

Understanding the response of SME suppliers to supply chain finance: a transaction cost economics perspective

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Abstract

Purpose – Reverse Factoring (RF) is the most widespread Supply Chain Finance (SCF) solution. This study challenges the preconceptual view that suppliers accept financially attractive Reverse Factoring offers (RFOs) and reject financially unattractive ones. Specifically, it focuses on SME suppliers and how Transaction Cost Economics (TCE) factors affect their decision.

Design/methodology/approach – We study 8 cases of RFOs, interviewing suppliers, buyers and financial service providers and using several sources of private and publicly available secondary data.

Findings – In five out of eight RFOs, suppliers either accepted unattractive offers or rejected attractive ones. Bounded rationality and opportunism seem to explain such misalignment, while asset specificity and frequency present a minor role in affecting decisions.

Research limitations / implications – The study shows the need for further investigation linking together analytical assessment of the benefits of SCF with qualitative factors.

Practical implications – SME suppliers cannot simply assume an RFO will be beneficial to them. They have to critically evaluate their buyer's offers, ideally with self-awareness towards how the abovementioned factors might affect their decisions. For buyers and banks, this study gives clear insights on how to approach SME suppliers to avoid rejection of financially attractive RFOs.

Originality/value – The study analyses financial attractiveness of RFOs in conjunction with qualitative factors, including in the sample rejected RFOs and without assuming that RFOs are always financially attractive for suppliers. This is original and relevant for both research and practice, since it extends the understanding of the supplier response to RFO, thanks to the consideration of TCE factors.

Paper type – Research paper

Keywords: Supply Chain Finance, SMEs, Transaction Cost Economics, Suppliers, Reverse Factoring

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1 Introduction

Supply Chain Finance (SCF) is often presented as a solution to improve working capital management of both single companies and the supply chains they are part of (Gelsomino et al., 2016; Pfohl & Gomm, 2009). Dekkers et al. (2020, p. 2) define SCF as: “*the financial flows and allocation of financial resources in a supply chain through the collaboration of at least two primary supply chain members, i.e. firms as resources delivering products in the primary process*”. This may “*possibly be facilitated by external service providers*”, which are usually financial service providers (FSPs) such as banks.

Both practitioner reports (Extra et al., 2018; Siemes et al., 2017) and academic literature (Lekkakos & Serrano, 2016) agree that Reverse Factoring (RF) is the SCF instrument used most in industry. With RF, a large creditworthy buyer allows his suppliers to sell approved invoices to the buyer’s FSP, based on the buyer’s own credit rating, to receive payments faster (Dello Iacono et al., 2015). The most important reason for buyers to use RF is optimization of their own working capital via payment term extension (Liebl et al., 2016; Extra et al., 2018).

Suppliers with the largest purchasing spend represent the biggest potential working capital benefits, and usually are the first to be offered a Reverse Factoring Offer (RFO) (De Boer et al., 2015). However, the RF market is maturing and RF is increasingly offered to the ‘long tail’ of Small and Medium Enterprise (SME) suppliers (Siemes et al., 2017), who are in greater need of financial support. RF is still relatively new for SMEs, which present a lack of knowledge about its effects (De Goeij et al., 2016; Dekkers et al., 2020). In literature, RF is usually portrayed as aiming at win-win situations (Hofmann & Belin, 2011). However, since payment term extensions (which increase financial costs for suppliers) are critical for buyers (Liebl et al., 2016), the financial attractiveness of an RFO for suppliers cannot be automatically assumed. SME suppliers may be pushed by buyers to accept an RFO, even if it is unattractive (Wuttke et al., 2013a; Liebl et al., 2016). For SME suppliers it is therefore important to be able to correctly assess an RFO received from a buyer, while buyers need to understand how SME suppliers make decisions about RFOs.

The paper aims at bridging the gap about the analysis of factors considered for the selection of RFOs by SME suppliers, through the lens of Transaction Cost Economics (TCE, Williamson, 1979; 2008), by jointly considering qualitative with quantitative factors (i.e. tangible costs and benefits of the RFO). For the qualitative factors, the paper relies on TCE theory and considers the impact that uncertainty, asset specificity and frequency have on the adoption of RF.

Current SCF research touches upon some important quantitative and qualitative factors, but does not show the full picture yet on how suppliers make decisions regarding RFOs. Analytical contributions offer little to no room for qualitative considerations. For example, Wuttke et al. (2016, p. 73) state that “*all suppliers will consider SCF and adopt it, if their evaluation demonstrates financial benefit*”, while Dello Iacono et al. (2015, p. 292) state that “*a party will participate in a reverse factoring arrangement only if the benefit for that party is positive*”. These examples seem to assume that, as long as tangible financial benefits from adopting RF overcome its costs, the supplier will adopt RF. Also Wang et al. (2020) developed an SCF adoption model to investigate SCF adoption decisions, but in their model they do not include relational factors, and conclude themselves that other drivers and enablers should be included in future research.

These examples seem to depict only one side of the coin, especially considering that other contributions – adopting a more qualitative approach – show the relevance of factors such as trust (Wuttke et al., 2013b) and bargaining power (Liebl et al., 2016). However, also some qualitative papers in SCF tend to assume that RF is adopted by the supplier when financial benefits overcome its costs and the complexity of its adoption. For example, Wuttke et al. (2013a, p. 149) state “*it can thus be concluded that the financial benefits available from SCF motivated its spread*”. Even when qualitative articles take into account relational factors, they tend not to do so conjointly with financial factors, as described by Martin (2017).

In essence, both qualitative and quantitative papers don’t parametrise the relational and other qualitative factors to the financial attractiveness of the offer that the supplier received. However, there might be value in doing so. Dekkers et al. (2020) mention that smaller suppliers in particular are often unable to

correctly assess SCF offers. Liebl et al. (2016) show that buyers sometimes use their bargaining power to pressure suppliers into accepting SCF offers. It is reasonable to believe that factors such as bounded rationality or bargaining power from the buyer lead to suppliers accepting financially unattractive or rejecting financially attractive RFOs. Therefore, next to financial cost and benefits, qualitative factors are taken into account in this research.

Literature shows the direct impact of financial costs and benefits on the outcome of an RFO (e.g., Wuttke et al., 2013a). Yet, it suggests also a possible moderating role for the TCE factors: bounded rationality, opportunism, asset specificity and frequency. These factors might influence the strength of the relation between financial costs and benefits and the outcome. Bounded rationality exists for example in the form of suppliers not being able to make correct financial assessments of RFOs (Dekkers et al., 2020). An incorrect assessment of the financial costs and benefits of an RFO might influence the supplier's perception of the attractiveness of the offer, leading to acceptance of unattractive offers or rejection of attractive offers. Likewise, opportunism via buyers using their bargaining power to pressure suppliers might lead to suppliers accepting financially unattractive RFOs (Liebl et al., 2016). Asset specificity can play a similar role: there can be financial benefits of an RFO, but the legal or learning investments needed (Dekkers et al., 2020) might negatively influence the decision. Lastly, frequency can also have a moderating effect. The role of frequency in SCF is underinvestigated, and authors that do mention it do not agree on whether a higher frequency of transactions increases or decreases costs in SCF: while Hofmann & Zumsteg (2015) mention that a higher frequency of transactions can lead to better financing terms since it allows the FSPs to learn more about the buyer's creditworthiness, Pezza (2011) mentions traditionally RF programmes have been aimed at less frequent, large transactions, because it results in lower administrative handling costs.

Since literature is not conclusive about the role played by qualitative factors, and understanding this is crucial to allow buyers, suppliers and FSPs to set up successful RF solutions, our aim is formalized in the following research question:

How do bounded rationality, opportunism, asset specificity and frequency influence the relationship between the SME supplier's assessment of financial costs and benefits of an RFO and the supplier's decision to accept or reject an RFO?

2 Literature review

2.1 Financial costs and benefits of RF

Pfohl & Gomm (2009) introduced the supply chain finance cube, a three-dimensional framework to assess benefits for SCF. Three aspects are included: the (sales) volume that needs to be financed, the duration of financing and the capital cost rate. Volume represents the total value of invoices pre-financed via RF. For duration, the payment term extension (Δ DSO), and the invoice approval time are relevant. When RF is introduced to a supplier, this usually includes an extension of the payment term (Wuttke et al., 2013a; Liebl et al., 2016). The invoice approval duration is the time needed for buyers to reconcile invoices with order documents and shipping information. With RF suppliers are financed only after approval of the invoice, therefore fast approval is beneficial for suppliers (Gelsomino et al., 2019). And lastly, there is a discount rate in RF for the supplier, charged by the FSP, usually presented as annual cost rate. The supplier needs to assess whether the financial benefits of an early payment (i.e. a reduction in working capital volume and cost of financing) offset the cost of the 'discount' paid to the FSP. This discount will be higher when the buyer's payment term extension will be bigger (as explained for example by Van der Vliet et al., 2015). This in turns implies the identification of the opportunity cost for the supplier (as done by Dello Iacono et al., 2015 and Van der Vliet et al. 2015). Although elaborating on the modelling of quantitative factors in RF is beyond the scope of this paper, appendix 2 gives more details on how financial costs and benefits in RF have been operationalized in this research.

2.2 Transaction Cost Economics for Supply Chain Finance

TCE (Williamson, 1979; 1981) deals with costs that come with running a transaction, wherein transaction costs consist of all costs related to "negotiating, implementing, coordinating, monitoring,

adjusting, enforcing and terminating exchange agreements” (Carr & Pearson, 1999, p. 498). It is often used to explain how firms enter in and control inter-organizational business relations, and therefore it has been used extensively in SCM literature. Themes in SCM literature such as buyer-supplier relationships (e.g. Handfield & Bechtel, 2002; Kwon & Suh, 2004), outsourcing (e.g. Williamson, 2008; Ellram et al., 2008), supplier performance (e.g. Mahapatra et al., 2010), make-or-buy decisions (e.g. Spina et al., 2016), sustainable supply chain management (e.g. Carter & Rogers, 2008; Carter & Liane Easton, 2011), supply chain risk management (e.g. Blome & Schoenherr, 2011), and the use of technologies in SCM such as cloud computing and blockchain (e.g. Schniederjans & Hales, 2016; Schmidt & Wagner, 2019) have all been addressed using TCE.

Recently, TCE has already been identified as a relevant theoretical lens in SCF literature (Wuttke et al. 2013b; Martin, 2017; Martin & Hofmann 2019; Dekkers et al., 2020).

Uncertainty, asset specificity and frequency, the main three concepts in TCE according to Williamson (1979; 2008), will be taken into account for our research. The following paragraphs will explain what these concepts are and how they are used in the context of SCF adoption by suppliers.

2.2.1 Uncertainty: Bounded Rationality and Opportunism

Uncertainty refers to a situation when “*the contingencies affecting the execution of the agreement are complex and difficult for the trading partners to understand, predict or articulate*” (Pisano, 1990, p. 156). In uncertainty Williamson (1975; 1985) emphasizes the importance of behavioural conditions, especially bounded rationality and opportunism, two factors which are also described as important in the adoption of SCF (Dekkers et al., 2020; Martin 2017).

Bounded rationality refers to decision makers not making perfectly rational decisions, because of cognitive or time-related restrictions in using all available information or limited prior experience (Pisano, 1990; Rindfleisch & Heide, 1997). There are multiple SCF papers reporting on restrictions in using available information by suppliers (e.g. Wuttke et al., 2013a; De Goeij et al., 2016; Dekkers et al., 2020). According to Dekkers et al. (2020) for smaller suppliers in particular there could be an inability to make correct financial analyses of SCF offers, which makes them apprehensive of SCF and hinders adoption. Wuttke et al. (2016) and Martin (2017) mention that prior experience with SCF or related financial instruments is relevant for suppliers when considering SCF. According to Martin (2017) experience with other financing alternatives like factoring reduces reluctance of suppliers to adopt SCF. Furthermore, SCF benefits from good intra-firm collaboration. Wuttke et al. (2016) mention that when buyers introduce RF to suppliers they usually first talk with sales managers, but there is often an absence of explicit incentives for sales people, since RF does not lead to increased prices or reduced payment terms. Therefore, it requires sales employees to collaborate with financial employees to get a better idea about company benefits. Since multiple departments are usually involved in SCF, and SCF requires both operational and financial expertise, bounded rationality can also be triggered by limited collaboration among these departments (Wuttke et al., 2013b). Dekkers et al. (2020, p. 8) mention that small companies lack this cross-functional expertise which “*makes it harder for them to evaluate proposed supply chain finance arrangements*”, which could hinder SCF adoption.

Opportunism in an organizational context means employees are human and therefore their decisions are driven by self-interest (Williamson, 1975). Opportunism often occurs when certain parties have leverage in a relationship, for example because of an imbalance in bargaining power between actors (Ireland & Webb, 2007), actors providing incomplete or incorrect information to each other (Hobbs, 1996) or a lack of trust between actors (Bromiley & Cummings, 1995; Nooteboom, 1996). As a consequence, opportunism contributes to the uncertainty of a transaction and leads to higher transaction costs (Ketokivi & Mahoney, 2020). In the context of SCF, Liebl et al. (2016) describe how buyers use bargaining power to pressure suppliers to accept RF. Wandfluh et al. (2016) state that information sharing between buyers and suppliers, or the lack of it, is also an important factor in SCF adoption. Dekkers et al. (2020) mention that in SCF suppliers sometimes do not receive the required information from buyers to correctly evaluate SCF offers. Furthermore, Wuttke et al. (2013a) mention that a lack of trust in the buyer and its SCF offer reduces the supplier’s willingness to adopt RF.

2.2.2. Asset specificity

Asset specificity is defined by Williamson (1985, p. 55) as “*durable investments that are undertaken in support of particular transactions*”. This may comprise investments for suppliers which are buyer-specific. In the context of SCF, asset specificity could comprise investments the supplier needs when assessing the RFO, or investments needed during and after the adoption of RF. Investments in skills and resources could lead to better knowledge on RF, thereby influencing suppliers’ decisions on RFOs. Also, investments needed might lead to costs which can make an RFO less attractive. Additional investments could pertain to activities necessary to maintain the transactional relationship with counterparties. Dekkers et al. (2020) report on suppliers who did not understand SCF forms at first, and therefore had to invest in learning and legal advice resulting in relation specific costs. Dello Iacono et al. (2015) mention training costs for staff to acquire skills on RF. De Boer et al. (2015, p. 36) mention “*RF could result in extra unforeseen costs for suppliers, for example legal costs, regulatory costs or costs for changed operational processes*”, and add that these “*extra costs lower the value of RF for suppliers*”. When introducing SCF instruments, buyers and FSPs can introduce IT platforms with automated invoicing (Silvestro & Lustrato, 2014), which can require the supplier’s employees to learn about changes in administrative tasks. These legal or learning investments needed for RF for suppliers might negatively influence the adoption decision.

2.2.3 Frequency

Frequency is the third key concept in TCE (Williamson, 1979). According to Everaert et al. (2010), recurrence in transactions can create economies of scale which are beneficial for the recovery of setup costs. This can be applied to RF, since there are costs for the setup of RF programmes (Liebl et al., 2016). In SCF literature frequency is not often taken into account. In cases when that happens, it is usually from the perspective of the FSP, and the role of frequency is only mentioned and explained briefly but it’s not a variable which is tested. Hofmann & Zumsteg (2015) mention that a higher frequency, in the form of recurring transactions, allows FSPs to learn more about the buyer’s creditworthiness, possibly leading to better financing terms for both buyers and suppliers. Pezza (2011) instead reports that traditionally RF programmes of FSPs have been aimed at less frequent, large transactions. This is because for the FSP the lower the frequency of invoicing in RF, the lower the administrative handling costs, possibly leading to better terms for buyers and suppliers.

3 Research methodology

3.1 Sample design

The explanatory nature of this research benefits from case study research (Yin, 2009). The research is explanatory as literature review was rich in illustrating the main concepts adopted in the paper, but it was not applied in the specific context of interest and we aim at explaining an event that is not easy to understand. The event we want to investigate is the fact that RF offers are accepted and rejected, but the decision is not always aligned with the financial attractiveness.

The sample includes 8 case studies, wherein the RFO is the unit of analysis. For each case, data from involved SME suppliers and buyers were collected, while in 4 out of 8 cases data from the involved FSPs were collected as well.

We took a theoretical sampling approach in the case selection process, focusing on theoretically useful cases that help in either replicating or extending theory (Eisenhardt, 1989). Critical for replicating and extending theory is the inclusion of both successful cases, where the RFO was accepted, and unsuccessful cases, where the RFO was rejected, as suggested by Caniato et al. (2016), which also reduces pro-innovation biases (Abrahamson, 1991). Furthermore, we selected cases with different supplier-buyer dynamics in terms of sizes of involved companies, sales volumes buyers represent and strategic importance of buyers for suppliers, and included both suppliers with and without previous

experience in SCF. Once additional insights from new cases were limited, we stopped adding new cases (Eisenhardt, 1989). The sample is summarized in Table 1.

Albeit some of them might be owned by companies in other countries, all of the SME suppliers, buyers and FSPs involved in the 8 RFOs have operations in the Netherlands. The suppliers are homogenous in size also, since they are all SMEs, meaning they have a yearly turnover below 50 million Euros and the number of employees is below 250. There are suppliers included with a yearly turnover of 25-50 million Euros, 10-25 million Euros and a turnover below 10 million Euros. All of the buyers are large companies, with yearly turnover higher than 500 million Euros. In absolute numbers, the sales volume the buyers represent for suppliers is between 0.33 million and 6.79 million Euros. In RFOs 1, 5 and 6 the involved buyers are the largest customers in terms of sales volume for the involved suppliers, while for RFO 2 and 3 the involved buyers are the second and third biggest customers respectively. In RFO 4, 7 and 8 the sales volume the buyers represent for the involved suppliers is relatively smaller. In the first four RFOs the involved suppliers sent invoices for every order, while in the last four RFOs the involved suppliers sent invoices weekly or monthly. The involved suppliers and buyers represent five different industries: transportation, logistics, food, retail and bikes. This specific set-up allows for cross-case comparability, while still being able to study clear differences, e.g. including SMEs from different industries, with different sizes and RFOs from buyers of different relevance in sales volume.

Some of the SME suppliers we interviewed received multiple RFOs from multiple buyers (supplier 2 and 5). By including multiple RFOs for the same supplier we were able to see if there were learning effects from prior experience for these companies. Also, one of the buyers (buyer 5) included in the sample offered RF to multiple SME suppliers (suppliers 3, 4 and 5) that we interviewed. This allows us to analyse how similar RFOs are perceived by different suppliers.

===INSERT TABLE 1 HERE===

We strived to achieve good construct validity, internal validity, external validity and reliability in our study, following Eisenhardt (1989), Gibbert et al. (2008) and Yin (2009), which is elaborated on in more detail in Appendix D.

3.2 Data collection

Data were collected from 2016 to 2019. The study relied on data triangulation by using several types of data collection and multiple sources, to limit biases of respondents and ensure construct validity. First of all, for all of the 8 RFOs, semi-structured interviews with all involved SME suppliers and buyers were conducted. These interviews lasted 45 to 120 minutes. The SME suppliers group provided most of the data, since for most of the cases they also shared detailed financial information related to their assessment of the RFO. In all of the cases the SME supplier was at the stage of assessing the buyer's RFO when we did the first interview. As explained by Wuttke et al. (2013a, p. 152) "*firms which undergo the particular decision process at the very moment of data collection are better able to provide detailed, multifaceted insights which enhance the validity and reliability of collected data*".

For all the SME suppliers there was at least one second moment of contact wherein we asked them about their decision on the offer. A case study protocol was prepared wherein amongst other data collection types, semi-structured interview guides, data storage and data sharing between involved researchers were addressed. The semi-structured interview questionnaire (see Appendix A), along with the methods for collecting secondary data (see also paragraph 3.3), were based on both SCF literature and TCE literature. We used the first interviews to adjust and fine-tune the interview guide (Eisenhardt, 1989); however, in case of missing information in the first interviews, involved companies were asked to share this via second interviews, phone calls or e-mail communication in a later stage.

Alongside interviews with SME suppliers and buyers, 2 interviews were done with 2 FSPs which were involved in 4 of the 8 RFOs. The SME supplier interviews were the most relevant for us in understanding

the importance of various financial cost/benefit and TCE factors for them. However, the interviews with buyers and FSPs provided many additional insights, for example on the buyer's or FSP's point of view on the supplier's understanding and benefits of the RFO. Furthermore, a great deal of secondary data was collected, including contracts between SME suppliers and banks (both the own bank and the buyer's bank who enables RF), contracts between SME suppliers and buyers, calculation models (e.g. Excel sheets) developed and used by employees of the SME suppliers to assess the RFOs, internal financial reports, extraction from the suppliers' ERPs with invoice data, sales presentations from banks and information coming from e-mail communication. This secondary data directly contributed to our results on financial costs and benefits (i.e. the contracts provided information on discount rates) or TCE factors (i.e. the invoice data were used to assess frequency). By making use of these extensive additional data sources we increased our construct validity, since this helped us create a better picture during the within-case analysis (Gibbert et al., 2008; Yin, 2009). We asked SME suppliers first about their perception of the RFO, including how they assessed its costs and benefits. With the quantitative data collected, we were able to make an accurate assessment, based on existing literature, of the financial costs and benefits of the RFO, which we compared to the assessment performed by the supplier.

All of the respondents that were interviewed, whether they represented SME suppliers, buyers or FSPs, were directly involved in proposing or responding to the RFO. On the SME supplier side, we conducted interviews mostly with sales managers and CEOs. On the buyer side we interviewed procurement managers and financial managers, whereas on the FSP side we interviewed SCF specialists. For some of the SME suppliers, we interviewed multiple respondents, representing multiple departments. Since teams working on the adoption of SCF are often cross-functional (Wuttke et al., 2013a), hearing the view of multiple departments helps in creating a more complete picture for the within and cross-case analysis. Throughout all stages of the research we ensured confidentiality, thereby contributing to limiting social desirability bias (Johnson, 1999). A summary of the number of interviews, function of interviewees and secondary data used per case can be found in Table 1.

3.3 Coding and Data Analysis

All of our codes are TCE items which can be seen in table A or table 2. All the TCE items are defined in literature in section 2 which gave us clear guidance in our coding. Coding was done independently by the involved researchers, after which discussion and reflection took place and consensus was achieved. We made both first-order tables for our within case analysis and second-order tables for our cross-case analysis.

For our within case analysis we triangulated all interviews with secondary data obtained from the involved companies. Appendix B shows how financial costs and benefits have been operationalized in this study. It explains in detail the calculations made on volumes, durations and capital cost rates. Appendix C and D show the quotations and most relevant results from secondary data per TCE item. These within case results were discussed both with researchers and the involved companies before moving to a cross-case analysis.

We did a cross case analysis performing data reduction and comparing the extensive amount of data from the different cases to identify patterns. Data reduction was achieved by giving high, medium, or low values to all TCE items. Table A shows how we operationalized high, medium and low values, and Table 2 shows the results. The data from the 8 cases were compared to address the main financial and TCE factors influencing the outcome of the RFO, which is summarized in Table 1. We analyzed similarities and differences between cases, and eventually patterns among cases were identified (Eisenhardt, 1989; Yin, 2009). The results from our within and cross-case results can be found in the next section. The most relevant findings were compared with existing SCF literature to see to what degree our research can confirm results of previous research or can bring new aspects to the literature (Eisenhardt, 1989), which can be found in our discussion section.

4 Financial costs and benefits

To analyse the case studies, first of all financial costs and benefits were assessed. From the 8 RFOs four of them are labelled as attractive (RFOs 1, 2, 3 and 4), and four of them as unattractive (RFOs 5, 6, 7 and 8), in terms of financial costs and benefits. This can be seen in Table 1.

The first four RFOs present an attractive financial proposition for suppliers: the lower costs of financing outweigh the extra cost coming from adopting RF. This is because discount rates in these RFOs are relatively low, all between 0.8% and 0.9% and, more importantly, the cost of financing in standard conditions for the suppliers is quite high, especially due to their use of credit insurance to cover for the credit risk of delays or unpaid invoices from the buyers (such risk would then be transferred to the FSP in RF, rendering credit insurance no more necessary for the supplier).

The increase in financing costs as a result of extended payment terms (when suppliers adopt RF) is, in most RFOs, roughly equal to how much the supplier benefits from a lower interest rate. In other words, only the savings in credit insurance make the RFO financially beneficial for the supplier. This is in itself a result: SCF is often marketed commercially and studied in literature as a ‘win-win’ solution, generating financial benefits for both buyers and supplier. For the latter, specifically, the benefits emerge from the lower cost of RF compared to the cost of borrowing from banks (e.g. Dello Iacono et al., 2015, p. 292; Van Der Vliet et al, 2015, p. 844). Our sample, however, shows that buyers set parameters such as to acquire the entirety of the financial benefits, leaving suppliers with almost nothing (i.e. the extension of payment terms required by the buyer would generate an extra financial cost for the supplier roughly equal to the financial benefit of the early payment). In fact, only the suppliers in the sample that were able to reduce their credit insurance costs, as an additional benefit of joining the RF programme, were actually able to obtain an overall financial benefit.

RFO 5s to 8 present all negative financial attractiveness. This is mostly due to two factors: the absence of credit insurance costs and the (relatively) high liquidity position of suppliers, which implies a null opportunity cost in the base case (see appendix B for more details).

For RFOs 5, 6, 7 and 8 the suppliers are all rather small companies (i.e. less than 10 million Euros in turnover per year) with a relatively strong liquidity position. Surprisingly, the cost of RF for the last four RFOs is much larger than for the first four RFOs, leading to unattractive offers in terms of financing costs. For RFO 5, 6 and 7 in particular, all offered by B5, the discount rate is rather high (2.25%) in comparison with the other offers. All suppliers involved in RFOs 5 to 8 also did not have credit insurance in place before RF, which in contrast to the other RFOs does not lead to benefits in terms of reducing the costs of credit risk insurance.

5 The impact of Transaction Cost Economics

Table 1 summarizes, per RFO, the main results of this study: whether the RFO was financially attractive or not, whether it was accepted or rejected by the supplier and the value assumed, case by case, by the key TCE factors influencing the decision. More importantly, table 1 shows whether the decision to accept or reject an RFO is aligned with the financial attractiveness (i.e. accepted financially attractive RFOs or rejected financially unattractive ones) or not (i.e. accepted financially unattractive RFOs or rejected financially attractive ones). In 5 out of 8 cases the decision on the RFO is misaligned with its financial attractiveness.

5.1 Uncertainty – Bounded Rationality

To assess the level of bounded rationality of the different RFOs, we first checked whether the suppliers had calculation models in place to assess financial costs and benefits. In particular, the research team identified for some suppliers a number of problems in the SME calculation models, either because these were not present or because these could bring suppliers to incorrect conclusions. The existing misalignment is confirmed by the SMEs that, when discussing these findings with the research team, decided to change their models or trust the information presented, if they did not have a model already in place. This indicates that existing models were not optimal and that the SMEs did not fully understand the implications of the RFO from a tangible cost / benefit perspective.

In Appendix B, table D summarizes for every RFO whether calculation models were in place, and shows if the suppliers’ calculations were coherent with our assessment of financial costs and benefits in table C. S1, S2 and S3 used calculation models, while S4 and S5 didn’t. In RFO 1, S1 had an extensive model in place, making them able to see the positive effects of the offer. S1 had a good understanding of direct

financial costs and benefits of RF, but made an error in calculating their costs of financing before RF. In addition, S1 was concerned about the effect of accepting the RFO on the relation with their own bank, since RF through the buyer's bank would replace the existing direct factoring programme with their own bank. S2 received RFOs 2 and 3 at the same time and at first did not understand the effects of key parameters such as the discount rate. At a later stage they built a calculation model, but this presented a clear mistake in calculation of credit insurance costs, contributing to a negative (but inaccurate) perception on RFO 2 and 3. Since RFO 4 was the third offer for S2, the effect of prior experience led to improved calculations and the acceptance of a financially attractive offer. S3 mentioned having some misunderstandings at first, but with a detailed calculation they were able to understand the financially negative consequences of RFO 5. They still accepted the RFO, mostly because of B5 using its bargaining power (as discussed in the next section). In RFO 6, S4 did not spend much time on assessing the offer. The company trusted the buyer and the involved bank, and assumed this would be a good deal. Even though S5 did not have a calculation model in place, the company did have a certain amount of knowledge about RF. RFO 8 was the second offer S5 received, so they benefited from prior experience. In addition, S5 discussed both offers with other entrepreneurs who also received RFOs, and visited an information seminar on RF.

A high level of bounded rationality influenced mainly RFO 2, 3 and 6. The suppliers involved had no prior experience, and did not spend much time on the assessment of the offers. For S2, which received RFO 2 and 3 in the same period of time, there was also low intra-firm collaboration. The involved sales manager of S2 explains: *"I look at it from a profit point of view, and finance is far away from me"*. In the eyes of the procurement manager of B2, SMEs like S2 do not always understand RF: *"I think one of the biggest hurdles, especially for SMEs, is understanding and believing the concept."* A low level of bounded rationality influenced mainly RFOs 4 and 8. Prior experience and greater knowledge on RF made S2 accept the financially attractive RFO 4, and made S5 reject the financially unattractive RFO 8.

5.2 Uncertainty – Opportunism

A high level of opportunism on the part of the buyer can push suppliers to accept an RFO. For RFOs 5, 6 and 7 B5 used its bargaining power to a large extent. The procurement manager of B5 mentions: *"If the supplier says no, we will stop the relationship"*. This led to the involved suppliers having to accept the offer, as the CEO of S4 mentions: *"we didn't have a real choice"*. Surprisingly S4 also states: *"I have full trust in this RFO. I have been working with [B5] already for a long time and I trust them"*. This high amount of trust of S4 was a reason for not assessing financial costs and benefits much in detail.

Opportunistic behaviour appears sometimes also in how the buyer shared the information with the supplier and this emerged from the comparison of how the buyer and the supplier presented the story. For example, in Case 1, the buyer says they want to explain the adoption of RF in simple terms to make the process as quick as possible; in this way, they explain costs just in very general terms, without providing the supplier with the necessary data to take an informed decision. Moreover, they were deliberately dodging questions about invoice approval time which was perceived as a negative sign by the supplier. A similar approach was identified in RFO 2 and 3, wherein the buyers mention wanting to explain RF in simple terms, but the involved supplier perceives this as a deliberate lack of transparency. The sales manager of S2 explains on these RFOs: *"We never know if they (B2) are really telling the truth. (...) These companies (B2 and B3) are not very transparent."*

RFO 2 and 3 show that a high level of opportunism does not always lead to the supplier accepting the RFO. S2, to whom both offers were directed, felt pressured because of little to no room for negotiation. Also influencing the decision to reject the RFOs was the limited amount of information sharing, which contributed to a lower level of trust.

In RFO 4, the buyer was not opportunistic. S2 felt very positive about the approach of B4 which was described as collaborative and transparent. This *"collaborative spirit"* was very important for S2 to accept the offer. In RFO 1 a high level of opportunistic behaviour of the buyer played a role in the decision of S1. Trust of S1 in RFO 1 was low, mainly because of a high payment term extension and uncertainty about the time the buyer needs to approve invoices with RF. B1 used bargaining power, and S1 felt like they had to accept since the RFO was coming from their most important customer. S5 was

generally low on trust about RF. While S5 had to accept RFO 7, they were in position to reject RFO 8 because of less bargaining power from the buyer in this case.

5.3 Asset specificity

Asset specificity plays a limited role within the sample. Some suppliers, like S1, foresee changes for administrative personnel in processing invoices, after accepting RF. However, none of the suppliers mentions relevant investments, or changes in skills and resources having a decisive role in assessing RFOs. Additionally, most buyers mention only limited changes required by suppliers, usually also in processing invoices. For example, the procurement manager of B2 states: *“There would be some really small changes for reconciling the accounts. With RF they have to get that statement from a different platform, so the statement will look different. So that’s about it”*. FSPs 1 and 2 confirm that only limited investments are needed during or after adopting RF. An SCF specialist at FSP 1 explains: *“Suppliers usually don’t need process changes because it’s web based, via Internet, so they don’t need an application on ERP system or something like that.”*

The most important investments were the efforts taken to understand the offer by building calculation models for assessment. Understanding RF required gaining certain knowledge and skills, for example the CEO of S3 mentions: *“I had to figure out technical and financial terms which I am not that familiar with”*.

5.4 Frequency

RFOs 5, 6 and 7 are the only cases in which frequency varied after adoption of RF, moving from weekly to monthly invoicing (and self-billing). In principle, this leads to lower average liquidity levels for suppliers. However, the suppliers involved (S3, S4 and S5) seem to appreciate this because of lower handling costs related to invoicing. These suppliers are all relatively small with non-automated order and invoicing processes, and therefore costs related to creating orders and invoices and monitoring the status becomes lower. The CEO of S3 states: *“I no longer have to send an invoice every week, this saves a lot of time and hassle.”* Overall, the change in frequency of invoicing coming from RFOs 5, 6 and 7 was seen as a positive aspect, even though it was not influential in the decisions to accept the offers.

Frequency in our results is mainly linked to supplier-buyer transaction costs. Moving from weekly to monthly invoicing in RFOs 5, 6 and 7 was in the first place the buyer’s decision. The suppliers involved mentioned appreciating this because of decreasing handling costs in invoicing.

===INSERT TABLE 2 HERE===

In conclusion, we find a strong impact of uncertainty on the relationship between financial attractiveness and the RFO decision by the supplier. Asset specificity and frequency appeared to have an isolated role in some of the RFOs, they were less significant overall and didn’t emerge as strong factors.

6 Discussion

As summarized in Table 1, behavioural uncertainty (in terms of bounded rationality and opportunism) played a key role in influencing suppliers’ decisions concerning their RFOs. We find this effect to be a moderating one, meaning that uncertainty acts and influences the existing relationship between financial attractiveness and the supplier RFO decision.

When uncertainty is low, the decision tends to be aligned with financial attractiveness. This is the case for RFO 4 and 8 where it led to the acceptance of an attractive offer, and for RFO 8 where it led to the rejection of an unattractive offer. This is understandable: without uncertainty the SMEs are able to evaluate an RFO without pressure and with sufficient and accurate information available. As a result, they tend to align their decision with what financial attractiveness would dictate. For example, S2’s prior experience (which reduces bounded rationality) made the supplier able to correctly assess costs and benefits involved in RFO 4.

When uncertainty is high the decision on the RFO tends to be misaligned with its financial attractiveness. This is the case in RFO 2 and 3 where it led to the rejection of financially attractive offers, and for RFO 6 where it led to the acceptance of an unattractive offer. Specifically, RFO 2 and 3 show high level of opportunism, which leads the supplier to mistrust the buyers and their RFOs, while at the same time presenting a high level of bounded rationality, which generates uncertainty over the actual financial benefits of accepting the RFO. In RFO 6 we see the acceptance of a financial unattractive offer, mostly as a consequence of the buyer pressuring the supplier to accept the RFO, combined with high level of bounded rationality, which in this case is expressed by the supplier being unable to perform any kind of quantitative assessment of the RFO.

In summary, the combination of high bounded rationality and opportunism moderates the relationship between the independent and dependent variables in our conceptual framework. While bounded rationality tends to homogeneously affect suppliers in misjudging the financial attractiveness of the RFOs (or overly relying, one way or the other, on their relationship with the buyer), opportunism naturally manifests in two different ways: when RFO are financially attractive as scepticism of the supplier towards the buyer (due to vague or incomplete information provided, or a general lack of trust deriving from the existing relationship), while when RFO are financially unattractive as bargaining power exercised by the buyer to push suppliers into accepting the RFO.

In RFOs 5 and 7 we can appreciate the single incidence of opportunism (without the effect of bounded rationality) on the RFO decision. The buyers' use of bargaining power in these cases is the only decisive subfactor within opportunism, but it is strong enough and leads suppliers to a misaligned decision.

Only RFO 1 seems not to fit the three categories of RFOs mentioned above. Despite high level of uncertainty (in both bounded rationality and opportunism), the supplier ends up accepting an attractive offer. Despite the apparent contradiction, we believe this is simply on occurrence of variation in our sample: uncertainty does not always, or necessarily, 'switch' the relationship between financial attractiveness and the RFO decision, but it simply reduces the likelihood of attractive solutions being accepted and unattractive being rejected. In support of this, it should be noted that RFO1 presents, both in absolute and relative terms, the most positive business case throughout the sample, which of course influences the supplier decision.

We also investigated asset specificity and frequency. Unlike the research of Dekkers et al. (2020) we found only a marginal role for asset specificity. The RFOs in this study did not bring along large investments for the suppliers during or after adoption. Practitioner reports show that the widespread use of RF has made it more of a 'standard practice' in recent years (Siemes et al., 2017), which can contribute to lower implementation costs and straighten out the learning curve. In earlier works like De Boer et al. (2015) and Dello Iacono et al. (2015), specific types of investments needed after adopting RF are mentioned, for example legal costs, training costs or IT related costs. However, the main investments represented in this study are the time and money spent by suppliers on building knowledge and calculation models to correctly assess the RFOs before adoption. This is, to some extent, a sign of the evolution of the SCF field. While initial SCF (and RF more specifically) programmes mapped out presented a strong investment on the supplier side, especially when not including digitalisation or use of platform (Caniato et al., 2016), modern RF programme, especially when targeting SMEs, are based on easy onboarding and limited to null specific investment in technology and transaction handling.

Frequency is not often taken into account in relation to SCF, but when it is, it is discussed mainly from the bank perspective (e.g. Hofmann & Zumsteg, 2015). Even though frequency was not a decisive factor in any of the cases, some of the RFOs show that it might impact suppliers, due to changes to average liquidity levels and suppliers' administrative burden in processing invoices.

It is also critical to notice the different perceptions of transaction costs across the triad of actors involved in our sample. The FSP and buyer jointly offer RF to supplier, and therefore it is not always possible to make a distinction between specific supplier-FSP transaction costs and supplier-buyer transaction costs. However, from our results it becomes clear that transaction costs coming from bounded rationality are mainly related to internal factors within the SME supplier organization, and transaction costs coming from opportunism are mainly related to the supplier-buyer relation. The main point of contact for the RFO is usually the buyer. Therefore, when the suppliers mention trust and information sharing they

usually refer to the buyer, since they don't experience much communication with the FSP at the RFO level. However, exceptions might exist, as for example S4, which mentions their trust in the FSP is an important factor for them in accepting the RFO. Asset specificity in relation to SCF could potentially be more linked to the supplier-FSP relation, for example because of time spent on getting used to new digital platforms of the FSP. However, in our sample asset specificity played a marginal role and the transaction costs coming from using digital SCF-platforms were not relevant for the decision on the RFO.

Finally, one of the strongest results that emerges from our sample is that there are important differences in what buyers, FSPs and suppliers experience, perceive or communicate in relation to the RF programme, showing the importance of having all three perspectives under investigation. Buyers and FSPs elaborate in interviews on the 'win-win-win' predicament of RF (the third 'win', not always present, refers to the FSP). However, as explained, the win is not always there for the SME supplier. This should be a strong take-away point both from a theoretical and managerial perspective, considering that the 'win-win' predicament is commonly accepted in literature (e.g. Hofmann & Belin, 2011; Hofmann & Zumsteg, 2015; De Boer et al., 2015).

7 Conclusion

Literature about SCF is growing in attention and in relevance, but there is still limited in-depth empirical research investigating the supplier's perspective and how suppliers take their adoption decision in RF, the most used SCF solution. This paper aims at elaborating on this phenomenon taking into consideration not only quantitative but also qualitative parameters. For the quantitative parameters, the most relevant elements presented in the literature review are considered; for the qualitative parameters, the paper relies on TCE theory, considering the impact that uncertainty, asset specificity and frequency have on the adoption of RF.

The analysis is conducted through the development of 8 case studies, using as unit of analysis the RFO and so interviewing buyer, supplier, and FSP.

Results of the paper show that qualitative factors play their role in the decision of accepting or rejecting the RF offer, sometimes also overcoming the quantitative results, both in positive and negative terms: leading to acceptance of RFOs that are financially inconvenient or vice versa to rejection of RFOs that were financially convenient for the supplier. The impact of these parameters is presented and discussed under the consideration of existing literature, contributing to the current debate about SCF.

7.1 Theoretical contributions

The introduction of a triadic perspective in SCF and the concurrent focus on the RFO as unit of analysis (rather than the more common focus on buyers or entire RF programmes) allows us to make three theoretical contributions.

The first pertains to the role of uncertainty in SCF and the somehow preconceived notion that the acceptance of an RFO is a sign that the RF programme is beneficial for the parties involved: we show that uncertainty has a mediating role on the relationship between the financial attractiveness and acceptance of the RFO by suppliers: this leads to suppliers accepting unattractive offers (which do not respect the traditional 'win-win' predicament of RF) or provide an additional and alternative explanation for why some programmes might fail in onboarding enough suppliers. High uncertainty levels throughout our sample are driven by bounded rationality (which reduces the confidence level of the suppliers in understanding the implications of the RFO), and opportunism from the buyer side, which reduces the supplier confidence in the 'winning proposition' of RFO (despite the fact that it might be there). More in general, our results provide a significant contribution in showing that SCF solutions are evaluated by suppliers not only in terms of objective, quantitative costs and benefits, but also qualitative relational factors, and by explaining which factors play a more relevant role and how, thus improving our understanding of the relational dimension of SCF.

The second pertains to the perspective of SMEs in SCF. While larger suppliers will tend to be more homogeneous across dimensions that determines costs and benefits of SCF (e.g. large suppliers will

have a clear cost of debt to which to compare the RFO, and won't likely suffer from bounded rationality to the same extent an SME might), we show how SMEs approach RFOs (and likely SCF more in general) differently than larger companies. This has implications in understanding why, for example, RF programmes do not target SMEs: while the common explanation is that small companies are not in target for RF programmes, the rapid digitalisation of those programmes should go hand-in-hand with an uptake in SMEs inclusiveness. However, we show how SMEs approach RFOs differently than larger suppliers and thus are not likely to respond to the same argument.

Finally, current literature (i.e. Gelsomino et al. [2016] and Dekkers et al. [2020]) pointed out that the theoretical foundation of SCF is rather weak and theoretical lenses like TCE are only sporadically linked to SCF. By building our contribution within the traditional TCE literature and by analysing RFOs through TCE factors we aimed at contributing to the formation of a '*general theory of SCF*', i.e. generating a series of hypothesis that might, once consolidated and integrated with existing knowledge, provide an overall explanation for the existence of SCF as a phenomena or at least spark a debate on its correct interpretation.

7.2 *Contribution to practice*

This paper provides also important contributions for managers and for practice. First of all, our study gives clear managerial implications for suppliers which have to assess RFOs, especially SME suppliers. SME suppliers seem to face challenges different to those of large suppliers, for example because of limited prior experience with RF and bargaining power which is often in favour of the bigger buyer. It shows that as an SME supplier, you cannot simply assume a win-win situation, in the way in which RF is often described. The identified parameters are presenting to SMEs the importance to have a quantitative model for the assessment of benefits. These models are not always taken into consideration in companies, and this paper provides them with a model that could be easily used by suppliers to make an informed decision. Moreover, the paper provides insights on potential behaviour that buyers and FSPs might have in presenting the SCF solutions, which can help SMEs to better read the situation.

The results of the paper could be beneficial for buyers and FSPs too. Buyers are often willing to provide a method that is helping their suppliers to access credit. Through this paper, they are provided with a simple tool to help their suppliers in assessing the value of the solution, maybe reducing the risk on failure of the RF programs. Moreover, this paper helps the buyers in understanding the qualitative factors that could impact the final decision of the supplier. Based on this, buyers could adapt their communication and explanation strategies regarding RFOs to suppliers. FSPs are interested in helping their counterparts in selecting the most proficient and most adequate solutions along their supply chain. Our findings help in understanding the most impacting parameters to advise buyers and suppliers in the most adequate direction and improve the likelihood of success of the program.

The study is done through empirical analyses and this is a contribution for all the actors involved as managers are provided not only with theoretical models but also with real examples from different companies' perspectives.

7.3 *Limitations and future research*

The main limitation of the paper is that the research focuses on companies active in the Netherlands. Just companies of a single country were selected to make the sample homogeneous, but the results are applicable also in other countries. For future research, it would be useful to include companies from other countries, especially countries with longer average payment terms, since this could have big effects for the financial attractiveness and relationship dynamics in RF. Moreover, there are hints in the data collected that cash flow predictability (i.e. the ability of decision makers in the supplier's organization to accurately forecast cash flow levels) might influence the financial attractiveness of the RFO and consequently the supplier's decision to accept or reject it. However, indications on its effect were weak and sporadic through the data collected, and therefore were left out from the results and discussion. We nonetheless invite further contributions in the SCF realm, from both an analytical and empirical

perspective, to focus on this specific topic to clarify whether it indeed impacts the financial attractiveness of RFOs.

In terms of future research, we invite contributions to focus, generalise and expand on the conditions and contextual factors that influence the adoption of SCF programmes that are financially unattractive, especially for suppliers. For example, modelling and analytical contributions could expand on this vein. In terms of theoretical grounding, the theory of agency seems to provide fertile ground for an alternative take on this topic.

Moreover, the paper provides a triadic perspective on the transactions costs faced by SME suppliers. Future research might also investigate the transaction costs faced by other involved actors in SCF. In the same vein, contextual factors might influence the components of TCE and these elements were not included in the paper: further studies could investigate this point. In addition, future survey research on SCF can test our results for larger groups of companies, but can also look into possible interactions between TCE factors in the context of SCF. Next to TCE, this research shows the potential of another theoretical lens for future research on SCF, which is agency theory, due to the relevance of concepts like goal conflicts between buyers, suppliers and FSPs and information asymmetry (as recognized also by Dekkers et al., 2020).

Finally, there is now a fair number of papers about initiation and adoption of RF, whereas there is a scarcity of papers about the post-adoption phase. Our research shows that there are uncertainties for SMEs at the initiation or adoption phase: they don't always receive all the necessary information about the RFO from the buyer, or might not take the effort to use information for a thorough analysis of an RFO. There seems to be value in assessing and evaluating whether uncertainty levels before and after adoption explain benefits achieved from RF years after adoption.

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Note: Tables and Appendices that are not to be included in the manuscript but are treated as 'available on request' are labelled alphabetically and are considered not to be part of the word count.

Appendix A – Semi-structured interview guide

Supplier and buyer - General information

- What is your function?
- Where is the company located?
- What is the annual turnover?
- What is the number of employees working at the company?
- In which industries do you operate?
- What is the geographic scope of operations?
- What are the current ways of financing working capital (bank loans, equity, factoring etc.)?
- What is the general feeling about the buyer's RFO? (for suppliers)
- Which are the involved departments in the RFO?
- What is the current state of the RFO (no decision made yet, accepted/rejected)?

Supplier and buyer - Reverse Factoring offer – financial costs/benefits¹

- What is the company's interest rate?
- What is the turnover the buyer represents (incl. and excl. VAT)/ What is the purchasing volume the supplier represents?
- What is the current payment term (before RF)?
- Do you have credit risk insurance, if so, at what costs? (suppliers)
- What are the main financial effects of RF (discount rate, new payment term, approval time, credit risk insurance)?

Supplier - Uncertainty

- How do you assess effects of the RFO?
- Is there previous experience with RF or similar financial instruments?
- What is the general level of understanding in the company about RF?
- How would you describe the internal collaboration between involved departments?
- How would you describe the buyer-supplier power balance?
- Do you experience buyer pressure related to the RFO, if so, in which way?
- What is your trust level in the buyer in general and in the RFO?
- Can you describe the length and strength of relationship with buyer?
- Can you describe the degree and nature of interaction with buyer and bank about the RFO?
- What can you say about the (completeness of) information shared by buyer and bank about the RFO?

Supplier - Asset specificity and frequency

- What are the (expected) investments needed when accepting RF (for example in a digital invoicing platform)?
- What are the (expected) investments in skills and resources needed when accepting RF?
- How much time and effort was spent on assessing the RFO?
- What is the frequency of invoices sent to buyer involved in the RFO?
- What are the (expected) effects of RF on handling invoices?
- Do you see a role for frequency of invoices in assessing the RFO?

Supplier - Outcome (asked when decision is made)

- Have you decided to accept or reject the offer?
- What were the key reasons for accepting/rejecting the RFO?
- What were your main misconceptions in earlier stages about the RFO?

Buyer questions

- What was your main motivation for offering RF?
- What is your perception about the main benefits for the supplier?
- How would you describe the internal collaboration between involved departments?
- How would you describe the collaboration with the involved bank?
- How would you describe the degree of pressure on the supplier to accept?
- How would you describe the strategic importance of the supplier?
- Can you describe the length and strength of relationship with the supplier?
- Can you describe the degree of interaction with suppliers about RF?
- What is your perception on the knowledge level of RF by the supplier?
- Do you see a role for frequency of invoices in assessing the RFO?
- What do you see as the (expected) effects of RF on handling invoices for buyer and supplier?
- What do you see as the main investments needed for supplier after accepting RF?

Bank questions

- How would you describe the role of the bank in proposing RF to suppliers?
- How would you describe the collaboration with the buyer in proposing RF to suppliers?
- How would you describe the collaboration/degree of interaction and information sharing with the supplier about RF?
- What is your perception about the benefits and drawbacks of RF in comparison to other forms of financing for suppliers?
- What is your perception of the knowledge level about RF by suppliers?
- What do you think are the main supplier investments needed for RF?
- What do you think are the (expected) effects of RF on handling invoices for buyers and suppliers?

¹ sometimes questions about quantitative details could not be answered in interviews. In this case, the necessary information has been obtained via secondary data, or via additional e-mail or phone contact.

Appendix B – Assessment of financial tangible costs and benefits

The assessment of financial tangible costs and benefits has been performed based on existing literature. The starting point for calculating costs and benefits derives from contributions such as van der Vliet et al. (2015) and Gelsomino et al. (2019). To operationalise the analytical model proposed in literature and quantify the tangible impacts of RF, it is first necessary to define the base case (i.e. the starting point) against which the financial costs of RF needs to be assessed.

Tangible financial costs in the base case

Based on the collected data, suppliers present three different base cases, summarized in Table B:

1. The supplier does not have any specific working capital arrangements in place which would be substituted by RF, and is financing its working capital (which, in this specific case, is the accounts receivable only, for the length of time required by the buyer to pay the invoice, called *DSO*) through its own financial means, at a rate r_s ;
2. The supplier is currently using direct factoring (i.e. sell of accounts receivable to a financial institution without the invoice approval and the involvement of the buyer), and RF would substitute this. Within direct factoring, the supplier receives a percentage of the invoice value (usually around 90%, called *ap*), within a short period of time (t_{ap}), while it will receive the remaining part when the invoice is paid by the buyer (*DSO*). It will then pay a fee to the financial institution that is proportional to *ap* and ($DSO - t_{ap}$). The (usually short) period of time between 0 and t_{ap} will be financed through own financial means, as in case 1;
3. The supplier uses credit insurance to reduce or eliminate the credit risk connected to accounts receivable. Within the sample, credit insurance is charged as a fixed percentage of the total volume (*ci*). It should be noticed that: (i) in all the cases encountered credit insurance is calculated on the volume net of Value-Added Tax (VAT), and that (ii) some of the suppliers analysed were employing both factoring and credit insurance at the same time, due to the fact that direct factoring was implemented with recourse, which would make the supplier liable to the financial institution for any delay, missed payments or default on the buyer side.

Table B: base cases for adoption of RF

Base case (alternative to RF)	Financial costs in annual terms, as percentage terms of the volume
1. Own financial resources	$\frac{DSO}{365} \cdot r_s$
2. Factoring	$\frac{t_{ap}}{365} \cdot r_s + ap \cdot \frac{(DSO - t_{ap})}{365} \cdot r_{DF}$
3. Credit insurance (always calculated net of VAT)	<i>ci</i>

On top of this first distinction, the value of parameter r_s (used in case 1 and 2), must be further differentiated depending on the capital structure of the supplier. Such parameter, in fact, is calculated as the opportunity cost of the supplier when it has to decide whether to adopt RF or not. This leads to three possible scenarios:

- a) The supplier has, on average, limited to no liquidity available but can access and uses short-term debt to finance day-to-day expenses. In this case, the parameter r_s has been assessed as the cost of generic short-term debt available to the supplier. This case applies to RFO 1 to 4 within the sample, for which the cost of overdraft (expressed in annual rate) indicated by each supplier was used in calculations;

- b) The supplier has high average level of cash available (e.g. due to a favourable cash-to-cash cycle or low capex) and uses its own cash to face day-to-day expenses. In this case the parameter r_s has been assessed as the return of investing cash in a low-risk investment, such as the national treasury bond. This case applies to RFO 5 to 8 within the sample. In these cases, a rate of 0.00% (representative of the negative to mildly positive current returns of Dutch Treasury bonds) was used;
- c) The supplier does not have enough cash to cover day-to-day expenses, and cannot access short-term debt and/or other forms of working capital financing. In this case the parameter r_s should be assessed as the return of the best opportunity foregone due to the fact that the supplier has to wait to collect money from the buyer (using either the weighted average cost of capital or the cost of equity). This instance, however, does not emerge in the cases part of our sample.

In conclusion and in summary, tangible financial costs in the base case are calculated as the combination of three possible base cases (numbered from 1 to 3), where the cost of finance for the supplier is chosen between three possible options (from a to c). As a mean of example, in case of RFO1 the supplier uses direct factoring and credit insurance (thus, options 2 and 3).. Its total cost of financing is then:

$$\frac{t_{ap}}{365} \cdot r_s + ap \cdot \frac{(DSO - t_{ap})}{365} \cdot r_{DF} + ci$$

multiplied by total volume. Since the liquidity position of the supplier is scarce, r_s is calculated as the cost of the supplier overdraft facility (case a).

For RFO5, instead, the base case is only option 3, which leads to total costs of financing equal to:

$$\frac{DSO}{365} \cdot r_s$$

where r_s is equal to 0.00%, given the high level of liquidity available to the supplier (case b).

Tangible financial costs of RF

The tangible financial costs of using RF from the supplier perspective (in annual terms and as percentage of the volume) are the same for all suppliers, and are formally expressed as:

$$\frac{DSO + \Delta DSO - t_a}{365} \cdot r_{RF} + \frac{t_a}{365} \cdot r_s$$

where:

1. ΔDSO is the payment term extension that the buyer requires from the supplier when onboarding on RF (see Gelsomino et al., 2019);
 2. t_a is the approval time required by the buyer to approve the invoice and communicate it to the financial institution;
 3. r_{RF} is the cost of RF for the supplier, as charged by the service provider, expressed as annual rate.
- Based on these assessments, the tangible financial benefits of using RF for a supplier are expressed as the difference between the tangible financial costs of using RF and the tangible financial costs in the base case. Thus, a positive number indicates that the base case presents higher financial costs than RF (i.e. adopting RF reduces financing costs for the supplier), while a negative number indicates that the tangible financial costs in the base case are lower than the one of using RF (i.e. adopting RF increases financing costs for the supplier). Table C summarises all the input values as well as the overall calculations with the indications of whether the difference in tangible benefits and costs of using RF is positive or negative for the supplier, while Table D compares the results to the calculations performed by the suppliers in evaluating their own RFOs.

Table C – calculations of tangible financial costs and benefits

	Base case	DSO ^(a) [days]	Δ DSO [days]	t_a [days]	r_{RF}	Volume [€/year]	Vol. net of VAT [€/year]	r_s [type] and value	ci	A) Financing costs base case [€/year]	B) Financing costs RF [€/year]	Difference A-B [€/year]	Difference as % of volume	RFO outcome
RFO1	2 ^(b) , 3	50	70	12	0.85%	6 879 658	5 685 659	[a] 2.20%	0.18% ^(c)	46 115.84	22 278.78	23 837.06	0.35%	A
RFO2	3	15	45	2	0.90%	5 567 822	5 359 859	[a] 3.50%	0.30%	24 088.09	9 030.55	15 057.54	0.27%	R
RFO3	3	18	42	5	0.80%	2 399 820	2 292 640	[a] 3.50%	0.30%	11 020.08	4 043.53	6 976.54	0.29%	R
RFO4	3	30	30	3	0.90%	376 961	359 216	[a] 3.50%	0.30%	2 162.06	638.25	1 523.80	0.40%	A
RFO5	1	34	46	29	2.25%	963 398	n/a	[b] 0.00%	n/a	0	7 621.40	-7 621.40	- 0.79%	A
RFO6	1	34	46	29	2.25%	750 000	n/a	[b] 0.00%	n/a	0	5 933.22	-5 933.22	- 0.79%	A
RFO7	1	34	46	29	2.25%	330 882	n/a	[b] 0.00%	n/a	0	2 223.26	-2 223.26	- 0.67%	A
RFO8	1	30	30	14	1.60%	1 102 941	n/a	[b] 0.00%	n/a	0	4 127.72	-4 127.72	- 0.37%	R

(a) Average time to collect payment prior to RF adoption (as measured by the supplier).

(b) Parameters in the direct factoring contract between the supplier and the financial institution take the following values: $ap = 90\%$; $t_{ap} = 3$ days; $r_{DF} = 4,1\%$.

(c) More specifically, this include both credit insurance (0.10%) and a flat direct factoring commission (0,08%).

Table D – assessment of financial costs and benefits compared to suppliers' own calculations in assessing RFOs.

	Difference A-B [€/year]	Difference as % of volume	Supplier own assessment of tangible financial benefits and costs	RFO outcome
RFO1	23 837.06	0.35%	Made error in assessing factoring cost ^(a)	A
RFO2	15 057.54	0.27%	Significantly underestimated insurance costs in base case	R
RFO3	6 976.54	0.29%	Significantly underestimated insurance costs in base case	R
RFO4	1 523.80	0.40%	Performed calculations coherent with table C	A
RFO5	-7 621.40	- 0.79%	Performed calculations coherent with table C	A
RFO6	-5 933.22	- 0.79%	Did not perform a quantitative assessment	A
RFO7	-2 223.26	- 0.67%	Did not perform a quantitative assessment	A
RFO8	-4 127.72	- 0.37%	Did not perform a quantitative assessment	R

(a) despite the mistake in calculations, it should be noticed that the supplier's calculations still returned a positive difference [A-B].

Appendix C - First order table – TCE Factors

Quotes and information coming from secondary data per category of TCE factors for RFOs 1 to 4

	RFO 1	RFO 2	RFO 3	RFO 4
Uncertainty – bounded rationality – use of prior experience	No prior experience for S1 with RF. However, they are familiar with factoring.	No prior experience for S2	No prior experience for S2, since RFO 2 and 3 came at same time	S2 gained experience from RFO 2 and 3 and had calculation model in place which made them able to see the quantitative benefits of RFO 4.
Uncertainty – bounded rationality – restriction in using all available information	S1 worked with an extensive calculation model to understand RF. In this model there was however a mistake made in the calculation of the costs of factoring. Also, S1 had some uncertainty on how the RFO will affect the relation with the own bank, because of changing from factoring with own bank to RF with bank of buyer.	B2: <i>"I think one of the biggest hurdles, especially for SMEs, is understanding and believing the concept (..)specifically to maybe somebody who is not financially the best or the strongest person, because SMEs do not regularly have highly advances CFOs."</i> S2 mentioned not understanding the effect of discount rates in RF at first. Wrong calculation of the costs of credit risk insurance in the base case.	B3 about suppliers rejecting the RFO: <i>"..they didn't understand the mechanism. They thought it's too good to be true."</i> S2 mentioned not understanding the effect of discount rates in RF at first. Wrong calculation of the costs of credit risk insurance in the base case.	S2: <i>"..the first time I was not very happy about RF because it was more expensive. Now that I got more knowledge about it, I think it can be very interesting for us as well."</i> B4: <i>"...if they are going deeper into the material a lot of them are realizing it's quite an interesting proposal. So that's why you want them to look into it very seriously"</i>
Uncertainty – bounded rationality – intra-firm collaboration	S1 mentions different perspectives of sales and finance on the RFO. Before accepting RF, it was internally discussed with multiple departments, consensus was achieved on the decision and the steps to take after implementation.	S2: <i>"I am a Sales Manager so I look at it from a profit point of view, and finance is far away from me. Also, my manager is not emphasizing financial goals."</i>	S2: <i>"I am a Sales Manager so I look at it from a profit point of view, and finance is far away from me. Also, my manager is not emphasizing financial goals."</i>	S2: <i>"I am a Sales Manager so I look at it from a profit point of view, and finance is far away from me. Also, my manager is not emphasizing financial goals."</i>
Uncertainty – Opportunism – buyer using bargaining power	B1 is most important customer for S1, representing 24% of turnover S1: <i>"When B1 comes to us, they were a bit demanding saying that all of their suppliers have to jump in this RF programme."</i> B1 extended payment terms from 45 to 120 days: <i>"There is no room for</i>	Power balance is in favour of B2 which represents 40% of S2's turnover. S2: <i>"They ask me for Reverse Factoring, and I say, what's in it for us. They always want more money, they always ask for more money."</i>	B3 is a big customer for S2, representing 17% of turnover. B3: <i>"We give certain options, but do not do it collaboratively."</i> S3: <i>"..they are really powerful in negotiations"</i>	In terms of turnover B4 is not a big customer for S2, representing 3% of turnover. S2: <i>"we are quite independent to each other. (...) I think we are quite equal".</i> S2: <i>"If we step out of the RF programme, we can go back to the old</i>

	<p><i>negotiation on payment terms and rates."</i></p>	<p>B2: <i>"if they want to leave the RF programme, that is possible, but the payment term remains as it is in RF"</i></p>		<p><i>payment term we had before RF. This is important for us."</i></p> <p>B4: <i>"we are not going to push anybody"</i></p>
<p>Uncertainty – Opportunism – buyer providing incomplete/incorrect information</p>	<p>S1 felt like B1 and FSP1 took good efforts to explain RF, however, still felt like they did not get clear answers to certain what-if situations. Especially S1 had doubts if B1 could approve invoices within 12 days, since before RF B1 would sometimes take much more time. S1 addressed these worries to B1 but felt like B1 deliberately not wanted to discuss this potential downside of RF. B1 mentioned in the interview they didn't want to give any kinds of guarantees for invoice approval time.</p> <p>B1: <i>"We try to explain RF as simple as possible to suppliers"</i></p>	<p>S2: <i>"They always say that it is fairly important and interesting for us, but on the other hand they are not able to explain it very clearly to us. ..) These companies (B2 and B3 are not very transparent."</i></p> <p>S2: <i>"We never know if they are really telling the truth or if they are a little bit lying. You never know. This can be hard."</i></p> <p>B2: <i>"The more details you provide, the more questions you get and the less understanding you have."</i></p>	<p>S2: <i>"a lot of what if-scenarios. So, what if interest rate in the market goes up to 8%, what if they don't support the discount rate of the buyer in this case anymore, should we still go on? Can we still go back to less payment days if necessary if we don't want to continue this program?"</i></p> <p>S2: <i>"There have been false promises. The purchasing manager also told me some things, and I also talked with other employees of B3 and they said it's not true."</i></p>	<p>S2: <i>"B4 is very open and transparent about RF in comparison to the other 2 buyers which offer RF".</i></p>
<p>Uncertainty – Opportunism - Trust</p>	<p>B2: <i>"We notice some suppliers have a sceptical view on RF."</i></p> <p>S1 doesn't trust the buyer with fast approval of invoices. This is a problem for them, before RF they did factoring and didn't have to wait for B2 to approve invoices. It makes S1 more uncertain about when they will receive cash.</p> <p>Some strong doubts from S1 about this offer, and the motivation behind this offer which is mainly motivated by the 120-days payment term and no guarantees on invoice approval time.</p>	<p>B2: <i>"We offered them (S2) RF, and I think they declined. They are a very distrustful organization, I must say."</i></p>	<p>S2: <i>"They are always asking for money but the performance of B3 is not very good".</i></p> <p>S2: <i>"We have a lot of disputes with B3."</i></p>	<p>S2: <i>"This customer chooses not to fight too much. The relationship is smooth (...). And actually the last 3-4 years there has been hardly any disputes."</i></p> <p>S2: <i>"There is a collaborative spirit in the negotiations."</i></p>

Asset specificity – investment	<p>S1 took much time and effort for figuring out effects on financing costs, cashflow, the relation with the buyer, the relation with the own bank, credit insurance etc.</p> <p>S1 wants to optimize O2C-process after implementation of RF. They see fast approval of invoices is important with RF, and a good O2C-process can help to achieve this.</p> <p>FSP 1: <i>"There are no other cost involved (for the supplier) other than the discount rate times the days outstanding of the invoice until maturity."</i></p>	<p>B2: <i>"Our suppliers are already on EDI, which is why they don't need much specific RF related IT investments. All our suppliers are on EDI, otherwise they cannot do business with us."</i></p> <p>FSP 2: <i>"in our program you don't also pay any cost to be part of the program. You only pay for early discounting."</i></p>	<p>FSP 1: <i>"Suppliers usually don't need process changes because it's web based, via internet, so they don't need an application on ERP system or something like that. They just login to see what's happening in the program."</i></p> <p>FSP 1: <i>"There are no other cost involved (for the supplier) other than the discount rate times the days outstanding of the invoice until maturity."</i></p>	<p>S2 built a detailed calculation model, based on the RFOs it received before.</p> <p>FSP 2: <i>"For suppliers, they don't need any IT changes. So you get login details for platform, the same as you would login for example to your Gmail account or another online account you login."</i></p> <p>FSP mentions low effort needed <i>"if you choose for automatic discounting, an auto-trade, then you basically never have to visit the platform, you don't need to login, because all you see is that you get money"</i></p>
Asset specificity – skills and resources needed	<p>The assessment of this RFO took specific people in the organization to build knowledge on effects of RF. Also, it meant that administrative people had to be informed to get used to new way of invoicing that comes with RF.</p>	<p>B2 mentions it will take some effort for SME suppliers to understand RF: <i>"SMEs do not regularly have highly advanced CFOs. They basically just have a very good bookkeeper or controller, so those people, they have to understand it."</i></p> <p>B2 mentions only small changes for employees handling invoices after accepting: <i>"There would be some really small changes for reconciling the accounts. With RF they have to get that statement from a different platform, so the statement will look different. So that's about it. So I think it's very little."</i></p>	<p>FSP 1 explains no big changes needed in way of working by supplier (see also quotes in column above)</p>	<p>Assessment of RFO took S2 to built specific knowledge.</p> <p>B4 mentions there will be some changes for employees who do reconciliation: <i>"I mean they are sending us an invoice and they don't know how much discount they have to give on that invoice. So the reconciliation, it is sometimes difficult to do it automatically"</i></p>
Frequency - # of invoices	<p>568 invoices sent to B1 in 2015 (the year before the RFO). Total yearly turnover volume B1 represented was 6,879,658 euros, every invoice represents on average 12,112 euros.</p>	<p>1,072 invoices sent by S2 to B2 in 2015 (year before RFO was introduced by B2). Total yearly turnover volume B2 represented was 5,567,822 euros,</p>	<p>246 invoices sent to B3 in 2015 (year before RFO was introduced by B3). Total yearly turnover volume B3 represented was 2,399,820 euros,</p>	<p>163 invoices sent to B4 in 2015 (year before RFO was introduced by B4). Total yearly turnover volume B4 represented was 376,961 euros, every</p>

	In the RF platform there is a grouping option allowing S1 to receive a single payment as a sum of a group of invoices instead of multiple single payments for each invoice.	each invoice on average represents 5,189 euros.	every invoice represents on average 9,755 euros.	invoice represents on average 2,313 euros.
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Quotes and information coming from secondary data per category for RFOs 5 to 8

	RFO 5	RFO 6	RFO 7	RFO 8
Uncertainty – bounded rationality – use of prior experience	No prior experience for S3.	First RFO for S4, however they were helped by S3: <i>"I have seen the calculations of S3"</i> .	First RFO they received <i>"I have discussed it with S3"</i> .	Second RFO for S5 <i>"We went to an information evening on Supply Chain Finance organized by the Dutch Transport and Logistics industry association"</i> . <i>"There were other transportation companies which received an RFO from B6. We discussed this with them and all companies decided together to reject this offer."</i>
Uncertainty – bounded rationality – restriction in using all available information	S2: <i>"Two weeks ago I had a conversation with a foreign controller of B5. The conversation was in English, and next to that a lot of technical and financial terms were mentioned, therefore this was hard to follow for me."</i> S3 asked for extra information to B5 and did extensive calculations on B5's RFO in which all information provided was taken into account.	S3: <i>"I have been working with this company (the buyer) already for a long time and I trust them. That's why I didn't spend much time on thinking about the effects of their offer and accepted it."</i>	Didn't perform extensive calculations of RFOs received. B5: <i>"We have operational contact with suppliers that are small trucking companies. And most of them do their own administration, but they are not accountants "</i>	Didn't perform extensive calculations on RFOs received. B6: <i>"Reasons for saying no are a combination of quantitative factors and a lack of understanding. Often smaller suppliers don't understand it, and their external financial advisors also do not understand it."</i>

Uncertainty – bounded rationality – intra-firm collaboration	Not applicable since S3 is a one-man company	Not applicable since S4 is a one-man company	Not applicable since there are <10 people who work for S5	Not applicable since there are <10 people who work for S5
Uncertainty – Opportunism – buyer using bargaining power	<p>B5 represents 38,7% of total turnover for S3: <i>"Because they are the largest customer of us, you always want to think about what's good for them."</i></p> <p>B5: <i>"If the supplier says no we will stop the relationship. Otherwise, the starting point of the entire talks would have been nonsense."</i></p>	<p>B5 is biggest customer of S4, representing around 50% of the total turnover of S4.</p> <p>S4: <i>"We accepted this RFO, we didn't have a real choice. There wasn't much room for negotiation."</i></p>	<p>B5 doesn't represent a large share of the turnover of S5.</p> <p>B5: <i>"If the supplier says no we will stop the relationship."</i></p>	<p>S5 has a relatively large client base with turnover spread out over many customers, even though B6 is the largest client they are not fully dependent on them.</p> <p>S5: <i>"At this moment there is not enough supply of transport services by trucks in The Netherlands, which gives us a better power position. Next to that we are located very close to B6, which allows us to offer a lot of flexibility and reduced transportation costs. That's why we are in a position to say no to the offer of B6."</i></p>
Uncertainty – Opportunism – buyer providing incomplete/incorrect information	S3 felt like B5 and the involved FSP in the beginning were providing only generic and incomplete information about the RFO. Buyer eventually gave more precise information, after many questions of S3, which satisfied S3 to a certain extent.	<p>S4: <i>"if something is not right, I can always discuss this with them."</i></p> <p>B5 mentions taking the time for suppliers who have extra questions on the RFO to explain it.</p>	B5 mentions taking the time for suppliers who have extra questions on the RFO to explain it.	B6: <i>"It is important to clearly explain RF to your suppliers. (...)We strive for open communication in onboarding suppliers. We try to be accessible, when suppliers have questions, we are available to answer them."</i>
Uncertainty – Opportunism - Trust	Reaction of S3 on RFO of B5 is very sceptical in general: <i>"B5 is flexing its muscles more and more in recent years, discussion about tariffs have become more tough."</i> To S3 it feels like the RFO is a new way for the buyer to further minimize supplier's margins: <i>"a frustrating process"</i> .	<p>S4: <i>"I have full trust in this RFO. I am working with B5 already for a long time and I trust them. That's why I don't spend much time on thinking about the effects of their offer and will accept it."</i></p> <p>S4: <i>"The (buyer's) bank looks reliable to me, so the offer will probably be okay."</i></p>	<p>S5 in general is low on trust regarding RF, they see it as extra costs, while they say early payment is not that relevant because they finance everything from equity.</p> <p>B5: <i>"They (SME suppliers) think: is this a trick to find some money somewhere from B5? So they are cautious."</i></p>	S5 in general is low on trust regarding RF. <i>"We do not want extra costs coming from RF"</i> .

Asset specificity investment –	<p>Main investments were in understanding the RFO, S3 spent some time in understanding all the aspects and making a calculation model. Not too much investments for example in IT needed after implementation, since S3 will do auto discounting and not make use of manual discounting.</p> <p>S3 prefers auto discounting on day 14, and doesn't use manual discounting which gives the opportunity to be paid after 7 days. This is because manual discounting brings investments that come with extra invoice handling time, that they don't want to do.</p>	<p>S4 doesn't mention expected investments needed during assessment of the RFO, or after accepting the RFO. No large investments for making use of platform, since S4 does auto discounting they don't even have to log in.</p> <p>S4 is unwilling to do the investments needed in invoice handling, to benefit from manual discounting.</p>	<p>S5 mentions not taking the effort to do extensive calculations on both RFOs. No large investments for making use of platform, since S4 does auto discounting.</p> <p>S5 is not willing to take the investments needed in invoice handling, to benefit from manual discounting.</p>	<p>S5 mentions not taking the effort to do extensive calculations on both RFOs. No specific investments taken, except for the time discussing with other suppliers who are in the same position and visiting the information evening about RF organized by the Dutch organization for transport and logistics.</p>
Asset specificity – skills and resources needed	<p>S3: <i>"I had to figure out technical and financial terms which I am not that familiar with"</i>.</p> <p>S3 foresees some changes in the way of doing administration, but not many extra skills or resources required for that.</p>	<p>S4 is a one-person company and didn't took much time to assess the offer. RF in this form, with self-billing and less frequency of invoicing, doesn't bring along requirements for extra skills on IT or invoicing for example.</p>	<p>RF in this form, with self-billing and less frequency of invoicing, doesn't bring along requirements for extra skills on IT or invoicing for example.</p>	<p>S5: <i>"We went to an information evening on Supply Chain Finance organized by the Dutch Transport and Logistics industry association"</i>.</p>

<p>Frequency - # of invoices</p>	<p>Before RF 52 invoices sent per year. Total yearly turnover volume the buyer represented was 963,398 euros every invoice represents on average 18,527 euros. After accepting RF it will be only 12 invoices per year, representing 80,283 euros each on average. This is because in B5's RFO monthly invoicing is included.</p> <p>S3 appreciates the change of frequency of invoicing that comes with RF, because of less handling costs and more cash flow predictability: <i>"I no longer have to send an invoice every week, this saves a lot of time and hassle. I only need to check an invoice once a month and check it out. This also makes planning holidays, for example, easier. Normally I have someone else do the billing when I am on vacation myself."</i></p>	<p>Before RF 52 invoices sent per year. Total yearly turnover volume the buyer represented was 750,000 euros, every invoice represents on average 14,423 euros. After accepting RF it will be only 12 invoices per year, representing 62,500 euros each on average. This is because in B5's RFO monthly invoicing is included.</p> <p>The monthly invoicing which is part of the RFO leads to less frequency of invoicing in the situation after RF. It is in combination with self-billing. S4 is positive about it, since it gives them less handling costs: <i>"it saves me a lot of time"</i>.</p>	<p>Before RF 52 invoices sent per year. Total yearly turnover volume the buyer represented was 330,882 euros, every invoice represents 6,363 euros on average. After accepting RF it will be only 12 invoices per year, representing 27,574 euros each on average. This is because in B5's RFO monthly invoicing is included.</p> <p>S5 appreciates the lower frequency of invoicing that comes with accepting the RFO</p>	<p>52 invoices sent per year in 2016 (year before RFO was introduced by B6). Total yearly turnover volume the buyer represented was 1,102,941 euros, every invoice represents on average 21,210 euros.</p> <p>Amount of invoices and payments were not really factors of consideration in assessing RFO8 for S5.</p>
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Appendix D – Precautions to ensure validity and reliability

	Design	Case selection	Data collection	Data analysis
Construct validity	Interview guides based on previous research on SCF literature, and on TCE literature.	Not applicable.	Rich set of data coming from multiple sources, many secondary data next to semi-structured interviews with suppliers, buyers and banks. Multiple interviewers. Ensuring of confidentiality to reduce social desirability bias.	Data analysis process explanation via first order and second order tables. Review of data by multiple researchers involved, and by companies involved in the RFOs.
Internal validity	Research framework derived from different fields of literature, both TCE and SCF literature.	Interviewing both supplier and buyer involved in the RFO. Including only suppliers who were at the stage of assessing the buyer's RFO, and a later stage made the decision to accept/reject.	All respondents were involved in either proposing or responding to the RFO. Multiple respondents within companies, representing different departments and giving different perspectives on the RFO. Additional questions sent to interviewees in case of unclarity.	Triangulation of interview data and secondary data. Discussion on and review of within case results by involved researchers and companies.
External validity	Comparative multiple case study design.	Theoretical sampling approach (Eisenhardt, 1989), a.o. inclusion of companies who reject RFO to limit pro-innovation bias. Thorough analysis of context and specific situation of companies involved per RFO.	Not applicable.	Pattern matching among cases. Detailed within and cross-case analysis, showing peculiarities of each case, and giving extensive insights on the degree of applicability for other companies.
Reliability	Case study protocol following Yin (2009). Case study database wherein all transcripts, within case and cross-case analyses are shared.	Case study protocol includes criteria for selection of cases to enhance replicability.	Interview protocol used with semi-structured interview guide, shared with all researchers in case study database.	Independent coding by researchers involved in the paper, after which discussion took place and consensus was achieved. Consultation from researchers not involved in gathering the data.

Table 1 – Summary of sample, data used and core results

	RFO 1	RFO 2	RFO 3	RFO 4	RFO 5	RFO 6	RFO 7	RFO 8
Involved supplier/ buyer	Supplier 1 Buyer 1	Supplier 2 Buyer 2	Supplier 2 Buyer 3	Supplier 2 Buyer 4	Supplier 3 Buyer 5	Supplier 4 Buyer 5	Supplier 5 Buyer 5	Supplier 5 Buyer 6
Turnover [M€ per year] Supplier Buyer	25 - 50 1000 - 5000	10 – 25 >5000	10 - 25 >5000	10 – 25 500 - 1000	0 – 10 1000 - 5000	0 – 10 1000 - 5000	0 - 10 1000 – 5000	0 – 10 >5000
Industry - Supplier Industry - Buyer	Logistics Bikes	Food Retail	Food Retail	Food Retail	Transportation Logistics	Transportation Logistics	Transportation Logistics	Transportation Logistics
# of interviews Supplier Buyer FSP	2 1 1	2 1 1	2 1 1	2 1 1	2 2 -	1 2 -	1 2 -	1 2 -
Functions of interviewees Supplier Buyer FSP	COO, CEO Procurement manager SCF specialist	Sales Manager, Director Procurement manager SCF specialist	Sales Manager, Director Procurement manager SCF specialist	Sales Manager, Director Procurement manager SCF specialist	CEO/owner (x2) Procurement and Finance manager	CEO/owner Procurement and Finance manager	CEO/owner Procurement and Finance Manager	CEO/owner Procurement and Finance manager
Secondary data	RF contracts (from supplier with both bank and buyer), calculation models	Internal fin. reports, invoicing data	Internal fin. reports, invoicing data	Internal fin. reports, invoicing data, calculation models	Calculation models, bank-supplier RF contract, RF presentation by bank	Internal financial reports	Internal financial reports, invoicing data	Internal financial reports
Difference in financing costs [€/year] (see App. B)	23 837.06	15 057.54	6 976.54	1 523.80	-7 621.40	-5 933.22	-2 223.26	-4 127.72
Attractiveness	ATTRACTIVE	ATTRACTIVE	ATTRACTIVE	ATTRACTIVE	UNATTRACTIVE	UNATTRACTIVE	UNATTRACTIVE	UNATTRACTIVE
Outcome	ACCEPTED	REJECTED	REJECTED	ACCEPTED	ACCEPTED	ACCEPTED	ACCEPTED	REJECTED
Key TCE factors influencing decision	A high amount of opportunism, and a medium amount of bounded rationality	A high amount of opportunism, and a high amount of bounded rationality	A high amount of opportunism, and a high amount of bounded rationality	A low amount of opportunism, and a low amount of bounded rationality	A high amount of opportunism	A high amount of opportunism, and a high amount of bounded rationality	A high amount of opportunism	A low amount of opportunism, and a low amount of bounded rationality
Aligned or misaligned*	ALIGNED	MISALIGNED	MISALIGNED	ALIGNED	MISALIGNED	MISALIGNED	MISALIGNED	ALIGNED

(*aligned represents an attractive accepted offer or an unattractive rejected offer, whereas misaligned represents an attractive rejected offer or an unattractive accepted offer

Table A – Operationalization of low/medium/high values per TCE factor

Variable	Sub-variable	Item	High/medium/low	Explanation
Uncertainty	Bounded rationality	Prior experience	High	Evaluated an RF offer before.
			Medium	Had experience with a similar financial instrument like factoring, learned from other companies or visited information seminars on RF/SCF.
			Low	Hasn't received an RF offer before, no experience with similar financial instruments and didn't learn about this from other companies or from information seminars.
		Restriction in using all available information	High	Not understanding effects of key parameters in RF, no calculation model in place to assess an RFO.
			Medium	Took effort to assess effects, but not all effects were assessed correctly or some uncertainties still exist due to lack of information.
			Low	Correct calculation model in place to assess an RFO, no uncertainties on effects of RFO.
		Intra-firm collaboration	High	Consensus and collaboration in financial and relational goals and in decision making on RF of involved departments.
			Medium	Some extent of consensus and collaboration in financial and relational goals and in decision making on RF of involved departments.
			Low	Low amount of consensus and collaboration in financial and relational goals and in decision making on RF of involved departments.
	Opportunism	Buyer using bargaining power	High	RFO comes with substantial payment term extension with no room for negotiation on terms and/or rejecting the RFO would mean the end of the relationship with the buyer.
			Medium	RFO comes with payment term extension, but there is some room for negotiating terms. Rejection would not mean the relationship with the buyer ends.
			Low	Collaborative approach to an RFO due to lack of payment term extension or the option to discuss terms on how the RFO would be beneficial for both parties. Or: buyer not being able to pressure supplier due to power balance in favour of the supplier.
		Providing incomplete or incorrect information	High	Buyer gives only 'high-level' information on RFO, but is not transparent on details, or gives incorrect information.
			Medium	Buyer in general has an open attitude towards sharing information on the RFO, but doesn't explain all of the details.
			Low	Buyer is transparent about RFO and collaborative in information sharing.
		Trust	High	Supplier trusts the RFO, possibly coming from an already good relationship with the buyer.
			Medium	Certain extent of trust in the buyer and its RFO, reasonably good relationship with buyer.
			Low	Supplier has strong doubts about the RFO, possibly coming from already existing distrust in the buyer.
	Asset specificity	Investment	High	High investments in assessing the RFO via calculation models, and high investments needed in legal and IT systems costs after adoption.
			Medium	Certain extent of investments during or after adoption, via investments in calculation models for assessment or legal/IT costs.
			Low	Little to none investments during or after adoption taken/needed.
Skills and resources		High	High training and learning costs of employees to assess the RFO and to adapt to a new situation during and after adoption of RF.	
		Medium	Certain extent of specific skills and resources built by specific employees for figuring out the RFO and/or changes in administrative tasks of employees after adoption.	
		Low	Little to none efforts taken/needed in terms of skills and resources in relation to the RFO.	

Frequency		# of invoices	High	>52 invoices per year
			Medium	13-52 invoices per year
			Low	Monthly invoicing or less (> 13 invoices per year)

Table 2 – Bounded Rationality, Opportunism, Asset Specificity and Frequency in the 8 RFOs

		RFO 1	RFO 2	RFO 3	RFO 4	RFO 5	RFO 6	RFO 7	RFO 8
Uncertainty – bounded rationality	<i>Prior experience</i>	MEDIUM (First RFO for S1, experience with Factoring before)	LOW (First RFO for S2)	LOW (Came together with RFO 2 for S2)	HIGH (RFO 2 and 3 came before RFO 4, for S2)	LOW (First RFO for S3)	MEDIUM (First RFO, but S4 learned from S3)	MEDIUM (First RFO, but learned from S3)	HIGH (Second RFO, visited information seminar on RF)
	<i>Restrictions in using available information</i>	MEDIUM (Calculation model used, uncertainty on effects of RF on relation with own bank)	HIGH (Not understanding effect of key parameters like discount rate)	HIGH (Not understanding effect of key parameters like discount rate)	LOW (Calculation model used, made S2 understand benefits)	MEDIUM (Some misunderstandings at first, but calculation model built gave insights)	HIGH (S4 mentions spending almost no time on understanding RF)	MEDIUM (Limited time spent on assessment, but learned from S3 and information seminar)	MEDIUM (Limited time spent on assessment, but learned from information seminar)
	<i>Intra-firm collaboration</i>	MEDIUM (Different goals of sales and finance, but consensus in decision making)	LOW (Mainly sales involved, limited financial perspective)	LOW (Mainly sales involved, limited financial perspective)	LOW (Mainly sales involved, limited financial perspective)	LOW (Mainly sales involved, limited financial perspective)	n/a (one-man company)	n/a (one-man company)	n/a (< 10 employees)
Uncertainty – opportunism	<i>Buyer using bargaining power</i>	HIGH (Buyer extending payment terms to 120 days, no room for negotiation)	HIGH (No room for negotiation on terms)	HIGH (No room for negotiation on terms)	LOW (Approach without pressure of B4)	HIGH (Rejecting the RFO means no longer being a supplier for B5)	HIGH (Rejecting the RFO means no longer being a supplier for B5)	HIGH (Rejecting the RFO means no longer being a supplier for B5)	LOW (B6 not in position to use bargaining power against S5)
	<i>Buyer providing incomplete/in-correct information</i>	MEDIUM (Many efforts of B1 to explain RF, however, still some 'what if situations')	HIGH (Only high-level explanation received by S2)	HIGH (Many 'what-if' scenarios for S2, unanswered by B3)	LOW (Transparency about the RFO of B4 towards S2)	MEDIUM (B5 in beginning giving generic info only, later on more detailed info)	MEDIUM (Supplier didn't ask much info, didn't spend much time on assessment, B5 open for explanation)	MEDIUM (Supplier didn't ask much info, didn't spend much time on assessment, B5 open for explanation)	MEDIUM (Supplier didn't ask much info, didn't spend much time on assessment, B6 open for explanation)
	<i>Trust level</i>	LOW	LOW	LOW	HIGH	LOW	HIGH	LOW	LOW

		(S1 has some strong doubts about the offer)	(both S2 and B2 mention there is distrust in relation)	(many disputes between S2 and B3)	(smooth relation, B4 seems collaborative in RFO)	(RFO is seen by S3 as a way for B5 to flex its muscles)	(S4 mentions having full trust in B5 and the RFO)	(S5 is generally low on trust in RF, sees it mainly as extra costs)	(S5 is generally low on trust in RF, sees it mainly as extra costs)
Asset specificity	<i>Investment</i>	MEDIUM (mainly related to figuring out the offer, not many process related changes needed after adoption)	LOW (not many investments needed for RF, explained by B2 and FSP 2)	LOW (not many investments needed for RF, explained by FSP 1)	MEDIUM (calculation model for assessment, not many investments for after adoption)	MEDIUM (making calculation model for assessment, no big investments needed after adoption)	LOW (S4 spent little time assessing the offer, no big RF-related investments needed after adoption)	LOW (S5 spent little time assessing the offer, no big RF-related investments needed after adoption)	LOW (S5 spent little time assessing the offer, no big RF-related investments needed after adoption)
	<i>Skills and resources needed</i>	MEDIUM (building knowledge on RF and small changes for administrative people in invoicing)	LOW (in case of acceptance some minor changes needed in invoicing and reconciliation)	LOW (in case of acceptance little to no investments needed)	LOW (building some knowledge on RF to asses it, some small changes needed in invoicing and reconciliation)	MEDIUM (Building financial knowledge to understand RF)	LOW (S4 spent little time assessing the offer, no investments foreseen on skills/resource for RF)	LOW (S5 spent little time assessing both RFOs, no investments foreseen on skills/resource for RF)	LOW (S5 spent little time assessing both RFOs, no investments foreseen on skills/resource for RF)
Frequency	<i># of invoices</i>	HIGH (568 invoices per year)	HIGH (1072 invoices per year)	HIGH (246 invoices per year)	HIGH (163 invoices per year)	LOW (52 invoices p/y before RF, 12 after RF)	LOW (52 invoices p/y before RF, 12 after RF)	LOW (52 invoices p/y before RF, 12 after RF)	MEDIUM (52 invoices per year)