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The impact of alternative financial supply chain management practices on supply risk: a relationship quality and buyer relative power perspective

Abstract

Despite increasing attention being paid to financial supply chain management (FSCM) practices as key factors that enable firms to gain competitive advantage, there is limited research on the consequences of such practices and their impact on buyer-supplier relationships. In particular, the existing literature lacks evidence of how FSCM practices can help buying firms to manage their supply-side risk. Using the two theoretical angles of relationship quality and buyer relative power, this study empirically examines the impact of FSCM practices on supply risk. Based on a cross-sectional survey of 244 manufacturers in Iran, the results show that depending on the quality of the buyer-supplier relationship and the level of buyer relative power, different FSCM practices should be implemented to mitigate supply risk. Our empirical findings present important implications for both theory and practice.

Keywords: Financial supply chain management, Relationship quality, Buyer relative power, Supply risk, Relationship management.

1. Introduction

Managing and mitigating supply risk is now known to be a critical task for businesses to consider in managing their supply chain (Fan, Stevenson & Li, 2020; Mohib & Deif, 2020). Whether the impacts are caused by major disruptions triggered by events such as Brexit¹, the COVID-19 pandemic², or the result of the failure of a supplier, buyers are at risk of interruption to their business due to supply risk. This is predicated on the well-developed literature on the role of suppliers in the buying firms' success (Kim & Choi, 2018; Najafi-Tavani, Sharifi & Ismail, 2014; Srinivasan, Mukherjee & Gaur, 2011). Such roles include not only providing the appropriate services and products (Amoako-Gyampah, Boakye, Adaku & Famiyeh, 2019), but also supporting the firm's product innovation through offering new knowledge and capabilities (Najafi-Tavani, Najafi-Tavani, Naudé, Oghazi & Zeynaloo, 2018). Therefore, managing relationships with strategic suppliers has become increasingly important (Yang, Jiang & Xie, 2019), with buying firms attempting to apply different mechanisms and stimuli to strengthen suppliers' willingness to contribute more in co-value creation (Marcos-Cuevas, Nätti, Palo & Baumann, 2016).

One of the mechanisms highlighted in the extant literature for buying firms to deal with supply risk is the use of '*financial supply chain management*' (FSCM) practices such as buyer credit, inventory financing, reverse factoring, and letters of credit (Dyckman, 2011; Wuttke, Blome & Henke, 2013; Wuttke, Rosenzweig & Heese, 2019). FSCM, which is fundamentally based on mechanisms offered for managing and controlling cash flows (Wuttke et al., 2013), has recently gained more attention from scholars (Dekkers et al., 2020; Song, Yang & Yu, 2020; Tseng, Lim & Wu, 2019). It is considered as key to firms' success if implemented properly and in the right form and format (Silvestro & Lustrato, 2014; Wuttke, Blome, Heese & Protopappa-Sieke, 2016). The literature shows support for the idea that firms' use of wide ranging FSCM practices, as intuitive rational decisions, can be effective in reducing supply risk (Dyckman, 2011; Fairchild, 2005; Wuttke et al., 2013). However, we know very little about the different roles and effects of the various FSCM practices and, to date, none of the existing studies have examined empirically the relationship between such practices and supply risk. Understanding the association between FSCM practices and supply risk is vital, particularly from the buyers'

¹ See: <https://www.bloomberg.com/news/articles/2020-12-30/brexit-border-chaos-forces-truckers-to-shun-u-k-deliveries>.

² See: <https://www.ft.com/content/d7a12d18-8313-11ea-b6e9-a94cffd1d9bf>.

side, as utilising untested financial practices may prove ineffective, causing firms to waste their resources and time while still being affected by potential risks from their supply side.

Moreover, FSCM practices take place within the relational space between buying and selling firms, and therefore understanding them properly requires knowledge of relational attributes, on which there is scant literature. A lack of such knowledge can influence the choice and effectiveness of different FSCM practices, thereby limiting our understanding of when and under what relational conditions these practices can be beneficial in dyadic relationships. Relationship management theory (Håkansson & Snehota, 1995) suggests that the '*relationship quality*' and power balance between partners (in this study we focus on the '*buyer relative power*') are two key relational attributes, determining the success or failure of buyer-supplier relationships (see Casidy & Nyadzayo, 2019; Chicksand, 2015; Zhang, Watson Iv, Palmatier & Dant, 2016). Relationship quality as the driver of buyer-supplier relationships (Jiang, Shiu, Henneberg & Naudé, 2016), continuously regulates and adjusts the behaviour of both parties involved in the relationship (Izquierdo & Cillan, 2004; Jiang, Henneberg & Naudé, 2012; Shahzad, Ali, Takala, Helo & Zaefarian, 2018). Power, on the other hand, as a factor acknowledged to have effects on the appropriation of created value between partners (Brito & Miguel, 2017), plays a critical role in determining the effectiveness of actions and practices implemented by buyers and suppliers (Chicksand, 2015; Liu, Li & Zhang, 2010). Although the contingent role of these two key relational attributes in shaping the outcomes of practices implemented by the buyer and supplier is highlighted by previous studies (e.g. Casidy & Nyadzayo, 2019; Chicksand, 2015; Zhang et al., 2016), the extent to which they act independently or in tandem is yet to be explored in the FSCM literature.

The main aims of this study are therefore to examine the relationship between FSCM practices and supply risk, and to explore under what relational conditions the practices can become more effective in mitigating supply risk. Drawing on relationship management theory, we theorise that the effectiveness of FSCM practices in supply risk reduction is contingent on the levels of relationship quality and the power balance between a buyer and its key supplier. We therefore examine the moderating effects of relationship quality and buyer relative power on the relationship between FSCM practices and supply risk. Moreover, since the buyer and supplier inevitably experience different levels of relationship quality and power, we study the concurrent effects of the two relational attributes on the effectiveness of the FSCM practices adopted. The empirical results from a survey of 244 manufacturing firms in Iran, a fair

representation of many Middle Eastern countries as well as those with similar cultural profiles, provides strong support for our predictions.

Our study contributes to the existing body of knowledge in a number of ways. In addressing the research and knowledge gap on the subject, we take an empirical approach to extend the current conversation on FSCM-supply risk association. The field study provides the opportunity not only to examine the previous studies, which had theoretically suggested FSCM practices as antecedents for mitigation of supply risk (e.g. Dyckman, 2011; Fairchild, 2005; Wuttke et al., 2013), but to extend and highlight new insights and nuances of this relationship. First, while previous studies had speculated that all FSCM practices can be beneficial for the buyer firm in supply risk mitigation, our research suggests that in considering the unilateral effect of each FSCM practice and in the absence of the effect of any moderating variables, the practice of reverse factoring is the only one that is shown to significantly reduce supply risk. This finding confirms the assertion in the FSCM literature that reverse factoring practice is the most common financial-related mechanism for helping suppliers to reduce their financial distress and enhance performance (see Silvestro & Lustrato, 2014; Van der Vliet, Reindorp & Fransoo, 2015; Wuttke et al., 2019; Zhan, Li & Chen, 2018). This view is then challenged by integrating relationship management theory into the FSCM literature to examine how the effect of both relationship quality and buyer relative power (individually and simultaneously) may influence the extent of usefulness of different FSCM practices in mitigating supply risk. This approach yielded new insights into understanding how FSCM practices may influence supply risk. We therefore suggest that the presence of relationship quality and buyer relative power can make a significant difference in enhancing some, though not all, of the FSCM practices that initially were found to be ineffective in supply risk reduction.

From a theoretical point of view, this means that FSCM practices and their effects on supply risk can be better explained in conjunction with relationship management theory, which invites further research and theorising in developing new combinatory theories for FSCM. This also bears important messages for practitioners to consider relationship quality and their relative power when they decide on their FSCM strategies. This contribution is further extended by introducing a ‘relationship quality-power’ matrix to enable the observation and examination of the combined/simultaneous role of relationship quality and buyer relative power, and to understand the range of effects that these two key factors have in adopting FSCM practices for supply risk reduction. Our research suggests that the combination of different levels of relationship quality and power can lead to different potential outcomes, providing the buyer

with an opportunity to distinguish between effective and ineffective FSCM practices in dealing with supply risk. This finding was supported by the existing views on the subject of firms' engagement in extra-role behaviour (e.g. providing alternative resources to their suppliers), suggesting that the efficacy of such activities is significantly dependent on the power asymmetry and the quality of relationship between the parties (see Izquierdo & Cillan, 2004; Shahzad et al., 2018; Zhang, Fu & Kang, 2018; Zhou, Zhang, Shen & Zhou, 2020). In particular, although not previously identified in the FSCM literature, our finding on the decisive role of relationship quality is in line with the results of earlier studies in the business-to-business literature that suggest it as one of the most influential attributes shaping the outcome of any buyer-supplier relationship (e.g. Casidy & Nyadzayo, 2019; Clauss & Bouncken, 2019; Palmatier, Dant, Grewal & Evans, 2006).

Our study also indicates important future research directions for business-to-business scholars interested in advancing the understanding of the FSCM implications in buyer-supplier relationships.

2. Theoretical background and literature review

2.1. Supply risk

The focus of this study, supply risk, relates to the domain of operational supply chain risks (Chen, Sohal & Prajogo, 2013; Chowdhury, Lau & Pittayachawan, 2019). Supply risk refers to *“the potential occurrence of an incident associated with inbound supply from individual supplier failures or the supply market”* (Zsidisin, 2003, p. 14). Supply risk is also defined as suppliers defaulting on fulfilling their obligations in terms of time, quality or quantity of product, or their inability to meet customers' needs (Chen et al., 2013). Supply risk, as an integral part of any buyer-supplier relationship (Van Poucke, Matthyssens, Van Weele & Van Bockhaven, 2019), can potentially have a detrimental effect on a buying firm's profitability, stock price performance, shareholder value and wealth (Kim, Wagner & Colicchia, 2019).

Reducing the harmful and possibly irrecoverable damages of supply risk necessitates careful monitoring and controlling of such risks (Fan et al., 2020; Mohib & Deif, 2020). From a buyer-supplier relationship perspective, close collaboration and the involvement of the supplier in the buyer's internal processes are highlighted as critical factors in supply risk management (Chen et al., 2013). The close collaboration with suppliers allows buying firms to help their suppliers to enhance their capacities and capabilities in order to better adjust to future demands, which consequently results in reducing supply risk (Chowdhury et al., 2019). An important

complementary approach to managing supply risk, identified in the recent literature, has been to consider the potential roles of financially related activities in dyadic supply chain relationships (Dekkers et al., 2020; Silvestro & Lustrato, 2014). As a result, FSCM practices have been proposed as vital mechanisms in managing and mitigating supply risk in buyer-supplier relationships (e.g. Dyckman, 2011; Fairchild, 2005; Wuttke et al., 2013).

2.2. FSCM practices

In the literature there are different views of FSCM which can be classified into either actor-based or practice-based views. From the actor-based point of view, FSCM is considered to involve the network of business actors who work closely together to smooth the financial flow within the supply chain activities (Blackman, Holland & Westcott, 2013). From the practice-based view, FSCM consists of a set of financial activities employed by actors in the supply chain that can be defined as “*optimized planning, managing, and controlling of supply chain cash flows to facilitate efficient supply chain material flows*” (Wuttke et al., 2013, p. 774). In fact, FSCM reflects several practices that deal with the management of financial processes not only within a firm’s boundaries, but also in communicating with external parties such as suppliers and customers. Based on an extensive literature review, Wuttke et al. (2013) summarise eight real-world FSCM practices, namely buyer credit, inventory/work-in-progress financing, reverse factoring, supply chain finance, electronic platforms, letters of credit, open account credit, and bank loans for financing the supply chain.

In our study we adopt the practice-based view and the FSCM practices identified by Wuttke et al. (2013). Considering the research aim, we concentrate on the subset of those FSCM practices that are focused on a single buyer-supplier relationship and are also commonly employed by the buying firms and not by the suppliers. FSCM practices initiated by suppliers (e.g. *open account credit*) are usually employed as an incentive for the buying firms to stay in a relationship with the supplier (Summers & Wilson, 2003), and may, therefore, not influence supply risk/dependability management. With this approach, we focus on the following four FSCM practices that meet our conditions: buyer credit, inventory financing, reverse factoring, and letters of credit (domestic or international). Table 1 summarises the definitions, meaning, and potential consequences of FSCM practices.

Insert Table 1 about here

Recent studies on FSCM in the business-to-business and supply chain literature can be classified into two main categories. First, several studies have been devoted to identifying the *antecedents* of successful FSCM practices' implementation. Factors such as initial payment terms, procurement volume (Wuttke et al., 2016), delivery management policies (Tseng, Wu, Hu & Wang, 2018), brand power (Yang, Sun, Chen & Chen, 2019), operational capacity, product/service management (Abdel-Basset, Mohamed, Sallam & Elhoseny, 2020), top management support, trust, IT infrastructure (Ma, Wang & Chan, 2020), perceived capital pressure, and order fulfilment cycle (Wang, Wang, Lai & Liang, 2020) are all identified as key factors that can influence the successful adoption FSCM practices by supply chain partners.

Secondly, a few studies have focused on the potential *consequences/implications* of FSCM practices. For example, Zhang, Zhang, and Pei (2019) studied the effects of supply chain finance solutions on firms' bankruptcy risk and financial and inventory performance. Using a longitudinal data of 18,448 firms located in the United States, over a period of 48 years, their findings assert that there is no significant relationship between supply chain finance and a firm's financial and inventory performance. However, they found that supply chain finance solutions can reduce the bankruptcy risk for firms. Similarly, Wang et al. (2020) used a survey of 683 firms in China and found that FSCM practices such as accounts receivable finance and inventory finance can result in reducing overall supply chain cost.

Despite recent attempts to shed light on the potential antecedents and consequences of FSCM, an extensive review of the literature suggests that our understanding of the role of FSCM practices in buyer-supplier relationships is incomplete in at least two important ways. First, although the current literature has partially addressed the importance of FSCM practices in mitigating supply risk in buyer-supplier relationships (e.g. Dyckman, 2011; Fairchild, 2005; Wuttke et al., 2013), none of the existing studies have examined empirically the potential association between FSCM practices and supply risk. Second, the pertinent literature generally remains silent about when and under what conditions FSCM practices can offer appropriate benefits to the supply chain actors (here the buyer). Only one study, to the best of our knowledge, endeavoured to partially address this gap. Based on eight German and Swiss case studies, Martin and Hofmann (2019) suggested a conceptual framework containing different factors that may influence the decision of the buyer to choose an appropriate FSCM practice in dealing with the supplier. Considering two factors of 'time of financing' (pre vs. post shipment) and 'source of funds' (supply chain internal and external), they suggested a number of propositions to shed light on the key criteria that the buyer should consider in selecting different

FSCM practices, including their working capital situation, and levels of trust, commitment, and dependency. However, the framework and propositions of that study remain untested empirically.

In addition to the aforementioned gaps, and apart from a few exceptions (e.g. Wang et al., 2020; Zhang et al., 2019), most studies in the FSCM literature have relied mainly on mathematical modelling, conceptual models, and case studies (e.g. Martin & Hofmann, 2019; Tseng et al., 2018; Wuttke et al., 2013; Yang et al., 2019), resulting in a dearth of empirical studies in the current literature. This gap may also be considered as a cause of the lack of consensus in the literature regarding the potential benefits and effectiveness of FSCM practices for the supply chain key actors, particularly for buying firms (see for example: Wang et al., 2020; Zhang et al., 2019).

To address these gaps, we formulate a number of hypotheses to first examine the relationship between FSCM practices and supply risk, and secondly to explore when and under what conditions the FSCM practices could be more effective in supply risk reduction. As argued above, since FSCM practices are defined and considered within the frame of managing relationships with suppliers, we find that relationship quality and buyer relative power are theoretically appropriate frameworks to explain the approach of buyers in adopting different FSCM practices. We further argue that these relational aspects can affect and shift the impact of the adopted practices. These views are expanded in the following sections.

2.3. Relationship quality and buyer relative power in buyer-supplier relationships

Relationship management refers to the proactive management of the activity links, resource ties and actors' bonds that exist in any buyer-supplier relationship (Håkansson & Snehota, 1995), and thus incorporates all those factors that can influence forming, developing, and sustaining of relational exchange between business partners (Morgan & Hunt, 1994). In examining relationship management theory, previous studies have highlighted various relationship attributes such as relationship quality, power/dependency levels, social bonds, norms, and mutual goals that can potentially affect business relationship consequences and partners' performance (Morgan & Hunt, 1994; Naudé & Buttle, 2000; Zhang et al., 2016). In this study, we focus on relationship quality and the level of relative power between partners in examining the relationship between FSCM practices and supply risk. The logic behind this selection consists of three key considerations: first, that these two constructs are widely recognised as being the most influential attributes shaping the outcome of any relationship (e.g.

Casidy & Nyadzayo, 2019; Clauss & Bouncken, 2019; Palmatier et al., 2006); second, it is shown that these two play a critical role in the formation and structuring of other relational attributes (e.g. norms) (Izquierdo & Cillan, 2004) as well as the overall relationship climate (Jiang et al., 2012); third, referring to the central focus of this study, the employment of FSCM practices, which can be considered as extra-role behaviour (actions undertaken by a firm to help its partner) (Wuyts, 2007; Zhou et al., 2020), are suggested to be highly dependent on the levels of relationship quality and power/dependency in the relationship (Zhang et al., 2018; Zhou et al., 2020).

Several definitions of buyer-supplier relationship quality are highlighted in the existing literature. Those most cited in previous studies include the appropriateness of the relationship (Jiang et al., 2016; Roberts, Varki & Brodie, 2003) and the development of a long-term and strong relationship between the two parties to create value (Naudé & Buttle, 2000). In the pertinent literature, relationship quality is mostly considered as a multidimensional construct including trust, commitment, and satisfaction (e.g. Leonidou, Samiee, Aykol & Talias, 2014; Rauyruen & Miller, 2007; Skarmeas, Saridakis & Leonidou, 2018). Reviewing the business-to-business marketing literature highlights these three facets as key in evaluating successful buyer-supplier relationships (Casidy & Nyadzayo, 2019). Accordingly, we adopt the concept of relationship quality as a multidimensional construct made up of trust, commitment, and satisfaction, reflecting the strength of the relationship between buyer and supplier.

Power, on the other hand, is defined as the sense of *dependency* between buyer and supplier, largely due to the relative attractiveness of each party's resources and the availability of a substitute for the counterpart (Fan et al., 2020; Wang, Wang, Jiang, Yang & Cui, 2016). It is understood that power represents the ability of parties to influence the beliefs, attitudes, and behaviour of each other (Kim, 2000). The literature generally reflects the two properties of magnitude and asymmetry for the power construct (Kumar, Scheer & Steenkamp, 1995). While the magnitude is the sum of buyer and supplier power, the asymmetry is calculated by subtracting them (Kim, 2000). In this study, we consider the *relative power* as representative of the level of interdependency between buyer and supplier, which highlights the net dependence of one party on the other (Jean, Chiou & Sinkovics, 2016). Based on this view, we consider buyer relative power as "*the difference between the supplier's dependence and the buyer's dependence*" (Caniëls & Gelderman, 2007, p. 221), a definition that has been widely used in the pertinent literature to reflect the level of power between buyers and suppliers (e.g. Clauss & Bouncken, 2019; Hoejmose, Grosvold & Millington, 2013; Wang et al., 2016). From

this point of view, the power of the buyer over the supplier is the opposite of the buyer's dependence on the supplier. A number of studies have argued for the possibility of the existence of balanced dependency between buyers and suppliers (e.g. Izquierdo & Cillan, 2004). In contrast, others have challenged this view, and instead suggested that relationships characterised by balanced dependence (supplier dependence = buyer dependence) are rare (e.g. Jean et al., 2016). We concur with the latter view and argue that the balanced power condition seems very rare in practice³.

As mentioned earlier, despite a large body of the pertinent literature dedicated to the exploration of the influence of relationship quality and buyer relative power on developing buyer-supplier relationships (e.g. Casidy & Nyadzayo, 2019; Chicksand, 2015; Zhang et al., 2016), there is a shortage of research on the decisive unilateral or simultaneous effect of these key relational attributes in determining the role of FSCM practices in managing and mitigating supply risk.

2.4. Research hypotheses

2.4.1. FSCM practices and supply risk

We employ the extra-role behaviour perspective to examine the relationship between FSCM practices and supply risk. A fundamental assumption of extra-role behaviour theory is that a firm involved in a dyadic relationship undertakes actions (e.g. providing alternative resources and capabilities) beyond their conventional role contributions in order to develop, maintain, and improve a productive relationship with its partner (Wuyts, 2007; Zhou et al., 2020). Using this perspective, we argue that the buyer can implement FSCM practices as incentives for their key supplier to mitigate supply risk.

The potential consequences and outcomes of these incentives can be explained from both behavioural and operational perspectives. From the behavioural perspective, the use of such financial stimuli can motivate the supplier to be morally obliged to fulfil its contractual promises. This is because the offering of incentives, as relationship-specific investments made by the buyer, shows the buyer's intention and commitment to fulfil their promises (cf. Patrucco,

³ To check the validity of this assumption, prior to conducting our data analysis, we calculated a difference between buyer and supplier dependency for all cases in our sample, and found that a 'zero' value accounted for only six companies. This early-stage checking process supports our argument on the infrequency of a balanced level of dependency between buyers and suppliers. We therefore considered the data of these companies as non-usable responses and hence we excluded them from our dataset.

Moretto, Luzzini & Glas, 2020). This conveys a message to the supplier that the chance of any counterpart's adverse behaviour is relatively low, thereby enhancing the supplier's willingness to act accordingly and keep their promises (Chen, Chen & Wu, 2017). Moreover, from the operational perspective, by implementing FSCM practices, the buyer provides the supplier with more secure ways to access finance (Wuttke et al., 2016). The employment of these practices can also increase the supplier's liquidity level, enabling them not only to meet their obligations appropriately but to enhance their resilience against external financial shocks (Wuttke et al., 2013). In addition, the offering of reliable financial resources (e.g. advance payments) and promising secure payment (e.g. letters of credit) can significantly improve the cash flow management between the buyer and its supplier (Gupta & Dutta, 2011; Silvestro & Lustrato, 2014; Zhan et al., 2018), thereby facilitating the smooth flow of materials between parties (Blackman et al., 2013).

Considering the behavioural and operational benefits explained above, we therefore propose that with a better financial position, as a consequence of the implementation of FSCM practices by the buying firm, the supplier can perform better in responding to the buyer's demand (in terms of both quantity and quality criteria), thus resulting in supply risk reduction. The review so far leads to our first hypothesis:

Hypothesis 1: FSCM practices (i.e. buyer credit, inventory financing, reverse factoring, and letters of credit) have a negative relationship with supply risk.

2.4.2. The moderating roles of relationship quality and buyer relative power on FSCM-supply risk relationship

Drawing on the relationship management perspective, we argue that the effectiveness of FSCM practices in reducing supply risk significantly relies on two key characteristics of the buyer-supplier relationship, namely relationship quality and buyer relative power.

2.4.2.1. The moderating role of relationship quality on the FSCM-supply risk relationship

The relationship management literature suggests relationship quality as a key factor in improving the performance, efficiency, and efficacy of any buyer-supplier relationship (Morgan & Hunt, 1994; Yumurtacı Hüseyinoğlu, Kotzab & Teller, 2020). The presence of good relationship quality enables both buyer and supplier to develop and maintain a productive relationship that can potentially improve value co-creation and enhance resource exploitation in their relationship (Gounaris, 2005). Moreover, good relationship quality can regulate the

behaviour of both parties involved in the relationship (Izquierdo & Cillan, 2004; Jiang et al., 2012; Shahzad et al., 2018) and thus can decrease opportunism between the partners (Casidy & Nyadzayo, 2019; Jiang et al., 2016). Relationship quality can also shape and adjust important relational attributes between partners such as norms and mutual goals (Izquierdo & Cillan, 2004; Jiang et al., 2012), which can in turn affect buyer-supplier relationship outcomes. We thus propose that it is critical to consider the contingent effect of relationship quality in examining the relationship between FSCM practices and supply risk.

We argue that good relationship quality would encourage the buyer to implement FSCM practices as a financial incentive to the supplier, proving their intention, which we may refer to as an '*intention intensifier*' phenomenon. This is in line with the suggestion of previous research that in a healthy buyer-supplier relationship, characterised by good relationship quality, partners would go the extra mile and get engaged in extra role behaviour (Kim, Hibbard & Swain, 2011). However, we theorise that the role of relationship quality may go beyond being only an 'intention intensifier' and can play a complementarity role to enhance the consequences of employing FSCM practices for the buyer, i.e. supply risk reduction. This means that while employing FSCM practices by the buyer improves the cash flow of the supplier (Gupta & Dutta, 2011; Silvestro & Lustrato, 2014; Zhan et al., 2018), good relationship quality can improve the working relationship atmosphere (Dawson, Young, Murray & Wilkinson, 2017), which results in a smoother information flow and better communication between the parties in dealing with potential obstacles in their exchange relationship (Naudé & Buttle, 2000; Yumurtacı Hüseyinoğlu et al., 2020). Higher levels of relationship quality can also encourage partners to steer away from decisions harming the other party's business, considering the good terms and commitments they have towards each other (Casidy & Nyadzayo, 2019). Therefore, we argue that relationship quality complements and as such strengthens the efficacy of FSCM practices in reducing supply risk. In other words, a sufficient level of relationship quality, as a stimulus in the buyer-supplier relationship (Jiang et al., 2016), is a required element for effective implementation of FSCM practices with the aim of supply risk reduction.

Conversely, a buyer-supplier relationship with poor relationship quality would result in an unreliable working atmosphere (Dawson et al., 2017). Under such circumstances, although FSCM practices can offer reliable financial sources and smoothen their financial flow, a lack of good relationship quality can give rise to difficulties in the relationship such as poor communication and misunderstanding that can negatively influence the potential outcomes of

buyer-supplier relationship (Leonidou, Aykol, Spyropoulou & Christodoulides, 2019). Moreover, since in a relationship with poor relationship quality the supplier may be neither appropriately committed to the relationship, nor have sufficient trust in the buyer, they may not feel well bound to the buyer firm and act opportunistically (Casidy & Nyadzayo, 2019; Jiang et al., 2016). As a result, even if the supplier does not avoid the completion of their promises fully, they may not prioritise fulfilling their obligations to the buyer, hampering the efficacy of FSCM practices in reducing supply risk.

We therefore propose that relationship quality moderates the association between FSCM practices and supply risk:

Hypothesis 2: Relationship quality enhances the effectiveness of FSCM practices implemented by the buyer in reducing supply risk.

2.4.2.2. The moderating role of buyer relative power on the FSCM-supply risk relationship

The relationship management literature has acknowledged power as a critical factor that can significantly shape and direct the outcome of actions and practices implemented by parties (Chicksand, 2015; Liu et al., 2010) due to its pivotal role in apportioning the values created between buyers and suppliers within their relationship (Brito & Miguel, 2017). Therefore, in the same way as we projected for relationship quality, it is equally important to take into account the contingent impact of power in examining the association between FSCM practices and supply risk.

High degrees of buyer relative power can enable the buyer to exert relative control over their relationship with the supplier (Berthon, Pitt, Ewing & Bakkeland, 2003). The presence of relative control enables the buyer to initiate and deploy different activities which are in line with their expectations (Liu, Luo, Huang & Yang, 2017). Therefore, one noticeable benefit that high levels of buyer relative power could offer the buyer in the relationship with the supplier is the opportunity to select and implement suitable FSCM practices that would fit better with their strategic, relational, and operational goals. More importantly, from the operational perspective, the buyer can use their power to manage the operational mechanisms and procedures by persuading the supplier to adjust their actions accordingly (Clauss & Bouncken, 2019), which ultimately enhances the effectiveness of practices in favour of the buyer. Considering the financial flow in an exchange partnership, power can therefore enhance the efficacy of financial practices in reducing supply risk due to the relative control of the buyer in their relationship with the supplier.

By comparison, under low levels of buyer relative power, although FSCM practices can potentially improve the financial flow, the buyer, having insufficient control over the relationship, may fail to manage the dyad's operational mechanisms appropriately. Moreover, a lack of power may also increase the chance of the supplier behaving opportunistically, which can significantly reduce their level of commitment to their obligations, and to an increase in supply risk.

Therefore, we suggest the following hypothesis:

Hypothesis 3: Buyer relative power enhances the effectiveness of FSCM practices implemented by the buyer in reducing supply risk.

2.4.2.3. FSCM-supply risk interplay in the relationship quality-power matrix

We further argue that considering the cross effects of relationship quality and buyer relative power is also critical to complete our understanding of the FSCM-supply risk association. The buyer and supplier can potentially experience different levels of relationship quality and, simultaneously, face varying degrees of power asymmetry. Therefore, it is important to examine the dynamic cross effects of these two independent factors on the management of the buyer-supplier relationship and how they influence the effectiveness of the adopted FSCM practices in reducing supply risk. For this purpose, we employ a matrix-based framework using relationship quality and buyer relative power as the two key grouping factors, a framework which is widely applied in buyer-supplier relationship literature (e.g. Furlan, Grandinetti & Camuffo, 2009; Son, Kocabasoglu-Hillmer & Roden, 2016; Tong, Lai, Zhu, Zhao, Chen & Cheng, 2018). We theorise that the buyer-supplier relationship can be categorised into four groups/clusters based on the levels of relationship quality and buyer relative power (Figure 1). In Cluster 1, the supplier is powerful (the buyer has a low level of relative power) and the quality of relationship between the two partners is high. Similarly, in Cluster 2 the supplier is dominant, however, there is a low level of relationship quality between the two parties. In contrast, in Cluster 3, while the level of relationship quality is still low, the buying firm has a high level of relative power (i.e. the buyer is dominant). Finally, in Cluster 4, the buyer is powerful and the relationship quality level between the buyer and supplier is high. Using this classification, the partners involved in the relationship experience different levels of relative power and relationship quality, and as a consequence we predict different effects on supply risk to the buyer side.

We argue that the buyer regularly monitors the power level and the quality of the relationship with its key supplier and therefore acts accordingly in offering different financial and/or operational practices (Liu et al., 2010; Zhang et al., 2018; Zhou et al., 2020). In general, the buyer may adopt different FSCM practices. However, considering the power asymmetry in buyer-supplier relationships, different levels of buyer relative power can have a different effect on the way the adopted practices may work to reduce supply risk. By implication, this can mean that employing all available FSCM practices may not be influential and instead the buyer may need to consider and select the more effective practices when and where needed. For instance, under low levels of buyer relative power, employing all FSCM practices may not be effective and instead the buyer may need to offer only strong financial incentives such as advance payment (i.e. buyer credit) to persuade the supplier to be more committed to its obligations. Similarly, we can argue that the level of relationship quality can be a decisive factor on the implementation of different FSCM practices and their impacts. For instance, under low levels of relationship quality, using practices such as advance payment may not be the best option to select, as it can put the financial resources of the buyer at risk.

As both relationship quality and relative power may alter the consequences of FSCM practices as well as the buyer's decision to choose the right practice, we argue that it is vital to examine their concurrent influence on the effectiveness of FSCM practices in mitigating supply risk. We utilise the relationship quality-power matrix to examine the relationship between FSCM practices and supply risk under low versus high levels of relationship quality and buyer relative power and suggest the following hypothesis:

Hypothesis 4: The interaction of relationship quality and buyer relative power moderates the relationship between FSCM practices and supply risk, in which there is a difference between the effect of FSCM practices on supply risk under conditions of high levels of relationship quality and buyer relative power versus low levels.

 Insert Figure 1 about here

3. Research methodology

3.1. Sample and data collection

To explore the impact of FSCM practices on supply risk, we conducted empirical research employing a questionnaire-based survey. The survey data were collected from a sample drawn from the Iranian manufacturing industry in various sectors containing high, medium-high,

medium-low, and low-tech industries. Iran as one of the Next Eleven⁴ emerging regions (Vesal et al., 2021) can be considered as a fair representation of many Middle Eastern and North African countries in terms of its stage of growth and development and also considering the region's overall culture, the characterisation of which can be reasonably extended to other similar developing states (Najafi-Tavani et al., 2018). The comparison between different countries in the region shows that the organisational culture in our research sample frame is similar to many Middle Eastern and North African countries such as Algeria, Egypt, Iraq, Jordan, Saudi Arabia, and United Arab Emirates (for full comparison see www.hofstede-insights.com). Similar to these countries, Iran's culture can be considered as a hierarchical society (scoring 58 on the power distance dimension). The country also scores 41 in terms of individualism measure, indicating Iran as a collectivist society. Moreover, the Iranian culture scores 59 on the uncertainty avoidance dimension suggesting that organisations in this cultural set show high preference for avoiding uncertainty.

An English version of our questionnaire was structured by reviewing the relevant literature on relationship quality, supplier/buyer dependency, supply risk, and FSCM practices. We then carried out a consultation stage with academic colleagues to refine and improve the content and structure of our questionnaire. In the next stage, to reduce concerns about face validity, the questionnaire was translated from English into Persian and then back translated into English by professional translators. In addition, before carrying out the survey, we further examined the face validity of the questionnaire through consultation with five supply chain managers/directors in Iran. Managers were asked to highlight any statement that they found difficult to understand, and this step helped us to further improve the wording of items in our questionnaire. The consultation process with the supply chain managers also confirmed that we were focusing on appropriate constructs in our study. In particular, the managers confirmed that they see FSCM practices as being among the most important incentives/issues in the relationship of firms with key suppliers, enhancing our confidence in considering FSCM as a key concept in our study.

The research data were collected by conducting a face-to-face questionnaire-based survey as suggested by Hoskisson, Eden, Lau, and Wright (2000) for undertaking research in emerging

⁴ The Next Eleven countries are known to be the potential candidates to enter the list of the world's top 20 economies by the end of the current decade. "*These countries can also bridge between developed and developing (or underdeveloped) countries. Therefore...what happens in the Next Eleven emerging countries can be seen as examples of, or a litmus test of what may happen to countries advancing behind them*" (Vesal, Siahtiri & O'Cass, 2021, p. 325).

economies such as Iran and other Middle-Eastern countries. Conducting our survey onsite enabled us to secure the completion of the questionnaire by the pre-targeted informants, which significantly improved the accuracy of responses. In order to conduct the survey, we randomly selected 850 manufacturing firms from the Iranian Ministry of Industry, Mine and Trade database (www.behinyab.ir). We first contacted firms in our sample to ask whether or not they had been engaged in the advanced methods of managing financial flow in the relationship with their suppliers. This was done to ensure that the selected firms had already implemented FSCM practices, and thus were appropriate to be considered in our study. In the next step the questionnaires were handed to senior managers or directors in charge of supply chain management. They were asked to answer the questionnaire based on their relationship with their key supplier. In total, 244 usable responses were collected, representing an acceptable response rate of 28.7%.

To limit the potential impact of non-response bias, we investigated whether non-respondent firms differ significantly from the responding firms, considering characteristics such as size, age, and turnover. The result of this comparison showed no significant differences, suggesting that non-response bias is not a major concern in this research. We also compared differences in the key constructs between respondents who answered our questions fully versus those who partially completed the questionnaire. The t-test results indicate no significant differences, providing further evidence that non-response bias is not an issue in this study. The firms in our sample represent an acceptable range of different industries. Out of the 244 usable cases, 13.1% of firms operate in the food industry, 12.3% in plastic, 11.5% in electrical and electronics, 10.2% in automotive, 9.8% in chemical, 9% in engineering and machinery equipment, 8.6% in textile, clothing and apparel, 7.1% in metal, iron and steel, 6.6% in wood production, 6.1% in medical and pharmaceutical, and 5.7% in paper-related production. The participating firms' age varied between 3 and 60 years, while the number of employees ranged from 10 to 1200.

3.2. Common method bias

In this study, data for both dependent and independent variables were collected using a single informant strategy. For this reason, utmost care was taken to reduce concern regarding common method bias (CMB) by following the suggestions of previous studies (see Podsakoff, MacKenzie & Lee, 2003). As indicated earlier, we undertook a refining process involving academic scholars to avoid any unclear phrases and grammatical complications. We also tried not to categorise items in separate sections in the questionnaire to reduce the possibility of the

respondents picturing the relationship among the variables. In addition, we promised anonymity to the participants to enhance the response accuracy.

After collecting the research data, we employed confirmatory factor analysis (CFA) to check the existence of CMB. CFA relies on the comparison of fit indices between the research model and alternative model with a different level of complexity. CMB can be a serious problem if fit indices of the two models (simpler vs. more complex) are not significantly different. To develop an alternative model, we ran a simple CFA model containing a single construct loaded by all items in the research model ($\chi^2 = 2333.47$, $df = 209$, NFI = 0.29, TLI = 0.15, CFI = 0.30, and RMSEA = 0.20). The comparison of the alternative model and our measurement model with $\chi^2 = 353.04$, $df = 194$, NFI = 0.90, TLI = 0.95, CFI = 0.96, and RMSEA = 0.05, confirms a significant difference i.e. $\Delta\chi^2 = 1980.43$ with $\Delta df = 15$, $p < 0.01$. This result suggests that CMB is not an issue in our study. We also conducted a marker variable test to further examine the possibility of CMB. Following a suggestion of Lindell and Whitney (2001), we selected the correlation between the firm's age and reverse factoring as an estimate for the marker variable in our model (the second smallest positive correlation among all constructs in the study). Based on this marker variable, we then computed the CMB-adjusted correlations for all variables. The result indicates that our adjustment caused no difference to the statistical significance of the correlations. While we cannot fully reject the existence of CMB, the results of these two statistical tests did significantly reduce concerns about this measurement bias.

3.3. Measures

In this study, all construct measures were based on previous relevant studies. To measure *supply risk*, a six-item scale was adopted from the study of Chen et al. (2013), which in general reflects the existence of variations in the inbound supply (Chowdhury et al., 2019). The supply risk's items examine the variance of supply in terms of volume, quality, lead-time as well as overall assessment of risk in comparison to the buyer's expected value from their key supplier. The buyer's 'expected value' is integral to the risk concept (Chen et al., 2013) and has been widely applied in previous research to measure the supply risk construct (e.g. Chowdhury et al., 2019; Kumar, Bak, Guo, Shaw, Colicchia, Garza-Reyes & Kumari, 2018; Srinivasan et al., 2011). We therefore used a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree) to assess the buyer's perception of supply risk.

The *FSCM practices* represent the four types of practices employed by buying firms in the relationship with their key supplier (buyer credit, inventory financing, reverse factoring, and

letters of credit). We adapted the measures for FSCM practices from the study of Wuttke et al. (2013), and first asked respondents to specify which one of the four FSCM practices they employed in their relationship with their key supplier (note that FSCM practices tend to be mutually exclusive – the use of one of the practices makes it extremely difficult to adopt one of the other practices at the same time). Respondents were then asked to evaluate the extent to which they employed that FSCM practice using a seven-point Likert scale range from 1 = very rarely to 7 = very frequently.

The measures for *trust*, *commitment*, and *satisfaction* as the three underlining dimensions of buyer-supplier relationship quality (a second-order construct) were adapted from the study of Skarmas, Katsikeas, Spyropoulou, and Salehi-Sangari (2008). A four-item scale for ‘trust’ reflects the buyer’s assessment of the supplier’s honesty and reliability in the relationship. A four-item scale for ‘commitment’ reflects the buyer’s sense of unity and strength in their relationships with their key supplier. Additionally, a five-item scale for ‘satisfaction’ measures the extent to which the buyer firms were satisfied with their working relationship with a key supplier. To assess all three dimensions of relationship quality, participants used a seven-point Likert scale (from 1 = strongly disagree to 7 = strongly agree) to evaluate the related items.

To measure *supplier dependence* and *buyer dependence*, a six-item scale was adapted from Kumar et al. (1995) using a similar seven-point Likert-type measurement scale. The measurements for buyer and supplier dependence were formulated based on resource criticality, switching costs, and availability of alternative sources of supply and demand (Caniëls & Gelderman, 2007; Fan et al., 2020; Kim & Choi, 2018). A three-item scale for ‘supplier dependence’ measures the supplier’s difficulty to replace the sales and profits that stem from the buyer. To measure the supplier’s dependence we considered the buyer’s perception which is in line with the examination of the buyer’s relational attitudes (in terms of trust, commitment, and satisfaction) in our study and has been widely applied in previous research (e.g. Fan et al., 2020; Shen, Su, Zheng & Zhuang, 2019; Wang, Craighead & Li, 2014). As we asked our respondents’ opinion about their key supplier, we argue that they had an adequate level of knowledge to judge and indicate the level of their supplier dependency. Additionally, a three-item scale for ‘buyer dependence’ measures the buyer’s level of dependence by assessing their ability to replace the key supplier with alternative sources.

We also included five control variables in our model. To control for a firm’s main characteristics in our sample, we considered the firm’s *number of employees* and the *age* of the firm. Furthermore, we considered the *number of key suppliers* as the next control variable to

capture its potential effect on the development of a buying firm's relationships with key suppliers (i.e. in terms of relationship quality) as well as its possible impact on the selection of financial related practices by a buyer firm. In addition, we included a dummy variable to control the effect of working with different *types of banks* on a firm's financial relationships with key suppliers. This question asked managers to specify what type of bank (private vs. public) they consider to be the main financial partner in their business. Finally, since different types of industry could potentially affect our research outcomes, we also included an *industry dummy* (low-tech vs. high tech-industry) to our regression analysis. The appendix presents a full description of the questionnaire scales and item loadings.

4. Analysis and results

4.1. Reliability, validity, and descriptive statistics

Confirmatory factor analysis was employed using AMOS 25 to refine the research measurements for all research constructs apart from FSCM practices, which are treated as four single variables in the model. Item loadings of less than the cut-off point 0.7 were removed to improve the fit indices, which verified that the model fits the data quite well, with $\chi^2 = 353.04$, $df = 194$, NFI = 0.90, TLI = 0.95, CFI = 0.96, and RMSEA = 0.05. The appendix presents the factor loadings, composite reliabilities (CR), average variances extracted (AVE), and Cronbach's alpha for each multi-item construct. Considering the figures in the appendix, all CRs and AVEs are higher than the minimum threshold of 0.7 and 0.5 respectively. In addition, item loadings for each research item are higher than the accepted level of 0.7 and significant at the 0.01 level, suggesting convergent validity. We also evaluated discriminant validity by comparing the square root of the AVEs and the inter-construct correlation estimates. As can be seen in Table 2, for all constructs, the square root of the AVE is higher than the respective construct correlations, representing discriminant validity.

 Insert Table 2 about here

4.1.1. Second-order factor (relationship quality)

In our research model, relationship quality is a higher-order construct composed of trust, commitment, and satisfaction. The results of a second order CFA shows that the loadings from first-order factors to the second-order factor (relationship quality) are above the cut-off point of 0.7, and significant at $p < 0.01$ (trust = 0.73, commitment = 0.72, and satisfaction = 0.71).

While the ratio of χ^2 to df is 1.15, NFI is 0.97, TLI is 0.99, and RMSEA is 0.02, the AVE for relationship quality is 0.52, suggesting that the model fits the data quite well. Based on these results, the second-order factor model was used to represent the relationship quality construct.

4.2. Cluster analysis and regression results

To examine our research hypotheses, we performed a three-step statistical analysis. First, to examine Hypotheses 1, 2, and 3, we regressed supply risk against FSCM practices and their interactions with both relationship quality and buyer relative power for the whole sample. In the next step, we applied a cluster analysis technique to classify the firms in our sample based on different levels of relationship quality and buyer relative power. Given that identifying a number of clusters is a key concern in the clustering methods, in line with a suggestion from previous studies (e.g. Liu et al., 2010), we used both hierarchical and non-hierarchical cluster (i.e. k-means) analysis to validate the proposed theoretical relationship quality-power matrix. Finally, to examine Hypothesis 4, we employed a multivariate regression to examine the relationship between FSCM practices and supply risk in each of the four clusters identified in the clustering step.

4.2.1. Conducting regression analysis within the whole sample

In testing Hypotheses 1, 2, and 3, we conducted a multivariate regression considering the whole sample (Table 3). Model 1 contains the control variables, namely the firm's number of employees, age of firm, number of key suppliers, firm's main bank_{dummy}, and industry_{dummy}. The natural logarithm value was given to each control instead of the original value, apart from the firm's main bank and industry (included as a dummy variable into the model), in order to reduce concerns regarding the problem of skewness. In the next step, the dependent variables (FSCM practices) and moderators (relationship quality and buyer relative power) were entered in Model 2. Finally, we included the interaction terms between FSCM practices and both relationship quality and buyer relative power in Model 3. It should be noted that, prior to computing the interaction terms, all relevant variables were standardised to avoid multicollinearity problem.

As Table 3 shows, control variables do not result in significant association with supply risk in Model 1. In Model 2, only the β coefficient for reverse factoring is found to be negative and significant ($\beta = -0.32$, $p < 0.01$). This result fails to fully support our first hypothesis as the remaining FSCM practices are found to have insignificant relationships with our dependent

variable, supply risk. After considering the interaction terms in model 3, while the interaction terms ‘inventory financing $\times$ relationship quality’ and ‘letters of credit $\times$ relationship quality’ are found to be not significantly related to supply risk ($\beta = 0.08$ and 0.12 respectively, $p > 0.05$), the coefficient estimates for the interaction terms ‘buyer credit $\times$ relationship quality’ and ‘reverse factoring $\times$ relationship quality’ are negative and significant ($\beta = -0.30$, $p < 0.01$; $\beta = -0.19$, $p < 0.05$ respectively). This result suggests that the presence of relationship quality strengthens the efficacy of at least two FSCM practices, buyer credit and reverse factoring, for supply risk reduction, which partially supports Hypothesis 2.

Moving on to consider Hypothesis 3, whereas the coefficient estimates for cross product terms ‘buyer credit $\times$ buyer relative power’ and ‘letters of credit $\times$ buyer relative power’ did not attain the statistical significance ($\beta = -0.01$ and -0.12 respectively, $p > 0.05$), both ‘inventory financing $\times$ buyer relative power’ and ‘reverse factoring $\times$ buyer relative power’ had a negative and significant association with supply risk ($\beta = -0.22$ and -0.18 respectively, $p < 0.05$), and hence Hypothesis 3 is also partially supported. This finding suggests that greater levels of buyer relative power strengthen the efficacy of two FSCM practices, inventory financing and reverse factoring, for supply risk reduction.

Insert Table 3 about here

4.2.2. Conducting hierarchical and K-means cluster analysis

To examine Hypothesis 4, as a first step, we employed cluster analysis to classify our sample using two cluster variables, namely relationship quality and buyer relative power. Prior to conducting the cluster analysis, we calculated the asymmetry of buyer-supplier dependence by subtracting buyer dependence from supplier dependence (i.e. buyer relative power = supplier dependence – buyer dependence). We first utilized a hierarchical cluster analysis to find the number of clusters appropriate for our analysis. As recommended by Lehmann (1989) the number of clusters should be between $(n/30)$ and $(n/60)$, where n represents the sample size. Based on this, with a sample size of 244 firms, the suitable number of clusters for this study should be between four and eight clusters. As Table 4 shows, the agglomeration coefficient increases significantly when moving from stage 240 to 241 (from 4.54 to 8.15). More importantly, the movement between stages 240 to 241 presents the largest increases in

heterogeneity (79.49%). These results indicate that four clusters are appropriate to describe our sample, supporting our theoretical framework.

Insert Table 4 about here

In the next phase, K-means cluster analysis was carried out to generate the four clusters. Figure 2 presents the classified samples based on the levels of relationship quality and buyer relative power in the four clusters. We employed an ANOVA test to assess the differences between the four clusters. The F-values show that the four clusters differ significantly from each other considering both relationship quality and buyer relative power as cluster dimensions (108.99 and 195.05 respectively, $p < 0.01$). Cluster 1 with 69 members represents high levels of relationship quality and low levels of buyer relative power. The second cluster (Cluster 2) containing 64 members demonstrates low levels of both relationship quality and buyer relative power. Cluster 3 with 59 members shows low levels of relationship quality and high levels of buyer relative power. Finally, Cluster 4, representing 52 members, depicts high levels of both relationship quality and buyer relative power. These results statistically support our theoretical argument for classifying buyer-supplier relationships into four distinct groups based on the levels of relationship quality and buyer relative power.

Insert Figure 2 about here

4.2.3. Conducting regression analysis in different clusters

As a final step, we conducted multivariate regression in each of the four identified clusters to examine the relationship between FSCM practices and supply risk (see Table 5). Considering model 2, in Cluster 1, while buyer credit and reverse factoring show negative and significant effects on supply risk ($\beta = -0.37$ and -0.39 respectively; $p < 0.05$), inventory financing and letters of credit are not significantly related to supply risk ($\beta = 0.13$ and -0.04 , respectively; $p > 0.05$). In Cluster 2, however, the coefficient estimates for all four FSCM practices did not reach statistical significance. This statistical result indicates that no FSCM practices in Cluster 2 can facilitate firms in reducing supply-related risks. In Cluster 3, while buyer credit does not show a significant relationship with supply risk ($\beta = 0.11$, $p > 0.05$), inventory financing, reverse factoring, and letters of credit are found to have a negative and significant impact on supply risk ($\beta = -0.40$, -0.42 , and -0.41 respectively; $p < 0.05$). Finally, in Cluster 4, buyer

credit, inventory financing, and reverse factoring show a negative and significant association with supply risk ($\beta = -0.44, -0.43, \text{ and } -0.38$ respectively; $p < 0.05$). However, the coefficient estimate for letters of credit was not significant in this cluster ($\beta = -0.15, p > 0.05$). Overall, the findings support Hypothesis 4 and demonstrate statistically that, depending on different levels of relationship quality and buyer relative power, different FSCM practices are implemented by buying firms to reduce supply risk. Moreover, the comparison between the findings of the whole sample model and the four cluster models clearly further supports the importance of considering the simultaneous effects of relationship quality and power in examining the impact of different FSCM practices on supply risk.

Insert Table 5 about here

5. Discussion and conclusion

5.1. Discussion

With the focus on Iranian manufacturing firms, we examined the effect of the buyer side FSCM practices on supply risk and explored when and under what relational conditions these practices can be beneficial for buying firms to mitigate supply risk. Considering our first hypothesis, the statistical results suggest that from the four FSCM practices examined, it is only the practice of reverse factoring that is found to be effective for supply risk mitigation in the absence of the effect of the two moderating variables, relationship quality and buyer relative power. This finding confirms that the practice of reverse factoring can be considered as an attractive choice for supplier firms to better fulfil their obligations in terms of lead time, quality and quantity of product supplied, which can result in supply risk reduction. The outcome therefore only partially supports our first hypothesis, and in fact confirms our initial view of the existence of more complex constructs related to buyer-supplier relationships that can determine the effectiveness of FSCM mechanisms. As such, the outcome gives a clear justification for the theoretical position that relationship quality and relative power should be considered as key factors in determining which practices to adopt for effective reduction of supply risk.

Drawing on relationship management theory, we examined the unilateral moderating effect of relationship quality (Hypothesis 2) and buyer relative power (Hypothesis 3) on the relationship between FSCM practices and supply risk. Our statistical analysis suggests that high levels of either, or preferably both, relationship quality and buyer relative power offer the buyer more

choices in terms of effective FSCM practices that can be adopted to mitigate and manage supply risk. The result of regression analysis suggests that the presence of good relationship quality not only enhances the effectiveness of reverse factoring, but also transforms buyer credit from an ineffective to an effective financial incentive in dealing with supply risk. This finding confirms the vital role of relationship quality in enhancing the effectiveness of FSCM practices in supply risk reduction, suggesting that a reliable working atmosphere, enhanced by good relationship quality (Dawson et al., 2017), complements and supports the smoother financial flow that results from implementing FSCM practices, i.e. reverse factoring and buyer credit (Silvestro & Lustrato, 2014; Zhan et al., 2018). Similarly, our statistical analysis suggests that while buyer relative power can improve the efficacy of reverse factoring, its presence could turn the inventory financing practice into an effective stimulus that helps the buyer to deal with supply risk successfully. This result confirms the contingent and complementary role of buyer relative power. Offering financial incentives through implementing practices such as reverse factoring and inventory financing guarantees smoother financial flow that enables the supplier to fulfil their obligations with no major financial obstacles (Gupta & Dutta, 2011). Having greater relative power, on the other hand, can play a controlling mechanism role, which enables the buyer to pursue and, if needed, coerce the supplier to manage their actions in line with the buyer's expectations (Clauss & Bouncken, 2019).

The existence of non-significant associations between supply risk and the interaction terms of 'inventory financing $\times$ relationship quality', 'letters of credit $\times$ relationship quality', 'buyer credit $\times$ buyer relative power', and 'letters of credit $\times$ buyer relative power', further support our theoretical projection regarding the concurrent role of relationship quality and relative power in determining when and under what relational conditions FSCM practices can lead to supply risk reduction. In examining Hypothesis 4, we used a matrix structure that enabled us to empirically highlight which FSCM practices can be effective in managing supply-related risk for buying firms, considering the simultaneous effects of relationship quality and buyer relative power. Figure 3 highlights the most influential FSCM practices for each of the different clusters of the relationship quality-power matrix.

 Insert Figure 3 about here

As Figure 3 demonstrates, our findings suggest that different FSCM practices can reduce risk in all clusters except Cluster 2, in which no significant association exists between FSCM

practices and supply risk. The absence of influential practices in Cluster 2 is an interesting finding, especially considering the characteristics of this cluster, where low levels of buyer relative power combine with low levels of relationship quality between the partners. In this situation, employing financially related practices may not reduce the risk associated with the supply side. While our research did not investigate the underlying reasons for the ineffectiveness of FSCM practices in this cluster, it does intuitively make sense. We would suggest that the buyer may not benefit from FSCM practices in managing supply risk, given that the supplier with high levels of relative power, in a poor-quality relationship with the buyer, may be driven to act opportunistically by cherry-picking the best deals available at any one point in time. An alternative interpretation might be that, because of the risk of the supplier behaving opportunistically with the buyer having no power, the buyer is in no position to design and impose formal controls. For this reason, they might seek to rely more on FSCM approaches to decrease the opportunistic behaviour of the supplier. However, our results do not support the occurrence of this happening. Therefore, we cautiously suggest that the occurrence of opportunistic behaviour by the supplier may reduce the efficacy of FSCM practices, as it can sabotage the relationship (Narasimhan, Narayanan & Srinivasan, 2013).

Within each of the other three clusters, reverse factoring is found to be a common practice that can help firms in reducing supply risk in all cases, irrespective of levels of buyer relative power or relationship quality. This result is in line with the findings of previous research suggesting reverse factoring as the most popular supply chain financial-related mechanism for helping suppliers to manage their financial distress (Wuttke et al., 2019). This FSCM practice is widely suggested to be beneficial for all parties involved in a three-way financial relationship, i.e. buyer, supplier, and financial institution (Lekkakos, Serrano & Ellinger, 2016). However, the research shows that the practice could be most valuable to the supplier by increasing their liquidity level, optimising their capital resources, and strengthening their cashflow (Silvestro & Lustrato, 2014; Van der Vliet et al., 2015; Zhan et al., 2018). The result of the supplier being in a better financial position can thus lead to better performance in terms of reliability and dependability, to the benefit of the buyer.

Considering other FSCM practices, our statistical results show that in both cases of high relationship quality (Clusters 1 and 4), utilising buyer credit allows supply risk to be managed effectively, irrespective of the level of buyer relative power. As a result of a good relationship between partners in these two clusters, the buyer can feel more confident in making an advance payment to their key supplier. While an advance payment can be a sign of the buyers'

creditworthiness, it also reassures the supplier that the buyer would not cancel the order (Chen, Lu & Cai, 2020). Moreover, as an early payment can potentially increase the profit margin of the supplier by earning interest on the deposit (Thangam, 2012), it could be considered as an attractive financial incentive for the supplier. The advance payment can also be regarded as a good risk sharing mechanism (Chen et al., 2020; Zhao & Huchzermeier, 2019), encouraging the supplier to fulfil their supply obligations in a better way.

In the clusters where buyer relative power is high, our analysis suggests inventory financing as a common practice that can be employed by the buyer to reduce supply risk, irrespective of the level of relationship quality (Cluster 3 and 4). This loan-based mechanism helps the supplier in financing the ongoing work such as semi-finished products (Wuttke et al., 2013), strengthens their cashflow and liquidity level and also reduces their capital cost (Chauffour & Farole, 2009; Tseng et al., 2019). Therefore suppliers, and in particular the less powerful ones, can see the inventory financing practice as a strong financial incentive, encouraging them to be more committed to their obligations. This finding confirms the previous research suggesting that inventory financing practice is commonly adopted by powerful buyers to finance their supplier's internal operation (Gomm, 2010).

Furthermore, considering Cluster 3, where the buyer has high levels of relative power as well as a poor relationship with its key supplier, adopting letters of credit can result in a reduction of supply risk. Due to the low level of relationship quality between partners in this cluster, the buyer would be more interested in engaging a third party (i.e. bank) to provide finance for the supplier. In this case, the bank guarantees the payment for products that should be made by the buying firm to the supplier, and therefore a potential risk of delay in payment will be transferred from the buyer to the bank. The implementation of this mechanism not only results in a short/mid-term improvement to the supplier's cashflow (Amiti & Weinstein, 2011; Silvestro & Lustrato, 2014), but can also be considered by the supplier as a reliable assurance for the buyer's future payment, further increasing the supplier's commitment to their obligations.

In general, the above results suggest that at higher degrees of buyer relative power, more financial related practices would be available to the buyer to choose from for dealing with key suppliers and managing supply risk. A further insight here is that, as relationship quality increases in this equation, the buyer may be encouraged to finance their key supplier in earlier stages using internal resources (i.e. buyer credit), while in the case of low relationship quality they may prefer to involve a third party to provide the required protection as a more effective way for the management of supply risk.

5.2. Theoretical and managerial implications

Overall, our study makes important contributions to the current literature on managing buyer-supplier relationships. We extended the FSCM-supply risk conversation through an empirical study. Previous studies suggest (although do not empirically prove) that FSCM practices are vital antecedents of supply risk mitigation (i.e. Dyckman, 2011; Fairchild, 2005; Wuttke et al., 2013). However, our study revealed that among the four practices and in the absence of the effect of moderating variables, only reverse factoring was found to be effective in reducing supply risk when the unilateral effect of each FSCM practice was considered. This finding is in line with the suggestions of previous studies that reverse factoring, as the most common form of FSCM practices, enables suppliers to overcome their financial distress and improve performance i.e. reliability and dependability (see Silvestro & Lustrato, 2014; Van der Vliet et al., 2015; Wuttke et al., 2019; Zhan et al., 2018). Our next important step was to integrate the relationship management theory into the FSCM literature. Using this, we examined the unilateral and simultaneous effect of relationship quality and buyer relative power on the efficacy of FSCM practices in reducing supply risk, which offered new insights into the understanding of under which relational conditions FSCM practices can influence supply risk. Our results suggest that relationship quality and buyer relative power can play a vital role in enhancing the effectiveness of FSCM practices in supply risk reduction. More importantly, our findings assert that the amalgamation or the interaction between relationship quality and power can result in the formation of four distinctive relational circumstances in which the effectiveness of FSCM practices varies depending on the levels of the two constituting factors. The findings confirm the results of previous studies asserting that the efficacy of extra-role behaviour employed by partners is highly dependent on the power asymmetry and the quality of relationship between them (see Izquierdo & Cillan, 2004; Shahzad et al., 2018; Zhang et al., 2018; Zhou et al., 2020). In particular, our finding on the decisive role of relationship quality is in line with the results of earlier studies asserting relationship quality as a highly influential factor in shaping the outcomes of buyer-supplier relationships (e.g. Casidy & Nyadzayo, 2019; Clauss & Bouncken, 2019; Palmatier et al., 2006).

This study also highlights important implications for managerial practices. To manage the financial flow as an essential part of any business relationship, it is important for buying firms to choose appropriate financially related practices in building their relationship with key suppliers. While our results show that FSCM practices can facilitate firms in managing their supply risk, they reveal that it is vital for managers to understand the nature of their buyer-

supplier relationship when adopting financially related practices. By introducing the relationship quality-power matrix structure, this study offers an approach that can help managers of manufacturing firms to select suitable FSCM practices in harmony with the relevant business relationship characteristics.

The research findings thus have a clear message for managers that it is crucial to continuously consider and monitor the levels of relationship quality and relative power in order to select the appropriate FSCM practices when dealing with their key suppliers. While consideration of the levels of relationship quality and power is important in selecting the most appropriate FSCM practices, managers should also endeavour to enhance the level of the two relational attributes to achieve the benefits they can offer in the firm's relationship with their key supplier. The enhancement of relative power may not however be an easy task as the level of the firm's power relies on the attractiveness of its resources and the availability of a substitute for the counterpart (Fan et al., 2020; Wang et al., 2016). There are many macro-level factors such as the level of industry competition that can influence power asymmetry between the parties, and so it cannot be controlled directly by the managers' intervention. However, managers could consider adopting *structural bonding* practices in the form of non-retrievable investments (e.g. adopting shared technology in the relationship) to increase the switching costs of the supplier, thus enhancing the focal firm's power (Wang et al., 2016).

Managers can also develop and introduce suitable mechanisms to improve the level of trust and commitment in their relationship with key suppliers. An example of such mechanisms is the implementation of *social bonding* practices via structuring social ties and employing informal socialisation activities between the employees' partners (Gounaris, 2005). The use of such practices can also facilitate managers to better monitor the quality of the relationship between the partners, as the process of bonding can provide valuable insights regarding the relationship at both the individual and firm level.

5.3. Limitations and future research

While our findings offer new insights into buyer-supplier relationships, like other studies it is subject to some limitations and shortcomings that need to be addressed in future research. First, since our study focused on a sample of Iranian manufacturing firms, the general applicability of our findings needs further validation. Therefore, extending the study to other geographical contexts can be considered as an avenue for further investigations. Secondly, since our results suggest no significant relationship between FSCM practices and supply risk in Cluster 2,

undertaking more in-depth research (e.g. through the application of a qualitative study) seems to be important to identify the main drivers behind the absence of influential practices in this cluster. Next, our study investigates the consequences of FSCM practices in terms of supply risk. However, it can be envisaged that financially related practices could influence other relationship outcomes (i.e. performance), and this remains an area for future academic research. In particular, researchers can conduct a longitudinal study to explore further the implications of the FSCM practices for both buyer and supplier firms over time. Employing the findings of our study as the theoretical foundation, future research can also investigate the potential challenges that firms may confront in implementing FSCM practices in buyer-supplier relationships. In addition, we discussed the contingent effect of relationship quality and relative power on the association between FSCM practices and supply risk. Future research can investigate the potential roles of other business relationship characteristics (e.g. relationship length, norms, and types) on the linkage between FSCM practices and business relationship outcomes. Finally, our study focuses on the relationship of a buying firm with its key supplier. As firms deal with a portfolio of suppliers, future studies can examine FSCM practices and their consequences in a wider context, utilising a network structure for the supply base of buying firms.

 Insert Appendix about here

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FIGURES:

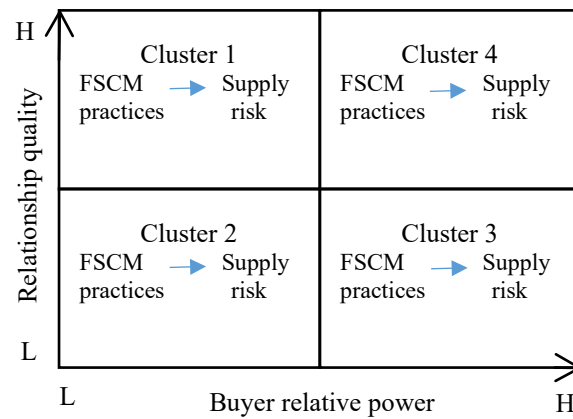


Figure 1: Relationship quality-Power matrix structure

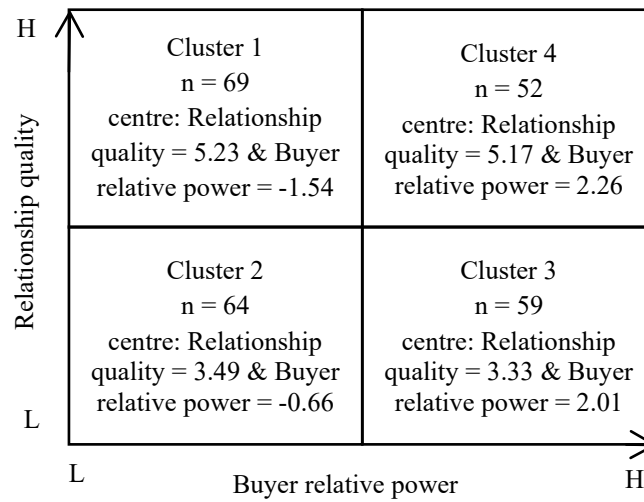


Figure 2: Relationship quality-Power clustering structure

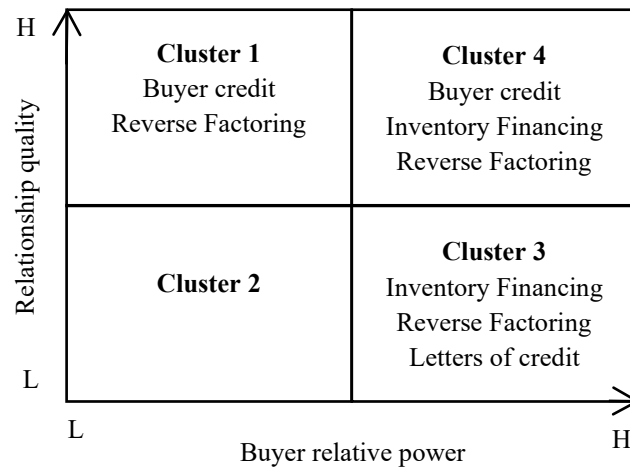


Figure 3: Key FSCM practices in managing supply risk considering the contingent roles of relationship quality and buyer relative power

TABLES:

Table 1: FSCM practices, meaning, and consequences

Practice	Explanation	Consequences	Source
<i>Buyer credit</i>	- The buying firm offers term financing to finance the supplier by using methods such as advance payments or deposits. - The buying firm agrees to pay in advance based on the discount opportunities promised by the supplier.	- Increasing profit margin of the supplier. - Optimizing capital resources. - Reducing risk of trade credit. - Improving cash flow of the key supplier. - Increasing the supplier's liquidity level.	Chauffour and Malouche (2011); Wuttke et al. (2013); Zhan et al. (2018)
<i>Inventory financing</i>	- The buying firm offers a loan to the supplier that enables the financing of semi-finished products and ongoing work. - This inventory financing practice is commonly employed by powerful buying firms.	- Reducing the supplier's capital cost. - Improving cash flow of the key supplier. - Increasing the supplier's liquidity level.	Chauffour and Farole (2009); Gomm (2010). Tseng et al. (2019); Wuttke et al. (2013)
<i>Reverse factoring</i>	- A reverse factoring practice considers financial flows between buyers, suppliers, and financial third parties such as banks. - The supplier receives credit from a bank and the buying firm is responsible for paying back the original loan amount. - Due to the payment terms agreed by all three parties, the supplier is committed to pay interest to the bank according to the buyer's interest rate.	- Enabling the key supplier to finance its receivables more easily, with a better interest rate. - Optimizing capital resources. - Improving cash flow of the key supplier. - Increasing the supplier's liquidity level.	Silvestro and Lustrato (2014); Van der Vliet et al. (2015); Wuttke et al. (2013); Zhan et al. (2018)
<i>Letters of credit (domestic or international)</i>	- Letters of credit practices represent the financial agreement between buyers, suppliers, and financial institutions (e.g. banks). - A bank guarantees the payment for products that should be made by the buying firm to the supplier.	- Transferring the risk of delay in payment by the buyer to a bank. - Improving cash flow of the key supplier.	Amiti and Weinstein (2011); Silvestro and Lustrato (2014); Wuttke et al. (2013)

Table 2: Means, standard deviations, inter-construct correlation estimates, and square root of the AVEs.

	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Trust	4.15	1.47	<u>0.81</u>														
(2) Commitment	4.37	1.44	0.45**	<u>0.83</u>													
(3) Satisfaction	4.38	1.55	0.46**	0.45**	<u>0.86</u>												
(4) Supplier dependence	4.25	1.60	-0.19**	-0.25**	-0.15*	<u>0.77</u>											
(5) Buyer dependence	3.89	1.37	0.01	-0.06	-0.01	0.13*	<u>0.79</u>										
(6) Supply risk	3.99	1.50	-0.05	0.07	-0.06	0.08	-0.01	<u>0.80</u>									
(7) Buyer credit	0.29 ¹	0.46 ¹	-0.01	0.10	0.05	-0.09	-0.12	0.01	n/a								
(8) Inventory financing	0.23 ¹	0.42 ¹	-0.09	0.04	-0.05	0.00	-0.02	0.00	-0.24**	n/a							
(9) Reverse factoring	0.25 ¹	0.43 ¹	0.05	-0.07	0.11	-0.08	0.02	-0.23**	-0.24**	-0.18**	n/a						
(10) Letters of credit	0.23 ¹	0.42 ¹	-0.08	-0.08	-0.04	0.02	-0.05	-0.03	-0.23**	-0.18**	-0.18**	n/a					
(11) Firm's NE	252.17	310.36	-0.01	0.05	0.08	-0.24**	-0.01	-0.16*	-0.04	0.07	0.00	0.09	n/a				
(12) Firm's Age	20.50	16.22	0.13	0.06	0.15*	-0.10	-0.01	-0.08	-0.04	0.14	0.02	-0.02	0.46**	n/a			
(13) Firm's NKS	12.64	15.74	0.00	0.13	0.07	-0.01	0.02	0.01	-0.03	0.06	0.11	0.04	0.20**	0.18*	n/a		
(14) Firm's MB _{dummy}	0.45	0.50	-0.09	-0.05	0.01	0.14*	-0.06	-0.14*	-0.07	-0.04	-0.07	0.05	0.03	-0.06	-0.10	n/a	
(15) Industry _{dummy}	0.47	0.50	0.02	0.04	0.03	0.02	0.10	0.06	-0.08	0.08	-0.13	0.04	0.17*	0.07	0.13	0.00	n/a

*Notes: The bold, underlined figures on the diagonal are the square root of the AVEs; **, $p < 0.01$, *, $p < 0.05$; SD: Standard deviation; NE: Number of employees; NKS: Number of key suppliers; MB: Main bank; ¹ Mean and SD values for FSCM dummy variables.*

Table 3: Regression analysis - whole sample

Variable	Model 1	Model 2	Model 3	VIF
Firm's NE	-0.16 (-1.85)	-0.13 (-1.55)	-0.05 (-0.65)	1.54
Firm's age	-0.03 (-0.32)	-0.03 (-0.34)	-0.05 (-0.60)	1.41
Firm's NKS	0.03 (0.33)	0.07 (0.90)	0.07 (1.04)	1.14
Firm's MB_{dummy}	-0.14 (-1.80)	-0.17* (-2.26)	-0.19** (-2.73)	1.10
Industry_{dummy}	0.09 (1.11)	0.04 (0.55)	0.04 (0.52)	1.11
Buyer credit		-0.13 (-1.52)	-0.14 (-1.79)	1.41
Inventory financing		-0.12 (-1.37)	-0.11 (-1.40)	1.34
Reverse factoring		-0.32** (-3.71)	-0.33** (-4.15)	1.40
Letters of credit		-0.12 (-1.48)	-0.10 (-1.26)	1.34
RQ		-0.01 (-0.10)	0.15 (1.13)	3.87
BRP		0.06 (0.71)	0.26* (2.02)	3.74
Buyer credit × RQ			-0.30** (-2.90)	2.40
Inventory financing × RQ			0.08 (1.00)	1.58
Reverse factoring × RQ			-0.19* (-2.21)	1.66
Letters of credit × RQ			0.12 (1.21)	2.07
Buyer credit × BRP			-0.01 (-0.12)	2.23
Inventory financing × BRP			-0.22* (-2.56)	1.60
Reverse factoring × BRP			-0.18* (-2.00)	1.76
Letters of credit × BRP			-0.12 (-1.29)	2.07
R²	0.05	0.13	0.31	
Adj-R²	0.02	0.07	0.22	
F-Value	1.84	2.21*	3.57**	

*Notes: Dependent variable: supply risk; **, $p < 0.01$, *, $p < 0.05$; T-values are in parentheses; RQ: Relationship quality; BRP: Buyer relative power; NE: Number of employees; NKS: Number of key suppliers; MB: Main bank.*

Table 4: Agglomeration schedule

Stage	Coefficient	Number of clusters after combining	Differences	Percent Change in Heterogeneity
236	02.85	8	0.58	20.30
237	03.42	7	0.39	11.48
238	03.82	6	0.13	03.45
239	03.95	5	0.60	15.10
240	04.54	4	3.61	79.49
241	08.15	3	1.18	14.49
242	09.34	2	4.39	47.03
243	13.73	1		

Table 5: Regression analysis for the distinctive clusters

Variable	Cluster 1		Cluster 2		Cluster 3		Cluster 4	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Firm's NE	-0.02 (-0.12)	0.00 (-0.02)	-0.11 (-0.71)	-0.19 (-1.08)	-0.29 (-1.34)	-0.02 (-0.11)	-0.11 (-0.61)	-0.02 (-0.11)
Firm's age	-0.28 (-1.60)	-0.29 (-1.86)	-0.03 (-0.20)	-0.04 (-0.21)	0.27 (1.34)	0.09 (0.45)	0.03 (0.15)	-0.01 (-0.03)
Firm's NKS	0.20 (1.34)	0.20 (1.43)	0.32* (2.17)	0.29 (1.81)	-0.33* (-1.95)	-0.24 (-1.65)	-0.21 (-1.23)	-0.12 (-0.70)
Firm's MB_{dummy}	-0.24 (-1.53)	-0.34* (-2.38)	0.13 (0.88)	0.15 (1.00)	-0.07 (-0.40)	-0.14 (-0.96)	-0.25 (-1.49)	-0.35* (-2.23)
Industry_{dummy}	-0.06 (-0.34)	-0.02 (-0.14)	0.07 (0.48)	0.09 (0.58)	0.13 (0.80)	-0.03 (-0.19)	0.30 (1.88)	0.21 (1.21)
Buyer credit		-0.37* (-2.17)		0.28 (1.53)		0.11 (0.66)		-0.44* (-2.49)
Inventory financing		0.13 (0.79)		0.16 (0.93)		-0.40* (-2.47)		-0.43* (-2.27)
Reverse factoring		-0.39* (-2.46)		0.10 (0.55)		-0.42* (-2.68)		-0.38* (-2.25)
Letters of credit		-0.04 (-0.24)		0.16 (0.93)		-0.41* (-2.51)		-0.15 (-0.87)
R²	0.14	0.39	0.12	0.18	0.20	0.51	0.17	0.38
Adj-R²	0.03	0.23	0.02	-0.01	0.07	0.36	0.06	0.21
F-Value	1.24	2.40*	1.17	0.93	1.59	3.29**	1.49	2.19*

Notes: Dependent variable: supply risk; **, $p < 0.01$, *, $p < 0.05$; T-values are in parentheses; NE: Number of employees; NKS: Number of key suppliers; MB: Main bank.

Appendix:

Research measurements

Scales	Loadings
Supply risk (AVE = 0.64; CR = 0.91; α = 0.91)	
This supplier meets our quality specification requirement on a consistent basis ®	0.76
This supplier meets our required delivery lead times on a consistent basis ®	0.79
This supplier meets our volume requirement on a consistent basis ®	0.83
This supplier consistently meets our overall requirement ®	0.83
This supplier always delivers our orders as promised ®	0.87
This supplier has the capacity to meet our requirement ®	0.71
FSCM practices (AVE = n/a; CR = n/a; α = n/a)	
Buyer credit: Your firm offers term financing to finance this supplier by using methods such as advance payments or deposits	n/a
Inventory/work-in-progress financing: Your firm provides loan to this supplier to finance work in progress	n/a
Reverse factoring: This supplier obtains a credit from a bank and pays the interest according to your firm's interest rate and your firm pays the loan principal to payment terms	n/a
Letters of credit: A financial institution provides guarantee to this supplier by replacing your firm's risk with its own default risk	n/a
Trust (AVE = 0.66; CR = 0.89; α = 0.89)	
Supplier's honesty about problems that might arise (e.g. shipment delay)	0.76
Feeling that the supplier has been on our side	0.83
Supplier's not making false claims	0.82
Supplier's reliability of promises	0.85
Commitment (AVE = 0.69; CR = 0.87; α = 0.87)	
Supplier being a very important ally of our business	0.77
Lacking a strong business link with the supplier* ®	-
Existence of a high sense of unity exists between this supplier and us	0.85
Development of a close business relationship with this supplier	0.86
Satisfaction (AVE = 0.74; CR = 0.90; α = 0.90)	
In general, we are satisfied with our dealings with this supplier	0.89
We would discontinue working with this supplier if we could* ®	-
This supplier is a good company to do business with	0.87
If we had to do it over again, we would not do business with this supplier ®	0.83
Overall, we are satisfied with the products and services we get from this supplier*	-
Supplier dependence (AVE = 0.6; CR = 0.82; α = 0.81)	
In our trade area, there are other firms that could provide the supplier with comparable offerings ®	0.70
In our trade area, the supplier would incur minimal costs in replacing our firm with another ®	0.83
It would be difficult for the supplier to replace the sales and profits our firm generates	0.78
Buyer dependence (AVE = 0.62; CR = 0.83; α = 0.83)	
There are other suppliers who could provide us with comparable product and service ®	0.71
Our total costs of switching to competing suppliers would be prohibitive	0.84
It would be difficult for our firm to replace the sales and profits generated from this supplier	0.80

Notes: ®: Reverse-coded items; α : Cronbach's alpha; *: Deleted based on loadings.