



Choice of supply chain governance: Self-managing or outsourcing?



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ABSTRACT

As the outsourcing of key supplies and business processes becomes increasingly popular, the effective management of the outsourced business functions is of critical importance in supply chain management. Instead of managing all supply chain activities by themselves, many firms have chosen to transfer the governance of certain supply chain processes to third parties for lower cost and better service levels. This paper addresses the selection of the supply chain governance mode between self-managing and outsourcing from the perspective of the focal companies. To facilitate the decision-making process, we develop a model to investigate supply chain performance where knowledge transfer and compliance effort are two determinant factors. Mathematical properties related to the existence, uniqueness, and monotonicity of the model solution are derived. The results show that the optimal governance mode of the supply chain depends on the characteristics of the chain. Specifically, outsourcing to a third-party can function well only if the external coordinator can ensure low knowledge transfer cost along the supply chain. Self-managing by the focal company is preferred if the company can keep the cost of the compliance effort low.

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1. Introduction

The past few decades have witnessed a dramatic shift in the manner of conducting business. National economies have become increasingly interdependent, incurring tremendous pressure on companies to maximize productivity and profitability. Such a pressure has caused many firms to shift from hierarchical, integrated supply chains to strategic partnerships with external entities, and resulted in a dramatic change of the supply environment (Zineldin and Bredenlow, 2003). Many critical business processes and value chain activities, that had previously been performed internally, are now shifted to outsourcers thousands of miles away for responsiveness or cost reduction (Nieminen and Takala, 2006). Today, creating value through outsourcing has emerged as a popular competitive strategy for many a firm.

With the growing level of complexity tied to outsourcing and especially offshore outsourcing, many companies have resorted to outsourcing their supply chain management (SCM) functions partly or entirely. Such a type of outsourcing can be viewed as a form of business process outsourcing, which has grown rapidly since the early 2000s (Kotabe and Mudambi, 2009). Currently,

there are various types of SCM outsourcing, such as procurement outsourcing, third-party logistics, and the neutral third-party governance covering the entire supply chain. Procurement outsourcing is the transfer of specific key procurement activities related to sourcing and supplier management to a professional third-party. Most providers of such services are specialized in IT services and normally manage one or a few sections of the procurement process of their client firms (Staff Journalist, 2009). In contrast, third-party logistics is the outsourcing of part or entire logistics functions of a focal firm to a third-party logistics service provider (3PL) (Hertz and Alfredsson, 2003). Neutral third-party governance, sometimes classified as a type of third-party logistics, is more complex as the chain governor coordinates the entire supply network and aligns the incentives for all the actors (Bitran et al., 2007).

A distinct advantage of SCM outsourcing over the traditional self-managed supply chain is cost reduction through utilizing (i) the third-party's demand pooling; (ii) expertise in SCM; and (iii) sophisticated operational or technology infrastructure. Further, the focal firm can also save the cost of setting-up and maintaining an internal SCM department and thus tighten its focus on core competencies (Staff Journalist, 2008). On the other hand, some controversies have also arisen surrounding the sustainability of outsourcing critical supplies and processes. Some offshore outsourcing arrangements seem unable to sustain an organized cultivation of value (Bielski, 2006; Shahani, 2007).

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While the procurement outsourcing market has been described as being on the verge of a major expansion a number of times in recent years, the promised boom has yet to materialize, and full-scale supply chain coordinators are even rarer (Staff Journalist, 2009).

The management of outsourcing becomes a critical issue to manufacturers for quality control and chain coordination in SCM (Youngdahl et al., 2008). For instance, a manufacturer facing a complex and fragmented supply chain needs to decide whether to outsource the governance of its supply chain partly or entirely. If the SCM outsourcing scenario is adopted, the firm is then required to set proper criteria to choose third-party coordinators which is of pivotal importance. While some studies have addressed the performance impact of outsourcing from practical and empirical points of view (e.g., Hsiao et al., 2010; Tjader et al., 2014), there has been little study to tackle this issue from a theoretical perspective. In this paper, we investigate SCM outsourcing via a mathematical model to explore the association between the scope of outsourcing and firm performance. Specifically, a model is developed to find the optimal supply chain governance mode, where two parameters, *knowledge transferred* and *compliance effort*, are introduced in the model to reflect the relative benefits and costs of SCM outsourcing. Under some mild assumptions such as the Inada conditions for the performance level function under consideration, nice properties including the existence, uniqueness, and monotonicity of the optimal solution are derived under both linear and nonlinear cost functions. From which, we derive an outsourcing governance mode matrix to aid firms in their outsourcing decisions. The obtained results will complement and benefit the current field of outsourcing management both academically and practically.

The rest of this paper is organized as follows. Section 2 reviews the literature on outsourcing governance as well as some contemporary business practices. A quantitative model is established in Section 3. Section 4 examines the properties of the model, followed by an illustration using the Cobb–Douglas production function. Section 5 discusses the managerial implications of our model. Section 6 concludes the paper.

2. Literature review

In a typical supply chain, one focal manufacturer procures supplies from multiple suppliers and sends its products to multiple customers. With globalization, the suppliers and customers could be located in far away countries, and the manufacturer needs to find effective ways to manage the flow of goods along a disintegrated and dispersed supply chain. When the firm further outsources the management of the supply chain, it can choose to outsource part of the procurement processes, the logistics of its supplies or end-products, or the entire supply chain of certain products.

There are two different types of procurement outsourcing: direct procurement outsourcing and indirect procurement outsourcing. Direct procurement outsourcing includes all goods purchased which then directly enter into the production process of the company, while indirect procurement outsourcing are all the goods and services that are bought by the company to enable its activity. Indirect procurement outsourcing is gaining greater acceptance as many companies have to procure various services ranging from office services to IT services sourcing. The lack of knowledge in areas that have traditionally been outside the scope of the procurement department makes outsourcing an attractive option. This could eke benefits such as better leverage, expert negotiators, and smaller headcount (Staff Journalist, 2008). For example, British Petroleum (BP), the energy giant, signed a

five-year £150 m contract with two service providers as global partners to procure software licences, servers, PC commodities and maintenance across Europe and the US respectively in 2010. BP expects to save more than £20 m over the next five years by reducing the supply base from 540 to 2 (Kunert, 2010).

Compared to procurement outsourcing which only started in the 2000s, the history of third-party logistics (3PLs) is longer. For instance, the outsourcing of distribution activities, such as warehousing and transportation operations, is now prevalent in many manufacturing firms (Hertz and Alfredsson, 2003). Following the recent trends of globalization and specialization, companies have outsourced not only traditional distribution activities but also managerial activities related to the flow of goods, as well as certain production activities to the 3PLs. At the same time, 3PLs have developed their capabilities in terms of broader service offerings and customized solutions adapted to specific customers or customer segments. Hence, for many companies, major parts of a supply chain are located outside their borders and not executed by the companies. It is even argued that some 3PLs act as consultants or even substitute for manufacturers in the design and management of their supply chains, often called fourth-party logistics (4PLs), as supply chain coordinators (Fulconis et al., 2007). However, contrary to expectation, it is reported that a higher level of outsourcing may not lead to better firm performance (Hsiao et al., 2010).

Some successful third-party coordinators, like UPS and FedEx, have helped their clients in the electronics industry to manage their outbound logistics (Bitran et al., 2007). However, most 3PLs are not full-scale chain coordinators in general, and are seldom involved in supplier selection and monitoring. One full-scale third-party coordinator is Li & Fung, a Hong Kong-based company which serves private label apparel firms in Europe and North America. It is known to operate as a “smokeless” factory by maintaining a large network of suppliers even though it does not own any of the factories. After receiving an order from its customer, Li & Fung dissects the manufacturing process for the order and allocates the work to its supply chain partners around the world, and it will also coordinate and manage the logistics and transportation of the supply chain. By using its buying power and trust developed with its supply base, Li & Fung is able to considerably shrink the delivery cycle of time sensitive products (Fung et al., 2008).

Apparently, there are benefits from third-party governance, but it is rare that supply chains are fully governed by third-parties in the corporate world. Few studies have examined factors, such as the capability limitation of third-parties, as the reason for the low adoption. Hertz and Alfredsson (2003) pointed out that third-parties equipped with the ability of problem solving and customer adaptation are better able at coordinating supply chains. Further theoretical and empirical examination on the issue are needed for a better understanding of third-party governance implementation and SCM outsourcing.

Motivated by the above observations, this paper conducts an analytical examination of SCM outsourcing using concepts in strategic management. Specifically, we treat SCM outsourcing as a *buy* decision in SCM, similar to the conventional outsourcing which is a *buy* decision in corporate strategy. On the other hand, it is known that the *make-or-buy* problem is a fundamental issue in strategic management (Rumelt et al., 1994). Two relevant management theories, transaction cost economics (TCE) and resource-based view (RBV), are commonly-used tools to tackle the *make-or-buy* problem. Briefly, TCE, focusing on cost, examines the effect of transaction characteristics such as uncertainty and asset specificity on the associated governance costs. This theory thus examines how the *make-or-buy* decision magnifies or diminishes such an effect (Williamson, 1981, 1991). From another lens, RBV looks at the partners’ technical capabilities and the potential synergies

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