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Cooperative strategy in supply chain networks

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ABSTRACT

Firms require strategic action to successfully respond to competition within their supply chain networks. The supply chain network is a complicated network model, and its specific context depends on the relationships among the network members. Developing a strategy under these circumstances is not straightforward and must proceed through a series of systematic analyses. The purpose of this paper is to provide strategy development for a firm within a supply chain network. To develop these strategies, this study first classifies supply chain networks as being one of four types, defined by the role of the focal firm relative to its suppliers and buyers: (1) upstream network dominance, (2) focal firm dominance, (3) focal firm obedience, and (4) downstream network dominance. Once the types are defined, the context of each type is further analyzed at the upstream level, the focal firm level, the downstream level, and the network level. These context analyses offer a more detailed understanding of each network's environment. But two questions remain to be answered: what are the sources of advantage in a network environment? And how does one develop a strategy in these complex network environments? The relational view (Dyer & Singh, 1998) provides strong theoretical support for these two questions. Utilizing the relational view and the context analyses, our study develops a focal firm strategy for both upstream and downstream in a supply chain network in the following areas: relation-specific assets, knowledge-sharing routines, complementary resources and capabilities, and network position.

1. Introduction

Over the past few decades, supply chain networks have inspired a number of interesting from scholarly studies and practical implications (Stadtler, 2005). In academia, researchers have taken multiple perspectives and have developed many theories to understand the activities involved in inter-organizational collaboration. Since the emergence of international cooperation and the development of vertical disintegration, managers have paid more attention to inter-firm spanning activities than to the optimization of interior processes (Buhman, Kekre, & Singhal, 2005; Chen & Paulraj, 2004). The common objective of academics and practitioners is to determine how a firm can achieve a sustainable competitive advantage. In marketing, related studies have focused on buyer and supplier relationship management. In operational management, the focus is on optimal manufacturing strategies to improve time, delivery, cost, quality, and design (Halley & Beaulieu, 2009); in addition, the strategic management field highlights the links between an organization and its performance. It is essential for a firm to use strategic to achieve a competitive advantage. Few studies, however, have proposed strategies for a given firm within a supply chain network. Because the supply chain network environment is intricate, it is difficult to directly construct strategic actions to achieve competitive advantage unless we examine the environment's essential characteristics. Several essential characteristics of the supply chain network environment have been investigated:

The nature of supply chain networks is that they are a complicated network structure, and each specific relationship within this structure has a unique context. A firm within a business environment is not only a linear sequence supply chain but also a network structure (Kothandaraman & Wilson, 2001; Lamming, Johnsen, Zheng, & Harland, 2000). This network structure covers both the dyadic level (e.g., a single supplier and buyer relationship) and the network level (e.g., the net, the upstream, or the downstream level) (Ritter & Gemünden, 2003). Many firms are tied to each other, forming a specific type of supply chain network. These firms exhibit mutual relationships include: relative power (Cox, 2001; Cox, 2004; Cox, Ireland, Lonsdale, Sanderson, & Watson, 2002; Ritter, Wilkinson, & Johnston, 2004), transactional behavior, specific investment (Bensaou, 1999), and resources (Pfeffer & Salancik, 1978). The relationships between network levels are interrelated (Ritter et al., 2004). Each particular type of relationship in a supply chain network has a specific context and specific characteristics.

Strategy, structure, and environment are closely linked (Hall & Saias, 1980). A firm's strategy depends on its external network environment and structure. Therefore, we consider the focal firm to be the center (hub), and the focal firm maintains different relationships

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with its upstream supply chain (suppliers) and its downstream supply chain (buyers). This analytic architecture, the focal firm to the upstream and the focal firm to the downstream, is usually adopted in the field of supply chain management (Croom, Romano, & Giannakis, 2000; Harland, 1996; Lambert, Cooper, & Pagh, 1998; Lambert & Cooper, 2000). These particular relationships also form the distinctive relationship type and structure of the suppliers-buyers network. According to the relative strength of power between the focal firm and its upstream and downstream, we classify the relationship into one of four possible types: (1) focal firm dominance, (2) upstream network dominance, (3) focal firm obedience, and (4) downstream network dominance. Each context is then examined at the upstream level, the focal firm level, the downstream level, and the network level. The network level is the aggregate of the upstream, focal, and downstream levels and includes the relationships of all network members relative to the focal firm.

A strategy is established based on these specific relationship types and their different contexts within the supply chain network. However, we seek to identify a theory for supporting and developing inter-organizational strategies that will capitalize on the benefits of the supply chain network and its unique properties to offer a sustained competitive advantage. It is important to note that strategy and management differ between a single firm and a network environment, particularly when we consider the multiple relationships and activities spanning across firms. What are the sources of advantage in the network environment, and how can one develop strategies or provide guidelines in such an environment? It is necessary to have a framework to develop strategies underpinned by these network environments. Dyer and Singh (1998) propose the relational view, which focuses on the network as an important unit of analysis for analyzing a firm's competitive advantage. The competitive advantage and resources result from an inter-organizational network. After exploring the nature of supply chain networks and the theoretical support for them, the route to achieving a cooperative strategy becomes clearer. In this study, we define the *cooperative strategy of a supply chain network* as a means to enable a given firm to attain competitive advantage with its partnering firms (i.e., upstream suppliers and downstream buyers) within a specific type of supply chain network. The competitive advantage is a supernormal profit jointly generated in cooperative partners and exchange relationships of supply chain networks. Finally, we develop a strategy for a given firm toward its partners under a particular supply chain network with the four following determinants: (1) relation-specific assets; (2) knowledge-sharing routines; (3) complementary resources and capabilities; and (4) network position.

The rest of the article is structured as follows: in Section 2, we introduce a literature review of network organization theory and network management and strategy to establish the foundations of supply chain networks. Next, in Sections 3 and 4, we further identify and analyze supply chain network types and contexts. A supply chain network strategy is developed in Section 5, based on the contexts and the relational view. The final section provides conclusions for future research.

2. Theory and background

Over the past few decades, a considerable number of studies on supply chain networks have been performed. These studies span multiple disciplines such as organizational theory, supply chain management, logistics, marketing, economics, and strategic management. The paradigm of supply chain network research, therefore, needs to be developed through multiple methodologies. Depending on the network characteristics, the management and strategy of a network must address the following questions: how to manage or cope with the supply chain network under specific circumstances (i.e., under asymmetric power conditions)? And, what sources of advantage can be derived from a network? Therefore, the exploration of network organization theory (i.e., network perspective, social network, or resource dependence theory) and network management and strategy (i.e., the relational view) can help us to understand supply chain networks.

2.1. Network organization theory

2.1.1. Network perspective

Håkansson and Snehota (1989) argue that "no business is an island," pointing out the importance of relationships and interactions between firms. The network perspective focuses, therefore, on interactions among firms, requiring firms to adopt different strategies in different relationships (Johanson & Mattsson, 1987). The network perspective has been developed mainly by the Industrial Marketing and Purchasing (IMP) group (Håkansson & Ford, 2002; Håkansson & Snehota, 1989; Ritter & Gemünden, 2003). Such a network environment contains three main elements: actors, resources, and activities (A–R–A model). The focal firm (actor) maintains different relationships through specific activities (e.g., relation-specific assets investment, knowledge-sharing routines, and complementary resources and capabilities) with upstream and downstream partners that form their own network environment and generates the network resources. Gadde, Huemer, and Hakansson (2003, p. 360) view network relationships as resources, stating that "Resources always have 'hidden' and unexploited dimensions that can be explored and developed in interaction with business partners. … This means that a business relationship is not only an important resource in itself. It can also be utilized to change the use—and thereby the value—other resources." This viewpoint helps us to develop cooperative strategies by considering valuable and limited trading partners (i.e., existing upstream and downstream relationships and types of relationships for the focal firm). The network perspective also allows us to view the network as a whole (Wilkinson & Young, 2002). Consequently, the network perspective extends our focus from the single firm to the network while also focusing on the relationships and the interactions within the network. A firm's competitive advantage comes from its relationship with its own supply chain network.

2.1.2. Social network

Social network analysis concerns social relationships among a set of actors and their relationships within a network (Burt, 1992; Lin, Cook, & Burt, 2001; Tichy, Tushman, & Fombrun, 1979). Wasserman and Faust (1995, p. 4) defined the concept as follows: actors and their actions are viewed as interdependent; relational ties between actors are channels for the transfer or flow of resources; the network structure is viewed as an opportunity or a constraint; and network models conceptualize the structure as a lasting pattern of relationships among actors. A social network can be defined and analyzed based on structural characteristics such as size, density (connectedness), centrality (e.g., closeness or peripheral), clustering (or clique), and the nature of its ties (e.g., the intensity of strength or weakness, reciprocity) (Tichy et al., 1979). For example, strong or weak ties between network members influence the degree of information asymmetry between the actors and result in constraints or opportunities for information access (Todeva, 2006). In addition, each social network can be viewed as a map of all of the relevant ties, with each tie having its own specific form or pattern. Network perspectives build on the general belief that economic actions are influenced by the social context in which they are embedded and that actions can be influenced by the positions of actors within the social network (Gulati, 1998). In short, the social network framework provides a good approach for examining the network structure and patterns.

2.1.3. Resource dependency theory

Firms often exploit their power or resources to influence other network members; in fact, this can help increase performance and can even result in a competitive advantage. If one firm is relatively

dependent upon another firm's resources, the latter firm will have a power advantage (David & Barney, 1984; Fink, Edelman, Hatten, & James, 2006; Medcof, 2001; Pfeffer, 1982; Pfeffer & Salancik, 1978). Moreover, a firm has a greater power advantage when it occupies a more dominant position relative to other firms; this power advantage results in a competitive advantage. Pfeffer (1988, pp. 26–27) has stated that:

> The fundamental units for understanding intercorporate relation and society are organization … these organizations are constrained by a network of interdependencies with other organizations … Organizations tend to comply with the demands of those interests in their environment which have relatively more power, and those inside the organization who can successfully cope with these external contingencies come to have comparatively more power within the organization.

Power is, therefore, the main determinant of an organization's relationships within a network environment. In addition, research on the relative power of firms assists us by explaining the relationships between a firm and its counterparts.

We have discussed aspects of related theories that may help us to understand supply chain networks. In sum, the *network perspective* extends our focus from the single firm to the network while at the same time focusing on relationships and interactions within the network. *Social network theory* presents a good methodology for analyzing the network's forms and patterns. *Resource dependency theory* shows how power and resources influence the relationships between firms within the network.

2.2. Network management and strategy

2.2.1. Network management

Recent research has provoked a number of interesting arguments regarding network management, driven by the business trend toward globalization and vertical disintegration. A firm cannot be isolated from its business environment. Opinions vary, however, as to how a firm *manages* or *copes* with its outside network partners. Jarillo (1988) argues that networks represent a mode of organization that allows members to gain or sustain competitive advantage vis-à-vis their competitors outside of the network. He suggests that strategic networks allow a firm to specialize in those activities in the value chain where it displays a core competence while at the same time making useful arrangements with the other members of the network (e.g., farming out complementary activities to network members based on effectiveness and efficiency). Namely, a firm can proactively *manage* (or control) a network. This contrasts with the view of *coping* within the network (Gadde et al., 2003; Håkansson & Ford, 2002). The *coping* perspective, according to Håkansson and Snehota (1989, pp. 198–199), results from the firm's "continuous interaction with other parties constituting the context with which the organization interacts, endows the organization with meaning and a role … Such a concept of enterprise could lead naturally to a shift in focus, away from the control of resources towards the integration of resources, and away from the management of acting towards the management of reacting". Harland and Knight (2001, p. 478) attempt to integrate these two schools of thought, and they propose that these two perspectives at the extreme ends of a spectrum. They state that:

> Opportunities to plan and control networks overtly and systematically might be very limited for any but the most powerful network actors. However, opportunities to influence a network in more subtle ways can reasonably be expected to be available to more actors, more often. Indeed, the prospect of an actor involved in a network seems unlikely. Where opportunities are exploited to achieve organizational objectives, then this could be termed managing the network. Typically, an organization engaging in network management would neither be controlling, nor merely coping within, the network. Controlling and coping can be seen as extreme positions on a spectrum of actor's potential behavior within a network.

We agree with this argument. The ability to manage or cope with network management issues would be influenced by a given firm and its counterparts. For example, if a firm has power over its counterparts, then it tends to manage its counterparts proactively (e.g., initiating, acting, leading, influencing, planning, strategizing and forcing). But if a firm faces powerful counterparts, it then tends to cope with these counterparts (e.g., responding, reacting, following, being influenced, coping, improvising and adapting) (Ritter et al., 2004). Essentially, the firm's behavior will be determined or constrained by its relationships with its counterparts or within a specific network type.

2.2.2. Relational view

Using the relational view, we can understand how to develop a strategy in a network environment and which sources of competitive advantage originate from cooperation within the network organization. The relational view will also help us to see how to take strategic actions to achieve advantage using these sources and using specific relationship types. The relational view stresses the value of using inter-organizational relationships to access critical network resources (Baum, Calabrese, & Silverman, 2000; Hite & Hesterly, 2001) and focuses on how a firm creates sustained competitive advantage by developing relationships with other firms in pairs or in a network environment(Dyer & Singh, 1998). This view proposes that collaborating firms will achieve supernormal returns from the following primary sources: (1) relation-specific assets, (2) knowledge-sharing routines, (3) complementary resources and capabilities, and (4) effective governance. Relation-specific assets consider that the duration of the safeguard mechanism and the volume of inter-firm transactions influence the abilities of collaborating members. Knowledge-sharing routines facilitate knowledge exchange between transactional partners by enhancing partner-specific absorptive capability as well as transparency and reciprocity. The collaborating firms generate synergy through resources and capabilities complementary with those of their partners. Effective governance, then, enhances the willingness of various parties to enter into alliances by minimizing transaction costs and maximizing value. In addition, Chen and Paulraj (2004) argue that the relational view of strategic collaboration originates from the goal of deriving mutual benefits in the network environment; in addition, the relational view supports the framework and theory of network management. Similarly, Patnayakuni, Rai, and Seth (2006) also suggest that the relational view coordinates effectively with supply chain relationship analysis and exploration. Therefore, we adopt the relational view as a foundation to support our efforts to construct supply chain network strategies.

3. The types of supply chain networks

Before further exploring the relationship types, we must consider the structure of the supply chain network. The structure is composed of three levels: the upstream network level (supply base), the focal firm level and the downstream network level (customer base) (Lambert & Cooper, 2000; Lambert et al., 1998; Wathne & Heide, 2004). The focal firm is a relative perspective, in that any company can be the focal firm; in other words, all companies, big or small, have agency and the ability to make strategic choices. The focal firm might have a different relationship with each of its suppliers or customers in terms of its trading transactions, spanning activities or relative power influence.

Classification is often used to thoroughly explore research. By classifying the subject into different subcategories, we are able to perform intensive studies on each subcategory individually. Power is often

studied when exploring mutual relationships among firms (Cox, 2001; Cox, 2004; Cox et al., 2002; Ireland & Webb, 2007; Ritter et al., 2004; Zhao, Huo, Flynn, & Yeung, 2008). Cox (2001, 2004) applies the relative strength of power between buyers and suppliers, categorizing the relationships into four types: buyer dominance, independence, interdependence, and supplier dominance. Ritter et al. (2004) explores mutually dependent relationships between firms and categorizes the perceived power relationships into followship relationships, leadership relationships, mutual relationships, or no relationship. Bensaou (1999) proposes a structure-strategy paradigm to analyze the buyer–supplier relationship through the mutual exchange of specific investments. The study depicts each relationship's structure according to product, market, and supplier characteristics. Furthermore, considering each of the above structures and contexts, the study demonstrates the strategy and management profile for each relationship.

In this study, relationship types are classified according to power. The focal firm evaluates its power relative to the upstream and downstream firms in its supply chain network. There are two dimensions: the focal firm's power (high or low) relative to its upstream, and the firm's power relative to its downstream. These two dimensions result in four relationship types: (1) focal firm dominance; (2) upstream network dominance; (3) focal firm obedience; and (4) downstream network dominance.

The four types of supply chain network relationships are presented in Fig. 1.

4. The contexts of supply chain networks

We next explore each context according to the above relationship types. The main items to analyze are the degree of concentration (e.g., fragmented industry or consolidated industry), the transactional behavior and entry barriers (e.g., switching/searching costs) and the technology and product characteristics(e.g., product life cycle and product differentiation) (Bensaou, 1999; Caves, 1992; Porter, 1980).In addition, we investigate the contexts in detail at the following four levels: (1) the upstream network level, (2) the focal firm level, (3) the downstream network level, and (4) the network level.

The upstream level consists of the focal firm's suppliers, and the downstream level represents its buyers. The focal firm level is the target firm under consideration. The network level is the aggregated view of the upstream, focal and downstream levels. The network's properties—network density, network ties, and center/periphery—are identified at the network level.

4.1. Focal firm dominance

In focal firm dominance, the focal firm takes advantage of its power over its upstream and its downstream. This situation is characterized by the following qualities.(1) There exists a high degree of industry concentration (e.g., a monopoly or an oligopoly); for this reason, the focal firm usually gains additional profits from its buyers and/or minimizes costs from its suppliers. (2) The focal firm enjoys strong power over the upstream firms because of its high market share. (3) The focal firm offers unique or highly differential technology, products, or key components to its downstream network, resulting in greater dependence by the downstream firms. (4) Finally, from the product life cycle viewpoint, the focal firm is in the growth stage and is enjoying an increase in demand.

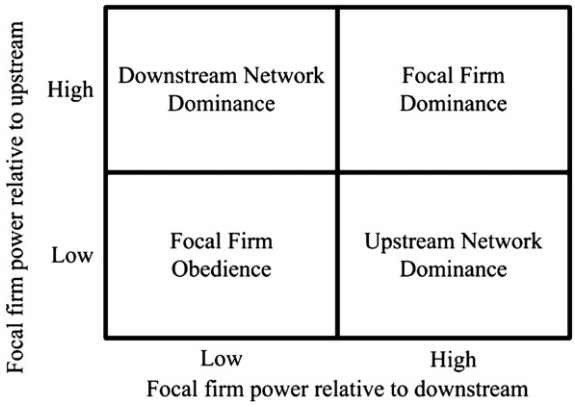

Fig. 1. The relationship types of supply chain networks.

Both the upstream and the downstream belong to fragmented industries with many small firms. Most of these firms offer homogeneous products and resources. Buyers, therefore, can easily switch suppliers due to low switching costs (i.e., the focal firm in relation to its upstream suppliers); similarly, the supplier side has low search costs (i.e., the focal firm in relation to its downstream customers).

Network form is related to the firm's profitability. Gulati, Nohria, and Zaheer (2000, p. 206) describe tie modality and profitability in the following passage:

> Network membership also influences the location of an industry in a broader network of resource flows that might influence its profitability.… Moreover, network ties to certain favorable supplier industries may preclude access by other firms or industries, and thus maintain high profits in the focal industry by imposing limits on firm entry into the industry.

The density center of the network is located in the focal firm. The focal firm plays a key role and influences all of the network members while continuing to achieve high profit or superior rents.

4.2. Upstream network dominance

Upstream network dominance occurs when the upstream firm's power is higher than that of the focal firm and the power of the focal firm is higher than that of the downstream firm. The upstream firms are highly concentrated and possess the power to influence the focal firm. In addition, the upstream firms own important property rights, key components, or critical resources and provide this advantage to their customer (e.g., the focal firm). On the other hand, these upstream firms exploit their critical resources to achieve a dominant position.

The downstream level is in the weakest position in the network and resides in a fragmented industry. There are many firms, but these firms are small and none of them can dominate the downstream market. Another potential reason for weakness downstream is when the downstream market is located in the decline stage of the product life cycle or when the market demand rapidly declines. In general, it is difficult for the downstream firms to switch their suppliers (i.e., high switching cost for the focal firm).

As the focal firm's power position is intermediate, the degree of industry concentration is also intermediate. Therefore, the focal firm experiences a high switching cost upstream and a low search cost downstream.

At the network level, the center of the network's density is located in the upstream; the downstream appears as the periphery. The upstream has strong ties with the focal firm and influences all members in the network.

4.3. Focal firm obedience

The context of focal firm obedience is opposite to that of focal firm dominance. In this scenario, both upstream and downstream firms have power over the focal firm. In this type of network, the focal firm is mainly constrained by the network's outside members. The characteristics of the focal firm are: (1) it belongs to a fragmented industry; (2) it is in a decline stage and faces decreased demand; and (3) because both the upstream and the downstream enjoy a relatively

high degree of power, the focal firm experiences high switching costs for upstream and high search costs for downstream.

The downstream firms have a power advantage over the focal firm because they have a high share of sales. In addition, the products of the downstream firms that are in the growth or maturity stage and/or with high growth in demand are strong channel leaders in the market. According to the industry structure, both the upstream and the downstream of the network may tend toward being highly consolidated industries.

The barycenter of the network is located both upstream and downstream where all of the network activities are located, and the focal firm is strongly tied and constrained by both the upstream and the downstream network.

4.4. Downstream network dominance

In the case of downstream network dominance, downstream network firms have power over the focal firm, and the focal firm simultaneously dominates its upstream network firms. Therefore, the barycenter is located in the downstream. The downstream is strongly tied to the focal firm and, furthermore, influences all members of the network. The downstream is characterized by the following traits: (1) it enjoys a high degree of prestige or a strong positive reputation; (2) it is located in a high-concentration industry and monopolizes the supply end; and (3) it possesses a high share of the sales of the focal firm. The upstream offers homogeneous resources; therefore, resources have a high degree of substitution for the focal firm, resulting in high search costs for the upstream firms. The upstream is in the decline stage. The focal firm is an intermediate concentration that experiences a low switching cost for its upstream and a high search cost for its downstream.

A summary of the supply chain network contexts is presented in Table 1.

5. The strategy of supply chain networks

Firms need to employ different strategies with different contexts and circumstances to achieve a competitive advantage (Donaldson, 2001). However, when encountering the network environment, the question becomes how to develop a proper strategy to fit not only a single firm but many firms? Furthermore, how does one generate synergy from these collaborating network partners? Dyer and Singh (1998) propose the relational view, which offers sustainable support in theory. In this paper, we use the relational view determinants to develop the network strategy.

5.1. The determinants of strategy development

The relational view may help to develop cooperative strategy in an inter-organizational environment (Baum et al., 2000; Chen & Paulraj,

Table 1
The contexts of supply chain networks.

Downstream network dominance	Focal firm dominance
1. Upstream network level — Fragmented industry — Homogeneous products or components — High search cost for focal firm – Products with high substitution for focal firm – Decline stage in product life cycle 2. Downstream network level – High-concentration or consolidated industry structure - High market share for focal firm – High growth demand – Strong brand name or channel leaders – Low switching costs for focal firm 3. Focal firm level – Low switching costs for upstream – High search costs for downstream – Intermediate degree of industry concentration 4. Network level – Center/periphery: barycenter on downstream and peripheral to upstream – Tie: downstream has strong ties to focal firm and influences the network	1. Upstream network level – Fragmented industry – Homogeneous products or components 2. Downstream network level – Fragmented industry – High switching costs for focal firm 3. Focal firm level – High degree of industry concentration – High market or sale shares for upstream – Highly differential technology, products, or critical components – Low search costs for downstream – Low switching costs for upstream – Growth stage in product life cycle – Strong brand name – Strong brand name 4. network level – Center/periphery: barycenter on focal firm and peripheral to both upstream and downstream – Tie: focal firm spans the structural holes (bridge ties) of upstream and downstream and keeps attaining high profits
Focal firm obedience	**Upstream network dominance**
1. Upstream network level – High degree of concentration or consolidated industry – Valuable intellectual property rights, key components, or critical resources – High prestige and reputation – Strong brand name 2. Downstream network level – High degree of industry concentration or consolidated industry – Strong channel leaders – High sale share for focal firm – High growth demand – High prestige and reputation or strong brand name 3. Focal firm level – High search costs for downstream – High switching costs for upstream – Fragmented industry – Decline stage in product life cycle – Products with high substitution for the customers 4. Network level – Center/periphery: barycenter on both upstream and downstream – Tie: the focal firm is strongly tied and constrained by upstream and downstream network	1. Upstream network level – High degree of industry concentration or consolidated industry – Valuable intellectual property rights – Critical components or resources – Strong brand name or high reputation 2. Downstream network level – Fragmented industry – Decline stage in product life cycle – Decreased market demand – High switching costs for focal firm 3. Focal firm level – Intermediate degree of industry concentration – High switching costs for upstream – Low search costs for downstream 4. Network level – Center/periphery: barycenter on upstream and peripheral to downstream – Tie: upstream has strong ties with focal firm and influences the network

2004; Hite & Hesterly, 2001; Patnayakuni et al., 2006). However, considering the characteristics of the supply chain network structure and strategy development, we use the social network to analyze the structure and forms of the supply chain network. Moreover, we modify the relational determinant *network position* to replace *effective governance*. The network position is combined by the original effective governance determinant and network structure. The objective of effective governance is to reduce transaction costs and enhance efficiency through the proper choice of governance structure. To reflect the network structure and environment, the network members' ties and the network's density and forms must be considered. The network position is shaped by the exchange relationships among its members and is constrained by the network settings, with each firm occupying a unique position. Different firms can apply different governance policies considering their specific network position. The four strategy determinants of supply chain networks are (1) relation-specific assets, (2) knowledge-sharing routines, (3) complementary resources and capabilities, and (4) network position. These determinants can be a useful guide for how a given firm should cooperate with its network partners. More specifically, the focal firm can exploit these determinants and cooperate with its upstream and downstream under specific relationships to achieve a competitive advantage within supply chain networks. Such a firm's determinants and critical resources extend beyond firm boundaries and generate synergies from the exchange relationships (Dyer & Singh, 1998). Next, employing these determinants, we develop a cooperative strategy for four types of supply chain networks: focal firm dominance, upstream network dominance, focal firm obedience, and downstream network dominance.

5.2. Focal firm dominance

5.2.1. Relation-specific assets

Safeguard mechanisms maintain relationships and defend against opportunistic behavior in business transactions (Léger, Cassivi, Hadaya, & Caya, 2006). When there is focal firm dominance, the focal firm proactively exploits activities to influence suppliers' relation-specific assets, thereby maintaining its resources and avoiding shortage. The focal firm manages its upstream suppliers and encourages them to invest in specific assets. However, to reduce mutual risk and opportunism, the focal firm should build long-term safeguards or contractual commitments to secure specific asset investment from their suppliers. For example, Toyota may manage its suppliers effectively and proactively by maintaining trustful, long and substantial relationships; they also maintain a relatively low number of suppliers. When a focal firm faces many small downstream customers, it should develop general-purpose relational assets to cover the most common requirements.

5.2.2. Knowledge-sharing routines

Because the focal firm is dominant in the network, it potentially has the right to build a platform or industry standard. The network members could share order tracking and production planning on this platform. Stuart (1998) argues that a focal firm with high technological prestige will develop more new technologies with its partners. For example, Toyota requires that its suppliers and dealers provide related production and sales ordering information such as demand forecasts, production planning, or inventory status to facilitate more network-wide capacity and production planning. These knowledge-sharing routines result in increased efficiency for all partners, cost reductions, enhancement of information transparency, and the building of cooperative advantages. Consequently, Toyota develops information systems (i.e., Toyota Production System), which include advanced planning systems, supply chain management information systems, and global logistics management information systems. These integrate the information activities of all of the network members. In addition, Toyota improves the capability of the entire chain by, for example, training dealers or problem-solving for suppliers. By using these types of knowledge transfers, all partners benefit from this stable network (Nishiguchi, 1994).

5.2.3. Complementary resources and capabilities

Dyer and Singh (1998, p. 667) suggest that it is valuable, rare, and difficult to imitate the number of synergy-sensitive resources owned by alliance partners. Therefore, the focal firm can adopt actions to progressively manage its network in order to attain complementary resources and enhance the network's capabilities as follows: (1) *organizational structure*, which is the design of activities that span inter-firm boundaries; (2) *expertise management teams*, which manage and facilitate partners to cooperate with the focal firm and other associates; (3) *cultural influence*, which is the influence on the network members with shared beliefs and norms; (4) *collective network*, which unites selective suppliers and customers to form an inimitable barrier to entry; (5) *control systems*, which are design systems to protect against opportunism through formal or informal self-enforcements (e.g., trust, reputation, financial investments or hostages).

5.2.4. Network position

From the social network perspective, a structural hole often arises when the upstream and downstream can only correlate with one particular firm. The focal firm, in this case, spans the structural hole to bridge the upstream and downstream, resulting in a situation with asymmetric information. De Toni and Nassimbeni (1995) have studied the stability and effectiveness of networks that are primarily dependent on the presence of a dominant barycentric player capable of developing, controlling, and managing the network relationships. The focal firm, by wielding powerful influence and enjoying a rich information position, can create a strategy as follows:(1) identify potential suppliers and customers; (2) find opportunities for forward or backward vertical integration or alliances; and (3) build substantial and trust-based relationships. This is significant, if a focal firm's taking "excessive" control over the network results in organization-wide inertia.

A summary of the strategy in the presence of focal firm dominance is presented in Table 2.

5.3. Upstream network dominance

5.3.1. Relation-specific assets

When confronting a powerful upstream, the focal firm should develop long-term safeguards to ensure stable access to resources (Léger et al., 2006). Within both the focal firm dominance and the upstream network dominance types, the focal firm tries to create long-term safeguards with its upstream firms. The major difference between the two dominance types is how proactively the firm intervenes (Harland & Knight, 2001). The focal firm adopts a proactive attitude toward its upstream under the focal firm dominance condition but a passive attitude to cope with its upstream under the upstream network dominance condition. A grains procurement and marketing company (the focal firm), for example, usually builds passive, long-term safeguards with its main grains exporters (the upstream) to avoid resource shortages. Compared with numerous fragmented wholesalers or retailers (the downstream), a grains procurement and marketing company invests more general-purpose assets to satisfy most of the grains wholesalers/retailers common requirements. By aggregating these common demands, the focal firm takes advantage of economies of scale and mass production to enhance supply efficiency. Accordingly, the focal firm focuses on the breadth rather than the depth of its linkages with downstream customers.

5.3.2. Knowledge-sharing routines

A small and disadvantageously positioned firm can use its proprietary knowledge to influence its partners. Bates and Slack (1998, p. 71) state that "small companies buying from large suppliers appear to lack power, but knowledge is power and a willingness to share

Table 2
The strategy of supply chain networks: focal firm dominance.

(e.g., suppliers ← Toyota → dealers)

Relation-specific assets	Knowledge-sharing routines	Complementary resources and capabilities	Network position
Upstream: – Build long-term safeguards or design cooperative trade mechanisms – Reduce the number of upstream suppliers – Manage the relation assets of upstream providers – Assist the upstream in investing in specific assets **Downstream:** – Invest in general-purpose relation assets to cover the most common requirements – Enlarge the volume of transactions – Aggregate the common demand of downstream firms and take advantage of economies of scale with mass production	**Upstream & Downstream:** – Offer a platform for upstream and downstream partners to collaboratively develop products – Offer mutual rich broadband communications and information for the whole supply chain network's planning, decision-making, and efficiency – Build an advanced information system to manage related information activities – Transfer the necessary knowledge and know-how upstream and downstream	**Upstream & Downstream:** – Use organizational structure, expertise management, cultural influence, collective network, and control systems progressively to manage the complementarity of the resources and capabilities of the network	**Upstream & Downstream:** – Identify potential suppliers and customers – Use opportunity for forward or backward vertical integration or alliance – Build substantial and trustful relationships – Be aware the issue of organization-wide inertia

knowledge with a supplier can be the catalyst needed to initiate trust and improve buyer–supplier relations to the benefit of both parties." In general, the upstream occupies the advantageous position of being able to develop industrial standards or platforms on the market. The focal firm may also try to join in the industry standard and develop products or services in the early stage to allow it to build more sustainable cooperative relationships with the upstream. The upstream and the focal firm share knowledge about product information, catalogs, transaction types, quality, and delivery information. To cope with its powerful upstream, the focal firm provides demand-planning information such as demand forecasts or future product mixes to assist in the upstream decision-making associated with long- or mid-term production planning.

The gains in production efficiency and product quality increase when the production and quality knowledge shared by the focal firm and its downstream are more closely related (Dyer & Hatch, 2006). The direction of knowledge-sharing routines is usually dictated by the powerful side, which asks all other sides to cope with its rules. Therefore, the focal firm may exert its power advantages to require its customers to provide demand forecasts and inventory status to benefit its production decisions and capacity planning. In addition, the focal firm should provide not only product and technology specifications but also production or manufacturing planning information (e.g., order statuses, due dates, production schedules, and capacity). These provisions result in increased frequency of knowledge-sharing and improved transparency of information by encouraging mutually enriching offers and broadband communication (Bensaou, 1999; Wagner & Buko, 2005). The focal firm can use its influence to guide activities connected with communication routines and to form common norms for knowledge sharing.

5.3.3. Complementary resources and capabilities

Firms draw on their complementary resources or capabilities (e.g., expertise management teams, organizational architectures, control systems or culture) to gain synergy with network partners and to develop cooperative resources or capabilities. With upstream network dominance, the focal firm should "proactively" possess or "manage" its capabilities with regard to the downstream firms. The focal firm draws on its expertise and capabilities to select strategic partners and manage inter-organizational activities and relationships. Furthermore, it uses culture to influence downstream firms. In terms of the complementary resource aspect, the focal firm also generates synergy by selecting strategic partners with mutually complementary resources. Doing so not only generates mutually complementary resource synergy but also reduces transaction costs between the focal firm and the downstream. Looking at the upstream network, the focal firm may improve its compatibility through harmonizing with the upstream (e.g., the focal firm adjusts the suppliers' management policies and organizational goals to cooperate with the upstream). These activities strengthen mutual relationships and cooperation.

5.3.4. Network position

Network position is a characteristic of exchange relationships in a network and a consequence of the process of establishing, maintaining, and developing exchange relationships (Johanson & Mattsson, 1992). The exchange relationships and the process define a firm's position, which represents both a constraint and an opportunity. Easton (1992) argues that history determines the current position but that the future offers opportunities for exchange; therefore, network position positively or negatively influences the relationships and performances of network members. The greater a firm's position, the more controlling, collaborating, and allying activities it coordinates with other network members (Powell, Koput, & Smith-Doerr, 1996). The focal firm occupies a better network position relative to the downstream; this constitutes an advantage and allows it to gain rich, trustworthy information from the downstream. The focal firm uses the following strategy with regard to its downstream. (1) Identify potential downstream customers. Using the rich information and social networks that result from enjoying a strong position, the focal firm can reach more downstream network firms and, furthermore, identify these potential customers. Identifying the right partners is the first step in cooperation management (Aulinger, 2003). (2) Build alliances or integrate with downstream firms. The focal firm has the opportunity to identify the right customers and exert its

Table 3
The strategy of supply chain networks: upstream network dominance.

(e.g., main grain exporter→ grain procurement and marketing company→grain wholesalers/retailers)

Relation-specific assets	Knowledge-sharing routines	Complementary resources and capabilities	Network position
Upstream: – Passively build long-term safeguard mechanisms to avoid resource shortages **Downstream:** – Invest in general-purpose relation assets – Enlarge the volume of transactions – Aggregate the common demand of downstream firms and take advantage of economies of scale and mass production to enhance supply efficiency	**Upstream**: – Strengthen and deepen bi-directional knowledge-sharing routines – Join the industrial standards of the key upstream firms – Offer production information and operational planning information for upstream decision-making as related to production planning **Downstream**: – Strengthen bi-directional knowledge-sharing routines – Increase the frequency of knowledge-sharing and the transparency of information – Offer enough product, operational, and planning information for upstream decision-making associated with long- or mid-term production planning	**Upstream**: – Increase the degree of compatibility to harmonize with the upstream – Adjust organizational goals to cooperate with the upstream **Downstream**: – Proactively possess and manage complementary resources or capabilities toward the downstream – Draw on expertise to select strategic partners and manage inter-organizational activities and relationships	**Upstream**: – Bridge upstream anddownstream – Cope with upstream governance and minimize the transaction costs – Strengthen relationships and foster an amicable atmosphere **Downstream**: –Identify potential downstream customers – Create the opportunity for alliances or integration with downstream firms – Build substantial and trusting relationships with downstream customers

powerful influence to reduce the risk of mutual opportunism and to increase goodwill and trust through cooperation. (3) Build substantial and trusting relationships with downstream customers.

Although the focal firm has a disadvantaged position in relation to its upstream, it can cope with upstream governance and minimize the transaction costs. Moreover, the focal firm bridges the downstream and the upstream in this supply chain network.

A summary of the strategy in the presence of upstream network dominance is presented in Table 3.

5.4. Focal firm obedience

5.4.1. Relation-specific assets

The duration of safeguard mechanisms and the volume of exchanges discouraging trading members' opportunism influence the ability of alliance partners to invest in relation-specific assets. Therefore, the focal firm will try to increase the duration of safeguards against opportunism and to avoid resource shortages.

In this type of supply chain network, the downstream customers are few but significant; the focal firm may invest in special-purpose relation assets for its important customers. The focal firm may also customize products or services to each vital customer to strengthen and deepen mutual relationships. In addition, the firm may cope with downstream partners and try to obtain a large volume of exchange or long-term contracts. A notebook computer ODM (own design manufacturing) can serve as an example: Quanta, a maker of laptop personal computers invests in specific production lines and builds long-term relationships with its important downstream customers(e.g., Hewlett-Packard and Acer).

5.4.2. Knowledge-sharing routines

Grant (1997, pp. 451–452) suggests that individual firm knowledge can be integrated by means of transfer, direction, sequencing, and routine. He bases this proposal on firm knowledge-based theory. Powerful upstream firms often integrate their downstream and enhance their leading position through the development of forums and platform technology. The focal firm could try to join early product development technology alliances or develop standards. The ODMs (e.g., Compal or Quanta) join in the architecture of Intel CPU development to promote total system solution design and manufacturing.

For the downstream network, the focal firm not only provides product information (e.g., product attributes, quality specifications, technology, and functionality) for its specific customers but also offers operational management information (e.g., production planning, delivery schedules, and manufacturing and process information) to help specific customers control, manage, and trace their production schedules and status. In fact, the ODMs offer their main customers control and management, starting with concept and engineering design through mass production.

5.4.3. Complementary resources and capabilities

Because the focal firm is in the weakest position, it is difficult for the focal firm to exercise complementary assets and capabilities to benefit from the network. Therefore, the focal firm may adopt two strategies. The first strategy is to modify their organizational structure, opening their structure to allow them to join boundary-spanning activities or to be considered as a selective partner for upstream or downstream firms (e.g., adjusting organizational structure and organizational culture to better engage partners or assigning specific project teams to particular customers and each important supplier). The second strategy is to fuse their culture with those of specific critical customers or suppliers. If we observe the organization of Compal or Quanta, we find that their organizational structure is designed specifically for each customer. In other words, a team works exclusively for each important customer.

5.4.4. Network position

In this network structure, the focal firm has little power or network information. It also has high search costs for its downstream and high switching costs for its upstream. Accordingly, the focal firm should strengthen its ties with its partners by seeking benevolence and goodwill,

Table 4
The strategy of supply chain networks: focal firm obedience.

(e.g., Intel → OEMs ← HP)

Relation-specific assets	Knowledge-sharing routines	Complementary resources and capabilities	Network position
Upstream: – Increase the duration of safeguards against opportunism and avoid resource shortages **Downstream:** – Invest special-purpose relation assets in important customers – Obtain a large volume of exchange or long-term contracts – Customize products or services for critical downstream customers	**Upstream:** – Join early product development technology alliances or standards – Strengthen bi-directional knowledge-sharing routines **Downstream:** – Provide product information and operational planning information to downstream customers – Assist specific customers to control, manage, and trace their production schedules and status – Transfer, recombine, or create specific knowledge for downstream	**Upstream & Downstream:** – Modify organizational structure, making it open to join boundary spanning activities – Be a candidate or a selective partner for upstream or downstream firms – Increase the complementarity of resources and capabilities both upstream and downstream –Adjust focal firm resources and capabilities to compromise with its upstream or downstream – Alter the culture to fuse with specific critical customers or suppliers	**Upstream & Downstream:** – Strengthen ties with the upstream and downstream by seeking benevolence and goodwill – Increase the chance of being exposed to the upstream and downstream – Aim for collaboration – Ally with the upstream and downstream

increasing both upstream and downstream exposure, and aiming for collaborations or even alliances with its partners. A special case arises when market information is asymmetrical. In this case, the focal firm can take an advantageous network position under the focal firm obedience condition, in which the upstream and downstream can only be connected through the focal firm. The result is a structural hole, and the focal firm can serve as a bridge to earn greater relational rent in the network.

A summary of the strategy in the situation of focal firm obedience is presented in Table 4.

5.5. Downstream network dominance

5.5.1. Relation-specific assets

When there is downstream network dominance, the focal firm may proactively possess a long-term safeguard mechanism with upstream suppliers and manage the relation-specific assets for its suppliers. For instance, Li & Fung Limited occupies 30 to 70% of the capacity of its 8000 major suppliers and simultaneously maintains its long-term safeguard mechanisms. On the downstream side, the focal firm may invest special-purpose assets in its important customers to increase cooperation throughout the value chain. Consequently, the focal firm can strengthen and maintain deep ties with its critical customers.

5.5.2. Knowledge-sharing routines

The focal firm faces powerful downstream firms, most of which dominate the main market channels or own a strong brand name among consumers. Therefore, the focal firm engages its customers and seeks to strengthen knowledge-sharing routines with each main customer. Through know-how and technology knowledge-sharing, the focal firm cooperates with its downstream customers and shortens the latter's product development time and time-to-market. The focal firm may require the upstream network to offer operational information so that it can control its own production status. Li & Fung Limited applies integrated information systems such as product development systems (e.g., Import Direct, JustWin and PDM), ordering systems (e.g., XTS) and production control systems to integrate its two-way upstream and downstream information flow, thereby reducing cost and shortening delivery times.

5.5.3. Complementary resources and capabilities

Most strategies in a downstream network dominance environment are contrasted with those in the previous example of upstream network dominance. The focal firm can proactively manage complementary resources and capabilities toward the upstream; in addition, the focal firm can increase its compatibility with its downstream. For example, the focal firm can try to become deeply involved in the operations of its downstream to improve both sides' performance levels (Singh & Power, 2009). In addition, the focal firms can adopt a strategy of co-branding with their well-known customers to promote their own position in this market.

5.5.4. Network position

With downstream network dominance, the focal firm earns an advantageous network position relative to its upstream and has a richer informational and social relationship with its suppliers. The focal firm can take the following strategic steps: (1) identify potential upstream suppliers; (2) take advantage of opportunities to ally or integrate with upstream firms; and (3) build substantial and trusting relationships with upstream suppliers. However, the focal firm possesses a weak position relative to its customers. The central objective is to determine how the focal firm can protect against the opportunism of its customers, strengthen relationships, and create an amicable atmosphere.

A summary of the strategy in a downstream network dominance situation is presented in Table 5.

6. Conclusion

Business competition has recently moved from single firms to supply chain networks (Kothandaraman & Wilson, 2001; Linton, Klassen, & Jayaraman, 2007). Therefore, understanding, managing and strategizing in the network context has become increasingly important. To develop a strategy for a supply chain network, we must first classify a supply chain network by its different relationship types and situations. As Håkansson and Snehota (1995: 18) stated, "As managerial action is guided by how situations *are framed*, the relationship perspective and the network approach are unquestionably of consequence to management. The frame of reference adopted affects the way in which the problems in different situations can be perceived and acted upon."

Table 5
The strategy of supply chain networks: downstream network dominance.

(e.g., suppliers ←Li & Fung limited ←GAP)

Relation-specific assets	Knowledge-sharing routines	Complementary resources and capabilities	Network position
Upstream: – Develop a long-term safeguard mechanism to strengthen relationships with upstream suppliers **Downstream:** – Invest in special-purpose relation assets for important customers – Strengthen and maintain deep ties with the critical downstream customers	**Upstream:** – Direct the knowledge-sharing routines upstream – Require suppliers to provide sufficient operational information for the focal firm to manage or control **Downstream:** – Transfer, recombine, or create specific knowledge for the downstream so as to shorten the product development time and time-to-market – Offer operational information for customers to control and manage production – Reduce the cost and shorten the delivery time for downstream	**Upstream:** – Proactively possess and manage complementary resources and capabilities toward the upstream **Downstream:** – Engage and increase the degree of compatibility with the downstream – Adopt co-branding strategy with well-known customers – Be a candidate or a selective partner for the key downstream customers	**Upstream:** – Identify potential upstream suppliers –Ally or integrate with upstream firms – Build substantial and trusting relationships with upstream suppliers **Downstream:** – Connect the upstream network with the downstream network – Strengthen relationships and foster an amicable atmosphere – Aim for collaboration and alliance with downstream customers

Therefore, after assessing the power of the focal firm relative to its upstream and downstream, we can classify the supply chain network into one of four relationship types: focal firm dominance, upstream network dominance, focal firm obedience, and downstream network dominance. We further explore the contexts of each relationship type at the upstream, focal firm, downstream, and network level. Finally, we develop strategies that can be applied by the focal firm toward its upstream suppliers and downstream customers in accordance with the context and the determinants of the relational view. Practice implications are gained from the strategies as follows: (1) *focal firm dominance*: The focal firm occupies the dominant position within the supply chain network; it does not use its power to compel its upstream and downstream. Instead, based on the relational view, the focal firm may try to integrate/manage its network partners and enhance all competitive advantages of the supply chain network. Furthermore, the focal firm plays an important role to lead the supply chain network to compete to another supply chain network. (2) *Upstream network dominance*: The relations are unbalance between upstream suppliers to the focal firm and the focal firm to downstream customers. The focal firm may try to strengthen the relations with its powerful upstream networks, in addition, to manage boundary-spanning activities for downstream and increase the trading efficiency. (3) *Focal firm obedience*: Differing from the focal firm dominance case, the focal firm is in the most weakness position. The major way is that the focal firm joins boundary-spanning activities and plays a complementary role in this supply chain network. By promoting the development of complementary resources and capabilities for its upstream and downstream networks would improve the importance and advantages within the supply chain network. (4) *Downstream network dominance*: The downstream network dominance case is contrasted with the upstream network dominance. The powerful downstream may take advantage in brand or channels. The focal firm complements with downstream customers' requirements and shortens products time to market, moreover, allies and secures the relations. The focal firm integrates upstream suppliers that would prevent resource shortages and result in the whole supply chain network efficiently.

Håkansson and Snehota (1989) point out three central issues in the network perspective of business strategy: organizational boundaries, determinants of organizational effectiveness, and the process of managing business strategy. Our study has responded to the main network issues and contributed to a theory of cooperative strategy development. The focal firm spans organizational boundaries, cooperates with its trading partners, and develops strategic activities within specific relationships using relational resources (relation-specific assets, knowledge-sharing routines, complementary resources and capabilities, and network position). The cooperative strategy developments are based on the network perspective and build on the relational view. The conceptual directions and strategic suggestions of this study have contributed to the fields of industrial marketing, strategic management, and supply chain management. Nevertheless, there is room for the following further research:

- *Strategic groups, entry barriers, and mobility of supply chain networks*. The firms have homogenous characteristics because they face similar situations. Namely, they are strategic groups in the field of strategic management and are categorized according to specific criteria (Mcgee & Thomas, 1986). Similarly, considering specific relationship types, we could also identify these firms as being in the same strategic group in this supply chain network. Through strategic group analysis, we are able to identify direct competitors (firms in the same group) for a given firm. Hence, we recommend that future studies explore entry and mobility barriers based on the strategic group in the supply chain network. For example: how does a firm, through partner selection, move from its existing group to its goal group? How does a firm collaborate with its trading partners to build barriers to entry against its outside competitors?
- *Extend study relationships to compound relationships*. Ross and Robertson (2007) propose that compound relationships are composed of two or more relationships between a pair of firms such as cooperative relationships (e.g., suppliers to customers) or competitive relationships (e.g. competitors to competitors). It would be valuable to extend our suggested relationships to compound relationships, which include competitors' relationships, to include the "co-opetition" strategy within the scope of the study (Brandenburger & Nalebuff, 1996). In addition, the cooperative scope could also be extended to other stakeholders.

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