# Enablers and inhibitors for the adoption of supply chain finance by logistics service providers

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## Abstract

Financial service providers lead in offering Supply Chain Finance (SCF) but their inability to monitor all the material and information flows is a major challenge. Logistics Service Providers (LSPs) overcome this challenge by exploiting their control over the material flows. Despite several studies on the competency of LSPs to offer SCF, the research on the influencing factors is still underinvestigated. Therefore, the aim of this paper is to identify the factors (enablers and inhibitors) that lead LSPs to adopt SCF. The findings show that these factors are related to finances, risks, standards, organisation, operations, information, cross-border transactions, and regulations.

Keywords: Supply Chain Finance, logistics service providers, enablers and inhibitors

### Introduction

Supply Chain Finance (SCF) relieves the companies from the financial constraints by providing a short-term capital access. By doing so, SCF optimises finances and financing processes as well as increases the integration among the supply chain actors (Pfohl and Gomm, 2009a).

SCF is complex and the successful adoption of SCF requires variable levels of coordination by the SCF actors (Mentzer et al., 2001, Buzacott and Zhang, 2004, Gupta and Dutta, 2011). The variability of coordination is directly affected by the set of factors that either act as the enablers or inhibitors for the adoption of SCF (More and Basu, 2013a, Caniato et al., 2016).

In the current SCF landscape, Supply Chain (SC) visibility plays a crucial role in the adoption of SCF. Logistics Service Providers (LSPs) fulfil the criteria of SC visibility by controlling the flow of materials along the SC (Hofmann, 2009). Hence, LSPs are competent to provide SCF services. In order to exploit their competency, it is important for LSPs to evaluate the factors (enablers and inhibitors) for the successful adoption of SCF.

The literature on factors for the adoption of SCF is multifaceted and their effect on the adoption of SCF by LSPs is rather unexplored in the academia. In the light of this gap, the main purpose of this article is to mark an early step into building the knowledge in the domain of enablers and inhibitors for the adoption of SCF by LSPs. In particular, authors address the following research question:

RQ How does 'enablers and inhibitors' for SCF effect its adoption by LSPs?

#### Method

The research methodology is based on the mixed method approach, involving Systematic Literature Review (SLR) and multiple-case study approach. Figure 1 shows the various steps involved in the research.

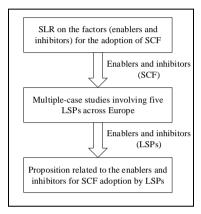


Figure 1 – Research design

The SLR summarises existing research by identifying the content related to the factors affecting the implementation/adoption of SCF. The SLR follows the framework proposed by Denyer and Tranfield (2009) and includes the creation of a review panel of experts monitoring steps of the review. The steps are locating the studies, the inclusion and exclusion criteria, the retrieval and analysis, and the synthesis of findings.

The multiple-case study approach proposed by Yin (2003) has been opted to categorise the factors identified from the SLR into enablers and inhibitors. Case studies are conducted at the five LSPs across Europe. The data collection procedure used for the case study is the interviews and a descriptive questionnaire supports them.

In the final step, cross-case comparison is performed to develop a set propositions related to the enablers and inhibitors for SCF adoption by LSPs.

#### Literature review: identification of factors

The main aim of SCF is to align physical, financial and information flow along the supply chain. In the literature, SCF perspectives are oriented on the finance (Camerinelli, 2009, More and Basu, 2013a, Bryant and Camerinelli, 2014) and supply chain (Hofmann, 2005, Pfohl and Gomm, 2009b, Wuttke et al., 2013, Mathis and Cavinato, 2010, Liebl et al., 2016) perspectives. The main difference between these two perspectives is the involvement of a lender. In finance-oriented perspective, there is a mandatory involvement of a financial institution where as supply chain-oriented perspective does not have such a requirement. In broader context, finance-oriented perspective is a sub-set of supply chain-oriented perspective as the latter takes into account all types of financial mechanisms directed towards the supply chain. Furthermore, literature has also revealed the supply chain members that can be involved to coordinate the SCF instruments. These members are categorised into the primary members, directly connected with each other

in the supply chain e.g. focal company/buyer and supplier and supportive members, providing the support services to the primary members e.g. service providers and traditional banks. The service providers are further categorised into logistics service providers (LSPs), non-bank financial institutions and platform providers (Chakuu et al., 2017).

Literature identifies the set of factors that affect the adoption of SCF. The factors include a specific set of enablers and inhibitors. The enablers support the adoption of SCF, whereas inhibitors limit it. These enablers and inhibitors are instrument specific rather than the SCF actor specific. Table 1 and table 2 presents the set of enablers and inhibitors respectively for the SCF adoption.

	Tuble 1 Enablers for the duoption of SCI
Enablers	Supporting references
Credit rationing	Paul and Boden, 2008; Seifert et al., 2013; Bryant and Camerinelli, 2014; O'Toole et al., 2015
Transaction costs	Asselbergh, 2002; Seifert et al., 2013; Ng et al., 1999; Cheng and Pike, 2003; Paul and Boden, 2008; Rodríguez -Rodríguez, 2008; Dyckman, 2009; Garcia-Teruel and Martinez-Solano, 2010; Hill et al., 2013; Wuttke et al. 2013; Kortman et al. 2016; Moritz et al., 2016; Wandfluh et al., 2016
Payment flexibility	Seifert and Seifert, 2011; Soufani et al., 2013; Extra et al., 2016
Liquidation advantage/policy	Buzacott and Zhang, 2004; Garcia-Teruel and Martinez-Solano, 2010
Monitoring advantage	Hofmann, 2009; Chen and Cai, 2011; Li et al., 2011; Liu et al., 2015
Exposure (global and local)	Lamoureux and Evans, 2011; Extra et al., 2016; Wuttke et al., 2016
Operating flexibility	Garcia-Teruel and Martinez-Solano, 2010; Lekkakos and Serrano, 2016
Seasonality of sales	Ng et al., 1999; Asselbergh, 2002
Supplier's sales growth	Asselbergh, 2002; Extra et al., 2016
Investment intensity of supplier	Asselbergh, 2002
SC receivables volume	Asselbergh, 2002; Iacono et al., 2015
Innovativeness of firms	Asselbergh, 2002; Moritz et al., 2016; Song et al., 2016
Intra and inter-firm collaborations	Buzacott and Zhang, 2004; Field and Meile, 2008; Paul and Boden, 2008; Seifert and Seifert, 2011; de Meijer and de Bruijn, 2013; More and Basu, 2013; Mateen and More, 2013; Wuttke et al. 2013; Yan and Sun, 2013; Bryant and Camerinelli, 2014; de Boer et al., 2015; Caniato et al., 2016; Extra et al., 2016; Lorentz et al., 2016; Song et al., 2016; Kortman et al. 2016; Wandfluh et al., 2016
Globalisation	Hofmann and Belin, 2011; de Meijer and de Bruijn, 2013; Extra et al., 2016; GBI, 2016; Lorentz et al., 2016
Market Power	Cheng and Pike, 2003; Berger and Udell, 2006; Paul and Boden, 2008; Soufani et al., 2013; Wuttke et al. 2013; Bryant and Camerinelli, 2014; Liebl et al., 2016; Lorentz et al., 2016
Bargaining Power	Paul and Boden, 2008; Wuttke et al. 2013; Mateut, 2014; Caniato et al., 2016; Liebl et al., 2016
Trade process digitalisation	Dyckman, 2009; Hofmann and Belin, 2011; Lamoureux and Evans, 2011; de Meijer and de Bruijn, 2013; More and Basu, 2013; Mateen and More, 2013; Popa, 2013; Wuttke et al. 2013; Bryant and Camerinelli, 2014; Caniato et al., 2016; Extra et al., 2016; GBI, 2016; Kortman et al. 2016
Information acquisition	Dyckman, 2009; García-Teruel and Martínez-Solano, 2010; Seifert and Seifert, 2011; Wuttke et al. 2013; Song et al., 2016
Information-sharing	Berger and Udell, 2006; Field and Meile, 2008; Dyckman, 2009; de Meijer and de Bruijn, 2013; More and Basu, 2013; Wuttke et al. 2013; van der Vliet et al., 2015; Extra et al., 2016; Song et al., 2016; Wandfluh et al., 2016
Social capital and trust	Berger and Udell, 2006; Leng and Suhaiza, 2012; More and Basu, 2013; Mateen and More, 2013; Wuttke et al. 2013; Liu et al., 2015; Caniato et al., 2016; Liebl et al., 2016; Moritz et al., 2016
Tax rate advantage	Asselbergh, 2002; Buzacott and Zhang, 2004; Berger and Udell, 2006; Hill et al., 2013; Soufani et al., 2013; Liebl et al., 2016
Bank regulatory environment	Yan and Sun, 2013; Casey and O'Toole, 2014

Table 1 Enablers for the adoption of SCF

Among the enablers shown in table 1, intra and inter-firm collaborations, which is associated with the collaborations within and outside the company for new service/product development and sustainability (Lorentz et al., 2016, Song et al., 2016, Wandfluh et al., 2016) is the most cited factor. The level of digitalisation follows it and involves easing of the information flow that is an essential impetus for SCF (Caniato et

al., 2016). Furthermore, the reduction in transaction costs associated with information exchange, monitoring costs, finance search, fee for renegotiating credit contracts, and payments is also a very crucial enabler for the adoption of SCF (Dyckman, 2011, Hill et al., 2013a, Rob Kortman, 2016, Moritz et al., 2016).

Although some of the enablers are not frequently cited in the literature but they do have positive impact on the SCF adoption. This impact involves decrease in the overall costs, increase in the purchases and effective lowering of the price, facilitation of trade by providing a contractual alternative to immediate money use, providing alternative source of financing for firms 'credit rationed' by the banks and additional concessions for lenders during the financial distress.

Description	Supporting references			
SCF Terminology	de Meijer and de Bruijn, 2013; Bryant and Camerinelli, 2014; de Boer et al., 2015; Extra et al., 2016; Song et al., 2016; Martin and Hofmann, 2017			
Expertise	Mateen and More, 2013; More and Basu, 2013; BAFT et al., 2016; Extra et al., 2016; Liebl et al., 2016 ; Martin and Hofmann , 2017			
Introduction timing	Wuttke et al., 2016			
Agency risks/ costs	Hill et al., 2013; Moritz et al., 2016; Yan et al., 2016			
Information asymmetry	Cheng and Pike, 2003; Buzacott and Zhang, 2004; Rodríguez-Rodríguez, 2008; Garcia- Teruel and Martinez-Solano, 2010; Atanasova, 2012; Hill et al., 2013; van der Vliet et al., 2015; Moritz et al., 2016; Yan et al., 2016			
Accounting/invoicing standards	Berger and Udell, 2006; Hofmann and Kotzab, 2010; de Meijer, 2013; Bryant and Camerinelli, 2014; BAFT et al., 2016; Extra et al., 2016; GBI, 2016; Song et al., 2016			
Organisational policies	de Meijer and de Bruijn, 2013; More and Basu, 2013			
Cultural difference	Camerinelli, 2009; de Meijer and de Bruijn, 2013; More and Basu, 2013; Mateen and More, 2013; Moritz et al., 2016; Wandfluh et al., 2016			
Cross-border transactions (multiple currencies, different languages and multiple legal jurisdictions)	More and Basu, 2013; Mateen and More , 2013			
Legal and Judicial (commercial, formal contracts)	Berger and Udell, 2006; Klapper , 2006; Beck et al., 2008; Lamoureux and Evans, 2011; de Meijer and de Bruijn, 2013; Extra et al., 2016; Moritz et al., 2016			
Government laws and regulations	Klapper, 2006; de Meijer and de Bruijn, 2013; More and Basu, 2013; Yiu et al., 2013; de Boer et al., 2015; BAFT et al., 2016; Extra et al., 2016; Liebl et al., 2016; Moritz et al., 2016			

Table 2 Inhibitors for the adoption of supply chain finance

As illustrated in table 2, the unavailability of expertise and standard terminology in SCF are the core challenge faced by SCF as the lack of knowledge about SCF and its mechanisms hinders the adoption of SCF. Apart from lack of knowledge realted to SCF, inefficiencies in financial transactions and poor visibility of movement of goods taking place in supply chains are also challenging. Furthermore, intra and inter silos lead to the agency risks and effects the global dimension demanded by SCF and leads to the ineffective supply chain planning that is an essential requirement for successful SCF (Hofmann, 2009, More and Basu, 2013b). Another major inhibitor includes the policies, government laws, and regulations that mainly hinders the cross-border transactions due to multiple currencies, different languages and multiple legal jurisdictions and makes processes like know your customers and anti-money laundering more complicated.

From the buyer's perspective, the need to change the internal process, the difficulty to get suppliers on board, lack of common standards and terminology, organisational culture, introduction timing, payments terms (interest rate) and conflicts of interest (creditworthiness and risk-adjusted interest rates) are the major inhibitors for adopting SCF (Demica, 2007, de Meijer and de Bruijn, 2013, Hofmann, 2009, Wuttke et al., 2016).

#### Findings: cross-case analysis

A systematic literature review on factors is followed by a cross-case analysis. The cases focus on the 'enablers and inhibitors' for SCF from the LSPs' perspective, making LSPs as the unit of analysis.

As proposed by Gibbert et al. (2008) and Yin (2009), authors took into consideration the construct validity, internal validity, external validity, and reliability throughout the research process. This was done by developing a descriptive protocol for cross-case analysis. To make it easier to collect the data, protocol was designed in the form of semistructured questionnaire. It included all the enablers and inhibitors highlighted in the literature. For simplification and analysis, the factors (enablers and inhibitors) were grouped into the themes related to finances, risks, standards, organisation, operations, information, cross-border transactions, and regulations.

The cases selected for this analysis are taken from the sample of LSPs, who are either willing to offer SCF instruments or extend their existing SCF offers. Table 3 presents the characteristics of the selected cases.

	Alpha	Beta	Delta	Gamma	Zeta
LSP categorisation	3 PL	3 PL	4 PL	3 PL	3 PL
Country	UK	Italy	Switzerland	Netherlands	Germany
Turnover	GBP 7.5 million	EUR 115 million	CHF 8.2 billion	EUR 125-150 million	EUR 3.4 billion
Services offered	Transportation, Warehousing, Distribution, returns management, WMS hosting, leasing freight forwarding.	Transportation, Warehousing, Distribution, Integrated Logistics	Traditional logistics services, digital, financial and mobility solutions	Warehousing and Transportation	Transport Solutions , Industry specific Solutions, Information Logistics, Warehousing, consultancy, Special Services
SCF Instruments (offered)	Leasing	None	Factoring, Reverse Factoring, Inventory financing/Warehou se financing, Dynamic Discounting, E- Payment Solutions	None	None
SCF Instruments (Planning)	Inventory financing / Warehouse financing, Purchase order financing, VMI	Reverse factoring, Inventory/wareh ouse financing	-	Inventory financing/Wareh ouse financing	Inventory Financing

Table 3 Case Characteristics

As illustrated in table 3, five LSPs are located across various regions of Europe. Interestingly, Delta is a 4 PL while as other LSPs are 3 PL. This is clear from the range of services each LSP is offering. Currently, only Delta is offering multiple solutions related to SCF, Alpha is offering leasing at a small scale and rest of LSPs are not offering any. It should be noted that Alpha, Beta, Gamma, and Zeta are interested in offering the inventory related SCF solutions.

The data collected using the descriptive protocol is summarised in table 4. As clear from the table, the factors are allocated to a particular theme based on their characteristics. Each of the factor qualifies as an enabler or inhibitor depending on the perspective of an individual LSP. The detailed analysis of the factors and the corresponding propositions are as follows:

	Tuble 4 Summar		1 - B, Delta - D, Gai	nma - G. Zeta - Z
Factors		Enabler	Inhibitor	N/A
	Credit rationing	A, D,Z		B, G
Financial	Tax rate advantage	А		B, D, G, Z
	Transaction pooling	А		B, D, G, Z
	Payment flexibility	B, Z	A, D, G	
Managing risk	Liquidation advantage/policy	A, D	Z	B, G
	Monitoring advantage	A, D, G, Z		В
Standards	SCF Terminology	D	A, G	B, Z
	Accounting/invoicing standards	Z	A, B, G	D
	Exposure (global and local)	A,B,G, Z	<i>N</i> , <i>D</i> , O	D
	Expertise	B, G, Z	А	D
Organisational	Agency risks/ costs			A, B, D, G, Z
C	Organisational policies	А	B, G, Z	D
	Intra and inter-firm collaborations	A,B,G, Z	D	
	Globalisation	D, Z		A,B,G
	Industrial Clustering	D	A,B,G, Z	
	Social capital and trust	A,B, Z		D,G
	Introduction timing	A, G, Z		B, D
	Operating flexibility	A,G	D	B, Z
Operational	Seasonality of sales	D,G, Z	В	A
Operational	Supplier's sales growth	A,D, Z		B,G
	Investment intensity of supplier	A,D, Z		B,G
	SC receivables volume	D, Z		A,B,G
	Innovativeness of firms	A,B,D,G	Z	
	Market Power	А		B,D,G
	Bargaining Power	A, B, G		D
Informational	Trade process digitalisation	A, B, Z	G	D
	Information symmetry	B, Z	D	A, G
	Information acquisition	A, B, Z		D,G
	Information-sharing	A, B, Z	D,G	
	Cultural difference	D	Z	A,B,G
Cross-border	Multiple currencies, different			
	languages and multiple legal	D 7	G	4.15
	jurisdictions	D, Z	G	A,B
Regulatory	Legal and Judicial (commercial, formal contracts)		B,D, Z	A, G
	Government laws and regulations		A,B,G, Z	D
	Bank regulatory environment	A,B,G	Z	D

Table 4 Summary of case analysis

Financial factors: Financial factors include the factors that involve financial transactions, such as credit rationing, tax rate advantage, transaction pooling, and payment flexibility. Alpha, Delta and Zeta considers credit rationing as an enabler as it creates need for alternative financing. On the other hand, for Beta and Gamma, this factor is not applicable as they don't aim to provide liquidity to the companies who can't access it. Tax rate advantage and transaction pooling is of the least importance for LSPs as only one LSP thinks that it might be useful for financial products and reduce overall transaction costs. The payment flexibility is quite important factor as all the considered LSPs see it as a factor that affects the adoption of SCF. According to Alpha, Beta and Zeta, it will allow higher returns and increase flexibility in making payments. From the customers' perspective although the constraints in payment days in countries like Italy may limit it.

According to Delta and Gamma, customer's increased payment flexibility may hinder the adoption of SCF. Furthermore, if LSPs will like to maintain their cash to cash cycle, the flexibility in payment will also act as an inhibitor.

Proposition 1 (a) Credit rationing is an enabler if LSP directly competes with the banks in granting loans. (b) Payment flexibility is an inhibitor if LSP will like to maintain its cash to cash cycle or if the payment terms are limited, otherwise it acts an enabler.

Managing risk: Liquidation advantage/policy and monitoring advantage are included in managing risks as these factors are involved while extending credit to high risk firms and monitoring of debts and inventory. The LSPs such as Alpha and Delta, who have capability of reselling the stock considers liquidation advantage/policy as an enabler, whilst Gamma do not consider it to be critical or having any significant impact on SCF. Taking into account the monitoring advantage, all LSPs have the mechanisms to monitor the stock. All LSPs consider it as enabler (currently or in near future) as it puts them in a right position to offer SCF or be a part of SCF offered by traditional banks.

Proposition 2 Liquidation advantage/policy act as an enabler if LSP has capability to resell the stock.

Standards: The new solutions thrive on the standards. SCF terminology, accounting standards and invoicing standards affect the adoption of SCF. LSPs such as Delta who have experience in offering SCF, considers it as an enabler while as the LSPs who are at the initial stage of offering SCF solutions consider it as an inhibitor. Taking into account the accounting and invoicing standards, any mismatch creates issues and involves extra costs impeding SCF.

Proposition 3 (a) Lack of standardised SCF terminology hinders its adoption. (b) Harmonised accounting/invoicing standards act as an enabler for SCF adoption.

Organisational factors: Organisational factors focus on the factors like exposure, expertise, agency risk, organisation policies and intra and inter-firm collaborations. Among these factors, majority of the LSPs considered exposure, expertise and collaborative environment as the factors enabling SCF. Internal exposure goes hand-in hand with expertise, lacking it hinders the successful adoption of SCF. In general, organisational policies hinder the adoption of new solutions as mentioned by Beta, Delta and Gamma. In contrast, Alpha considers it as an enabler as their organisational policies support offering of new innovative services.

Proposition 4 Successful adoption of SCF requires high level of expertise, exposure (in SCF) and supportive organisational policies.

Operational factors: Among operational factors, innovativeness of firm is an enabler. It is followed by social capital and trust, and introduction timing. Innovative firms are more willing to adapt SCF solutions in the developing markets by changing the way they do the things. As stated by Alpha, in the beginning it might be challenging but with time it will enable to offer more SCF solutions. Social capital and trust impacts SCF only at its earlier stage as it shows stability and versatility of the business.

Proposition 5 Operational factors affect the SCF adoption by LSPs at the beginning of the service offering (depending on the type of SCF instrument).

Informational factors: The trade process digitisation is usually a pre-requisite for SCF adoption. Digitalisation makes it easier to share and acquire the information. From Gamma's perspective, digitalisation is only necessary while offering some specialised solutions, while as Alpha, Beta and Zeta sees it as a crucial enabler especially for the SCF solutions, where they have to work in collaboration with other SCF actors like Banks.

Proposition 6 LSPs require high level of trade process digitalisation including enhanced information sharing strategy for the successful adoption of SCF. Cross-border factors: Cross-border factors hinder the business conduct due to the cultural difference, multiple currencies, different languages and multiple legal jurisdictions. The cases considered in this analysis have a localised business and consider it as a not applicable factor. They do realise that once they will expand their business beyond the borders and offer SCF, it will act as an inhibitor.

Proposition 7 Cross-borders transactions involving different cultures, currencies, languages and jurisdictions will hinder SCF adoption.

Regulatory factors: Regulatory factors includes legal and Judicial (commercial, formal contracts) aspects, Government laws and regulations and bank regulatory environment. The legal and judicial environment may play a critical role in determining the success of financial instruments. It also creates loop holes for the reorganisation of commercial laws. Beta, Delta and Zeta consider legal and judicial factor as an inhibitor as it might hinder cross-border transactions and contract negotiations. The laws and regulations imposed by the government on financial markets and other sectors hinders the adoption of SCF as well. The majority of the LSPs consider it as an inhibitor due to the licensing issues, payment days' constraints and complexity involved in fulling all the regulations. LSPs consider that the regulations directly effecting the banks e.g. BASEL III squeezes the availability of credit to potential customers, hence it will create opportunities to enter the SCF market.

Proposition 8 (a) Regulations directed towards LSPs (contracts, licencing, allowable payment days) will hinder adoption of SCF (b) Regulations directed towards banks (squeezing credit market) will enable adoption of SCF by LSPs.

#### Conclusion

This paper makes an important contribution towards the SCF by identifying the factors that enable or inhibit the adoption of SCF by LSPs based on in-depth cases. The factors were identified by conducting a systematic literature review and grouped into the themes based on the individual characteristics. A descriptive protocol for conducting case studies was developed to guide the cross-case analysis. Semi-structured interviews were conducted in order to collect the data related to the enablers and inhibitors from LSPs' perspective. Finally, propositions were developed to illustrate the factors that hinder or enable the SCF adoption by LSPs.

This paper makes a valuable contribution to both theory and practice. From the theoritical perspective, it addresses the change in the enablers and inhibitors for the SCF adoption from an actor perspective. It also contributes to the theoritical foundation by providing a set of propositions that can be further explored (by adding more cases) and used in the development of conceptual framework for the adoption of SCF by LSPs. From practitioner's perspective, LSPs will acquire practical knowledge on the enablers and inhibitors affecting the successful SCF adoption.

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