

Social relationships and supply chain risk information sharing

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Abstract

The main objective of this study is to investigate how social relationships enhance supply chain risk information sharing. A multiple-case, holistic design was adopted. Interviews targeted managers in supply chain, procurement, operations and distribution. The study findings revealed that building closeness, motivation and establishing a sense of collective consequence enhances supply chain risk information sharing. This study contributes valuable empirical insights into how social relationships can enhance risk information sharing so that firms can prepare against supply chain disruption.

Keywords: risk information sharing, social relationships, supply chain risk

Introduction

The recurrent occurrence of disruptive events continues to highlight the need to share supply chain risk information. According to Agigi and Niemann (2013), the frequency in supply chain disruption has brought a reality to firms that the question about supply chain disruption is not on whether it will occur but when it will occur and how prepared is the supply chain. Schoolers such as Hendricks and Singhal (2005) Costantino *et al.*, (2013), Jüttner (2005) and, Kleindorfer and Saad (2005) all have called for more research in the area. As an aspect of supply chain resilience and risk management, risk information sharing gives firms the ability to sense new threats which according to Ambulkar, Blackhurst and Grawe (2015) is a capability crucial for its survival. At the same time, Sheffi and Rice Jr., (2005) advocated that in order to reduce supply chain disruption and increase resilience, there has to be a culture which allows “maverick” information to be heard. As such, risk information sharing among supply chain stakeholders is highly encouraged. Empirically, Li *et al.*, (2006) found that by timely sharing of supply information, firms at downstream can alert a disruption at an upstream stage, which can drive the correct early warning time, and make proper decisions to offset the impact of the disruption.

However, Frazier et al., (2009) reported that some firms may not be willing to share information that has not been agreed in their contracts or beyond their dyadic ties (Kembro and Selviaridis, 2015). On the other hand, the relational dimensions of social capital theory explain the nature and quality of supplier relationships and how they can influence behaviours such as supply chain risk information sharing at both individual and firm level (Li and Ye, 2014; Nahapiet and Ghoshal, 1998).

Further, Johnson, Elliott and Drake, (2013) observe that there has been limited research examining the influence of inter-organisational relationship and social capital that may nurture in building supply chain resilience. Similarly, Cheng, Yip and Yeung (2012) had observed that little research has been carried on managing risk through relational approach. This is despite the submission by Borgatti and Li (2009) that social network analysis – an extension of structural dimension of social capital - “would have its greatest and most natural application on the soft side of SCM”. According to Borgatti and Li (2009), this will help in understanding “how patterns of personal relationships translate to competitive advantage through diffusion of information”. Based on a gap in the literature and the call by previous researchers, this study seeks to answer to the following research question: How can social relationships enhance supply chain risk information sharing? Consequently, the main objective of this study is to investigate how social relationships enhance supply chain risk information sharing.

Literature Review

Theoretical Background

Social relationships both at firm and individual level reinforces formal relationships which continues to provide supply chains with positive outcomes (Sukoco, Hardi and Qomariyah, 2018; Azar *et al.*, 2018). Social capital theory is one of the popular theories that have been used in psychology – later extended to other fields including supply chain and disaster risk management, to explain network of relationships and their advantages to individuals, communities and firms (Nahapiet and Ghoshal, 1998).

The theory of social capital according to Lin (2003) “focuses on the resources embedded in one’s social network and how access to and use of such resources benefit the individual actions”. Hence, actions taken to maintain and gain valued resources are the main focus of the theory (Lin, 2001). The social capital theory is not only focused on individuals but more importantly on relationships and their outcomes (Andriani and Christoforou, 2016). As a result, social capital does not belong to individuals but to a social structure, be it an organisation, community, or other social grouping.

Most scholars have agreed that there are three dimension of social capital: structural, cognitive and the relational dimensions of social capital (Nahapiet and Ghoshal, 1998; Krause, Handfield and Tyler, 2007). The relational dimension focuses on the personal relationships and direct ties between actors that have developed with each other through a history of interactions, as opposed to structural, outcomes of interactions (Nahapiet and Ghoshal, 1998; Inkpen and Tsang, 2005). The relational dimension focuses on the particular relations people build in the course of their interaction, such as respect and friendship trust, norms, and identification (Nahapiet and Ghoshal, 1998; Inkpen and Tsang, 2005). Scholars argue that relational capital translates to assets (relational assets)

which can be leveraged as a source of value (Nahapiet and Ghoshal, 1998; Cousins *et al.*, 2006). According to Cousins *et al.*, (2006), when actors interact in a social context, “trust, opportunity, and motivation may increase the level of social exchanges among the group”.

Supply Chain Risk Information Sharing and Social Relationships

According to Ali, Hird and Whitfield (2018), supply chain risk information sharing is “a communication - beyond normal business information exchange - between supply chain members, about the occurrence(s) of a sudden event(s) which has the possibility to cause disruption to the supply chain”. This definition differs from that of Li *et al.* (2015), which can be traced to Monczka *et al.*, (1998) and Mohr and Spekman, (1994). They defined supply chain risk information sharing as “the extent to which critical and proprietary information is communicated to one’s supply chain partner” (Li *et al.*, 2015). One major drawback from this definition – especially when traced to Monczka *et al.*, (1998) and Mohr and Spekman, (1994) is that the definition concentrates more on demand related information sharing. Supply chain risk information sharing on the other hand - which are usually voluntary and outside most supply chain contracts, are mostly related to sudden events that needs quick action.

The motivation to voluntarily share risk information (that is not binding) can best be explained using the social capital theory (Nahapiet and Ghoshal, 1998). For instance, a firm that have information about a possible strike or political embargo may not be obliged by most supply chain contract to share such information. However, firms that have informal relationship in place are more likely to share risk information between supply chain members especially when they know the nature of the supply chain of their partner – who probably maintain a just-in-time system with fewer suppliers or customers.

Though several studies have investigated the “soft aspect of supply chain relationships” which according to Borgatti and Li (2009) will help in understanding “how patterns of personal relationships translate to competitive advantage through diffusion of information”, however, none of the studies reviewed where focused on how social relationships enhance risk information sharing. For instance, unlike the studies of Kwon and Suh (2005), Eckerd and Sweeney (2018) that were focused on demand related information sharing, Durach and Machuca (2018) and Li *et al.*, (2015) studies where more specific to risk related information sharing. However, they both have contrary findings. While Durach and Machuca (2018) found no support for a positive impact of interpersonal information sharing on firm resilience, Li *et al.*, (2015) found that risk information sharing improve financial performance, and the effectiveness of risk information sharing is strengthened by relationship length and supplier trust. Li *et al.*, (2015) investigated whether association between risk information sharing and financial performance can be strengthened by collaborative relationship characteristics including relationship length and supplier trust. Their study however ranked respondents opinion on the conditions under which relational capital enhances risk information sharing.

In this regard, Johnson, Elliott and Drake (2013) argued that social activity is shaped by the context in which it is embedded. We therefore submit that to gain in-depth knowledge about social relationship and how it enhances supply chain risk information sharing, rather than rank the predefined measures of relational capital, it is preferably to understand firms context and give them opportunity to reveal their experiences and

describe how they feel social relationships is enhancing risk information sharing in their supply chain.

Methodology

A multiple-case, holistic design was adopted to explore how social relationships enhance risk information sharing in supply chains (Yin, 2014). In the holistic type of case study design, the organisation is viewed as a whole in terms of the social relationships it maintains with its supply chain partners. Since supply chain risk information involves voluntarily sharing risk between the focal firm and its supply chain partners, the case study approach was selected to show unique behaviour of multiple firms in their supply chain without influencing the observed behaviour – actions or reaction (Yin, 2014).

Case selection

In determining the ideal number of cases, a non-probability sampling approach was used (Yin, 2014). Specifically, convenience sampling strategy was employed. The convenience sampling notwithstanding, is theory driven as only firms that fulfil the theoretical requirement are selected (Miles, Huberman and Saldaña, 2013). Therefore, since the study focus and the unit of analysis are on “social relationships and supply chain risk information sharing”, only firms with multiple external relationships are included. As a result, firms in a monopoly or with no partner, i.e., firms that source, manufacture and sell their produced by their selves are not considered.

Consistent with the holistic case study design, each case company selected was viewed as single entities in their supply chain, that have developed a social relationships with their partners, and this can be leverage as a source of receiving and sharing risk information in their supply chain. Consequently, with the multiple case strategy, findings from one case can be generalized between selected cases, on the basis of a match to the underlying theory - social capital theory (Miles, Huberman and Saldana, 2014; Yin, 2014).

In all, five case companies were selected from the food and beverage industry, animal feed production and petroleum marketing industry. Further, two of the case companies have a business relationship with each other. The five case companies were deemed appropriate in order to avoid generating unwieldy data (Miles, Huberman and Saldana (2014 .p 34).

Each of the case company are involved in high level supply chain activities in the form of procurement, transportation, distribution and sales – which are likely to be negatively affected when risk event occurs. Hence, based on the operations of the selected case companies information about external risk event that can cause disruption is vital in order to maintain smooth flow of goods.

Data Collection

Interviews targeted managers in supply chain, procurement, operations and distribution. Seven interviews were conducted. Guided by the literature on social capital, the interviews were designed to collect information about firms policy, manager’s experiences and personal relationships with their partners and how such relationships enhances supply

chain risk information sharing. Interviews started with general questions on supply chain risks faced by case study companies, internal structures for risk information sharing and their social relationships with their partners both at firm to firm and at individual level. Building on previous questions and evidence cited, specific questions that prompted the participants to explain how the case companies' social relationships enhance supply chain risk information sharing with partnering firms.

Data Analysis

In analysing the data, we started by reducing the data to smaller units of sentence and paragraphs. This provides basis for first-order coding. At this stage, we used in vivo coding methods (Saldaña, 2009). Where vital language from the interview is used, we applied in vivo coding method (Saldaña, 2009). This was used when a particular language or statement made in the interview stands out (Saldana, 2009). In the second stage, we used descriptive coding method to summarise the basic topic of the message (Huberman and Saldana, 2014). Further, codes were carefully deployed after visiting past literature and the theory. However, where certain words or phrase stands out and provide meaning to the entire quote, we use the word or phrase from the quote as a code.

After the summarising the descriptive codes, we used pattern coding method to group summarised data in order to identify trends (Miles, Huberman and Saldana, 2014; Saldana, 2009). This was achieved by reorganising and reconfiguring the first circle codes in order to develop smaller categories/themes by identifying "recurring phrases" (Miles, Huberman and Saldana, 2014; Saldana, 2009).

In the final stage, we reflect on the result alongside the existing theoretical framework and literature. This enables us to make sense and understand the data better. This iterative process of comparing not only coded data, but also reflecting on emerging themes alongside practical understanding of the existing theory, which has been described by Miles, Huberman and Saldana, (2014) as a triangulating strategy, helped us to ensure the validity and credibility of the analysis. This is because, it proves flexibility and dynamic interaction between data and theory (Dubois, Hulthén and Pedersen, 2004). Other strategy employed in this study as suggested by (Miles, Huberman and Saldana, 2014) was checking for representativeness, checking for researcher effects, looking for negative evidence, checking out for rival explanations, and making if-then tests.

Findings

The case study findings unravel several emerged themes that indicate how social relationship enhances supply chain risk information sharing. This includes developing closeness with partners, motivation, and establishing a sense of collective consequence with partners. Further, transport related and political risk were the most prominent supply chain risk that majority of the case companies indicated that social relationship played a role i.e. receiving timely risk information. Information regarding other internal supply chain risk like internal operations and quality risk were also found to be facilitated by social relationships as discussed within the three emerging themes.

Developing closeness with partners

The findings of this study indicated how the importance of developing closeness with partners enhances supply chain risk information sharing. Closeness between supply chain partners creates a personal bond between partners (Nahapiet and Ghoshal, 1998). Though partners have no formal requirement to share supply chain risk information, the degree of closeness has made partnering firms feel obliged to share supply chain risk information. The following quote from one of the supply chain managers underscores this point. “if you have personalized the relationship the other party would not see any reason to hold back anything, they would gladly inform you” (Case 1).

At individual level, the closeness is not restricted to individuals in the same position. Instead, a close relationship is maintained with key individuals that are more likely to share not only external risk information but also internal risk information. “As I am concerned if there is any way that I know that I can move... more closely to them which will enhance me getting more from them, I’ll do” (Case 5).

Motivation

Consistent with (Nahapiet and Ghoshal, 1998), motivation creates condition for exchange. Our analysis finds that social relationships motivate partners to share supply chain risk information. Motivation in this context takes various forms and at both individual and firm level. For instance, Case 2, indicates that some actions taken for granted such as “smile” can motivate risk information sharing. “So some people if you smile to them they will assist you” Case 2. Though this might seem impossible in the absence of physical contacts, it is a common practice in marketing where customers are sometimes viewed as “rational and emotional animals” (Schmitt, 1999).

Other firm level motivations are in the form of corporate gifts. “we ensure that we maintain a relationship and we don’t just maintain it because at the end of the year we equally ensure that there is a package - a corporate gift” (Case 1). Such gifts do not translate to exchange for risk information, rather it strengthens the relationships and act as motivation for partners to share risk information. At individual level, our findings show that firms give both tangible and intangible gifts that are usually given to customers (e.g. award of recognition, gift cards, and vouchers) to both frontline staffs (like drivers) and managers of partnering firms. Similar to corporate gifts, this does not translate to exchange of risk information immediately, however, it motivates individuals to share both internal and external risk information.

Establishing a sense of collective consequence with partners

Our data indicates that establishing a sense of collective consequence with partners enhances supply chain risk information sharing. As declared by Case 4: “because of the understanding... and for the fact that they know we see them as part of the people we operate with, once there is any issue or they foresee that one material will give issue (i.e

rise in price) maybe in one or two months' time, they foresee what happens at times, so they tell us.” The interesting point about this quote is that though partners are likely to benefit from windfall (excess profit) if they don't share the risk information. However, because they understand that it's only a short-term profit which might affect future operations of their partner, they choose to share such information. It is also important to note that the market is not a monopoly and all case companies have multiple partners for each supply chain activity. Notwithstanding, since partners are willing to share information that has a direct impact on their profit, it is therefore unlikely for them to hold back other non-demand related risk information.

Discussion

This section discusses the findings of the study with regards to how social relationships enhance risk information sharing. The study builds on the argument of social capital theory that social relationships can be leveraged as a means of generating value (Nahapiet and Ghoshal, 1998). In the context of this study, value relates to the supply chain risk information which can save firms from lose resulting from disruption. Since disruptive event can occur outside a firm's business environment, it is impossible to get timely information about all risk events, which if firms have, will enable them to prepare and respond effectively (Li *et al.*, 2006) as against when risk information is known at a later time. As a result, this study contributes valuable empirical insights into how social relationships can enhance risk information sharing so that firms can prepare against supply chain disruption.

Firstly, in developing closeness, the cases indicated how supply chain risk information are received because supply chain partners have close relationship with each other and have no reason to hold back supply chain risk information from one another. As firms are closer to each other, they have mutual understanding of each other's business and the type of supply chain risk information that will be beneficial. Consistent with the social capital theory, due to the closeness of the relationships between supply chain partners, partners are obliged to share risk information so that they can maintain the relationship. In line with our findings, we proposed that: *For the purpose of supply chain risk information sharing developing relational closeness with supply chain partners enhances supply chain risk information sharing*

Regarding motivation, Nahapiet and Ghoshal (1998) hinted that “motivation” as a strategy for exchange is a reputational endorsement that derives from relational factor. Consequently, case companies indicated that motivation is a strong relational factor that enhances supply chain risk information sharing. Motivation with regards to supply chain risk information sharing, as indicated by one of the interviewees, is also linked to integrity of current and past risk information received and the future risk information firms anticipate to be received. As such, whether a partner has previously shared wrong, or risk information that is already known, motivation in this regard, is the endorsement giving in

order to receive future risk information. We therefore proposed that: *If partners that shares risk information in the past are motivated, they are more likely to continue sharing supply chain risk information.*

Thirdly, establishing a sense of collective consequence with partners proves to enhance supply chain risk information sharing - as partner are concerned with not only maintaining the relationship, but also the prosperity of all - which can be impaired when there is disruption and information not shared. Hence, similar to Durach and Machuca (2018), investments in interpersonal relationships are significant antecedents that are re-deployable in managing supply chain disruption. In the context of supply chain risk information sharing, such interpersonal relationship enables partners to understand that in a supply chain, a disaster that can affect a members operation can have negative consequence on the entire supply chain. On the other hand, if information about risk events is shared between partners, resilience can be achieved, which is beneficial to all partners. With this understanding, we propose that: *Establishing a sense of collective prosperity with partners enhances supply chain risk information sharing*

Conclusion

Contribution

First, this study contributes to the literature on the social capital aspect of supply chain research (Galaskiewicz, 2011; Borgatti and Li, 2009). The study stress the importance of building closeness, motivation and establishing a sense of collective consequence; as value creating activity among supply chain partners. In the context of this research, such activity enhances supply chain risk information sharing. Drawing particular on the work of (Li *et al.*, 2015), this study extends relational enhancing activities beyond length of relationship and trust and provides empirical evidence that supports building closeness, motivation and establishing a sense of collective prosperity are relational enhancing activities that promotes supply chain risk information sharing.

Also, giving the limited number of research on supply chain risk information sharing, this study contributes to the literature by carrying out an empirical research that identifies how social relationship enhances supply chain risk information sharing. This is, in considering that a large number of researches concentrate on demand related information sharing as compared to risk information sharing in the supply chain (Kwon & Suh, 2005; Eckerd & Sweeney; 2018; Kulangara, Jackson & Prater; 2016)

Further, with regards to the findings of previous study on the reluctance of firms to share information beyond dyadic ties (Kembro and Selviaridis 2015), this study highlights the need to establish relationships with partners outside dyadic ties closer and establishes a sense of collective prosperity so that risk information can be shared among all tiers of supply chain.

Limitation

This study demonstrates how social relationship enhances supply chain risk information sharing. Though we did our best to provide a valid and reliable research, there might be

some limitation which should be considered when interpreting the result of this study. Since the study is based on case study, the findings cannot be statistically generalised to a population. Thus, a quantitative approach is need for generalisation of the findings of this study. This will open avenue for future research.

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