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The Economics of Outsourcing in a De-integrating Industry

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The Economics of Outsourcing in a De-integrating Industry

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1. Introduction

An important problem in Supply Chain Management is to decide which set of capabilities to develop among partners and which to develop in-house. This decision impacts the strategic issue concerning the location of key resources within the supply chain network. The supply chain literature suggests that for a chain to successfully compete against other chains, such resource development decisions be made so as to optimize across the chain rather than from the point of view of any individual player (Christopher, 1998). Developing and managing supply chains in emerging markets is becoming increasingly important as firms position themselves to take advantage of global outsourcing to low income countries. Emerging markets are dominated by low scale economy industries, such as textiles, leather and light engineering. However, supply chains in many low scale economy industries in emerging markets remain suboptimal due to activities being performed within larger firms, even though better alternatives are available through outsourcing. High levels of vertical integration are often common in the early stages of industrial development. As markets develop, government policies change, technology diffuses, and new competitors emerge, large firms are forced to evaluate outsourcing options.

Reduction of transaction costs has been identified as an important objective of supply chain management, and the analysis of transaction costs provides a useful theoretical basis for the study of supply chain management (Hobbs, 1996, Ettlie and Sethuraman, 2002). Based on a case-study of outsourcing practices and de-integration in Pakistan's footwear industry, and concepts from transaction cost economics, a framework is developed for determining which set of products and activities to outsource and which to keep in-house. The framework is of relevance not only to large firms developing supply chains, but also to small and medium enterprises (SMEs) as they consider expansion decisions. Given the significant impact of government policy on vertical integration/de-integration decisions, the findings are also relevant to policy makers concerned with development of SME networks.

The next section lists the factors leading to vertical integration, followed by a discussion on drivers of de-integration. Based on these discussions, section 3 lists the key determinants of which products and activities are best outsourced and which are best kept in-house. Section 4 presents a case study of vertical integration and recent de-integration in Pakistan's footwear industry with examples of considerations affecting outsourcing decisions. Based on this case study, and analysis of the theoretical literature on vertical integration and supply chain management, a 'framework' for making outsourcing decisions is presented in the next section. The last section has some ideas for future research.

2. Drivers of Vertical Integration

Multiple factors contribute to the establishment and continued existence of large integrated firms despite inherent inefficiencies. These can be described in terms of reduced costs, weak supply networks, increased market power, and government policy.

These factors are important during the early stages of an industry, and particularly important during early stages of economic development.

2.1 Cost Reductions

Integrated firms have a cost advantage over smaller firms by avoiding transaction costs in imperfect markets, particularly during early stages of market development. According to Hennart (1993), transaction costs include 'the cost of measuring output in all of its dimensions and the consequence of not measuring it perfectly'. These include the costs of writing, monitoring and enforcing contracts with supply chain and other partners. Supply networks in early stages of development are characterized by imperfect markets resulting in high transaction costs. Such costs are further amplified under conditions of specialized assets, complexity, uncertainty, and information asymmetry. These costs apply not only to transactions with suppliers but also with customers. It is for this reason that larger firms are more able to become suppliers to global firms.

Integrated firms avoid the high transaction costs often associated with activities requiring highly specialized assets. In such cases the costs arise are related to writing, monitoring, and enforcing contracts where specialized assets makes each party vulnerable to the other (Holmstrom and Roberts, 1998).Outsourcing activities that require specialized assets can result in opportunistic behavior, thereby increasing the risk to the partners. For instance, an activity may require highly specialized equipment that cannot be used for any other purpose or for another customer. A supplier would be reluctant to invest in the equipment since if the buyer decides not to continue the outsourcing arrangement; the supplier would be left with an asset that has no alternate use. Such specialized assets can take various forms including physical assets such as equipment, human assets involving specialized training for the activity, and location in order to lower transportation and inventory costs. The need for specialized assets particularly arises when the industry is young or where new technology is being introduced. Firms pioneering a new market or technology may be unable to find suppliers willing to take the risk of investing in the specialized assets required to undertake the activity, or may simply prefer to appropriate the benefits of the innovation by keeping the new technology in-house. Integrated firms also avoid the high costs of writing contracts in situations with high uncertainty and high information exchange requirement (Winger, 1994), and the costs of enforcing contracts where the legal environment for contract enforcement is weak. In a study of 600 durable goods manufacturing companies in 20 countries, Ettlie and Sethuraman (2002) found that shorter frozen schedules (implying higher levels of uncertainty) were significantly correlated with low levels of (global) outsourcing.

Vertically integrated firms also benefit from reduced costs through economies of scale, improved capacity utilization, decreased labor costs due to learning curve, lower raw material procurement costs, etc. (Porter, 1985). The highly integrated Ford Motor Company utilized scale economies of mass production to provide better value at a lower price and thereby achieved market dominance (Langlois and Robertson, 1989).

These cost reductions are particularly significant in continuous process and assembly lines industries resulting in high scale economies. The vast integrated East India

Company in the 1700s, with its own fleet of ships, army, and diplomatic corp was able to obtain spices and other goods at better prices (Chaudhuri, 1981), while the large integrated American textile firms in the 1800's, were better able to obtain steady supplies of consistent quality yarn compared to smaller scattered firms (Tucker, 1984).

2.2 Offensive Market Power

Large integrated firms are better positioned to develop markets for new products due to increased access to resources (financial, human, technology) and bargaining power (Harrigan, 1985). Such firms are able to build on their market knowledge to identify niches, develop premium products and technology, invest in marketing efforts, and establish distribution networks. Furthermore such firms commit the necessary resources to ensure consistent quality thereby building brand equity.

The highly integrated Bird's Eye pioneered the frozen food industry by developing a raw material supply network, introducing new harvesting and freezing technologies, building product awareness, and establishing specialized warehousing, transportation and retail equipment for handling frozen foods (Collis, 1992). Rabellotti (1993) found that larger integrated firms in Mexico's footwear industry were more innovative in terms of process and production technology, while smaller firms were limited by unstable supplies, had little knowledge of the export market and generally earned lower profits.

2.3 Government Policy

Large integrated firms are better positioned to influence and benefit from government policy. In early stages of industrial development capital, labor, and product markets as well as the regulatory environment are poorly developed, and hence governments in emerging markets have greater control over the allocation of resources. For instance, in the 1970s about 85 percent of Chile's financial assets were state owned, labor markets were controlled by government-affiliated unions, and government set price levels (Khanna and Palepu, 1999). Larger firms in such emerging markets benefit from government policy and inefficient capital markets, and gradually become more vertically integrated and horizontally diversified (conglomerates). Indeed Williamson (1975) identifies vertical integration as evidence of intermediate (such as supply networks) markets failure and conglomerates as evidence of capital market failure. In the 1960's the Korean government as part of its Economic Development Plan gave preferential treatment to major business groups through subsidized loans despite high inflation (Chang and Choi, 1988). Small manufacturers usually face high capital costs, or inadequate capital. Little et al. (1987) point out that the high cost of capital to small firms can be traced to high cost of administering these loans.

Up until late 1980's, India government policy heavily regulated the establishment of new industries, restricted access to foreign exchange, and imposed high import tariffs. As a result conglomerates flourished. For instance, the Tata empire with 230,000 employees in 95 companies, dominates industries ranging from steel and trucks to software and power generation (Ellis, 2002).

In conclusion, large vertically integrated firms are likely to emerge in high scale economy industries, in situations where markets are imperfect, where government intervention is high, and where premium products are being pioneered.

3. Drivers of De-Integration

The previous section describes reasons for the existence of large integrated firms. However as markets develop, as knowledge diffuses, and as government influence on markets decrease, large firms in low scale economy industries face pressures to de-integrate. In such industries, smaller suppliers are often more flexible, specialized and avoid the inefficiencies generally prevalent in the larger integrated firms due to shirking and labor costs. Hence it is expected that to the extent possible, activities should be outsourced rather than conducted in-house.

There is considerable evidence, both theoretical and empirical, to support the assertion that outsourcing results in lower production costs and overheads. The classic paper by Stigler (1951), built on Adam Smith's theorem that the division of labor is limited by the extent of the market, argued that as markets develop, specialization increases and drives vertical de-integration. Specialization also results in economies of doing a limited set of activities. Strategically, the specialized supplier focusing on a few core technologies and markets would build a richer base of relevant knowledge. A study of nineteenth century American and English textile industry found that specialized firms were able to produce higher value products (Temin, 1988). Lall (1980) found that major Indian truck manufacturers outsourced components involving technologically dissimilar areas (such as electrical, glass, rubber). Furthermore these truck manufacturers outsourced "specialized products (like pistons, fasteners, fuel injection) to large independent producers who serve the whole industry to reap economies of scale". Finally specialized firms, because of their smaller size have greater hiring and firing flexibility and are able to respond faster to changing markets and technologies (Harrigan, 1985).

Mahoney (1992) identifies three major reasons for why firms do not integrate: increases in *production*, *bureaucratic*, and *strategic* costs. Specialized suppliers with a larger customer base would be able to achieve full economies of scale in their production technology, and also be less constrained by capacity imbalance, compared to the integrated firm. Integration increases the size of the firm, which results in such additional hierarchical levels, bureaucracy, and even deliberate distortions to achieve divisional objectives. The availability of captive internal markets reduces direct competitive pressures on intermediate products, thus increasing slack. Hennart (1993) refers to these as shirking costs, which he describes as: 'the cost of managing is the cost of directing and observing behavior and of failing to do it perfectly'. The supply chain literature contains numerous examples of advantages gained through outsourcing. Toyota subcontracts about 70 percent of its manufacturing, using over 30 thousand suppliers. General Motors, on the other extreme, sources 70 percent of its parts in-house. Consequently, Toyota is able to assemble a car in half the time, and with minimal inventory (2 days versus 2 weeks), while development time is also half that of U.S. competitors (Womack, et al. 1990). It is thus not surprising that

when Chrysler began its turnaround in the late eighties, it started by overhauling its supplier network, from 2500 to a lean long-term nucleus of 300. The benefits of outsourcing are not confined to the auto industry. Based on a survey of 3185 manufacturing lines of business in over 200 industries, D'Aveni, Richard and Ravenscraft (1994) found that integrated firms had significantly higher production costs, than specialized firms. Little et al. (1987), while surveying textile manufacturing units in various parts of the world point out that wages in larger units are probably twice those in small establishments even after controlling for skill differences.

4. What Not to Outsource

The previous section identifies industry conditions where de-integration represents the most efficient structure for organizing the supply chain. As a general rule firms facing such conditions should outsource their activities and develop supply partners. However, it is suggested that firm-level activities involving proprietary knowledge and high transaction costs (the latter due to high levels of product demand uncertainty and requirements for specialized assets) are best retained in-house.

4.1 Activities involving proprietary knowledge

Considerable literature exists suggesting that certain activities are to be recognized and treated as "core competencies" of the firm. Such core activities need to be developed as part of a strategic plan and resources committed accordingly. An important characteristic of core activities is propriety knowledge. This includes knowledge related to production and marketing, and resides mostly within the firm. In terms of the Resource Based theory, firms are characterized by resource heterogeneity which leads to competitive advantage and consequent rents (Moran and Ghoshal, 1999), (Madhok and Tallman, 1998). Economic value is created through resource deployments, particularly through new resource combinations resulting in the development of new products and services. The knowledge component of core activities often provides high rents and hence has attracted considerable research attention (Schoonhoven, 2002). Hence core activities involving propriety knowledge generally should not be outsourced. For instance, Cummins Engine Company retains the production of strategic component families in-house, except where the company does not have the resources or time for the required investment (Venkatesan, 1992).

4.2 Activities involving high transaction costs

As discussed in the earlier section on drivers of vertical integration, outsourcing activities requiring specialized assets and high levels of uncertainty may result in opportunistic behavior and thus higher transaction costs related to contract writing and monitoring. These specialized assets may take the form of specialized equipment, location, or human resources required for new product development and meeting stringent quality and delivery requirements.

5. Footwear Case-study

Pakistan, with a population of 140 million (growing at 2.9 percent per annum), has a footwear market of above 150 million pairs/year. There are three distinct classes of suppliers to this market, i.e., the informal sector, the small manufacturers, and large integrated units. The informal sector consists of over 17,000 units, each with an average of two employees. Firms in this sector generally pay no taxes, and predominantly sell non-branded shoes through cobbler-shops. In addition, there are about 500 small manufacturers who distribute through wholesalers or their own outlets. Finally there are two large integrated manufacturers, with almost 20 percent share of the market, and sell through their own national distribution network. Both of these firms have recently started outsourcing selected product lines and are actively developing supply networks.

In this section we explore the forces that led to the establishment of these two large integrated players, the forces which now are leading to de-integration, and detailed examination of specific instances of outsourcing choices. In the process we test the applicability of the theoretical literature presented in the previous sections.

5.1 Early vertical integration

Bata (Pakistan) was established in Batapur (near Lahore) in 1942 as a branch of Bata of British India in Batanagar (near Calcutta), as part of Bata International headquartered in Toronto, Canada. Bata (Pakistan) became an independent firm after the partition of British India in 1947. Service Industries was established in Gujrat in 1954. Though Bata[1] is almost twice the size than Servis[2] is (10% versus 6% share of market), both followed almost identical strategies. Both were vertically integrated firms, with company owned leather tanneries, shoe manufacturing, and retail network. Both had built strong brands by providing reliable quality shoes at affordable prices, and through extensive advertising particularly during Eid festivals and school openings.

Smaller non-integrated manufacturers with limited access to quality raw material, reliable distribution networks, low cost capital and imported technology, were unable to compete against Servis and Bata.

Access to consistent and high quality leather is essential to producing reliable shoes. Quality leather tanning involves a complex production process, imported chemicals, and expensive equipment. In 1947, with only five tanneries in Pakistan, an efficient market for quality leather did not exist and thus not allowing smaller manufacturers access to the raw material necessary for producing quality shoes. In the initial years Servis followed Bata's distribution strategy by simply opening a store right next to a Bata store. In 2002, Servis and Bata had 260 and 350 retail outlets (mostly in rented properties), respectively. Both had plans to expand the number of

[1]Henceforth Bata (Pakistan) will be referred to as Bata.

[2]Henceforth Service Industries will be referred to by its brand name 'Servis'.

outlets by about 30 percent in the next 3-5 years.[3] Both benefited from an inefficient market for property which allowed low rents to continue for decades despite double digit inflation. Small manufacturers without access to such retail networks were dependent on distribution systems controlled by wholesalers who often defaulted or delayed payments. Smaller players also lacked access to low cost capital and imported technology available to the larger players in the 1960's. At that time, the government through an extensive industrialization plan provided selected access to capital and licenses which were required for importing equipment. The smaller players neither had the political clout of the Servis Group nor the multinational influence wielded by Bata to benefit from government policy.

5.2 Gradual De-integration

During the 1980s the leather and footwear industries expanded, several new players entered the value chain, and the market for intermediate products became more efficient. Smaller non-integrated manufacturers gained increased access to quality raw material, to low cost capital, to imported technology, and to distribution networks. These smaller players generally had lower operating costs and at times developed specialized expertise. In the late nineties Bata and Servis were facing increased competition from these smaller firms as well as imported footwear, and were actively developing supply networks to remain competitive.

During the eighties, remittances from migrant workers in the Middle-East together with the Afghan war resulted in 6 percent annual GNP growth and increased consumer spending. The increased market size was accompanied by a three-fold increase in retailers and catalyzed a three-fold growth in the number of footwear manufacturers during 1982-88 (Government of Pakistan, 1988).

In addition to increased market access, smaller footwear manufacturers gained access to improved sources of raw material, technology and capital. During the period 1981 to 1992 the number of tanneries tripled (from 180 to 509), making quality finished leather widely available to footwear manufacturers. The increase in tanneries was a direct consequence of increased leather exports, caused by widespread closure of tanneries in Europe resulting from ecological concerns. Changes in the global leather industry provided local tanners access to inexpensive used equipment and technology from their international customers. Furthermore both tanners and footwear manufacturers gained from government de-regulation which decreased tariffs on imported equipment and raw material, and gave increased access to capital.

As a result of the changed economics of vertical integration during the eighties, both Bata and Servis started a process of de-integration in the late 1990s. Bata diversified out of leather tanning in 1996, and embarked on a program to increase outsourcing. The overall plan is to increase outsourcing to specialized vendors and not to vendors who manufacture multiple lines (caused due to vendors diversifying in response to

[3]Along with expanding its distribution, Bata was also planning to start a new chain of stores (with a new brand name) in a lower price segment to compete with the informal sector.

erratic demand/uncertainty). During this period, while Bata sales was roughly the same, its labour force decreased by 20 percent. In 1965, the marketing and distribution division of Servis was formed into a separate company: Service Sales Corporation (SSC). In 1998, SSC became an autonomous body and by 2002, SSC had increased the value of products being procured from outside the Servis group to 30 percent.

5.3 Outsourcing at Servis & Bata

In 2002, both Servis and Bata carried about 1500 Stock Keeping Units (SKUs) each, grouped broadly into six product categories. Each of these six categories is characterized by different production technologies, and market characteristics (see Table 1). The production technologies vary from processes like 'lasted stuck-on sole' which involve labour intensive stitching, to complex, capital intensive process like 'Direct Injection' for producing Joggers. Market characteristics for each product category also vary in terms of demand stability, quality and price sensitivity. As shown in Table 1 and discussed below, the outsourcing decision for each product category by Servis and Bata, also varies depending on scale economies, transactional costs (due to specialized assets and demand uncertainty), and proprietary knowledge.

Table 1: Production, Market and sourcing for different Product Categories

Items	**Product Category**					
	Women Sandals & Slippers	Men Moccasins	PVC Slippers	Thongs (Hawaii)	Canvas Shoes	Joggers
Production	Lasted Stuck-on	Lasted Stuck	Injected	Expanded	Build-up	Direct
Technology	Sole	on Sole	Plastic	Sheet	(vulcanized)	Injection
Equipment cost	0.3 m	1 m	3 m	2 m	5 m	5 m-40 m
One Shift capcity	80-100 pairs	400 pairs	800 pairs	5,000 pairs	1,500 pairs	300-500 pairs
No. of Workers/shift	30	15	10-15	10-15	70	50
Process Complexity	Simple	Simple	Medium	Medium	High	High
Process Knowledge	Diffused	Diffused	Diffused	Propriety	Propriety	Propriety
Lead Time	15-30 days	15-30 days	10 days	10 days	60-90 days	30-90 days
Demand Stability	Fashion Shoes	Stable	Stable	Stable	Stable	Stable
Mkt Price Sensitivity	High	Medium	Medium	High	High	Medium
Mkt Quality Reqt.	Medium	High	Medium	Low	Medium	Medium-High
Servis	Outsourced	In-house & Outsourced	Outsourced	In-house	In-house	In-house
Bata	Outsourced	In-house & Outsourced	In-house[a]	In-house	In-house	In-house

[a]But some production outsourced during peak season

Women Sandals & Slippers involve low scale economy technologies. These shoes are produced with 'stuck-on sole technology', using labor intensive stitching processes (10 pairs/worker/shift) and inexpensive technology (Rs 0.3 million). Despite the high demand uncertainty associated with fashion items, transaction costs of outsourcing are low, making contracts easy to write and enforce. The low transaction costs are due to low requirements for specialized assets since the technology and skills are widely diffused. Furthermore, any proprietary knowledge regarding new product development is more available with smaller specialized players. The combination of low scale economies, low transaction costs, and minimal proprietary knowledge has resulted in Women Sandals & Slippers being one of the first choices for outsourcing by both Servis and Bata. Men Moccasins have production characteristics similar to Women Sandals & Slippers. However the larger lot size (because of greater volume for a given SKU) allows for assembly line manufacturing, resulting in higher scale economies. Also, the longer product life cycle of Men Moccasins result in more stringent quality requirements.

The generally lower production quality of the small players makes enforcing standards more difficult. The scale economies and quality requirements has resulted in much of the production for this category being done inhouse. The recent growth of the industry and diffusion of quality stitching equipment has made it easier to monitor and enforce contracts for quality products, thus making outsourcing of Men Moccasins a viable option for both Bata and Service.

Production of PVC Slippers requires a more capital intensive process ('injected plastic technology' equipment worth Rs 3 million) compared to the two product categories discussed above, and faces a stable, price-sensitive market. In recent years a few new firms have developed the specialized expertise in the handling of equipment and chemicals required for PVC production. These firms due to their scale economies, specialized assets (human and equipment) and proprietary knowledge have become the leading suppliers in this product category to not only Servis but also the wholesale market. However, Bata has not moved out of PVC production yet, and is still producing slippers that are priced significantly higher than those available elsewhere. Production of thongs is similar to PVC slippers in terms of relatively high scale economies and level of expertise required. Market is price sensitive and the quality requirement is even lower than PVC. In such a case, with low levels of proprietary knowledge, and low levels of demand uncertainty, transaction costs are expected to be low, and as a result thongs would be more efficiently produced through outsourcing to smaller specialized manufacturers. Interestingly enough both Servis and Bata continue to produce thongs in-house, although for a short period Servis had outsourced thongs. Though production and marketing characteristics of thongs are conducive to outsourcing, specialized quality producers have not emerged, making outsourcing unviable for Servis and Bata. The reason may be due to the lack of an efficient market for the raw material for thongs (expanded foam sheets which are produced in-house by Servis and Bata) compared to the more efficient raw material market for PVC.

Canvas Shoes are produced through a complex 'vulcanization' process which is even more capital intensive (equipment cost Rs 5 million) than any of the technologies described above, making both scale economies and transaction costs high. Furthermore the technology is proprietary (has not diffused beyond Servis and Bata). As a result,

consistent with theory, both Servis and Bata produce canvas shoes in-house. Like Canvas Shoes, the production of Joggers also involves a complex, capital intensive process, and involves proprietary knowledge which has not diffused widely. Thus, like canvas shoes, and consistent with theory, both Servis and Bata produce Joggers in-house.

6. Framework for making outsourcing decisions

An analysis of the theoretical literature on vertical integration and supply chain management, together with evidence based on outsourcing decisions by major integrated footwear manufacturers in Pakistan, suggests a framework for making such decisions (see Figure 1 on page 11). The framework suggests activities being considered for outsourcing should be evaluated in terms of five key aspects: level of proprietary knowledge, economies of scale, inefficiencies of vertical integration, and transactional costs, and the existence of reliable vendors.

Thus, it is suggested that a firm considering activities for outsourcing should undertake the following steps:

Proprietary Knowledge. Estimate the impact due to diffusion of proprietary knowledge if activity is outsourced.

Cost Savings. Identify potential vendors, and compare in-house versus vendor costs (difference due to in-house scale economies and inefficiencies of vertical integration).

Transaction Costs. If a significant difference exists between in-house and vendor costs, estimate the potential transactional costs of outsourcing (in terms of costs of opportunistic behavior where specialized assets are involved, costs of exchange of tacit knowledge, and other overheads involved in contract writing, execution and enforcement).

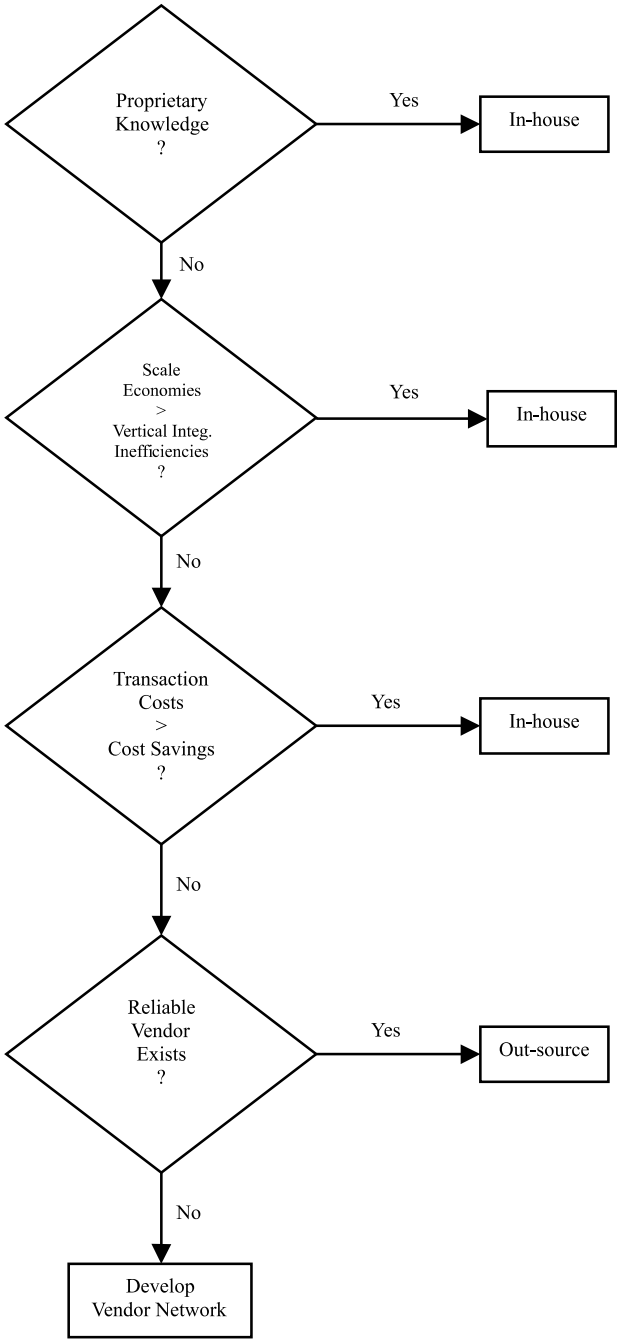
Reliable Vendors. If cost savings due to outsourcing justify the transaction costs, together with any strategic considerations, assess vendor reliability and outsource. If reliable (quality and delivery) vendors do not exist, invest in vendor development.

7. Further research

The framework developed in this paper, while based on strong theoretical foundations, needs to be further validated in the context of other low-scale economy industries going through the process of de-integration. The global textile industry presents one such example. Decreasing tariffs and quotas, and the consequent growth in international trade, is creating efficient markets in different parts of the supply chain and the emergence of specialized intermediaries.

The theoretical framework itself needs to be further refined. Particularly the notion of proprietary knowledge needs to be tied in to the large set of literature that is developing in the area of knowledge management across firm boundaries.

Figure 1: Frame work for Making Out-sourcing Decision



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Abstract

Many large firms in low scale economy industries are actively considering outsourcing options, in the face of competition from smaller more efficient players. Based on a review of the theoretical literature and a case-study of outsourcing decisions at two large vertically integrated footwear manufacturers in Pakistan, a framework is developed for determining which set of products and activities to outsource and which to keep in-house. The framework suggests activities being considered for outsourcing be evaluated in terms of level of proprietary knowledge, economies of scale, inefficiencies of vertical integration, transactional costs, and the existence of reliable vendors. It is suggested that activities with low levels of proprietary knowledge and activities where cost savings due to outsourcing justify the increased transaction costs, should be outsourced.

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