

Vertical integration in supply chains: driving forces and consequences for a manufacturer's downstream integration

Wei Guan and Jakob Rehme

Department of Management and Engineering, Linköping University, Linköping, Sweden

Abstract

Purpose – Strategic concentration is a key issue for manufacturing companies when designing a supply chain. As a corporate strategy and a supply chain governance strategy, vertical integration relates to organisational economics and strategic supply chain management. Numerous explanations have been created for vertical integration, and transaction cost economics (TCE) provides a theoretical basis to help understand the process. However, the current popularity of vertical integration seems inspired by something more than altering industry structure and minimising cost, which are the traditionally accepted explanations for vertical integration. This paper aims to explore the driving forces for vertical integration, particularly downstream integration of distribution, and the consequences of vertical integration in a manufacturer-distributor-reseller chain.

Design/methodology/approach – This study adopted an exploratory case study approach to examine a Swedish-based timber manufacturer that vertically integrated a distribution centre in the UK, which made it a direct supplier to DIY retailers and builders' merchants. Data were collected primarily through open-ended, face-to-face interviews.

Findings – The study found that the most important factors driving the manufacturer's vertical integration of distribution were the demands of large retail chains and the manufacturer's decisions to focus on developing its positioning strategy in the supply chain. Vertical integration has transformed the manufacturer into a supplier to large timber products resellers, offering the firm a greater potential to provide integrated solutions and, therefore, become a strategic partner to its customers.

Originality/value – This empirical study examined a building material distribution channel, a subject that has rarely been studied. Study results add empirical evidence to explanations and impacts of vertical integration, especially the integration of customer interface.

Keywords Vertical integration, Supply chain integration, Downstream integration, Building materials, Retailing, Merchanting, Vertical marketing, Sweden

Paper type Research paper

Introduction

Supply chain integration is a frequently examined topic in the supply chain management (SCM) literature. In order to grow – and sometimes to survive – companies must make wise decisions regarding appropriate governance models for efficient supply chains. This involves considering everything from open spot markets; hybrid forms including collaboration, alliances, and joint ventures; to contracting and full vertical integration (e.g. Hobbs, 1996). Vertical integration has attracted a great deal of research attention from multiple disciplines, and strategic management and organisational economics researchers have made significant contributions toward understanding this concept (Mahoney, 1992). The SCM literature views vertical integration as one extreme of vertical coordination of supply chains (e.g. Hobbs and Young, 2000), or as a precursor to supply chain integration (e.g. Stonebraker and Liao, 2006).

Strategic concentration in supply chains marks a key issue for manufacturing firms. Vertical integration means some companies, such as the Spanish clothier Zara, owning nearly the entire supply chain, from design and production, to distribution and logistics, to stores worldwide. Zara's retail clothing peers, such as Benetton, The Gap, and Hennes & Mauritz, continue to rely on outside production partners through complete or strong outsourcing (Ferdows *et al.*, 2004).

Many researchers herald the role of integration as the most important aspect of well-functioning supply chains (e.g. Richey *et al.*, 2009). Simultaneously, the current prevalence of outsourcing has forced many supply chains to become more specialised, making integration across company boundaries even more important. Some theorists even believe outsourcing *per se* can increase the efficiency of supply chains (Kroes and Ghosh, 2010). Although outsourcing is prevalent in certain industries and segments, it has been argued that different economic and technological circumstances require distinct supply chain governance strategies (Grossman and Helpman, 2002; Rothaermel *et al.*, 2006). In fact, the outsourcing of the buying firm can be seen as the downstream

The current issue and full text archive of this journal is available at www.emeraldinsight.com/1359-8546.htm



Supply Chain Management: An International Journal
17/2 (2012) 187–201
© Emerald Group Publishing Limited [ISSN 1359-8546]
[DOI 10.1108/13598541211212915]

Received: 8 February 2011
Revised: 25 May 2011
10 August 2011
Accepted: 6 November 2011

vertical integration of the supplying firm, in which the vertical integration results from the customer's outsourcing strategy. However, this paper focuses on a manufacturer's deliberate strategy to integrate vertically downstream.

Downstream integration plays an important role for manufacturing firms in several ways. First, it can help firms to secure the distribution channels of their products, especially in markets with increased uncertainties (Rangan *et al.*, 1993). Second, it can offer a way to control efficiency gains and cost reductions in the supply chain (Frohlich and Westbrook, 2001). And third, downstream markets can offer important benefits in addition to large new sources of revenue (Wise and Baumgartner, 1999). In order to capture the value downstream, manufacturers need to expand their focus from operational excellence to customer allegiance and rethink the meaning of vertical integration (Wise and Baumgartner, 1999). This study sheds light on this type of strategy by exploring the driving forces for and consequences of manufacturing firms' downstream vertical integration strategy.

In particular, this study seeks to explore the following questions:

- What are the driving forces for manufacturers' vertical integration of distribution?
- What are the consequences of manufacturers' vertical integration of distribution?

This paper will contribute to the SCM and vertical integration literature in three ways. First, it will focus on downstream integration of distribution, whereas the existing SCM literature has focused largely on studying "make-or-buy" decisions, which concern whether to integrate backwards (Lafontaine and Slade, 2007). Downstream integration has received little attention in supply chain research.

Second, this paper intends to identify the driving forces for vertical integration with a particular emphasis on the SCM perspective. Although there are many explanations for vertical integration (e.g. Balakrishnan and Wernerfelt, 1986; Bain, 1968; McDonald, 1985; Williamson, 1985), most of these arguments were formulated between the 1960s and the late 1980s using transaction cost theory to explain vertical boundary choice (Mahnke, 2001). Thirty years later, it is worth asking whether these explanations are still relevant in today's business environment. For instance, Osegowitsch and Madhok (2003) argue that recent cases of vertical integration indicate that explanations such as market power, monopoly profit, and transaction cost are increasingly seen as insufficient to explain current vertical integrations strategies, especially for those companies that move down to the customer interface. Moreover, Grossman and Helpman (2002) argue that economic theories have focused on the bilateral relationship between a producer and a potential supplier in explaining vertical integration while neglecting the interdependence among various firms in an industry. Therefore, examining vertical integration from an SCM perspective reflects the recent trends and should add insights to existing vertical integration research.

Third, current SCM literature agrees that a company's position in the supply chain is an important strategic aspect (e.g. Harland, 1996; Lambert and Cooper, 2000), because it relates to appropriating value for the company by participating in a supply chain (Cox, 1997). This paper will

contribute to this issue by analysing the impact of downstream vertical integration on supply chain positioning of manufacturing companies.

The paper is organised as follows. The next section briefly describes and compares the existing literature regarding two distinct perspectives of business integration:

- 1 vertical integration; and
- 2 supply chain integration.

Next, it develops a framework for understanding the driving forces for and consequences of vertical integration, while illustrating its research design and methods. Implications derived from the analysis will then be discussed, and an examination of the study's limitations and possible future research in this area will then conclude the paper.

Theoretical background

Different perspectives of business integration

A great deal of research has been done on the importance of integrating suppliers, manufacturers, distributors, and customers (e.g. Clinton and Closs, 1997; Reck and Long, 1988; Rudberg and Olhager, 2003; Stevens, 1989; Troyer and Russell, 1995). Researchers have employed several different approaches to examine these issues, including SCM (e.g. Lambert *et al.*, 1998), process engineering (e.g. Birou *et al.*, 1998) and supplier/customer involvement in new product development (e.g. Petersen *et al.*, 2005). In addition to the SCM literature, research in two other major fields – i.e. strategic management and organisational economics – has contributed significantly to the understanding of business integration.

The strategic management and economic perspective: vertical integration

A classic definition of vertical integration based on its application to large corporations (Stonebraker and Liao, 2006) suggests that it involves "a variety of decisions concerning whether corporations through their business units should provide certain goods or service in-house or purchase them from outsiders instead" (Harrigan, 1985, p. 397). Vertical integration can be also described as the overall scope of different business activities in a supply chain brought under the management of a single company (Majumdar and Ramaswamy, 1994). It can be realised through two approaches:

- 1 vertical financial ownership; and
- 2 vertical contracts.

Vertical financial ownership eliminates company boundaries through mergers and acquisitions, while vertical contracting, which includes exclusive dealing, resale price maintenance, and exclusive territories, offers a viable alternative to vertical financial ownership (Mahoney, 1992). According to Klein (1988), by shifting the ownership of an organisational asset, vertical integration can imply an increased ability to direct cooperating inputs compared to a long-term contractual arrangement. However, most theories of vertical financial ownership are more accurately described as theories of vertical integration strategy (Mahoney, 1992).

Driving forces for vertical integration

Research in a variety of fields, including economics, marketing, law and strategic management have produced theoretical rationales for vertical integration. Mahoney (1992)

concludes that the driving forces for vertical integration in strategic and economic theories can be classified into four categories:

- 1 transaction cost considerations;
- 2 strategic considerations;
- 3 output and/or input price advantages; and
- 4 uncertainties in cost and/or prices.

Majumdar and Ramaswamy (1994) organise the rationales for vertical integration into two major theoretical frameworks: traditional and transactional. The traditional framework views vertical integration as a response to technological and operational interdependencies between two successive stages of the activity chain (Bain, 1968; Chandler, 1977). The transactional framework states that an integrated firm will do better than its non-integrated competitors if high profits can be found in the supply chain (Klein *et al.*, 1978; Williamson, 1979).

A response to relatively high costs of market exchange is the most cited reason for vertical integration (McDonald, 1985). Adelman (1955) writes that every firm must choose between make or buy, sell or process further. The decisions depend upon the particular economies of each course of action (Adelman, 1955). In imperfect markets, transactions become costly when exchanges involve transaction-specific investment (Levy, 1985). Transaction costs may arise because of the expenditure of time and resources in identifying suitable trading partners, specifying product quality, gathering price information (Hobbs and Young, 2000), negotiation of contracts, and monitoring of performance (Majumdar and Ramaswamy, 1994). Therefore, the basic rationale for bringing various business activities under one umbrella is to lower marginal costs of intra-firm compared to the cost of managing contracts (Williamson, 1971, 1975). In other words, through vertical integration, a firm can use administrative direction to replace the bargaining of the market (Adelman, 1955), and the incentive of a bargain is restrained bureaucratically (Balakrishnan and Wernerfelt, 1986). In addition, by integrating forward, a monopolist can convert efficiency loss in two successive stages into profit, thereby expanding its input use to an optimal level (Vernon and Graham, 1971; Warren-Boulton, 1974).

From a strategic perspective, vertical integration can implement entry barriers for competitors and lead to excess profits. By integrating into additional stages of products, manufacturers raise the capital requirements for entrants (Balakrishnan and Wernerfelt, 1986). Similarly, Waterson (1993) argues that vertical integration can increase rivals' costs or leave the market thin, thereby restricting the expansion of competitors. Also, vertical integration is also viewed as a strategic response to monopoly market power (McDonald, 1985). If there are variable proportions between input and output, then integrating between two successive monopolies maximises joint profits (Majumdar and Ramaswamy, 1994).

Williamson (1985) argues that uncertainty plays a key role in forward vertical integration. In a distribution channel, uncertainties can exist with respect to many marketing activities, including sales targets and promotional activities. The transaction cost analysis (TCA) approach points out that a proper reaction to uncertainties is to internalise the transaction (John and Weitz, 1988). There are two reasons for this. First, vertical integration allows sequential decision-making to proceed more smoothly, and second, the authority

structure formed by vertical integration permits faster resolution of conflicts (John and Weitz, 1988). Barrera-Rey (1995) adds that forward integration by manufacturers may also be driven by the separation of downstream markets for the purpose of price discrimination, which could happen in the case of a monopoly selling to two industries.

The literature has identified two interrelated forms of vertical integration: forward and backward integration (e.g. Barreyre, 1988; Rangan *et al.*, 1993). However, recent cases of vertical integration, especially forward integration into customer interfaces, might be driven by factors not addressed in traditional explanations (Osegowitsch and Madhok, 2003). The present paper summarises most of the driving forces for vertical integration mentioned in the literature – except for transactions cost and bilateral monopoly considerations – and presents them in Table I.

Consequences of vertical integration on suppliers and their customer interface

The consequences of vertical integration have been examined based on market power (e.g. Hastings and Gilbert, 2005; Normann, 2009) and market outcomes, such as the price of a final product and product quality (e.g. Arya *et al.*, 2008; Matsubayashi, 2007). This study focuses on the consequences of vertical integration on a company's position in a supply chain, which is important because it determines the company's required resources, capabilities and competitive advantages (Nicovich and Dibrell, 2007).

From a company perspective, supply chains can be divided into upstream and downstream (Galbraith and Kazanjian, 1986; Nicovich and Dibrell, 2007). According to Nicovich and Dibrell (2007), organisations whose activities are centred in either upstream or downstream chains differ greatly in terms of the factors for success. Upstream competitors are closer to the material end of an industry's supply chain, and thus value is added by transferring raw materials into standardised commodities. Competitive advantages likely involve process- and cost-oriented mechanisms that facilitate the achievement of a low-cost position (Nicovich and Dibrell, 2007).

In contrast, downstream actors are closer to the final consumption of products and services, and value is added through advertising, product positioning, and marketing channels. Therefore, downstream organisations are characterised as having the ability to produce products that meet diversified needs (Nicovich and Dibrell, 2007). Downstream integration gives manufacturers control over how products are marketed. However, manufacturers might take the risk of bearing distribution and selling expenses (McGuire and Staelin, 2008). Cox (1999) argues that it is best to be in a position of power over all others in the supply chain relationship.

The supply chain management perspective: supply chain integration

SCM has been described as the integration of all value-adding business processes from raw material extraction to the consumption of products by end users (Cooper *et al.*, 1997; Wisner and Tan, 2000). Supply chain integration is related to coordination mechanism and especially implies that business should be streamlined both within and outside the company (Cagliano *et al.*, 2006).

The challenges with supply chain integration involve internally integrating cross-functional business processes within a company and externally integrating material and

Table I Driving forces for vertical integration of distribution

Driving force	Explanation	Source
Technical complexity	High penetration rates and longer product life spans make the number of products in use relatively larger than the number of products sold in any year. Therefore, a significant portion of value-added activities has shifted away from manufacturing towards maintaining and servicing existing products	Osegowitsch and Madhok (2003)
Differentiation	The use of distribution services for product differentiation is especially necessary for products that are not easy to differentiate by their own attributes, either because of a lack of physical differences or because consumers do not perceive any significant differences	Etgar (1978), Osegowitsch and Madhok (2003)
Higher margin	Downstream markets offer important benefits such as large new sources of revenue and require fewer assets than product manufacturing	Wise and Baumgartner (1999)
Strategic partnership with customers	Service offerings in the customer interface provide supplier with a powerful means of retaining and expanding business with their most valuable customers. This creates potential opportunities for companies to become more strategic business partners with customers, thereby improving customer retention	Anderson and Narus (1995)
Customer demand of integrated solutions	Customers concentrate more on their own core competencies and increasingly rely on their suppliers to provide solutions that can be integrated into businesses processes	Osegowitsch and Madhok (2003)
Synergies	Powerful synergies can be obtained by supplier penetration into customers' decision-making processes. For example, by getting involved in customers' inventory management, suppliers have access to more timely and accurate information of demand. Lead-time may be used to change manufacturing plans	Osegowitsch and Madhok (2003)
Learning	Downstream integration facilitates suppliers' access to both information and knowledge about customers. This knowledge extends beyond insight into what customers want to an in-depth understanding of why particular offerings are seen as desirable by the customer, how best to provide them, and what future offerings might look like	Osegowitsch and Madhok (2003)

information flows across actors in the supply chain (Lambert *et al.*, 2005; Richey *et al.*, 2010). External integration involves coordinating and integrating the forward physical flow of deliveries to customers and the backward flow of materials and information from manufacturers to suppliers (Martin, 1992; Saunders, 1997; Trent and Monczka, 1998). Romano's (2003) review identifies four types of integration in supply chains:

- 1 functional;
- 2 logistical;
- 3 informational; and
- 4 process.

Stonebraker and Liao (2006) argue that, in management theory, vertical integration is a precursor to supply chain integration; therefore, it is no surprise that these two concepts share a number of characteristics. However, two distinctions should be recognised. First, transaction cost economics (TCE) provides the theoretical basis for vertical integration (Hobbs and Young, 2000), while the theory of industrial dynamics supplies the foundation for supply chain integration (Chen and Paulraj, 2004). Second, the primary integrating mechanism in supply chain integration is considered to be cooperation and coordination rather than ownership (Lee and Ng, 1997; Stock *et al.*, 1998).

Driving forces for supply chain integration

The driving forces for creating supply chains where the members are strategically, operationally, and technologically

integrated stem from two sources: external pressure and potential benefits from supply chain alignment (Fawcett *et al.*, 2008). Chen and Paulraj (2004) conclude that environmental uncertainty, customer focus, and information technology form the three key external forces driving the development of SCM. Simatupang and Sridharan (2004) stress that intensified competition in slower growth markets can stimulate supply chain integration. Mehta (2004) believes that advances in technology and increased customer demand have been driving integration both within and across company boundaries. Cook and Garver (2002) write that integration can be sparked by the desire to satisfy diverse customer needs while maintaining lower costs.

Potential benefits from successful supply chain collaboration provide the second main source of driving forces. The goal of supply chain integration is typically to achieve lower costs and/or better services (Troyer and Russell, 1995). Simatupang *et al.* (2002) add that supply chain integration is the key to obtaining the necessary flexibility so that firms can progressively improve the logistics process in response to rapidly changing market conditions. A properly managed relational integration can lead to collaborative planning, reduced inventories, lower distribution and transportation costs, and improved cycle times and customer services levels (Richey *et al.*, 2010).

Some factors common to both vertical integration and supply chain integration include customer demand, advanced technology, and intensified competition, although they are

formulated differently. For example, technical complexity in Table I means high-tech products have longer life spans and require intensive maintenance and support services, thereby creating new sources of revenue. Increased technical complexity is a reflection of progression of technologies in manufacturing, information sharing, and communication. What's more, differentiation and higher margins are viewed as forces driving companies to vertically integrate forward. The lack of product differentiation and low margin are results of intensified competition in the market place, which is identified as one of the driving forces of supply chain integration.

By contrasting and synthesising the driving forces of vertical integration and supply chain integration, the factors listed in Table I can be split into two groups:

- 1 external factors; and
- 2 potential benefits.

Within each group, factors with strategic importance can be separated from those factors that have economic importance. Figure 1 displays the framework for understanding driving forces for and consequences of downstream vertical integration. This paper will focus on the consequences of vertical integration with respect to business focus, required resources, and competitive advantage, which are relevant to the company's position in the supply chain, and will examine whether the potential benefits driving vertical integration can be achieved.

Methods

Background and sampling

This study adopted an exploratory approach that allowed for flexibility and adaptability (Yin, 2008). Case-based qualitative and exploratory approaches were chosen as the most appropriate in this context to uncover and promote a better understanding of this complex field (Frey and Fontana, 1991; McCutcheon and Meredith, 1993).

Strategic case selection can increase the generalisability of case studies, according to Flyvbjerg (2006), who summarises two general types of selection, including random selection and information-oriented selection. For this study, information-oriented selection was chosen in order to maximise the utility of information from a small sample. The selection was based mainly on the following criteria:

- 1 the company should be a leading player in its industry; and
- 2 the company must have vertically integrated forward in its supply chain recently.

The search for a suitable case study subject was begun in the Swedish sawmilling sector because vertical integration is prevalent there. This sector is a dominant force in the forestry industry, accounting for 4 per cent of Sweden's GDP and approximately 13 per cent of its export goods (Swedish Forest Industries Federation, 2009). S Timber, one of the top Swedish timber product manufacturers, was chosen to be the main subject of the case study; the company, which is a leading and large player in the industry, recently acquired a distribution centre in the UK. In order to involve more actors in the supply chain, resellers were chosen from the supplier's customer base, and each studied company formed a case unit.

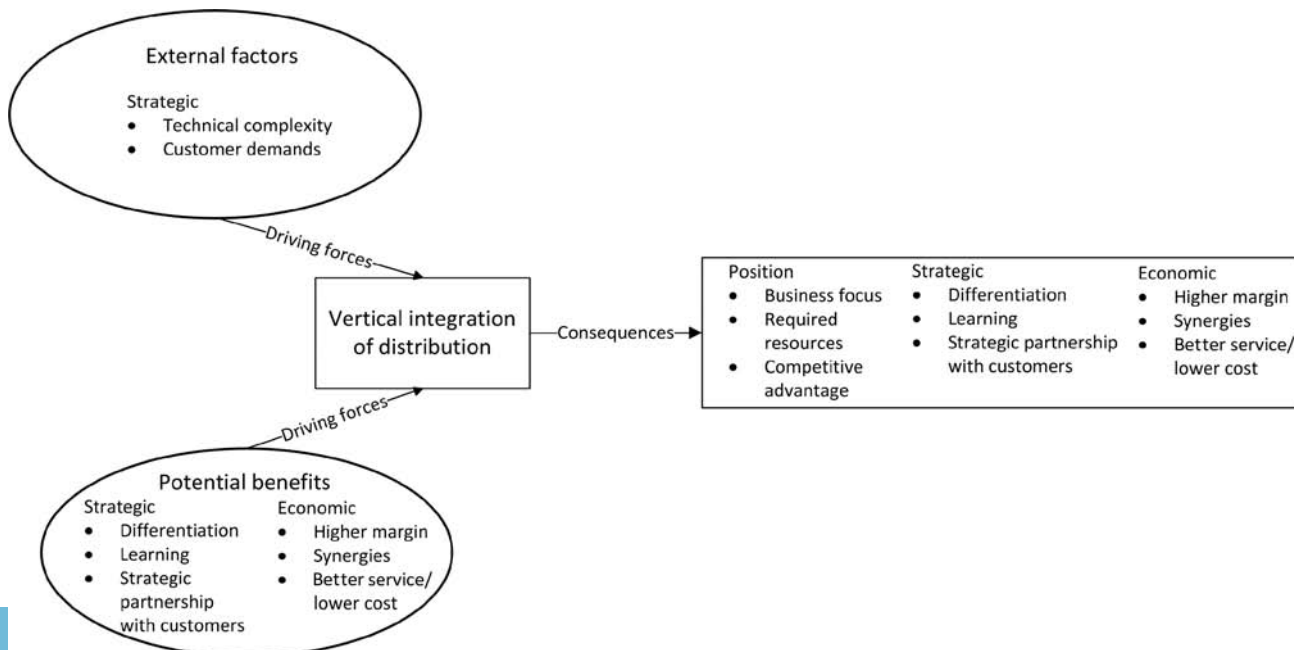
Data sources and informants

Frey and Fontana (1991) note that case studies normally focus on two types of data gathering:

- 1 observation; and
- 2 interviews.

Primary data in this study were collected through in-depth interviews with the help of loosely structured interview guides. Three distinct interview protocols were designed for the manufacturer, distributor, and reseller, which included both do-it-yourself (DIY) retailers and builders' merchants (BMs). Protocols were developed that included topics and

Figure 1 Proposed framework for understanding the driving forces and consequences of vertical integration



questions to be covered in the interviews, while also allowing for open-ended conversations in order to encourage participants to talk freely. Information questions and opinion questions were used to collect facts and perceptions; probing questions were also prepared to be used when informants' answers caused confusion or required more details. The questions were sorted into topic areas. For the manufacturer, the key questions focused on the supply chain strategy for distribution and sales of products, as well as the company's positioning in its supply chain. The central questions for the manufacturer's subsidiary – the distributor in the UK – related to its operations of warehousing, delivery and customer management. Resellers' views were sought regarding the focus of their operation, particularly in terms of supply strategy for the timber section and supplier value.

A total of 19 interviews, lasting from 30 minutes to two hours, were conducted between 2009 and 2010 with eight companies that represented three stages in the supply chain. According to Yin (2008), when utilising semi-structured interviews, it is important to identify key informants and focus on those who are in a position to have information about the problems studied. Table II shows details about the informants in the interviews.

Data analysis

All interviews were documented and transcribed, and the information was collated into case units along with any supporting secondary data, such as company magazines, web resources, annual reports, sales reports and meeting presentations. The interview transcripts and documents were examined thoroughly for themes and patterns (Miles and Huberman, 1994), and then each case unit was studied in detail. Open and axial coding techniques were used to break down the data for analysis, and a number of logical sections emerged, each with a sub-theme. Theoretical themes were continuously matched and contracted with the evidence from each case unit in order to assess how well or poorly they fit with the case data (Eisenhardt, 1989). Conceptualisation, categorisation and building connections across categories were conducted during the analysis.

Table II Companies studied and respondents interviewed

Position in supply chain	Company	Company type	Informants
Manufacturer	S Timber	Timber manufacturer	Marketing director
Distributor	STS	Timber products distributor	Managing director Operation director Marketing director Two account managers Warehousing and transportation director Production manager Purchase manager
Reseller	A	DIY retailer	DIY manager and store manager
Reseller	B	DIY retailer	Timber trading director and store manager
Reseller	C	DIY retailer	Timber buyer and store manager
Reseller	D	Builders' merchant	Timber buying manager and store manager
Reseller	E	Builders' merchant	Timber buyer (G Group) and store manager
Reseller	F	Builders' merchant	Two store managers

Case studies

S Timber Sweden

S Timber is a part of the F Group, which manages extensive forest holdings and supplies raw wood materials, as well as transport solutions to its business units. The firm is one of the largest sawmill companies in Europe, including sawmills, wood-processing units, distribution and wholesale operations. During 2003 and the first half of 2004, S Timber conducted an extensive review of its strategy, and eventually implemented a new strategy in response to the changing environment:

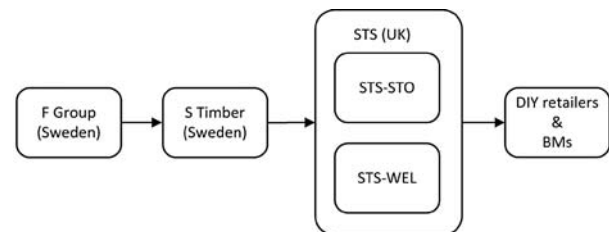
Gradually and systematically, S Timber shall develop relationships with selected customers toward a supplier role, implying that S Timber's own products can be supplemented with products produced through outsourcing or purchased, if needed.

S Timber Supply UK (STS)

In order to increase its market shares in the UK, in which DIY retailers are strong, S Timber began to investigate the possibility of supplying the DIY sector, and learned that a distribution platform was needed in order to satisfy the complex demands of DIY retailers. Consequently, S Timber acquired a distribution company (STS-STO in Figure 2), forming STS in 2003. Through the acquisition, S Timber vertically integrated downstream in the supply chain and obtained a position to supply to DIY retailers.

S Timber had previously cooperated with a British regional planner and distributor, referred to here as BS Timber (STS-WEL in Figure 2), which represented an important link in the supply chain to the British market, primarily in the builders' merchant (BM) segment. The objective of working closely

Figure 2 The supply chain of S Timber



with BS Timber was to get a strong supply chain concept on the market with the capacity to complement S Timber's product portfolio. In order to strengthen its position as a supplier to the BM sector, STS acquired BS Timber in 2007. Figure 2 illustrates the current supply chain for S Timber.

S Timber's position as a direct supplier to the building material resellers gives it better access to the market and stimulates the entire company to be more-market oriented. For example, S Timber periodically reviews the effects of changes in its business environment, such as regulations, raw material supply volume, and customer tastes. Inter-departmental meetings are held to discuss market trends and developments. The marketing director commented that S timber has a solid background in production but that its knowledge of DIY retailers and BMs was weak. As a result, the company finds it difficult to constantly satisfy these chains.

Customer base of STS

STS's top five customers contribute 80 per cent of its business, with the remaining 20 per cent coming from smaller, independent merchants. STS has placed a low priority on increasing its customer base and instead focused on growing with existing customers into other product categories. By expanding the business into new categories, the volume of goods for each delivery has increased, which has improved the efficiency of the supply chain.

The DIY retailers

Company A, B, and C are the major chains in STS's DIY account. Company A is the UK's second-largest home improvement retailer and STS's largest DIY customer. It has more than 300 stores throughout the UK and the Republic of Ireland, aims to provide top-grade products with reasonable prices, and has attached a great deal of importance to delivery reliability. Although the chain has its own distribution centres, the products supplied by STS are delivered directly to company A's stores. Each store usually receives one delivery per week, but some stores can receive more frequent deliveries if their demand is high. The top 50 stores, for example, receive two deliveries each week. According to the DIY manager of company A, the company has abandoned the traditional way of working that involves a large number of suppliers competing with each other based on prices, and shifted to a process of forming partnership with large suppliers. This shift allows company A to keep a smaller number of suppliers for each product category and designate the largest and most proactive supplier to be the captain of that category.

Company B is the third-largest DIY retailer in the UK. It serves the light DIY market sector and most of its stores have some form of garden centre. STS supplies the company with about 30 kinds of products, ranging from interior decorations to outdoor living. Company B considers price to be one of the most important factors when selecting suppliers. However, the timber trading director commented that it would not trade product quality for price. Unlike company A, company B uses its own distribution centres to supply its stores and keeps two to three suppliers for each category. In general, three major suppliers are used to supply the timber section. The timber trading director claims that company B offers relationships with some of their suppliers in category management.

Company C, which has more than 190 stores, focuses on the hard-side DIY products and mainly serving serious DIY buyers and those in building trades. In order to successfully handle the challenges from the competitive marketplace, the company had recently radically reengineered its whole supply chain, creating three distribution centres and extensively consolidating its supply base. On average, only four suppliers are retained for each category. STS supplies decking products to company C.

These three customers all require products that are privately labelled and wrapped, as products supplied to DIY chains generally must be ready-to-go and ready-to-use for private consumers. This means that the size of products should fit in a car and be easy to assemble with a minimum number of pieces, accompanied by easy-to-read instructions. In addition, these DIY retailers put the supplier in charge of in-store merchandising, making the supplier's responsible for ensuring that products are nicely presented on shelves and that paper materials for promoting sales are in place and replenished in a timely manner.

The builders' merchants

One of the top accounts for STS is company D, one of the UK's leading builders' merchants with more than 600 branches nationwide. Timber is a particularly important product category for company D, with timber products contributing an average of 20 per cent of a branch's turnover, according to the store manager. And because it is such a big group with a high-demand level, company D places a high value on the security of its timber supply, according to the buying manager in charge of the timber sector. Instead of buying machined products from external suppliers, company D runs three sawmills, believing this operation is the most profitable option. The company receives timber materials from suppliers worldwide, but mainly from Nordic countries and Russia. Because centralised operation practices dominate company D's purchasing and distribution, STS delivers materials to the company's distribution centres.

Company E and F are also among STS's top three BM accounts. They belong to the G Group, which places five key demands on its suppliers:

- 1 supply FSC-certified timber products;
- 2 supply a complete range of DIY and merchant mouldings;
- 3 provide just-in-time delivery;
- 4 provide marketing support and innovative ideas; and
- 5 provide staff training.

Company F is a fast-growing company with more than 150 branches that trade only with professionals. It targets renovation, maintenance and improvements (RMI) project contractors. STS has been one of the biggest suppliers of solid wood products to company E for several years, and approximately 90 per cent of all finished wood sold in company E's stores comes from STS. All deliveries from STS are made to stores of company E and F.

Analysis and discussion

Driving forces of vertical integration in supply chain

External factors

Technical complexity. The sawmilling industry has benefited from advancing technologies. "Thanks to the massive and sophisticated machines, the efficiency and quality of felling, grading, and sawing work has been improved greatly in forest

and sawmills”, said the operations director for STS. In addition, the adoption of technologies has allowed sawmills to move toward value-adding production, such as planning, drying, stress grading, trimming, and laminating. However, technology complexity is not considered as a force driving S Timber’s downstream integration in this study, because a significant portion of value-added activities still take place in manufacturing process. Not only that, more of S Timber’s profits come from increased sales of more wood pieces and decreased production or distribution costs than from maintaining and servicing existing products.

Customer demands. This study indicates that, as predicated in Osegowitsch and Madhok (2003), customer demands were the major driving force for S Timber’s vertical integration strategy of distribution. This impetus can be understood from several viewpoints. First, resellers are expanding in terms of size and scope while decreasing the number of their suppliers and concentrating of supplier management. For example, company A has moved from working with a large number of suppliers based on price competition to working with a smaller number of suppliers based on commitment to relationships. Company B is keeping only three suppliers for its timber section and offering relationships to these active and larger suppliers. Company C has retained an average of four suppliers in each category. In the BM sector, the timber buying manager for company D also believes that the company favours large suppliers to meet its high-demand level. Similarly, the timber buyer of G Group believes a qualified supplier must provide a complete range of DIY and products. For these businesses, reducing the number of suppliers for a given product helps to develop a strong supplier-buyer relationship (Sarkar and Mohapatra, 2006) and could release valuable resources that can be more effectively utilised in other supply management strategies (Ogden and Carter, 2008). As a consequence, suppliers must carry a wide assortment of products and be able to supply all or most of a product category in order to be deemed as a qualified supplier. Thus, STS requires external sourcing in order to complement its product assortments.

Second, in order to service the entire building material market, the suppliers should be able to provide products and services for both the DIY and BM sectors, which vary from each other in supply management (see Table III). In general, customer demand from both sectors calls for the right products to arrive on time at competitive prices. However, customers of BMs are usually professional builders and

contractors who know what materials to use for a particular job and how to use them. Therefore, unlike DIY retailers, these BMs do not have requirements on how timber must be wrapped and packaged, do allow longer and larger pieces of timber in their stores, and attach greater importance to supply volume than do the DIY retailers. In order to supply both kinds of business, suppliers must be able to meet the mixed customer demands and to make deliveries in flexible ways. Because of these factors, S Timber decided a distribution platform was necessary in the British market.

Third, the importance of focusing on the total customer offering had been dramatically increased in the British market, because of increased consolidation among competitors and customers’ emphasis on the large-scale operations at the supplier. The buyers in the case study demanded adapted product portfolios, developed logistics solutions, and professional sales organisations, particular in the DIY sector. Activities such as product development, design of promotional materials, and merchandising formerly were conducted by the retailers themselves but now are being passed to the supplier, making frequent and direct interactions with retailers particularly necessary. This finding confirms Osegowitsch and Madhok’s (2003) argument that vertical integration of distribution is driven by customer demands for a greater range of products and services. Customers are increasingly relying on suppliers to provide solutions that can be integrated into their own business processes.

The case study also noted that a desire by S Timber to change its position in the supply chain was a factor driving its move into vertical integration, and this factor has not been explored much in the literature. The marketing directors for S Timber and STS both emphasised that because timber is a non-branded product the manufacturer has little influence over how products are marketed, thereby putting the manufacturer at a disadvantage when appropriating value from downstream supply chain actors. Changing its position in the supply chain was not done only to the get closer to customers but also to appropriate value for itself from participating in a supply chain (Cox, 1997). As the marketing director for S Timber said, taking more critical stages of the timber product supply chain, from abstraction of raw materials to distribution to large DIY and BM chains, under our thumb is S Timber’s way of strengthening our power of discourse in the supply chain”.

Table III Comparison between DIY and BM sector

Aspects	DIY retailers	BMs
Major customer	Private	Professionals
Product range	Focus on home improvement, repair materials, and tools	Focus on house building and improvement materials, and tools
Product type	Suitable for home improvement projects; small-size and easy to use	Suitable for construction projects
Labelling and wrapping	High demand	Low demand
Stock	Stable stock and quick replenishment	Massive stock in project quantities
Delivery	Deliver to distribution centre or stores	Deliver to distribution centre or stores
Training	Basic knowledge of house keeping in store	Industrial training with focus on knowledge of wood and wood products
Merchandising	Required	Not required

Potential benefits

Differentiation. One concern expressed by the marketing director for S Timber is that solid wood products can be classified as a kind of standardised commodity that it is hard to differentiate due to lack of physical differences. Therefore, adding distribution solutions to S Timber's total offering was expected to make a distinction between S Timber and its competitors. This finding supports the argument that using distribution services in the customer interface could lead to an offering differentiation (Etgar, 1978; Osegowitsch and Madhok, 2003).

Learning/strategic partnership with customers. S Timber also expected that its vertical integration moves would allow it get closer to its customers and obtain a better understanding about their businesses. Like many other manufacturers, S Timber formerly placed great emphasis on meeting production quotas, ensuring quality levels, and pricing its products suitably for distribution (Blois, 2001). But, according to S Timber's marketing director, that production-orientated strategy had been seriously challenged by decreasing profitability and lack of knowledge about end markets. Downstream integration was expected to facilitate the manufacturer's access to both information and knowledge about its customers (Osegowitsch and Madhok, 2003). In this case study, one of the most significant potential benefits of acquiring the British distributor was to give S Timber more accurate and more timely information about demand level, inventory level, and customers' requirements for products and services.

S Timber expected the better knowledge about its customers could lead to more in-depth collaboration with them. The marketing director for S Timber expected that developing partnerships with its customers could lead to better product innovation "Integrating DIY chains into our new product development process from idea generation to product launch is what we are aiming for", he said.

Higher margin/synergies/better services. This case did not find evidence of higher margin obtained from downstream business and synergies obtained by supplier penetration into customers' decision processes driving S Timber's decision of downstream vertical integration. This lack, according to the marketing director for S Timber, is most likely because augmented products are only a very small portion of the entire timber product, so there is little space for S Timber to make high profits from conducting activities such as distribution, packing, and labelling. But the managing director for STS did mention improved logistics service in terms of delivery reliability. On one hand, better logistic service can be seen as a potential benefit of a company running its own distribution centre, and on the other hand, it can be regarded as one aspect of customer demands that enticed S Timber to set foot in the distribution business.

Consequences for vertical integration in supply chain*Position*

Business focus. Before the integration, S Timber was situated upstream in the supply chain, supplying products to wood manufacturers, wholesalers and exporters, and its business strategy focused on improving production efficiency and increasing production volume. Value was added by transforming raw materials into finished products or semi-finished products for downstream companies (Nicovich and Dibrell, 2007). Now, the company operates both upstream

and downstream activities, and STS can create value by customising, packaging, positioning, and distributing products.

Required resources. Ideally, companies should position themselves to possess those supply chain resources that have a low propensity for competition and around which they can build market entry barriers (Cox, 1999). The sawmilling industry is a process industry that heavily relies on raw materials; therefore, controlling the source of raw material is essential for securing the supply to large chains. Distribution, on the other hand, includes greater potentials for higher profits (Wise and Baumgartner, 1999) and more opportunities to establishing relationships with customers (Anderson and Narus, 1995). Since its integration, S Timber has concentrated on the phases – from raw material supply to distribution to the final link in supply chain – that are highly important in the timber product supply chain.

Competitive advantage. S Timber's current competitive advantages include efficient production as well as complete offerings to customers. Wise and Baumgartner (1999) argue that manufacturers have an intimate knowledge of their product and markets, which makes them well positioned to carry out many downstream activities, such as providing training services. The store manager for company B speaks highly about the training programme of Wood Champion. The fact that STS has been active in organising the training programme relieves the store manager of some of his workload, and the store manager believes that the improved staff knowledge positively influences consumers' purchase decisions.

Benefits

Differentiation. In this case study, differentiation has been identified as one of the benefits created by downstream integration. S Timber distinguishes itself from other timber manufacturers by taking the supplier role in supply chain, which means it can provide one-stop timber solutions for large DIY retailers and BMs. The benefits offered include complete product range for sectors, efficient warehousing and logistical services, reliable supply volume, technical support, and e-business applications.

Learning/strategic partnership with customers. Doyle (1994) argues that satisfying customer needs is central to any business. The rationale for a firm paying attention to its customers lies in the linkage between customer research and rewards from exchange. According to Carson *et al.* (1998), the more research a firm does to identify its customers' needs, the more rewarding the exchange transaction will be for the firm. In addition, a deeper understanding of customers can be used to better segment them (DaSilva and Rahimi, 2007).

Being a direct supplier dramatically improves the company's knowledge about its customers and markets by creating numerous direct interactions with customers during the process of sales and services. Better understanding of customers' needs and their businesses also lead to product/services innovation. For example, the marketing director for S Timber noted that the idea of a decking system was generated during a sales meeting with company B. Additionally, better knowledge about its market and customers can lead the entire company to be more market-oriented in its thinking. Regular reviews are conducted of business environments, involving competition, industry policy, upstream supply conditions and customer changes in order to adjust production and

marketing strategies. As a result, S Timber's product lines depend more on its customers' needs than its own internal politics.

Supply chain efficiency. The vertical integration strategy has improved the company's supply chain efficiency in several ways. First, according to the warehousing and transportation manager for STS, after the acquisition of the British distribution centre, S Timber extensively rearranged its warehouse to optimise the route of truck loading/unloading and order pick-up, and also began to employ a more-cost efficient logistics provider. Second, having its own distribution centre stimulated S Timber to maximise its production capacity in production sites both in Sweden and in the UK. Third, a wide product assortment has increased the volume of goods for each delivery, which has reduced the numbers of order pick-ups in the warehouse. This, in turn, reduces the number of trucks sent out from the distribution centre and increases the value of each delivery.

Supply chain visibility. After the two acquisitions, S Timber has invested the time and effort needed to map their supply chains. "We now have a better idea of how our core supply chain works and who are the key participants", said the managing director for STS. Ownership eliminates the boundary between S Timber and the British distributor and gives S Timber access to information about various aspects of the distributor's operational activities. For example, S Timber is able to see product-related data, cost-related data, process-related data, customer-demand related data, and performance metrics. Mapping the supply chain has the potential to enhance transparency and help close the gaps that impede coordination of key value-added activities (Fawcett and Magnan, 2002), but S Timber has not yet fully exploited the potential of the mapping efforts to improve its channel costs and value propositions.

Formulation of the strategy. Vertical integration has not only influenced S Timber's production, distribution, and logistics at the operational level, but also pushed the company to formulate its strategy adopting a supply-chain-wide perspective. For instance, it has now a supply-chain-view in development of solutions and products, with the aim to provide cost reductions and more value for both intermediaries and end customers. Power (2005) offers some support for this finding, writing that a holistic and systematic view of the supply chain can provide an effective means to reduce cost and improve customer service, while also forcing supply chain partners to think and act strategically.

Discussion about the proposed research framework

At this point, it is time to revisit the proposed research framework in Figure 1 and review its value. That research framework was developed from the extant literature on vertical integration and supply chain integration. The study was designed to examine factors most mentioned in the literature regarding the driving forces for and consequences of vertical integration as complete as possible and to create a brief categorisation of these factors. The scope of the literature review was limited to vertical integration and supply chain integration, and so the proposed framework cannot and does not attempt to cover the full range of the literature, but only a sampling of important and influential works. In addition, this framework did not include the traditional explanations of vertical integration based on

theories of transaction cost analysis (TCA). The framework did attempt to create a list of relevant factors and to divide these factors into groups according to their relationship with companies (external and internal/potential benefits) and types of importance (strategic and economic).

The research framework was not only the fruit of literature study, but it also provided a useful guide to case study design, data collection, and data analysis. According to the framework, a number of factors are relevant to the phenomena under investigation, which indicated the complexity of the study and led to the choice of a deep, single- case study as the research strategy. Interview guides were developed to frame questions around the factors listed in the framework. In the analysis phase, data collected in the interview was compared and contrasted with the framework. Using the framework as a guide in research design and analysis allowed the discovery of answers to the two research questions.

The research findings extracted one driving force – i.e. positioning in the supply chain – and one consequence – i.e. supply chain visibility – that were not included in the proposed framework (Figure 1). Positioning deals with a company's strategic plan regarding its place in the supply chain and its desire to gain influence when appropriating value from other supply chain actors. The power of vertical integration can help eliminate the hindrance created by company boundaries and therefore gives companies access to critical data regarding downstream activities.

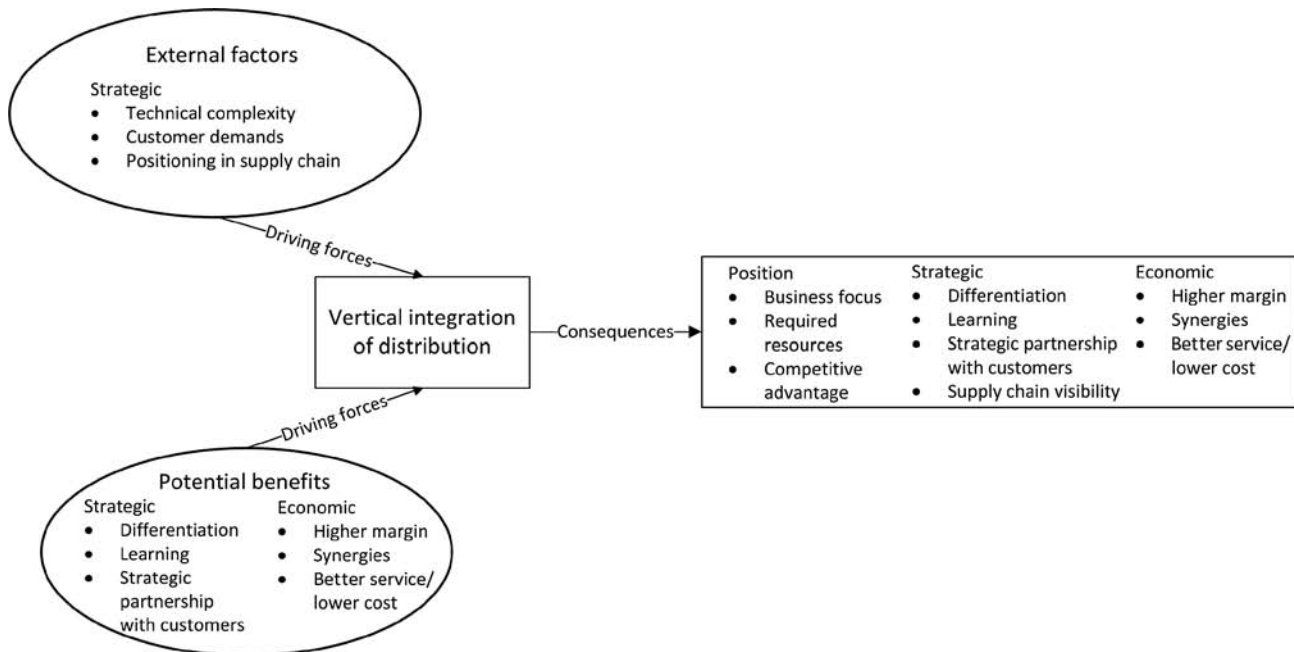
Based on the outcomes of this study, a refined framework has been created to explain the driving forces for and consequences of vertical integration, and it is presented in Figure 3. Although the refined framework has been modified based only on a single case study, it could be further used to understand literature and to guide future investigations of cases without any significant modifications as the major value of the framework is to predict real-life situations of downstream vertical integration.

Conclusions and implications

Conclusions

This paper has analysed empirically the driving forces for and consequences of a manufacturer's downstream vertical integration. The study results support Osegowitsch and Madhok's (2003) idea of vertical integration, which is that a supplier's vertical integration is no longer limited to governance efficiency. Instead, vertical integration of distribution is driven primarily by the external factors including customer demands and the potential benefits involving differentiation, increased information about customers, and supply chain efficiency improvement.

A company's supply chain positioning strategy has also been found to be an important internal driving force of downstream vertical integration because position in the supply chain affects the company's functions and roles, required resources, added value, and competitive advantages (Nicovich and Dibrell, 2007). Among the three fundamental stages of supply chain – i.e. procurement, production, and distribution (Thomas and Griffin, 1996) – downstream distribution business carries the potential for selling more products (Mathe and Shapiro, 1993). Moreover, a company indicates its ambitions to be a powerful player in the supply chain when it is willing to take the supplier role, including

Figure 3 Modified framework for understanding driving forces and consequences of vertical integration

organising product assortments, product customisation, assuring stock availability, logistics and providing after-sales services (Riis *et al.*, 2007), which increases its influence when appropriating value from other supply actors.

Undertaking more functions in a supply chain requires intensive collaboration with other suppliers and exposes a company to more firms in the business network, such as product suppliers, logistics suppliers, and marketing service providers. Interaction between companies is a key aspect for accessing and utilising other actors' resources and competencies (Cox and Lamming, 1997; Svahn and Westerlund, 2007). Consequently, key managerial capabilities, such as influencing, controlling, coordinating and integrating (Svahn and Westerlund, 2007), need to be strengthened.

In an increasingly tough and competitive business climate, manufacturers are focusing more intently on highly processed products with higher knowledge content. This change means that soft values such as smart logistics, technical support, and after-sales service have been assigned greater importance. This trend is a response to customer needs of integrated solutions (Osegowitsch and Madhok, 2003), and it is also a major consequence of manufacturers' vertical integration strategy. Working directly with resellers provides opportunities to study customers and discover their needs and requirements in many regards, including goods, services and knowledge. The knowledge obtained from interacting with customers represents a powerful means of improving the total offering, which in turn, improves customer retention.

Theoretical and practical implications

These findings from this study have some important implications for SCM theory and managerial practice. In theory, SCM allows companies to focus on doing exceptionally well a few things for which it has unique skills and advantages. Non-core activities are outsourced to channel

members that possess superior capabilities in those areas (Cox, 1999; Lutz and Ritter, 2009; Quinn, 2000). Vertical integration through ownership appears to implement a different mind-set of restructuring and reengineering the supply chain in order to increase company competitiveness and satisfy key customers. The classic works of understanding vertical integration, including those by Adelman (1955) and Bain (1968), followed by Williamson (1971, 1975, 1979) and Levy (1985), are primarily concentrated on the theory framework based on transaction cost economics (TCE). However, with the fast pace of change in the business environment, considerations such as the inefficient market-mediated exchange and uncertainties are not sufficient to explain modern cases of vertical integration. In addition, traditional explanations based on the TCE framework have not given much attention to the role of customers. The notion of customer focus in terms of understanding customer needs, satisfying customer needs, providing timely service, creating customer value has received attention in several research communities, such as SCM (e.g. Chen and Paulraj, 2004), market orientation (e.g. Kohli and Jaworski, 1990), and new product development (e.g. Cooper and Kleinschmidt, 1995; Fang *et al.*, 2008). In this study, the results demonstrate a need to put customers as the central element of vertical integration strategy. Future research into vertical integration, especially forward integration into customer interface, could benefit from other theory frameworks, such as SCM, which have addressed customer focus.

This study raises the question of how manufacturing companies are viewed and positioned in supply chains. Not only is the number of performed functions increasing, but through these functions, manufacturers are developing a greater appreciation for supply chain integration that synthesises their plans and strategies, and ultimately leads to upstream and downstream changes. Moreover, it may no longer be enough to consider moves to enhance management

of supply chains that are concerned only with improving manufacturers' efficiency in order to obtain competitive advantage. Considerations regarding strategic positioning in a supply chain and market with the aim of obtaining better conditions in appropriating value from other supply chain actors may have greater relevance and significance in vertical integration decisions.

This study also raises the interesting prospect that future SCM research should not consider vertical integration as an organisation's last resort (Williamson, 1991), but could view it as an appealing strategy for supply chain design and restructure. Downstream vertical integration is relevant to strategic positioning, efficiency, capacity and some other issues that are critical to most firms.

One of the challenges associated with supply chain length is the lack of visibility within the pipeline. Hence, it is often the case that one actor of a supply has no detailed knowledge about the situation (e.g. pipeline inventory, order status, demands forecast, etc.) in other parts of the supply chain (Christopher and Lee, 2004). It is believed that sharing information among supply chain members is the key to improve supply chain visibility (Barratt and Oke, 2007; Christopher and Lee, 2004); however, access to information is often hindered by lack of trust between companies (Barratt, 2004). Vertical integration could improve supply chain visibility by eliminating the boundaries between two supply chain members, thereby giving companies access to detail information about the successive parts of the pipeline.

Although this paper argues that vertical integration has its advantages, supply chain collaboration, both external and internal, remains a relevant issue for vertically integrated companies. On a more fundamental level, we would suggest that more attention should be paid to internal collaboration; because each organisation in a supply chain has its own plan for its activities, ownership cannot improve efficiency of these activities and solve all emerged conflicts. In order to maximise the success of vertical integration, companies need to understand a number of issues, such as which activities call for collaboration and what are the elements of collaboration?

This study also reveals several important implications for managers. First, integrating downstream business could imply high investment, and, therefore, high risks. Any initiative in this area is likely to be resource intensive in its early stages. However, owning the most critical resources in a supply chain helps the company appropriate value from other supply chain actors, and ultimately, strengthens the company's power position in the supply chain (Cox, 1997). Downstream vertical integration in the supply chain involves a strategic intent with regard to controlling the resources required to deliver differentiated offerings to customers, which would improve the company's goal of claiming value for itself.

In the case study, the manufacturer's strategy of positioning itself in the supply chain can be seen as a move to control critical supply chain resources. For a process industry like sawmilling, volume production is the traditional emphasis and a key factor for success. Downstream vertical integration creates a new set of resources and capabilities that the manufacturer must master. Therefore, it is important to understand the resources and competencies required to perform the downstream functions, since manufacturing and distribution requires different sets of skills.

Second, although vertical integration internalises the manufacturers' interactions with distributors, it also

increases the need for interaction with other downstream actors, and led to increased demands pertaining to understand the needs and requirements of merchants and retailers. Not least, vertical integration also necessitates a deeper understanding of functions such as purchasing, logistics and marketing. Therefore, vertical integration in the supply chain also implies an increased emphasis on key managerial capabilities, such as influencing, controlling, coordinating and integrating.

Limitations and future research

The use of case study to examine driving forces for and consequences of vertical integration has some very obvious limitations, particularly that of generalisability. However, this study relies on analytical generalisation (Yin, 2008) and was exploratory in seeking to identify relevant factors. Thus, it is suggested that the arguments developed here be tested statistically by means of a survey that utilises a larger sample and in contexts other than timber products distribution channels to improve their external validity.

Although much of the supply chain and operation literature assumes that a greater degree of supply chain integration is strongly associated with higher levels of operational and business performance (e.g. Cagliano *et al.*, 2004; Frohlich and Westbrook, 2001; Rosenzweig *et al.*, 2003), empirical evidence is needed to evaluate the relationship between vertical integration and level of performance. Therefore, future study could examine the impact of vertical integration on manufacturer performance level.

Finally, the unit of investigation in this study is from the perspective of a company, and thus a single supply chain. Future study could present a new layer of investigation unit based on several supply chains and/or networks. Such study would include data collected from several supply chains in order to provide insights about the patterns of vertical integration.

References

- Adelman, M.A. (1955), "Concept of statistical measurement of vertical integration", in Stigler, G.J. (Ed.), *Business Concentration and Price Policy*, Princeton University Press, Princeton, NJ, pp. 279-328.
- Anderson, J.C. and Narus, J.A. (1995), "Capturing the value of supplementary services", *Harvard Business Review*, Vol. 73 No. 1, pp. 75-83.
- Arya, A., Mittendorf, B. and Sappington, D.E.M. (2008), "Outsourcing, vertical integration, and price vs quantity competition", *International Journal of Industrial Organization*, Vol. 26 No. 1, pp. 1-16.
- Bain, J.S. (1968), *Industrial Organization*, Wiley, New York, NY.
- Balakrishnan, S. and Wernerfelt, B. (1986), "Technical change, competition and vertical integration", *Strategic Management Journal*, Vol. 7 No. 4, pp. 347-59.
- Barratt, M. (2004), "Understanding the meaning of collaboration in the supply chain", *Supply Chain Management: An International Journal*, Vol. 9 No. 1, pp. 30-42.
- Barratt, M. and Oke, A. (2007), "Antecedents of supply chain visibility in retail supply chains: a resourced-based theory perspective", *Journal of Operations Management*, Vol. 25, pp. 1217-33.

- Barrera-Rey, F. (1995), *The Effects of Vertical Integration on Oil Company Performance*, Oxford Institute for Energy Studies, Oxford, October.
- Barreyre, P.Y. (1988), "The concept of importation policies: a different approach to vertical integration strategies", *Strategic Management Journal*, Vol. 9 No. 5, pp. 507-20.
- Birou, L.M., Fawcett, S.E. and Magnan, G.M. (1998), "The product life cycle: a tool for functional strategic alignment", *International Journal of Purchasing and Materials Management*, Vol. 34 No. 2, pp. 37-51.
- Blois, K.J. (2001), "The manufacturing-marketing orientation and its information needs", *European Journal of Marketing*, Vol. 14 Nos 5/6, pp. 354-64.
- Cagliano, R., Caniato, F. and Spina, G. (2004), "Lean, agile and traditional supply: how do they impact manufacturing performance?", *Journal of Purchasing & Supply Management*, Vol. 10 Nos 4/5, pp. 151-64.
- Cagliano, R., Caniato, F. and Spina, G. (2006), "The linkage between supply chain integration and manufacturing improvement programmes", *International Journal of Operation & Production Management*, Vol. 26 No. 3, pp. 252-99.
- Carson, D., Gilmore, A. and Maclaran, P. (1998), "Customer or profit focus: an alternative perspective", *Journal of Marketing Practice: Applied Marketing Science*, Vol. 4 No. 1, pp. 26-39.
- Chandler, A.D. (1977), *The Visible Hand: The Managerial Revolution in American Business*, Harvard University Press, Cambridge, MA.
- Chen, I.J. and Paulraj, A. (2004), "Towards a theory of supply chain management: the constructs and measurements", *Journal of Operations Management*, Vol. 22 No. 2, pp. 119-50.
- Christopher, M. and Lee, H. (2004), "Mitigating supply chain risk through improved confidence", *International Journal of Physical Distribution & Logistics Management*, Vol. 34 No. 5, pp. 388-96.
- Clinton, S.R. and Closs, D.J. (1997), "Logistics strategy: does it exist?", *Journal of Business Logistics*, Vol. 18 No. 1, pp. 19-44.
- Cook, R.L. and Garver, M.S. (2002), "Subscription supply chains: the ultimate collaborative paradigm", *Mid-American Journal of Business*, Vol. 17 No. 2, pp. 37-46.
- Cooper, M.C., Lambert, D.M. and Pagh, J.D. (1997), "Supply chain management: more than a new name for logistics", *The International Journal of Logistics Management*, Vol. 8 No. 1, pp. 1-14.
- Cooper, R.G. and Kleinschmidt, E.J. (1995), "Benchmarking the firm's critical success factors in new product development", *Journal of Product Innovation Management*, Vol. 12 No. 5, pp. 374-91.
- Cox, A. (1997), *Business Success*, Earlsgate Press, Midsomer Norton.
- Cox, A. (1999), "Power, value and supply chain management", *Supply Chain Management: An International Journal*, Vol. 4 No. 4, pp. 167-75.
- Cox, A. and Lamming, R. (1997), "Managing supply in the firm of the future", *European Journal of Purchasing and Supply Management*, Vol. 6 No. 2, pp. 53-62.
- DaSilva, R.V. and Rahimi, I. (2007), "A critical success factor model for CRM implementation", *International Journal of Electronic Relationship Management*, Vol. 1 No. 1, pp. 3-15.
- Doyle, P. (1994), *Marketing Management and Strategy*, Prentice Hall, London.
- Eisenhardt, K.M. (1989), "Building theories from case study research", *The Academy of Management Review*, Vol. 14 No. 4, pp. 532-50.
- Etgar, M. (1978), "The effects of forward vertical integration on service performance of a distributive industry", *Journal of Industrial Economics*, Vol. 26 No. 3, pp. 249-55.
- Fang, E., Palmatier, R.W. and Evans, K.R. (2008), "Influence of customer participation on creating and sharing of new product value", *Journal of the Academy of Marketing Science*, Vol. 36 No. 3, pp. 322-36.
- Fawcett, S.E. and Magnan, G.M. (2002), "The rhetoric and reality of supply chain integration", *International Journal of Physical Distribution & Logistics Management*, Vol. 32 No. 5, pp. 339-61.
- Fawcett, S.E., Magnan, G.M. and McCarter, M.W. (2008), "Benefits, barriers, and bridges to effective supply chain management", *Supply Chain Management: An International Journal*, Vol. 13 No. 1, pp. 35-48.
- Ferdows, K., Lewis, M.A. and Machuca, J.A.D. (2004), "Rapid-fire fulfillment", *Harvard Business Review*, November, pp. 104-10.
- Flyvbjerg, B. (2006), "Five misunderstandings about case-study research", *Qualitative Inquiry*, Vol. 12 No. 2, pp. 219-45.
- Frey, J.H. and Fontana, A. (1991), "The group interview in social research", *The Social Science Journal*, Vol. 28 No. 2, pp. 175-87.
- Frohlich, M.T. and Westbrook, R. (2001), "Arcs of integration: an integration study of supply chain strategies", *Journal of Operations Management*, Vol. 19 No. 2, pp. 185-200.
- Galbraith, J. and Kazanjian, R. (1986), *Strategy Implementation: Structure, Systems, and Process*, West Publishing, St Paul, MN.
- Grossman, G.M. and Helpman, E. (2002), "Integration versus outsourcing in industry equilibrium", *The Quarterly Journal of Economics*, Vol. 117 No. 1, pp. 85-120.
- Harland, C.M. (1996), "Supply chain management: relationships, chains and networks", *British Journal of Management*, Vol. 7 No. 1, pp. 63-80.
- Harrigan, K.R. (1985), "Vertical integration and corporate strategy", *Academy of Management Journal*, Vol. 28 No. 2, pp. 397-425.
- Hastings, J.S. and Gilbert, R.J. (2005), "Market power, vertical integration and the wholesale price of gasoline", *Journal of Industrial Economics*, Vol. 53 No. 4, pp. 469-92.
- Hobbs, J.E. (1996), "A transaction cost approach to supply chain management", *Supply Chain Management: An International Journal*, Vol. 1 No. 2, pp. 15-27.
- Hobbs, J.E. and Young, L.M. (2000), "Closer vertical co-ordination in agri-food supply chains: a conceptual framework and some preliminary evidence", *Supply Chain Management: An International Journal*, Vol. 5 No. 3, pp. 131-42.
- John, G. and Weitz, B. (1988), "Forward integration into distribution: an empirical test of transaction cost analysis", *Journal of Law, Economics, & Organization*, Vol. 4 No. 2, pp. 337-55.
- Klein, B. (1988), "Vertical integration as organizational ownership: the Fisher Body-General Motors relationship

- revisited”, *Journal of Law, Economics & Organization*, Vol. 4 No. 1, pp. 199-213.
- Klein, B., Crawford, R.G. and Alchian, A.A. (1978), “Vertical integration, appropriable rents and competitive contracting process”, *Journal of Law and Economics*, Vol. 21 No. 2, pp. 297-326.
- Kohli, A.K. and Jaworski, B.J. (1990), “Market orientation: the construct, research propositions, and managerial implications”, *Journal of Marketing*, Vol. 54 No. 2, pp. 1-18.
- Kroes, J.R. and Ghosh, S. (2010), “Outsourcing congruence with competitive priorities: impact on supply chain and firm performance”, *Journal of Operations Management*, Vol. 28 No. 2, pp. 124-43.
- Lafontaine, F. and Slade, M. (2007), “Vertical integration and firm boundaries: the evidence”, *Journal of Economic Literature*, Vol. 45 No. 3, pp. 629-85.
- Lambert, D.M. and Cooper, M.C. (2000), “Issues in supply chain management”, *Industrial Marketing Management*, Vol. 29 No. 1, pp. 65-83.
- Lambert, D.M., Cooper, M.C. and Pagh, J.D. (1998), “Supply chain management implementation issues and research opportunities”, *International Journal of Logistics Management*, Vol. 9 No. 2, pp. 1-18.
- Lambert, D.M., Garcia-Dastugue, S.J. and Croxton, K.L. (2005), “An evolution of process-orientated supply chain management frameworks”, *Journal of Business Logistics*, Vol. 26 No. 1, pp. 25-51.
- Lee, H.L. and Ng, S.M. (1997), “Introduction to the special issue on global supply chain management”, *Production and Operations Management*, Vol. 6 No. 3, pp. 191-2.
- Levy, D.T. (1985), “The transaction cost approach to vertical integration: an empirical examination”, *The Review of Economics and Statistics*, Vol. 67 No. 3, pp. 438-45.
- Lutz, S. and Ritter, T. (2009), “Outsourcing, supply chain upgrading and connectedness of a firm’s competencies”, *Industrial Marketing Management*, Vol. 38 No. 4, pp. 387-93.
- McCutcheon, D.M. and Meredith, J.R. (1993), “Conducting case study research in operations management”, *Journal of Operations Management*, Vol. 11 No. 3, pp. 239-56.
- McDonald, J.M. (1985), “Market exchange or vertical integration: an empirical analysis”, *Review of Economics & Statistics*, Vol. 67 No. 2, pp. 327-32.
- McGuire, T.W. and Staelin, R. (2008), “An industry equilibrium analysis of downstream vertical integration”, *Marketing Science*, Vol. 27 No. 1, pp. 115-30.
- Mahnke, V. (2001), “The process of vertical dis-integration: an evolutionary perspective on outsourcing”, *Journal of Management and Governance*, Vol. 5 Nos 3/4, pp. 353-79.
- Mahoney, J.T. (1992), “The choice of organizational form: vertical financial ownership versus other methods of vertical integration”, *Strategic Management Journal*, Vol. 13 No. 8, pp. 559-84.
- Majumdar, S.K. and Ramaswamy, V. (1994), “Explaining downstream integration”, *Managerial and Decision Economics*, Vol. 15 No. 2, pp. 119-29.
- Martin, C. (1992), *Logistics and Supply Chain Management*, Financial Times, London.
- Mathe, H. and Shapiro, R.D. (1993), *Integrating Service Strategy in the Manufacturing Company*, Chapman & Hall, London.
- Matsubayashi, N. (2007), “Price and quality competition: the effect of differentiation and vertical integration”, *European Journal of Operational Research*, Vol. 180 No. 2, pp. 907-21.
- Mehta, J. (2004), “Supply chain management in a global economy”, *Total Quality Management and Business Excellence*, Vol. 15 Nos 5/6, pp. 841-8.
- Miles, M.B. and Huberman, A.M. (1994), *Qualitative Data Analysis*, Sage Publications, Thousand Oaks, CA.
- Nicovich, S.G. and Dibrell, C.C. (2007), “Integration of value chain and Porter’s (1980) competitive strategies into market orientation conversation: an examination upstream and downstream activities”, *Journal of Business and Economic Studies*, Vol. 113 No. 2, pp. 91-106.
- Normann, H.T. (2009), “Vertical integration, raising rivals’ costs and upstream collusion”, *European Economic Review*, Vol. 53 No. 4, pp. 461-80.
- Ogden, J.A. and Carter, P.L. (2008), “The supply base reduction process: an empirical investigation”, *The International Journal of Logistics Management*, Vol. 19 No. 1, pp. 5-28.
- Osegowitsch, T. and Madhok, A. (2003), “Vertical integration is dead, or is it?”, *Business Horizons*, Vol. 46 No. 2, pp. 25-34.
- Petersen, K.J., Handfield, R.B. and Ragatz, G.L. (2005), “Supplier integration into new product development: coordinating product, process and supply chain design”, *Journal of Operations Management*, Vol. 23 Nos 3/4, pp. 371-88.
- Power, D. (2005), “Supply chain management integration and implementation: a literature review”, *Supply Chain Management: An International Journal*, Vol. 10 No. 4, pp. 252-63.
- Quinn, J.B. (2000), “Outsourcing innovation: the new engine of growth”, *Sloan Management Review*, Vol. 41 No. 4, pp. 13-28.
- Rangan, V.K., Corey, E.R. and Cespedes, F. (1993), “Transaction cost theory: inferences from clinical field research on downstream vertical integration”, *Organization Science*, Vol. 4 No. 3, pp. 454-77.
- Reck, R.F. and Long, B.G. (1988), “Purchasing: a competitive weapon”, *Journal of Purchasing and Materials Management*, Vol. 24 No. 3, pp. 1-12.
- Richey, R.J., Roath, A.S., Whipple, J.M. and Fawcett, S.E. (2010), “Exploring governance theory of supply chain management: barriers and facilitators to integration”, *Journal of Business Logistics*, Vol. 31 No. 1, pp. 237-56.
- Richey, R.J., Chen, H., Upreti, R., Fawcett, S.E. and Adams, F.G. (2009), “The moderating role of barriers on the relationship between drivers to supply chain integration and firm performance”, *International Journal of Physical Distribution & Logistics Management*, Vol. 39 No. 10, pp. 826-40.
- Riis, J.O., Johansen, J., Waehrens, V. and Englyst, L. (2007), “Strategic roles of manufacturing”, *Journal of Manufacturing Technology Management*, Vol. 18 No. 8, pp. 933-48.
- Romano, P. (2003), “Co-ordination and integration mechanisms to manage logistic processes across supply networks”, *Journal of Purchasing & Supply Management*, Vol. 9 No. 3, pp. 119-34.
- Rosenzweig, E.D., Roth, A.V. and Dean, J.W. (2003), “The influence of an integration strategy on competitive capabilities and business performance: an exploratory study of consumer products manufacturers”, *Journal of Operations Management*, Vol. 21 No. 4, pp. 437-56.

- Rothaermel, F.T., Hitt, M.A. and Jobe, L.A. (2006), "Balancing vertical integration and strategic outsourcing: effects on product portfolio, product success and firm performance", *Strategic Management Journal*, Vol. 27 No. 11, pp. 1033-56.
- Rudberg, M. and Olhager, J. (2003), "Manufacturing networks and supply chains: an operations strategy perspective", *Omega*, Vol. 31 No. 1, pp. 29-39.
- Sarkar, A. and Mohapatra, P.K.J. (2006), "Evaluation of supplier capability and performance: a method for supply base reduction", *Journal of Purchasing & Supply Management*, Vol. 12 No. 3, pp. 148-63.
- Saunders, M. (1997), *Strategic Purchasing and Supply Chain Management*, Pitman Publishing, London.
- Simatupang, T.M. and Sridharan, S. (2004), "A benchmarking scheme for supply chain collaboration", *Benchmarking: An International Journal*, Vol. 11 No. 1, pp. 9-31.
- Simatupang, T.M., Wright, A.C. and Sridharan, R. (2002), "The knowledge of coordination for supply chain integration", *Business Process Management Journal*, Vol. 8 No. 3, pp. 289-308.
- Stevens, G.C. (1989), "Integrating the supply chain", *International Journal of Physical Distribution & Logistics Management*, Vol. 19 No. 8, pp. 3-8.
- Stock, G.N., Greis, N.P. and Kasarda, J.D. (1998), "Logistics, strategy and structure. a conceptual framework", *International Journal of Operations & Production Management*, Vol. 18 No. 1, pp. 37-52.
- Stonebraker, P.W. and Liao, J.W. (2006), "Supply chain integration: exploring product and environmental contingencies", *Supply Chain Management: An International Journal*, Vol. 11 No. 1, pp. 34-43.
- Svahn, S. and Westerlund, M. (2007), "The modes of supply net management: a capability view", *Supply Chain Management: An International Journal*, Vol. 12 No. 5, pp. 369-76.
- Swedish Forest Industries Federation (2009), "The Swedish forest industries facts and figures", available at: www.forindustries.se/web/Facts_and_figures.aspxU (accessed 8 April 2010).
- Thomas, D.J. and Griffin, P.M. (1996), "Coordinated supply chain management", *European Journal of Operational Research*, Vol. 94 No. 1, pp. 1-15.
- Trent, R.J. and Monczka, R.M. (1998), "Purchasing and supply management: trends and changes throughout the 1990s", *International Journal of Purchasing & Materials Management*, Vol. 34 No. 4, pp. 2-11.
- Troyer, C. and Russell, C. (1995), "Smart moves in supply chain integration", *Transportation & Distribution*, Vol. 36 No. 9, pp. 55-8.
- Vernon, M. and Graham, D.M. (1971), "Profitability of monopolization by vertical integration", *Journal of Political Economy*, Vol. 79, pp. 924-49.
- Warren-Boulton, F.R. (1974), "Vertical control with variable proportions", *Journal of Political Economy*, Vol. 82 Nos 7/8, pp. 783-802.
- Waterson, M. (1993), "Vertical integration and vertical restraints", *Oxford Review of Economic Policy*, Vol. 9 No. 2, pp. 41-57.
- Williamson, O.E. (1971), "The vertical integration of production: market failure considerations", *American Economics Review*, Vol. 61 No. 2, pp. 112-23.
- Williamson, O.E. (1975), *Markets and Hierarchies: Analysis and Antitrust Implications*, The Free Press, New York, NY.
- Williamson, O.E. (1979), "Transaction-cost economics: the governance of contractual relations", *Journal of Law and Economics*, Vol. 22 No. 2, pp. 233-61.
- Williamson, O.E. (1985), *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*, The Free Press, New York, NY.
- Williamson, O.E. (1991), "Strategizing, economizing and economic organization", *Strategic Management Journal*, Vol. 12, S2, pp. 75-94.
- Wise, R. and Baumgartner, P. (1999), "Go downstream: the new profit imperative in manufacturing", *Harvard Business Review*, September/October, pp. 133-41.
- Wisner, J.D. and Tan, K.C. (2000), "Supply chain management and its impact on purchasing", *Journal of Supply Chain Management*, Vol. 36 No. 4, pp. 33-42.
- Yin, R. (2008), *Case Study Research: Design and Methods*, Sage Publications, Thousand Oaks, CA.

About the authors

Wei Guan is a PhD Student at the Division of Industrial Marketing. Her research interests are distribution channels, sales management, marketing towards retailers, etc. She is currently doing research within the Lean Wood Engineering (LWE) program, which is a research platform based on a cooperation between universities and industrial companies. Wei Guan is the corresponding author and can be contacted at: wei.guan@liu.se

Jakob Rehme is an Associate Professor of Industrial Marketing. His research interests include distribution channels, key account management (KAM), industrial sales, etc. He is also teaches courses in business strategy, industrial economy, industrial sales, electronic commerce, etc.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.