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The effects of volume consolidation on buyer–supplier relationships: A study of Chinese firms

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ABSTRACT

Volume consolidation is a major consequence of supply base reduction. This study explores the relationships between volume consolidation and supply chain outcomes such as buyer coordination costs, supplier performance, buyer environment learning ability, and buyer learning from the supplier. This study also examines the effects of these supply chain outcomes on buyer satisfaction. Based on results derived from an empirical study of 398 Chinese manufacturing companies, it is found that volume consolidation enhances supplier performance, buyer learning from the supplier, and its environment learning ability. It is also determined that coordination costs negatively affect supplier performance and buyer satisfaction. Environment learning ability does not affect buyer satisfaction, while supplier performance and buyer learning from the supplier positively affect buyer satisfaction. As such, the effects of volume consolidation are not limited to enhanced supply chain performance, but also to organizational learning in the supply chain.

1. Introduction

Supply base reduction has attracted significant research interest in recent years. Researchers argue that companies can achieve various supply chain outcomes, such as supplier and customer responsiveness, reduced transaction cost, reduced supply risk, supplier innovation, and financial performance, using a limited number of suppliers (e.g., Chen et al., 2004; Choi and Krause, 2006; Goffin et al., 1997). These studies have emphasized the benefits of such reduction at the overall supply base level. Reduction of costs by handling fewer suppliers, for example, is a distinct benefit (Choi and Krause, 2006). However, little attention has been paid to the effects of supplier base reduction on the individual buyer–supplier relationship.

For a buyer, one major result of its supply base reduction effort is volume consolidation, i.e., the buyer purchases a large portion of its supply from one supplier. In a particular buyer–supplier dyad, the level of volume consolidation can be measured by the percentage of total supply that the buyer purchases from the supplier. Here we maintain that studying the effects of volume consolidation on the individual buyer–supplier relationship is critical. Specifically, when examining the outcomes of a buyer–supplier relationship, prior researchers often focus on two prominent indicators: supplier performance and buyer satisfaction (e.g., Cannon and Perreault, 1999; Mohr and Spekman, 1994; Monczka et al., 1998). However, the effects of volume consolidation extend, in fact, beyond these two indicators. Specifically, for a buyer, volume consolidation generally leads to *integration* with its suppliers (Zaheer et al., 1998). Essentially, the volume of transactions between two parties reflects the importance of inter-firm transactions, and subsequently influences efficacy of inter-firm coordination (Buvik and Gronhaug, 2000a). That is, repeated, high-volume business transactions generate mutual dependence between two parties. This dependence, in turn, motivates companies to integrate activities across partners and supply chains to effectively deliver product to the market (Choi and Krause, 2006; Das et al., 2006; Handfield, 1993). Under these circumstances, integration between trading partners is expected.

Therefore, we argue that successful volume consolidation should allow a buyer to achieve various benefits of inter-organizational integration. Following this logic, one should study the effects of volume consolidation in terms of the benefits of inter-organizational integration. Thus, two questions arise: (1) What are the major dimensions of integration? (2) What are the major benefits offered by these integration dimensions?

Adapting Jaspers and van den Ende's (2006) dimensions of integration, we first argue that the major dimensions of inter-organizational integration include task integration, coordination

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integration, and knowledge integration. Next, four supply chain outcomes are identified as the indicators of outcomes of the three dimensions. They are supplier performance, buyer coordination costs, buyer learning from the supplier, and buyer environment learning ability. Subsequently, we maintain that these outcomes also constitute major benefits of integration associated with volume consolidation. We then study the relationships between volume consolidation and the four outcomes. In addition, we examine the effects of the four outcomes on buyer satisfaction, which is a reflection of assessment of the value that it receives from the supplier (Zaheer and Venkatraman, 1995). Thus, buyer satisfaction is a critical indicator of *overall* success of the buyer–supplier relationship.

This study contributes to supply chain management literature in a unique way. While prior studies focus on the antecedents and overall effects of supply base reduction (e.g., Chen and Paulraj, 2004; Ogden, 2006), we focus on its various effects on organizational learning, as well as on overall relational performance and coordination costs at the level of individual buyer–supplier dyads. Specifically, we extend the existing literature by exploring different supply chain outcomes of volume consolidation, to include its effects on an organization's learning ability. Our empirical findings indicated that, contrary to the suggestion of some prior studies (e.g., Das et al., 2006), integration between two independent companies may enhance their ability of learning from their environment. Our results also indicate that volume consolidation enhances buyer learning from the supplier. As such, from a buyer's perspective, volume consolidation not only improves supplier performance, but also provides strategic advantages in terms of organizational learning. Thus, our findings enhance our understanding of learning among supply chain members.

The next two sections of this paper present our conceptual framework and research hypotheses, followed by research methodology and findings. The remaining sections provide the implications of our findings, limitations of the study, future research directions, and conclusions.

2. Literature review

2.1. Volume consolidation as an indicator of integration

Traditionally, research on transaction cost analysis (TCA) and supply chain management has regarded volume consolidation as an indicator of the integration level between two parties (e.g., Buvik and Gronhaug, 2000b; D'Aveni and Ravenscraft, 1994; Horwitch and Thietart, 1987; Novak and Eppinger, 2001; Zaheer and Venkatraman, 1995). In the case of vertical integration through ownership, a high degree of volume consolidation can result in economies of integration by reducing transaction costs such as finding, selling, negotiating, contracting, monitoring, and resolving disputes with other firms in the open market (D'Aveni and Ravenscraft, 1994). Arguably, one could find similar effects in a buyer–supplier dyad with volume consolidation, or quasi-integration. The concentration of transaction volume reduces costs, such as those associated with finding and selling to new trading partners. Furthermore, as volume consolidation increases dependence between two parties, they tend to develop a collective structure of inter-organizational action (Handfield, 1993). Accordingly, cooperative norms could be established in the relationship (Cai and Yang, 2008), motivating companies to compromise during the processes of negotiating, contracting, and dispute resolution. Furthermore, companies tend to communicate with each other frequently in such cases (Handfield, 1993), which makes it relatively easy for the parties to monitor each other's performance.

In sum, volume consolidation serves as an alternative governance mechanism to vertical integration, as it promotes cooperative norms and coordination between trading partners, and reduces transaction costs (Cai et al., 2009; Handfield, 1993; Zaheer and Venkatraman, 1995). Following Zaheer and Venkatraman (1995), we maintain that volume consolidation reflects the level of integration between two parties. Consequently, it has the potential to influence various aspects of the buyer–supplier relationship.

2.2. The consequences of volume consolidation

As mentioned earlier, volume consolidation often leads to integration between two parties. Jaspers and van den Ende's (2006) posit four dimensions of vertical integration between two parties: (1) ownership integration, referring to the extent to which the component supplier is owned by the buying firm; (2) task integration, considering the degree to which the focal firm performs the upstream tasks required to develop and produce the component; (3) coordination integration, which refers to the intensity of information exchange between the focal firm and the component supplier; and (4) knowledge integration, referring to the extent to which the focal firm possesses the knowledge required to develop and produce the component.

In the current study, we exclude the level of ownership integration when examining the effects of volume consolidation and its associated integration. We do so for the following reasons. While ownership could be a critical dimension of vertical integration, recent studies seem to suggest that volume consolidation may not necessarily lead to ownership (Heide, 2003; McCutcheon and Stuart, 2000). As mentioned earlier, volume consolidation leads to interdependence between organizations. Classical TCA theory posits that, given volume increase between organizations, companies may tend to utilize vertical integration, or hierarchy, in order to control growing risks in the relationship (Williamson, 1981). Yet, recent studies argue that vertical integration through ownership may not be either feasible or desirable at times, thus quasi-integration without ownership may be needed (Heide and John, 1990; McCutcheon and Stuart, 2000; Zaheer and Zaheer, 2006). Quasi-integration allows firms to achieve benefits from a relational buyer–supplier exchange as in the case of vertical integration (Cousins and Menguc, 2006; D'Aveni and Ravenscraft, 1994; Frohlich and Westbrook, 2001; Handfield, 1993; Kulp et al., 2004). Volume consolidation may not necessarily result in vertical integration, and thus ownership may not be a necessary outcome of such consolidation. Note that Jaspers and van den Ende's (2006) framework is developed for vertical integration (hierarchy), while the current study focuses on integration between two independent firms. We therefore decide to exclude ownership integration to reflect the proper nature of this study.

In contrast, since both vertical integration and quasi-integration should result in similar coordination and collaboration between two parties, all three remaining dimensions of integration could be applied to either vertical integration or quasi-integration. The outcomes of these dimensions may define what companies could achieve from buyer–supplier integration. Thus, effects of these three types of integration could be regarded as outcomes of inter-organizational integration. The foregoing reasoning provides preliminary answers to our questions.

3. Hypotheses

In this paper, we study the outcomes of volume consolidation based on the three aforementioned dimensions of buyer–supplier