



Impact of strategic decision making for outsourcing on managing manufacturing

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Abstract

Purpose – The theories of transaction-cost economics, the resource-based view and the core competencies approach have been used extensively to justify the rationale behind strategic decisions on outsourcing, but their validity has not been investigated yet in comparative empirical research. Additionally, no study has examined the operational effects of these decisions in-depth. The purpose of this paper is to fill these two gaps in the academic literature.

Design/methodology/approach – A literature review confirms the existence of these gaps and informs hypotheses based on the three theories. Additionally, the model for continuous decision making on outsourcing is used to systematically collect data from five cases studies. The cases – all make-to-order or engineering-to-order – have been analysed on effects for operational performance and control resulting from strategic decision making on outsourcing.

Findings – From this evaluation, it appears that these companies perform weakly on the control of the outsourced activities. Furthermore, it seems that the (manufacturing) strategy is disconnected from outsourcing practices and that outsourcing hardly contributes to competitive advantage. Moreover, from some of the case studies it appears that the decision for strategic outsourcing is irreversible. Finally, traditional criteria and behaviour during decision making prevail, i.e. a cost-driven perspective, which does not address contemporary challenges.

Research limitations/implications – Despite being explorative and based on only five cases, these findings indicate that strategic decision making on outsourcing based on the three theories insufficiently accounts for operational issues that emerge later during manufacturing; it might be necessary to revise the theoretical base for outsourcing to include management of outsourced manufacturing activities.

Practical implications – The findings imply also that managers in companies, in any case those firms that operate on the basis of make-to-order or engineering-to-order, should be less “rushed” into strategic decision making on outsourcing that has adverse effects. Rather, outsourcing requires integral decision making in contrast to factual decision making that displayed signs of bounded rationality (particularly expressed through the focus on cost savings).

Social implications – The dominant, one-sided view of the cost perspectives contributes to the notion that the shareholders’ interests for short-term profitability conflict with long-term organisational health (apparent through the impact on operational management of outsourcing activities).

Originality/value – Stakeholders involved in strategic decision making might use this research to evaluate fundamentally decisions that cover outsourcing. At the same time, for consultants and practitioners it offers insight that is complementary to the often one-sided strategic decision making with its focus on cost reductions. Furthermore, this paper demonstrates the limited validity of current theories that underpin strategic decision making on outsourcing and provides an impetus for academics to develop more appropriate theory.

Keywords Decision making, Outsourcing, Manufacturing systems, Operations management

Paper type Research paper



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Introduction

The reasons to include outsourcing in manufacturing strategies have been extensively elaborated in academic literature (Kremic *et al.*, 2006, p. 467). Many have related outsourcing confidently to the performance of manufacturing organisations; for example, Görzig and Stephan (2002, p. 12) positively associate outsourcing to profits and Görg and Hanley (2004, p. 283) relate it to profitability and plant size. In that respect, more recently, there are signs that outsourcing is not all rosy. First of all, Leiblein *et al.* (2002, p. 829) present evidence and infer that outsourcing or internalisation does not make a difference. This is supported by Rothaermel *et al.* (2006, p. 1052) who stipulate that vertical integration and outsourcing should be carefully balanced. Furthermore, Barthélemy (2003) refers to seven deadly sins for outsourcing, like hidden costs, losing control over the outsourced activity and failing to plan an exit strategy. Broedner *et al.*'s (2009) study points out that outsourcing has a detrimental effect on labour productivity in German firms. Finally, there is a trend to insourcing (Caputo and Palumbo, 2005) to meet criteria of flexibility and responsiveness. Kinkel *et al.* (2008, p. 255) note a similar trend for German companies, with flexibility, capacity bottlenecks, quality and coordination costs motivating back-sourcing decisions. That all points into the direction that although we generally perceive outsourcing as a positive move for companies, factually, we know little of what impact (strategic) decision making about outsourcing of manufacturing activities has.

Research objectives

The wave of literature for manufacturing that followed the notion of core competencies has mainly focused on decision making on outsourcing as a one-time process (Cáñez *et al.*, 2000; Hafeez *et al.*, 2002; Humphreys *et al.*, 2002; Probert, 1997). Others have concentrated on criteria for decision making, both qualitative and quantitative (Akarte *et al.*, 2001; Choi and Hartley, 1996; Dowlatsahi, 2000; Ghodsypour and O'Brien, 1998; Stamm and Golhar, 1993). At the same time, the implementation appears to be under-researched (Busi and McIvor, 2008, p. 191; Freytag and Kirk, 2003, p. 141; Momme, 2002, p. 73); or better, there are no publications yet on this topic, except for publications on performance measurement of suppliers (Gunasekaran *et al.*, 2001; Simatupang and Sridharan, 2004) and information exchange across the supply chain (Holweg and Pil, 2008). Furthermore, Wasner (cited by Momme (2002, p. 62)) refers to the impact of strategic decision making on interdependencies at operational level based on only one case study. Quélin and Duhamel (2003, p. 647) state that operational cost savings of outsourcing must be balanced with the cost of monitoring suppliers. Momme (2002, p. 73) mentions that "operational details are a prerequisite for choosing the right sourcing strategy", without further specification. Finally, Nassimbeni (1998, p. 539) remarks that the dynamic forms of coordination, in the perspective of this paper understood as control mechanisms, require more attention (Freytag and Kirk (2003, p. 149) only mention it in a strategic context).

To that purpose, this contribution investigates three research questions:

RQ1. What impact strategic decision making on outsourcing has on the management of operations?

RQ2. To what extent operational performance management has been accounted for during strategic decision making?

RQ3. Which issues for outsourcing related to operational control mechanisms emerge after implementation?

Henceforth, this paper investigates the interrelationship between strategic decision making and operational control and performance management, and, indirectly, examines the validity of current theories that drive these (strategic) decisions.

Scope and outline of paper

This explorative study in this paper will present five case studies on operational control mechanisms for managing outsourcing from the perspective of strategic decision making, and, at the same time, identify avenues for more detailed research. However, the study has two limitations. A first limitation is that the operational processes in the case studies concern make-to-order or engineering-to-order. Both have been limitedly studied in the context of outsourcing; for example, in the case of make-to-order, Lee *et al.* (2002) consider outsourcing for advanced planning and scheduling and Azevedo and Sousa (2000) for a single case study on order planning. The second limitation is that literature on outsourcing related to IT and services has been mostly ignored since these fields have little relation to manufacturing and at the same time a vast amount of literature is available for the manufacturing domain. The limitations imply that this study will only indicate operational challenges for control mechanisms resulting from strategic decision making on outsourcing, particularly for cases of engineering-to-order.

This paper will proceed as follows. First, given the seemingly popularity of the theories on transaction-cost economics, the resource-based view and the notion of core competencies, the next section will elaborate on their meaning for outsourcing and operational control. The third section will focus on the research methodology. The fourth section presents the case studies and the analysis, followed by a discussion of the findings in the fifth section. Implications for practice and avenues for further research appear in the final section.

Literature review of existing theories

This paper starts with discussing main theories that have dominated academic thinking on outsourcing: transaction-cost economics, resource-based view and the notion of core competencies. Other theories resemble the theory of transaction-cost economics, like the agency theory (Logan, 2000), or fall in the category of Nassimbeni's (1998, p. 539) remarks about contractual aspects and social dynamics of inter-organisational relationships; hence, these have been excluded given the focus of this study. The review of the theories is necessary to establish later to what extent issues arising in operational control are explained by inappropriate alignment between theory and practice.

Transaction-cost economics

The first theory, Williamson's (1975) transaction-cost economics, a combination of economic theory and management theory, according to Humphreys *et al.* (2002, p. 568), and attributed to earlier thoughts by Coase (1937), tells that the characteristics of a transaction – frequency of transactions, asset specificity, uncertainty in demand, limited rationality and opportunistic behaviour – determine the most efficient governance structure: market, hierarchy or hybrid (i.e. a collaborative arrangement). Many have accepted this reasoning and the application of transaction-cost economics to outsourcing has given rise to many followers (Shelanski and Klein, 1995).

Geyskens *et al.* (2006, p. 531) provide evidence for this theory by their analysis of other primary studies and state that the make-or-buy decision is mostly related to uncertainty. Others have focused on methods for decision making. For example, Humphreys *et al.* (2002, pp. 572-3) introduce a knowledge-based system with the fifth step being based on transaction-cost economics. Dyer (1997) uses transaction-cost economics to explain differences between Japanese and US practices. Fill and Visser (2000, p. 46) and McIvor (2000b, 2003) base their research into outsourcing on transaction-cost economics combined with the core competencies approach. These studies mentioned serve as examples for those that deploy transaction-cost economics for setting out approaches to decision making on outsourcing.

Despite these disciples, there are also academics that question the validity of transaction-cost economics. Ghoshal and Moran (1996, pp. 40-41) mention that they consider the possibility for fostering opportunistic behaviour the main flaw of the theory, even though Williamson (1998, p. 31) mentions this explicitly as part of the theory; that latter position is reiterated by Grover and Malhotra (2003, p. 459). Other critiques include the questioning of the role of uncertainty in necessitating hierarchical governance (Grover and Malhotra, 2003, p. 461). Some argue that basing interorganisational decisions on transaction costs alone could undermine the collaborative benefits and the transaction value of inter-firm collaborations (Sturgeon and Lee, 2001, p. 3). Mahnke (2001, p. 356) adds that transaction-cost economics blackboxes historical context, interrelationships between transactions as well as long-term consequences of boundary choices. It all indicates that this theory might difficultly describe decision making on outsourcing and the impact on operational management.

The application of transaction-cost economics to outsourcing implies that uncertainty in demand, asset specificity and frequency of transactions determine the governance structure. From these factors, specifically the frequency of transactions and uncertainty might have an impact on control mechanisms and performance management in manufacturing. The factor asset specificity contributes to taking outsourcing decisions but also might cause dependencies in the buyer-supplier relationship affecting operations management. Hence, the first proposition for this study reads:

PIA. When taking strategic decisions on outsourcing manufacturing activities or processes, firms have accounted for uncertainty, asset specificity and frequency of transactions during operations.

The theory also implies an integral view on costs related to transactions. For strategic decision making on outsourcing, costs related to the transactions (e.g. purchasing orders, transfer of goods, quality inspections, control efforts) have to be accounted for besides the cost of the product, sub-assembly, component, part or materials themselves. That leads to a second proposition:

PIB. When taking strategic decisions on outsourcing manufacturing activities or processes, firms have accounted for integral cost of transactions.

Resource-based view

The second theory for outsourcing, the resource-based view, as similar thinking, quickly followed the concept of the transaction-cost economics in the 1980s. This view appeared in the 1960s and 1970s when organisational theorists combined research on inter-organisational relations and political economy of organisations

(Hemphill and Vonortas, 2003, p. 261). This theory defines resources as tangible and intangible assets that are tied semi-permanently to a firm (Wernerfelt, 1984, p. 172). Others, especially Barney (1991), have articulated this view by shifting the emphasis from organisational theory to the organisation's goal of reducing the uncertainty and the dependency on other organisations for its survival. For outsourcing, the resource-based view is enjoying increasing popularity. For example, Espino-Rodríguez and Padrón-Robaina (2006) consider the resource-based view a more up-to-date theory for outsourcing than transaction-cost economics. Ettlíe and Sethuraman (2002, pp. 353-4) positively relate the resource-based view to outsourcing. Holcomb and Hitt (2007) combine this view with transaction-cost economics to arrive at propositions for outsourcing. McIvor (2008, p. 26) combines the same theories for analysing case studies in outsourcing. From these instances, it might be inferred that the resource-based view often together with transaction-cost economics serves as theoretical base for strategic sourcing.

At the same time, the resource-based view receives substantial criticism. For example, Hoopes *et al.* (2003, p. 897) remark that the resource-based view arrives from simple applications of micro-economics, industrial organisation, organisational theory and traditional business policy and that it would be treated better in the context of competitive heterogeneity (Dyer and Singh, 1998; Mahoney and Pandian, 1992, p. 374). Mahnke (2001, p. 357) notes that strategic capabilities and resources are often hard to identify in practice and often remain limited to current activities of a firm. She adds that the resource-based view helps little to understand switching costs related to vertical disintegration, fails to relate outsourcing to competitive dynamics and downplays long-term consequences on dynamic capabilities (Mahnke, 2001, p. 358). Priem and Butler (2001, pp. 30-31) denote the ignorance of the characteristics of demand as the main failing; this is reiterated by Holcomb and Hitt (2007, p. 473) when they write that this perspective assumes that all firms face a similar set of exchange conditions. Fahy and Smithee (1999, pp. 12-13) add that the theory's static view on competition will likely lead to difficulties (combined with a lack of empirical validation). This raises doubts to the effective application of the resource-based view for outsourcing, certainly for operational control.

Even given those doubts, the resource-based view implies a competitive strategy model rather than a decision model for outsourcing. Independence of agents, fuelled by the uniqueness of their resources, will create power shifts (Medcof, 2001). That results in issues of power and trust in the relationships (Das and Teng, 2001; Huemer, 2004; Thorelli, 1986, p. 38; Vangen and Huxham, 2000) and interdependencies (Wasner cited by Momme (2002, p. 62)). That leads to the following proposition:

- P2A.* In the case of unique resources or assets possessed by the supplier, the decision for outsourcing leads to issues of power and trust affecting operational control and performance.

As competitive model between suppliers, the resource-based view prescribes differentiation between suppliers. The more unique these resources and capabilities are, the more the buyer will become dependent on that supplier: whether it concerns knowledge or non-trivial investments in asset specificity. However, that implies that the decision to outsourcing will lead to a dependency or lock-in:

P2B. The selection process of suppliers will cause lock-in for the case of asset specificity or specific knowledge possessed by the supplier.

These two propositions show that the strategic decision on outsourcing might lead to dependencies for operational control in the buyer-supplier relationship.

Core competencies

The third theory, the notion of core competencies, focuses on strategic decision making itself. Javidan (1998, p. 60) declares it is consistent with arguments of the resource-based view. According to Friedrich (2000, p. 19), focusing on core competencies (Prahalad and Hamel, 1990) and outsourcing (Gilley and Rasheed, 2000) raises the key issue on which areas a company should concentrate for achieving optimal performance. Generally speaking, these competencies are hard to define (Mahnke, 2001, p. 357). And often this thinking about core competencies leads to outsourcing mostly based on a cost perspective for manufacturing (Arnold, 2000). Only when companies succeed in linking core competencies to integral performance criteria will a manufacturing strategy be found that offers guidelines on decision making for resource acquisition and capability management (Hayes and Pisano, 1994); that leads to the proposition:

P3. The strategic outsourcing decision has accounted for integral performance criteria.

To that purpose, numerous studies have linked strategic decision making based on core competencies to outsourcing (Dekkers, 2000; McIvor, 2000a, b; Momme, 2002; Reed and Walsh, 2000; Tayles and Drury, 2001), sometimes in combination with transaction-cost economics (Arnold, 2000; Fill and Visser, 2000) or the resource-based view (Hafeez *et al.*, 2002). This approach to outsourcing hardly receives any critiques from academics. Only Scarbrough (1998, p. 230) raises doubts whether the resource-based view and the core competencies approach have succeeded in opening the blackbox of the firm. And he renders the approach inadequate for firms where process and product design plays a key role (Scarbrough, 1998, p. 219). Hence, despite numerous studies taking the core competencies approach as starting point for outsourcing decisions, it cannot be established whether it accounts for the operational processes necessary for sustaining order processing and whether it considers industry or firm characteristics.

Implications for outsourcing

Nevertheless, the three theories have stimulated writings about strategic decision making on outsourcing but at the same time, they could be criticised for their limited views in relation to operational control. First, for some studies, it appears that reported improvements are not only related to outsourcing but also to improvements in operational control. For example, McIvor (2003, p. 390) reports that all three cases in his study introduced just-in-time (JIT) delivery. Given the potential impact of JIT (Cua *et al.*, 2001), it might be questioned whether outsourcing has been the driving factor in cost reduction and improvement of performance. Arnold (2000, p. 27) hints in the same direction. In that respect, Narasimhan and Das (1999, pp. 711-12) mention that strategic outsourcing improves flexibility. That is only possible when the operational control structures are adapted to the characteristics of the outsourced activities and embedded in manufacturing processes. That introduces the next proposition:

P4A. The implementation of outsourcing decisions requires adequate operational control structures.

In this paper, “adequate” means aligned with integral business approaches towards control structures and organisational structures; this is covered in this study by deploying the Delft School Approach (Dekkers, 2005, pp. 429-34). Second, at the same time, doubts have been raised towards the decision making on outsourcing in practice. Mazzawi (2002, p. 43) states that the focus is more on cost reduction than integral performance improvement. In addition, Blaxill and Hout (1991) have found the many firms take sourcing decisions primarily based on overhead costs. That aligns with that most companies still regard efficiency as the main objective of their production departments in a survey amongst the Spanish industry (Avella, 1999, p. 1312; Dekkers and Bennet, 2009, p. 15; Sturgeon 2002, pp. 8-10) relate that to the low corporate esteem of manufacturing. Furthermore, Humphreys *et al.* (2002, pp. 568-9) point towards the lack of formal methods for evaluating the decision on outsourcing, particularly when companies measure competitiveness in terms of price only. Hence, companies tend to overemphasise cost reduction as main motive for outsourcing:

P4B. The decision for outsourcing is dominantly informed by cost considerations.

This proposition could be considered the zero-hypothesis for *P3*; they are mutually exclusive. Third, the concept of bounded rationality states that rationality of individuals is restrained by information they have, cognitive limitations and finite amount of time for decision making. de Boer *et al.* (2006, p. 451) remark that bounded rationality rules out that all activities are explicitly identified let alone evaluated. As Mahnke (2001, p. 358) states those that happen to decide on outsourcing might consequently engage in experimental search to improve efficiency under conditions of uncertainty. That search for efficiency strengthens the case for *P4B*. Therefore, the relationship between strategic decision making and operational control and performance management should be the focus of study and whether strategic decision making can be linked to the cost perspective or an integral view on manufacturing performance.

Research methodology

After establishing the hypotheses, this section elaborates on the research methods chosen and the data collection. Particularly, the explorative character of the research requires some deliberation.

Research rationale

It makes sense to follow a qualitative case study approach that is explanatory, according to Yin (1994, p. 140). That is possible because most of the existing studies are based on transaction-cost economics, the resource-based view and the core competencies approach, implicitly or explicitly; the implications of these theories have been considered as propositions for the five case studies on decision making, operational control and performance management. In the case of an explanatory (or predictive) study, according to Popper (1999, p. 10), hypotheses (or in this case propositions) should be falsifiable. Nola and Sankey (2000, p. 18) add that in case of theories with a generic character and in case of a limited number of case studies the findings from the research will not allow verification, but only falsification. Furthermore, a second point of Popper’s philosophy towards scientific discovery, induction logic, warns for drawing generalisations where possibly

inappropriate (Popper, 1966, pp. 98-9; Selz, 1913, p. 97). Finally, since operational matters for outsourcing involve scheduling and planning, organisational structures and purchasing activities, the analysis will cover production processes, logistical activities and control mechanisms. That means that the units of analysis is found at the total company performance, engineering and manufacturing as processes, and purchasing and scheduling as control processes; in that respect this study in this chapter is of type 4, according to Yin (1994, p. 39). Data collected during the case studies will serve as base for evaluating the propositions and that way indicating the validity of the theories that drive the strategic decision making by the search for possible falsification.

It could be argued that a grounded theory approach should be followed. As Allan (2003, p. 1) states, in principle, the grounded theory investigates actualities in the real world and analyses the data with no preconceived hypothesis (Glaser and Strauss, 1967). But Yin (1994, p. 13) suggests that the case study “benefits from the prior development of theoretical propositions to guide data collection and analysis”; as do Glaser and Strauss (1967, p. 169) who encouraged researchers to “use any material bearing in the area”. Strauss and Corbin (1998) see the use of literature as a basis of professional knowledge and refer to it as literature sensitivity; Dey (1993, p. 66) views it as “accumulated knowledge”; a condition fulfilled by the preceding literature review. Since this study excavates an area hardly explored the thoughts of Feyerabend on methodological pluralism (Leavitt, 2001, p. 6; Nola and Sankey, 2000, p. 12) allow an uncanonical approach. Hence, for this investigation the vast amount of literature on outsourcing, particularly for strategic decision making allows using a case study approach combined with the propositions and a more detailed analysis using the model for implementation and operational control for outsourcing.

Collection of data

Each of these cases represents an in-depth-study of typically eight to nine months, comprising of both the analysis of the specific problems of a company and the detailing of the solution. Because of this reason, the table lists the original problem definition for the case studies. For all the cases, outsourcing issues were a major part of the challenges as a result of strategic decisions for in-house and external production; in four cases that resulted in divesting manufacturing activities and in one case the contracting of suppliers (only the consequences of these strategic decisions have been considered). Each of these case studies has been exclusively undertaken to analyse current practices and to issue guidelines and proposals for improvement; interviews have taken place with management teams, relevant department managers and operational staff. The collection of data and the interviews were repeated and complemented until a complete picture emerged of:

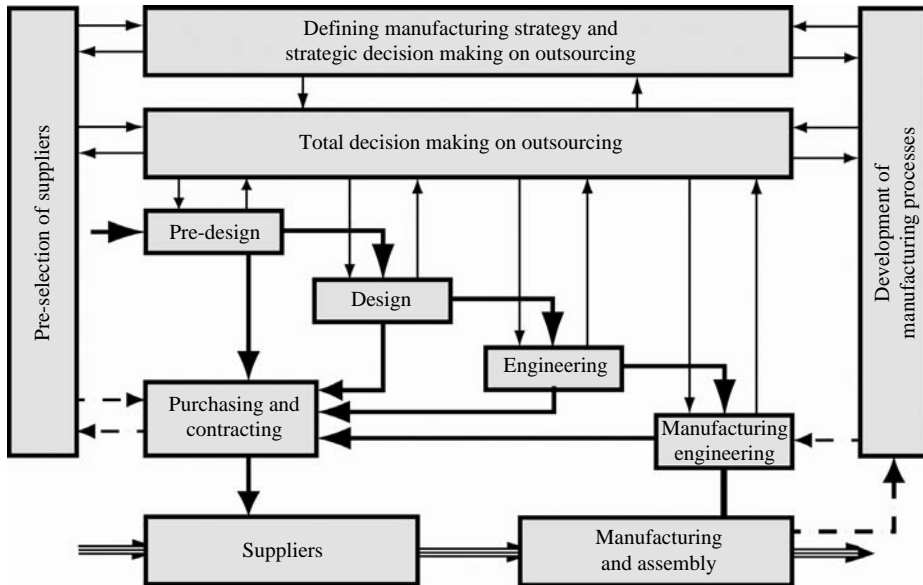
- the criteria used for strategic decision making;
- the relation of these criteria to the competitive strategy;
- performance of manufacturing in relation to outsourcing;
- operational control mechanisms for managing production and outsourcing; and
- organisational structures.

Additionally, the analysis was continued until there was a clear relationship between the original problem statement and root causes. Furthermore, interim reports have

been produced and assessed by managers and academics during the various stages of each case study. For each company as an in-depth case study, the models have been applied during the period 2001-2006 to solve issues of outsourcing and operations management. After the latest study, results have been classified and compared. The five case studies represent a variety of companies, each of them typical engineering and manufacturing companies (make-to-order or engineering-to-order). The companies have chosen to remain anonymous due to the sensitivity of the information.

Empirical research

In this section, the case studies will be presented with a brief description of the companies, the challenges they faced and solutions put forward. Please note that for engineering-to-order and to a certain extent make-to-order, the outsourcing decision typically results in purchasing activities since each order is unique with different requirements for products, parts and processes. Since the focus is on the impact of strategic decision making on operational control that should not be confused with purchasing; the analysis only considers those activities that were previously performed in-house and are now outsourced (except for case D where the company at start-up made a strategic decision not to manufacture parts in-house). The descriptions will be followed by the analysis against the model for continuous decision making on outsourcing (Dekkers, 2000), see Figure 1 with a more detailed explanation;



Notes: During the subsequent stages of design and engineering customer requirements are translated into instructions for manufacturing and assembly and into instructions for supply of materials, components and subassemblies; the traditional purchasing activities constitute only a part of all processes; additional processes include strategic decision making on competencies, pre-selection of suppliers and evaluation of supplier's performance; particularly, for the engineering-to-order and make-to-order modes each order will result in purchasing and contracting activities
Source: Dekkers (2000, p. 4090)

Figure 1.
Model for continuous
decision making on
outsourcing

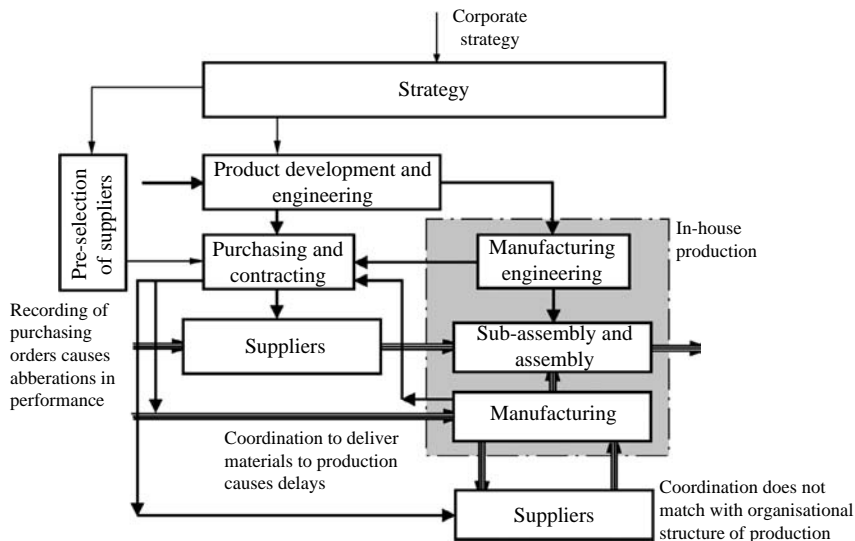
no integral view seems present in literature other than this model covering strategic, tactical and operational decision making. After the analysis against this model the evaluation of the propositions will follow.

Five case studies

“Case A” (3,000 employees, Europe) produced dedicated vision systems for specific applications for a wide variety of customers having their own requirements (about 50 systems/year). The total lead-times for specific orders (product development and manufacturing) amounted to five years, the planned lead-time was exceeded by 50 per cent or more. Manufacturing costs could amount to 65-70 per cent of the sales per order, lot-sizes for orders varied between a few systems to sometimes 30 pieces of equipment. Outsourcing was about 30 per cent of the total sales, a relatively low figure in comparison to the industry standard of 50-60 per cent. The manufacturing phase of order processing continued to pose problems, even after the implementation of a new strategy that emphasised a more active approach towards outsourcing. The management team of this company asked for an evaluation of the implementation of the outsourcing strategy and recommendations for operational management of outsourcing.

Because of decision making far before the investigation, the company in case A had outsourced what they considered non-core competencies based on investments to maintain specific capabilities and cost considerations (Dekkers, 2002, p. 3907). The galvanising department serves as an example; it is noteworthy to mention that three of these “departments” were already serving large numbers of external customers before they became independent companies. The decision for a greater degree of outsourcing came about through the strategy formation taking place in the conglomerate the company was part of. Even though objections – based on possible dependency on suppliers – were put forward, the decision was made to spin-off suppliers out of departments and to rely on outsourcing to a greater extent. During the decision making, no formal methods were used; the managers relied on the core competencies approach (even though not attributing it to a theoretical or academic concept) and primarily financial-economic criteria did drive their decisions.

After the implementation of this strategy, the operational management of outsourcing continued to pose challenges (Figure 2). During the investigation, it appeared that delivery dates were exceeded by far – about 60 per cent of deliveries was late – and that the ratio purchasing cost vs actual production costs could amount to 100:1 in some cases; for the galvanising processes, about 4,500 purchasing orders per year, 50 per cent of the volume has an order value of less than €13 and 25 per cent even less than €3. One cause for late deliveries was the independence of these suppliers. Not any more a department in the parent company, other customers had become dominant for their portfolio and, hence, orders for the company were placed low on the list of priorities (for example, the orders from case A only represented 1 per cent of the revenues for one of the suppliers of galvanising processes). In addition, suppliers did not favour case A because of the procedures and documentation necessary for producing parts. Furthermore, production planning was not able to issue reliable scheduling data neither did the suppliers. This was strengthened by the fact that the issuing of orders was done by purchasers whereas internal job orders were issued automatically; in combination with operating procedures for information systems, this was another source of delay and incomplete and inaccurate information.



Notes: Please note the central role of purchasing in this case of a producer of dedicated vision systems; many of the problems relate to synchronisation between scheduling and purchasing, dependency on suppliers and administrative procedures

Figure 2. Process for outsourcing in case A

The analysis proved that it might be beneficial to insource this capacity but that was not possible any more. At the end, a solution for improved production planning and scheduling was proposed.

“Case B” (845 employees), a European producer of hydraulic telescope cylinders and related products, was aiming to expand its market share but was experiencing increasingly production problems. Its product range consisted of about 1,000 different cylinder types and, typically, each year about 360 types were manufactured for specific orders; it produced about 12,000 cylinders annually. The company emphasised product flexibility to address the needs of its customer base, mostly through modification of existing products, although redesign often required little effort. About 59 per cent of the products (representing 19 per cent of sales) was custom made (engineering-to-order for initial orders) and later delivered as make-to-order for recurrent orders. The relatively long lead-time for its markets (six to eight weeks) meant an amplification of late delivery of orders.

Outsourcing played a crucial role in the strategy for case B; the in-house production covered mostly assembly and some critical production processes. However, most of the critical components were now produced internally and externally as a consequence of strategic decision making, even though finishing of components takes place in-house. In the case of galvanising, the production processes were interrupted to bring the components as work-in-progress to the supplier. In addition, a Brazilian plant, owned by the parent company, was considered an “external” supplier. The company had chosen to allocate the manufacturing of some cylinder types to this plant for efficiency reasons (those that were sold at larger volumes). The company had chosen for this mixed approach in view of cost considerations, investments and to some extent flexibility.

Because of this mixed approach towards in-house production and outsourcing, the operational management of production caused considerable difficulties (Figure 3). For the Brazilian operations, given the distance, lead-time including transportation cumulated to eight weeks. Even though, “standard” cylinders to be stocked were produced there, this caused shortages since the company wanted to avoid inventory. For a range of other parts needed for final processing and assembly, suppliers had been selected and were evaluated each year depending on availability of new suppliers. Again, like in the previous case, one cause for production problems was the independence of these suppliers; orders for this case were placed low on the list of priorities (for one supplier they only represented 10 per cent of the revenues). Another problem was the batch processing, which required integration of scheduling between suppliers and case B, and the parts needed for custom-made products, which had to pushed through the supply chain at additional cost. Solutions were put forward to standardise the product range, to improve forecasting and scheduling (based on three manufacturing streams classified according to volume and frequency), to reduce manufacturing lead-time based on order entry points (Dekkers, 2006) and to improve scheduling and information exchange between suppliers and the company.

“Case C” concerned a European manufacturer that would produce ten large custom-made systems, and 200 small semi-standard pieces of equipment (the core component was produced in an identical way) each year. The order process involved engineering and manufacturing of these pieces, driven by specific orders of industrial customers. A newly set strategy for manufacturing and the exploitation of core competencies, to reduce costs, forced the manufacturer to renew its strategy. To address these challenges the production department had implemented semi-autonomous groups and, typically, these groups had to control outsourcing, too; it was assumed that these semi-autonomous groups would bring cost reductions and increase flexibility.

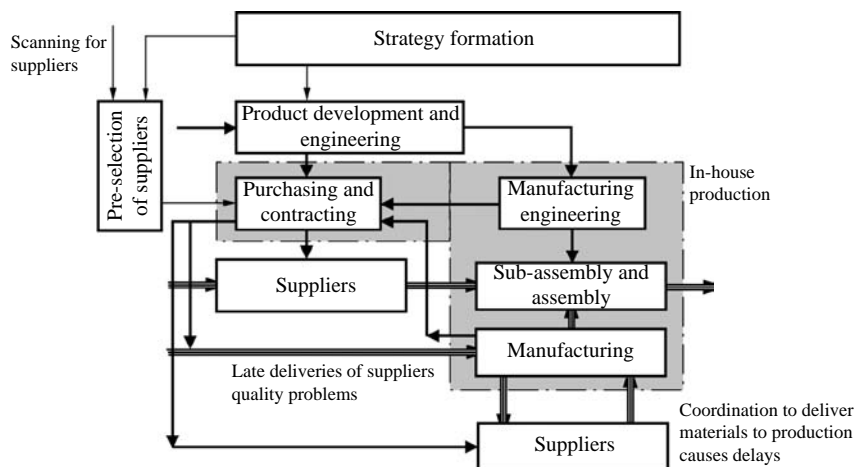


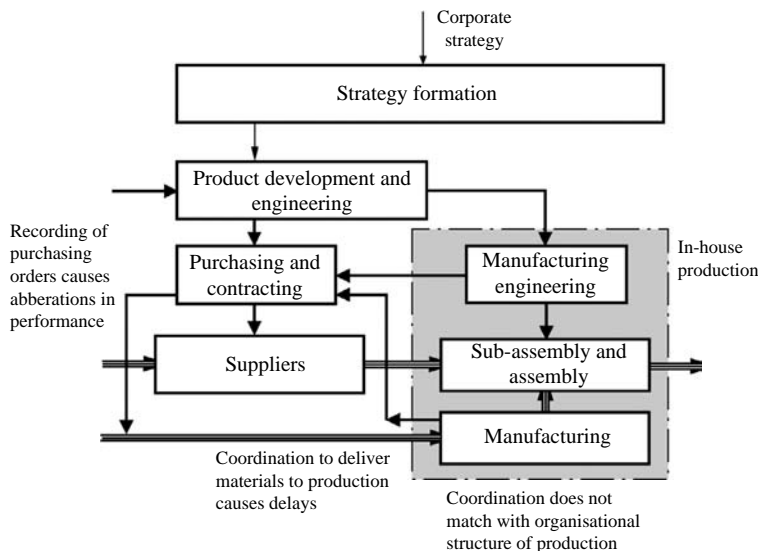
Figure 3.
Process for outsourcing
in case B

Notes: Although in this case of a manufacturer of hydraulic telescope cylinders, purchasing has a central role, it was also part of the production department; many of the problems could be attributed to dependency on suppliers and to scheduling

The strategy for concentrating on core competencies and consequently outsourcing manufacturing activities was instigated by the corporate strategy. The conglomerate the company was part of has issued directions to divert investments to core activities and increase profitability. That corresponded with an increasing pressure on pricing of systems offered. Hence, the manufacturing strategy was aiming at reducing non-core activities through spin-offs and strengthening production through a more advanced organisational structure.

That had an impact the control of outsourced activities, too (Figure 4). Particularly, outsourcing during production caused problems, such as 50 per cent late deliveries. These problems were mostly absorbed by the semi-autonomous groups through working additional hours on orders. For a large part, this originated in inappropriate recording of data in the information systems, much like in case A, and in the lack of adequate coordination between purchasing and the semi-autonomous groups. Suggestions were made for the recording of information, for the scheduling and planning and for the organelle structure[1] of outsourcing; outsourcing was split in “initial purchasing”, i.e. pre-selection of suppliers during design and engineering, and control of supply during the manufacturing of products. The pre-selection of suppliers became the domain of the purchasing department and the actual operational control was allocated to the semi-autonomous groups. Furthermore, the information exchange internally, driven by adaptations in logistic control, and with suppliers was improved (Figure 5).

“Case D” represented a company, employing 200 people and based in China, which had deliberately chosen to operate as a networked enterprise (make-to-order).



Notes: Please note the central role of purchasing in this case of a manufacturer of machinery and equipment for the food industry; many of the problems could be connected to (i) coordination between purchasing and the semi-autonomous groups and (ii) administrative procedures

Figure 4.
Process for outsourcing
in case C

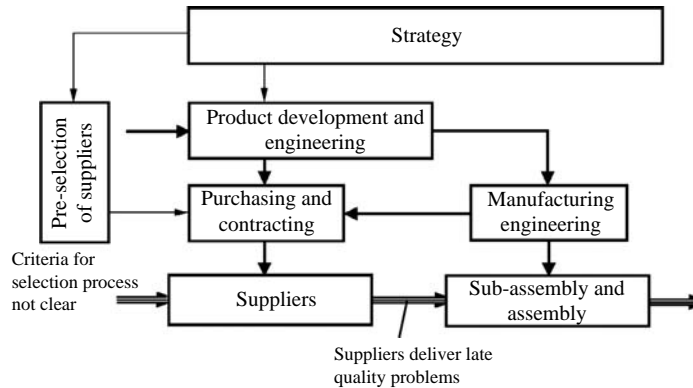


Figure 5.
Process for outsourcing
in case D

Notes: Many of the problems could be associated with poor performance of suppliers, in this case of a component manufacturer for the automotive industry; no formal process for supplier selection was in place neither a process for evaluation of the performance of suppliers

The company consisted of four separate business units, one of them being contract manufacturing directed at the automotive industry. The main contract of this business unit concerned a major part for truck manufacturing for which it was starting up production. The first analysis of the company as a whole revealed that an improved organisational structure was needed together with formalised systems for operations management, especially management of outsourcing. For example, the selection of suppliers was based on non-directive search and personal relationships rather than a complete evaluation of the suppliers' base. The second phase concerned the implementation of control processes for outsourcing within the new organisational structure for contract manufacturing. A lack of a local supplier base with adequate technological capabilities restricted the growth of the company; it was suggested that the company would invest in upgrading the competencies of the suppliers (Figure 6).

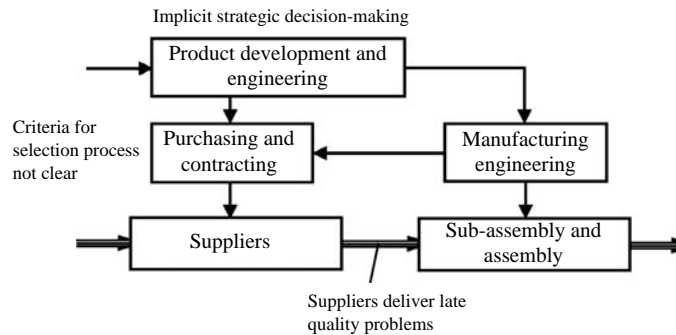


Figure 6.
Process for outsourcing
in case E

Notes: Many of the problems could be associated poor performance of suppliers in this case of a company providing engineering solutions to the aerospace industry; no formal process for evaluation of the performance of suppliers existed and there was a poor supplier base regionally

“Case E” constituted a company, based in Indonesia, that did design, engineer, and manufacture prototype solutions of complex systems, e.g. for aerospace (220 employees). Design and engineering-to-order did form the core business of this company. Analysis showed that further improvement would only be possible by including more knowledge of manufacturing (including capabilities of suppliers) into the design phase. Second, because of the lack of adequate knowledge exchange, suppliers regularly failed to deliver in-time and to adhere to quality standards. Also, the lack of an appropriate supplier base with sufficient technological capabilities contributed to lower performance levels during manufacturing. An integral solution for both control of outsourcing and manufacturing was put forward to meet performance requirements.

Analysis

To compare the case studies, the model for continuous decision making has served as classification of decision making and operational problems. The solutions for the companies have been unique; hence, they have not been fully taken into account. Table I addresses the themes by short statements to indicate the type of problems; each of these problems arrives from the individual reports of the case studies. The five cases together show that industrial companies in different settings and different markets experience similar problems for the management of outsourcing.

Most of the five companies experienced problems with implementing manufacturing strategies for part caused by strategic decision making. Concerning this decision making, in cases A-C there was a deliberate choice to concentrate on core competencies, instigated mostly by cost reductions and divesting; more implicitly the same could be said for case E because their core competence was in design and engineering. It should be noted that the divestments results in suppliers that became largely independent on the former parent companies. However, none of the companies did deploy a decision model for outsourcing, whether based on one of the theories or selection of suppliers, as found in the literature. Rather, they had evaluated potential cost savings, external manufacturing of parts would be cheaper (accounting for transportations costs but discounting costs related to logistics control), or they had looked at ways to reduce investments in assets and technology (e.g. the galvanising department in case A). This concurs with findings from Fan (2000, p. 216) and Mazzawi (2002, p. 43), also pointing to cost reductions as driver. Decision making related to other criteria than cost, e.g. impact on lead-time, appeared more to be more limited: the effects should not be too bad before they were considered. This is congruent with the statement of Gilley and Rasheed (2000, p. 788) that those firms that pursue cost leadership and innovative differentiation strategies might more fully reap the benefits of outsourcing. That was limitedly apparent in the case studies; all companies were distinctive present in their markets but they experienced cost pressures by market forces leading them to look for cost reduction rather than re-evaluate their strategies. McIvor (2000a, p. 50), who generally favours outsourcing practices, adds that sometimes companies misuse outsourcing to get rid of problem-ridden parts of the business; as he demonstrates with a case study. It appears that random or opportunistic strategic decision making on outsourcing occurs rather than a deliberate strategy to evaluate integral performance from which an outcome could be outsourcing.

As for all five case studies, the pre-selection of key suppliers based on the strategic decisions for outsourcing happens mostly during design or product development based

Table I.
Overview of the
five case studies

Case	Scope of study	Strategy	Pre-selection	Technological capabilities	Operational control	Performance evaluation
A	<p>Manufacturer of vision systems. Typically 50 systems/yr. (small series), custom-made systems, development costs dominate</p>	<p>On-going concentration on core competencies. Decision making on outsourcing during product development (especially commercial of the shelf); decision making on outsourcing during manufacturing for capacity management</p>	<p>Single-sourcing during product development. Databases of suppliers for specific manufacturing processes</p>	<p>Suppliers should obtain prequalification based on quality management, adherence to standards (mostly copy of internal production instructions)</p>	<p>Issuing of orders based on internal order processing: does not match with processing orders of suppliers (small series vs batch processes). Late issuing of orders causes production delays. Ratio of administrative procedures vs order cost unbeneficial. Metal treatment in-between in-house processes.</p>	<p>No systematic performance evaluation present. Measurement only of individual production processes</p>
B	<p>Manufacturer of cylinders. 8,000 cylinders/yr., high variety of products</p> <p>Improve manufacturing flexibility, current operations management insufficient. Performance of suppliers unreliable</p>	<p>Three manufacturing sites (three countries). Outsourcing of some manufacturing processes (investment in production equipment)</p>	<p>One defined main supplier for welding process</p>	<p>More based on investment than capability</p>	<p>No quality issues. Welding process located in centre of in-house processes. No match between processing of orders and control of capacity supplier. More time needed for order processing than in-house</p>	<p>No systematic performance evaluation present. Yearly review hardly resulting in changes to suppliers' base</p>

(continued)

Case	Scope of study	Strategy	Pre-selection	Technological capabilities	Operational control	Performance evaluation
C	Manufacturer of large equipment food processing. 10 systems/yr., custom design	Core competencies (design, engineering, assembly, key technologies); outsourcing partially to East Europe. Initial decision making on outsourcing during development	Decision making during product development (no alternatives)	Outsourcing of base technologies with low added value has priority	Issuing of orders late due to late documentation of engineering; specifications known already. Dispersed responsibilities for control; no alternatives for suppliers	No systematic performance evaluation present
D	Producer of components for automotive (China), contract manufacturer. 1,000/yr	Reduce own core capabilities to design and assembly. Added value of industrial networks; enhance performance of network	No systematic approach towards supplier selection. Personal relationships prevail	Knowledge base of company exceeds knowledge and skills of suppliers	Issuing of orders but no follow-up. Quality problems reactive more than preventive	No systematic performance evaluation present
E	Custom-designed high-tech systems (Indonesia). Production is mostly assembly	Assembly of prototypes. Network of suppliers to meet variety in demand (prototypes/small series)	No systematic approach towards supplier selection. Personal relationships prevail	Knowledge base of company exceeds knowledge and skills of suppliers	Issuing of orders but no follow-up. Unique specifications lead to solving problems afterwards (rush-orders; own job-shop)	No systematic performance evaluation present

Notes: For each company the scope of the original study has been listed; some of the studies did aim at improving the total performance of manufacturing, in which case the outsourcing issues were part of the problems investigated; each case has been evaluated against the five issues from the framework

Table I.

on specifications; during later stages it turns more into purchasing within the constraints of very defined specifications (sometimes with no or limited technological input from suppliers). This confirms the position of Nellore and Söderquist (2000) and Hicks *et al.* (2000, p. 187) on the vital role of specifications for outsourcing, certainly for engineering-to-order and to some extent for make-to-order. Cases A and C have assigned purchasers for participation during the design and engineering process for more adequate pre-selection of suppliers (although limited in choice). The processes of pre-selection did also lead to allocation of single sources, which reduces the operational flexibility (capacity problems at suppliers, non-competitive bidding) (Hicks *et al.*, 2000, p. 186). During the stages of design and engineering, none of the companies used a formal method for decision making, as available in academic literature; there appears to be a dominance of cost-driven decisions. There was no feedback about supplier performance to the stages of design and engineering, like in case A. Therefore, operational problems would occur over and over again; also as a consequence of the lack of formal decision-making methods.

The operational control posed additional challenges although not all companies were aware of the impact. First, in two cases (A and B) the in-house production of some manufacturing processes proved more beneficial than outsourcing, particularly those ones in between production processes (Caputo and Palumbo (2005, p. 205) draw a similar conclusion for the textile industry in relation to responsiveness). However, at the same time, this decision seemed irreversible. The suppliers had build up their own capabilities, knowledge and customer base. Scarbrough (1998) contests the views of the core competencies approach for that very same reason. This position is in strong contrast with Jonash (1997) who speaks strongly in favour of external sourcing of technology. Furthermore, all companies reported problems on in-time deliveries by suppliers; some of the problems arose from reactive interventions rather than pro-active securing of purchasing orders. The two industrial networks (D and E) had additional problems with meeting quality standards but that might be due to the capabilities of the local suppliers' base (also the case for C). Third, the information systems proved sometimes to be inadequate (recording and follow-up of purchasing orders in ERP-systems seems consistently difficult) and scheduling with suppliers proved difficult, sometimes strengthened by the dependencies on specific suppliers. This happened much more frequent in the case of outsourcing during manufacturing (cases A-C) and less when complete parts or components were purchased. Fourth, the scheduling was part of overall planning and control for manufacturing, while practices at purchasing departments did not always align with those of manufacturing. In addition, the transaction costs of the purchasing systems could exceed the cost of the order itself. Finally, there was some evidence that the allocation of the purchasing functions should align with the manufacturing organisation. In case C, that was apparent in the re-allocation of the control of outsourcing to the semi-autonomous groups. And in case A, the organisational structure of manufacturing was identified as a potential area for improvement in control of outsourcing. This aligns with comments of Hicks *et al.* (2000) that in the case of mass production JIT could be applied while that seems almost impossible for engineering-to-order (and may be also for make-to-order under certain circumstances). Putting it all together, the operational control posed a wide variety of problems showing a poor integration between design, engineering, purchasing and manufacturing.

All cases showed that no formal performance evaluation was in place, even if the companies had the ability to intervene or select other suppliers, except for case B. Nevertheless, even in case B options were limited because of the technological capabilities that suppliers should have. In the other cases, a reactive approach prevailed above pro-active solving potential problems. Roberts (1994, p. 15) mentions that the effectiveness of performance measurement systems might be doubtful; they do not always measure adequate performance criteria for understanding what is going on. Nevertheless, the companies do not actively seek improvement while some of the problems could be quite simply solved.

Evaluation of propositions

The issues for operational control and performance management constituted one part of the research while the strategic decision making on outsourcing makes up the other part of this study; particularly, to what extent the decision-making influences these issues. In Table II, the results of the case studies for the propositions are summarised. However, during the evaluation of the propositions one should keep in mind that the limited number of case studies can only lead to refusal of hypotheses; if the case studies are affirmative towards the hypotheses they can only support them but never confirm (that would require representative sample sizes).

The first finding from the propositions is the emphasis on cost reduction as main driver for outsourcing decisions. In this context, it appears from the evidence that only two propositions are refuted, namely *PIB* and *P3*. That is mainly caused by the emphasis on cost reductions as a traditional strategy for the manufacturing domain, ignoring integral performance criteria. That is congruent with the findings from Fan (2000, p. 216), Gilley and Rasheed (2000, p. 788) and Mazzawi (2002, p. 43). Or alternatively, bounded rationality forces managers to limit the information to cost considerations. That has been implied but would require an in-depth analysis of the decision-making processes, which was not the scope of this particular study. In the case of *P1A*, *P2A* and *P4A* the evidence from the case studies seems to support the propositions. For *P1A* that means that the resource-based view as theory for outsourcing decisions might hold true. In each of the cases, the decisions did account on hindsight for uncertainty (outsourcing than equals externalisation of uncertainty) and asset specificity (outsourcing reduces investments in non-core competencies). However, from the issues arising from operational control it might be doubted whether the frequency of transactions has been considered. However, *P1A* is contradicted by *PIB* that not all cost are accounted for during decision making, indirectly supporting the stance of Broedner *et al.* (2009, p. 144) that outsourcing has to account for more than just supply cost and transaction cost. The indications for *P4B* support this thought (the focus is mostly on cost considerations). In all case studies there is ample evidence that *P2A* is supported: outsourcing leads to dependencies on suppliers, which leads to issues of power and trust in the relationships. Ultimately, those dependencies affect the overall performance of manufacturing negatively. That triggers that control structures should be rendered inadequate, *P4A*, following from the issues surrounding scheduling and planning in the case studies. Putting it all together, insufficient accounting for all costs and an over-emphasis on costs leads to ineffective implementation of the strategic decision for outsourcing.

A second finding from the propositions is the necessity for coordination between suppliers and companies hindered by the dependency in the relationship.

Table II.
Presentation of evidence
vs propositions

Proposition	Cases			Proposition	
	A	B	C	Supported	Refuted
<i>P1A.</i> When taking strategic decisions on outsourcing manufacturing activities or processes, firms have accounted for uncertainty, asset specificity and frequency of transactions	Asset specificity addressed by requirement to redirect investment to core competencies. Frequency of transactions not fully covered	Flexibility, and investment in assets (indirectly addressing core competencies)	Asset specificity addressed by requirement to redirect investment to core competencies. Frequency not considered	Strategy results from growth and core competencies	For most part confirmed as part of drivers for outsourcing not covered
<i>P1B.</i> When taking strategic decisions on outsourcing manufacturing activities or processes, firms have accounted for integral cost of transactions	Cost of supply has been considered. Cost related to administration and control has hardly been accounted for	Cost of supply has been considered. Cost of quality, administration and control not accounted for	Cost of supply has been considered. Cost related to administration and control has hardly been accounted for	Cost of supply has been considered	Insufficient accounting of all costs related to outsourcing
<i>P2A.</i> In the case of unique resources or assets possessed by the supplier, the decision for outsourcing leads to issues of power and trust	Purchased parts relatively less problems. Outsourcing during production issues of scheduling and dependency	Purchased parts relatively less problems. Outsourcing during production issues of scheduling and dependency	Purchased parts relatively less problems. Outsourcing during production issues of scheduling and dependency	Low quality of delivered parts and problems with adherence to schedules	Dependency on suppliers leads to unreliability of delivery. Sometimes accompanied by quality issues

(continued)

Proposition	Cases				Proposition	
	A	B	C	D	E	Supported / Refuted
<i>P2B.</i> The selection of suppliers will lead to lock-in for the case of asset specificity or specific knowledge possessed by the supplier.	Lock-in happened due to asset specificity	Lock-in happened due to asset specificity and specific knowledge	Not really an issue for this case	Knowledge of company more than suppliers	Knowledge of company more than suppliers	True for two of the cases
<i>P3.</i> The strategic outsourcing decision has accounted for integral performance criteria	Only financial/economic considerations	Mostly cost considered	Only financial/economic considerations	Only cost considerations	Only cost considerations	Cost as main driver for outsourcing
<i>P4A.</i> The implementation of outsourcing decisions requires adequate operational control structures	Scheduling and planning inadequate. Link with organisational structure identified	Scheduling and planning inadequate	Scheduling and planning inadequate. Link with organisational structure identified	Scheduling and planning inadequate	Scheduling and planning inadequate	Scheduling and planning inadequate. Link with organisational structure
<i>P4B.</i> The decision for outsourcing is dominantly informed by cost considerations	Cost considerations as main driver	Cost considerations as main driver. Flexibility as additional criterion	Cost considerations as main driver	–	–	Mostly confirmed by three cases

Notes: The text in the table is a summary of the findings in the text; please note that the propositions can only be refuted and not confirmed; hence, the table lists a column with the heading “supported” rather than “confirmed”

That outsourcing leads to dependency and lock-in is also confirmed (*P2B*), particularly shown by the cases A and B. *P4A* could not be refuted, indicating that there is possible link to outsourcing and the implementation of adequate control mechanisms (and possibly a link to organisational structures). The specific circumstances of each of the case studies, the variety in industrial sectors they represent and the diversity of products between them does not allow drawing further conclusions on this matter.

As mentioned during the research rationale, the limited number of case studies makes it only possible to refute propositions. In that sense, this research has shown the limited validity of transaction-cost economics by refuting *P1B*. That means that either the transaction costs cover insufficiently operational costs, especially for coordination and management of aberrations, or it is difficult to capture those costs (the latter seems more likely). The refuting of accounting for integral performance criteria during decision making on outsourcing, *P3*, corresponds with remarks from Avella (1999) and Dekkers and Bennett (2009, p. 15) that cost reductions remain the main driver for manufacturing strategy. The other propositions: *P1A*, *P2A*, *P2B*, *P4A* and *P4B* are not refuted; the evidence can merely be seen as support.

Discussion of findings

The analysis reveals the strategic intents for outsourcing often work out differently when operational control and performance management are considered. In that sense, it might be questioned to what extent managerial decision making, industrial practices and current theories cover these issues.

Strategic decision making

First, this comes about through the strategic decision-making processes itself. Even though, manufacturing managers in all companies had academic backgrounds, they hardly resorted to the use of methods or tools for decision making. That aligns with a study of Frost (2003, p. 59) who found that among Australian, Hong Kong, Malaysian and Singaporean SMEs there is a lack of (or limited) strategic tool usage. The lack of method and tool usage in the case studies, certainly in two of the cases (A and C), might also have been encouraged by the corporate strategies of the conglomerates. It was those that had set out the factual strategy for reducing investments and emphasising cutbacks in cost[2]; hence, it could be questioned whether there was any well-thought strategy in place.

Especially, since for many of the strategic decisions, costs appeared to be the main consideration in these case studies for outsourcing. Even though Skinner's (1969) seminal work has recognised manufacturing as a fundamental cornerstone for achieving corporate competitive advantage, the cost perspective prevails. According to Sturgeon (2002, pp. 8-10), American firms have generally placed manufacturing in a low position on the hierarchy of corporate esteem. However, this might be also the case for European firms, given the view on manufacturing for cases A-C. Also, Avella (1999) found that most Spanish companies still regard efficiency as the main objective of their production departments. The case studies support the findings from Leiblein *et al.* (2002) that the choice for outsourcing might not have an effect on operational performance. The evidence from Broedner *et al.* (2009) makes them conclude that cost considerations alone are insufficient to warrant a positive effect on performance (much like Gilley and Rasheed's (2000, p. 788) position).

Issues for operational control of outsourcing

That reverberates in operational control surrounding outsourcing that affect operational performance. First, it appears that mostly the strategic choice for outsourcing has not been transferred to guidelines for implementation. That makes it difficult to align the operational control with integral performance criteria for manufacturing. Second, the strategic decision to outsource will lead to dependency on suppliers and could lead to unintended effects, like lower ranking on priorities. At least in two of the cases, the outsourcing decision should be reversed; this aligns Kinkel *et al.* (2008, p. 255) who mention that flexibility, capacity bottlenecks, quality and coordination costs act as driver for back-sourcing decisions. Third, all cases reported problems with the scheduling and planning of manufacturing and operations by suppliers, sometimes caused by lack of information, sometimes by independent scheduling by supplier and sometimes by ambiguities in internal management towards suppliers (e.g. different departments interacting with suppliers). Fourth, the control of outsourcing is related to the internal organisational structure as clearly demonstrated by case C and to a lesser extent in case A (and as present in McIvor (2003)). These four inferences underline the point of Momme (2002, p. 73) that operational details should inform the sourcing strategy; it could be doubted if these details were known at the time of decision making that still a choice would be made for outsourcing.

Transaction-cost economics, resource-based view and core competencies

That also brings to the theories that have driven outsourcing to the spotlight. The core competencies approach has mostly driven the decisions made by the companies included in the case studies; and it revealed the operational issues that had been hardly, or better not, accounted for during the decision making. But, implicitly, the companies as case studies have followed closer the thoughts of transaction-cost economics. The case studies show again that it is difficult to assess transaction costs, particularly those related to coordination. Furthermore, transaction-cost economics assumes that the governance is a choice in its continuum; the (potential) irreversibility of the decision indicates it is not. That aligns with Mahnke (2001, p. 357) who renders transaction-cost economics, the resource-based view and the core competencies approach insufficient to account for long-term consequences. Rather according to her, path dependency and evolutionary approaches could be far more effective in explaining the effects of outsourcing; that concurs with Dekkers (2005, pp. 150-55) who proposes also more dynamic approaches towards management of companies based on evolutionary models.

Concluding remarks

Outsourcing has been driven by insight from management science that has mainly relied on three theories: transaction-cost economics, resource-based view and core competencies approach. Some of the companies have clearly underestimated the necessary control mechanisms for managing outsourcing, even though they have followed implicitly or explicitly the three theories for strategic decision making.

Managerial implications

That implies that managers in companies, the case of make-to-order or engineering-to-order, should consider that strategic decision making on outsourcing impacts operational performance and should be less “rushed” into decision making that

has adverse effects. In that respect, Görzig and Stephan (2002, p. 13) remark that companies overestimate the benefits from outsourcing or underestimate the transaction costs. It exceeds the focus on costs, which does not only appear in this work but also in that of others, like Fan (2000, p. 216), Gilley and Rasheed (2000, p. 788), Mazzawi (2002, p. 43) and Hätönen and Eriksson (2009, p. 152) even call it the primary rationale that prevails in practice. In that respect, Barthélemy (2003, p. 94) mentions to look out for hidden cost, a topic that appeared in the case studies. Rather, outsourcing or better sourcing requires integral decision making addressing for which the companies seem poorly equipped, given that factual decision making displayed signs of bounded rationality.

Additionally, strategic decision making, certainly in two cases (A and C), corresponds with findings of Quélin and Duhamel (2003, p. 655), who highlight that most companies they interviewed do react to opportunities rather than that they have a predetermined plan. At present, the strategic decision making appears inadequate. Management hardly deploys explicitly multi-criteria decision making even though many methods and tools are available and there is no consideration of long-term effects. It seems that cost act as main driver, with only other criteria considered when they get in the way of implementing the solution. Companies should move towards integral decision making based on appropriate methods and tools.

Consequently, that erratic decision making resulted in loss of control over the outsourced activities. Again, Barthélemy (2003, p. 95) mentions that as one of the seven sins. However, none of the companies seemed to be able to move away from the loss of control. That was caused by the irreversibility of the decisions; outsourced activities turned into independent suppliers. Ultimately, losing control implies a poorer performance of manufacturing (as part of the total primary process); this situation can only be avoided if the decision making had accounted for operational control and performance management in a broad sense.

Future research

This study has extracted issues for operational control, an area hardly explored in academic literature, resulting in directions for research:

- Control mechanisms for planning and scheduling as used by organisations are particularly inadequate for outsourced activities that are interwoven with in-house production. So far, scheduling and planning approaches in academic literature have considered outsourcing as a solution to solving bottlenecks in capacity (Lee *et al.*, 2002, p. 355) or hinted at integrating outsourced activities in scheduling and planning routines (Momme, 2002, p. 63). Certainly, the approaches so far do not cover strategic outsourcing of manufacturing processes that are embedded in-between in-house production activities. That points to a gap in academic literature: scheduling and planning as dependencies on suppliers upstream and downstream of those outsourced manufacturing activities.
- Systems for planning and scheduling do not always record and generate information that matches reality for outsourcing. Traditionally, the focus of previous research related to scheduling and planning has been on obtaining accurate information and aberrations should be treated as exceptions (Strong and Miller, 1995, p. 222). Otherwise, authors refer to inconsummate and inaccurate information but hardly provide solutions to it (Butala and Sluga, 2002, p. 127).

However, the effect of incomplete and inaccurate information for outsourced activities has been hardly considered and could form a new stream of research to develop more robust planning and scheduling systems.

- Organisational structures should allow for integral control of outsourcing (and not be departmentalised). Although Momme (2002, p. 72) refers to re-engineering as prerequisite for outsourcing but he does not generate any method or approach for that. Berggren and Bengtsson (2004, p. 221) conclude that there is no single way to organise manufacturing and outsourcing; a statement confirmed by the five case studies. The link between outsourcing and organisational structures for manufacturing should be explicitly investigated as a new strand of research into outsourcing.
- That research should include studies to separate the effects caused by the outsourcing decision from the implementation of improved control structures. Works like that of McIvor (2003) do that implicitly. Research to understand that relationship might also prove that the impact of outsourcing could be overshadowed by potential savings through adequate control structures. The development of adequate metrics for this research constitutes a major challenge.
- Transaction-cost economics, the resource-based view and the core competencies approach have to be expanded or other theories that account for long-term consequences and operational issues need to be developed (like evolutionary theory). A first step is made by Kotabe and Mol (2009, p. 206) who find that the “right” outsourcing decision becomes more important as uncertainty increases. Current approaches to strategic decision making do insufficiently account for operational control and supplier relationships as determinants.
- The study at hand had limitations, too, in terms of restricting itself mostly to engineering-to-order cases and the number of case studies. Larger samples, also spanning different modes of operation (e.g. make-to-stock), are needed to confirm initial results and relate findings to contingencies and to develop more refined theory.

Only when these issues have been clarified, can we get a better picture of methods and tools that really support effective strategic decision making on outsourcing in industry.

Notes

1. See Dekkers (2005, pp. 432-3) for an explanation of the organelle structure.
2. That corresponds possibly with the set of mind in this period, where shareholder value became the priority of many boards and management teams (Lazonick and O'Sullivan, 2000).

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