capital costs within supply chains. Scholars and practitioners usually determine a company's *capital costs through the weighted average cost of capital approach,* defining it as the weighted sum of equity and debt costs (Frank and Shen, 2016; Nantell and Carlson, 1975). Risk factors (e.g., country or operational risks) influence the specific capital cost rates included in the equation (Brealey et al., 2011; Spremann, 2010). Modern portfolio theory emphasizes that investors expect increased returns for accepting greater levels of risk (Black et al., 1972; Markowitz, 1999).[19] Investors may even decline to provide financing when the perceived risks exceed their risk preferences. Jensen and Meckling (1976) described how information asymmetries between a firm's internal management and its external investors (e.g., shareholders and banks) affect the availability and cost of financing. For instance, external investors might struggle with determining whether new machinery will provide the expected value to customers. In such a scenario, external investors would benefit from direct information on customer preferences, as it would allow them to more accurately assess the operational risks. Such an improved evaluation

[19] For additional information on modern portfolio theory, see Markowitz (1999).

of operational risks would again reduce financing costs and facilitate access to external financing for the firm in question. Thus, the inter-organizational management of funding sources also involves exchanging information as a means of reducing capital costs within supply chains.

In conclusion, the finance literature has pointed out the weaknesses of a company-focused approach to managing funding sources. Consequently, it has several implications for the inter-organizational management of financial flows. *First*, the finance literature has differentiated questions related to the application of funds and the funding sources. While the application of funds addresses the management of assets, the coordination of funding sources ensures the availability of funds to finance these assets. *Second*, the finance literature has developed a classification of funding sources in terms of internal versus external financing and debt versus equity financing. It has identified supply chain members as one possible source of funding. Nonetheless, previous studies have focused on the provision of financing alternatives for the demand side. *Third*, involving supply chain members in financing decisions may reduce uncertainties for external investors and, hence, capital costs within supply chains. Thus, the finance literature yields valuable insights regarding FSCM.

2.1.3 Management layers for financial flows in supply chains

In recent years, FSCM has emerged as a new research stream at the intersection of the SCM and finance literature. Specifically, FSCM enhances SCM, thanks to its explicit focus on managing financial flows, and it extends company-focused financing findings towards the supply chain (Blackman et al., 2011; Fairchild, 2005; Gupta and Dutta, 2011; Randall and Farris, 2009). For instance, Blount (2008) described how the optimization of material flows results in inefficiencies, since that approach overlooks interdependencies within financial flows. Hofmann and Kotzab (2010) analyzed the negative consequences of company-focused working capital improvements for supply chain partners and supported a collaborative approach to WCM. Apart from the emphasis on financial flows in supply chains, *there is little consensus on common FSCM definitions and terminologies* (e.g., Gelsomino et al., 2016; Hofmann and Johnson, 2016; Metze, 2010).[20] In fact, Hofmann and Johnson (2016) differentiated among six

[20] The term "supply chain finance" is also used in the context of financial supply chains. Yet, researchers have not agreed on a single definition and focus. Some scholars have analyzed one specific technique, while others have concentrated on financial supply chains more broadly (Liebl et al., 2016). To avoid any ambiguity, this thesis employs the term "financial supply chain management." For a further explanation, refer to Templar et al. (2016).

schools of thought regarding FSCM research (e.g., quantitative modeling and an asset-centered approach).

To delineate FSCM's characteristics, this thesis identifies common layers involved in the management of financial flows. These layers are based on recent FSCM findings and also integrate insights from the SCM and finance literature (see Sections 2.1.1. and 2.1.2). Table 2 describes the resulting management layers and categorizes previous FSCM studies by the layers that they address. Pfohl and Gomm (2009) established a solid foundation for this categorization, as they differentiated between a transfer-oriented and a financing-oriented view on financial flows in supply chains. The *transfer-oriented view*—also referred to as financial chain management—stresses increasing efficiency and automation in information flows and documents related to financial flows (Kristofik et al., 2012; Popa, 2013; Weiss, 2008). It captures the "how" dimension of financial flows described in SCM research (see Table 1 in Section 2.1.1). This thesis does not further elaborate on the transfer-oriented view, since that approach concentrates on information rather than on financial flows.

Perspective	**Management layer**	**Description**	**Sources (examples)**
Transfer-oriented view	Transfer of funds and financial information	Efficient transfer of funds (e.g., payments) and financial information (e.g., invoices) between and within companies.	Donovan, 2004; Kristofik et al., 2012; Popa, 2013; Weiss, 2008
Financing-oriented view	Application of funds	Funds are tied up in current and fixed assets along supply chains. The goal of FSCM is to reduce the volume of assets within supply chains, along with the amount of time they spend there (duration).	Caniato et al., 2016; Carnovale and Yeniyurt, 2015; Gelsomino et al., 2016; Gomm, 2010
	Source of funds	Adequate funding sources must be available. These sources again charge financing costs. In this context, FSCM addresses the management of financing sources and costs in supply chains.	Hofmann, 2009; Liebl et al., 2016; van der Vliet et al., 2015; Wandfluh et al., 2016; Wuttke et al., 2016

Table 2: Management layers for financial flows in supply chains

The finance literature has further specified the financing-oriented view, differentiating between the application of funds, as well as the sources of funds (Brealey et al., 2011; Spremann and Gantenbein, 2014). They constitute two additional management layers and also correspond to dimensions of financial flows that the SCM literature has

explored (see Table 1 in Section 2.1.1). Application of funds primarily addresses the "what" dimension of financial flows, while funding sources capture the dimension of "capital cost rate". The remaining two dimensions of financial flows (volume and duration) pertain to all three management layers. In the following sections, the two management layers "application of funds" and "source of funds" are examined in detail including a review of previous findings in the FSCM literature.

Application of funds within supply chains: Managing the application of funds within supply chains constitutes a central layer of FSCM. Such funds are tied up in current and fixed assets. The transfer of goods and services within supply chains again leads to changes in asset levels for individual supply chain members. Previous studies have mainly investigated current assets by focusing on net working capital and cash flows (Grosse-Ruyken et al., 2011; Hofmann and Kotzab, 2010; Srinivasa Raghavan and Mishra, 2011). In their conceptualization of FSCM, Wuttke et al. (2013a) emphasized "supply chain cash flows". Randall and Farris (2009) studied accounts receivables, inventories, and accounts payables in supply chains. A few studies have also included fixed assets as an element of FSCM (Gomm, 2010; Pfohl and Gomm, 2009). This is because current assets are directly linked to events in material flows. For instance, a transfer of goods also results in a payment obligation. Fixed assets, however, serve as a permanent foundation for the supply of goods and services. Scholars have only recently incorporated them into FSCM research (Templar et al., 2016).

The goal of FSCM research is to *reduce the amount of funds tied up in fixed and current assets* within supply chains (Hofmann and Johnson, 2016). The volume of tied-up capital, along with the length of time that it is thus occupied, constitutes the main lever that firms can exploit to achieve this objective. For instance, Huff and Rogers (2015) analyzed the positive effects of inventory reductions on long-term firm performance. Similarly, scholars have analyzed vendor management inventory or just-in-time/just-in-time approaches to coordinate and reduce inventories within supply chains (e.g., Claassen et al., 2008; Kannan, 2005; Kauremaa et al., 2009). SCM research has already offered valuable insights into this management layer (see Section 2.1.1). The present thesis therefore focuses on the third FSCM management layer, as described in the following paragraph.

Sources of funds within supply chains: Fixed and current assets tied up in supply chains require funding, and available funding sources can differ between the supply chain level and the company level. *Network financing* expands the classification of internal and external financing developed in the finance literature (Spremann and Gantenbein, 2014; Templar et al., 2016). It introduces a supply chain network perspective on funding

sources. A supply chain's internal funding sources include funds provided by other supply chain members, as well as traditional firm-internal financing options (see Section 2.1.2). For instance, trade credits offered by suppliers to buyers are a form of supply chain-internal financing. In contrast, supply chain-external financing comprises funds from outside partners, such as banks.

With the goals of ensuring sufficient access to financing and reducing associated costs within supply chains, FSCM captures the *inter-organizational management of both types of funding sources* (Wandfluh et al., 2016; Wuttke et al., 2013a). For instance, several scholars have examined approved payables techniques in which financially strong buyers provide a financing alternative for their suppliers (e.g., Iacono et al., 2015; Liebl et al., 2016; van der Vliet et al., 2015). In that way, buyers can mitigate financial risks in supply chains and use their credit rating to reduce suppliers' financing costs. In addition, Hofmann and Kotzab (2010) evaluated an approach in which assets are assigned to those supply chain members with the lowest financing costs. Other scholars have analyzed how guarantees between supply chain members reduce information asymmetries with supply chain-external funders and, consequently, decrease financing costs (Bryant and Camerinelli, 2014; Camerinelli, 2008; Hofmann, 2011; Pfohl and Gomm, 2009).

Overall, these management layers permit a structured approach to the inter-organizational management of financial flows. They underline the interrelations between supply chain flows. Changes and events related to the flow of materials and information influence financial flows. Consequently, FSCM research is not limited to financial flows and instead takes an integrated perspective on supply chain flows. Furthermore, the above management layers for financial flows in supply chains reveal a number of interrelations. For instance, a supply chain's external financing of inventories constitutes not only a source of funds but also a reduced inventory value on a company's balance sheet (Hofmann, 2009).

Nevertheless, all three management layers have a different emphasis: The first addresses the efficient transfer of funds and financial information. The second is concerned with reducing the demand for funds, while the last considers the availability of funds and means of reducing financing costs. As previously mentioned, the management layer concerned with funding sources especially requires additional attention, which explains why this thesis concentrates on that layer (Pfohl and Gomm, 2009). To ensure valid results, the present research project focuses on the financing of current assets and *not*

the financing of fixed assets, due to sizable differences in their risk structures, maturity levels, and funding levels.[21]

2.2 Understanding financial supply chain management practices for the supply side

Financial supply chain management practices apply the abstract idea of inter-organizational financing to observable constructs. Still, scholars have not established a common terminology and have instead employed various terms without explicitly defining them. Therefore, this section explores previous research to develop an understanding of FSCM practices. Section 2.2.1 defines and classifies FSCM practices, explaining why this thesis addresses the supply side. Subsequently, Section 2.2.2 offers first insights regarding the application of FSCM practices for the supply side, while Section 2.2.3 describes the perspectives of relevant actors.

2.2.1 Definition and classification

When it comes to the actual application of FSCM, scholars have used various terms to describe the level of analysis (e.g., instruments, practices, and solutions), often without explicitly defining these terms (Camerinelli, 2009; Caniato et al., 2016; Casterman, 2012; Wuttke et al., 2016). For instance, several studies have utilized the term "solution" to describe financial techniques for managing financial flows (Gelsomino et al., 2016; Hofmann and Belin, 2011). Most previous studies have focused on a single technique, namely, approved payables financing (Tanrisever et al., 2012; Wandfluh et al., 2016). For instance, Iacono et al. (2015) studied the market adoption of approved payables financing. Other authors have analyzed success factors for implementing that technique, as well as possible outcomes (e.g., Lekkakos and Serrano, 2016; Liebl et al., 2016; van der Vliet et al., 2015). Results for individual techniques are highly specific, which has impeded researchers from drawing comprehensive conclusions regarding the application of FSCM and revealed a need for a more general level of analysis.

In the context of supply chains, the OM literature has employed the term "practice" to the actual application of a concept (Dean and Bowen, 1994; Rönnbäck and Witell, 2008; Sousa and Voss, 2002). Specifically, a *practice is an observable construct* that falls between general principles and specific techniques (Tan and Wisner, 2003). In addition, SCM studies have examined practices as a central unit of analysis in supply chains

[21] See footnote 6.

(Acosta et al., 2014; Barros et al., 2013; Lopes de Sousa Jabbour et al., 2011; Sukati et al., 2012). For instance, Li et al. (2006, p. 109) defined SCM practices as "a set of activities undertaken in an organization to promote effective management of its supply chain." Still, many scholars have equated practices with instruments, tools, or techniques, causing confusion regarding how to properly utilize different terms. This thesis draws on both the OM and SCM literature to develop an initial understanding of FSCM practices as compared to FSCM principles and FSCM techniques:

- *FSCM principles* describe fundamental management systems (e.g., inter-organizational financing or the alignment of financial strategies; Wandfluh et al., 2016).
- *FSCM practices* refer to an organization's activities for the purpose of enhancing the inter-organizational management of financial flows in supply chains (e.g., post-shipment versus pre-shipment financing; Wuttke et al., 2013a).
- *FSCM techniques* are applied so that organizations can perform certain activities (e.g., approved payables or inventory financing; Caniato et al., 2016).

As aforementioned, the existing FSCM literature has focused on specific FSCM techniques, highlighting the need for a more general unit of analysis, and FSCM practices fit that description (Sousa and Voss, 2002). In particular, this thesis considers organizations' activities aimed at providing financing alternatives to other supply chain members for current assets, in accordance with the goals outlined in Section 2.1.3.

Related fields of research, as well as initial FSCM studies, offer first insight into FSCM practices. As Section 2.1.2 introduced, the *trade finance* literature has analyzed suppliers' provision of trade credit to buyers (Emery, 1984; Garcia-Appendini and Montoriol-Garriga, 2013; García-Teruel et al., 2014; Soni et al., 2010; Yan et al., 2016). Numerous studies have examined trade credit as one approach to inter-organizational financing (Klapper et al., 2012; Seifert et al., 2013). In addition, SCM researchers have explored *vendor managed inventory* practices, in which suppliers finance buyers' inventories by listing those inventories on their balance sheets (Borade and Bansod, 2010; Claassen et al., 2008). Still, all of these practices refer to financing alternatives for the demand side. As a consequence, this thesis focuses on FSCM practices for the supply side.

Furthermore, a few FSCM studies have drawn initial conclusions on FSCM practices for the supply side. Thus, they are useful for differentiating among various types of practices:

- Caniato et al. (2016) distinguished between *traditional and innovative financing practices,* and also characterized supply chain collaborative practices as a separate category. According to them, in contrast to traditional financing, innovative financing employs highly digitalized trade processes. Supply chain collaborative practices address supply chain members' joint efforts to manage working capital, especially inventories.
- Wuttke et al. (2013a) analyzed *post-shipment and pre-shipment practices,* which differ in terms of when the financing takes place. Pre-shipment[22] practices "have in common that they take place before the actual delivery, quality control, and invoice release" (Wuttke et al., 2013a, p. 778). In contrast, post-shipment financing practices rely on released invoices, thus reducing the level of risk for funders (Bryant and Camerinelli, 2014).
- Templar et al. (2016) provided an additional means of classifying FSCM practices for the supply side. As explained in Section 2.1.3, they *separated supply chain-internal funding sources from supply chain-external funding sources*. For the supply side, supply chain-internal financing practices encompass all practices in which buyers themselves deploy the necessary funds. In contrast, with supply chain-external financing practices, additional funders serve as intermediaries between buyers and suppliers.

Camiato et al.'s (2016) classification distinguished between newer FSCM practices and longstanding traditional approaches. Yet, their criteria were somewhat vague and overlapping, making it difficult to categorize FSCM practices for the supply side. In contrast, the *"time of financing"* and the *"source of funds"* are both explicit criteria for differentiating among types of FSCM practices for the supply side (Templar et al., 2016; Wuttke et al., 2013a). In addition, they are rather robust in terms of their ability to categorize new developments. For instance, the criterion "source of funds" also captures the newer funding constructs that financial start-ups have introduced. Overall, this thesis distinguishes among four types of FSCM practices for the supply side using the criteria "time of financing" and "source of funds." Figure 5 summarizes this classification scheme[23] and assigns FSCM techniques for the supply side to the appropriate categories. For example, supply chain members can apply dynamic discounting techniques to

[22] Some scholars additionally distinguish between pre-shipment and at-shipment financing (Bryant and Camerinelli, 2014; Templar et al., 2016). At-shipment financing is provided during shipment, and pre-shipment financing is provided prior to shipment to the buyer. This thesis treats them as one type of financing (pre-shipment) due to their similar risk structures. Neither pre-shipment nor at-shipment financing is based on confirmed deliveries and approved invoices.

[23] Appendix A.7 provides detailed descriptions of FSCM techniques and relates them to FSCM practices for the supply side.

implement post-shipment/supply chain-internal financing practices for the supply side. The subsequent two sections elaborate on these findings in terms of their applications and relevant actors.

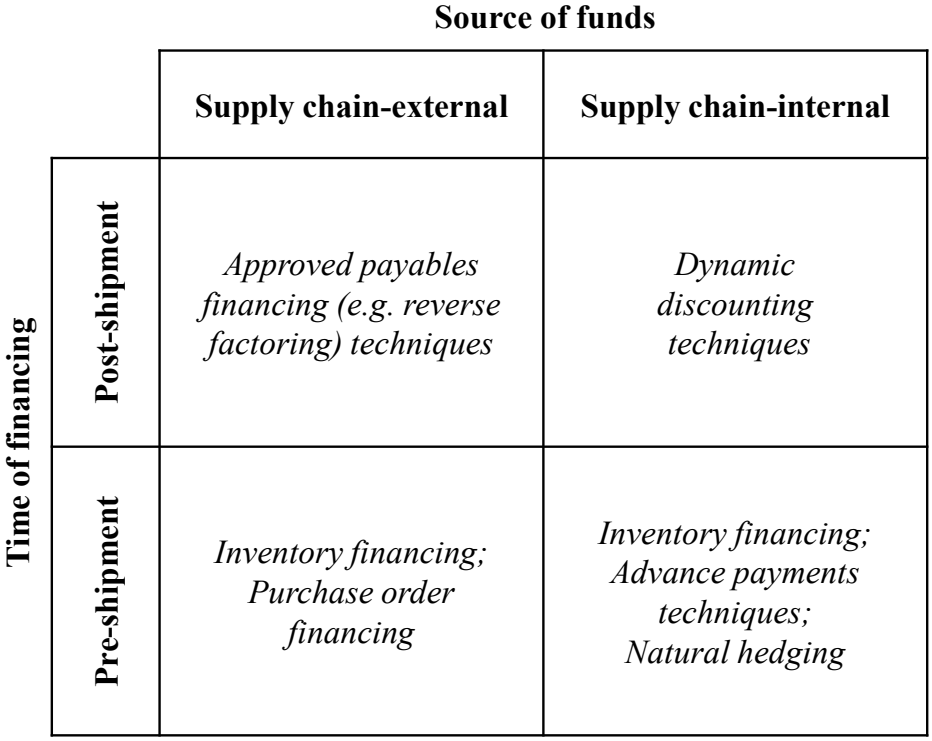

Figure 5: Classification of FSCM practices for the supply side and assignment of FSCM techniques

2.2.2 Application of practices

Management research has generated a rich body of literature on *the process of adopting and diffusing innovations and new practices* within organizations (e.g., Abrahamson, 1991; Birkinshaw et al., 2008; Mol and Birkinshaw, 2009; Rogers, 1976). Rogers (2003) developed a framework detailing the adoption of innovations, including sequential process steps separated into an initiation and implementation phase. Related studies have either directly addressed the framework's process steps (process view) or explained why and how organizations adopt innovations (content view; e.g., Kimberly and Evanisko, 1981; Leseure et al., 2004; Pil and Macduffie, 1996). Figure 6 illustrates Rogers' framework, including both the process view and the content view, within the context of FSCM practices for the supply side. The *content view of the initiation phase is of particular interest* within this thesis, since it focuses on contextual conditions for different FSCM practices for the supply side (see Section 1.2). Thus, this thesis refers to the "application" of practices rather than to the "adoption" of practices, which matches its focal point and prevents confusion with Roger's adoption process framework. Specifically, the term "application" raises the general question of why

buyers introduce financing alternatives for the supply side and which related FSCM practices are the best fit.

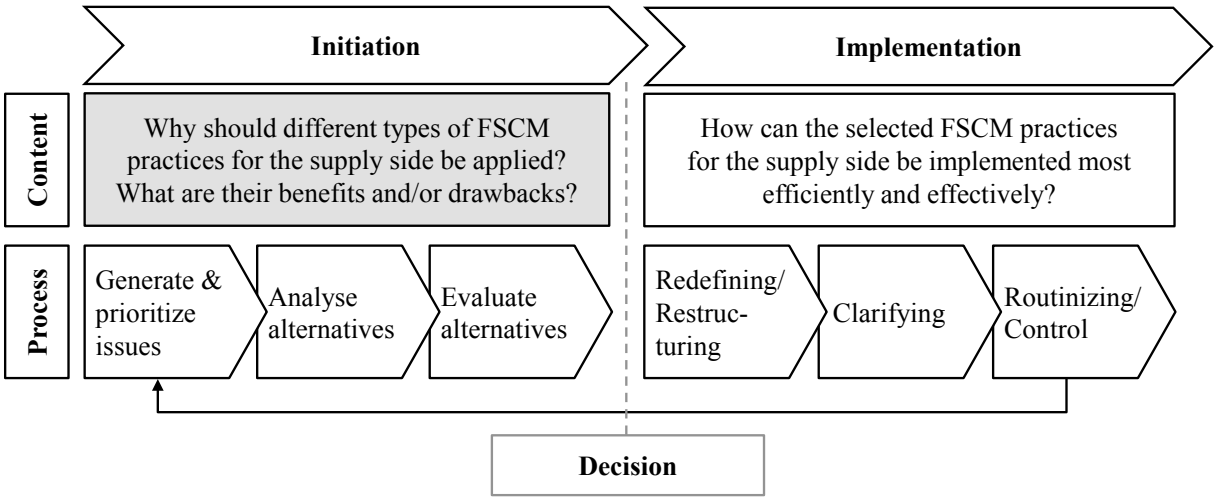

Figure 6: Process view and content view on the initiation and implementation of FSCM practices for the supply side[24]

Overall, previous research on introducing innovations at the firm level has treated individual organizations' commitment as necessary for new practices to be applied. Yet, FSCM practices for the supply side have a supply chain orientation and, thus, presuppose the commitment of the involved supply chain members (Wuttke et al., 2013b). As a consequence, factors that explain the application of such practices range beyond individual organizations. *The SCM literature and related fields* of research (e.g., supply management literature) have identified those factors that are relevant in terms of the application of new practices within supply chains (Barros et al., 2013; Choi and Hartley, 1996; Lopes de Sousa Jabbour et al., 2011). For instance, Li et al. (2006) analyzed a firm's position within the supply chain to explain the introduction of SCM practices. Several scholars have assessed typologies of buyer-supplier relationships to draw conclusions regarding applied management practices (e.g., Autry and Golicic, 2010; Cox, 2001, 2004; Tangpong et al., 2015; Walter et al., 2001). Results have pointed towards the relevance of *relational factors*—such as interdependence, trust, and specific investments—for the integrated management of supply chain flows (Ambrose et al., 2010; Cannon and Perreault, 1999; Hofer et al., 2014; Kwon and Suh, 2004; Rossiter Hofer et al., 2014; Sriram et al., 1992). Nevertheless, SCM research has connected the application of practices to benefits in terms of costs, quality, service level, and flexibility, neglecting the availability of funds and decreased financing costs (Pfohl and Gomm, 2009).

[24] Adapted from Rogers (2003, p. 170). This thesis' focus area is highlighted in grey.

The latter two objectives are more the domain of the *finance literature*. Previous research has elaborated on factors with an effect on a company's selection of financing sources (see Section 2.1.2). Key findings have highlighted the impact of a firm's financial strength on the cost and availability of various sources of funding (Agliardi et al., 2016; Brealey et al., 2011; Casey and O'Toole, 2014; Myers, 1977). Furthermore, scholars have examined the financial decisions of firms of differing sizes, legal structures, and industry types (Berger and Udell, 2006; Jensen and Meckling, 1976; Klapper, 2006). Again, however, the finance literature has focused on individual companies.

When it comes to the provision of financing alternatives for the supply side, the question arises as to whether supply chain factors or finance factors are more important. Still, *FSCM* studies have indicated that *supply chain and finance aspects need to be considered in unison*. For instance, Wuttke et al. (2013a) focused on supply chain members' working capital positions, as well as on pooled buyer dependence. Van der Vliet et al. (2015) assessed how payments terms and suppliers' financing costs affected the introduction of approved payables techniques. Relevant insights are limited, however, since most studies have been more concerned with the contextual conditions of specific FSCM techniques, frequently relying on analytical models (Iacono et al., 2015; Liebl et al., 2016; Tanrisever et al., 2012; Wuttke et al., 2016). Due to this emphasis of individual techniques, previous findings only have restricted utility in explaining differences between FSCM practices for the supply side (Gelsomino et al., 2016). For instance, none of the above-mentioned studies addressed the choice of supply chain-internal versus supply chain-external financing practices for the supply side.

A comprehensive framework based on empirical data is needed to understand the application of FSCM practices for the supply side. Doing so is complex, however, since the context in which such practices are employed is not limited to one organization. Therefore, the following section identifies the relevant actors and considers their perspectives.

2.2.3 Perspectives of actors involved

As this section demonstrates, FSCM practices for the supply side involve various internal and external actors (Hofmann, 2009; Hofmann and Johnson, 2016; Silvestro and Lustrato, 2014; Templar et al. 2016). Figure 7 presents an overview of the key actors. *Supply chain-external* actors facilitate or impede the application of FSCM practices for the supply side. Still, they are not directly involved in the financing

structure. For instance, government sponsorship programs promote adoption in regional markets (Bryant and Camerinelli, 2014). In contrast, *supply chain-internal* actors can all play an active role in FSCM practices for the supply side. Nevertheless, current FSCM practices and previous FSCM studies have both focused on inter-organizational financing within the buyer-supplier dyad (Bryant and Camerinelli, 2014; Hofmann and Belin, 2011; Meijer and Bruijn, 2013). Therefore, this thesis focuses on FSCM practices for the supply side within the buyer-supplier dyad (i.e., buyers offering financing alternatives to their suppliers). It thus creates a solid foundation from which to extend FSCM research towards sub-suppliers. In addition to the buyer-supplier dyad, an FSP is usually involved as an intermediary, facilitating financing between buyers and suppliers (Seifert and Seifert, 2011). FSPs are classified in between supply chain-external and supply chain-internal actors, since they are not directly involved in the physical supply chain but play a key role in enabling FSCM practices for the supply side. Subsequently, the perspectives of all three actors are examined, since they actively influence the application of FSCM practices for the supply side.

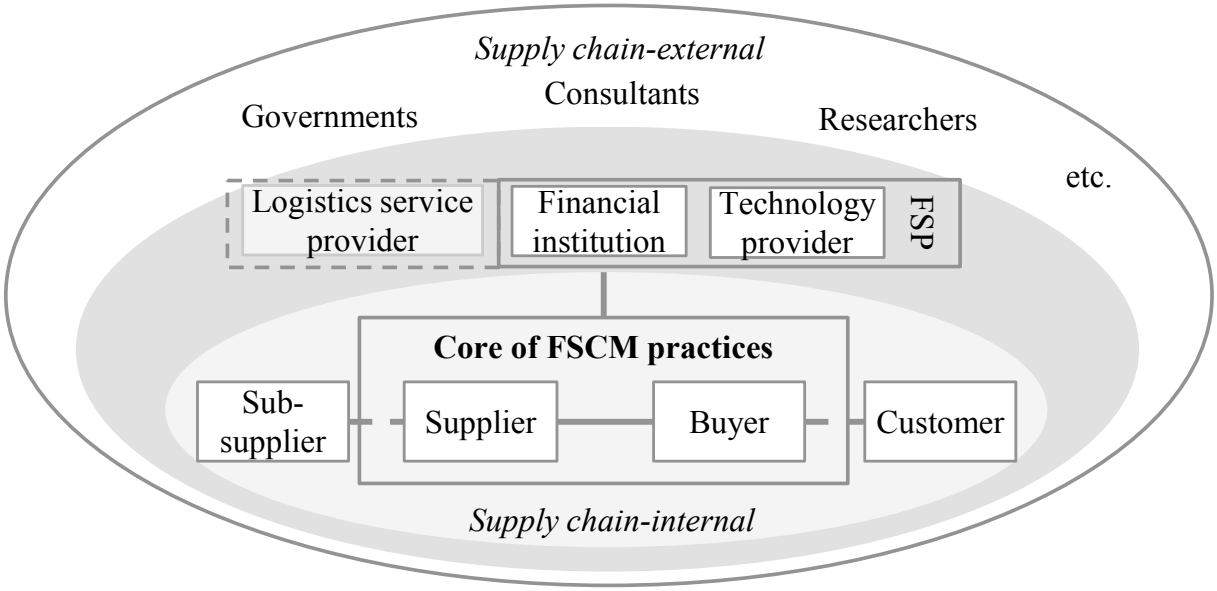

Figure 7: Supply chain-internal and supply chain-external actors involved in FSCM practices for the supply side[25]

Buyer perspective – Within FSCM practices for the supply side, buyers offer financing alternatives to their suppliers. Yet, they themselves do not necessarily represent the source of funds. Buyers only use their own liquidity for supply chain-internal financing, involving additional funders for supply chain-external financing (Templar et al., 2016). In the latter case, buyers use their credit rating and acceptance guarantee to provide financing for suppliers (Camerinelli, 2009). Scholars have cited multiple potential

[25] Adapted from Templar et al. (2016, p. 149).

benefits, both tangible (e.g., working capital or cost reductions) and intangible (e.g., risk mitigation and relational strength), as reasons that buyers offer financing alternatives to suppliers (Beck, 2011; Bryant and Camerinelli, 2014; Liebl et al., 2016). The type of FSCM practice for the supply side has an effect on the potential benefits. For instance, supply chain-internal financing has a negative impact on a buyer's working capital position, but can entail discounts on purchase prices. However, buyers need an infrastructure and resources to offer FSCM practices for the supply side (Tanrisever et al., 2012; van der Vliet et al., 2015). Hence, advantages must be weighed against costs when analyzing buyers' commitment to offering financing alternatives to the supply side.

Supplier perspective – Buyers offer suppliers a financing alternative. Their commitment determines whether buyers can reap the benefits of FSCM practices for the supply side. For instance, the effects on a buyer's financial performance (in terms of working capital or/and cost reductions) reduce when strategic suppliers responsible for a large share of the procurement volume do not commit. The FSCM literature has identified potential tangible and intangible benefits for suppliers (Camerinelli, 2007; Lekkakos and Serrano, 2016). There are financial advantages, since suppliers receive access to funds on the basis of the buyer's credit rating, thus releasing working capital (Hofmann and Belin, 2011; van der Vliet et al., 2015). Furthermore, early payments decrease suppliers' risk of delayed cash inflows or a default (Wuttke et al., 2013a). These potential benefits for suppliers are independent of supply chain-external or supply chain-internal financing practices. Pre-shipment financing further accelerates incoming cash flows and diminishes the risk of payment delays or defaults. Still, suppliers experience negative effects on their margins, since they usually have to pay a discount in return for the funds (Iacono et al., 2015).[26] Set-up costs (e.g., IT interfaces and training) additionally counter the potential advantages. Thus, both positive and negative outcomes need to be considered when studying suppliers' commitment.

In summary, the application of FSCM practices for the supply side presupposes the commitment of buyers and suppliers. For a long time, scholars primarily focused on the potential advantages for buyers and suppliers, with the goal of making FSCM research more relevant (Gelsomino et al., 2016). Only recently have studies started to analyze the impact of contextual conditions on supplier and buyer outcomes (e.g., Lekkakos and Serrano, 2016; Liebl et al., 2016; Wuttke et al., 2016). As described in Section 2.2.2,

[26] In some cases, pre-shipment financing constitutes an exception. This is the case when buyers provide advanced payments to ensure delivery. Still, most buyers only allow such structures in exceptional circumstances (Wuttke 2013a).

empirical studies are scarce, mainly focusing on specific techniques and buyer-oriented data and revealing the need for additional supplier-related insights.

Financial service provider perspective – As previously mentioned, FSPs act as an intermediary, facilitating inter-organizational financing between buyers and suppliers. In that regard, they offer two main services: They allocate funds to the buyer-supplier dyad, and they provide IT services to enhance transparency and reduce the amount of effort required to apply FSCM practices for the supply side (Hofmann, 2009; Seifert and Seifert, 2011; Silvestro and Lustrato, 2014). The first service comprises a central element of supply chain-external financing practices, while the second service is essential for all types of practices. Thus, applying FSCM practices for the supply side usually also entails introducing FSPs to the buyer-supplier dyad. Initial research findings have identified three types of FSPs, and Figure 8 illustrates their relationship to the FSCM practice categories outlined in Section 2.2.1.

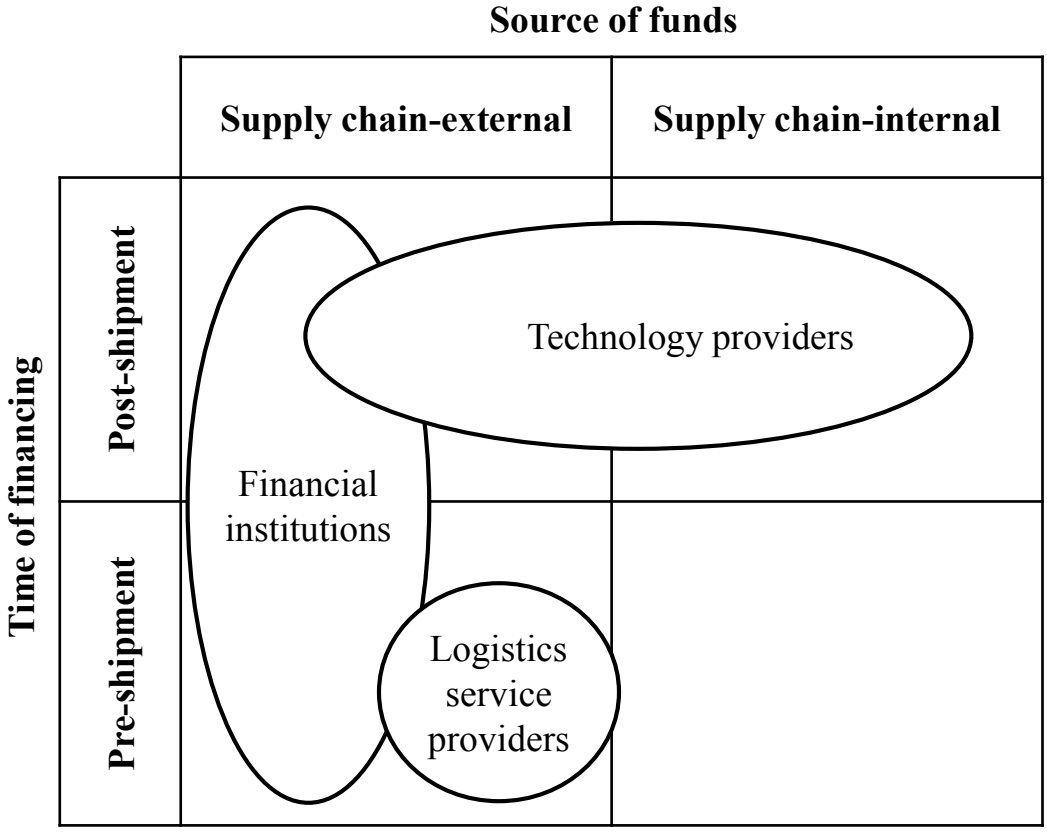

Figure 8: Current service offerings of different types of FSPs related to FSCM practices for the supply side[27]

Financial institutions (e.g., banks) constitute a central funder of FSCM practices for the supply side (Hofmann and Belin, 2011). They provide services related to supply chain-

[27] The assignment is based on FSPs' current service offerings. Future developments can result in extensions or reductions of offered services. For instance, technology providers have just recently started to explore opportunities involved in pre-shipment financing (Bryant and Camerinelli, 2014).

external, post-shipment, and supply chain-external, pre-shipment financing. In contrast, *technology providers* focus on the provision of IT infrastructure through platform structures (Fellenz et al., 2009). They allow buyers to use their own liquidity (supply chain-internal financing), or they involve external funders (supply chain-external financing).[28] Finally, *LSPs* permit pre-shipment financing through inventory financing (Hofmann, 2009; Steinmüller, 2007). Still, LSPs' role in financing alternatives for the supply side represents a potential direction more than a present reality. Today, inventory financing approaches are mostly applied as financing alternatives for individual companies (Bryant and Camerinelli, 2014). In the future, this will probably change, as discussions with FSPs and buyers have revealed.[29]

The FSCM literature has emphasized the critical role of FSPs but has provided only limited insights in that regard, due to a lack of FSP-oriented data. Seifert and Seifert (2011) revealed that FSPs' capabilities play a key role in enabling the application of FSCM practices for the supply side. Silvestro and Lustrato (2014) described the role of banks in the context of the integrated management of supply chain flows. For instance, they demonstrated how banks facilitate the sharing of financial information between buyers and suppliers. Fellenz et al. (2009) incorporated certain characteristics of today's financial markets and possible weaknesses related to the inter-organizational management of financial flows. Yet, all three examinations remained descriptive rather than explanatory and yielded only minimal evidence as to why the buyer-supplier dyad expands to include FSPs. Yet, understanding the reasons that FSPs become involved is a prerequisite for formulating service requirements for FSPs in the context of FSCM practices for the supply side.

Overall, these explanations indicate that applying FSCM practices for the supply side requires the commitment of both buyers and suppliers. In addition, FSPs play a crucial role in enabling the application of such practices, since their services strengthen the commitment of suppliers and buyers. Thus, *FSCM research has linked specific actors with practices.* Consequently, a deep understanding of the determinants of all three of these actors is essential for determining the contextual preconditions for the application of FSCM practices for the supply side. In particular, data on supplier and FSPs is scarce, despite their relevance. Therefore, this thesis aims to better understand the application of different practices in relation to the buyer-supplier-FSP triad.

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[28] Funding models vary across technology providers: Some offer access to a pool of banks, while others have expanded the pool of possible funders to include investment funds and governments. See Templar et al. (2016) for a detailed description.

[29] These discussions were mainly conducted in the context of study A (see Appendix A).

3 Theoretical positioning of the research on financial supply chain management practices for the supply side

The subsequent chapter introduces the theoretical lenses employed within the present thesis. To that end, Section 3.1 describes the selection criteria and the associated theories. Section 3.2 examines the selected theories, and their contributions, ultimately constructing a theoretical framework for this thesis.

3.1 Theory selection and applicability

As previously noted, FSCM practices for the supply side are linked to various academic disciplines, making any analysis of such practices a complex undertaking. Accordingly, this thesis employs multiple theoretical lenses, so as to provide more valuable results. Section 3.1.1 explains the criteria applied to evaluate theories in terms of their applicability. On the basis of those criteria, Section 3.1.2 analyzes different theories and selects the most appropriate ones.

3.1.1 Applicability criteria

The FSCM literature still constitutes an emerging stream of research, with both theory and empirical research still in early stages (Hofmann and Johnson, 2016). As a consequence, FSCM research benefits from adopting theoretical lenses applied in related disciplines. At the same time, this thesis has a highly explorative character, with its focus on understanding the context of various FSCM practices for the supply side. Chapter 1 and Section 2.2.3 discussed why the buyer-supplier-FSP triad is the relevant context of FSCM practices for the supply side. Thus, this thesis requires a theoretical foundation capable of *structuring* possible contextual factors in the buyer-supplier-FSP triad. Furthermore, this foundation needs to be able to *explain* the application of FSCM practices for the supply side in general, as well as the selection of specific practices. Consequently, the present research explicitly adopts a broad perspective, meaning that its theoretical framework needs to integrate multiple lenses. Theories employed in this thesis thus have to meet the following requirements:

- An appropriate theory provides a framework capable of analyzing and explaining why FSCM practices are applied for the supply side.
- An appropriate theory explains differences between FSCM practices for the supply side.

- An appropriate theory helps to identify relevant contextual factors within the buyer-supplier-FSP triad.

Due to the newness of FSCM research, few scholars have explicitly incorporated theories into their studies. Transaction cost economics and principle-agent theory are rare exceptions (Pfohl and Gomm, 2009; Wandfluh et al., 2016; Wuttke et al., 2013a). Additionally, Wuttke et al. (2013b) applied the innovation diffusion theory within an FSCM context. Moreover, the interconnections between FSCM research and the finance and SCM literature mean that a substantial number of potential theories might be relevant. Thus, additional criteria are required to structure the selection of appropriate theories for this thesis. Stölzle (1999) referred to four criteria based on the existing literature:

- *Theoretical attractiveness* captures a theory's explanatory power and the existence of a research paradigm (e.g., generalizable and precise models). For the present research, an attractive theory provides clear explanatory patterns, broad problem-solving potential, and generalizable results.
- A theory's *design orientation* refers to whether it has efficiency criteria determining objectives, design variables, and determinants. At the same time, it presupposes formal aspects, such as empirical relevance. For this thesis, an appropriate theory permits the derivation of explicit implications.
- *Integrative power* is of the utmost importance for this research project, since it emphasizes a theory's systematization potential and is indicative of a theory's ability to combine different explanatory patterns. In particular, the explorative character of this study results in a need for systematization.
- *Adaptability to the present research context* indicates whether a theory's explanatory patterns are appropriate for investigating FSCM practices for the supply side and drawing conclusions on their basis. Thus, an appropriate theory needs to meet both of those requirements.

The criteria derived from the introduction (Chapter 1) and the conceptual background (Chapter 2) in combination with Stölzle's (1999) four criteria guide the selection of appropriate theories, as the next section describes.

3.1.2 The selection of theories

As aforementioned, the FSCM literature has only incorporated the following theories: transaction cost economics, principle-agent theory, and innovation diffusion theory. At the same time, it has suggested the integration of related disciplines and theories. Supply management, a discipline related to SCM, is of particular interest in this regard, due to this thesis' focus on the supply side. Spina et al. (2013) conducted an extensive literature review of supply management papers and identified 17 main theories that researchers applied frequently. To limit the number of theories considered in detail, those theories addressed in only one or two papers (including innovation diffusion theory) were briefly analyzed.[30] Since none of them provided substantial added value in the present research context, that left 10 theories in need of further analysis. In alphabetical order, these were: Principle-agent theory, contingency theory, game theory, institutional theory, the knowledge-based view, network theory, the resource-based view, resource dependency theory, social exchange theory, and transaction cost economics. An further exploration of theoretical lenses employed within an inter-organizational context did not identify further candidates, as the theories uncovered during that search only had limited explanatory power for the research at hand (Halldorsson et al., 2007; Ketchen and Hult, 2007; Stölzle, 1999; Wolf, 2011). Overall, 10 theories are subsequently discussed in more detail:

- *Principle-agent theory* emphasizes the contractual relations between principles and their agents (Eisenhardt, 1989a; Shapiro, 2005). According to the theory, principles transfer certain tasks to their agents in exchange for remuneration. The bounded rationality and self-interested behavior of the involved actors results in goal conflicts and information asymmetries (Jensen and Meckling, 1976). Therefore, the principle seeks to introduce mechanisms (e.g., control and incentives) to optimize agency costs. In particular, goal conflicts and information asymmetries highlight patterns that can help explain inter-organizational financing (Wandfluh et al., 2016). Yet, the generalizability of this theory is reduced due to its focus on avoiding undesirable behavior on the part of agents at the expense of overlooking principles as a cause of opportunistic behavior (Stölzle, 1999). These restrictions reduce the principle-agent theory's

[30] The additional analysis reviewed these theories in terms of Stölzle's criteria (1999). None of them were deemed sufficiently relevant for this research project. For instance, innovation diffusion theory primarily focuses on adoption processes and provides only limited insights on contextual factors within the buyer-supplier-FSP triad (Rogers, 2003). Other "theories" can be better classified as evaluation models for investment decision-making (e.g., real options approaches; Spina et al. 2013).

applicability for this research project, since the number of contextual situations in which it might be relevant is limited.

- *Contingency theory* questions the universal applicability of organizational structures and points to the importance of achieving a fit between contingencies and response variables (Donaldson, 2001; Sousa and Voss, 2008). Scholars have analyzed the firm environment, firm size, and firm strategy as possible contingencies of an organization's structures. Initial studies also applied contingency theory within a supply chain context (Kajüter and Kulmala, 2005). They expanded considered contingencies and also incorporated relationship-related factors. Contingency theory has frequently been criticized for its limited explanatory value and deterministic perspective (Wolf, 2011). At the same time, when combined with other theories, it does allow researchers to draw inferences within a clearly defined context (Kieser, 2014). Well aware of its limitations, the contingency theory is a suitable fit for this thesis.
- *Game theory* considers decision situations involving at least two decision-makers and it analyzes their rational choices concerning alternative actions (Ketchen and Hult, 2007). It is based on mathematical models analyzing outcomes for decision-makers. Thus, game theory has strong explanatory power but restricted applicability for empirical studies (Stölzle, 1999). In particular, the explorative character of the present research means that game theory is not applicable in this context.
- *Institutional theory* emphasizes institutional pressures as a means of explaining organizational structures and activities (DiMaggio and Powell, 1983). It thereby studies the relevance of coercive (e.g., legal authorities), mimetic (e.g., competitors), and normative (e.g., societal) pressures (Williams et al., 2009). It would explain the application of FSCM practices for the supply side as a response to the institutional environment. Institutional theory neglects most relationship-related and internal factors and is thus only capable of generating limited insights in this context.
- *Network theory* focuses on describing and analyzing social relationships in networks (Halldorsson et al., 2007). Therefore, it differentiates among social relationships on the basis of content, form, and intensity (Wolf, 2011). Due to its descriptive focus, scholars have tended to use the term "approach" rather than "theory", reducing its theoretical attractiveness and design orientation. In terms of the present research project, it provides insights to describe the buyer-supplier-

FSP triad. Despite that, it only has a limited explanatory ability to generate conclusions regarding FSCM practices for the supply side.

- *The resource-based view* emphasizes the relevance of an organization's resources (e.g., assets, capabilities, and knowledge) for achieving a competitive advantage (Barney, 1991). *The knowledge-based view* expands on the resource-based view, stressing that knowledge is needed if one is to benefit from resources (Grant, 1996). Financial resources, however, only play a supportive role and have a limited ability to directly translate into a competitive advantage (Porter, 2004). Additionally, Bromiley and Rau (2016) have pointed out that such a competitive advantage is gained at the firm level, making it difficult to transfer the theory to inter-organizational financing practices. Therefore, all three theories only have limited power to yield insights within the given research context, although there is one exception: The resource-based view could provide explanations regarding FSPs' involvement in FSCM practices for the supply side. Thus, it is also capable of suggesting potential service requirements.
- *Resource dependency theory* reveals how firms rely on other supply chain members' resources (Ketchen and Hult, 2007; Pfeffer and Salancik, 1978). When managing their relationships, firms simultaneously seek to ensure their access to necessary external resources and strengthen their autonomy (Stölzle, 1999). Yet, the wide range of potential resources reduces the design orientation of the resource dependency theory. For the present research project, it cites resource dependency as one contextual factor explaining the application of FSCM practices for the supply side. While such dependence is indeed relevant to the FSCM literature, the theory overlooks other key factors (Wuttke et al., 2013a).
- *Social exchange theory* was developed at the intersection of social psychology and sociology (Emerson, 1976; Molm, 1991). It uses relational factors (and especially dependence, power, and trust) to explain individual actors' commitment levels. According to this theory, economic and social rewards (e.g., appreciation of other actors and shared values) drive an actor's commitment. Scholars have utilized social exchange theory to differentiate among types of relationships and formulate measures for managing them (Ambrose et al., 2010; Tangpong et al., 2015). In terms of its connection to this research, social exchange theory permits valuable insights regarding relational factors with an effect on the application of FSCM practices. Yet, due to its roots in social disciplines, it has primarily generated conclusions on the individual level, rather

than on the organization level, and it has thus underestimated formal mechanisms (Wynstra et al., 2015).

- *Transaction cost economics* is based on Coase (1937) and Williamson's (2008, 1979) idea of treating transactions between exchange partners as the main unit of analysis. Similar to principle-agent theory, it assumes that the exchange partners are characterized by bounded rationality and opportunism (Wolf, 2011). Transaction cost economics aims to lower the costs of transactions both ex-ante and ex-post the conclusion of a contract. It therefore seeks to identify the determinants (e.g., transaction frequency) of such transaction costs, and it also analyzes the relations between government structures, determinants, and transaction costs (Halldorsson et al., 2007). Within the SCM literature, transaction cost economics is often applied to explain "make or buy" decisions, as well as to formulate management practices for different types of relationships (Hofer et al., 2014; Holcomb and Hitt, 2007). In terms of FSCM practices for the supply side, transaction cost economics provides valuable insights for structuring and explaining the contextual factors that play a role in transactions between exchange partners. Yet, its focus on costs means that it overlooks other elements of FSCM (Wolf, 2011).

Table 3 (below) summarizes the strengths and weaknesses of the above theories in terms of their applicability to the present research project.

Theory	**Strengths**	**Weaknesses**	**Applicability**
Principle-agent theory	⇒ Provides initial contextual factors related to information asymmetries and goal conflicts	⇒ Restricts view to static principle-agent relations ⇒ Focus on agents' undesirable behavior	
Contingency theory	⇒ Introduces the idea of fit between contingencies and structures ⇒ Enables structuring of contingencies of FSCM practices for the supply side	⇒ Reduces generalizability of results due to theory's situational emphasis ⇒ Requires additional theories to enhance explanatory power	
Game theory	⇒ Permits analysis of application decision and yields related conclusions	⇒ Applies analytical models that are not appropriate for an explorative approach	

Theory	Strengths	Weaknesses	Applicability
Institutional theory	⇒ Points towards institutional pressures as possible contextual factors	⇒ Ignores factors other than conforming behavior to explain commitment ⇒ Focuses on specific types of contextual factors	
Network theory	⇒ Describes individual actors and their interrelations within the buyer-supplier-FSP triad	⇒ Has no explanatory power regarding the reasons that FSCM practices for the supply side are applied	
Resource-based view	⇒ Explains the involvement of FSPs on the basis of access to resources ⇒ Has implications for service requirements	⇒ Does not necessarily addresses financial resources, due to their supportive function ⇒ Only views competitive advantage at the firm level	
Resource dependency theory	⇒ Introduces dependence as a contextual factor related to FSCM practices for the supply side	⇒ Only emphasizes a single contextual factor ⇒ Has a restricted design orientation, due to the variety of resources under consideration	
Social exchange theory	⇒ Points towards dependence, power, and trust as contextual factors ⇒ Considers economic and social rewards	⇒ Neglects formal governmental mechanisms	
Transaction cost economics	⇒ Points out transaction-related determinants (e.g., uncertainty, frequency) ⇒ Has determinant-related implications for applying FSCM practices for the supply side	⇒ Focus on cost reductions excludes alternative aspects (e.g., relational factors)	
Legend:  = Low applicability →  = High applicability			

Table 3: Overview of potential theoretical lenses

The analysis suggests that none of the theories is applicable to all aspects of this research project. This is unsurprising, however, due to its explorative and wide-ranging nature. Yet, three of these theories—contingency theory, transaction cost economics, and social exchange theory—provide a diverse range of insights, and together they have a high degree of explanatory power. In terms of the criteria introduced by Stölzle (1999),

contingency theory incorporates rather low theoretical attractiveness due to its lack of a general research paradigm and its limited explanatory power. Yet, its emphasis on ensuring a close fit between contingencies and structures creates an overall framework capable of explaining the application of different FSCM practices for the supply side. Complementing that theory, transaction cost economics and social exchange theory reveal a number of key patterns that help explain the buyer-supplier relationship. Transaction cost economics centers on economic determinants (e.g., uncertainty), while social exchange theory stresses social elements (e.g., trust).

3.2 Applied theories and their contributions

While Section 3.1 described how theories were selected, this section discusses those theories key constituents, research goals, and contributions to this thesis.

3.2.1 Contingency approach

The contingency theory[31] constitutes a frequently applied theoretical lens for analyzing organizations (Donaldson, 2001; Kieser, 2014; Wolf, 2011). Scholars have employed various terminologies (e.g., the situational approach, contingency theory, and the contingency approach) to refer to it. Furthermore, Donaldson (2001) pointed out the existence of different contingency theories that differ in terms of the specific organizational characteristics on which they focus (e.g., organizational structure, leadership, or human resource management). This variety makes it difficult to identify a general research paradigm. As the present thesis emphasizes the theory's structural elements rather than its generalizable explanatory patterns, the thesis refers to it as the "contingency approach" from this point onwards.

In general, the contingency approach explains differences in organizational activities as products of *distinct contextual situations* (Ulrich and Fluri, 1995; Wolf, 2011). Accordingly, a specific activity is not equally efficient in different contexts. Consequently, the contingency approach allows researchers to analyze managerial problems and draw conclusions regarding activities within a specific context (Kieser, 2014). As regards FSCM, the contingency theory suggests that FSCM practices for the supply side are not universally applicable. In addition, the particular context can determine which practices are selected.

[31] Section 3.2.1 relates to the theoretical framework of study A described in Section A.2.3.

Scholars utilize *contingency variables* to further specify the relevant context (Donaldson, 2001). Most studies have thus distinguished between internal and external contextual variables, with the environment, company size, and strategy of particular importance (Chandler, 1969). Recently, studies have explored potential contingency variables in the context of supply chains. For instance, Kajüter and Kulmala (2005) examined relationship-specific contingency variables, as well as exogenous and endogenous factors.

In addition to contingency variables, the *idea of fit* is a main element of the contingency approach. Thereby, a fit between contingency variables and activities (which are also known as response variables) enhances performance (Doty et al., 1993). Following the lead of previous studies, Sousa and Voss (2008) identified three types of fit: (1) *Selection* does not include an explicit performance variable and focuses on realizing a match between the contextual variables and the response variables (Drazin and Van De Ven, 1985). (2) *Interaction* identifies "pairs of organizational context-response variables which affect performance" (Sousa and Voss 2008, p. 706). (3) *System approaches* address the most complex types of fits, since they consider interrelations between various contingency variables and response variables, as well as their impact on performance. This thesis does not directly investigate performance, since the application of FSCM practices for the supply side is more concerned with "yes or no" considerations. Therefore, the thesis at hand captures the first type of fit (selection), which emphasizes a match between contingencies within the buyer-supplier-FSP triad and FSCM practices for the supply side.

The contingency approach has been the target of a considerable amount of criticism (Donaldson, 2001; Kieser, 2014; Wolf, 2011). Critiquing its explanatory power, scholars have questioned the generalizability of the theory's findings, as well as the independence of particular contingency variables. Furthermore, conceptual and methodological critiques have underscored the fact that the theory does not consider the dynamics of individual contingency variables, and they have also pointed to its low levels of comparability, reliability, and validity.[32] Table 4 summarizes the theory's major contributions, as well as its weaknesses.

Despite these possible deficits, the contingency approach seems suitable for this thesis, since it provides a general framework for understanding contingency variables related to the application of FSCM practices for the supply side. The first study (study A) relies

[32] See Donaldson (2001) or Wolf (2011) for a detailed review of the criticism that has been leveled at the contingency approach.

on the contingency approach to structure its explorative analysis of contextual factors. In response to the criticism the contingency approach has received, both transaction cost economics and social exchange theory are employed as a means of interpreting the study's findings. Studies B and C build on the findings of study A, bringing in transaction cost economics and social exchange theory to enhance the explanatory value of their results.

Contingency approach	
Contributions relevant to the **application** of FSCM practices for the supply side	⇒ FSCM practices for the supply side are applied when they match associated contingencies in the buyer-supplier-FSP triad. ⇒ Endogenous, relationship-related, and exogenous contingencies need to be differentiated from each other.
Contributions that help explain **differences** between applied FSCM practices for the supply side	⇒ Differences in contingencies explain the selection of specific FSCM practices for the supply side. ⇒ A change in contingencies may result in the adaptation of selected FSCM practices for the supply side.
Weaknesses of the configuration approach in terms of FSCM practices for the supply side	⇒ The contingency approach has been frequently criticized for its lack of an explicit research paradigm and limited explanatory power. ⇒ Conceptual and methodical weaknesses reduce the generalizability of findings.

Table 4: The contingency approach's contributions to the present research

3.2.2 Transaction cost economics

Coase (1937) first introduced the idea of transaction costs as an add-on to production costs. As the main unit of analysis, transactions are single exchanges of resources (Halldorsson et al., 2007; Ketchen and Hult, 2007).[33] Williamson (1979) advanced Coase's general idea and discussed the *central role of transaction costs* within exchange relationships. Nevertheless, the literature has not employed a consistent definition of transaction costs (Seggie, 2012; Williamson, 2008). Most definitions have differentiated between the transaction costs *prior to* the conclusion of a contract (e.g., the cost of identifying suitable business partners) and *after* the conclusion of a contract (e.g., protection and enforcement costs) (Wolf, 2011). Behavioral, transaction-related, and environmental determinants affect whether transaction costs are present, as well as their extent (Stölzle, 1999).

[33] Section 3.2.2 relates to the theoretical framework of studies B and C described in Section B.3 and C.2.

Behavioral determinants assume bounded rationality, opportunism, and risk neutrality for involved actors (Shelanski and Klein, 1995). In particular, the first two assumptions influence the relation between buyers and suppliers. *Opportunistic behavior* means that actors maximize their own outcomes first (Ebers and Gotsch, 2014). *Bounded rationality* means that actors have a limited ability to make rational decisions, due to restrictions regarding their information-processing capabilities and the amount of knowledge available (Halldorsson et al., 2007). This is relevant in an FSCM context, since buyers and suppliers' commitment to FSCM practices for the supply side might not be solely the product of a rational appraisal of financial factors. All three behavioral determinants must be considered when analyzing FSCM practices for the supply side.

Transaction-related determinants pertain to the central characteristics of transactions. In general, scholars have distinguished among three types of characteristics (Ebers and Gotsch, 2014; Stölzle, 1999; Wolf, 2011):

- *Transaction-specific assets* refer to the level of investments required to perform a specific transaction. When highly specific assets are introduced, it hinders both parties from switching business partners, resulting in lock-in effects.
- *Uncertainty* refers to the behavior of other actors or to the transaction environment. It is caused by a lack of relevant information, and it results in, for example, information asymmetries.
- *Transaction frequency* captures the rate of exchange between two actors. Frequency can make possible synergy effects or economies of scale, but it can also make transaction partners dependent on each other.

For FSCM practices for the supply side, transaction cost characteristics can point towards and explain contextual factors with an effect on application. For instance, long payment terms can create uncertainty regarding cash inflows, which can strengthen a supplier's commitment to FSCM practices for the supply side (van der Vliet et al., 2015). In addition, differences in transaction characteristics can explain the selection of specific practices. For instance, pre-shipment financing is more risky for buyers, since financing is provided before delivery. Thus, pre-shipment financing may presuppose other transaction characteristics than post-shipment financing.

Environmental determinants refer to the transaction's setting and include social and technological conditions (Seggie, 2012). Most studies have not explicitly addressed differences in environmental determinants. Overall, transaction cost economics seeks to identify cost-minimizing institutional arrangements for performing specific transactions

(Shelanski and Klein, 1995). Williamson (1991) therefore differentiated among *market, hierarchical, and hybrid forms* of institutional arrangements. Hybrid forms are of interest when studying FSCM practices for the supply side, since they can include long-term contracts and relational cooperation.

Furthermore, finance research uses transaction cost economics to explain the involvement of financial institutions at the firm level (Spremann and Gantenbein, 2014). Financial institutions serve as intermediaries between debtors and creditors by reducing transaction costs. Transferred to an FSCM context, transaction cost economics includes two explanations why FSPs are involved in supply chains (Silvestro and Lustrato, 2014). First, they solve goal conflicts between buyers and suppliers by providing funds. Second, by proving IT systems, they facilitate the introduction of FSCM practices for the supply side. Both of these factors can help identify possible service requirements, which could serve as contextual variables describing the application of FSCM practices for the supply side.

Despite its explanatory power, transaction cost economics has been criticized for focusing on cost factors (Wolf, 2011). In addition, the effect of relational aspects (e.g., trust and interdependencies) has been underestimated in most studies. This thesis therefore complements transaction cost economics with social exchange theory. Table 5 describes the former's contributions and weaknesses. Specifically, transaction cost economics is applied in this thesis to reflect on the findings of study A's explorative analysis. Furthermore, it forms a foundation for studies B and C.

Transaction costs economics (TCE)	
Contributions relevant to the **application** of FSCM practices for the supply side	⇒ FSCM practices for the supply side should be applied when they reduce transaction costs for buyers and suppliers. Hence, uncertainty, frequency, and asset specificity are possible contextual factors related to the application of practices. ⇒ TCE explains the involvement of FSPs in FSCM practices for the supply side, claiming that their presence reduces transaction costs.
Contributions that help explain **differences** between applied FSCM practices for the supply side	⇒ Differences in transaction cost characteristics influence the selection of FSCM practices for the supply side. ⇒ Goal conflicts between buyers and suppliers explain the selection of supply chain-external financing practices, since an external funder intermediates between both actors.
Weaknesses of TCE in terms of FSCM practices for the supply side	⇒ TCE has a strong focus on transaction costs, neglecting alternative aspects (e.g., relational factors). ⇒ TCE underestimates relational contextual factors and the reward gained from specific relationships.

Table 5: Transaction cost economics' contributions to the present research

3.2.3 Social exchange theory

Social exchange theory[34] was developed at the intersection of social psychology and sociology (Cook, 1987; Emerson, 1976; Kramer, 2006; Thibaut and Harold, 1959; Turner, 1987). Despite its origins in interpersonal exchanges, several scholars have demonstrated its applicability in organizational contexts, and particularly in buyer-supplier relationships (Abdullah and Musa, 2014; Ambrose et al., 2010; Griffith et al., 2006; Kirst, 2008; Molm, 1991). Social exchange theory focuses on recurring exchanges between actors, and so continuous *relationships are its central unit of analysis*. It explains the stability and adaptation of these exchange relationships via a cost-reward analysis for individual actors (Thibaut and Harold, 1959). Such analyses indicate the exchange partners' level of commitment to a specific relationship (Lambe et al., 2001). Dependence, power, and trust again constitute characteristics of relationships that affect expected costs and rewards (Molm and Cook, 1995).

Scholars have stressed the importance of the connection between power and dependence. Thereby, *dependence* is influenced by "the degree to which actor A values what B offers in the relation, and the degree to which A has access to these resources from sources other than B" (Cook et al., 2005, p. 41). Thus, B has *power* over actor A only when actor A is dependent on actor B and when actor B can influence actor A's actions and level of commitment (Emerson, 1976). In addition to power, *trust* constitutes a central element of relationships, and it refers to one's "willingness to rely on an exchange partner in whom one has confidence" (Moorman et al., 1992, p. 315). Several studies have indicated that power imbalances reduce the level of trust between exchange partners (Kollock, 2006). Therefore, trust is often associated with interdependent exchange partners. All three factors can serve as contingency variables in the context of applying FSCM practices for the supply side.

Furthermore, social exchange theory aims at explaining network structures and their stability. To that end, scholars have understood service providers as intermediaries or "brokers" between exchange partners (Molm and Cook, 1995, p. 222). In short, they enable social exchanges. Thus, social exchange theory justifies the involvement of FSPs in a similar manner as does transaction cost economics. In combination, the two theories point towards service requirements as potential contextual factors connected to the application of FSCM practices for the supply side.

[34] Section 3.2.3 relates to the theoretical framework of studies B and C described in Section B.3 and C.2.

Social exchange theory has often been criticized for its roots in interpersonal research (Turner, 1987). It has underestimated the significance of formal contracts as the basis for exchange (Wynstra et al., 2015). Furthermore, rewards are difficult to specify, as social outcomes incorporate subjective evaluations of specific relationships, which are difficult to analyze. To mitigate these weaknesses, this thesis unites social exchange theory and transaction cost economics. Table 6 provides an overview of social exchange theory's contributions and weaknesses. Together with transaction cost economics, social exchange theory helps to interpret the findings of study A and serves as the theoretical basis for studies B and C.

Social exchange theory (SET)	
Contributions relevant to the **application** of FSCM practices for the supply side	⇒ FSCM practices for the supply side should be applied when they offer superior rewards (social and economic) for suppliers and buyers. Trust, dependence, and power affect possible rewards and are thus contextual factors with an effect on application. ⇒ From a SET perspective, FSPs enable FSCM practices for the supply side. Respectively, service requirements can be derived facilitating their application.
Contributions that help explain **differences** between applied FSCM practices for the supply side	⇒ Differences in relational contextual factors determine the selection of FSCM practices for the supply side. ⇒ Similar to TCE, SET considers conflicts between social exchange partners as a justification for involving an external funder as an intermediary, thus resulting in supply chain-external financing. ⇒ Relational factors, and especially trust and interdependence, can make pre-shipment financing more beneficial relative to post-shipment financing.
Weaknesses of SET in terms of FSCM practices for the supply side	⇒ SET underlines the relevance of relational aspects and under-estimates formal mechanisms. ⇒ Rewards are difficult to specify, as they involve a subjective evaluation of social outcomes.

Table 6: Social exchange theory's contributions to the present research

3.2.4 Integration of applied theoretical lenses

The contingency approach, transaction cost economics, and social exchange theory form the theoretical framework for the present research. The contingency approach introduces the idea of fit between contingency variables and the application of FSCM practices for the supply side (Donaldson, 2001). Accordingly, the provision of financing alternatives to suppliers is not equally efficient across different contextual situations in the buyer-supplier-FSP triad. The contingency approach enables a further specification of such

situations, since it differentiates among endogenous, relationship-related, and exogenous contingencies (Kajüter and Kulmala, 2005). Due to its emphasis on fit and contingency structures, the contingency approach forms the foundations of this research project's theoretical framework. Nevertheless, it has often been criticized for the limited generalizability of its findings, since it concentrates on specific contextual situations (Kieser, 2014). Various scholars explicitly have stressed the importance of combining it with additional theories, so as to enhance its explanatory power (Stölzle, 1999; Wolf, 2011). In particular, the contingency approach has weaknesses regarding relationship-related contingencies, since its traditional focus has been on individual organizations (Donaldson, 2001).

The integration of transaction cost economics and social exchange theory addresses this gap. As described in previous sections, both theories involve explanatory patterns on relationship-related contingencies relevant to inter-organizational financing. Furthermore, both theories display interrelations, due to their focus on exchanges between actors. Molm and Cook (1995, p. 223) described social exchange theory as "complementary to […] the developments in economics, particularly institutional economics." Cook and Emerson (1984) identified a link between social exchange theory and transaction cost economics, since both are able to explain institutional arrangements (e.g., hierarchies and markets) on the basis of their theoretical patterns. Social exchange theory's emphasis on power, dependence, and trust sheds light on both social and economic rewards (Thibaut and Harold, 1959). Still, transaction cost economics helps social exchange theory to overcome its key weaknesses related to its interpersonal origins (Wynstra et al., 2015). Transaction cost economics stresses contracts as a central and formalized government mechanism for coordinating the exchange of resources (Williamson, 1979). Contract characteristics (e.g., payment terms) determine inter-organizational financing levels and, thus, need to be considered when studying FSCM practices for the supply side. Early studies in this area have integrated social exchange theory and transaction cost economics to analyze research problems in an SCM context (e.g., Ambrose et al., 2010; Lambe et al., 2001). The present thesis seeks to build on these studies by combining both of these theories to study the inter-organizational management of funding sources.

4 Empirical studies on financial supply chain management practices for the supply side

The subsequent chapter draws on research objectives, conceptual background, and theoretical positioning to outline the research project's structure and methodology (Section 4.1). Sections 4.2 to 4.4 introduce the research designs, and they also describe the key findings and contributions of all three empirical studies.

4.1 Overview of the research framework and methodology

Integrating the research objectives, conceptual knowledge, and theoretical perspectives results in a research framework that specifies the phenomena under consideration, and serves as basis for the subsequent empirical research approach. Figure 9 presents the research framework, which incorporates the theoretical lenses discussed in the previous chapter.

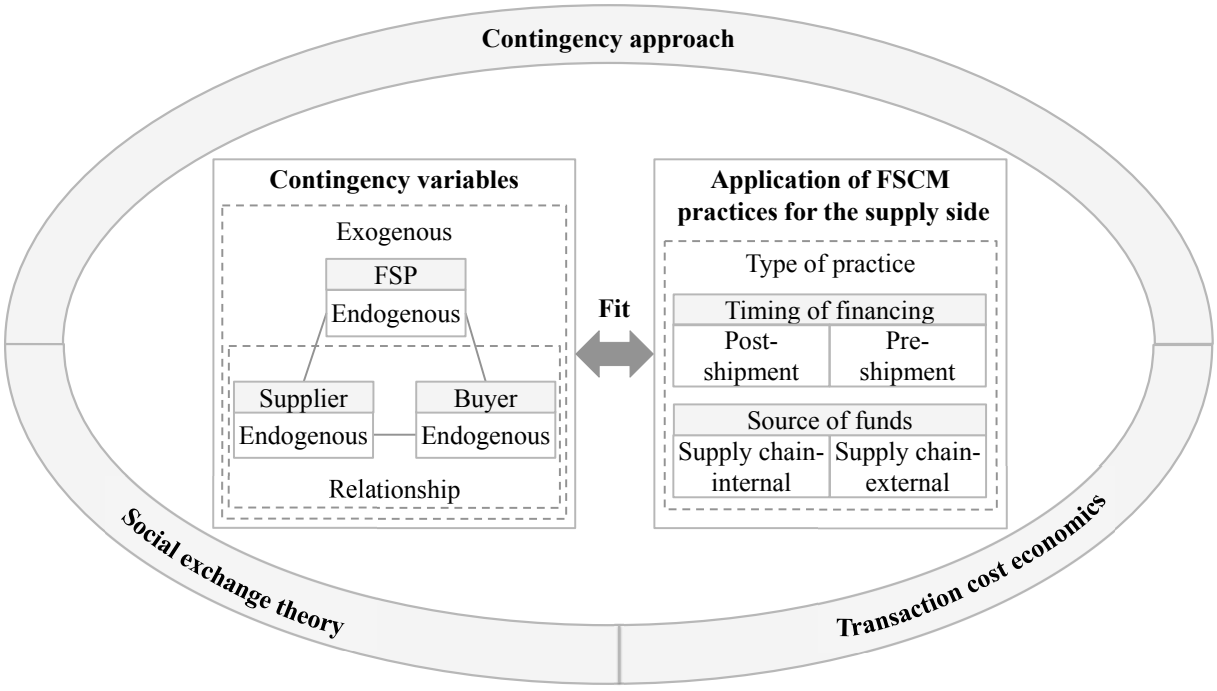


Figure 9: Research framework of the present thesis

The research framework focuses on activities that buyers undertake to provide financing alternatives for suppliers (i.e., FSCM practices for the supply side). To that end, it differentiates among four types of practices, as delineated by the dimensions "timing of financing" and "source of funds." Contingency variables link the application of FSCM

practices for the supply side to specific contextual situations within the buyer-supplier-FSP triad.[35]

This triad constitutes the relevant context for the application of FSCM practices for the supply side, since all three actors have a considerable amount of influence. *First*, the application of FSCM practices for the supply side presupposes the commitment of buyers and suppliers. *Second*, FSPs are an essential enabler of the application of such practices. The contingency approach provides the research framework's overall structure, as it emphasizes the link between contingency variables and FSCM practices for the supply side (Sousa and Voss, 2008). Accordingly, the application of different practices presupposes distinct contextual preconditions in the buyer-supplier-FSP triad. Moreover, the contingency approach classifies possible contingencies as endogenous, relationship-related, or exogenous variables (Kajüter and Kulmala, 2005). Transaction cost economics and social exchange theory have the explanatory power needed to derive generalizable conclusions.

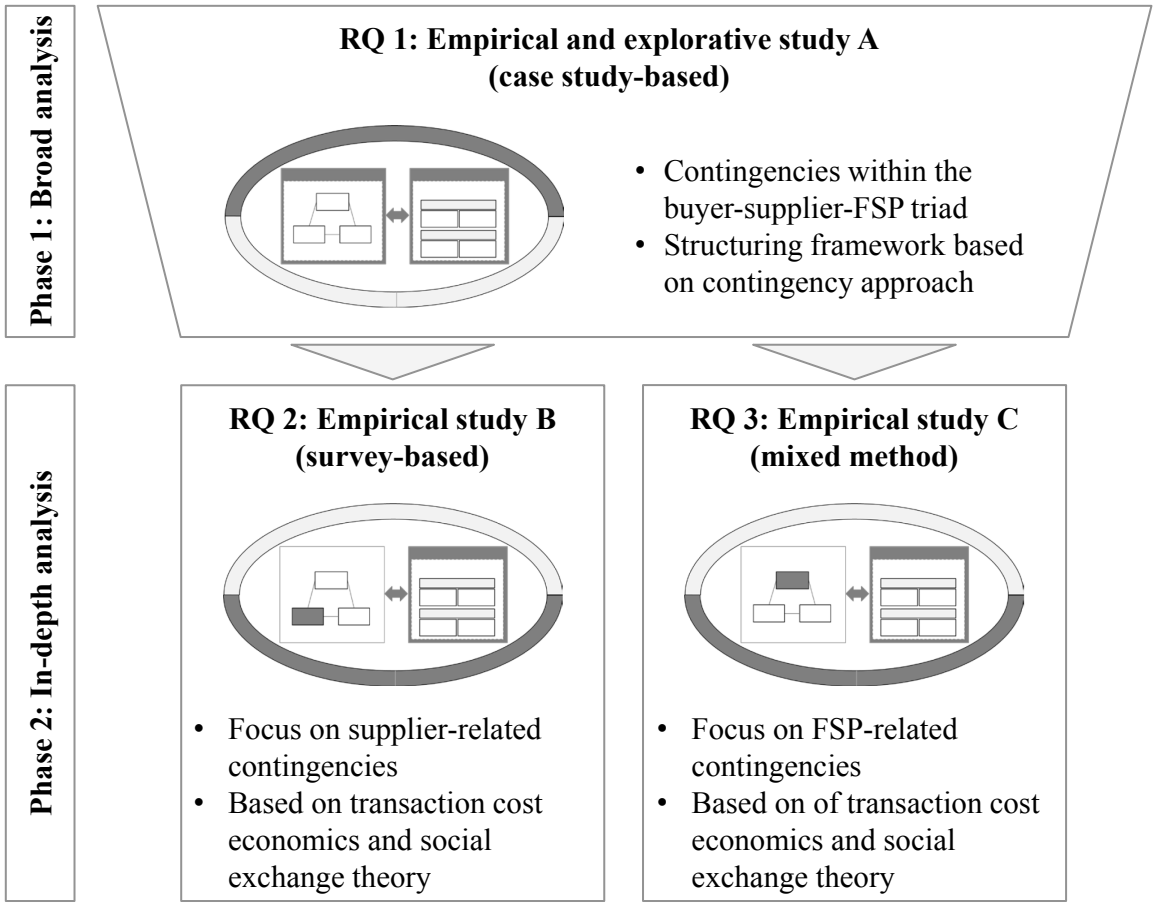


Figure 10: Overview of the research phases and their specific focus[36]

[35] See Section 2.2.3 for an explanation of the focus on the buyer-supplier dyad within the physical supply chain.
[36] The focus of each study is highlighted in dark grey for the research framework presented in Figure 9.

To address the primary research question presented in Section 1.3, three empirical studies are conducted and these can be separated into two research phases (see Figure 10). This distinction comes along with a combination of qualitative and quantitative approaches for the applied methodologies. The *first phase* (study A) adopts a broad explorative approach, and takes account for the innovative character of this research project. It utilizes a case study research design to explain the general application of FSCM practices for the supply side and differences between specific practices in relation to the buyer-supplier-FSP triad (Eisenhardt, 1989b; Yin, 2009). The contingency approach structures the research and helps classify the relevant contingencies. Transaction cost economics and social exchange theory play only a minor role within the first study, but both are employed to interpret its findings in the discussion section. In addition, study A generates the propositions that form the basis for the two studies comprising stage two of the research project.

In *phase two*, studies B and C address the fact that previous FSCM research has only incorporated a limited amount of supplier and FSP data. *Study B* analyzes supplier-related contingency variables to explain suppliers' commitment and to thereby derive implications for the application of FSCM practices for the supply side. It tests hypotheses that are developed on the basis of study A's results, transaction cost economics, and social exchange theory. Study B seeks to confirm study A's findings to enhance their validity. In contrast*, study C* addresses FSP-related contingencies, using an explorative approach similar to that of study A. Such a design is necessary, since only few researchers have examined FSPs in supply chains (see Section 2.2.3). In particular, the variety of provider types calls for an in-depth analysis to follow study A. First, study C aims to explain the involvement of FSPs as an enabler of FSCM practices for the supply side via transaction cost economics and social exchange theory. Then, it determines service requirements as contingencies for applying FSCM practices for the supply side. It draws on both quantitative and qualitative approaches to enhance the validity of its results.

Table 7 summarizes the research questions, methodologies, and theoretical lenses linked to each study.

Research question	Methodology	Theoretical lenses
Study A – Towards a framework for FSCM practices for the supply side		
RQ 1: Why are FSCM practices applied for the supply side, and *how* can differences between these practices be explained in relation to the buyer-supplier-FSP triad?	Eight explorative case studies examining buyer-supplier-FSP triads • Literature review • Semi-structured interviews • Workshop • Archival data	Contingency approach
Study B – Predictors and outcomes of suppliers' commitment to FSCM practices for the supply side		
RQ 2: What are the predictors and outcomes of a supplier's commitment to FSCM practices for the supply side, and *how* do they affect the application of these practices?	Confirmative survey-based study with a sample of 115 Swiss suppliers • Literature review • Workshop • Single and multiple binary logistic regression analyses • T-test analyses	Transaction cost economics Social exchange theory
Study C – Financial service providers as enablers of FSCM practices for the supply side		
RQ 3: Why are FSPs involved in FSCM practices for the supply side, and *how* do their service offerings enhance the application of these practices?	Explorative mixed-method approach gathering quantitative (62 questionnaires) and qualitative (21 expert interviews) data • Literature and grey press review • Objective misfit analyses • Quality gaps analyses	Transaction cost economics Social exchange theory

Table 7: Overview of the research questions, methodologies, and theoretical lenses employed in studies A-C

4.2 Study A: Towards a framework for financial supply chain management practices for the supply side

The following sections provide an overview on study A's research design (Section 4.2.1), as well as its key findings and contributions (Section 4.2.2). For the full paper, see Appendix A.

4.2.1 Research design

Despite the increasing relevance of FSCM practices for the supply side, previous research provides limited guidance capable of explaining when and why to apply

different practices. The first study seeks to address this issue and involves a broad, explorative analysis of contingencies in the context of the buyer-supplier-FSP triad (see *RQ 1* in Table 7). For this purpose, it utilizes a *case study research* approach based on eight cases within the buyer-supplier-FSP triad (Eisenhardt, 1989b; Eisenhardt and Graebner, 2007; Langley and Abdallah, 2015).

The *case study selection* relied on an iterative process following a theoretical sampling approach (Glaser and Strauss, 1967). Buyers served as the focal point, since they usually initiate financing alternatives for the supply side. All of the buying companies under consideration were similar in terms of size (large companies), industry (production and commerce), and origin (Europe), thus ensuring cross-case comparability. At the same time, the selected cases captured the diversity of practices, adoption stages, FSP types, and suppliers. Additional cases were added until further insights included only marginal value.

The *data collection* stage drew on various sources (e.g., interviews, annual reports, and presentations, and a half-day workshop with all of the selected buyers) to gather information on the individual cases (Yin, 2009). Buyers provided most of the information analyzed in study A. At least one representative from the finance and operations department was interviewed at each buying company, due to the cross-functional character of FSCM. Additional interviews were conducted with suppliers and FSPs in cases in which the buyer had already rolled out a financing alternative for the supply side. Overall, study A consisted of 34 interviews within the buyer-supplier-FSP triads, and these offered diverse insights on the application of FSCM practices for the supply side.[37] All of the interviews employed a semi-structured format.

The *data analysis* stage first involved open coding for the interview transcripts, and these codes were then categorized on the basis of the existing literature and theory (Miles et al., 2014). Afterwards, a within-case analysis and a cross-case analysis sought to determine differences and commonalities across the cases. This research design helped to identify contingency variables as preconditions for the application of FSCM practices for the supply side, and it also established criteria capable of explaining dissimilarities between specific practices. Throughout the entire research process, this first study performed several measures to strengthen the validity and reliability of the overall results (Gibbert et al., 2008; Yin, 2009).[38]

[37] See Table A-2 in Appendix A.3 for additional information on the cases.
[38] See Table A-1 in Appendix A.3 for more information on applied measures.

4.2.2 Key findings and contributions

Study A identified contextual situations in which FSCM practices for the supply side are applied. To that end, it differentiated among endogenous, relationship-related, and exogenous contingency variables within the buyer-supplier-FSP triad *(P1-P5)*. Five propositions were formulated on the basis of those results:

- ***P1 – Buyer-related endogenous:*** *A buying company's financial strength, size, and aligned financial strategy jointly contribute to the application of FSCM practices for the supply side.*
- ***P2 – Supplier-related endogenous:*** *A supplier's financial weakness and working capital orientation encourage the application of FSCM practices for the supply side.*
- ***P3 – FSP-related endogenous:*** *The FSP's IT capabilities and reputation regarding FSCM promote the application of FSCM practices for the supply side.*
- ***P4 – Relationship-related:*** *Reliable goods of exchange, aggregated buyer dependence, cash flow uncertainty, and supplier dependence encourage the application of FSCM practices for the supply side.*
- ***P5 – Exogenous:*** *A positive economic trend is negatively associated with the application of FSCM practices for the supply side.*

Buyer-related endogenous contingencies underscore financially strong buyers' ability to secure low financing costs and easily accessible external funding. This financial strength enables them to offer ongoing financing alternatives for the supplier base. Furthermore, an aligned financial strategy ensures that the involved finance and operations departments pursue similar objectives and jointly commit to applying FSCM practices for the supply side. The *supplier-related endogenous contingencies* form the basis for FSCM practices to actually respond to a financial need of suppliers. Thereby, the practices do not necessarily presuppose financially weak suppliers. Also, suppliers with a focus on working capital improvements benefit from financing alternatives. *FSP-related endogenous contingencies* describe service requirements (IT capabilities and FSCM reputation) as prerequisites for applying such practices.

For *relationship-related contingencies*, financing alternatives for the supply side presuppose reliable goods of exchange that allow earlier payments. Furthermore, a buyer's aggregated dependence on the supplier base ensures its support of inter-organizational financing rather than of company-focused funding improvements. Additionally, cash flow uncertainty and a supplier's dependence on the buyer enhance applicability, since they increase the financial and relational leverage of FSCM practices

for suppliers. Similar to lead times in material flows, long payment terms or late/default payments (cash flow uncertainty) make early payments more valuable for suppliers. As supplier dependence increases, so does the level of funding and the strategic relevance of the buyer. Finally, a *negative economic trend* heightens financial distress in supply chains, thus making it more likely that FSCM practices for the supply side will be applied. In sum, the results revealed that financial variables and supply chain-related factors need to be considered together if they are to explain the application of FSCM practices for the supply side. Table A-3 in Appendix A.4 defines and operationalizes the contingency variables.

Besides the described contingencies, the analysis added a dynamic character to the framework on FSCM practices for the supply side. It pointed to the moderating effect of FSCM market adoption and technological progress on relationships between contingency variables and the application of FSCM practices for the supply side *(P6)*. Furthermore, study A explained differences between FSCM practices for the supply side in terms of the dimensions "source of funds" and "time of financing" (see Section 2.2.1). Thus, it pointed towards differentiation criteria for the selection of practices, as captured within four propositions.

The choice of supply chain-internal financing versus supply chain-external financing:

- ***P7a:*** *A buyer's working capital position, working capital conflicts, and general interest rates determine the selection of supply chain-internal financing or supply-chain external financing. Low general interest rates and a buyer with a strong working capital position jointly contribute to the application of supply chain-internal financing. Working capital conflicts between buyers and suppliers make supply chain-external financing more attractive.*
- ***P7b:*** *Legal factors have a moderating effect on the relationships between all three factors (P7a) and the selection of supply chain-internal or supply chain-external financing.*

The choice of post-shipment financing versus pre-shipment financing:

- ***P8a:*** *Characteristics for goods of exchange, trust, interdependence, and dispersion of buyer dependence determine the selection of post-shipment versus pre-shipment financing. Pre-shipment financing fits relationships characterized by high levels of trust, interdependence, and goods of exchange with distinct commitment. In contrast, more dispersed buyer dependence promotes the application of post-shipment financing.*

- ***P8b:*** *The type of industry to which buyers and suppliers belong has a moderating effect on the relationships between all four factors (P8a) and the selection of post-shipment or pre-shipment financing.*

Additionally, the findings revealed that contradictory types of FSCM practices for the supply side can complement each other under specific circumstances. For instance, supply chain-internal financing is sometimes applied until the funding volume reaches an upper limit, at which point an external funder becomes involved to avoid negative financial repercussions for the buyer. Yet, this combination of supply chain-internal and supply chain-external financing is only possible in the absence of working capital conflicts between buyers and suppliers.

In summary, study A's findings have diverse managerial and theoretical implications regarding FSCM practices for the supply side. From a managerial perspective, the study yields a list of contingency variables that practitioners can use to identify the general applicability of FSCM practices for the supply side. Furthermore, the differentiation criteria can guide the selection of specific types of practices. From a theoretical perspective, the results add to existing FSCM research by offering a structured, explorative overview of the contextual situations in which FSCM practices for the supply side are applied. In addition, as it did not focus on specific techniques, its findings help to explain differences between practices.

4.3 Study B: Predictors and outcomes of suppliers' commitment to financial supply chain management practices for the supply side

The subsequent sections briefly introduce study B's research design (Section 4.3.1) and key findings and contributions (Section 4.3.2). The complete study can be found in Appendix B.

4.3.1 Research design

Suppliers' commitment constitutes a central prerequisite for the application of FSCM practices for the supply side, as it ensures the creation of value for all involved actors (van der Vliet et al., 2015; Wuttke et al., 2013a). Yet, FSCM research has primarily focused on the buyer as the central unit of analysis, revealing a need for empirical data on suppliers. Related fields of research (SCM and finance) have used either financial or relational factors to explain a supplier's commitment (Gelsomino et al., 2016). Thus, the second study jointly analyzes both aspects to understand suppliers' commitment to

FSCM practices for the supply side (see *RQ 2* in Table 7). It therefore addresses contingencies within the supplier context to derive predictors of commitment. Additionally, study B analyzes potential positive and negative effects of FSCM practices for suppliers. Based on an understanding of predictors and outcomes, it defines implications for the application of FSCM practices for the supply side. Study B applies a *quantitative, confirmative approach* to test the subsequent hypotheses (Forza, 2002):

- *Hypothesis 1: Trust, supplier dependence, and buyer power are positively associated with a supplier's commitment to FSCM practices for the supply side.*
- *Hypothesis 2a: The higher the liquidity level and the easier the access to external funding, the lower a supplier's commitment to FSCM practices for the supply side.*
- *Hypothesis 2b: The higher the financing costs, the higher a supplier's commitment to FSCM practices for the supply side.*
- *Hypothesis 3a: Suppliers committed to participate in FSCM practices for the supply side stress the financial benefits and reduced cash inflow risks.*
- *Hypothesis 3b: Suppliers not committed to participate in FSCM practices for the supply side emphasize the costs, revenue reductions, and uncertainty involved in participation.*

All hypotheses[39] were anchored in the existing literature and related to the propositions from study A, transaction cost economics, and social exchange theory (Ambrose et al., 2010; Gelsomino et al., 2016; Griffith et al., 2006; Molm and Cook, 1995; Singh and Kumar, 2014; Williamson, 2008, 1979).

Study B employed a *random sampling approach* to avoid any selection bias (Kaplowitz et al., 2004). Overall, 618 companies were approached to participate in an online survey. Of these companies, 94 had invalid contact details, and 115 completed the questionnaire, representing a response rate of 22%. The final sample consisted of companies of various sizes from a range of industries. In addition, a project team comprised of representatives from corporations and FSPs, as well as senior researchers, served as a steering committee for the conducted research.[40]

The *questionnaire* had four central elements as presented in Figure 11. (1) Suppliers' commitment was the decision variable, (2) predictors (relational and financial variables) and (3) outcomes (advantages and disadvantages) of commitment, and (4) control variables moderating the predictors' effect on commitment. To make the survey more

[39] See Appendix B.3 for detailed explanations of how the hypotheses were derived from the literature and theory.
[40] Appendix B.4 provides a detailed description of the data sampling methodology and the role of the project team.

specific, the questionnaire focused on an approved payables program as an example of a widely accepted technique of applying FSCM practices for the supply side (Iacono et al., 2015). The respondents took the role of suppliers and had to indicate general interest to participate, interest for selected buyers, or no interest to participate in an approved payables financing program. The first two cases were deemed committed suppliers, resulting in a binary variable. Furthermore, all questionnaire items measuring predictors and outcomes were based on the previous literature (SCM, finance, and FSCM) and theory (transaction cost economics and social exchange theory). Finally, company size, industry type, and experience with financing alternatives (e.g., traditional factoring) were considered control variables. A pre-test was conducted with the project team to ensure the questionnaire's clarity.

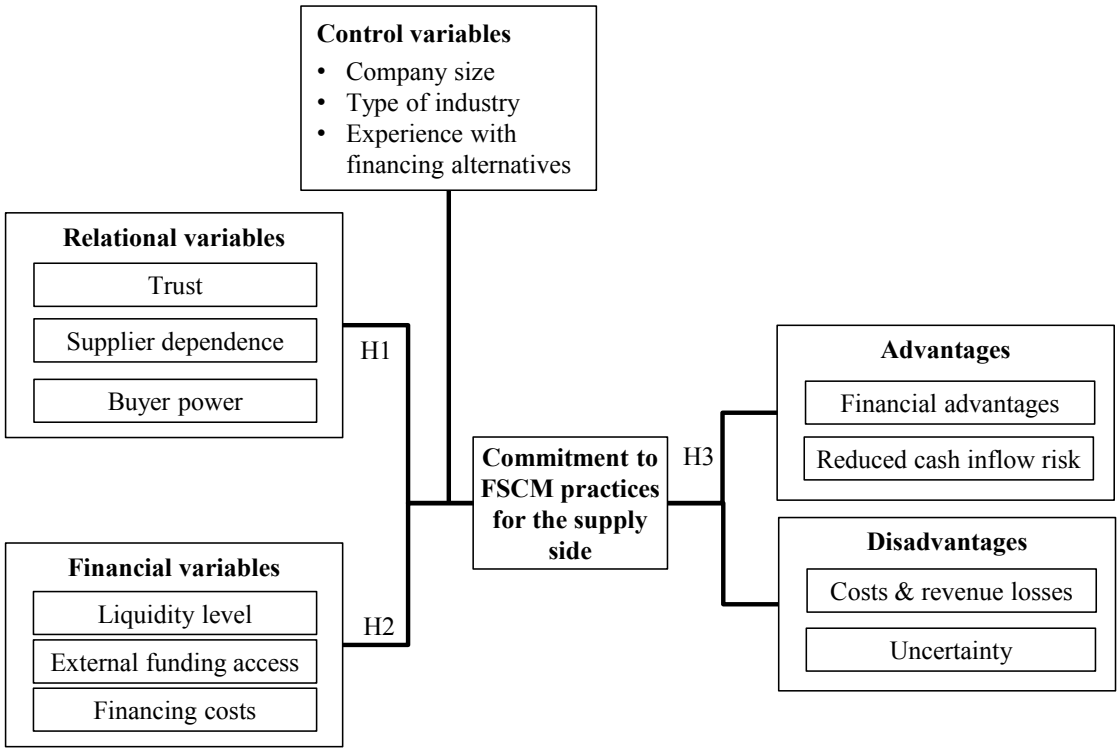


Figure 11: Conceptual model of study B[41]

Prior to the data analysis stage, *various tests* (e.g., non-response bias tests, factor analyses, cross-loading tests, Cronbach's alphas calculations) guaranteed the validity and reliability of the results (Forza, 2002; Zhao et al., 2010). The *data analysis* stage included three steps: First, relevant predictors were determined on the basis of univariate and multivariate logistic regression analyses. Then, a moderation analysis evaluated the effects of the control variables (Baron and Kenny, 1986; Zhao et al., 2010). Second, a t-test analyzed expected outcomes for both committed and not committed suppliers. In a

[41] Adapted from Figure B-1 in Appendix B.3.

third and final step, the findings of the first two analyses were combined to establish whether potential outcomes depended on the predictors of suppliers' commitment.

4.3.2 Key findings and contributions

Study B indicated that a supplier's commitment to FSCM practices for the supply side is certainly *not based on rational financial arguments alone*. In contrast, the univariate analysis demonstrated the relevance of all of the relational (see H1) and financial (H2) predictors despite the liquidity level. These findings resulted in an acceptance of both hypotheses. According to the subsequent multivariate analysis, however, supplier dependence, trust, and access to external funding were the central factors explaining a supplier's commitment. The influence of the predictor variables depended on the supplier's industry and experience with financing alternatives, but not on its size.

In accordance with H3a, committed suppliers emphasized financial benefits and reduced cash inflow risks. As expected, financial benefits were more important to committed suppliers lacking easy access to external funding. More surprising were the results regarding disadvantages. In contrast to H3b, committed suppliers placed more value on financial and uncertainty-related disadvantages. In particular, they were unsure about buyers' motives for offering such financing alternatives and feared that it might negatively affect their profitability, due to discounts and costs. The expected disadvantages did not have a relationship with the predictors, with one exception: Uncertainty disadvantages were significantly less important for committed suppliers that did not have easily accessible external funding, but experience with financing alternatives. Knowledge regarding financing alternatives seemed to make suppliers less reluctant to commit to FSCM practices for the supply side.

The findings distinguished *five types of supplier commitment,* and knowledge of them is important for understanding the application of FSCM practices for the supply side (Figure 12):

- *Type A* refers to suppliers' *financial and relational commitment,* due to their lack of easy access to external funding and high levels of trust and dependence.
- *Type B* emphasizes suppliers' commitment as an investment in *relationships with strategic buyers.* The easy access to external funding diminishes the financial benefits. Still, suppliers remain committed as a favor to strengthen their relationships with key buyers.
- *Type C* refers to suppliers' *power-related commitment,* which occurs when buyers pressure them to participate. The low level of trust heightens suppliers'

uncertainty and, therefore, their reluctance. Yet, difficult access to external funding, especially when combined with experience with financing alternatives, reduces suppliers' reluctance.

- *Types D and E* refer to suppliers with a limited level of commitment, since they stand to gain few financial and relational benefits. For instance, low levels of supplier dependence reduce the amount of funding for suppliers. Thus, the positive effects for suppliers diminish even if they have a difficult access to external funding.

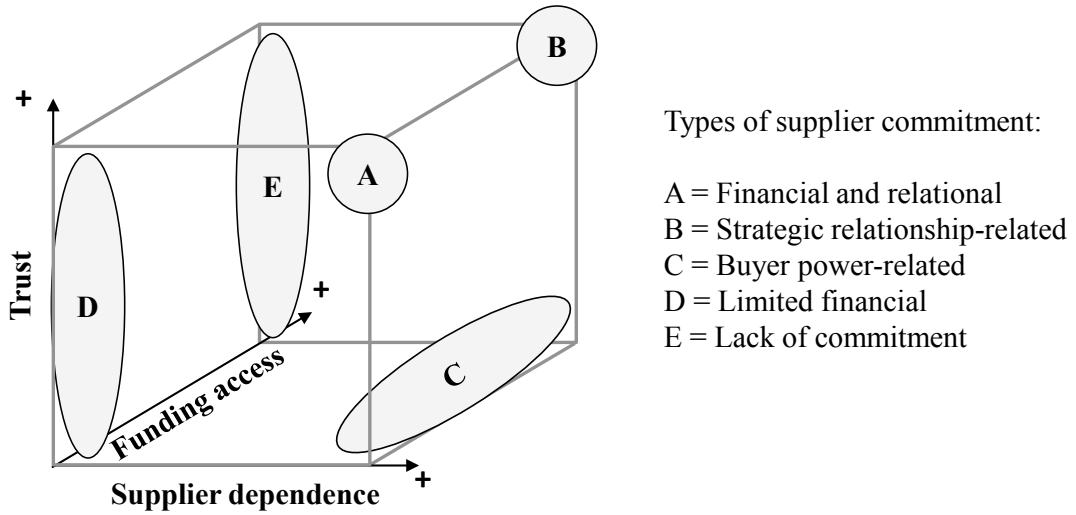


Figure 12: Five types of supplier commitment to FSCM practices for the supply side [42]

Thus, the application of FSCM practices for the supply side presupposes suppliers' commitment of type A to C. The distribution of possible commitment types thereby depends on the supplier base.

These findings have numerous managerial and theoretical implications. From a managerial perspective, buyers can identify a suppliers' commitment type as means of analyzing their supplier base. On the basis of the results, they can tailor an approach for specific suppliers when offering financing alternatives. Furthermore, suppliers benefit from an objective analysis of outcomes, as the results can be employed to reduce their reluctance. Moreover, FSPs can use the results to improve their service offerings in terms of "onboarding" options for suppliers. From a theoretical perspective, the analysis contributes to the FSCM literature, as it provides empirical, supplier-related data. The findings underline that FSCM practices for the supply side are not necessarily beneficial for suppliers. Financial and relational factors have to correspond to one of the types of

[42] Adapted from Figure B-3 in Appendix B.6.

supplier commitment. Consequently, study B derives contingencies for the application of FSCM practices for the supply side.

4.4 Study C: Financial service providers as enablers of financial supply chain management practices for the supply side

The following sections briefly introduce the research design of study C (Section 4.4.1), discussing its key findings and contributions (Section 4.4.2). The complete study is provided in Appendix C.

4.4.1 Research design

Financial service providers play a crucial role in the application of FSCM practices for the supply side. Still, little is known about their involvement in supply chains (Silvestro and Lustrato, 2014). Study C seeks to explain FSPs' involvement and to identify service requirements as contingencies for the application of FSCM practices for the supply side (see *RQ 3* in Table 7). In accordance with these two research objectives, study C can be subdivided into two stages. Each combines qualitative and quantitative data within a mixed-method approach to enhance the validity of the findings (Creswell and Plano Clark, 2011; Tashakkori and Teddlie, 1998). Figure 13 provides an overview of the data and analytical methods.

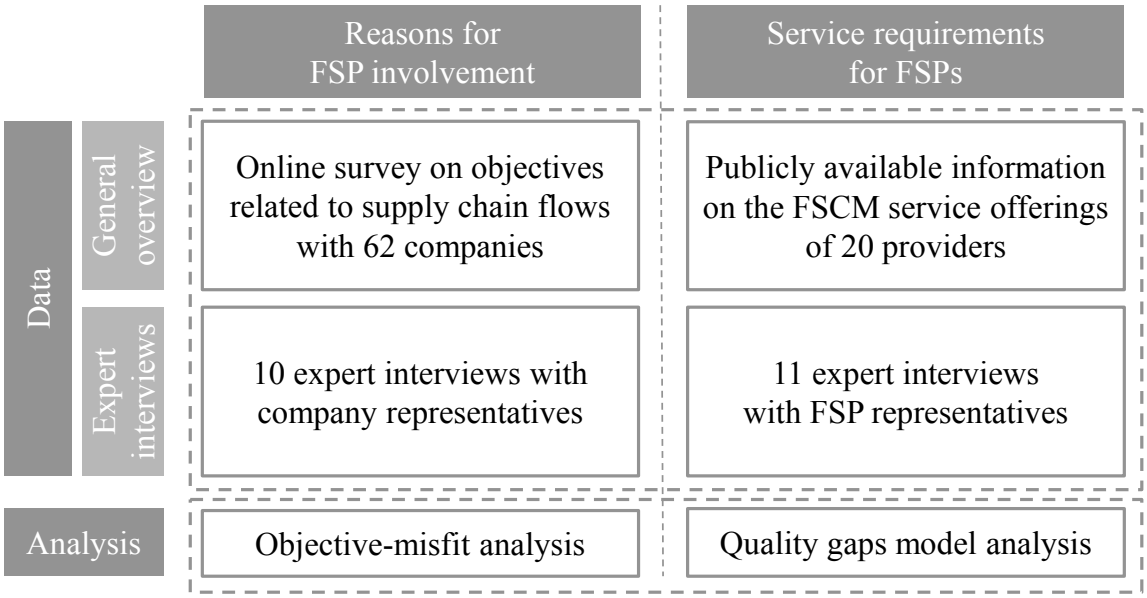


Figure 13: Design and analyses of study C[43]

[43] Adapted from Figure C-3 in Appendix C.3.

Stage 1 – Reasons for FSP involvement: Study C was based on transaction cost economics and social exchange theory's emphasis on the involvement of external providers, due to goal conflicts (Cook and Emerson, 1984; Spremann and Gantenbein, 2014; Williamson, 2008). It included an *online survey* of 62 companies, which sought to understand possible conflicts between and within supply chain flows in buyer-supplier dyads. The survey incorporated questions on the relevance and achievement of goals related to financial flows, material flows, and information flows. The existing FSCM, finance, and SCM literature suggested the objectives that were included in the questionnaire.[44] An *objective misfit analysis* identified all goals assigned high relevance and low achievement rate, thus revealing a need for action.

Moreover, additional *10 expert interviews with company representatives* were conducted to classify these objective misfits and gain additional insights. The classification of objective misfits resulted in the identification of supply chain needs for the involvement of FSPs in FSCM practices for the supply side. The selection of interview partners was based on a *theoretical sampling approach* with two criteria (Glaser and Strauss, 1967). First, all considered companies belonged to the manufacturing industry, ensuring that they had similar working capital orientations. Second, companies were only considered if they contributed to a diverse set of objective misfits. Most of the interview partners were chief financial officers (CFOs), and the interviews employed a semi-structured design based on the online survey's structure.

Stage 2 – Service requirements for FSPs: Based on the identified types of supply chain needs, the second step was analyzing FSPs and their FSCM service offerings. A *review of publicly available information* (websites, brochures, and grey press) on the service offerings of 20 FSPs provided an initial overview. The analysis considered a diverse range of FSP types.[45] Similar to stage one, the selection of FSPs also followed a *theoretical sampling approach* (Glaser and Strauss, 1967). The present study considered all FSPs engaged with, or easily accessible to, the interviewed companies in step one.

In addition to the descriptive overview of the service offerings, *11 expert interviews with FSP representatives* led to detailed insights on service quality. A semi-structured questionnaire based on the quality gaps model formed the foundation for the interviews (Mauri et al., 2013; Zeithaml et al., 1993). In terms of data analysis, study C combined

[44] See Appendix C.3 for a detailed description of the study's design, data collection techniques, and analytical methods.

[45] Currently, LSPs' service offerings related to FSCM practices for the supply side are limited (See Section 2.2.3). They offer inventory financing, mainly as a financing alternative for individual companies. To that end, they collaborate with financial institutions or technology providers. Therefore, the interviewed FSPs did not include LSPs themselves, but rather their partners that allowed them to offer inventory financing.

the FSP interviews and the previous company interviews to *detect service gaps* in the FSPs' offerings in terms of FSCM services. These gaps were then used to formulate service requirements for FSPs.

4.4.2 Key findings and contributions

Study C generated initial insights into the role of FSPs within FSCM practices for the supply side. It analyzed differences across FSPs' traditional service offerings and identified the service requirements necessary to respond to these practices. To that end, study C classified objective misfits into three groups on the basis of supply chain flows[46]:

- *Financial flow-specific objective misfits* emerge whenever financial objectives are assigned a high relevance but have low achievement rates. For instance, companies might aim at lower default rates for incoming payments, but not yet achieve this objective.
- *Cross-functional objective misfits* involve trade-offs between business functions within companies. For instance, the sales department might want to increase inventory levels to respond to customer needs, while the accounting department might be interested in reducing the level of tied-up capital.
- *Supply chain-related objective misfits* capture conflicts related to financial and material flows between buyers and suppliers. For instance, buyers might seek longer payment terms, while suppliers might want to accelerate incoming payments.

Study C revealed that financial institutions, and especially banks, have long been the central players addressing these objective misfits. Yet, their traditional approaches solely focus on coordinating financial flows within and between supply chain members. They primarily address financial flow-specific objective misfits and do not require intra-organizational or inter-organizational involvement. FSCM practices for the supply side, however, explicitly address cross-functional and supply chain-related objective misfits. Therefore, study C pointed to two changes in recent years related to the FSCM service offerings of FSPs:[47]

[46] The identified types of objective misfits are not distinct to the supply side. Thus, the subsequent analysis steps did not follow this specific focus.
[47] See Appendix C.8.3 for a detailed description of these new services.

- *Innovative FSCM services* combine technology-driven services for financing, transactions, and risk mitigation, and they target the integrated management of supply chain flows. They actively promote cross-functional and inter-organizational coordination.
- *New technology providers* attack the positions of long-established market players. In contrast to financial institutions, these FSPs are less funding-focused with their service offerings and instead, they are more technology-driven. For instance in contrast to banks, they also offer FSCM services related to supply chain-internal financing practices where buyers themselves make funding sources available.

By now, financial institutions and technology providers both offer innovative FSCM services. In short, FSPs thereby serve as intermediaries facilitating FSCM practices for the supply side, and they resolve cross-functional and supply chain-related objective misfits. The integrative character of these innovative FSCM services constitutes a central difference from traditional approaches, revealing the need for explicit service requirements. A quality gaps analysis, conducted for that purpose revealed a lack of supply chain orientation, the absence of standards, and limited SCM knowledge. Study C used those gaps to derive explicit service requirements for innovative FSCM service offerings. The service requirements constitute prerequisites for applying FSCM practices for the supply side:

- *Supply chain orientation*: FSPs should not focus on providing independent products but should instead develop an understanding of needs along supply chains. Accordingly, FSPs must adapt internal structures and required knowledge profiles of employees. Furthermore, a supply chain orientation enhances the comparability of different practices and thus increases transparency for buyers and suppliers. In particular, financial institutions struggle with achieving a supply chain orientation, since they primarily treat innovative FSCM services as cross-selling activities spread across various departments.
- *FSCM reputation*: FSPs often underestimate the need for a FSCM reputation, due to the integrative character of FSCM practices for the supply side. FSPs can demonstrate reputation on FSCM services through various approaches. Long-term expertise with applying FSCM practices for the supply side signals reliability and knowledge. Moreover, employees who are knowledgeable regarding FSCM, as well as trainings for buyers and suppliers, can accomplish the same goal.

- *Technological expertise*: Technology-driven platforms and automated processes are necessary to successfully apply FSCM practices for the supply side. They facilitate the integration of various functions and supply chain members. Furthermore, the automated exchange of information, along with higher levels of transparency, simplifies transactions and mitigates risks. Thus, simple interfaces for buyers and suppliers significantly ease the application of FSCM practices for the supply side.

The objective misfits and service requirements that study C identifies are not unique to the supply side. They also provide valuable insights regarding FSCM practices for the demand side. Thus, study C has various managerial and theoretical implications. From a managerial perspective, FSPs can analyze supply chain objective misfits to improve their understanding of supply chain needs and accordingly adapt their services. Buyers and suppliers can both gain knowledge regarding FSPs' various FSCM service offerings, and they can use the resultant requirements to evaluate those services. From a theoretical perspective, study C explains the involvement of FSPs in FSCM practices for the supply side on the basis of financial flow-specific, cross-functional, and supply chain-related objective misfits. Moreover, it categorizes different provider types and their FSCM service offerings. Finally, the findings stress distinct requirements for FSCM services that form contingencies for applying FSCM practices for the supply side.

5 Conclusions and outlook

The final chapter[48] summarizes this thesis' main managerial (Section 5.1) and theoretical (Section 5.2) contributions regarding FSCM practices for the supply side. Furthermore, Section 5.3 discusses the limitations of this research project, as well as opportunities for future research.

5.1 Managerial contributions

The application of FSCM practices for the supply side presupposes a fit with contextual preconditions in the buyer-supplier-FSP triad. This thesis provides guidance for practitioners and researchers regarding contingency variables that explain when to apply financing alternatives for the supply side and why different practices are appropriate in different situations. All three empirical studies were aligned with the thesis' overall research objective and resulted in conclusions regarding the application of FSCM practices for the supply side (see Table 8). *From a managerial perspective*, these findings have implications for actors involved in the buyer-supplier-FSP triad.

Buyers can utilize endogenous, relationship-related, and exogenous contingencies as a checklist for the provisions of financing alternatives to suppliers. *First*, buying companies must be sufficiently large and financially strong to offer continuous, low-cost funding. Ensuring an alignment of the financial strategy for the finance and operations departments can prevent internal conflicts. *Second*, reliable goods of exchange and aggregated buyer dependence serve as relational prerequisites for the application of such practices. *Third*, the identified contingencies result in five types of supplier commitment to FSCM practices for the supply side, and these are defined in relation to the dimensions of supplier dependence, trust, and access to external funding. On the basis of these commitment types, buyers can develop individualized approaches to address their suppliers. *Fourth*, the findings review the types of FSPs engaged in applying FSCM practices for the supply side. Furthermore, they derive explicit requirements related to the FSCM service offerings of FSPs. Buyers can utilize these requirements to evaluate and compare FSPs for their suitability to be involved in FSCM practices for the supply side.

[48] Chapter 5 relates to the conclusion sections of studies A-C described in Sections A.6, B.7, and C.7.

	Implications for the application of FSCM practices for the supply side	Contingencies				
		Endogenous			Relation-ship related	Exoge-nous
		Buyer	Supplier	FSP		
Study A	⇒ Study A provides a list of endogenous, relationship-related, and exogenous factors that are preconditions for the application of FSCM practices for the supply side.					
	⇒ Specific differentiation criteria explain differences across FSCM practices for the supply side.	✓	✓	✓	✓	✓
	⇒ In exceptional situations, usually opposed types of practices can complement each other.					
Study B	⇒ Identification of five types of supplier commitment, based on trust, supplier dependence, and access to external funding. These types can be used to analyze suppliers and determine whether to apply FSCM practices for the supply side.					
	⇒ Experience with financing alternatives reduces suppliers' reluctance regarding FSCM practices and, thus, makes their application more likely.		✓		✓	
Study C	⇒ Differentiation of financial flow-specific, cross-functional, and supply chain-related objective misfits capable of explaining the involvement of FSPs in FSCM practices for the supply side.					
	⇒ The application of these practices presupposes supply chain orientation, FSCM reputation, and technological expertise on the part of FSPs.			✓	✓	

Table 8: Contributions of studies A-C to the overall research objective, including the analyzed contingencies

In addition, this research project also offers buyers a means *classifying practices* according to the "time of financing" (post-shipment versus pre-shipment) and the "source of funds" (supply chain-internal versus supply chain-external). Moreover, the identified differentiation criteria can guide the selection of specific FSCM practices for the supply side. For instance, buyers should involve a supply chain-external funder if they are experiencing working capital conflicts with their suppliers.

The findings were introduced to the participants of the FSCM workshop[49] mentioned in Section 1.1. They explained differences in financing volumes across participating buyers' business units. Several buyers emphasized a working capital focus in their treasury department and a cost focus in the procurement department of several business units. Applying FSCM practices for the supply side failed within these business units, since the financial strategy was not aligned. Other participants noted that suppliers exhibited only a limited dependence on the buying company within some of the buyer's business units. In the absence of supplier dependence, the financial impact of financing alternatives for suppliers diminished, and the relational reasons for committing disappeared. Yet, business units that fulfilled the identified contingencies within the buyer-supplier-FSP triad demonstrated internal "best practices" on the part of the buying companies. Moreover, the selection of inappropriate FSCM practices could explain low funding volumes. For example, one buyer initially implemented a supply chain-external financing practice, although its focus was on profitability, and it was not experiencing any working capital conflicts with suppliers. That buyer switched to supply chain-internal financing to realize additional discounts on its invoices.

Suppliers benefit from insights into FSCM practices for the supply side, and they can use such measures to strengthen their relationships with buyers. The identified contingencies allow them to identify the prerequisites of inter-organizational financing. For instance, suppliers can identify relationships that qualify for pre-shipment financing (relationships based on trust, interdependence, a high level of commitment for goods of exchange) and thus advance payments prior to delivery. With growing market dissemination, suppliers are beginning to ask buyers for financing alternatives, and become the initiator of FSCM practices for the supply side. Moreover, suppliers can apply the objective analysis of outcomes conducted in study B to better assess potential benefits and disadvantages.

[49] Workshop conducted January 27, 2017 at the University of St. Gallen. For additional information on the workshop participants, see footnote 4.

In addition, *FSPs* gain access to additional information on the relationship between supply chain needs and financial flows-specific, cross-functional, or supply chain-related objective misfits. FSPs can use the findings on service quality gaps to compare their FSCM service offerings and identify where they have a need for action. Based on such an analysis, they are able to improve their existing services in terms of their supply chain orientation, FSCM reputation, and technological expertise. Furthermore, introducing innovative services widens the spectrum of FSCM techniques employed to execute FSCM practices for the supply side. In particular, pre-shipment financing practices are still limited and represent a future opportunity for FSPs.

5.2 Theoretical contributions

This research project integrates insights from the fields of finance and SCM to explain inter-organizational financing for the supply side. It thus constitutes a contribution to the evolving body of FSCM literature. Moreover, the results have implications for all three fields of research.

The findings help to fill a gap between the general concept of *FSCM* and research on specific FSCM techniques (Gelsomino et al., 2016; Hofmann and Johnson, 2016). Thus, the studies' findings have implications regarding the overall applicability of inter-organizational financing activities, rather than regarding specific techniques. This thesis identifies endogenous, relationship-related, and exogenous contingencies within the buyer-supplier-FSP triad as prerequisites for the application of FSCM practices for the supply side (Kajüter and Kulmala, 2005). Furthermore, it differentiates among four types of practices defined according to the dimensions "time of financing" and "source of funds." These dimensions result in differentiation criteria explaining the selection of specific FSCM practices for the supply side in certain contexts.

Additionally, previous empirical FSCM studies have focused on buyer-related data (Caniato et al., 2016; Wuttke et al., 2013b). This thesis instead examined data on the buyer-supplier-FSP triad, thus generating new insights regarding FSCM. The supplier data highlights five types of supplier commitment and explains why suppliers accept financing alternatives from buyers. The FSP data results in a differentiation of traditional and innovative FSCM services, and the identification of specific FSP service requirements (supply chain orientation, FSCM reputation, and technological expertise).

The *SCM literature* has underlined the importance of the inter-organizational management of supply chain flows (Cooper et al., 1997; Eßig et al., 2013; Stock and Boyer, 2009). Yet, it has not employed this inter-organizational perspective to examine financing sources and costs (Pfohl and Gomm, 2009). This thesis combined financial factors (e.g., financing access and costs) with supply chain factors (e.g., trust, uncertainty, and dependence), thus boosting the SCM literature's knowledge of financial flows in supply chains. In addition to traditional supply chain objectives (e.g., risk mitigation, cost reduction and quality upgrades, service improvements, and flexibility) capital commitment in supply chains also plays a key role. Moreover, the present research project stresses FSPs as a central actor in supply chains, with FSPs facilitating the integrated management of supply chain flows.

The *finance research* has emphasized the management of financing costs and funding sources, but it has done so at the firm level (Brealey et al., 2011). Accordingly, companies often improve their own financial position at the expense of upstream and downstream supply chain members (Hofmann and Kotzab, 2010; Wandfluh et al., 2016). This thesis took a wider perspective, focusing on supply chains' ability to find additional funding sources and to reduce financing costs. For instance, information exchanges between buyers and suppliers considerably reduce suppliers' uncertainty regarding cash inflows. With their emphasis on financing current assets for the supply side, this thesis' findings contribute to the trade finance literature.

Moreover, this research project combined three *theoretical lenses*, namely, the contingency approach, transaction cost economics, and social exchange theory. The latter does not have a long tradition of studying organizations, due to its initial use in studying interpersonal relationships (Wynstra et al., 2015). However, this thesis reveals its utility in an inter-organizational context when combined with transaction cost economics (Ambrose et al., 2010; Griffith et al., 2006; Molm, 1991). The linkage with transaction cost economics enables social exchange theory to overcome weaknesses related to its limited consideration of formal contracts as a governmental mechanism (Lambe et al., 2001). At the same time, transaction cost economics also benefits from its integration with social exchange theory, since the latter is less focused on costs as an objective criterion. Finally, this thesis strengthens the theoretical foundation of FSCM research with its consideration of these three theories. Only few FSCM studies have so far integrated any theoretical lenses (Hofmann and Johnson, 2016).

5.3 Limitations and future research

The present research project involves limitations, and these are related to the project's focus, methodology, and theoretical lenses. Yet, the limitations also point towards future research opportunities.

As regards the *research focus and methodology*, this thesis faces the following limitations, which highlight a number of research opportunities:

- The focus on buyer-supplier dyads within physical supply chains constitutes a limitation, as supply chains usually consist of at least triads within material flows (Mentzer et al., 2001).[50] Such a focus was necessary, since existing techniques employed to apply FSCM practices for the supply side are restricted to the buyer-supplier dyad. Yet, buyers have begun to discuss expanding financing to target earlier stages in the supply chain. Future research could build on these findings' for dyadic relationships to identify how triadic relationships differ from them.
- The studies underlined the importance of the inter-organizational management of funding sources. They overlooked those activities connected to the other two FSCM management layers introduced in Section 2.1.3, namely, the application and the transfer of funds (Caniato et al., 2016). However, these two areas have already received considerable attention in previous SCM research (Gomm, 2010; Pfohl and Gomm, 2009). Consequently, an emphasis on inter-organizational financing was necessary to contribute to the field of SCM. Still, future research would benefit from a more integrated approach to FSCM management layers.
- The emphasis on FSCM practices for the supply side revealed that the demand side requires additional analysis (Hofmann and Zumsteg, 2015). The trade finance literature has taken initial steps to investigate trade credits (Seifert et al., 2013). Thus, focusing on the supply side was necessary to develop a solid foundation for future FSCM research. At the same time, it permitted a clear assignment of key roles within the buyer-supplier-FSP triad. However, future research could analyze when focal firms prioritize financing alternatives for the supply side versus the demand side.

[50] For example, a triad composed of a customer, a focal company, and a supplier.

- The thesis at hand examined inter-organizational financing activities for current and *not* fixed assets, due to the fundamental differences across asset types regarding risk structures, duration, and funding volume (Spremann and Gantenbein, 2014). Nevertheless, fixed assets (e.g., warehouses, fleets, and machinery) are a critical element of financial flows in supply chains (Templar et al., 2016). Consequently, FSCM practices related to fixed assets require additional research.
- Market adoption of FSCM is still in its early stage. As a consequence, FSCM practices for the supply side differ in terms of their maturity levels. For instance, post-shipment financing practices are more common than are pre-shipment financing practices. These studies gathered initial data on all types of FSCM practices for the supply side, but future studies could explicitly focus on less mature practices. In accordance with the still limited market adoption of FSCM, the present research project did not further distinguish between pre-shipment and at-shipment financing, but summarized them within on type of practice. Future research would benefits from additional research to explain differences between them.

This thesis' *theoretical lenses* limit the studies' findings in certain ways, while also presenting opportunities for future research:

- Scholars have criticized contingency approaches for overlooking possible interrelations between individual contingencies (Donaldson, 2001; Kieser, 2014). In particular, study A did not explicitly examine such interrelations. Rather, the contingency approach's main contribution was its ability to structure the research. Transaction cost economics and social exchange theory both were involved in order to benefit from their explanatory patterns and to avoid the risk of described interrelations. The contingencies create a foundation for future research, which could analyze potential interrelations.
- The contingency approach has three central elements: contingency, response, and performance variables (Sousa and Voss, 2008). Nevertheless, as this thesis focused on whether or not to apply FSCM practices for the supply side, it did not directly measure performance. Thus, further studies could examine factors explaining differences in performance outcomes.

- In addition, contingency approaches have been frequently criticized for the static character of their contingency variables (Wolf, 2011). Yet, this stationary character was an advantage in this context, since it yielded clear contingencies that could serve as a foundation for future research. Furthermore, this thesis captured technological progress and general FSCM market adoption to address the dynamic character of contingencies. Technological progress and FSCM market adoption both influence the effect of the contingencies on the application of FSCM practices for the supply side.
- Transaction cost economics underlines cost aspects but neglects rewards as relevant for FSCM practices for the supply side (Ebers and Gotsch, 2014). In contrast, social exchange theory underscores economic and social rewards, but mainly in connection with relational aspects (Kramer, 2006). This thesis combined both theories, to overcome their previously demonstrated weaknesses (e.g., Molm and Cook, 1995). Social exchange theory has an additional drawback, as its original purpose was to examine interpersonal relationships (Wynstra et al., 2015). Yet, previous studies have indicated that it is applicable for organizational issues (Ambrose et al., 2010; Griffith et al., 2006), and this thesis supports that use. Specifically, it emphasizes social exchange theory's utility in an inter-organizational context when combined with transaction cost economics. Therefore, this point is more of a theoretical contribution than an actual limitation (see Section 5.2).
- The explorative character of this project means that researchers can use it as a starting point for investigating whether other theories are suitable for studying individual contingency factors in more detail. The present thesis offers a list of contingencies within the buyer-supplier-FSP triad, and future research could build on these. For instance, principle-agent theory could be used to study both internal (e.g., finance versus procurement functions) and external (e.g., buyer versus supplier) conflicts related to FSCM practices for the supply side (Wandfluh et al., 2016).

Overall, the FSCM literature is still young, and future research could move in a variety of directions. Technological innovations (e.g., blockchain technology), new funding concepts (e.g., crowdfunding), regional financing differences (e.g., Islamic financing), or linkages to sustainability research (e.g., funding suppliers in developing countries) are only a few topics relevant to FSCM (Templar et al., 2016). This thesis builds a solid foundation for understanding inter-organizational financing with a supply side focus. Nevertheless, additional studies are needed to further enrich research on FSCM.

Appendices

Appendix A. Towards a framework for financial supply chain management practices for the supply side

Presented in former versions at the following conferences:

25th International Purchasing and Supply, Education and Research Association Conference, March 20-23, 2016, Dortmund.

24th European Operations Management Conference, Edinburgh, July 1-5, 2017, (status: accepted).

Published in a former version:

Martin, J. and Hofmann, E. (2016), "Configuring supply chain finance practices: A triadic perspective", *Proceedings of 25th International Purchasing and Supply, Education and Research Association Conference*, Dortmund.

Submitted to the special topic forum on supply chain finance in the Journal of Purchasing and Supply Management (status: *In revision*).

Appendix B. Predictors and outcomes of suppliers' commitment to financial supply chain management practices for the supply side

Presented in a former version at the following conference:

23rd European Operations Management Conference, Trondheim, June 17-22, 2016.

Published in a former version:

Martin, J. (2016), "Suppliers' participation in supply chain finance: Relationship- vs. working capital-related motives", *Proceedings of the 23rd European Operations Management Association Conference*, Trondheim.

Accepted for the International Journal of Integrated Supply Management in an adapted version (status: *Forthcoming*).

Appendix C. Financial service providers as enablers of financial supply chain management practices for the supply side

Presented in a former version:

14th Finance, Risk and Accounting Management Perspectives Conference, Oxford, September 22-24, 2014.

Published in a former version:

Martin, J. and Hofmann, E. (2014), "Managing financial flows in supply chains: How companies can benefit from financial service providers", *Proceedings of the 14th Finance, Risk and Accounting Management Perspectives Conference*, Oxford.

Published in an adapted version:

Martin, J. and Hofmann, E. (2017), "Involving financial service providers in supply chain finance practices: Company needs and service requirements", *Journal of Applied Accounting Research*, Vol. 18 No. 1, pp. 42–62.

A Towards a framework for financial supply chain management practices for the supply side

Judith Carin Martin*, Erik Hofmann*

*Chair of Logistics Management, University of St. Gallen[51]

A.1 Introduction

Modern business management has long emphasized optimizing individual firms' funding structures. Extending payment terms towards suppliers is therefore a common means of avoiding dependence on traditional external equity and debt financing through trade credit (Casey and O'Toole, 2014). The consequences for material flows in supply chains are manifold, with financial risks increasing within upstream supply chains (Blome and Schoenherr, 2011). Some suppliers respond by rising prices or offering products of lower quality (Hofmann and Belin, 2011; Klapper and Randall, 2011). This focus on individual firms contradicts the basic paradigm of supply chain management (SCM), which stresses that companies "no longer compete as solely autonomous entities, but rather as supply chains" (Lambert and Cooper, 2000, p. 65). Practices that foster the inter-organizational management of financial flows in supply chains are thus needed. Increasingly, companies are responding to this need by offering financing alternatives to supply chain partners, via so-called financial supply chain management (FSCM) practices. In particular, FSCM practices for the supply side have become popular in recent years (Gelsomino et al., 2016; Lamoureux and Evans, 2011). For instance, financial service providers (FSPs) enable longer payment terms for buyers while at the same time, suppliers still receive early payment (Tanrisever et al., 2012). Other practices involve buyers paying suppliers earlier in exchange for "dynamic" discounts on prices. Furthermore, some buyers offer financing alternatives to their suppliers upon delivery or upon receipt of the purchase order (Bryant and Camerinelli, 2014).

Previous FSCM studies have examined the inter-organizational management of financial flows and identified the benefits for the entire supply chain (e.g., Gomm, 2010; Hofmann and Belin, 2011; Randall and Farris, 2009; Scott Pezza, 2011). Most previous work in this area, however, has either remained on the conceptual level or analyzed

[51] For information on publication process and current publication status for study A see Appendix front page, p.74.

specific FSCM techniques. In particular, several studies have focused on approved payables financing (Wandfluh et al., 2016), and researchers have identified prerequisites for its application. For instance, van der Vliet et al. (2015) discussed how a supplier's financing costs and existing payment terms affect approved payables financing. Lieb et al. (2016) examined antecedents of, and barriers to, its application, including buyer's bargaining power. Yet, the question arises as to whether these factors are only relevant for approved payables financing, or whether they apply to financing alternatives for the supply side in general.

Moreover, previous studies have barely scratched the surface in terms of when different kinds of techniques are preferable. Studies by Caniato et al. (2016) and Wuttke et al. (2013a) constitute two exceptions, since they both involved a respective comparison. Nevertheless, they are more of a starting point than a comprehensive analysis. Overall, the FSCM literature has revealed a need for guidance regarding how the context affects the provision of financing alternatives, as well as differences between FSCM practices for the supply side.

Providing such guidance is complex, however, since FSCM practices for the supply side involve various actors. Buyers need to commit offering a financing alternative for suppliers (Templar et al., 2016), while suppliers also must signal their willingness to participate (Wuttke et al., 2016). Furthermore, FSPs often facilitate the application of FSCM practices for the supply side (Fellenz et al., 2009; Silvestro and Lustrato, 2014). Therefore, factors explaining the buyers and suppliers' commitment, as well as service requirements for FSPs, are needed to understand the application of different practices. In accordance with the goal of developing guidelines regarding the provision of financing alternatives for the supply side, this study addresses the following research question:

RQ: *Why are FSCM practices applied for the supply side, and how can differences between these practices be explained in relation to the buyer-supplier-FSP triad?*

This study employs the term "practices," as it suggests a more general unit of analysis (Sousa and Voss, 2008). This choice is in accordance with the operations management (OM) and SCM literature, which defines practices as "the set of activities undertaken by an organization to promote effective management of its supply chain" (Li et al., 2006, p. 109). In contrast, techniques and instruments are the methods that an organization employs to perform these activities (Rönnbäck and Witell, 2008; Tan and Wisner, 2003). Transferred to the FSCM context, approved payables financing constitutes a technique allowing buyers to offer post-shipment, supply chain-external financing practices to

suppliers. Sousa and Voss (2002, p. 92) have stressed that "techniques are too detailed to obtain reliable results" in the context of financing alternatives in general.

To answer the research question, we first derive criteria from literature to classify FSCM practices for the supply side. Based on this classification, multiple case studies are conducted to understand the contexts in which different practices are applied. The contingency approach structures the analysis of possible contextual situations within the buyer-supplier-FSP triad. We employ a case study design, due to the explorative character of the research (Eisenhardt, 1989b; Langley and Abdallah, 2015). The case study findings allow us to derive propositions, as well as a contingency framework for FSCM practices for the supply side.

This paper is structured as follows: First, we provide an overview of the current state of research on financial flows in supply chains and develop a research framework for our further analysis (Section A.2). The next section describes the methodology (Section A.3). Subsequently, Section A.4 and Section A.5 present the results of the cross-case analysis. Finally, the theoretical and practical implications of the results are discussed (Section A.6), and then the findings are summarized in Section A.7.

A.2 Conceptual background

A.2.1 Management of financial flows in supply chains

The SCM literature has examined the integrated management of supply chain flows, and it has thus treated financial flows as a central element (Mentzer et al., 2001; Stock and Boyer, 2009). Scholars describe financial flows as the flow of cash, capital tied up in material flows (e.g., inventories) and financial information (e.g., invoices; Blount, 2008; Comelli et al., 2008; Fairchild, 2005). Previous studies on SCM have mainly focused on the management of material and information flows (Gomm, 2010; Hofmann and Belin, 2011). Yet, they have indirectly captured financial factors, and, thus, enable initial implications for the management of financial flows.

Studies on *SCM* have used financing restrictions and costs as parameters in their analyses of supply chain decisions (Chandra and Grabis, 2007; D'Avanzo et al., 2003; Rodrigue, 2012). For instance, scholars have studied how inventory holding costs and advanced payments affect order quantities (Käki et al., 2015; Yan et al., 2016). Furthermore, financial performance models (e.g., the return on assets model and the du Pont model) have measured the financial impact of supply chain decisions (Billington et al., 2002; Keebler, 2001). These models reveal how supply chain initiatives (e.g., just-

in-time approaches and integrated inventory management) affect the volume and duration of tied-up capital (Claassen et al., 2008; Kannan, 2005). Yet, the SCM literature has primarily treated capital costs as given, rather than as levers that can be managed across supply chains (Pfohl and Gomm, 2009). In particular, funding sources have not received much attention. Research on supply chain risks represents an exception, and it has analyzed the negative effect of financial distress on supply chains (Chen et al., 2013a; Chopra and Sodhi, 2004; Colicchia and Strozzi, 2012). Nevertheless, risk-management tools have emphasized transparency or monitoring, neglecting the inter-organizational management of funding sources (Wandfluh et al., 2016).

The *finance literature* has explicitly analyzed funding sources, although at the firm level (Brealey et al., 2011; Clayman et al., 2012). Scholars have compared internal and external funding sources to determine optimal funding structures (Almeida and Campello, 2010; Myers and Majluf, 1984; Rahaman, 2011). Thereby, working capital management (WCM) is a common approach that firms can follow to reduce their dependence on external equity and bank credit financing (Boisjoly and Izzo, 2009; Singh and Kumar, 2014). Studies have used the cash-to-cash cycle to measure and reduce the time gap between cash inflows from customers and cash outflows to suppliers (Jose et al., 1996). Suppliers thereby represent a possible source of financing, thanks to their provision of trade credits. Nevertheless, studies have emphasized optimizing individual companies' cash-to-cash cycles, with negative consequences for other supply chain members (Wandfluh et al., 2016).

The *trade finance* research has further analyzed firm's motives for providing trade credits through deferred payments (Casey and O'Toole, 2014; Casterman, 2012; Emery, 1984; Seifert et al., 2013). Studies in this area have shed light on the inter-organizational management of funding sources. Petersen and Rajan (1997) cited price promotions and price discrimination as reasons that suppliers offer trade credits. Moreover, scholars have identified determinants of trade credit terms, and emphasized that buyers consider a supplier's financial situation when defining payment terms (Ng et al., 1999; Yan et al., 2016). Yet, the existing trade finance literature has focused on downstream funding rather than on upstream funding.

In recent years, *FSCM research* has emerged at the intersection of both fields of research. Scholars have stressed the importance of the inter-organizational management of financial flows in supply chains (Blackman et al., 2011; Randall and Farris, 2009; Tanrisever et al., 2012). For instance, Hofmann and Kotzab (2010) evaluated the negative effects of a company-focused approach to WCM in supply chains. Nevertheless, previous research misses a common definition of FSCM (Hofmann and

Johnson, 2016). Various scholars and practitioners have equated FSCM with a single technique: approved payables financing (Lekkakos and Serrano, 2016; Tanrisever et al., 2012; van der Vliet et al., 2015). Others have developed a broad understanding of FSCM, including the transfer of financial information and the inter-organizational management of funding sources and tied-up capital (Caniato et al., 2016; Gelsomino et al., 2016; Hofmann and Belin, 2011). This paper adopts a comprehensive understanding of FSCM, but with a focus on inter-organizational financing, due to the above-mentioned gaps in the SCM literature. Furthermore, our focus on the supply side builds on the trade finance literature's previous focus on downstream supply chains.

A.2.2 Financial supply chain management practices for the supply side

As previously mentioned, the literature does not provide a clear terminology for FSCM. Similarly, previous studies lack common definitions of activities to transfer the general concept of FSCM towards its concrete application. The range of terms employed includes "solutions," "instruments," and "practices" (Caniato et al., 2016; Lekkakos and Serrano, 2016; Wuttke et al., 2013). Yet, related fields of research, and OM in particular, derive a classification to describe a study's level of examination. Thereby, scholars have defined practices as activities for the purpose of actual application classifying them between general principles and specific techniques (Rönnbäck and Witell, 2008; Tan and Wisner, 2003). In this context, FSCM practices for the supply side include the activities that a buyer undertakes to offer financing alternatives to suppliers. In contrast, supply chain members employ FSCM techniques (e.g., approved payables financing) to perform FSCM practices for the supply side. The existing FSCM literature has focused on either general principles (e.g., Gomm, 2010; Wandfluh et al., 2016) or specific techniques (e.g., Tanrisever et al., 2012; van der Vliet et al., 2015; Wuttke et al., 2016). In particular, approved payables financing has been the focus of various analytical models and empirical, case study-based studies. For instance, Iacono et al. (2015) simulated the effect of different factors, such as competition and receivables volumes, on the market adoption of approved payables financing. The emphasis on a single technique impedes comparisons of different techniques, due to the high specificity of results (Sousa and Voss, 2002). As already stressed, the question arises as to whether findings on individual techniques are generalizable to funding alternatives for the supply side in general. Using a broader unit of analysis—FSCM practices for the supply side—enables the derivation of such implications.

Only few scholars provide insights to further specify FSCM practices for the supply side. Caniato et al. (2016) distinguished supply chain collaborative solutions from

traditional and innovative financing solutions. Moreover, Wuttke et al. (2013a) differentiated between post-shipment and pre-shipment financing practices on the basis of timing.[52] Post-shipment financing occurs after goods have been delivered and approved by the buyer, while pre-shipment financing is offered during, or prior to, shipment. Finally, Templar et al. (2016) distinguished between supply chain-internal and supply chain-external funding sources, depending on whether the approach involves an additional funder or utilizes the buyer's own funds. The latter approach results in a working capital increase for buyers. In accordance with this paper's emphasis on inter-organizational financing, Wuttke et al. (2013a) and Templar et al.'s (2016) dimensions are used to further classify FSCM practices for the supply side. Thus, Figure A-1 depicts four types of practices (with example techniques), classified according to the dimensions "time of financing" and "source of funds." Appendix A.8 includes a brief description of these FSCM techniques.

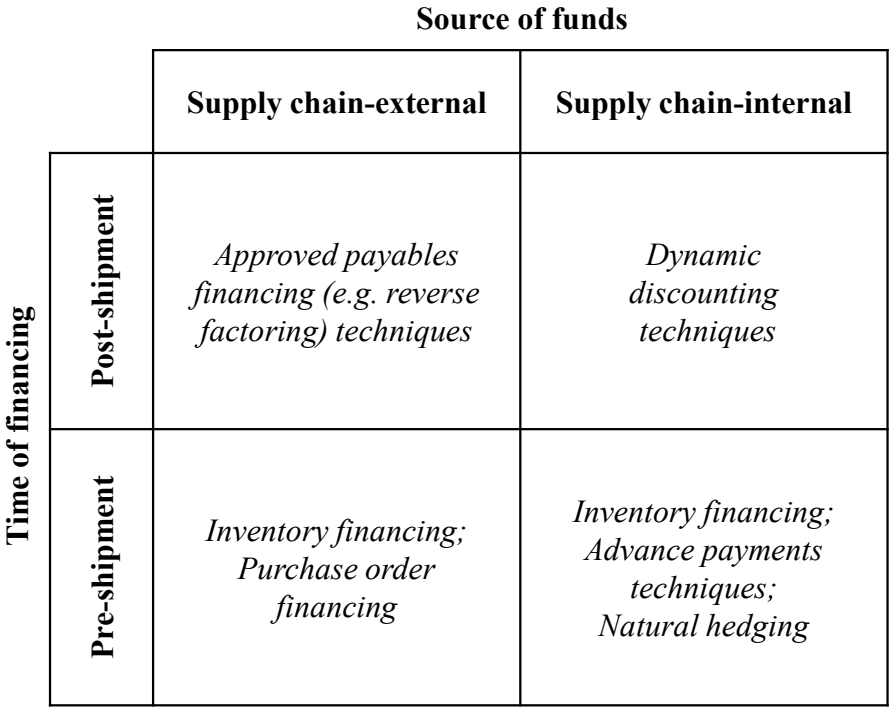


Figure A-1: Classification of FSCM practices for the supply side and corresponding FSCM techniques

A.2.3 Contingency approach

The third relevant research area refers to the contingency approach, which constitutes a common theoretical lens for studying organizations (Donaldson, 2001; Miller, 1987). It

[52] Pre-shipment financing is sometimes additionally subdivided into pre-shipment and at-shipment financing (Bryant and Camerinelli, 2014). At-shipment financing occurs during shipment, while pre-shipment financing takes place prior to shipment. We treat them as one financing type, due to their similar risk structures.

introduces the idea that a fit between an organization's activities and its context can boost performance (Doty et al., 1993). Consequently, an activity's efficiency level depends on the organizational context. Scholars have utilized internal and external contingency variables to specify the relevant context (Chandler, 1969). Initial studies in in this area have applied the contingency approach to supply chains, resulting in a distinction between endogenous, relationship-related, and exogenous contingency variables (Flynn et al., 2010; Kajüter and Kulmala, 2005; Wagner and Bode, 2008). Furthermore, previous research on the contingency approach has identified three types of fits, which can be used to analyze managerial problems (Sousa and Voss, 2008). The first form does not explicitly consider performance but addresses the match between contingencies and activities (Drazin and Van De Ven, 1985). In contrast, the interaction form describes pairs of contingencies and activities that influence performance. The third form extends the second one to cover entire systems, integrating multiple contingencies and activities, as well as their impact on performance (Sousa and Voss, 2008).

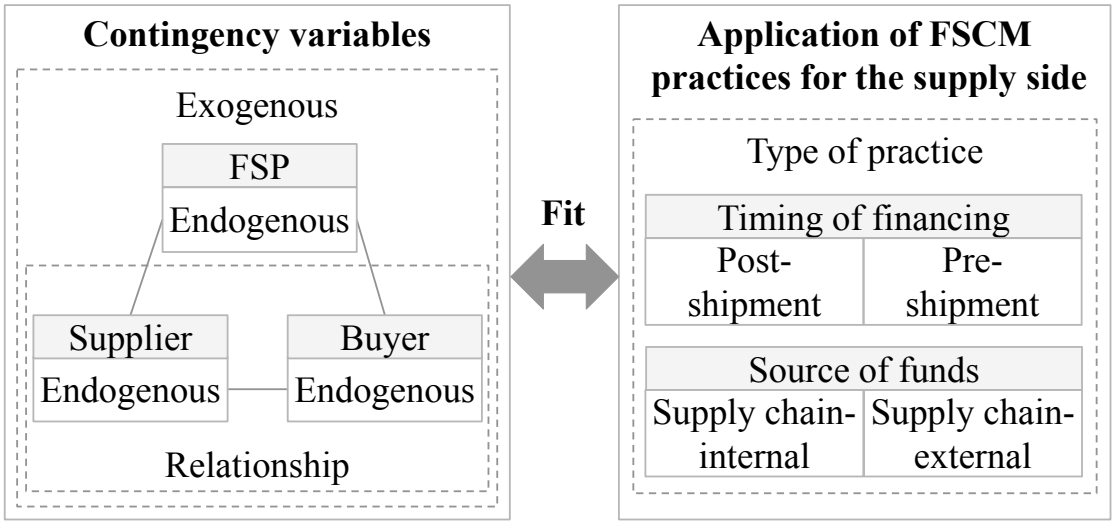


Figure A-2: Preliminary framework based on the contingency approach

In our study, the contingency approach forms a foundation for structuring the explorative examination on FSCM practices for the supply side. It underlines the assumption that the application of practices depends on the distinct context of the buyer-supplier-FSP triad. In addition, differences in contingency variables can explain the selection of different FSCM practices for the supply side. Providing guidance on the application of different FSCM practices for the supply is complex, as it requires more than the commitment of an individual organization (Rogers and Leuschner, 2015; Seifert and Seifert, 2011). The relevant context for the provision of financing alternatives is the buyer-supplier-FSP triad. Thus, we distinguish among endogenous, relationship-related, and exogenous contingency variables in the buyer-supplier-FSP triad, as presented in

Figure A-2. Our study refers to the first form of fit as addressing the match between contingencies and the application of different FSCM practices for the supply side.

A.3 Case study method

A.3.1 Study design

Our research examines the application of FSCM practices with a focus on the supply side. In addition to our previously described reasons, we have selected this focus on the supply side, as it permits an explicit study design. Thereby, we ensure cross-case comparability but can still analyze distinct differences (Eisenhardt, 1989b). We are also able to clearly define the role of actors involved in FSCM practices: Who offers the financing alternative (buyers)? Who accepts it (suppliers)? Who enables it (FSPs)? Furthermore, we primarily focus on FSCM practices for the supply side, because of their level of maturity in practice, which enables an empirical approach, rather than simply a model-driven one.

We employed a multiple case design, as this allowed us to contribute to theory development in the newly evolving field of FSCM (Eisenhardt and Graebner, 2007; Langley and Abdallah, 2015; Siggelkow, 2007). Throughout our entire research process, we sought to ensure construct validity, internal validity, external validity, and reliability (see Table A-1), referring to Gibbert et al. (2008) and Yin (2009).

Buying companies strongly influence the application of FSCM practices for the supply side, since they mainly initiate financing alternatives for suppliers. Therefore, we began by examining buyers and then moved on to suppliers and FSPs. Our study relied on data triangulation, which combined multiple sources (Miles et al., 2014). We conducted interviews with buyers (50 to 90 minutes in length), as well as with suppliers and FSPs (both 30 to 45 minutes in length). All interviews relied on semi-structured questionnaires, but the focus depended on the particular actor (Yin, 2009). We used both internal and external materials (e.g., presentations and brochures) on the applied FSCM practices for the supply side. Publicly available information, and especially company websites and annual reports, provided general insights on buyers and their recent financial performance. Furthermore, we conducted a half-day workshop with representatives of all participating buying organizations. We briefly presented our main results to the experts and discussed our initial propositions with them (Bryman and Bell, 2015).

	Definition	Operationalization examples
Construct validity	Use of adequate measures for the examined constructs	• Development of semi-structured questionnaire in accordance with the related literature • Data triangulation of multiple sources • Multiple interviewers • Reviews of transcripts by interviewers
Internal validity	Establishment of causal relationships and identification of spurious correlations	• Research framework based on the contingency approach • Inclusion of multiple, well-informed respondents • Open-coding and pattern-matching among cases
External validity	(Partial) generalizability of results to another context	• Within-case analyses • Theoretical sampling approach • Comparative, multiple case design, including different types of practices and adopters/non-adopters within the buying companies
Reliability	Possible repetition of examinations with same findings	• Case study protocols • Case study database • Semi-structured questionnaire as basis for interviews • Transcripts of all interviews • Involvement of independent researchers

Table A-1: Measures to ensure validity and reliability of case study results

A *buyer* interview was conducted with at least one senior representative in the finance department and in the SCM or procurement department. In that manner, we could capture the cross-functional character of FSCM practices for the supply side (Gelsomino et al., 2016). For two buying companies, we performed additional interviews with representatives of a dedicated FSCM department. The selected interview partners were all directly involved in the FSCM decision within their companies. We added further interviewees until we completely understood the FSCM approach from the buyer's perspective (Miles et al., 2014). As all participants were involved in implementing FSCM practices within various business units, we were able to detect differences between these business units through an embedded case study design (Yin, 2009). In total, we conducted 20 interviews with representatives of buying companies.

In addition, for those buyers already offering a financing alternative for the supply side, our analysis also considered their suppliers and FSPs. *For suppliers*, we interviewed the chief executive officers (CEOs) of small and medium-sized (SME) suppliers, as well as dedicated experts within the finance departments of large, multinational suppliers, for a total of six additional interviews. *For FSPs*, we considered banks and technology

providers participating in the specific FSCM practices for the supply side. As two cases involved separate regional programs partnered with different banks, we interviewed representatives of both banks. In sum, we conducted eight interviews with FSPs. Still, buyers provided most of the information for our study.

A.3.2 Case selection

The case selection followed a theoretical sampling approach (Eisenhardt, 1989b; Glaser and Strauss, 1967; Langley and Abdallah, 2015). First, we ensured that the buyer firms were similar in terms of size (large companies), industry (manufacturing and commerce), and headquarter (Europe). Size restrictions were essential and ensured that the companies had similar organizational structures. We focused on large buyers, since they so far lead the way for applying FSCM practices for the supply side. The annual sales volume for 2016 ranged between 3-80 billion euros, meaning that we could still draw conclusions about the effect of company size. We focused on companies from the manufacturing and commerce industries, since they had similar working capital orientations, in contrast to service firms (Chiou et al., 2006; Singh and Kumar, 2014). Finally, companies with similar origins face comparable economic trends, legal issues, and financial markets (Wagner and Bode, 2008; Wuttke et al., 2013a).

Second, we selected cases that differed in terms of types of practices, adoption stages, types of FSPs involved, and interviewed suppliers. We made sure to include *all types of FSCM practices for the supply side*. Post-shipment, supply chain-external financing practices (e.g., approved payables financing) were rather mature in terms of market adoption and thus comprised the largest share of the dataset. Yet, all other types of FSCM practices for the supply were also addressed, as Table A-2 indicates.

Furthermore, we explored different *stages of adoption* regarding FSCM practices for the supply side. We considered buyers with well-established FSCM practices for the supply side, some of which were initiating adaptations and possible extensions involving other practices. Understanding these changes was of particular interest for us, as it shed light on differences between FSCM practices for the supply side. At the same time, all of these buying companies' business units were at different steps of the adoption process, and they included also non-adopting business units. Thus, we could detect distinct contexts relevant for adopting and non-adopting business units (Bryman and Bell, 2015). We also involved buyers that had not yet offered a financing alternative to suppliers but that were planning to do so within the next two years. There, we gained direct access to their evaluation criteria and processes. This approach allowed us to differentiate

between contingencies for the actual application decision and factors connected to the subsequent implementation.

Additionally, we guaranteed the involvement of *different types of FSPs* within our cases to avoid biased results. For instance, in some cases, a single bank acted as an external partner, while in others, multiple banks or technology providers filled that role. Two buyers discussed excluding FSPs entirely from their practices. Finally, the cases were *diverse in terms of interviewed suppliers* and these ranged from large multinationals to SME suppliers. Table A-2 includes a comparison of the financial strength of the buyers and suppliers considered in our case studies. Thereby, we also captured arrangements in which the participating supplier was the financial stronger party.

The diversity of our case sample enhanced the external validity of our results (Gibbert et al., 2008; Yin, 2009). Our case selection followed an iterative process of data collection and initial analyses (Glaser and Strauss, 1967). Additional cases were only included when they deepened our knowledge of the four above-mentioned dimensions. We stopped adding cases when additional insights were marginal (Eisenhardt and Graebner, 2007; Langley and Abdallah, 2015).

A.3.3 Case analysis

Our analysis integrated all of the above data sources, including interview and workshop transcripts, as well as additional materials. Initially, we performed a within-case analysis to better understand the actors and the FSCM practices for the supply side that they had considered or applied (Bryman and Bell, 2015). The results are briefly summarized in Table A-2, and implicitly captured in the subsequent sections.

Afterwards, we conducted a cross-case analysis, which allowed us to identify differences and common patterns (Eisenhardt, 1989b; Gephart, 2004; Langley and Abdallah, 2015). We used codes grounded in the data to analyze our cases (Glaser and Strauss, 1967; Yin, 2009). The codes were then categorized and challenged in accordance with previous literature and theory (Miles et al., 2014). Multiple researchers reflected on these categories and then organized them in order of their importance in terms of the research objective. Furthermore, we discussed the resultant categories with the workshop participants and incorporated their feedback. Finally, we classified the categories according to our preliminary framework based on the contingency approach. Our analysis differentiated between contingencies for the general application of practices and contingencies for the selection of specific practices. To gain further insights, we included descriptions and operationalization of those categories related to

the general application of practices (see Table A-3). Within the subsequent sections, citations are involved to delineate low and high values for our categories. Additionally, we include examples demonstrating differences in applied FSCM practices for the supply side. These are in Table A-4 (supply chain-internal versus supply chain-external financing) and Table A-5 (pre-shipment versus post-shipment financing). Our findings are based on a rich dataset, and the subsequent explanations cannot capture its full depth, but involve only illustrative examples.

		Alpha	Beta	Gamma	Delta	Epsi-lon	Zeta	Eta	Theta
Size		Huge	Huge	Huge	Large	Huge	Large	Large	Large
Type of industry		Manu-factu-ring	Manu-factu-ring	Com-merce	Manu-factu-ring	Phar-maceu-tical	Trans-porta-tion	Trans-porta-tion	Com-merce
Number of interviews									
Buyer	Finance	1	2	2	1	1	1	1	1
Buyer	Opera-tions	1	1	2	2	1	1	1	1
Supplier		1	1	1	1	1	1	-	-
FSP		2	1	1	1	2	1	-	-
Additional interview characteristics									
Relative financial strength*		B = S	B > S	B > S	B < S	B > S	B < S	-	-
Type of FSP		Bank	Tech-nology provider	Tech-nology provider	Bank	Bank	Bank		
Applied FSCM practices for the supply side									
Pre-shipment						○	○		
Post-shipment		✓	✓	✓	✓	✓	✓	☐	☐
SC internal				○				☐	☐
SC external		✓	✓	✓	✓	✓	✓	☐	

Table A-2: Overview of cases; *Relative financial strength compares a buyer's financial situation (B) with the interviewed supplier's financial situation (S);
Adoption stage: ✓ = implemented; ○ = pilot projects; ☐ = Planned adoption.

A.4 Findings of cross-case analysis

Applied FSCM practices for the supply side were diverse in terms of the "time of financing" and "source of funds" (see Table A-2). The cases Gamma, Epsilon, and Zeta intended to adapt or extend their applied practices. For instance, Gamma started to utilize its own funds for financing within initial pilot projects. In contrast, Epsilon and Zeta extended their post-shipment towards pre-shipment financing for selected suppliers. To structure our analysis, we first derived those contingencies relevant to the general provision of financing alternatives for suppliers, independent of the specific practice (Section A.4.1). Subsequently, we considered those contingencies explaining differences between selected FSCM practices for the supply side (Section A.4.2). All of our cases involved financing alternatives offering some sort of discount on the suppliers' revenues in return for the funding. All buyers kept these funding costs for suppliers as low as possible to increase the practices' attractiveness for that group. We only included contingencies that are also relevant when suppliers gain access to financing without any charges. The resultant differences are addressed within both individual sections and the subsequent discussion of findings.

A.4.1 Contingencies of applying practices

Our analysis yielded numerous insights into possible contingencies within the buyer-supplier-FSP triad. We prioritized them in accordance with patterns that were present in the dataset, and the below section presents them according to the framework categories described in Section A.2.3.

Buyer-related endogenous

Buyer-related endogenous contingencies constitute all buyer-internal prerequisites for the application of FSCM practices for the supply side. All cases underlined that *buyers needed to be financially strong* to offer financing alternatives to suppliers. In contrast to company-focused financing, such FSCM practices involve the supplier accessing the buyer's financing costs and funding sources (Dyckman, 2011; Meijer and Bruijn, 2013). Thus, a buyer's financial strength forms the foundation of FSCM practices for the supply side. It ensures that funds are continuously available for suppliers. As a financial representative from Delta explained, "What will happen with our practice when our credit rating worsens? We may have to abandon the provision of financing to our suppliers." Financial stability is especially essential when suppliers begin to rely on funds from their buyers. Moreover, a buyer's financial strength reduces the arising financing costs for suppliers, as described by a procurement manager from Alpha: "Our

rates are very beneficial and attractive to our suppliers due to our good credit rating." With less financially strong buyers, suppliers' financial benefits decline, making FSCM practices less applicable.

Increasing *company size* allows business units to realize synergy effects between business units, and it ensures an adequate amount of available resources for managing FSCM practices for the supply side. Delta, the smallest buyer within our case sample, described that its finance department only contained two employees, who were both responsible for other major projects. For Delta, managing FSCM practice for the supply side was difficult. All of the interviewees emphasized that FSCM's complexity demands specialized finance and supply chain knowledge. Unlike Delta, Alpha, Beta, Gamma, and Epsilon had established dedicated project teams, with employees specialized in FSCM. A representative from Beta stated that, "We have a centralized team of around five people who combine know-how on SCM, as well as finance, and are solely responsible for our practices across business units and countries." It is important to note that being a large firm is not always beneficial in an FSCM context. Although size encourages the application of FSCM practices for the supply side, it also impedes subsequent implementation, due to the complexity of internal interfaces.

Moreover, FSCM studies have citied the relevance of inter-organizational collaboration (Caniato et al., 2016). In contrast, our results indicated that *rather financial strategy alignment* of the finance and operations department is a key prerequisite for the application of financing alternatives, with this factor having a greater effect than inter-organizational collaboration. Such an alignment resolves cross-functional conflicts that would otherwise form fundamental barriers (Wandfluh et al., 2016). For instance, application becomes difficult when the procurement department wants to achieve lower purchase prices and the finance department desires to improve the firm's working capital position. As the head of procurement at Beta put it, "Our purchasers do not like to hear about payment extensions. They fear suppliers could increase their prices." In contrast, Theta's finance and operations departments both pursued profit-related objectives, resulting in joint efforts to achieve them. Common incentives played a crucial role in aligning financial strategies across units. Epsilon's finance manager described what happens in the absence of such an alignment: "We failed in one business unit, although suppliers revealed a strong need for financing. Within this business unit, the procurement department captures FSCM as a minor issue in its negotiations, since the employees first have to achieve four opposed key performance indicators (KPIs)." The following proposition summarizes these endogenous contingencies:

- ***P1 – Buyer-related endogenous:*** *A buying company's financial strength, size, and aligned financial strategy jointly contribute to the application of FSCM practices for the supply side.*

Category	Definition	Operationalization (e.g.)
Buyer-related endogenous		
Financial strength	Financial strength stems from low costs, easy access to external funding, and sufficient liquidity (Brealey et al., 2011). It increases the financial benefits of FSCM practices for suppliers.	• Financial costs • Access to external funding • Liquidity level
Company size	A firm's sales and number of employees determine its size. Large corporations benefit from synergy effects across business units (Lambert and Cooper, 2000). They are able to centralize resources and knowledge on FSCM.	• Sales volume • Number of employees
Financial strategy alignment	Financial strategy alignment describes common financial objectives for finance and operations departments (Wandfluh et al., 2016).	• Aligned objectives • Common incentive structures
Supplier-related endogenous		
Financial weakness	The reverse of financial strength (defined above). With increasingly weak suppliers, the benefits of FSCM practices for the supply side rise for them (Brealey et al., 2011).	• Financial costs • Access to external funding • Liquidity level
Working capital orientation	A supplier's working capital orientation describes its focus on working capital and liquidity (Chiou et al., 2006; Erasmus, 2010). It enhances the benefits a supplier stands to gain from FSCM practices for the supply side.	• Working capital objectives • Avoidance of late cash inflows
FSP-related endogenous		
FSCM reputation	FSPs can develop a FSCM reputation in various ways, including financial stability, previous experience with FSCM practices for the supply side, and innovative service offerings.	• Financial strength • Experience with FSCM • Innovativeness of service offerings
IT capabilities	IT capabilities involve platform features, the ability to ensure ERP interfaces, IT knowledge, and technological advancements for platforms (Lacity et al., 2009).	• Simplicity of ERP interfaces • Features of platforms

Category	Definition	Operationalization (e.g.)
Relationship-related		
Reliable goods of exchange	The reliability of goods of exchange is characterized by the quality of products, as well as by the continuity of demand (seasonal/non-seasonal and project/series production).	• Quality level • Continuity of demand • Additional claims after delivery
Aggregated buyer dependence	Buyer dependence describes the degree to which a buyer requires valuable resources from a supplier (Pfeffer and Salancik, 1978). Aggregated buyer dependence on suppliers refers to buyers' overall dependence on their supplier base (Wuttke et al., 2013a).	• Aggregated relevance of supplier base • Substitutability of suppliers
Cash flow uncertainty	Uncertain cash flows increase with the length of payment terms and the level of variance for incoming payments (Ng et al., 1999; van der Vliet et al., 2015).	• Length of payment terms • Punctuality of incoming payments
Supplier dependence on buyers	Supplier dependence describes the degree to which a supplier requires valuable resources from a buyer (Pfeffer and Salancik, 1978).	• Buyer's share of sales volume • Expected future relevance of buyer
Exogenous		
Economic trend	An economic trend can consist of either a stable economic environment or growth rates. A recession increases the need for financing of suppliers and a focus on working capital management (Wilner, 2000).	• Growth rates • Stability of economic situation • Stability of finance industry

Table A-3: Description and operationalization of categories, including related literature (examples)

Supplier-related endogenous

Supplier-related insights into FSCM have been limited or have relied on analytical models (Gelsomino et al., 2016). Our cross-case analysis revealed that financial weakness and a working capital orientation are relevant internal factors that influence suppliers' commitment to, and thus application of, FSCM practices for the supply side. Related research has also cited company size as playing a key role (Berger and Udell, 2006; Lekkakos and Serrano, 2016). In our analysis, findings regarding supplier size were somewhat ambiguous. While Alpha, Gama, Epsilon, and Theta stressed lower financial strength and faster decision making of SME suppliers, the other four cases claimed that SMEs sometimes lacked FSCM knowledge and a working capital orientation. A procurement manager from Zeta pointed out that, "Their privately owned SME suppliers are focused on equity financing. They do not want to depend on alternative financing." Therefore, we excluded company size as a contingency variable.

The relevance of *a supplier's financial weakness* is rather apparent, since financing costs and access to external funding directly influence a supplier's financial benefits (van der Vliet et al., 2015). Thus, as a supplier's financial weakness becomes more pronounced, it enjoys greater leverage from access to a buyer's financial strength. As Beta's supplier explained, "The FSCM practice constitutes a financial benefit for us. We face higher financing costs than does our buyer." In contrast with company-focused financing (Agliardi et al., 2016), a supplier's financial weakness does not restrict its access to FSCM practices, since it benefits from the buyer's financial strength. Consequently, the applicability of FSCM practices for the supply side increases as suppliers become less financially strong.

Yet, financing alternatives for the supply side do not necessarily presuppose financial weakness on the part of suppliers. Eta constituted an illustrative example, citing the importance of a supplier's *working capital orientation*: "We have large, cash-rich suppliers who are still incentivized to improve working capital KPIs. They are interested in an FSCM practice for the supply side." Furthermore, an interviewee from Beta stated that a supplier's working capital orientation comes along with the expertise necessary to evaluate the impact of FSCM practices for the supply side. Thereby, the results added to previous findings on FSCM, emphasizing suppliers' actual working capital positions and financing costs over working capital objectives (Hofmann and Belin, 2011; Wuttke et al., 2013a). The consideration of supplier endogenous contingencies resulted in the subsequent proposition:

- ***P2 – Supplier-related endogenous:*** *A supplier's financial weakness and working capital orientation encourage the application of FSCM practices for the supply side.*

FSP-related endogenous

FSPs do not represent a compulsory actor involved in FSCM practices for the supply side. Yet, they are a key enabler of such financing alternatives (Martin and Hofmann, 2017; Seifert and Seifert, 2011). The cases cited two types of service providers. Beta and Gamma followed an approach centered on technology providers, with a platform provider allowing access to multiple funders. Eta and Theta both also intended to involve a technology provider in their planned supply chain-internal financing practices. Thereby, FSPs facilitate inter-organizational financing through a digital platform. Although all other cases utilized bank platforms, specific approaches varied. For instance, while Zeta used one bank platform with multiple funders, Alpha and Epsilon each offered regional programs with different banks. This variety made it difficult to

derive service requirements. Still, we analyzed common patterns across the cases so that we could contribute to the as-of-yet limited research on FSPs within supply chains (Silvestro and Lustrato, 2014).

All of the cases in our sample stressed that it is important for FSPs to have an *FSCM reputation*, noting that such a reputation can be built in multiple ways. Beta, Zeta, and Eta noted that providers need to be reliable in terms of their financial position and business models. Reliability is crucial, due to the continuous emergence and disappearance of start-ups in the FSCM market. At the same time, several banks experienced financial issues in the aftermath of the economic crises of 2008/2009. The FSCM expert at Beta accordingly explained: "We depend on our FSP to offer our financing alternative to suppliers. The FSP's financial strength is essential, since otherwise we would need to repeat the entire effort with a different service provider." Moreover, all interviewees underscored that FSPs require overall FSCM expertise, in the form of previous FSCM experience and knowledge of SCM and finance. For Beta, Gamma, Epsilon, and Zeta, innovativeness can enhance an FSP's FSCM reputation, since that quality is expected to expand the introduction of innovative types of FSCM techniques.

In addition, FSPs are involved in FSCM practices for the supply side as intermediaries between buyers and suppliers, digitalizing the transfer of invoices and payments, and increasing the transparency of payment processes. In accordance with transaction cost economics, FSPs can thus help to reduce transaction costs (Seggie, 2012; Williamson, 2008). For this to be possible, however, all of the interviewees mentioned that FSPs must have *IT capabilities.* As a regional CFO from Beta pointed out, "With the complexity of more than 80 enterprise-resource-planning (ERP) systems, we need an FSP to offer customized interfaces for all our systems in order to apply FSCM practices for the supply side." Similarly, representatives from Alpha, Delta, and Theta stressed the importance of automated platforms and a streamlined technical structure. The FSPs also emphasized the distinct service requirements of FSCM in contrast to those of traditional funding services. In the context of FSCM, they found funding aspects to be less important, instead citing the need for more guidance on FSCM and associated technological interfaces. From those findings, we derived the below proposition on FSP endogenous contingencies:

- ***P3 – FSP-related endogenous:*** *The FSP's IT capabilities and reputation regarding FSCM promote the application of FSCM practices for the supply side.*

Buyer-supplier relationship-related

In our cases, buyers and suppliers both indicated that relational factors had an effect on their commitment to, and consequently their application of, FSCM practices for the supply side. Yet, their perspectives varied significantly. For buyers, the reliability of goods of exchange and aggregated buyer dependence on suppliers were key contingency variables. For suppliers, their dependence on the buying company and cash flow uncertainty were the primary relational factors.

The previous FSCM literature has not focused on the characteristics of goods of exchange. Some trade finance studies have analyzed the impact of product quality on trade credit terms (Ng et al., 1999). Similarly, transaction cost economics has indicated that characteristics of goods influence, for example, actors' uncertainty levels (Shelanski and Klein, 1995; Williamson, 1979). Transferred to an FSCM context, the *reliability for goods of exchange* determines a buyer's willingness to offer early payments. Gamma and Theta accordingly did not offer financing alternatives for seasonal products, since they returned unsold goods to suppliers at the end of season. Furthermore, they described needing to file claims with suppliers after delivery for quality-related reasons. In contrast, Epsilon introduced such high quality standards for suppliers that it could release payments before quality checks were finished. Thus, the provision of financing alternatives to suppliers presupposes reliable goods of exchange for buyers.

Wuttke et al. (2013a) introduced the notion that the provision of financing alternatives for the supply side is not determined by a buyer's dependence on individual suppliers, but rather by the *buyer's aggregated dependence on the supplier base*. Our results supported their findings. All buyers noted that they only offered FSCM practices for the supply side for business units that depended on their supplier base. For instance, Zeta explained that it had stopped offering an FSCM option for one business unit, because it purchased commodities traded on markets and did not depend on the supplier base.

In contrast, for suppliers, the specific buyer-supplier relationship was relevant. A *supplier's dependence* defines the relational and financial leverage it stands to gain from FSCM practices for the supply side. With an increasing share of the buyer for suppliers' sales volume, the funding volume raises as well, and thus also financial leverage. Previous FSCM studies have mainly underscored the relational leverage of a supplier's dependence (Liebl et al., 2016; Wuttke et al., 2013b). In particular, they have described the impact of power, as defined in social exchange theory, to pressure suppliers to commit (Caniato et al., 2016). Nevertheless, the type of relational leverage again depends on the supplier's own power position. In our study, Alpha, Delta, and Zeta

emphasized the state of interdependence, besides buyer power, in long-term and trusting relationships for financially strong suppliers with a limited working capital orientation. Zeta's supplier explained its commitment: "For us, our commitment is not driven by any direct economic advantages. Our own credit rating is better than the buyer's rating. Yet, the buyer's practices make longer payment terms acceptable and are an investment in a strategic customer." To sum up, a supplier's dependence on the buying company defines the former's commitment and, thereby, the applicability of FSCM practices for the supply side.

Moreover, a supplier's benefits depend on *cash flow uncertainty,* in terms of existing payment terms and the punctuality of incoming cash flows. This contingency variable transfers the idea of lead times in material flows to financial flows and captures the qualitative benefits of FSCM practices for the supply side (Gelsomino et al., 2016; van der Vliet et al., 2015; Wuttke et al., 2013b). Accordingly, our analysis indicated that cash flow uncertainty increases the application of FSCM practices for the supply side. As the procurement manager from Alpha stated, "Existing long payment terms are a crucial prerequisite for the application of FSCM practices. When I have suppliers with 90-day payment terms, the benefits of an early payment are obvious to them." The various relationship-related factors were captured in the following proposition:

- ***P4 – Relationship-related:*** *Reliable goods of exchange, aggregated buyer dependence, cash flow uncertainty, and supplier dependence encourage the application of FSCM practices for the supply side.*

Exogenous

Exogenous contingency variables detect influential factors within the buyer-supplier-FSP triad environment. Our findings indicated that the general economic climate was the only exogenous variable shared across all cases. Although FSCM market adoption and technological progress were also relevant factors, they served as moderators, as subsequently described. All of the cases underscored that the need for financing alternatives increases during economic downturns, as the example of Epsilon demonstrated: "We benefited from the economic crisis in 2008/2009. From 2010 to 2011, the suppliers' application rate increased by 250%." Similar to previous FSCM studies, the analysis indicated that FSCM practices for the supply side serve as pro-active measures, mitigating upstream financial distress in times of economic downturns (Lamoureux and Evans, 2011). At the same time, our results contradict to some extend the findings of Iacono et al. (2015). Their model of approved payables financing found that an economic downturn would have a limited effect, due to reduced receivables

volumes. Nevertheless, the suppliers within our case sample stressed that strategic buyers have significant financial leverage, even when the overall receivables volumes decrease. We therefore conclude with the following proposition:

- ***P5 – Exogenous:*** *A positive economic trend is negatively associated with the application of FSCM practices for the supply side.*

Moderators of application

With technological progress and FSCM market adoption, our cross-case analysis revealed that two variables moderate the effect of contingencies on the application of FSCM practices for the supply side. These moderators add a dynamic character to our contingency framework.

Currently, FSCM still remains an innovative concept with unexploited potential (Iacono et al., 2015; Wuttke et al., 2016). Nevertheless, in recent years, market adoption has proceeded, with the increased use of approved payables financing and the introduction of new techniques (Bryant and Camerinelli, 2014; Templar et al., 2016). Furthermore, *FSCM market adoption* places pressure on buyers to offer financing alternatives. This occurs when competitors already offer such alternatives, and suppliers start to ask for them. A finance manager from Alpha accordingly indicated that the company had introduced FSCM practices for the supply side to meet market demands and respond to an increasing number of supplier requests. Furthermore, all cases highlighted that FSCM market adoption goes hand-in-hand with an increase in knowledge on financing alternatives, thus reducing suppliers' reluctance. For instance, a procurement manager from Epsilon noted that, "Suppliers are more reluctant to commit to our practice when they do not have any previous experience with related constructs, since they experience difficulties with evaluating possible outcomes." Consequently, increasing market adoption rates strengthen the effects of the above-mentioned contingency variables on the application of FSCM practices for the supply side.

In contrast, the moderating effect of *technological progress* was less consistent. Our findings revealed that technological progress strengthens the effect of certain contingencies, while weakening the influence of others. In general, technological progress reduces the amount of effort needed to apply FSCM practices for the supply side, and it increases the potential benefits (Caniato et al., 2016). For instance, a representative from Gamma underlined that suppliers' paper-based invoices significantly increased the amount of effort the firm needed to expend on its FSCM practices. At the same time, the head of procurement from Delta indicated that automated reports had boosted transparency for their suppliers regarding incoming cash

flows. Thus, technological progress facilitates internal and external interfaces. It reduces reluctance regarding FSCM practices for the supply side and reinforces the impact of most contingencies. Yet, technological progress also decreases the relevance of some contingencies. In particular, a buyer's company size becomes less important as the amount of effort and resources needed to offer financing alternatives declines. Regarding the moderating variables, the subsequent proposition summarizes our findings:

- ***P6 – Moderators:*** *FSCM market adoption and technological progress moderate the influence of all contingency variables on the application of FSCM practices for the supply side.*

A.4.2 Contingencies of selecting practices

Besides addressing the general question of application, our cross-case analysis provided insights regarding the selection of different types of practices. The subsequent sections present the additional contingency variables, as differentiation criteria for determining which types of FSCM practices for the supply side are the most appropriate. We underline that all of these differentiation criteria presuppose the general applicability of FSCM practices for the supply side.

Supply chain-internal versus supply chain-external financing

Supply chain-external financing involves an additional funder from outside the physical supply chain (Templar et al., 2016). In our samples, buyers offered a guarantee to the external funder, in the form of either approved invoices or payment promises. Thereby, they indirectly provided the suppliers with access to their financing costs. Supply chain-external financing does not affect buyers' working capital position. On the contrary, it even improves their working capital position, when buyers combine supply chain-external financing with an extension of payment terms towards suppliers (Liebl et al., 2016; van der Vliet et al., 2015). In our sample, only Gamma did not introduce longer payment terms with its supply chain-external financing options. Supply chain internal-financing utilizes the buyer's own funds to enable earlier payments (Polak et al., 2012). Consequently, the buyer's working capital increases. In return, buyers can secure their deliveries or achieve discounts on procurement prices. Gamma, Eta, and Theta were all considering supply chain-internal practices, and these included requests for "dynamic" discounts on procurement prices. Our findings indicated the existence of three relevant differentiation criteria. Table A-4 presents illustrative citations for these contingencies related to the opposed types of practices.

Gamma, Eta, and Theta all had a very *strong working capital position*. Eta even had achieved a negative working capital position, due to customers' advance payments. Similarly, Gamma and Theta both experienced only a short time gap between cash inflows from customers and cash outflows to suppliers. Accordingly, the head of treasury at Eta stated that, "We have high levels of surplus cash and are looking for new investment instruments." For that firm, supply chain-internal financing was a tool permitting it to invest its surplus cash in exchange for additional returns. In contrast, in the remaining cases, the time gap was considerably longer, resulting in higher levels of working capital. Thus, all of the cases intended to more actively manage the time gap between cash inflows and cash outflows through supply chain-external financing.

Furthermore, *working capital conflicts between buyers and suppliers* lead to a preference for supply chain-external financing over supply chain-internal financing. Transaction cost economics describes how conflicts result in increased transaction costs (Williamson, 2008, 1979). The finance literature has analyzed the role of external funders as intermediaries, but it has focused on debtors and creditors in general, rather than on supply chains (Greenbaum and Thakor, 2007). Supply chain-external financing seeks to solve the conflict between a buyer's goal of extending payment terms and a supplier's goal of accelerating cash inflows. Correspondingly, Alpha and Beta both emphasized the working capital benefits for both themselves and their suppliers. For Zeta, supply chain-external financing was a central financing instrument without negatively influencing its supplier's working capital position. At the same time, the cases revealed two scenarios in which no working capital conflict is present between buyers and suppliers:

- *Buyers have a strong working capital focus, but suppliers do not*: Representatives from Beta, Delta, and Epsilon explained that some suppliers were not interested in participating but still enabled longer payment terms. As Beta's regional CFO described, "We had several suppliers who offered us longer payment terms without committing to our practices. They did not need the cash and wanted to strengthen the relationship with us."
- *Buyers do not have a working capital focus, but suppliers do*: Gamma, Eta, and Theta were all examples of companies with a very strong working capital position, resulting in a limited working capital focus. As a procurement manager from Theta noted, "Our firm's focus is on profitability. We need our resources within procurement to achieve positive effects on profitability." For that firm, supply chain-internal financing played a role in achieving these objectives. Moreover, Gamma and Eta intended to combine supply chain-internal and supply

chain-external financing. An interviewee from Gamma elaborated that the firm was currently testing pilot programs, and these utilized its own cash until a predetermined upper limit, at which point an external funder would become involved, to avoid harming the firm's financial position.

All of the cases also illustrated that general interest rates have an effect on whether supply chain-internal or supply chain-external financing are a better fit. High general interest rates increase the cost of external funding, and particularly of bank credits (Qian and Yeung, 2015). On the other hand, low interest rates facilitate the access to external funds and reduce the pressure on working capital. Negative interest rates strengthen this effect. The CFO of Theta even mentioned that the firm was currently receiving money from banks for borrowing from them. Consequently, an interviewee from Eta described supply chain-internal financing as an appropriate investment tool in a low interest rate environment. In contrast, high interest rates encourage companies to focus on achieving working capital reductions to enhance their self-financing ability (Singh and Kumar, 2014). Thus, supply chain external-financing becomes more interesting, as it releases tied-up capital for buyers.

Category	**Supply chain-internal financing**	**Supply chain-external financing**
Buyer's working capital position	"Our company generates lots of cash that we can utilize for supply chain-internal financing." (Gamma)	"Besides our financial strength, we have funds tied up in working capital that we want to release." (Alpha)
Working capital conflicts	"Margin, margin, margin – everything we do needs to have a positive effect on margin. Working capital and longer payment terms are not a central topic for us."(Theta)	"Supply chain-external financing enables us to prolong our payment terms without negative working capital impacts on our suppliers. They can even improve their liquidity levels." (Epsilon)
General interest rates	"Using our own liquidity for the FSCM practices becomes particularly interesting for us in times of negative interest rates." (Eta)	"High interest rates increase the pressure on working capital and foster the benefits of supply chain-external financing." (Beta)

Table A-4: Examples of quotes regarding key categories related to supply chain-internal and supply chain-external financing

Moreover, our findings suggested that *legal factors* have a moderating effect on the differentiation criteria used for determining whether supply chain-internal or supply chain-external financing is a better fit. For instance, Beta, Gamma, Delta, and Zeta stressed that legal restrictions (e.g., taxes and legislation) had forced them to abandon supply chain-external financing in some countries. Similarly, buyers noted that changing accounting standards pose a risk for supply chain-external financing when they result in

a reclassification of their payables as short-term debt. Such factors enhance the positive effects of a buyer's strong working capital position and low interest rates on supply chain-internal financing, while simultaneously reducing the impact of working capital conflicts. Some buyers additionally mentioned an FSP's business model as a moderating variable. For instance, interviewees from Eta and Alpha noted that banks push their own supply chain-external financing options. Nevertheless, as technology providers become more widespread, this effect diminishes, with the key question becoming how to select an appropriate FSP rather than how to select a specific type of practice. The resulting proposition is accordingly divided into two parts:

- ***P7a:*** *A buyer's working capital position, working capital conflicts, and general interest rates determine the selection of supply chain-internal financing or supply-chain external financing. Low general interest rates and a buyer with a strong working capital position jointly contribute to the application of supply chain-internal financing. Working capital conflicts between buyers and suppliers make supply chain-external financing more attractive.*
- ***P7b:*** *Legal factors have a moderating effect on the relationships between all three factors (P7a) and the selection of supply chain-internal or supply chain-external financing.*

Pre-shipment financing versus post-shipment financing

Pre-shipment and post-shipment financing describe different types of funding alternatives for the supply side, and they differ in terms of whether funding is provided prior to delivery or after delivery (including the approval of invoice). Pre-shipment financing captures a broad time span, ranging from the point when a supplier sources materials, through production and storage, and up until delivery to the buyer. Thereby, the funding risks are higher, since the quality of goods has not been confirmed, and the invoice has not been released for payment. Within our sample, Epsilon and Zeta had started pilot projects assessing pre-shipment financing. Epsilon offered advanced payments for selected suppliers on the basis of the purchase order. To that end, it involved an external funder that financed the time gap between the purchase order and the payment from Epsilon. In partnership with an FSP, Zeta offered some suppliers credit for inventories, and it guaranteed purchases to lower the risk for the external funder. All of the other cases employed post-shipment financing practices for the supply side. Our findings indicated that the specific buyer-supplier relationship is of major importance for pre-shipment financing practices, but not for post-shipment financing practices.

Social exchange theory claims that *trust and interdependence* explain exchange partners' commitment levels (Emerson, 1976; Griffith et al., 2006; Lambe et al., 2001). Our results revealed that both factors are not essential for post-shipment financing, although they are important for pre-shipment financing. Epsilon and Zeta pointed to the importance of a strategic buyer-supplier relationship characterized by mutual trust and interdependence for pre-shipment financing. These characteristics reduce risk levels for actors involved. For instance, Zeta was only considering pre-shipment financing for suppliers with a yearly procurement volume of more than 20 million euros. Lower limits for post-shipment ranged between 50,000-2,000,000 euros in our sample. On the topic of trust, a supplier involved in pre-shipment financing with Epsilon underlined that, "Our relationship with Epsilon is built on trust. Otherwise, pre-shipment financing would not be possible."

Category	**Pre-shipment financing**	**Post-shipment financing**
Commitment level for goods of exchange	"The purchase order basically obliges us to accept the delivery afterwards. Therefore, we are exposed with 95% of the purchase value." (Epsilon)	"We are able to reject deliveries and adapt orders prior to delivery. Thus, it becomes difficult to evaluate financial risks prior to delivery." (Delta)
Trust	"Pre-shipment becomes relevant for reliable and benevolent suppliers, since we know that they adhere to our agreements." (Epsilon)	"Post-shipment financing is based on invoices, reducing risks for us. Trust is beneficial for ensuring suppliers' commitment but not required." (Alpha)
Interdependence	"We only consider pre-shipment financing for very strategic suppliers with a yearly volume of at least 20,000,000 €." (Zeta)	"We also involve suppliers in our FSCM practices that are less relevant for us and account for a yearly procurement volume of minimum 50,000 €." (Beta)
Dispersion of buyer dependence	"Pre-shipment financing is of interest for business units that depend strongly on very few suppliers." (Zeta)	"Most of our suppliers are not easily exchangeable. Still, we avoid being too dependent on suppliers through multiple sourcing." (Eta)

Table A-5: Examples of quotes regarding key categories related to pre-shipment and post-shipment financing

Nevertheless, trust and interdependence alone are not enough to make pre-shipment financing the best fit. Epsilon and Zeta both stressed *high levels of commitment for their goods of exchange* as central prerequisites. One Epsilon business unit needed to invest in suppliers on a large scale to ensure sufficiently high quality standards. Purchase orders resulted in a payment obligation for 95% of the procurement volume. The head of procurement for that business unit explained that, "Once we order, we have to pay anyway. Our investment in suppliers guarantees compliance to our quality standards.

Consequently, the risks of pre-shipment financing diminish." Zeta sourced goods from suppliers that specifically designed those products for it. Similar to Epsilon, the purchase order entailed a partial payment obligation. In contrast, all other buyers indicated that they struggled with evaluating the financial risks associated with pre-shipment financing prior to delivery. They therefore preferred post-shipment financing practices.

Our findings regarding the choice between pre-shipment and post-shipment financing partly contradict those of Wuttke et al. (2013a), who provided initial insights on this topic. They indicated that pre-shipment financing is less attractive for buyers with a weak working capital position relative to the upstream supply chain. Zeta, however, utilized pre-shipment financing to improve its own working capital position. It transferred inventories to strategic suppliers with a strong working capital position, offering a financing alternative through an external funder in exchange. Based on our results, Wuttke et al.'s (2013a) results rather hold true when pre-shipment financing is combined with supply chain-internal funds. Our cross-case analysis supported their findings regarding the dispersion of buyer dependence. Pre-shipment financing involves high levels of buyer dependence with few suppliers, while post-shipment financing is applicable when buyer dependence is more dispersed. Alpha, Beta, Gamma, and Epsilon also offered their financing alternatives to suppliers with smaller procurement volumes and medium to low buyer dependence.

It is important to mention that pre-shipment financing can complement post-shipment financing. As our case descriptions in Table A-2 reveal, Epsilon and Zeta combined both types of funding. They applied post-shipment financing in breadth, as well as pre-shipment financing in depth, for selected strategic suppliers. The findings indicated that this combination presupposes high levels of commitment for goods of exchange, at least for parts of the materials buyers purchase from their suppliers.

Moreover, the industry type seems to moderate these relationships, due to differences in lead times, process structures, and levels of commitment for goods of exchange, as previous studies have demonstrated (Chiou et al., 2006). For instance, in Zeta's industry, lead times were two to five years long, increasing financial pressure on suppliers. Products were designed and made in accordance with customer orders. In contrast, Gamma and Theta were both from the commerce industry, in which lead times were shorter due to a lack of own production. Our findings also demonstrated that dependence levels differed across industries. Consequently, the moderating effect of industry type must be considered when analyzing the choice of pre-shipment financing versus post-shipment financing, as summarized in the following propositions.

- ***P8a:*** *Characteristics for goods of exchange, trust, interdependence, and dispersion of buyer dependence determine the selection of post-shipment versus pre-shipment financing. Pre-shipment financing fits relationships characterized by high levels of trust, interdependence, and goods of exchange with distinct commitment. In contrast, more dispersed buyer dependence promotes the application of post-shipment financing.*
- ***P8b:*** *The type of industry to which buyers and suppliers belong has a moderating effect on the relationships between all four factors (P8a) and the selection of post-shipment or pre-shipment financing.*

A.5 Discussion

Our findings resulted in propositions related to buyers' provision of financing alternatives for suppliers. These combine finance- and supply chain-related factors to explain the general application and specific selection of FSCM practices for the supply side. Based on the contingency approach, we emphasize ensuring a fit between contextual situations and FSCM practices for the supply side, to avoid inefficiencies in the subsequent implementation (Donaldson, 2001). Moreover, contingencies are not limited to buyers, but involve the buyer-supplier-FSP triad.

Some of these contingencies came from previous FSCM studies, which have focused on both specific techniques and inter-organizational financing in general. For instance, van der Vliet et al. (2015) analyzed the effect of existing payment terms on the benefits suppliers gain from approved payables financing. Referring to the trade finance literature, we captured that association as cash flow uncertainty and indicated its overall relevance for the provision of financing alternatives for the supply side (Seifert et al., 2013). Other contingencies (e.g., characteristics of goods of exchange) were adapted from related fields of research, since the existing FSCM research has barely made mention of them. For instance, transaction cost economics describes how characteristics of goods of exchange influence uncertainty (Williamson, 2008).

The contingency approach formed the theoretical basis for our research. Previous research underlines its power in order to integrate explanatory patterns of other theories (Donaldson, 2001). We treated the concept of fit as the basic principle underlying our framework. Furthermore, endogenous, relationship-related, and exogenous contingencies structured our analysis. Transaction cost economics, social exchange theory, and principle-agent theory strengthened the explanatory power of the contingency variables (Cook, 1987; Eisenhardt, 1989a; Williamson, 1979). Existing

FSCM studies have only occasionally applied theoretical lenses (Hofmann and Johnson, 2016). Consequently, the theories employed in this study can serve as a starting point for strengthening the theoretical foundations of FSCM.

Application of practices

Our analysis identified various contingency variables in the buyer-supplier-FSP triad (see Figure A-3). In a best-case scenario, all contingencies will fulfill the requirements for the application of FSCM practices for the supply side. Nevertheless, our findings indicate that not all identified contingencies are obligatory.

As aforementioned, the application of FSCM practices for the supply side presupposes the *commitment of buyers*. Financial strategy alignment thereby constitutes an obligatory prerequisite, since in its absence, a buyer's commitment is limited to specific functions, resulting in internal conflicts and inefficiencies (Wandfluh et al., 2016). In contrast, the provision of financing alternatives is also possible for buyers with lower levels of financial strength and company size. For instance, due to its limited size and strength, Delta introduced an upper limit on funding volumes, keeping its program manageable. Moreover, reliable goods of exchange and aggregated buyer dependence on suppliers are essential relational factors ensuring a buyer's commitment.

Our findings reveal that *suppliers' commitment* to funding alternatives is always founded on a supplier's dependence on the buyer. Supplier dependence thereby determines the financial and relational leverage of FSCM practices for the supply side. Previous FSCM research has underscored the importance of buyer power, which permits buyers to pressure their suppliers to participate (Liebl et al., 2016; Wuttke et al., 2013b). Our findings do not contradict these insights. Yet, they also point to the significance of interdependence. Our sample included three suppliers that described their commitment as a deliberate investment in selected strategic partnerships. Through the employed practices, they extended payment terms for strategic customers without negative affecting their own working capital position.

Based on the supposition that supplier dependence is a general prerequisite, we differentiate *three types of reasons for suppliers to commit*: First, some suppliers are primarily motivated by financial reasons (type A), and suppliers with high financing costs and a difficult access to external funding fall into this category (Brealey et al., 2011; Myers and Majluf, 1984). Second, financially stronger suppliers with a distinct working capital orientation and cash flow focus (type B) benefit from the positive effects on their working capital positions. Third, in the absence of other reasons (types A and B), suppliers commit to financing alternatives only for relational reasons (type C). The

next step is then to categorize relationships on the basis of buyer power and interdependence.

In specific cases, buyers offer their suppliers financing alternatives free of charge, so as to ensure deliveries. Suppliers' commitment is then not an issue. The above contingencies are still relevant, since they mean that the funding alternative gives suppliers financial leverage. Overall, suppliers have diverse reasons for committing, and the existing literature has not yet comprehensively explored these.

In addition, FSPs do not necessarily need to be involved in FSCM practices for the supply side (Gelsomino et al., 2016). Yet, they often serve as enablers (Silvestro and Lustrato, 2014). Thus, FSCM reputation and IT capabilities serve as *service requirements for FSPs,* describing their role as a facilitator. Both contingencies address the objective of reducing transaction costs by involving service providers, as expressed in transaction cost economics (Williamson, 2008). Our findings thereby contribute to the limited existing insights on FSPs in supply chains (Fellenz et al., 2009).

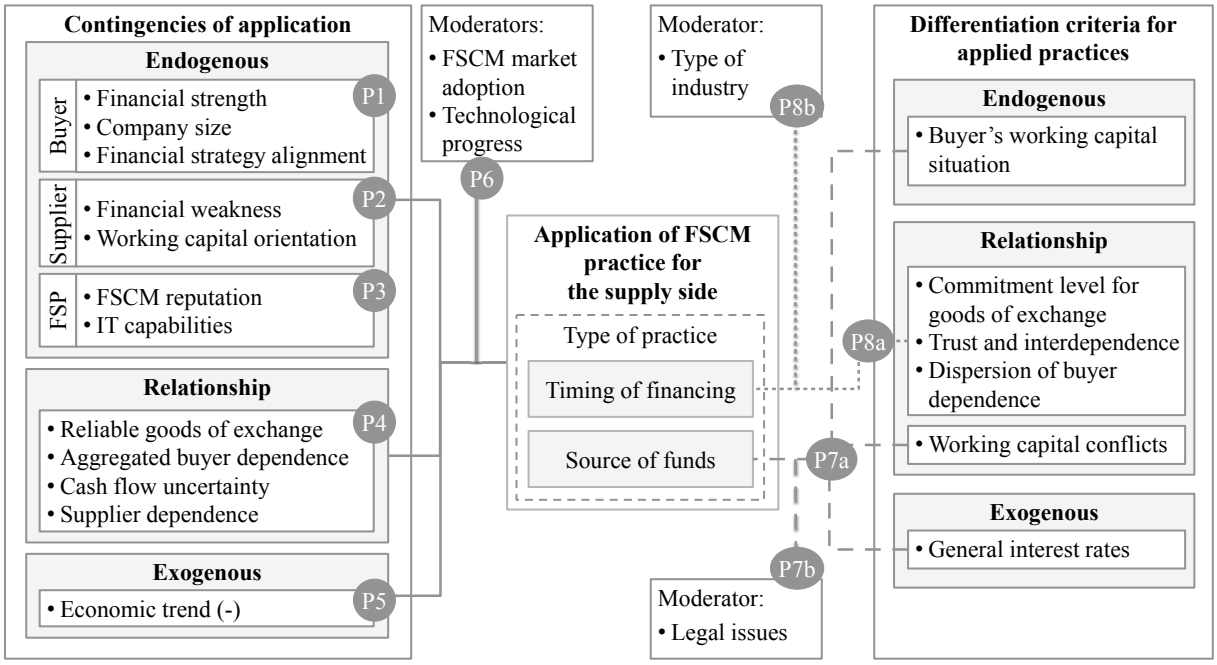


Figure A-3: Contingency framework for the application of FSCM practices for the supply side

Moreover, FSCM market adoption and technological progress affect these contingencies' influence on application. Both factors have been addressed in previous FSCM studies (Templar et al., 2016; Wuttke et al., 2016). We agree with Caniato et al. (2016) regarding the central role of digital innovation in FSCM. In addition to previous research, our study stresses that FSCM knowledge is a critical element of FSCM market adoption. Such expertise plays a key role in ensuring the commitment of buyers and

suppliers. Both moderating variables also affect the selection of FSCM practices for the supply side, since they determine the availability of related techniques.

Selection of practices

As mentioned in Sections A.1 and A.2, the existing FSCM literature has generated limited insights on the selection of FSCM practices for the supply side. Within our analysis, however, we referred to social exchange theory and transaction cost economics, thus strengthening the explanatory power of our propositions (Molm, 1991; Williamson, 1979).

Our findings indicate that working capital conflicts between buyers and suppliers deeply affect whether they prefer supply chain-external financing. Existing FSCM studies have demonstrated that resolving these conflicts is one of the main advantages of approved payables financing (Lekkakos and Serrano, 2016). In the absence of working capital conflicts, supply chain-internal financing yields superior outcomes for buyers with a strong working capital position in a low, or even negative, interest rate environment. Supply chain-internal financing has received only limited attention in the FSCM literature, since it has emphasized approved payables financing. The trade finance literature has provided initial insights, analyzing trade credit terms (Seifert et al., 2013). We build on that foundation, considering supply chain-internal financing in a pre-shipment and post-shipment financing context.

Wuttke et al. (2013a) first sought to explain preferences for post-shipment versus pre-shipment financing. We extend their work by analyzing characteristics of goods of exchange. Our findings demonstrate that high levels of commitment for sourced materials reduce buyers' risks related to pre-shipment financing. Combined with relationships characterized by trust and interdependence, this causes uncertainty to decline. In contrast, post-shipment financing does not presuppose similar prerequisites, since it involves limited financing risks for buyers. It tends to be applied when buyer dependence on suppliers is more dispersed (Wuttke et al., 2013a).

Moreover, our findings indicate that contradictory FSCM practices for the supply side can complement each other in specific situations. In the absence of working capital conflicts, supply chain-internal financing can be applied until an upper limit is reached, triggering involvement on the part of an external funder. Given the requirements related to goods of exchange, pre-shipment financing can be utilized in depth for selected relationships, with post-shipment offered in breadth to finance suppliers. We thus identify a differentiated approach for selecting financing alternatives for the supply side on the basis of contingency variables.

A.6 Conclusion and outlook

The present research examined the application of FSCM practices for the supply side, as well as the differences between such practices. The findings were based on eight case studies that collected data on buyer-supplier-FSP triads. They have numerous managerial and theoretical implications. *First*, we offer empirical insights into the existing FSCM literature (Rogers and Leuschner, 2015). *Second*, our study relies on FSCM practices as a more general unit of analysis, allowing us to establish contingencies for the provision of funding alternative to suppliers (Sousa and Voss, 2002). *Third*, we classify FSCM practices for the supply side in terms of the "time of financing" (post-shipment versus pre-shipment) and the "source of funds" (supply chain-internal versus supply chain-external). Based on this classification, we derive criteria to select different types of practices. Our findings also consider contextual situations permitting the combination of several practices, resulting in a differentiated selection approach. *Fourth*, we use the contingency approach as a theoretical framework for our analysis. Together with transaction cost economics and social exchange theory, our research provides interfaces with theoretical lenses applicable in the field of FSCM (Hofmann and Johnson, 2016). *Fifth*, our findings differentiate among three types of reasons explaining a supplier's commitment to FSCM practices for the supply side.

From a managerial perspective, *buyers* can utilize these contingencies as a list of prerequisites when considering initiating FSCM practices for the supply side. Insights on suppliers and FSPs can enhance their understanding of relevant actors. Buyers can consequently develop individualized approaches for addressing suppliers. The service requirements are initial criteria for evaluating and comparing FSPs. The differentiation criteria help buyers to select appropriate FSCM practices for the supply side. *Suppliers* can better understand the financing alternatives available to them. The derived contingencies enable them to analyze the applicability of different practices and approach buyers accordingly. For instance, in our sample, there were several cases of suppliers proactively approaching buyers about FSCM practices for the supply side. Finally, *FSPs* can utilize the results to improve their services related to inter-organizational financing.

Nevertheless, our research also faces several limitations, opening opportunities for future research. For content-related and methodological reasons, this study focused on the supply side. Future studies should thus examine the demand side and analyze any differences (Gelsomino et al., 2016). Furthermore, market adoption rates vary by the type of practice. Although our sample included all relevant practice types, future studies

would benefit from further analyzing supply chain-internal and pre-shipment financing. Further insights are particularly needed regarding pre-shipment financing, considering its potential with onward market adoption of innovative approaches. For instance, our analysis treated pre-shipment and at-shipment financing as a single type of practice. Future studies could thus extend our contingency framework. In addition, we focused on the inter-organizational management of funding and neglected collaborative approaches to inventory management (Caniato et al., 2016). In the future, it would be interesting to investigate differences and similarities regarding the integrated management of inventories in supply chains. Overall, our findings constitute a starting point for future research, since we conducted a broad, explorative analysis. In particular, data on suppliers and FSPs is scarce, and our research only offers initial insights. Focus studies could apply quantitative approaches to extend out work. In addition, the moderating effects of FSCM market adoption and technological process require additional research. Such analyses could assess the effect of disruptive innovations, such blockchain technology, in an FSCM context (Templar et al., 2016).

A.7 Appendix

FSCM technique	Description	Type of FSCM practices				Example studies
		SC-ext	SC-int	PoS	PrS	
Approved payables financing	An FSP is introduced as an intermediary to the buyer-supplier dyad. The buyer approves the invoice for payment to the FSP. The supplier receives an early payment from the FSP in exchange for a discount. The buyer pays the full invoice on the agreed-upon due date. The FSPs ensures intermediate financing, relying on the buyer's creditworthiness.	X		X		(Lekkakos and Serrano, 2016; Liebl et al., 2016; Meijer and Bruijn, 2013; Wuttke et al., 2016)
Dynamic discoun-ting	The supplier receives early payment from the buyer for approved invoices in exchange for variable discounts. The buyer's discounts increase with every day of earlier payment. The buyer uses its own liquidity for funding.		X	X		(Beck, 2011; Caniato et al., 2016)
Inventory financing	The buyer offers funding to the supplier for the latter's inventories. Buyers can utilize their own funds. Typically, an FSP (e.g., a bank or LSP) provides funding sources.	X	X		X	(Bryant and Camerinelli, 2014; Hofmann, 2009)
Purchase order financing	An FSP offers funding to suppliers on the basis of the buyer's purchase order. The buyer provides an acceptance guarantee to reduce financing costs for suppliers.	X			X	(Bryant and Camerinelli, 2014; Wuttke et al., 2013a)

FSCM technique	Description	Type of FSCM practice				Example studies
		SC-ext	SC-int	PoS	PrS	
Advance payments	The buyer provides early payments to suppliers prior to delivery, either to ensure deliveries or in exchange for price discounts.		X		X	(Chauffour and Malouche, 2011; Talonpoika et al., 2014; Zhang et al., 2014)
Natural hedging	The buyer purchases and stores materials from sub-suppliers and provides them to the direct supplier for production. Natural hedging involves a physical component in the form of guaranteed quantity and availability. A financial element is involved when the buyer and the supplier are situated in currency area A, while the sub-supplier is in currency area B.		X		X	(Hofmann, 2011; Makar et al., 1999)

Table A-6: Description of FSCM techniques and their assignment to FSCM practices for the supply side

Note: SC-int = supply chain-internal; SC-ext = supply chain-external; PoS = post-shipment; PrS = pre-shipment.

B Predictors and outcomes of suppliers' commitment to financial supply chain management practices for the supply side

Judith Carin Martin*

*Chair of Logistics Management, University of St. Gallen[53]

B.1 Introduction

Division of labor characterizes today's business practices and forces suppliers to source, make, and deliver weeks or months before they receive payment. Large corporates extend their payment terms beyond 100 days transferring financial pressure towards their supplier base (Caniato et al., 2016; Huff and Rogers, 2015). The consequences are, among others, reduced investments in quality or innovation by suppliers and increased financial risks in upstream supply chains (Hofmann and Belin, 2011; Klapper and Randall, 2011). Buying companies have started the application of financial supply chain management (FSCM) practices to avoid negative effects on their supplier base. With these practices, they address the management of capital tied up in supply chain processes and offer financing alternatives to their suppliers. For instance, approved payables financing programs constitute a common approach to strengthen upstream supply chains (Bryant and Camerinelli, 2014; van der Vliet et al., 2015). Thereby, buyers can extend their payment terms towards 90 to 120 days while suppliers receive early payments after around five to ten days. A financial service provider (FSP) offers intermediary financing to suppliers based on the buyer's interest rate. In particular large corporates have initiated such programs allowing suppliers to benefit from their low interest rates (Wuttke et al., 2013b). Other approaches, e.g., dynamic discounting or purchase order financing, follow similar structures but involve different benefits to the buyer (e.g., cost reduction). When offering financing alternatives to suppliers, buyers depend on suppliers' commitment in order to achieve their preset objectives (Wuttke et al., 2016). Nevertheless, suppliers' commitment levels often remain below expectations revealing a need for guidance.

[53] For information on publication process and current publication status for study B see Appendix front page, p.74.

Supply chain management (SCM) research has long emphasized material and information flows. In recent years, FSCM has emerged as a new area of research explicitly addressing financial flows and the inter-organizational management of funding sources (Gelsomino et al., 2016; Templar et al., 2016). Initial studies have focused on benefits of FSCM for all involved actors (Dyckman, 2011; Meijer and Bruijn, 2013). Only recently, analytical models have started to identify preconditions for the application of FSCM practices for the supply side and for the commitment of involved suppliers. For instance, van der Vliet et al. (2015) analyzed the influence of buyers' and suppliers' financing costs on experienced financial benefits. The first case study findings have underscored that a supplier's commitment constitutes not only a rational consideration of financial but also relational outcomes. Exemplarily, Lieb et al. (2016) described how buyers use their power position to pressure suppliers to participate in approved payables financing programs. Yet, the conclusions of these previous studies have either been based on conceptual work, analytical models, or mainly buyer-related empirical data. Thus, empirical data on suppliers that considers relational and financial factors conjointly appears to be absent in the literature. Therefore, this paper aims at understanding factors that cause a supplier to accept a buyer's financing alternatives and potential outcomes of their commitment. Based on the results, I derive implications for the application of FSCM practices for the supply side including possible approaches to select and address suppliers, as summarized in the following research question:

RQ: *What are predictors and outcomes of a supplier's commitment to FSCM practices for the supply side, and how do they affect the application of these practices?*

A quantitative, confirmative approach is selected to address the described research objectives (Forza, 2002). A detailed literature review of FSCM, SCM, and finance literature enables the derivation of relevant items for the questionnaire. Involved items are based on previous findings in the related research areas to ensure sound theoretical contribution.

The paper adheres to the following structure: In Section B.2, an overview on the current FSCM literature is combined with related insights from SCM and finance research. The literature analysis serves as a basis for the development of the conceptual model and hypotheses in Section B.3. Section B.4 describes the methodology including data sampling, questionnaire design, as well as validity and reliability tests. Subsequently, the results for predictors of commitment and outcomes are presented (Section B.5) and discussed (Section B.6). In this process, implications for the application of FSCM practices for the supply side are explained. Finally, Section B.7 summarizes contributions and findings as well as possible limitations.

B.2 Theoretical background

In recent years, FSCM has emerged as a new research stream at the intersection of the SCM and finance literature focusing on the inter-organizational management of financial flows (Fairchild, 2005; Gomm, 2010; Gupta and Dutta, 2011; Hofmann, 2010). Yet, FSCM, sometimes also referred to as supply chain finance, still lacks a common terminology. For instance, some scholars have equated FSCM with one particular technique, namely approved payables financing (Hofmann and Johnson, 2016; Iacono et al., 2015). The present research follows a broader perspective and defines FSCM as "the inter-company optimization of financing […] in order to increase the value of all participating companies" (Pfohl and Gomm, 2009, p. 151). Accordingly, FSCM practices involve inter-organizational financing activities between supply chain members. For instance, Wuttke et al. (2013a, p. 778) described how post-shipment financing practices "have in common that they take place after the actual delivery, quality control, and invoice release". In contrast, FSCM techniques put inter-organizational financing activities to use (Sousa and Voss, 2002). Approved payables financing programs and dynamic discounting constitute, for example, FSCM techniques implementing post-shipment financing practices.

FSCM practices for the supply side have gained increasing attention in the literature. Thereby, research on FSCM has contributed to findings in trade finance theory. The latter has, however, primarily focused on motives of suppliers to grant trade credits to buyers (Seifert et al., 2013). Previous studies on FSCM practices for the supply side have underlined the practices' benefits for involved actors (Dyckman, 2011; Meijer and Bruijn, 2013). At the same time, several scholars have identified that suppliers hesitate to accept financing alternatives from their buyers (Seifert and Seifert, 2011; Wuttke et al., 2013a). Analytical models have provided first insights on predictors of a supplier's commitment to FSCM practices for the supply side. Iacono et al. (2015) simulated the influence of working capital objectives and receivables volumes on a supplier's commitment. Van der Vliet et al. (2015) analyzed the relevance of a supplier's financing costs and existing payment terms on the application of FSCM practices for the supply side. Previous case study-based findings have expanded the findings of analytical models with empirical data and showed that financial factors alone are not able to explain a supplier's commitment (Caniato et al., 2016; Templar et al., 2016). Relational aspects (e.g., buyer power, interdependence, and trust) influence a supplier's commitment as well (Liebl et al., 2016). For instance, Wuttke et al. (2013b) identified that trust reduces suppliers' reluctance to commit while buyer power can be applied to pressure suppliers to accept a buyer's financing alternative. Thus, previous studies have

indicated that financial and relational factors need to be studied conjointly. However, none of the aforementioned studies has involved comprehensive supplier-oriented, empirical data.

Existing FSCM findings have revealed direct connections to related fields of research. The previous literature on *SCM and buyer-supplier relationships* has differentiated attributes of relationships related to various predicting factors (e.g., trust, power-dependence, and uncertainty) from a buyer's and from a supplier's perspective (Cox, 2004; Ganesan and Hess, 1997; Tangpong et al., 2015). The relationship attributes can be applied to derive implications for the management of buyer-supplier relationships (Cox, 2001; Maloni and Benton, 2000; Nyaga et al., 2010). Although these studies have provided valuable inputs regarding relational factors of a supplier's commitment to FSCM practices for the supply side, they have neglected financial aspects inherent.

In contrast to SCM research, the *finance literature* has emphasized financial decisions of organizations (Brealey et al., 2011). Previous finance studies have evaluated the prioritization of internal versus external sources of funding (Agliardi et al., 2016; Clayman et al., 2012; Fama and French, 2002). They have thereby identified factors (e.g., financing costs and funding access) influencing a company's funding structures (Almeida and Campello, 2010; Myers and Majluf, 1984; Qian and Yeung, 2015). These factors form predictors of a supplier's commitment to FSCM practices for the supply side. Moreover, the working capital management (WCM) literature has provided valuable insights in the context of FSCM (e.g., Pfohl and Gomm, 2009; Randall and Farris, 2009; Singh and Kumar, 2014). Companies aim at a reduction of their working capital to release capital tied-up and avoid dependency on external funding (Casey and O'Toole, 2014; Hofmann and Kotzab, 2010; Seifert et al., 2013). Existing WCM findings can be applied to specify positive financial outcomes of FSCM practices for suppliers. In summary, previous studies in finance research offer valuable insights on financial predictors and outcomes of FSCM practices for the supply side. Nevertheless, they have neglected relational aspects of inter-organizational financing.

Overall, FSCM research has underscored that financial and relational factors need to be considered conjointly in order to understand why a supplier accepts a buyer's financing alternative. Still, FSCM research has lacked supplier-oriented, empirical data for detailed insights. Previous SCM and finance studies have enabled further insights on either relational or financial aspects of a supplier's commitment to FSCM practices for the supply side. Nevertheless, both fields of research have revealed a need for an integrated perspective. Therefore, this paper aims at examining relational and financial predictors and outcomes conjointly based on supplier-oriented data.

B.3 Conceptual model and hypotheses

The conceptual model addresses two main objectives. First, it explains the predictors of a supplier's commitment to FSCM practices for the supply side. Second, it depicts the outcomes for suppliers and reveals interrelations between predictors and a supplier's emphasized outcomes. The model has to consider relational and financial elements for predictors and outcomes. Previous findings on buyer-supplier relationships have emphasized social exchange variables as predictors of commitment (e.g., Ambrose et al., 2010; Brown et al., 1995; Hudnurkar et al., 2014; Morgan and Hunt, 1994). Simultaneously, finance research has underlined the influence of a firm's financial situation on its financing decisions (Almeida and Campello, 2010; Atanasova, 2012). The FSCM literature has provided insights on the outcomes of practices for suppliers, but focused on the advantages. Wuttke et al. (2013b) introduced financial gains and improved liquidity planning as main benefits. Following transaction cost economics, the benefits for liquidity planning result from reduced uncertainty on incoming cash inflows and improved information sharing. Then again, initial studies also have mentioned possible disadvantages due to costs and increased uncertainty (Gelsomino et al., 2016). Figure B-1 summarizes all relevant variables.

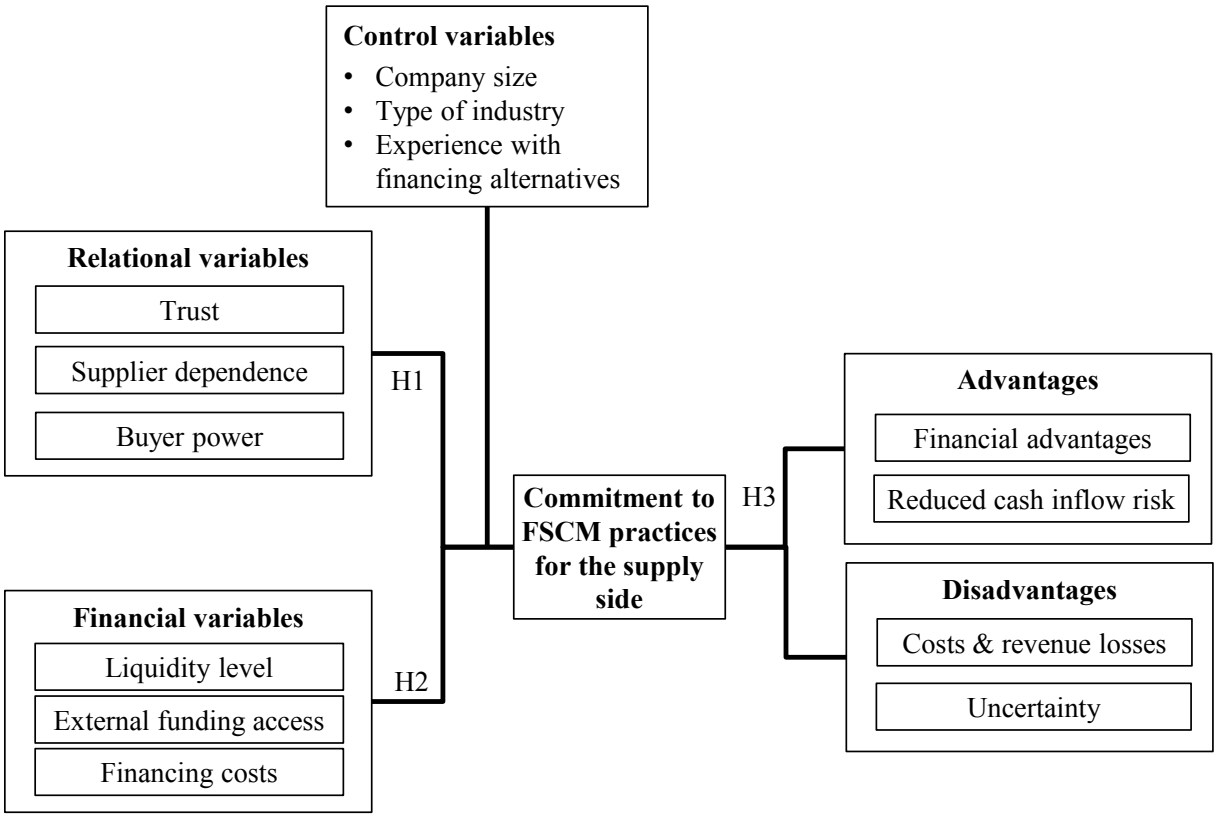


Figure B-1: Conceptual model of suppliers' commitment

B.3.1 Financial and relational predictors

Social exchange theory has captured various factors influencing the relationship building process (Morgan and Hunt, 1994). Thereby, trust constitutes a central element of commitment (Ganesan and Hess, 1997; Ozer et al., 2011). Scholars described trust, power, and interdependence as main drivers of collaboration within buyer-supplier relationships (e.g., Abdullah and Musa, 2014; Gadde and Snehota, 2000). First findings within FSCM research also have emphasized the importance of these factors on a supplier's commitment to FSCM practices for the supply side (Caniato et al., 2016; Liebl et al., 2016).

Trust "exists when a firm believes its partner is honest and benevolent" (Kumar et al., 1995, p. 351). A supplier shows more willingness to take risks within a trustful relationship (Kwon and Suh, 2004). As a consequence, researchers have stressed the impact of trust on reduced transaction costs and on relational commitment (Özer et al., 2014). Wuttke et al. (2013b) identified a similar effect of trust within FSCM practices for the supply side. The role of power and dependence has been comprehensively discussed within the buyer-supplier relationship literature. Scholars have argued that power and dependence influence the level of commitment within relationships (Brown et al., 1995; Cox, 2004; Zhao et al., 2008). Power can be defined as "the ability of one firm (the source) to influence the intentions and actions of another firm (the target)" (Maloni and Benton, 2000, p. 53). Buyer power presupposes a supplier's dependence on the buying firm (Cook et al., 2005; Tangpong et al., 2015). Transferred to the research context of this paper, supplier dependence and buyer power should enhance a supplier's commitment to FSCM practices for the supply side. Buyers may even be able to force their suppliers to accept the offered financing alternative.

Hypothesis 1: Trust, supplier dependence, and buyer power are positively associated with a supplier's commitment to FSCM practices for the supply side.

The finance literature has distinguished between internal and external sources of funding (Qian and Yeung, 2015). Working capital reductions constitute internal funding sources while debt and equity financing represent external funding sources (Brealey et al., 2011). Previous finance research has identified various theoretical approaches to determine a company's optimal capital structure (e.g., Jensen and Meckling, 1976; Myers and Majluf, 1984). Empirical findings have indicated that the combination of different funding sources is influenced by a firm's financial situation (e.g., Almeida and Campello, 2010; Atanasova, 2012). A firm's financial situation then again influences the terms and conditions for available funding sources. Banks make the availability and

costs of credits dependent on a company's financial strength (e.g., liquidity level or working capital position; Draper and Hoag, 2013; Rahaman, 2011). Once debt financing becomes restricted, companies try to identify financing alternatives. FSCM practices for the supply side constitute such an alternative for suppliers. Few initial studies in FSCM have involved the previous finance literature to analyze financial predictors for a supplier's commitment (Iacono et al., 2015; Lekkakos and Serrano, 2016). Van der Vliet et al. (2015) simulated how the spread between a buyer's and a supplier's financing costs influence potential outcomes. The higher a supplier's financing costs are in contrast to a buyer's financing costs, the more suppliers are expected to benefit from participating in FSCM practices for the supply side.

Hypothesis 2a: The higher the liquidity level and the easier the access to external funding, the lower a supplier's commitment to FSCM practices for the supply side.

Hypothesis 2b: The higher the financing costs, the higher a supplier's commitment to FSCM practices for the supply side.

B.3.2 Advantages and disadvantages for suppliers

The FSCM literature has differentiated qualitative and quantitative outcomes for suppliers (Meijer and Bruijn, 2013; Templar et al., 2016; Wuttke et al., 2016). Qualitative outcomes result from positive and negative effects on experienced uncertainty within buyer-supplier relationships. Financial benefits and losses describe quantitative outcomes for suppliers.

Uncertainty results from difficulties to predict potential outcomes (Joshi and Stump, 1999). Transaction costs increase with higher levels of uncertainty (Williamson, 2008, 1979). Supply chain members attempt to avoid uncertainty whenever possible (Hawkins et al., 2008). Respectively, information sharing has been emphasized as a central success factor for SCM (Abdullah and Musa, 2014; Bowersox et al., 2003). Previous FSCM studies expect FSCM practices for the supply side to reduce a supplier's cash inflow risks due to earlier (shorter lead times) and on time (less deviations) payments (Seifert and Seifert, 2011). Furthermore, inter-organizational financing enhances information sharing on payment processes between buyers and suppliers (Lekkakos and Serrano, 2016). For instance, suppliers receive immediate notification in case of payment delays.

Then again, transaction cost economics assumes opportunistic behavior of supply chain members (Joshi and Stump, 1999). The concern of opportunistic behavior causes uncertainty for suppliers on a buyer's motives to offer them a financing alternative. At the same time, FSCM practices for the supply side increase the complexity of transfer

processes due to new information technology (IT) interfaces and additional contracts. This complexity results in uncertainty on future terms and conditions. Suppliers themselves often lack knowledge on FSCM practices for the supply side causing reluctance to commit (Wuttke et al., 2016). Thus, the acceptance of financing alternatives induces potential positive and negative effects on uncertainty for suppliers.

Moreover, commitment to FSCM practices for the supply side constitutes a financial decision for suppliers. The FSCM literature has emphasized financial benefits for suppliers when accepting financing alternatives from buyers (e.g., Lekkakos and Serrano, 2016; Vliet et al., 2015). Through the commitment to a practice, suppliers benefit from the buyer's credit rating and they are able reduce their financing costs. Nevertheless, this advantage is limited to suppliers with higher financing costs than their buyers. All suppliers can exploit increased financing flexibility due to an alternative funding source that they gain access to through FSCM practices for the supply side (Wuttke et al., 2013a; Wuttke et al., 2013b; Almeida and Campello, 2010; Petersen and Rajan, 1997; Seifert et al., 2013). Suppliers, however, also experience negative influences caused by implementation costs, discounts on their invoice volume and often an extension of payment terms. Thus, FSCM practices for the supply side involve opposed influences on a supplier's financial performance.

Hypothesis 3a: Suppliers committed to participate in FSCM practices for the supply side stress the financial benefits and reduced cash inflow risks.

Hypothesis 3b: Suppliers not committed to participate in FSCM practices for the supply side emphasize the costs, revenue reductions, and uncertainty involved in participation.

B.4 Methodology

B.4.1 Data sampling and survey response

I conducted an online survey among 618 Swiss companies to test H1 to H3 quantitatively. The focus on Swiss companies allowed a certain homogeneity among external influences, e.g., structure of financial services and economic development. Wagner and Bode (2008) have underlined Switzerland as representative for developed Western countries. FSCM practices for the supply side are always introduced in a B2B context restricting the possible population. Suppliers from various types of industries can participate in inter-organizational financing alternatives. Yet, certain service industries, e.g., financial services and insurances, and public organizations were not included in the survey due to their limited WCM orientation. I excluded companies with

less than 10 employees, since they are often not involved in FSCM practices for the supply side. The research addressed financial representatives on a senior level within all companies as they decide on accepting a buyer's financing alternatives. CFOs and head of treasury constituted the main positions within all companies.

I derived the initial list of contacts from 1864 companies addressed in a Swiss WCM survey based on the criteria listed above. In total, 618 companies were approached and reminded to complete the online survey between April and May 2016. From the 618 addresses, 94 had invalid correspondent details or were no longer with the company. Of the remaining 524 companies 115 submitted a complete questionnaire resulting in a response rate of 22%. Table B-1 summarizes the sample characteristics, including the type of industry and the company size. Of the total number of respondents, 89 indicated that they would commit to an FSCM practice for the supply side for selected buyers (participators), while 26 declined acceptance in general (non-participators). The sample involved companies from various industries in accordance with Swiss industry structures. SMEs represented a significant share of involved companies with 63 survey participants. The study consequently enabled conclusions for SMEs as well as large, publicly-listed companies.

Research on new practices experiences the risk of a selection bias, when only participants are involved already interested in an innovative solution. Yet, Abrahamson (1991) has underlined that companies also commit to innovations for alternative reasons, for instance when they imitate others. Therefore, I included the questionnaire in a general survey on WCM. This topic is well-known to the financial representatives within the addressed companies. The questions on FSCM practices for the supply side represented one element within the overall questionnaire and they were not explicitly addressed in my introductory text. The response rates remained similar for the questions on FSCM and general WCM issues indicating no innovation bias for the survey.

	Participators		**Non-Participators**		**Total**	
	Count	%	Count	%	Count	%
Commitment to FSCM practices	89	77%	26	23%	115	100%
Industries						
Chemicals	7	8%	1	4%	8	7%
Electronics	5	6%	1	4%	6	5%
Mechanical engineering	13	15%	6	23%	19	17%
Commerce	16	18%	4	15%	20	17%
Consumer goods	12	13%	3	12%	15	13%
Construction	7	8%	0	0%	7	6%
Services	16	18%	6	23%	22	19%
Others	13	15%	5	19%	18	16%
Employees						
<=50	10	11%	3	12%	13	11%
51-250	40	45%	13	50%	53	46%
251-1000	24	27%	5	19%	29	25%
>1000	15	17%	5	19%	20	17%

Table B-1: Descriptive overview on survey sample

As explained in Section B.2, FSCM still constitutes an emerging field of research and, thus, the present study comprises a certain, explorative character despite its overall quantitative, confirmative approach. Therefore, I involved a project team of nine large, multi-national corporates, two FSPs (one bank, one technology provider), and two senior researchers in the field of FSCM to strengthen the reliability of results and to reflect on the derived implications. All corporations within the project team offered financing alternatives to their suppliers. Six of the corporates themselves participated in one or more FSCM practices of their buyers. The project team contributed to the study in the following two ways:

- *Development of the questionnaire:* I derived all constructs based on the theory and previous literature. Yet, the project team verified the clarity of the final questionnaire and captured constructs within a pre-test.

- *Derivation of implications*: The conducted survey served as a basis for the results outlined in the paper at hand. Still, I conducted a half-day workshop with the project team to present and discuss derived results. This approach allowed me to strengthen the derived managerial and theoretical implications. The discussion section involves insights from this workshop in order to interpret the survey results.

B.4.2 Questionnaire design

I selected an approved payables financing program as a representative and widely accepted technique to implement an FSCM practice for the supply side (Iacono et al., 2015). This modification was inevitable to ensure comparability of results. An approved payables program adheres to the following procedure (Bryant and Camerinelli, 2014): Once the buyer accepts delivery, the invoice is confirmed and uploaded to a platform. The supplier can now choose to receive immediate payment less than an agreed service fee. The questionnaire contained a brief description of an approved payables financing program as well as additional specifications on the service fee (1.05% p.a.) and days until the invoices can be discounted (five days) to enhance clarity for addressed participants. The involved service fee was low to avoid the discount price as a rejection criterion. It was based on the lowest service fee of the corporations within the project team and the input of the two involved FSPs.

Furthermore, the description of the approved payables financing program involved an extension of payment terms. The FSCM literature has emphasized that buyers usually prolong their payment terms towards suppliers along with these programs, since they aim at reductions of their net working capital (van der Vliet et al., 2015). Buyers are able to achieve financial benefits targeted at them with offering financing alternatives for suppliers, and thus are interested in their commitment. Realizing alternative objectives – in particular a reduction of upstream financial risks – can still be addressed with this modification.

Within the questionnaire, companies had to indicate if they already participated in approved payables financing programs, if they were interested to participate for selected buyers or if they were not interested at all. The first two options were summarized as suppliers committed to participate in an FSCM practice for the supply side, in contrast to suppliers not committed to participate. Through this classification, the survey introduced a binary variable to study the commitment of suppliers.

Most of the studied items have already been defined in literature. Hence, all measures were based on existing findings to strengthen their reliability. Previous research has differentiated credibility and benevolence trust (Kwon and Suh, 2004). Following these findings, I used the items developed by Kumar et al. (1995) to explain trust. In addition, Monczka et al. (1995) were applied to derive measures specifying supplier dependence within the questionnaire. Maloni and Benton (2000) formed the basis to define relevant items in accordance to expert, referent, legitimate, reward, and coercive buyer power. Resent FSCM research has indicated that, in particular, reward and coercive buyer power constitute relevant measures for buyer power in an FSCM context. For instance, Wuttke et al. (2013b) described how buyers apply their power to introduce longer payment terms that suppliers have to agree to, if they want to continue business with the buyer. Hence, participating in the approved payables financing program is optional for suppliers in this scenario, while the payment extension is compulsory. In accordance to these findings in FSCM, the questionnaire involved only items related to reward and coercive buyer power. All relationship-related items were measured on a five Likert scale ranging from "strongly agree" to "strongly disagree" (all items are listed in Appendix B.8).

Existing FSCM studies enabled the derivation of benefits and disadvantages of suppliers' commitment to an approved payables financing program within the questionnaire (e.g., Bryant and Camerinelli, 2014; Liebl et al., 2016; Templar et al., 2016). Previous literature on transaction cost economics and WCM strengthened the theoretical foundation of the items applied to describe possible outcomes (Joshi and Stump, 1999; Kieschnick et al., 2013; Williamson, 1979). I involved benefits related to a reduction of cash inflow risks in terms of reduced payment period (after five days) and avoidance of payment defaults in order to be assessable also for companies not yet participating in an approved payables financing program. The outcomes were measured on the same scale as relationship-related predictors.

For capturing a supplier's financial situation, I applied quantitative as well as qualitative measures. Previous research in the WCM and trade finance literature has emphasized the importance of liquidity level, financing costs, and access to external funding as main factors influencing a company's short-term financing decisions (Almeida and Campello, 2010; Atanasova, 2012; Rahaman, 2011). Within the questionnaire, companies had to indicate their financing costs for a medium-term loan within five ranges (range one: <1%; range two: 1%-3%, etc.). The WCM literature provided the foundation to determine the captured ranges. I measured the liquidity level on a five Likert scale ranging from "very low" to "very high". This qualitative measure was selected, since,

in particular, privately-owned SMEs are often reluctant to indicate exact information (Berger and Udell, 2006). In general, companies mostly apply non-standardized formulas to calculate their liquidity level. The access to external funding was evaluated on a five Likert scale ranging from “very easy” to “very difficult”.

Besides the independent variables, the survey introduced three control variables to study their moderating effects on the relationship between predictive and decision variables. First, existing literature has indicated that SMEs experience more difficulties in receiving access to external funding than large companies (Berger and Udell, 2006; Klapper, 2006). Second, the WCM literature has underlined varying working capital orientations depending on the type of industry (Chiou et al., 2006; Singh and Kumar, 2014). Third, previous experience with traditional financing alternatives (e.g., factoring) is expected to influence suppliers’ knowledge on approved payables financing programs due to similar funding structures (Klapper, 2006; Liebl et al., 2016). Additionally, these programs offer lower financing costs in contrast to traditional financing alternatives – in particular factoring (Gelsomino et al., 2016). Within the questionnaire, number of employees and worldwide sales in 2015 were applied to specify company size. Suppliers had to select their type of industry from a respective list. Finally, the questionnaire asked participants whether or not they applied different, traditional financing alternatives (e.g., factoring and inventory financing).

B.4.3 Data cleaning and scale purification

The supplier data was extracted and analyzed in SPSS Version 23. In an initial step, I conducted two tests to avoid non-response bias. The first one compared annual sales and number of employees for respondents and non-respondents. The second test opposed data for early and late respondents (Wong et al., 2011). Both approaches indicated no significant differences. A graphical search for outliers yielded no relevant results for which reason no data had to be deleted (Ambrose et al., 2010).

The further analysis followed the procedure described by Forza (2002) to establish validity and reliability of results. The findings of these preliminary analyses are depicted in Table B-2. A factor analysis ensured convergent validity of constructs (Zhao et al., 2008). Factor loadings need to be > 0.50 which resulted in the exclusion of FD1 and RPW1. Besides, I merged financial and uncertainty disadvantages within one construct. A test for cross-loadings revealed no significant results for the final constructs. Overall, the analysis resulted in a Kaiser-Meyer-Olkin (KMO) value of 0.816 and significance level of $p < 0.001$ for the Bartlett’s test of sphericity (Abdullah and Musa, 2014).

Items	Financial benefits	Reduced cash inflow risks	Financial and uncertainty disadvantages	Supplier dependence	Buyer power	Trust
FB2	0.65					
FB3	0.74					
FB4	0.75					
FB5	0.63					
FB6	0.76					
FB7	0.64					
UR1		0.71				
UR2		0.81				
UR3		0.72				
UR4		0.72				
IS1		0.63				
IS2		0.54				
IS3		0.58				
FD2			0.79			
FD3			0.62			
FD4			0.74			
UD1			0.75			
UD2			0.77			
UD3			0.73			
UD4			0.56			
RD1				0.82		
RD2				0.89		
RD3				0.78		
CPW1					0.86	
CPW2					0.76	
RPW2					0.60	
CTR1						0.76
CTR2						0.74
CTR3						0.78
BTR1						0.87
BTR2						0.84
BTR3						0.83
BTR4						0.86
Cronbach's α	0.85	0.88	0.86	0.87	0.76	0.92

Table B-2: Items purification and reliability tests

Criterion-related validity was evaluated by studying the correlations between independent and dependent variables. This step resulted in two examinations: One for the relation between predictors and the commitment to participate in FSCM practices for the supply side and one for the relation between commitment and possible outcomes.

Both analyses demonstrated significant correlations > 0.50. Finally, I determined Cronbach's Alpha to ascertain reliability. All constructs achieved values above 0.75.

B.5 Data analysis

B.5.1 Predictors of commitment

In an initial step, a univariate analysis was conducted to test H1 and H2. A logistic regression model was applied with the commitment to participate in an FSCM practice for the supply side as the binary decision variable. Table B-3 summarizes the outcomes of this first analysis step. The results displayed significant differences in the mean values with $p < 0.01$ for all dimensions except liquidity. One possible explanation for the low relevance of liquidity level could constitute the negative interest rates currently in place in Switzerland. These interest rates resulted in high liquidity levels for most suppliers within the survey independent of company size. With financing costs and funding access, two financial variables illustrated relevant predictors. Relationship-related factors also had a strong influence on a supplier's commitment to participate. Supplier dependence alone achieved a Cox R Square of 0.294 and Nagelkerke R Square of 0.447.

Dimension	Participators mean	Non-participators mean	Mean difference	Chi-square	Signifi-cance
Liquidity level	3.93	3.96	0.03	3.686	0.170
Financing costs	2.00	1.42	-0.58	13.426	0.001
Funding access	3.49	4.15	0.66	8.711	0.008
Dependence	4.08	2.86	-1.22	39.992	0.000
Power	2.96	2.41	-0.55	8.097	0.006
Trust	2.98	2.02	-0.96	22.662	0.000

Table B-3: Univariate analysis of predictors for suppliers' commitment to FSCM practices for the supply side

In a second step, a multivariate analysis included all significant predictors ($p < 0.01$) of the univariate analysis: Financing costs, funding access, dependence, power, and trust. First, all predictors were added to a multivariate logistic regression model. Thereby, supplier dependence and trust represented the only two significant variables with $p < 0.01$. Subsequently, I excluded all non-significant variables in a stepwise process starting with the lowest significant predictors. This approach resulted in the model depicted in Figure B-2 and higher R Square values. The correlation matrix of predicting

variables showed only very low correlations (< 0.257) indicating no multicollinearity. A calculation of the variance inflation factor (VIF) confirmed this diagnostics with a value of 1.77 (Ganesan and Hess, 1997).

Following H1, the findings emphasized that supplier dependence and trust are positively associated with a supplier's commitment towards FSCM practices for the supply side. Conversely, access to external funding is negatively related to the decision to participate. This is in accordance with H2a, which states that an easy access to external funding reduces a supplier's commitment to participate in FSCM practices for the supply side.

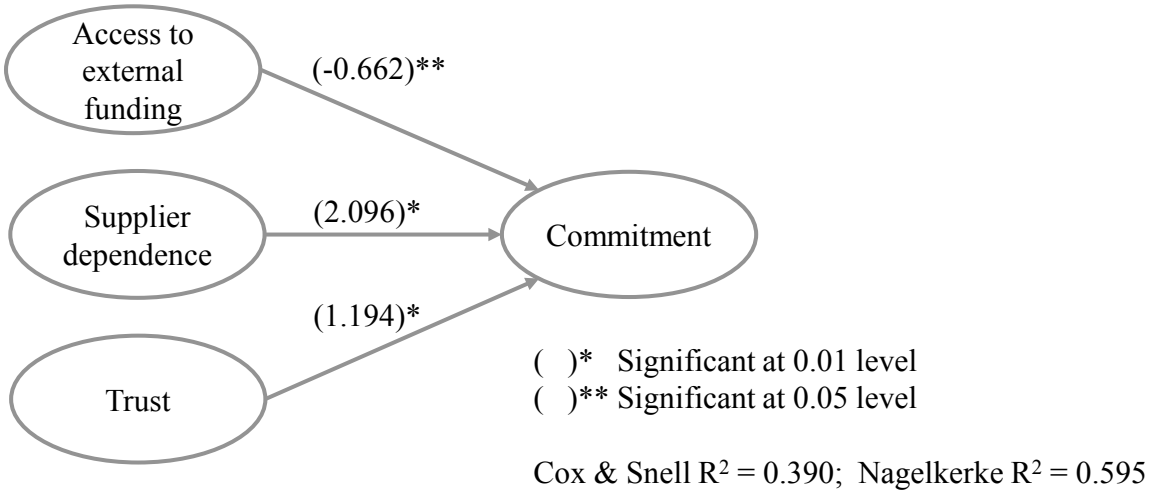


Figure B-2: Multivariate analysis of predictors for suppliers' commitment to FSCM practices for the supply side

In addition to the predictors itself, company size, type of industry and experience with traditional financing alternatives were studied to test their moderating effects, following the procedure applied by Baron and Kenny (1986). Results indicated no impact of company size on the depicted regression model. Only the type of industry and the experience with traditional financing alternatives affected the relationships between predicting variables and the decision variable in the analysis. For instance, suppliers from mechanical engineering and services revealed particularly reluctance to commit resulting in lower predictive effects of all three factors (access to external funding, supplier dependence, and trust). In contrast, suppliers from construction industries demonstrated high commitment to FSCM practices for the supply side. Previous experience with traditional financing alternatives reinforced the influence of financial predictors, but did not moderate the impact of supplier dependence and trust. Thus, a difficult access to external funding combined with previous experience for traditional financing alternatives significantly reduced reluctance to commit.

Overall, all factors mentioned in H1 and H2 influence a supplier's commitment to participate in FSCM practices for the supply side except liquidity level. Based on the multivariate analysis, access to external funding, supplier dependence, and trust represent the main factors predicting a supplier's commitment.

B.5.2 Outcomes of commitment

I applied a t-test to evaluate expected outcomes and to compare mean values of suppliers committed and not committed to participate in FSCM practices for the supply side. The analysis indicated significant differences for all three constructs. Both, financial benefits und reduced cash inflow risks were experienced as benefits of participating in FSCM practices for the supply side. Yet, reduced cash inflow risks showed higher participators mean than financial benefits and a significance level below $p < .01$. Table B-4 summarizes the mean differences of financial benefits, reduced cash inflow risks as well as financial and uncertainty disadvantages. The findings underscored that suppliers assign qualitative factors higher relevance than financial benefits.

Dimension	Participators mean	Non-participators mean	Mean difference	t-value	DF	Signifi-cance
Financial benefits	2.88	2.43	-0.45	-2.465	113	0.015
Reduced cash inflow risks	3.34	2.88	-0.46	-3.228	113	0.002
Financial and uncertainty disadvantages	3.56	3.17	-0.39	-2.633	113	0.01

Table B-4: Outcomes of suppliers' commitment to FSCM practices for the supply side

In contrast to H3b, suppliers committed to participate demonstrated a higher mean value for disadvantages than suppliers not committed to participate. Furthermore, suppliers revealed a general lack of knowledge on approved payables financing programs. Overall, the analysis partly confirmed H3 for the evaluation of benefits, but not for financial and uncertainty disadvantages. The results illustrated that suppliers committed to participate still want to avoid discounts on their invoices, longer payment terms, and implementation costs. At the same time, the findings underlined suppliers' uncertainty on future terms and conditions as well as on reasons for buyers to provide them a financing alternative. In particular, uncertainty disadvantages indicated that not always entirely rational reasons explain why a supplier commits or does not commit to FSCM practices for the supply side.

An additional analysis studied how predictors affect experienced outcomes (Baron and Kenny, 1986; Zhao et al., 2010). The results showed that expected benefits for committing to FSCM practices for the supply side vary depending on a supplier's financial situation. An evaluation of mean values for suppliers revealed significantly higher values for financial benefits when committed suppliers experienced a difficult access to external funding. Interestingly, none of the predictors (access to external funding, supplier dependence, and trust) reduced the relevance of experienced disadvantages in general. For instance, suppliers with difficult access to external funding still indicated high relevance for the described disadvantages. Predictors rather caused suppliers to consider commitment for selected buyers. There existed one exception: Mean values for disadvantages decreased for suppliers with a difficult access to external funding that had experience with traditional financing alternatives. Experience with financing alternatives particularly contributed to a lower relevance of uncertainty disadvantages.

B.6 Discussion

The results showed that a supplier's commitment to participate in an FSCM practice for the supply side is not a purely rational consideration in terms of experienced financial benefits and disadvantages. Respectively, not only a supplier's financial situation, but also relational factors need to be considered—trust and supplier dependence in particular. The subsequent section reflects on the survey results in relation to previous findings in research and the workshop discussions with the project team.

B.6.1 Commitment predictors and outcomes

The multivariate analysis emphasized dependence, trust, and access to external funding as main predictors of a supplier's commitment to FSCM practices for the supply side. Supplier dependence comprises three import aspects: *First*, from a purely rational perspective, a certain dependence on the buyer is essential in order to achieve a sufficient amount of funding and respective benefits for the supplier (Iacono et al., 2015). *Second*, suppliers may have little choice whether or not to accept the financing alternative when their power position towards the buyer is weak and the buyer wants to enforce its objectives (Cox, 2001, 2004; Maloni and Benton, 2000). In accordance, one of the workshop participants emphasized: "When we have two suppliers for one product—one in our program and one not. We for sure go with the supplier in our FSCM program. " The commitment of suppliers is not a rational, financial decision in this case, but one

essential in order to continue business with this buyer. *Third*, supplier dependence can also result in a state of interdependence for equal power distributions between buyers and suppliers as often emphasized for strategic relationships. Within such relationships buyers cannot easily pressure their suppliers to participate. At the same time, buyers want to involve strategic suppliers in their FSCM practices for the supply side to achieve their objectives (Wuttke et al., 2013b). The state of interdependence between buyers and suppliers can closely be linked to high levels of trust (Cook et al., 2005; Kollock, 2006). Within FSCM practices for the supply side, trust reduces a supplier's fear for opportunistic behavior of the buyer and, thereby, it decreases experienced uncertainty disadvantages for specific relationships (Abdullah and Musa, 2014; Joshi and Stump, 1999). As a consequence, suppliers consider commitment within strategic buyer-supplier relationships either as a long-term investment in a strategic buyer or when it provides them financial benefits. Overall, a supplier's financial situation influences commitment to FSCM practices for the supply side, since it determines the experienced financial benefits. Reduced cash inflow risks constitute advantages independent of a supplier's financial situation (van der Vliet et al., 2015). Within the workshop, companies underlined that they benefited from automated insights on the exact payment status of invoices through the FSCM practices of their buyers, since they had several thousands of invoices globally with them.

The unexpected importance of disadvantages for suppliers committed to participate indicates a general reluctance towards FSCM practices for the supply side. Yet, it also explains the influence of type of industry and experience with traditional financing alternatives as moderators. The WCM literature has identified differences in working capital orientation between various industries caused by differences in lead times and capital intensity (Chiou et al., 2006; Singh and Kumar, 2014). Accordingly, some industries, e.g., construction and chemicals, pursue a strong working capital emphasis. In addition, experience with traditional financing alternatives (e.g., factoring) decreases expected uncertainty disadvantages, since respective suppliers know how to evaluate the terms and conditions of FSCM practices for the supply side. They have structures in place to adopt them internally. Currently, dissemination of FSCM is still limited and suppliers indicate little overall knowledge on the topic. Rising dissemination of FSCM practices for the supply side will reinforce the identified effects of previous experience with traditional financing alternatives (Iacono et al., 2015; Wuttke et al., 2016).

B.6.2 Types of supplier commitment

The results indicate that suppliers commit to FSCM practices for the supply side for different reasons depending on the identified predictors. Figure B-3 depicts five types of commitment depending on the level of supplier dependence, trust, and funding access. The commitment types enable first a general understanding when to provide FSCM practices for the supply side and second a differentiated approach to address suppliers.

In the following, I briefly explain the derived types of supplier commitment:

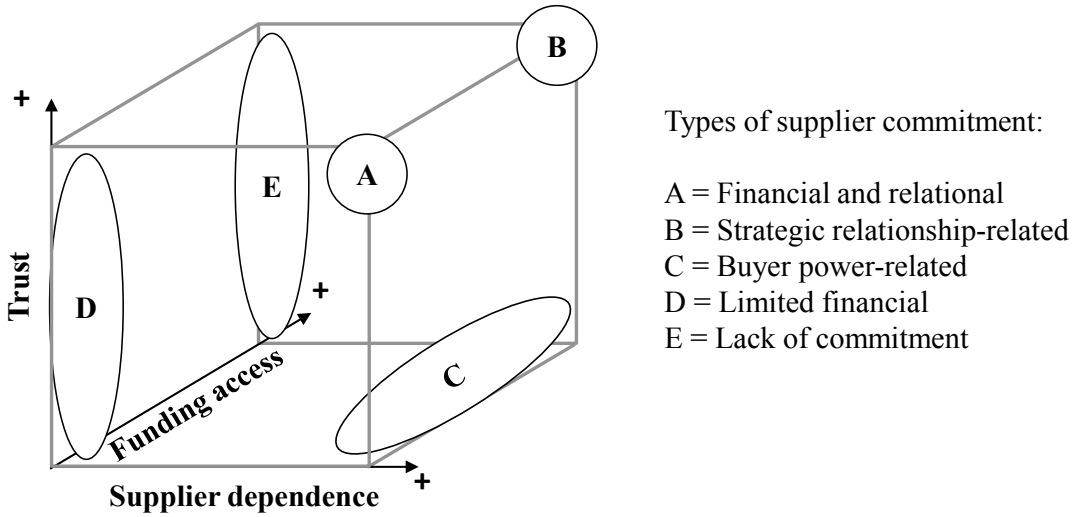


Figure B-3: Different types of supplier commitment to FSCM practices for the supply side

- *Type A – Financial and relational commitment (High dependence—high trust—difficult access to external funding):* Suppliers benefit from positive financial effects due to their difficult access to external funding. The buyer accounts for a large share of the supplier's sales volume resulting in a sizeable amount of funding and supplier dependence. Furthermore, trust encourages collaborative behavior and decreases a supplier's perception of uncertainty disadvantages for the particular buyer. Hence, suppliers are committed to accept financing alternatives offered by the buyer due to financial and relational reasons. Buyers should emphasize financial benefits combined with a stronger relationship when they approach suppliers.
- *Type B – Strategic relationship-related commitment (High dependence—high trust—easy access to external funding):* High dependence and trust indicate distinct levels of interdependence between buyers and suppliers. Despite the easy access to external funding, suppliers still often commit to participate in FSCM practices for the supply side as explained by several workshop participants: "Our rating is better than the ratings of most of our buyers. We are a multinational, cash-rich company. Participation does not provide us any immediate financial

benefits. Still, we commit for selected buyers in order to strengthen our relationship with them. It then constitutes a strategic, long-term investment in these buyers." For this type of commitment, buyers should not address financial benefits when they approach suppliers, but rather positive influences on the exchange relationship.

- *Type C – Buyer power-related commitment (High dependence—low trust—difficult/easy access to external funding):* A lack of trust between exchange partners increases uncertainty within the buyer-supplier relationship (Kramer, 2006). Suppliers may be suspicious regarding the buyer's motives and objectives of offering them a financing alternative. Yet, FSCM practices for the supply side can still be introduced due to high supplier dependence when the buying company pressures suppliers to commit. Nevertheless, the buyer needs to be prepared for resistance from suppliers and even growing costs due to a prolonged implementation process. Resistance decreases for suppliers with a difficult access to external funding. In addition, experience with traditional financing alternatives further enhances the positive impact of a difficult access to external funding on a supplier's commitment.
- *Type D – Limited financial commitment (Low dependence—low/high trust—difficult access to external funding):* The buyer is accountable for only a small share of the supplier's sales volume reducing the amount of funding and achievable financial benefits. Thus, a supplier's commitment to participate in FSCM practices for the supply side is limited despite the difficult access to external funding. As aforementioned, experience with traditional financing alternatives, however, enhances the positive impact of a difficult access to external funding. Suppliers then have well-established internal interfaces reducing their efforts of commitment and they may consider participation despite the limited impact. Buyers should not focus on these suppliers in an initial application step, but rather when they want to further expand the volume of their offered financing alternative.
- *Type E – Lack of commitment (Low dependence—low/high trust—easy access to external funding):* The specific combination of predictors diminishes any reasons for suppliers and results in low commitment for participating in FSCM practices for the supply side. Neither relational nor financial factors support a supplier's commitment within such an arm's-length relationship (Cox, 2004). High levels of trust are scarce is this type of relationship and alone barely result in reasons for suppliers to commit to an FSCM practice for the supply side. Consequently,

the provision of inter-organizational financing alternatives within this type of buyer-supplier relationship is not very promising. In contrast, both exchange partners will negotiate payment terms most beneficial for them or apply standardized terms and conditions to avoid additional efforts.

Overall, the results indicate that the application of FSCM practices for the supply side presupposes at least one of the supplier commitment types A to C. In accordance, workshop participants explained that they achieved low supplier commitment rates for business units with limited dependence of their suppliers on them. When it comes to the relevance of commitment types, six of the nine workshop companies emphasized that type B constituted the main reason for their suppliers to commit in relation to the funding volume of their practices. This is due to the fact that these buyers first focused on their strategic suppliers responsible for a large share of the purchasing volume in order to increase the impact on their own financial performance (e.g., working capital reduction). In contrast, types A and C represented the main commitment reasons in relation to the number of suppliers participating in their practices. Yet, the specific distribution of commitment types depends on a buyer's objectives, the supplier base structure, the type of industry, and suppliers' previous experience with traditional financing alternatives. For instance, a buyer focused on mitigating upstream financial risks does not need to involve suppliers of commitment type B, since these suppliers have access to sufficient liquidity. Buyers can analyze their supplier base in relation to the identified commitment types and their own objectives in order to determine whether to offer FSCM practices to specific suppliers and how to approach them.

B.7 Conclusion

The results enable valuable insights for both researchers and practitioners. They enhance the FSCM literature with empirical, supplier-oriented data (Caniato et al., 2016; Hofmann and Johnson, 2016). Additionally, the findings enable a differentiation of five types of supplier commitment to FSCM practices for the supply side based on the dimensions supplier dependence, trust and external funding access. The commitment types can be applied to derive initial implications on how to approach specific suppliers. The results indicate that a supplier's commitment is not solely a rational consideration of financial aspects. On the contrary, relational factors strongly influence a supplier's decision. Thus, the present research integrates previous findings from the SCM and finance literature. Furthermore, the analysis enhances the FSCM literature with explanations on positive and negative outcomes of the FSCM practices for suppliers. In

particular, negative outcomes have mainly been neglected in previous studies (Gelsomino et al., 2016). Finally, the finding indicate a general reluctance of suppliers towards FSCM practices for the supply side and emphasize the moderating impact of previous experience with financing alternatives to foster dissemination (Iacono et al., 2015; Wuttke et al., 2016).

Practitioners can also benefit from detailed insights on predictors and outcomes of suppliers' participation in FSCM practices for the supply side. *Buyers* can improve their decision on whether to offer financing alternatives for specific suppliers and how to approach them. *First*, an analysis of the supplier base allows a segmentation depending on the identified commitment types. *Second*, buyers need to be aware about types of commitment relevant for them in order to achieve their objectives. *Third*, buyers can approach supplier segments in accordance to the relevant types of commitments and define individualized argumentation strategies to ensure their commitment. *Suppliers* are able to apply the derived predictors to evaluate possible outcomes for them based on their relationship with the buyer and on their own financial situation. Furthermore, the objective assessment of qualitative and quantitative outcomes may reduce general reservations of suppliers due to limited knowledge of FSCM practices for the supply side. Finally, *FSPs* can use the findings to enhance their service offerings related to the 'onboarding' process of suppliers.

Overall, the present research constitutes an initial step to understand suppliers' perspectives on FSCM practices for the supply side. Future studies could analyze in more detail how a buyer's objectives as well as terms and conditions of the financing alternatives for the supply side affect the identified commitment types and experienced outcomes. Additional opportunities for future research result from limitations of this study. First, the survey was focused on one specific FSCM technique, namely approved payables financing. This narrowing was vital to ensure validity of the results. Although certain specific structural elements may change (e.g., specific type of costs), the overall benefits and disadvantages for suppliers remain similar for FSCM practices for the supply side (Bryant and Camerinelli, 2014). Still, future research could take up these aspects and evaluate differences between FSCM practices for the supply side from a supplier's perspective. Furthermore, the derived results were based on suppliers in Switzerland and, therefore, applicable to suppliers based in Western countries. A study with suppliers from developing countries would allow detailed insights on the impact of a supplier's financial situation on the commitment towards FSCM practices for the supply side (More and Basu, 2013). Finally, the sample included only a limited number of suppliers already involved in inter-organizational financing alternatives. The

evaluation of outcomes may change once participating in an FSCM practices for the supply side (Wuttke et al., 2016). The sample characteristics captured the moment when suppliers decide on participation. An evaluation of outcomes once participating in practices could have biased the findings on the commitment decision itself. Nevertheless, future research would benefit from insights how a supplier's experienced outcomes change over time and how FSCM dissemination influences the general application of FSCM practices for the supply side. Moreover, technological innovation (e.g., blockchain technology), new funding concepts (e.g., crowd financing), and governmental programs (e.g., in the US or the UK) influence market dissemination (Templar et al., 2016). Overall, research on FSCM is still in its beginnings and reveals numerous opportunities for future research.

B.8 Appendix

Financial benefits:	
Access to an additional source of financing.	Financial benefits
Access to off-balance funding.	Financial benefits
Support internal financing strength.	Financial benefits
Reduce dependence on external funding.	Financial benefits
Release working capital.	Financial benefits
Funding at low interest rates.	Financial benefits
Reduction of our organization's financing costs.	Financial benefits
Cash inflow risk benefits:	
Improved transparency throughout the payment process.	Reduced uncertainty
Higher planning certainty on incoming payments.	Reduced uncertainty
Avoidance of payment defaults.	Reduced uncertainty
Reduced uncertainty concerning the customer's payment behavior.	Reduced uncertainty
Easy and automated information exchange through IT-platforms.	Information sharing
Frequent sharing of information on payment processes.	Information sharing
Immediate notifications of payment delays (incl. incidents).	Information sharing
Financial Disadvantages:	
Invoice discounts due to interest rates.	Financial benefits
Dependency on the customer as a source of funding.	Financial benefits
Extension of payment terms.	Financial benefits
Expected costs for program implementation.	Financial benefits
Uncertainty-related disadvantages:	
Uncertainty, whether the program will be provided in the future and with which terms and conditions.	Uncertainty
Restricted information on the impact of participating in the program for our organization.	Uncertainty
Uncertainty on the motives and purpose of this customer to offer the program.	Uncertainty
Lack of knowledge about approved payables financing programs in general.	Uncertainty

Table B-5: Financial items and transaction cost variables (see Section B.4.2 for literature references on listed questions)

The customer is very important to our company's future success.	Dependence
Purchases from this customer are very important to our present success.	Dependence
A loss of this customer's orders would affect our business success.	Dependence
The customer makes it clear, that non-participation will result in penalties against us (e.g., decrease of revenue, payment term extension).	Coercive Power
If we do not join the program, we will not receive a good treatment from this customer.	Coercive Power
The customer offers incentives when we join the program.	Reward Power
We feel that by joining the program, we will be favored on other occasions.	Reward Power
Our organization can count on this customer to be sincere.	Credibility trust
This customer usually keeps the promises that it makes to our firm.	Credibility trust
This customer does NOT make false claims.	Credibility trust
When making important decisions, this customer is concerned about our welfare.	Benevolence trust
In the future, we can count on this customer to consider how its decisions and actions will affect us.	Benevolence trust
When we share our problems with this customer, we know that it will respond with understanding.	Benevolence trust
Though circumstances change, we believe that this customer will be ready and willing to offer us assistance and support.	Benevolence trust

Table B-6: Social exchange variables (see Section B.4.2 for literature references on listed questions)

C Financial service providers as enablers of financial supply chain management practices for the supply side

Judith Carin Martin*, Erik Hofmann*

*Chair of Logistics Management, University of St. Gallen[54]

C.1 Introduction

Financial flows are linked to material and information flows within and between companies (Blount, 2008; Comelli et al., 2008). Measures to improve a company's working capital position may impede the overall business performance due to negative influences on material flows (Wandfluh et al., 2016). For instance, reducing inventories can result in lower service levels for customers. Extending payment terms increases suppliers' working capital and financial risks in supply chains (Dyckman, 2011; Klapper and Randall, 2011). A great variety of financing supply chain management (FSCM) practices address these issues through an inter-organizational management of funding sources and an integrated perspective on supply chain flows (Gelsomino et al., 2016). In particular, the application of practices for the supply side has increased in recent years (Templar et al., 2016). Buyers thereby offer financing alternatives to their suppliers. For these financing alternatives, financial service providers (FSPs) serve as central enablers to facilitate application (Seifert and Seifert, 2011). Besides their relevance, little is known on the role of FSPs in FSCM practices for the supply side.

Previous research has focused on FSPs as providers of external financing to companies and of services for payment transactions as well as risk mitigation (Brealey et al., 2011; Greenbaum and Thakor, 2007; Saunders, 2010). Yet, research on reasons to involve FSPs in supply chains for the application of FSCM practices for the supply side has been scarce (Silvestro and Lustrato, 2014). In addition, the landscape of available providers and their service offerings for an inter-organizational management of financial flows is diverse. Traditional banks have extended their existing service offerings to enhance customer loyalty. In addition, new technology providers (e.g., online platform providers) have entered the market fostering bank-independent financing alternatives (Hofmann and Belin, 2011). Thus, a structured approach is needed to analyze why

[54] For information on publication process and current publication status for study C see Appendix front page, p.74.

supply chain members involve FSPs in the integrated management of supply chain flows through FSCM practices for the supply side.

The involvement of FSPs in these practices results in adapted service requirements in contrast to traditional financing services (Fellenz et al., 2009). FSPs get directly involved with a buyer's suppliers during their "onboarding" process. Thus, knowledge on material, financial, and information flows is compulsory to provide a sound value proposition (Silvestro and Lustrato, 2014). This paper aims at achieving two main objectives. First of all, reasons are analyzed to involve FSPs in FSCM practices for the supply side. Second, service requirements are derived for FSPs in order to serve as an enabler for the integrated management of supply chain flows. Therefore, the following research questions have to be answered:

- *Needs of FSPs:* Why are FSPs involved in FSCM practices for the supply side?
- *Service requirements for FSPs:* How can their service offerings enhance the application of these practices?

The selected methodology to respond to these research questions represents an explorative, mixed-method approach (Bishop, 2015; Creswell and Plano Clark, 2011). We link quantitative and qualitative data to strengthen our results (Tashakkori and Teddlie, 1998). First, we study reasons for the involvement of FSPs in FSCM practices for the supply side based on a quantitative survey and detailed expert interviews with companies. Second, our analysis is complemented with a review of grey press and online offerings as well as detailed expert interviews with FSPs to derive requirements for their services. Thereby, the paper contributes to research at the intersection of finance and supply chain management (SCM).

The present paper is structured as follows: First, we provide an overview on the current state of research at the intersection of finance/SCM and derive a research framework for our further analysis (Section C.2). Based on this theoretical background the selected research method is described in Section C.3. Subsequently, we analyze needs of supply chain members to involve FSPs in the integrated management of supply chain flows through FSCM practices for the supply side (Section C.4). Section C.5 briefly examines available services offered by FSPs to address the identified needs and evaluates service quality based on the quality gaps model (Mauri et al., 2013). Finally, initial measures to improve the service quality of FSPs are discussed in Section C.6, before all findings are summarized (Section C.7).

C.2 Current state of research

In the subsequent section, we provide an overview on related research for the involvement of FSPs in supply chains. The interrelations between flows in supply chains are explored prior to an investigation of previous research on FSPs. The SCM and finance literature have provided main insights to both areas. In addition, we elaborate research on strategic planning processes to develop an initial framework structuring our research. Transaction cost economics and social exchange theory are involved to strengthen our theoretical contribution.

The literature on SCM has steadily been expanding over the last few decades studying material, information and financial flows in supply chains (Bowersox et al., 2003; Chopra and Meindl, 2013; Lambert and Cooper, 2000). It has emphasized an integrated management of flows along supply chains in contrast to company-focused improvements (Keebler, 2001). Research on supply chain risks has considered financial aspects as one type of risk (e.g., Chopra and Sodhi, 2004; Pfohl et al., 2010; Wagner and Bode, 2008). For instance, Chen et al. (2014) studied the effects of macroeconomic risks of supply chain counterparties on corporate bond yield spreads. Other authors have analyzed suppliers' and customers' information asymmetries as well as company-focused WCM practices as possible sources of supply chain financial risks (Chen et al., 2013b; Tsai, 2008). Measures to mitigate these financial risks, however, have remained focused on monitoring the financial situation of suppliers (Wandfluh et al., 2016). Thus, the supply chain risk literature can only serve as a starting point to understand the relevance of managing financial flows together with material and information flows in supply chains.

In contrast, the finance literature has captured financial flows as net working capital comprising current assets and liabilities (Bhalla, 2007). A common way of measuring the effect of working capital management (WCM) on the profitability of the firm constitutes the cash conversion cycle (Deloof, 2003; Garcia-Teruel and Martinez-Solano, 2007). It describes the time difference between cash disbursement and cash collection based on the number of days in inventory, the number of days in accounts receivables, and the number of days in accounts payables (Singh and Kumar, 2014). The three elements of the cash conversion cycle can be operationalized as sub-cycles describing financial flows in supply chains (see Figure C-1). The WCM literature has discussed possible trade-off situations with material flows (Kieschnick et al., 2013). For instance, reduced inventories can cause decreased service levels and thereby affect customer satisfaction. Still, WCM addresses performance improvements for a single

firm and not for the supply chain altogether (Templar et al., 2016). For instance, extending payment terms towards suppliers improves a firm's working capital position but causes negative implications for the upstream supply chain (Jing and Seidmann, 2014; Lamoureux and Evans, 2011). Research on trade credits has studied this approach of using suppliers as a credit source (Klapper, 2006; Love, 2011; Seifert et al., 2013). Nevertheless, it has neglected financing alternatives offered by buyers to their suppliers. An integrated approach to manage supply chain flows including the supply side has not been captured.

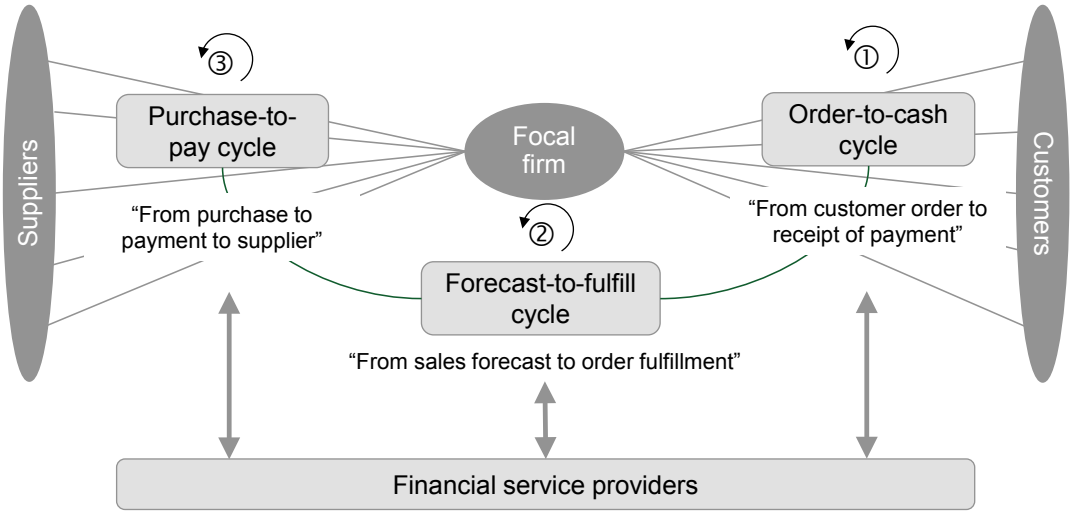


Figure C-1: Elements of financial flows in supply chains

In recent years, FSCM has evolved as an emerging stream of literature at the intersection of finance and SCM research (Gelsomino et al., 2016; Hofmann and Kotzab, 2010; Wuttke et al., 2013a). For instance, Fairchild (2005) has underlined that management practices focused on material flows in supply chains are only partly successful when they disregard financial flows. Yet, there has existed little consensus on one common definition regarding the concept of FSCM (Gomm, 2010; Hofmann and Johnson, 2016; Wandfluh et al., 2016). Specific to FSCM is its focus on the integrated management of financial flows with material and information flows. Pfohl et al. (2009) has emphasized that in particular an inter-organizational management of funding sources has been neglected in the existing literature. FSCM practices for the supply side address both issues. They involve the provision of financing alternatives from buyers to suppliers to avoid negative impacts on material flows. Furthermore, FSCM practices for the supply side contribute to improved information sharing between buyers and suppliers (Wuttke et al., 2013a, 2013b). The application of these practices usually involves some type of FSP indicating a contribution of FSPs to the integrated management of supply chain flows (Fellenz et al., 2009). Furthermore, Seifert and Seifert (2011) have stressed FSPs as a critical enabler for the application of FSCM practices for the supply side.

Besides the relevance, research on FSPs in supply chains has been scarce. Silvestro and Lustrato (2014) provided first insights on the role of FSPs for supply chain integration. Though, they remained on a descriptive level and did not analyze the service quality of FSPs. In addition, they focused on banks as one specific service provider related to FSCM practices for the supply side and neglected alternative providers. Technology providers have entered the market in recent years and, now, serve as an additional provider for FSCM services (Hofmann and Belin 2011). They constitute an intermediary between buyers, suppliers, and funders (e.g., banks, investors, or hedge funds). The SCM literature has primarily studied the involvement of LSPs and IT service providers in supply chains (Lacity et al., 2009; Marasco, 2008). Within finance research, FSPs have been discussed from a company-focused, but not a supply chain perspective (Draper and Hoag, 2013; Greenbaum and Thakor, 2007; Saunders, 2010).

Transaction cost economics and social exchange theory provide initial explanations to involve an external service provider in FSCM practices for the supply side. They both underline that service providers can constitute an intermediary to solve conflicts between exchange partners (Emerson, 1976; Molm and Cook, 1995; Williamson, 2008, 1979). Transaction cost economics additionally points out that service providers can reduce efforts involved in business exchange (Seggie, 2012). For instance, automated information exchange through electronic interfaces decreases transfer costs and uncertainty for actors involved (Ozer et al., 2011; Wang et al., 2016).

Overall, the literature analysis identifies valuable inputs for our research from finance, SCM, and FSCM. Still, WCM and trade credit research have focused on company-focused improvements of financial flows or have neglected financing alternatives for the supply side. The SCM literature has long disregarded the management of financial flows. Recent research on FSCM has addressed this issue through FSCM practices for the supply side and emphasized the relevance of FSPs. Nevertheless, the involvement of FSPs in buyer-supplier relationships through the described practices has rarely been studied. We aim at an overview on reasons to involve FSPs in FSCM practices for the supply side and on distinct service requirements for them. The described explanatory patterns of transaction cost economics and social exchange theory thereby serve as the foundation for our analyses.

Finally, to derive a preliminary framework for our research we follow literature on strategic planning processes as described by Mintzberg and Westley (2001). Strategic planning processes base the decision for a specific initiative on the generation or diagnose of issues as well as analysis and evaluation of alternatives (Camillus, 2003). They are applied to structure the decision making on management initiatives (Huff and

Reger, 1987). In our case, we do *not* examine the process itself, but the content of the individual steps to structure our research. We explicitly focus on the planning and not realization phase (Figure C-2).

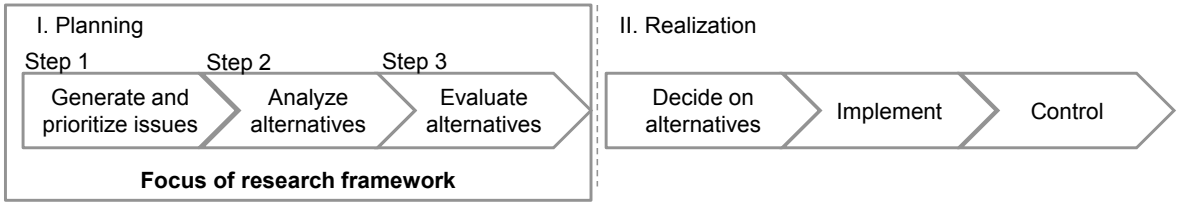


Figure C-2: Focus of the research framework based on strategic planning processes

The emphasis of the planning phase is due to our focus on a more general match of supply chain needs and service offerings for FSPs. In accordance to the first step (generate and prioritize issues), we want to identify reasons to involve FSPs in supply chains. Based on these reasons, we are able to classify different types of supply chain needs and explain why to involve FSPs in FSCM practices for the supply side. In step two and three the available service offerings and service quality of FSPs are analyzed and matched with the supply chain needs identified in step one. As both steps are closely interlinked step two and three are merged in our framework.

C.3 Methodology

Due to the explorative character of the research questions and the objective of contributing to theory building in a newly evolving field we applied a mixed-method approach (Creswell and Plano Clark, 2011; Tashakkori and Teddlie, 1998). Qualitative and quantitative data were combined to strengthen the validity of the results. Figure C-3 summarizes all data sources and indicates the sections capturing their analysis.

C.3.1 Study design and data collection

The study design[55] follows the planning steps of our research framework and is divided into two main parts. The first part enables a response to research question one while the second part addresses our research question two. *First*, we analyzed data to derive reasons for involving FSPs in FSCM practices for the supply side (Generate and prioritize issues). Therefore, a quantitative survey was performed to receive an overview on objective misfits between and within supply chain flows. Based on these initial

[55] The results of this survey were also published in practitioner-focused articles of the Supply Chain Finance-Lab at the University of St. Gallen. All expert interviews were conducted as part of the research work in the Supply Chain Finance-Lab at the University of St. Gallen.

findings detailed expert interviews were conducted to structure the derived reasons and to define supply chain needs for involving FSPs. *Second*, different types of FSPs and the quality of their FSCM services were studied (Analyze and evaluate alternatives). For this purpose, we analyzed publicly available information on FSCM services to gain an overview on existing services. Detailed expert interviews were conducted to examine service quality and to match offered FSCM services to supply chain needs. With this data triangulation of multiple data sources, we ensured construct validity for the research design (Miles et al., 2014). We subsequently present the four data collection steps in detail.

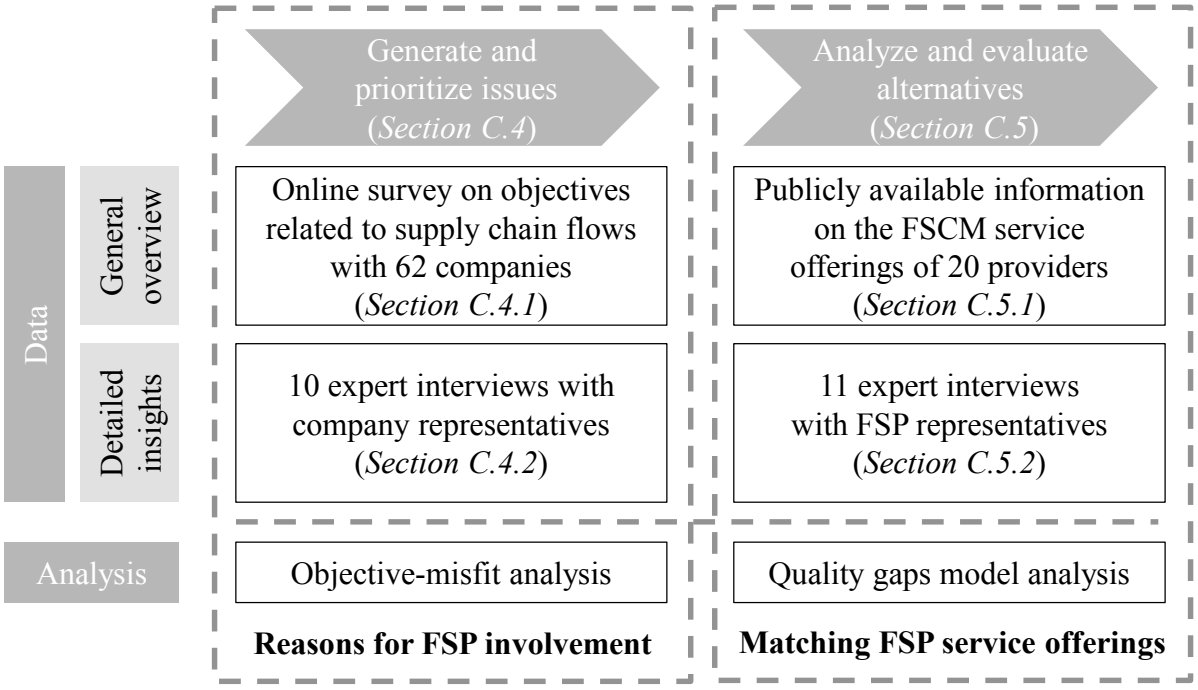


Figure C-3: Study design and analysis

Generate and prioritize issues to derive reasons for FSP involvement—overview on objective misfits: Within our questionnaire we opposed objective relevance and achievement in order to identify conflicts within and between supply chain flows. Companies had to assess the relevance of objectives based on a five Likert scale from no to very high relevance. For the achievement rate, the companies stated whether the objectives were missed, reached or exceeded. The questionnaire was subdivided into two main parts. The first part captured general objectives related to financial, material and information flows (Comelli et al., 2008). The second part included detailed insights into the sub-cycles of the cash conversion cycle, which was applied to operationalize supply chain flows (Grosse-Ruyken et al., 2011; Jose et al., 1996; Talonpoika et al., 2014). Based on the sub-cycles, the questionnaire involved insights for the supply side and the demand side addressing the perspectives of buyers and suppliers.

We utilized Singh and Kumar (2014) to describe objectives of financial flows based on their extensive review of WCM research. Previous SCM research provided items to define objectives for material and information flows in supply chains. In accordance to Chopra and Meindl (2013), we differentiated service, quality, cost, and innovation related objectives for supply chains. Furthermore, our questionnaire involved supply chain-oriented objectives based on previous FSCM studies (Gelsomino et al., 2016; Huff and Rogers, 2015). These studies have emphasized negative influences of a company-focused WCM on a firm's profitability (Dyckman, 2011; Hofmann and Kotzab, 2010). Within the Appendix C.8.1, we indicate the literature areas for all included objectives (WCM, SCM or FSCM). Finally, company size and type of industry were captured as important control variables to show how company characteristics influence supply chain needs.

The questionnaire was sent to 638 companies in Switzerland and 62 companies returned a complete questionnaire. The study was part of an extensive study on WCM requiring companies around 90 min to respond. As a consequence the response rate was comparably low with 62 companies (Forza, 2002). The survey involved a diverse sample in terms of company characteristics enabling profound insights. From the total sample, 31% of the participants were from service industries while 69% were assigned to industry and commerce. Referring to company size, 34 large companies and 28 small and medium-sized enterprises (SMEs) participated in our survey.

Generate and prioritize issues to derive reasons for FSP involvement—detailed insights on supply chain needs: Additional expert interviews were conducted to structure reasons to involve FSPs in FSCM practices for the supply side and to derive respective supply chain needs (Bryman and Bell, 2015). We employed the interviews to derive initial requirements for FSPs. Thereby, we ensured sample effectiveness and strengthened the validity of our analysis on supply chain needs (Miles et al., 2014). The selection of companies for the detailed expert interviews was based on a theoretical sampling approach with a focus on manufacturing industries (Glaser and Strauss, 1967). To derive comprehensive insights, we selected companies with different challenges for their financial and material flows. For instance, companies showed variances in their liquidity levels and production processes (make-to-order versus make-to-stock). In total, ten experts from eight Swiss companies participated in the interviews. The interviews were conducted mainly with CFOs of the respective companies, but also further representatives of finance and SCM departments. The interviews were based on a semi-structured questionnaire and lasted between 50 and 70 minutes. The interview guideline was configured similarly to the questionnaire of our survey to ensure comparability. All

participants provided insights for the demand and supply side and, thus, incorporated the role of buyers and suppliers simultaneously.

Analyze and evaluate alternatives—overview on FSPs: Publicly available information served as a foundation to study the FSCM service offerings of FSPs responding to supply chain needs. The selection of FSPs also followed a theoretical sampling approach (Glaser and Strauss, 1967). First, we selected FSPs, in particular banks, which were involved by the interviewed companies. Thereby, we ensured to analyze relevant service providers. Second, we added further FSPs that offer services accessible to the studied companies. We received a diverse sample of 20 FSPs (eight banks, two finance companies, two insurance companies and eight technology providers). We studied their homepages, brochures, and grey press articles to structure the available FSCM service offerings and develop an understanding on their target groups. Finally, we applied this initial data set to identify FSPs for our expert interviews.

Analyze and evaluate alternatives—detailed insights on service quality of FSPs: To not only structure the FSCM service offerings, but also evaluate its quality we conducted expert interviews with FSPs. The selection process was similar to the selection of FSPs for the general analysis of publicly available information. We added FSPs until we achieved a diverse sample in terms of product range, types of providers, and internal organization. We received detailed information on how the interviewed FSPs offer their FSCM services. Overall, we conducted six interviews with four banks and five interviews with technology providers. As insurances play a minor role within services relevant for FSCM practices for the supply side, we did not involve them in our expert interviews. All interviews lasted between 40 and 90 minutes. The semi-structured questionnaire was derived from literature in reference to the quality gaps model (Mauri et al., 2013; Zeithaml et al., 1993). The questionnaire captured reasons to offer FSCM services for FSPs, their service design as well as internal and external structures influencing service quality.

C.3.2 Data analysis

Generate and prioritize issues to derive reasons for FSP involvement—overview on objective misfits: With our overview on objective misfits, we identified relevant objectives within supply chain flows. For this identification, we compared relevance and achievement of objectives. A need for action was derived from a misfit between objective relevance and objective achievement. We distinguished between two possible types of objective misfits within our analysis (see Figure C-4):

- *Type A – "High achievement rate with low objective relevance":* Although the objective is assigned only low relevance, companies exceed the expected performance. They can either increase relevance or reduce achievement rate to reach alignment.
- *Type B – "Low achievement rate with high objective relevance":* Although the objective is assigned high relevance, companies do not reach the expected performance. They can either reduce relevance or increase achievement rate to reach alignment.

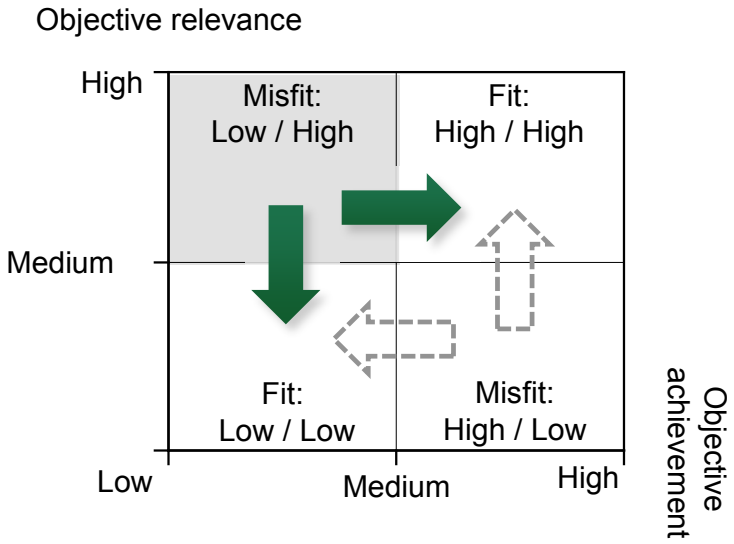


Figure C-4: Fit and misfit of objective relevance and achievement rate

Type A does not necessarily require direct management measures, since the performance is well and relevance low. In contrast, type B indicates an immediate need for action, since relevant objectives related to supply chain flows are not achieved. We analyzed all objectives within our survey in accordance to their level of relevance and achievement rate to identify objective misfits of type B. Appendix C.8.1 includes additional information on our analysis and on differences in accordance to company size and type of industry.

Generate and prioritize issues to derive reasons for FSP involvement—detailed insights on supply chain needs: The expert interviews with companies were applied to structure objective misfits and to derive trade-offs within and between supply chain flows. To analyze the interviews, we used codes grounded in our data but based on theoretical propositions (Yin, 2009). In particular transaction cost economics and social exchange theory served as a foundation to classify the identified trade-offs into financial flow-specific, cross-functional and supply chain-related objective misfits (Griffith et al., 2006; Molm and Cook, 1995; Williamson, 2008, 1979). These three types of objective

misfits constitute reasons to involve FSPs. As the derived objective misfits were not specific to the supply side, we removed this restriction from our subsequent analysis. We summarize the identified objective misfits and provide examples in Appendix C.8.2.

Analyze and evaluate alternatives—overview on FSPs: Publicly available information was analyzed regarding different types of FSPs. We identified services related to supply chain flows (FSCM services) and compared them to the identified supply chain needs. We distinguished between long existing traditional services and innovative FSCM services that involve an integrated management of supply chain flows. Within the subsequently described, final analysis step, we explicitly focused on these innovative FSCM services, since they address FSCM practices for the supply side. We include additional insights on the analyzed FSPs and identified FSCM services in Appendix C.8.3.

Analyze and evaluate alternatives—detailed insights on service quality of FSPs: To evaluate the quality of FSCM services, we analyzed our expert interviews with FSPs. The analysis approach was similar to our expert interviews with companies. Yet, we applied the quality gaps model to reflect on our codes generated from the interviews (Zeithaml et al., 1993). The model explores causes for a gap between customer expectation and perception (gap five) based on four further gaps that occur during service production (Mauri et al., 2013):

- Gap 1—The customer expectations perceived by the management do not represent actual consumer expectations;
- Gap 2—Management perceptions of customer expectations are not adequately transferred into the FSP's service specifications;
- Gap 3—Service in not delivered as indicated in quality specifications;
- Gap 4—Service is not delivered as described in external communication;
- Gap 5—Customer expected service quality exceeds customer perceived service quality.

We applied gaps one to four to evaluate the service quality of FSPs in detail. Within gap five we matched the service quality as determined in gap one to four to the supply chain needs in our previous analysis. Thereby, we were able to derive service requirements for the involvement of FSPs in FSCM practices for the supply side. As our study involves a generic and conceptual approach, the analysis of quality gaps was not based on effective customer experience but more on general requirements and supply chain needs.

C.4 Generate and prioritize issues to derive supply chain needs

C.4.1 Overview on objective misfits

General financial objectives considered overall aspects of the financial supply chain of a company. Objectives related to material and information flows were indirectly captured through profitability and improved process flows. This analysis of general objectives served as a starting point for the detailed evaluation of all three sub-cycles (order-to-cash, forecast-to-fulfill and purchase-to-pay). The results of all four analyses are summarized in Figure C-5. Companies stood in between an objective misfit of improved profitability and liquidity. Both objectives were ranked with medium to high relevance, but profitability received a lower achievement rate. In contrast, supply chain-oriented objectives considering impacts of working capital improvements on the demand side and supply side showed low average relevance for all participants.

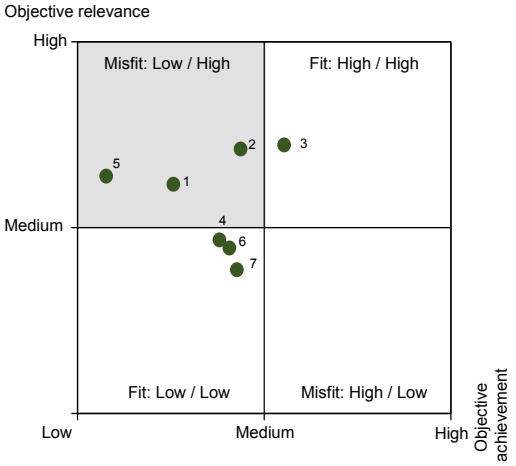
The *order-to-cash cycle* emphasizes flows on the demand side of a company's supply chain and involves all process steps from customer order to order fulfillment (Hofmann and Belin, 2011). Related to the buyer-supplier dyad, it provides insights on the perspectives of suppliers. Objectives for financial flows demonstrated several misfits, e.g., avoidance of payment defaults and delays. Similarly, customer satisfaction demonstrated a misfit between relevance and achievement rate. Both identified misfits reveal interrelations. On the one hand, delayed payments can be an outcome of poor customer service when delayed payments are caused by low quality delivered to buyers. On the other hand, strict payment terms can result in customer dissatisfaction.

The *forecast-to-fulfill cycle* includes all process steps from demand forecast to order fulfillment (Singh and Kumar, 2014). As the analysis indicated, this cycle generated misfits for almost all objectives resulting in trade-offs between supply chain flows. Companies increase product variety and service levels through higher inventory levels to elevate customer satisfaction (Enqvist et al., 2014). Similarly, production costs are reduced through augmented capacity utilization causing inventory levels to rise. Hence, reducing inventories without considering the effects on material flows in supply chains can cause negative outcomes for a company`s profitability.

The *purchase-to-pay cycle* focuses on the supply side and incorporates all process steps from purchasing to supplier payment (Templar et al., 2016). Related to the buyer-supplier dyad, it captures the perspectives of buyers. The analysis indicated an emphasis of cost objectives for this cycle. The realization of savings and improved discount rates received high relevance but low achievement rates. Nonetheless, objectives related to

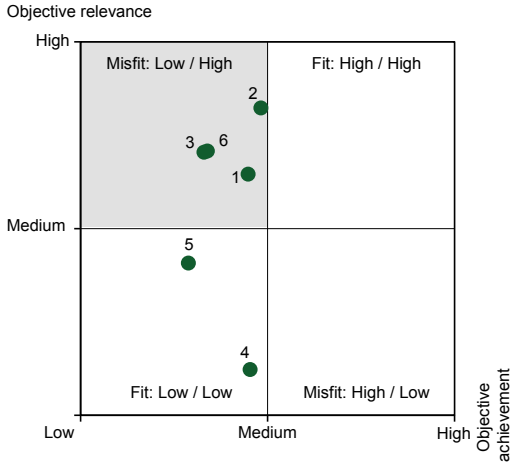
quality, innovation, and extended payment terms also demonstrated objective misfits. Consequently, measures need to be applied improving all objectives conjointly.

1. General objectives



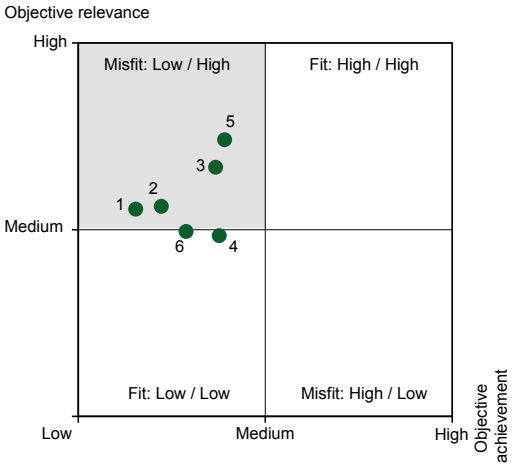
1	Improved profitability
2	Improved liquidity
3	Improvement of self-financing strength
4	Reduced capital commitment
5	Improvement of process flows
6	Financially strong customers
7	Financially strong suppliers

2. Order-to-cash cycle



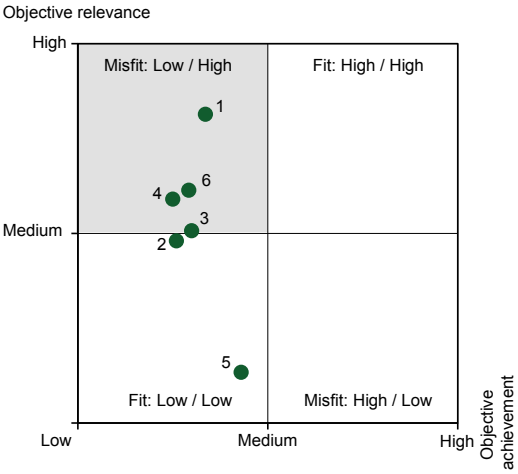
1	Faster billing processes
2	Avoidance of payment defaults and delays
3	Faster payment receipt
4	Improved liquidity of customers
5	Reduced process costs
6	Improved customer satisfaction

3. Forecast-to-fulfill cycle



1	Inventory reduction
2	Capacity utilization
3	Secured supply
4	Product variety
5	Improved service levels
6	Reduced transport costs

4. Purchase-to-pay cycle



1	Realization of savings
2	Access to innovations
3	Extended payment terms
4	Improved discount rates
5	Financial support of suppliers
6	Improved quality

Figure C-5: Results of the objective misfit analyses

Company characteristics influenced the identified objective misfits. *Company size* affected the evaluation of objectives in particular. SMEs assigned a higher relevance for

general working capital objectives. For instance, they faced an objective misfit for the improvement of self-financing strength. In contrast, large companies did not struggle with any misfits for general working capital objectives, but aimed at improved process flows to increase their profitability. Large companies often capture a strong position in supply chains and pass on pressure towards smaller and less powerful members in supply chains (Chiou et al., 2006). On the demand side, SMEs experienced issues for receiving punctual payments and assigned this objective a much lower achievement rate in contrast to large companies. Similarly on the supply side, SMEs addressed a more diverse set of objectives and did not only emphasize savings. *Industry classification* had also a strong impact on objective misfits. For service providers, the focus was on objectives in the order-to-cash cycle. Objectives in the forecast-to-fulfill cycle were assigned very low relevance, as inventory levels were negligible. Also in the purchase-to-pay cycle, most objectives received little attention despite the realization of savings. For industrial and commercial companies, the relevance of objectives along supply chains was more balanced.

Altogether, we were able identify multiple objective misfits, which resulted in trade-off situations between supply chain flows. Companies required integrated management approaches to solve these trade-offs situations. Yet, we needed to gain detailed insights to better understand why the identified trade-off situations occurred and how they could be addressed by FSPs.

C.4.2 Structuring and prioritization

The overview of objective misfits combined with the analysis of our expert interviews, resulted in the differentiation of three types of misfits:

Financial flow-specific objective misfits occur whenever respective objectives are assigned high relevance and show low achievement rates. For instance, companies might show a need for action regarding faster billing processes or inventory reduction. This became obvious in the interviews where all companies emphasized the relevance of receiving outstanding cash on time. One company implemented weekly meetings to discuss all its outstanding positions. FSCM services of FSPs that address these issues without negative effects on material or information flows can assist companies to manage their financial flows.

Cross-functional objective misfits capture trade-offs between business functions of a company. As indicated in the interviews, sales force might be more focused on receiving an order from a buying company than negotiating shorter payment terms: “When we

negotiate a project, sales wants to sell the project and is less focused on short payment terms. This issue plays a minor role for them. Their focus is on the customer signing the contract […].” Similarly, one CFO underscored that their sales team required increased inventories to ensure high service levels: “Within one of our business units, we had to increase inventories in order to reduce customer lead times. This is a fast turning business. We have to deliver fast to our customers. In exchange, we accept higher costs for our inventories.” Cross-functional objective misfits require an integrated management of supply chain flows in order to achieve value added for all involved business functions.

Supply chain-related objective misfits occur at the intersection of buyers and suppliers. For instance, suppliers’ quality and service levels might reduce when buyers extend their payment terms towards them. The interviews revealed that most companies passed on the pressure they received from their customers towards suppliers: “On the supply side, we have a different market power, since we are the customer. There procurement is attentive to prolong payment terms as far as possible. ” Power and dependence strongly influence the specificity of supply chain-related objective misfits. For illustration, one of the companies explained that they had global OEMs as customers where 90 days payment terms represented a standard. This standard could not be negotiated, since otherwise one was not able to participate in the call for proposals. At the same time, objective misfits experienced by suppliers could cause objective misfits for buyers. For instance, suppliers with a lack of funding might reduce their investments in quality and services resulting in objective misfits for buyers related to service and quality levels.

Our results indicated that the role of FSPs in supply chains is not restricted to financial flow-specific objective misfits. On the contrary, FSPs may serve as an intermediary between business functions or supply chain members to solve cross-functional and supply chain-related objective misfits. FSCM practices for the supply side emphasize supply chain-related and cross-functional objective misfits. They thereby indirectly also address financial flow-specific misfits. For instance, when a buyer offers a financing alternative to its supplier base, suppliers benefit from accelerated cash inflows and they can solve financial flow-specific objective misfits.

The identified types of misfits explain the involvement of FSPs in FSCM practices for the supply side. FSPs need to solve conflicts between business functions and, in particular, supply chain members in order to facilitate an integrated management of supply chain flows. Still, FSPs require supply chain expertise to understand the described trade-offs. Otherwise, FSPs are not experienced as an actual partner or as illustrated within one of the interviews: “The bank supports me in letting me know that

I perform 2% worse than my competitors. When I say, ok I understand, what has to be done? They respond: I do not know that is your problem. I have to be able to operationalize their input." Consequently, FSPs have to address these supply chain needs in their service offerings in order to contribute to FSCM practices for the supply side.

C.5 Analyze and evaluate service offerings of financial service providers

In recent years, the financial system has experienced severe changes that affected also the service offerings of FSPs (Draper and Hoag, 2013; Gup, 2011). Large banks operate on global markets and can offer more globalized financial services to international companies. New market players increase competition for traditional commercial banks and extend the available services. To develop an understanding on how FSPs address the objective misfits identified in the previous section, we first analyzed and classified the available services and types of FSPs based on publicly available data (Section C.5.1). Subsequently, we evaluated their service quality based on the quality gaps model (Section C.5.2).

C.5.1 Available service offerings

Within our analysis on available services, we captured all services addressing the management of supply chain flows. As our identified objective misfits in Section C.4.2 were not limited to the supply side, we also involved a broad perspective on services of FSPs. The findings resulted in a differentiation of traditional and innovative FSCM services of FSPs.

Traditional FSCM services encompass short-term financing, risk mitigation as well as trade financing instruments. They are primarily focused on the coordination of financial flows within and between companies (Hofmann and Belin, 2011). Yet, they usually do not include cross-functional or supply chain coordination. For instance, asset-based financing services enable the funding of working capital and reduce financial flow-related objective misfits (Featherstone, 2010; Soufani, 2002). But, they do not require the involvement of partners within a company or the supply chain. In consequence, traditional FSCM services do not explicitly address cross-functional and supply chain-related objective misfits, and thus constitute no direct basis for FSCM practices for the supply side.

In contrast, *innovative FSCM services* foster the integrated management of supply chain flows. These services form the basis for the provision of inter-organizational financing alternatives and they enable FSCM techniques, e.g., approved payables or advanced inventory financing (Bryant and Camerinelli, 2014). In contrast to traditional FSCM services, departments other than finance and partners within the supply chain need to be actively involved. In addition, innovative FSCM services are characterized by a high degree of process digitalization to facilitate information sharing between involved actors (Caniato et al., 2016). Innovative FSCM services address all three types of objective misfits (financial flows-specific, cross-functional and supply chain-related). Various types of FSPs offer the two types of FSCM services.

Commercial banks still constitute the most important source of funding related to external debt financing in most parts of the world (Saunders, 2010). Their traditional services for managing financial flows of companies revolve around transaction banking, loans and risk mitigation (Greenbaum and Thakor, 2007). In the past years, large commercial banks have also started to offer innovative FSCM services (Deutsche Bank, 2014). As one consequence of the global financial crises in 2008/2009, an increasing number of large commercial banks has incorporated innovative FSCM services in their product portfolio (UBS Supply Chain Financing, 2013).

Finance companies, such as GE Capital or Siemens Financial Services, emerged as a direct subsidiary of manufacturing companies (Greenbaum and Thakor, 2007). In recent years, these kinds of financial institutions have represented one of the fastest growing groups of FSPs. The results of our analysis revealed that the service offerings of large finance companies are similar to the one of banks ranging from traditional to innovative FSCM services.

Technology providers represent a new group of FSPs (e.g., Global Supply Chain Finance, Prime Revenue, or Orbian). They serve as an intermediary between funders (e.g., banks and investment funds) and supply chain members (Templar et al., 2016). Thereby, technology providers offer FSCM services independent of a single funder – often a bank. They are specialized on innovative FSCM services of various types. In contrast to financial institutions, technology providers focus not only on practices including a supply chain external funder. They offer technological interfaces for supply chain-internal financing where buyers themselves offer funding directly to suppliers. Several commercial banks have initiated cooperation projects with platform providers to avoid large investments in service offerings on innovative FSCM services.

Insurance companies mitigate risks related with managing financial flows. They serve as an intermediary to mitigate risks for commercial banks, finance companies or technology providers (Gup, 2011). The analysis results indicated that insurances have played an important role in enabling FSPs to provide traditional FSCM services. Nevertheless, their relevance within innovative FSCM services decreases, since the information exchange between supply chain members reduces involved financing risk.

In general, FSPs provide a great variety of FSCM services related to supply chain flows. Traditional FSCM services address financial flow-specific objective misfits. Innovative FSCM services provide additional benefits to avoid cross-functional and supply chain-related objective misfits. Thereby, the FSP serves as an intermediary to reduce trade-offs between involved partners. Commercial banks and financial companies still represent the most important players on the market for FSCM services. They often already have a long-term business relationship with supply chain members and serve as first "contact person" to approach for FSCM services. Nevertheless, the relevance of technology providers increases, in particular, regarding innovative FSCM services.

In principle the relevant FSCM services are available on financial markets to respond to financial flow-specific, cross-functional as well as supply chain-related objective misfits. Whether supply chain needs are actually fulfilled strongly depends on the quality of services offered by FSPs. As traditional FSCM services have been on the market for many years and are not essential for the application of FSCM practices for the supply side, we focus in the following evaluation on innovative FSCM services of FSPs.

C.5.2 Provided service quality

As aforementioned in Section C.3.2, we analyzed the service offerings of FSPs for innovative FSCM services along the quality gaps model (Mauri et al., 2013; Zeithaml et al., 1993). The evaluation was based on our conducted expert interviews with FSPs.

Gap 1 – Supply chain needs and FSP management perception gap: This first gap indicates that executives of FSPs may not always capture all features relevant for FSCM services. It constituted one main explanation for the differences between the service offerings of FSPs. While some FSPs established innovative FSCM services already some years ago others have just recently entered the market as a response to increasing market demand as explained by one bank representative: "The main reason for our launch of innovative FSCM services was the request of one of our key clients […]. We then developed the product together with this client". Hence, while some FSPs

anticipated customer demand others lagged behind in terms of expertise. This example also revealed how most banks were still very product-driven while, especially, technology providers rather underlined the relevance of end-to-end FSCM services for the entire supply chain. To achieve this end-to-end supply chain orientation, individual products of FSPs have to be aligned along supply chain flows to avoid improving only small sections. At the same time, the interviews indicated that FSPs are driven by their own USP when interpreting reasons to involve a FSPs in FSCM practices for the supply side. Banks emphasized needs of companies to shorten the balance statement of involved actors, to receive cost efficient FSCM services and to rely on their relationship bank. Technology providers indicated the importance of bank-independent funding structures, their supply chain expertise and the possibility of supply chain-internal financing as summarized by one provider: "Banks don't finance the supply chain. They only finance paper; in this case it happens to be invoices. Banks don't understand what this represents for buyers and suppliers. It is beyond their expertise." These opposed perspectives were also reflected later on in our analysis of the service specification and delivery.

The continuous dissemination of technology providers indicates that they serve supply chain needs. This is probably also the reason why some of the banks emphasized the importance of a supply chain orientation: "[…] In particular the demand for strengthening the supply chain is increasing. FSCM practices enhance the relationships between suppliers and buyers." Nevertheless, the relevance of banks in providing innovative FSCM services demonstrates that also low costs and an existing, trustful service relationships constitute essential requirements.

Another gap between supply chain needs and management perception occurred for company size. Most FSPs focused on large, international companies. They addressed SMEs indirectly through the financing alternatives offered by these large companies to their suppliers and customers. Only few providers developed adjusted versions of innovative FSCM services to also approach SMEs.

Gap 2 – Gap between FSP management perceptions and the FSCM service specifications: Understanding supply chain needs is not enough if the FSP lacks the necessary means to deliver to them. Reasons can be a lack of adequate resources, market constraints or an absence of management commitment. The differences between banks and technology providers could be transferred from gap one to gap two. All involved banks emphasized the importance of developing a proprietary platform although this approach requires time and financial resources as expressed by one of the bank: "We needed almost one and half year of planning and development". Another bank was not able to yet establish all innovative FSCM services due to the large amount of required

funding. Thus, transferring supply chain needs into a specific FSCM service design can be time consuming. Banks experience particular issues due to strict legal regulations in terms of platform security and transparency. The interviewed banks, however, underlined the benefits of proprietary platforms, since they enabled them to adapt their FSCM services according to specific customer requirements. In contrast, technology providers underscored the consulting and training opportunities of their services. One of the providers established a training platform for buyers and suppliers. Respectively, technology providers also prioritized the need for a work force with supply chain expertise. In contrast, some banks underlined difficulties in finding specialists with FSCM expertise. As a consequence, there existed a wide spread between FSPs strongly focusing on supply chain expertise and those who neglected this aspect.

Another important issue mentioned by the FSPs was how supply chain members are approached. Long-established providers of FSCM services stressed the relevance of interacting with finance and SCM representatives during the sales process. Otherwise supply chain members might decide on an FSCM service that is afterwards not supported by all relevant functions. Finally, the variety of FSPs has increased the diversity of innovative FSCM services and resulted in a lack of standardization for involved IT interfaces. This low standardization has enhanced complexity of FSCM practices for the supply side, since supply chain members need to always adapt their interfaces. The FSPs in our sample neglected this need for standards when deriving their service specifications.

Gap 3 – FSCM service specifications and FSCM service delivery gap: The perceived FSCM service quality is always dependent on the responsible contact person at the FSP. Nevertheless, employee performance can show great variability. For the interviewed banks this could become a reason for low service quality as they all relied on one responsible client manager, “who connects the customer with the specialists in the factoring or trade finance department.” Consequently, service quality strongly depends on the capabilities and knowledge of this client relationship manager.

Gap 4 – FSCM service delivery and external FSCM service communication gap: This gap captures differences between the delivered and communicated FSCM services. One problem in this context was the lack of standards when innovative FSCM services were communicated. For instance, FSCM services related to approved payables financing were referred to as reverse factoring, supply chain finance or supplier financing. It could be offered as an early-payment solution or a true-sale product. In addition, most FSPs did not organize their communication in relation to supply chains. They assigned some services to SMEs while others were combined as trade finance solutions. This resulted

in difficulties for supply chain members to understand products and compare different services. This lack of standards and supply chain orientation reduces transparency for supply chain members when they want to find information on available innovative FSCM services to manage their supply chains. Consequently, FSPs may well offer the relevant services, but if not communicated correctly supply chain members may not know about them.

Gap 5 – Supply chain needs and delivered FSCM services do not match: Our findings for gaps one to four were applied to understand gap five due to short-comings on the FSPs' side. Still, this gap can also be caused by supply chain members. Companies might not be aware of objective misfits along the supply chain themselves and, hence, are not communicating their needs to FSPs. A lack of internal cross-functional coordination between finance and SCM departments can cause this missing awareness. As a result, supply chain members do not initiate FSCM practices for the supply side in advance, but as a reaction to disruptions in financial, material, or information flows. For instance, as a response to the financial crisis in 2008/2009 various buyers have started to offer financing alternatives to their suppliers (Dyckman, 2011).

C.6 Discussion

Our analyses captured reasons why FSPs are involved in FSCM practices for the supply side and facilitate the integrated management of supply chain flows. We identified three central explanations based on the idea of objective misfits: financial flow-specific, cross-functional and supply chain-oriented. These types of objective misfits display the idea of conflict identified in transaction cost economics and social exchange theory as reasons to involve external providers (Griffith et al., 2006; Molm and Cook, 1995; Williamson, 2008, 1979).

FSPs offer traditional and innovative FSCM services that capture the identified objective misfits. Since traditional FSCM services mainly address financial flow-specific objective misfits, we introduced the term "innovative" FSCM services. These innovative FSCM services form the foundation for FSCM practices for the supply side. They aim at reducing cross-functional and supply chain-related objective misfits. Thereby, FSPs serve as intermediaries between involved actors within companies and across supply chains. Moreover, we derived distinct service requirements based on an analysis of the service quality of available, innovative FSCM services.

While some of the FSCM services have been offered for many years, others have just recently emerged and changed the market for FSCM. Still, certain challenges and

constrains slow down market growth and explain the gap between supply chain needs and FSCM services delivered by FSPs (Bryant and Camerinelli, 2014):

- *Lack of supply chain orientation:* Most FSPs still have a strong product focus instead of addressing needs along the supply chain. Only parts of the supply chain are managed while others are neglected. Hence, an end-to-end focus is necessary to respond to supply chain needs.
- *Lack of standards:* FSPs use no common terminology for their services making it difficult for supply chain members to understand characteristics and compare them with other service providers. In addition, the lack of standards results in many individual IT platform types and interfaces. This low standardization impedes, for instance, the onboarding of suppliers, since suppliers have to deal with various platform connections of their buyers.
- *Lack of SCM knowledge:* FSPs usually employ people with a finance or legal background not having the supply chain expertise necessary to consult supply chain members in this regard. Yet, supply chain expertise is essential in order to enable the application of FSCM practices for the supply side.

To overcome these challenges FSPs have to advance their service offerings from a mere financing and risk mitigation product to a consulting approach related to the management of supply chain flows. A consulting-oriented approach would require supply chain orientation, FSCM reputation, and technological expertise from FSPs. As aforementioned, a *supply chain orientation* presupposes an alignment of internal structures and offered FSCM services with supply chain flows. FSCM services should not only be introduced to realize additional profits through cross-selling activities. Furthermore, FSPs often underestimate the relevance of a distinct *reputation for innovative FSCM services*. In contrast to many traditional FSCM services, innovative FSCM services require specific financial and supply chain-related knowledge of FSPs. Combined with long-term expertise on FSCM services, FSPs are able to develop a respective FSCM reputation. Finally, innovative FSCM services are characterized by a high degree of process digitalization to facilitate information sharing. FSPs need to develop simple interfaces and provide respective *technological expertise*. All three service requirements serve as preconditions for the application of FSCM practices in general and, consequently, also for practices with a supply side emphasis.

Governmental intervention could be another approach to reduce the identified challenges. Some countries, e.g., the UK and the Netherlands, already introduced first programs to foster SME financing through FSCM practices for the supply side (Templar

et al., 2016). Additional initiatives aim at increased transparency on FSCM services and on available types of FSPs (Bryant and Camerinelli, 2014). Based on transparency, standards can be established to derive a common understanding.

The applied gaps model constitutes a reference point in literature on service quality (Mauri et al., 2013). The model's strength but probably also its weakness is the simplicity and linearity. Due to these characteristics the model is suitable for our generic match between supply chain needs and FSPs' service offer. The purpose of this paper is not to identify specific drivers and measures of customer satisfaction within an FSCM context. We derive more generic obstacles in the service process to identify overall service requirements for FSPs related to FSCM practices for the supply side. Thereby, we show how the new role of FSPs in supply chains should change the way that FSPs offer their FSCM services. Similarly, supply chain members need to adapt their approaches of integrating FSPs in supply chains in order to add value.

C.7 Conclusion

The managerial and theoretical implications of the conducted research are manifold. We identify financial flow-specific, cross-functional, and supply chain-related objective misfits as reasons to involve FSPs in supply chains. Cross-functional and supply chain-related objective misfits explain the specific contribution of FSPs for the application of FSCM practices for the supply side. They solve conflicts between business functions and, in particular, supply chain members to enhance an integrated management of supply chain flows. Thereby, we enhance previous research that restricts the role of FSPs mainly to financial flows in supply chain (Silvestro and Lustrato, 2014).

Furthermore, we analyze the available FSCM services of FSPs and distinguish between traditional and innovative FSCM services. We compare different types of FSPs and their specific approach towards FSCM. We also study the service quality of offered innovative FSCM services along the quality gaps model and derive causes for limited service quality (Mauri et al., 2013). The results of this analysis are applied to derive supply chain orientation, FSCM reputation, and technological expertise as service requirements for FSPs. They serve as preconditions for the application of FSCM practices for the supply side.

As aforementioned in our analysis, it is important to mention that the identified objective misfits as well as the derived service requirements are not distinct to FSCM practices for the supply side. They are valid for the inter-organizational management of funding sources in general. This further enhances the theoretical contribution of our findings

(Caniato et al., 2016). Still, additional research is necessary in order to identify a framework for the involvement of FSPs in supply chains.

Furthermore, the results indicate that FSPs underestimate the relevance of a supply chain orientation and SCM knowledge in the context of FSCM services. Besides a better understanding of supply chain needs, the research implicates an enhancement of the role of FSPs in supply chains. Therefore, FSPs need to enlarge their supply chain expertise. A detailed analysis of the offered FSCM services and different types of FSPs would be beneficial to derive enablers and inhibitors for their successful engagement in FSCM.

The research contributes to the existing SCM literature by focusing on financial flows and studying the interrelations of financial flows with material and information flows (Gelsomino et al., 2016; Hofmann and Kotzab, 2010). In addition, the value added of FSPs is analyzed from a supply chain perspective. The paper contributes to the finance literature by redefining the role of FSPs in their customers' supply chains. The findings integrate financial and supply chain perspectives on the involvement of FSPs in FSCM practices for the supply side. Nevertheless, the continuous introduction of innovative services and the entry of new providers (e.g., logistics service providers) reveals a need to extend research on the contribution of FSPs for the integrated management of supply chain flows.

In addition, the following research limitations should be addressed in future research:

- The conducted study was focused on Swiss companies. It would be interesting to compare supply chain needs between regions and countries to identify differences.
- The paper included an explorative research approach resulting in a need for quantitative, confirmative studies.
- The research was focused on financial flows related to net working capital. Managing needs for fixed assets in supply chains (e.g., warehouses, IT-systems or transportation fleets) could be studied in future work.

C.8 Appendix

C.8.1 Company characteristics' related differences

To analyze company characteristics we separated our sample from the survey into two groups: Company size (SME and large companies (LC)) and type of industry (industry and commerce (I/C), services (S)). Tables C-1 and C-2 summarize the differences in average values for objectives relevance and achievement rate. As we analyzed our expert interviews we also coded statements on company characteristics in reference to the data. Thereby, we derived statements on the impact of liquidity situation and power dependencies in supply chains.

		Objective relevance				Objective achievement rate			
	Source	S	I/C	LC	SME	S	I/C	LC	SME
General objectives									
Improved profitability	SCM	2.68	3.65	3.15	3.57	-0.13	-0.30	-0.18	-0.28
Improved liquidity	WCM	3.37	3.77	3.71	3.57	0.07	-0.12	-0.05	-0.08
Improvement of self-financing ability	WCM	3.26	3.85	3.69	3.57	0.18	0.00	0.17	-0.07
Reduced capital commitment	WCM	2.32	3.17	2.85	2.96	-0.14	-0.11	-0.07	-0.19
Improvement of process flows	WCM	3.11	3.56	3.53	3.25	-0.27	-0.49	-0.41	-0.44
Financially strong customers	FSCM	2.58	2.95	2.68	2.89	-0.13	-0.08	-0.07	-0.08
Financially strong suppliers	FSCM	2.37	2.79	2.65	2.54	-0.07	-0.08	-0.03	-0.08
Order-to-cash cycle									
Faster billing processes	WCM	3.53	3.40	3.41	3.57	0.00	-0.08	0.03	-0.15
Avoidance of payment defaults	WCM	3.79	4.05	3.94	4.07	0.12	-0.07	-0.03	-0.04
Faster payment receipt	WCM	3.32	3.74	3.47	3.89	-0.06	-0.22	-0.22	-0.15
Improved liquidity of customers	FSCM	1.58	2.00	1.82	1.92	-0.19	0.04	-0.09	0.00
Reduced process costs	WCM	2.79	2.69	2.76	2.67	-0.19	-0.22	-0.25	-0.17
Improved customer satisfaction	SCM	3.74	3.57	3.59	3.59	-0.12	-0.18	-0.13	-0.16

Table C-1: Analysis of objective misfits based on company characteristics (I)

		Objective relevance				Objective achievement rate			
	Source	S	I/C	LC	SME	S	I/C	LC	SME
Forecast-to-fulfill cycle									
Inventory reduction	WCM	2.22	3.56	3.12	3.14	-0.13	-0.43	-0.38	-0.30
Capacity utilization	SCM	-	3.19	3.00	3.30		-0.28	-0.15	-0.38
Secured supply	SCM	3.42	3.53	3.62	3.36	-0.07	-0.16	-0.10	-0.13
Product variety	SCM	2.39	3.19	2.91	2.93	0.07	-0.20	-0.11	-0.14
Improved service level	SCM	-	3.72	3.52	3.95		-0.11	-0.08	-0.18
Reduced transport costs	SCM	2.58	3.16	2.85	3.07	-0.20	-0.22	-0.05	-0.31
Purchase-to-pay cycle									
Realization of savings	SCM	3.79	4.00	4.03	3.79	-0.24	-0.13	-0.10	-0.16
Access to innovations	SCM	2.63	3.07	2.71	3.21	-0.18	-0.27	-0.18	-0.35
Extended payment terms	WCM	2.18	3.40	3.12	2.91	-0.12	-0.24	-0.29	-0.08
Improved discount rates	SCM	2.58	3.58	3.35	3.18	-0.13	-0.31	-0.36	-0.12
Financial support of suppliers	FSCM	1.58	2.05	1.94	1.82	0.08	-0.13	-0.08	-0.05
Improved quality	SCM	2.53	3.70	3.29	3.39	-0.06	-0.27	-0.13	-0.29

Table C-2: Analysis of objective misfits based on company characteristics (II)

C.8.2 Structuring and prioritization of supply chain needs

To structure our analysis we assigned the objective misfits into three categories. Table C-3 provides a description as well as examples for objectives misfits in the respective categories.

Categories	Description	Examples
Financial flow specific misfits	Misfits occur whenever an objective is assigned high relevance but only low achievement rate.	• Improved liquidity • Faster billing services • Inventory reduction
Cross-functional misfits	Misfits occur within the same sub-cycle when objectives related to different functions are assigned high relevance but only low achievement rates and these objectives result in trade-off situations. Cross-functional misfits can represent supply chain misfits.	• Realization of savings—Improved quality—Extended payment terms • Inventory reduction—Secured supply—Capacity utilization • Faster billing processes—customer satisfaction
Supply chain misfits	Misfits occur between buyers and suppliers in a supply chain. They can be identified for opposed sub-cycles (order-to-cash and purchase-to-pay cycle) and for general objectives when objectives related to the cycles are assigned high relevance but only low achievement rate and these objectives result in trade-off situations between supply chain members.	• P2P focal company: Extend payment terms—O2C supplier: Faster billing processes and faster payment receipt • P2P focal company: Realization of savings—General objectives supplier: Improve profitability

Table C-3: Classification of objective misfits into three categories

C.8.3 Overview of available service offerings

The analysis of publicly available information for FSPs was conducted for 20 FSPs. The selected and available data sets are summarized in Table C-4. Based on the available information on FSPs we analyzed their service offerings related to supply chains. Services providing short-term financing, enabling payment transactions or mitigating risks were studied. In Table C-5 we describe our two categories of FSCM services with respective examples. We did not introduce any sub-categories for innovative FSCM services, since they usually combine financing, transaction, and risk mitigation aspects. Some of the FSCM services can be assigned to both categories depending on the exact structure of the service. For instance, factoring can be limited to one specific invoice between one company and its customers (traditional service). At the same time, it can be part of a receivables platform integrating factoring with managing invoices and payment transactions (innovative FSCM services).

Type	Banks	Financial institution	Insurances	Technology providers
FSP	• HSBC • Deutsche Bank • UBS • Crédit Suisse • Commerzbank • Unicredit • Santander • Citigroup	• Siemens Financial Services • GE Capital	• Coface • Euler Hermes	• Global SCF • Prime Revenue • Taulia • Orbian • Bolero • Demica • Asyx International • CorporateLinx
Data set	• Homepage • Grey Press • Company presentations	• Homepage • Grey Press • Company presentations	• Homepage • Grey Press	• Homepage • Grey Press

Table C-4: Overview of publicly available data on FSPs

Type	Description	Exemplary FSCM techniques		
		Financing	Transaction	Risk mitigation
Traditional FSCM services	Services address one of the sub-categories. They are often limited to 1-1 or 1-2 relationships, e.g., 1 company and 1 bank; 1 company, 1 bank and 1 suppliers. Usually little technologically advanced.	• Asset-backed securities • Short-term loans	• Bank account management • Cash pooling practices • International bank transfer	• Letter of credit • Bank guarantees • Insurances • Credit assessment
Innovative FSCM services	Services address multiple sub-categories. They can include 1-n relationships, e.g., 1 company, 1 FSP and multiple suppliers. Often technologically advanced	• Approved payables financing and "advanced" factoring platforms • "Advanced" inventory financing together with 3PLs • Dynamic Discounting • Purchase order financing		

Table C-5: Classification of FSCM service offerings and assignment of FSCM techniques (examples)

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Curriculum Vitae

Judith Carin Martin [judith.c.martin@gmx.de]

Place/Date of birth: Gengenbach, May 23 1988
Nationality: German

Work experience

Since 08/2013	University of St. Gallen Project manager and research associate at the Chair of Logistics Management
12/2011 – 05/2013	Vienna University of Economics and Business Tutor at the Institute for Production Management

Internships

07/2012 – 08/2012	A.T. Kearney GmbH, Vienna, Austria Summer trainee for supplier relationship management
04/2011 – 07/2011	MÄURER & WIRTZ GmbH, Stolberg, Germany Internship in strategic procurement
11/2010 – 03/2011	Porsche Ing. AG, Zuffenhausen, Germany Internship in resource and capacity management
09/2009 – 02/2010	German Chamber of Commerce, Casablanca, Morocco Internship in general business support (market entry)
02/2009 – 03/2009	ALDI GmbH, Mahlberg, Germany Internship general management

Education and research

02/2014 – 06/2017	University of St. Gallen, Switzerland Studies in business administration Degree: Doctor of Philosophy in Management
02/2013 – 07/2013	Clariant International Ltd, Muttenz, Switzerland External master thesis on lead time management
10/2011 – 07/2013	Vienna University of Economics and Business, Austria Studies in supply chain management Degree: Master of Science
10/2007 – 03/2011	Catholic University of Eichstaett-Ingolstadt, Germany Studies in business administration Degree: Bachelor of Science
09/1998 – 07/2007	Okengymnasium, Offenburg, Germany Degree: Abitur (equivalent to high school diploma)