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**Outsourcing and its implications for market success:  
Negative curvilinearity, firm resources, and competition**

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## **Outsourcing and its implications for market success: Negative curvilinearity, firm resources, and competition**

### **Abstract**

Over the past few decades, outsourcing has become a widely discussed and researched means for firms to change their performance. In this article, we attempt to link outsourcing to the market success of firms, specifically their market share. We argue that although firms may be able to increase their market share through outsourcing, this is only true up to a point, beyond which market share actually decreases as a consequence of further outsourcing. There is, in other words, a negatively curvilinear (inverted U) relationship between outsourcing and market share. We also hypothesize that the outsourcing–market share relationship is moderated negatively by both the strength of firm resources and the extent of competition in a firm’s market. We empirically confirm these arguments through a panel data analysis containing over 19,000 observations on manufacturing firms, and offer some case examples to illustrate the mechanisms driving these results. We discuss implications for marketing research and practice.

**Keywords** Outsourcing . Marketing performance . Market share . Resources . Competition

## **Outsourcing and its implications for market success: Negative curvilinearity, firm resources, and competition**

### **Introduction**

What makes some organizations more competitive than others in the international marketplace? Is the “international competitiveness” of these organizations driven by structural properties, strategic elements, tactical implementation, opportunistic behavior, or a combination of one or more of these and/or a myriad of other potential components? What could be marketing’s contribution to the scholarly dialogue about what makes some organizations internationally competitive? These are the intellectual challenges called for in this special issue.

We take a unique position by raising an awareness about what academic research in marketing has focused on over the years and what academics in (international) marketing and management may have missed out on, in the hope that some of our research efforts can be re-directed to squarely address the issue of building firms’ international competitiveness. Although it is far from extensive, we draw from our own research on global sourcing strategy, and produce new findings here to illustrate our point empirically.

Take, for example, the following three cases in the personal computer industry. First, Michael Dell established Dell Computer in the 1980s because he saw a burgeoning market potential for IBM-compatible personal computers in the United States. After his immediate success at home, he realized a future growth potential would exist in foreign markets. Then his company began exporting Dell PCs to Europe and Japan, followed by foreign production and subsequently by outsourcing more of its production to Quanta, a major Taiwanese computer contract manufacturer. In the process, Dell’s computers have lost their uniqueness in a competitive market.

Second, think about a notebook-size Macintosh computer called the PowerBook 100 that Apple introduced in 1991. Apple enlisted Sony, the Japanese consumer electronics giant, to design and manufacture this notebook computer for both the U.S. and Japanese markets (*Fortune*, 1991). Sony was long known for its expertise in miniaturization and has been a supplier of disk drives, monitors, and power supplies to Apple for various Macintosh models. In an industry such as personal computers, where technology changes quickly and the existing product becomes obsolete in a short period of time, a window of business opportunity is naturally limited. Therefore, Apple's inclination was to outsource production of its notebook computer so as to introduce it in markets around the world as soon as it could, before competition picked up. However, this outsourcing relationship did not last long as Apple became concerned about a technology loss to Sony.

Third, take a look at Sony's own recent struggle with its worldwide recall of lithium-ion batteries for notebook computers used by Dell, Apple, and Lenovo and its postponement of the European release of the PlayStation 3 game due to delays in production of blue laser diodes, a key component of Blue-ray Disc players. Sony was the symbol of technological excellence and product creativity in the highly competitive Japanese electronics industry. One explanation for Sony's recent crises is attributed to the trend toward outsourcing to electronic manufacturing services (EMS) companies to cut costs. As a result, the company has lost consumer confidence (Nikkei.com 2006).

These companies were always faced with technological competition and cost pressure to meet customer needs. Marketing is essentially the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large (American Marketing Association 2007). Marketing is not only much broader than selling, but it also encompasses the entire company's *market orientation* toward customer satisfaction in a competitive environment. In

other words, marketing strategy requires close attention to both customers and competitors. Indeed, these companies had practiced marketing the way it was defined. What went wrong in these cases? As these examples show, outsourcing strategy seems to affect not only the cost structure but also marketing performance, including product, consumer confidence, product delivery, brand equity, and corporate reputation, among others.

Over the past two decades scholars and practitioners have repeatedly warned about the risks of excessive outsourcing, especially in terms of the negative side effects of cost-reducing outsourcing (e.g., Bettis et al. 1992; Bruck 1995; Hendry 1995; Kotabe 1998). Kotabe et al. (2008a), in their longitudinal study of three global consumer electronics companies (Emerson Radio, Philips, and Sony), have shown a consistent evolutionary path starting from competitive pressure forcing the firms to cut costs by increasing outsourcing, to an eventual realization that their technology base got weakened by excessive reliance on their outside suppliers over time. What these studies have shown is that high and consistent firm performance cannot be achieved simply by paying close attention to both customers and competitors under the rubric of market orientation. To be successful firms must equally consider, along with their output side, how they source their inputs.

Rapid technological advances have drastically altered the competitive landscape in the global economy. Many firms are leveraging their resources by strategically outsourcing the competencies that they either lack the ability to perform or need to perform exceptionally well (Murray et al. 2009). Thus, firms have increasingly come to rely on their external suppliers' low-cost and technical capabilities through outsourcing. Indeed, Hult et al. (2007, p. 1035) have asserted that “[w]hen rivals such as UPS and FedEx clash, it is not merely their individual capabilities, but rather the collective capabilities of their respective supply chains, that determine the outcome.” Consequently, outsourcing has become a prominent part of the restructuring of a firm’s supply chain, which is facilitated by the heightened organizational

and technological capacity of firms in decoupling and coordinating a network of remotely located external suppliers performing an intricate set of activities (Levy 2005) as well as the ubiquitous drive for production cost savings.

The pros and cons of outsourcing strategy have been discussed in detail elsewhere (Kotabe et al. 2008b; Mol 2007). In a review of the information technology outsourcing (ITO) empirical literature in the last two decades, Lacity et al. (2010) reported that the empirical findings are conflicting in nature, in that the relationship between the degree of outsourcing and ITO outcomes was found to be positive, negative or insignificant. These empirical findings suggest that despite the popularity of using outsourcing to enhance performance, firms may experience differential performance.

Indeed, various scholars have pointed to the existence of a negatively curvilinear (inverted U-shape) relationship between outsourcing and performance measures such as overall, financial, manufacturing, product, and innovation performance (e.g., Grimpe and Kaiser 2010; Kotabe and Mol 2004, 2009; Kotabe et al. 2008b; Mol 2007; Rothaermel et al. 2006). This implies that the benefits of outsourcing only occur up to a point.

A second observation, from a marketing research point of view, is that what seems to be missing in the extant literature is an examination of the role of purchasing, more broadly referred to as supply chain management or logistics. Indeed, if we consider the early definition of marketing, research in marketing used to emphasize the purchasing side of business as well. For example, early marketing thinkers, such as Duddy and Revzan (1953, p. 6), emphasized that “marketing (purchasing) includes all those activities that are necessary for acquiring the ownership or use of goods from others; but it may, and often does, include conscious effort on the part of the buyer to organize or influence sources of supply so as to achieve an advantage over other buyers and so to improve his bargaining position with the

seller.” Later, Kotler and Levy (1973) and Bartels (1974) made a similar call for studies on the purchasing side of marketing.

However, research in marketing has since tended to neglect this important nexus between upstream and downstream marketing activities and therefore the effect of purchasing in a more contemporary role of marketing strategy. Interestingly, organizational economists and strategic management scholars recently appear to have reached the same conclusion from the opposite perspective (Adner and Zemsky 2006), when they argue that while their understanding of governance issues, including whether and how much to outsource, has become highly sophisticated, they have lost the connection to the demand side of the firm, its customers. It is our hope that by incorporating the purchasing and governance side of marketing (i.e., outsourcing strategy) in our research, we can link it to firms’ marketing strategy and performance, and stimulate research on this important nexus in marketing.

In the spirit of these two observations, that outsourcing is worthy of more attention by marketing scholars and that there may be limits to the efficacy of outsourcing, the focal question of this article is: *How does outsourcing affect the marketing performance of firms?* We will not only discuss the relationship between outsourcing and marketing performance, but also address which factors might moderate that relationship. We will not address offshoring separately, although we believe some of the underlying mechanisms in offshoring decisions are quite similar to those in outsourcing decisions. Also, note that empirically we will measure marketing performance as market share, although we acknowledge and later discuss how there are other viable ways of examining marketing performance.

In the following section we review research on the outsourcing–performance nexus. We formulate hypotheses, suggesting that there is negative curvilinearity in that relationship. We also present two key moderating factors that lower the optimal outsourcing levels: namely, the strength of the firm’s own resources and the degree of competition it experiences

in its markets. We argue that misaligning outsourcing levels with these factors is costly. Subsequently, we describe the research methods, consisting of a large scale panel data study and a few case analyses that provide additional in-depth illustrations. The results broadly confirm the hypotheses. The contributions of this article are threefold. First, this study extends existing arguments that there may be limits to the benefits of outsourcing, and specifically that the outsourcing–performance relationship may be negatively curvilinear, in the case of marketing performance. Second, it reinforces the importance of outsourcing choices as a topic of interest to marketing scholars. Third, we provide new theoretical insights by arguing that not only is there a negatively curvilinear relationship between outsourcing and performance, but the outsourcing–performance relationship is also negatively moderated by two factors: a firm’s own resource strength and the extent of competition it faces in the marketplace.

### **Outsourcing and marketing performance**

In observing that many firms do not outsource all their activities but instead use both insourcing and outsourcing (Harrigan 1984; Afuah 2001), Rothaermel et al. (2006) argued that these firms were attempting to strike the most effective balance between insourcing and outsourcing to leverage their benefits and mitigate their costs. Leachman et al. (2005) empirically found that the relationship between outsourcing rate (measured as the percentage of outsourcing of each company) and relative manufacturing performance is nonlinear convex in that as the outsourcing rate increases, the returns in manufacturing performance decrease at an accelerating rate. In the sample, since the lowest and the highest outsourcing rates are 30% and 80%, respectively, it implies that within the range of these outsourcing rates, firms with higher levels of outsourcing activity have disproportionately lower levels of manufacturing performance. A firm can achieve a balance when it neither focuses too much on insourcing nor on outsourcing, such that either insourcing or outsourcing alone should

exhibit a curvilinear relationship on firm-level performance. Rothaermel et al. (2006) empirically found that the effects of a firm's degree of strategic outsourcing on the size of its product portfolio, new product success, and firm performance are characterized by diminishing returns in that these relationships resemble an inverted U-shape. They provided three reasons for the inverted U-shape relationships. First, firms often compete for and enter the most promising outsourcing options first, thus leaving less productive outsourcing options when they engage more intensively in outsourcing. Second, as increased outsourcing demands more managerial attention and frequently constrains internal managerial resources, it may lead to inadequate oversight of the outsourcing activities. Third, increased outsourcing leads to an increase in transaction and bureaucratic costs, beyond a point where the benefits to additional outsourcing are outweighed by their marginal costs, thus producing marginal returns. They all result in slower responses to the changing needs of the consumers.

Grimpe and Kaiser (2010) provide similar arguments to substantiate and empirically verify their claim that R&D outsourcing has a negatively curvilinear effect on a firm's innovation performance. We also previously asserted that there is an optimal degree of outsourcing across all of a firm's activities (Kotabe and Mol 2004; Kotabe et al. 2008b; Mol 2007). The outsourcing-performance relationship takes on an inverted-U shape, implying that as firms deviate further from their optimal degree of outsourcing, by either insourcing or outsourcing too much, their performance will suffer disproportionately. In some recently published empirical work (Kotabe and Mol 2009), the level of outsourcing across all of a firm's activities has a negatively curvilinear relationship with its return on value added (i.e., the financial returns relative to the activities performed by the firm). Mol (2007) provides a much more extensive argument as to why examining the performance impact of all of a firm's activities simultaneously is theoretically superior to investigating just a single activity,

including among others that it is how many outsourcing decisions are evaluated and taken in practice.

Consequently our current focus is on a firm's overall extent of outsourcing, *across all of the activities performed to meet customer demand*. For each of these activities, whether it is a primary activity such as production or marketing, or a support activity such as human resource management or information technology, a firm has a choice between performing it internally, or alternatively, having it performed outside the firm through outsourcing. And indeed plenty of examples can be given of firms that outsource parts or all of those activities, and equally of firms keeping them in-house. This effectively puts the focus of our research on the overall vertical structure of a firm, especially what part of all of these activities takes place outside the firm.

Although the transaction cost economics (TCE) approach has been widely adopted in examining whether a firm should insource or outsource, it lacks a systemic approach by focusing on one transaction at a time (Argyres and Liebeskind 1999). In addressing TCE's shortcomings, researchers (e.g., Rothaermel et al. 2006) have used the knowledge-based view (KBV) of the firm to examine sourcing strategies, in that using both insourcing and outsourcing provides complementary knowledge across different stages of a firm's value chain (Brusoni et al. 2001; Jacobides and Billinger 2006; Reitzig and Wagner 2010). Thus, the KBV explains why firms do not outsource their entire production, especially in times of technological change. Firms that engage in too much outsourcing of supply technologies may incur the opportunity costs of not learning about changes in these technologies through insourcing (Brusoni et al. 2001; Kotabe et al. 2008a).

Recognizing that knowledge complementarities exist across value chain activities through both insourcing and outsourcing, Reitzig and Wagner (2010) questioned whether outsourcing costs are always flip sides of insourcing benefits. They asserted that while

knowledge complementarities arise from learning through outsourcing, firms may suffer from ‘hidden outsourcing costs’ by forgetting their existing knowledge after outsourcing. Their empirical findings support that hidden outsourcing costs exist, and these costs explain why firms would not outsource all of their activities. Furthermore, these hidden outsourcing costs differ conceptually from their seeming flipside of insourcing benefits. Firms suffer knowledge losses through outsourcing by both forgetting prior knowledge and missing the learning opportunities via insourcing.

Furthermore, Weigelt (2009) argued that although firms can gain access to a new technology by outsourcing, it does not guarantee that they can integrate the new technology into their existing business processes and deploy it in the marketplace. Her empirical findings show that increased outsourcing of business process enhancing technologies decreases a firm’s integrative capabilities and market performance. The first reason is that internal capabilities cannot be substituted by outsourcing, since passive capability accumulation is unlikely to occur (Powell et al. 1996). Second, comprehending how customers’ user experience with a new technology depends on various interdependent, tacit processes, which may be interrupted when activities are decoupled across internal and external suppliers. Also, learning about customers’ preferences requires successive modifications, which demands frequent updating and renegotiation of outsourcing contracts.

Although these researchers have voiced the concern that outsourcing may lead to a diminution of core capabilities, others have argued otherwise. McEvily and Marcus (2005) empirically found that joint problem-solving with supply chain partners is a prominent driver of capability acquisition. Similarly, Rodan and Galunic (2004) concluded that the variety of knowledge in a network to which managers are exposed is an important factor affecting individual managerial performance. However, contrary to these findings, Murray et al. (2005) empirically found a lack of positive relationship between strategic alliance-based

sourcing of major components and market performance. Instead, the relationship between strategic alliance-based sourcing and market performance was moderated by several product and environmental factors. Taking these findings together, one cannot rule out the possibility that outsourcing indeed may lead to a diminution of core capabilities.

As the examples of Dell, Apple, and Sony cases presented at the beginning of this article amply attested, outsourcing strategy clearly affected their marketing performance, including product quality, product delivery, consumer confidence, brand equity, and corporate reputation.

The marketing performance impact of various strategic issues, such as market structure, brand equity, market share, and competitive strategies, has been widely studied (e.g., Buzzell and Gale 1987; Rao and Bharadwaj, 2008; Rust et al., 2004; Srinivasan and Hanssens, 2009; Szymanski et al. 1993). In the 1980s and 1990s, the profit impact of market strategy (PIMS) project managed by the Strategic Planning Institute was instrumental in empirically establishing relationships between various marketing variables and firm performance (e.g., Buzzell and Gale 1987; Szymanski et al. 1993). The empirical evidence accumulated offered a realistic appraisal of the linkages among market structure, marketing strategy, and market performance; one of which is a well-documented market share-profitability relationship (Buzzell and Gale 1987). Since then, a further attempt has been made to relate marketing strategy to firm value (e.g., Rao and Bharadwaj, 2008; Rust et al., 2004; Srinivasan and Hanssens, 2009). For example, in Rust et al. (2004), the marketing strategy mix is posited to generate marketing assets (such as brand equity and customer equity), which subsequently affects market position (i.e., market share and sales), leading to financial performance. However, this causal relationship is not necessarily direct but rather associative. Overall, market share is considered a good indicator of marketing performance.

To the extent of our knowledge, the literature on the outsourcing-market share relationship is non-existent in the marketing literature, and is also scarce in other academic literatures and mostly conceptual (e.g., Cocheo 1995; Glover and Williams 1995; Suter and Michael 1999). The only exception is Bae et al.'s (2010) study, in which using a three-stage game-theoretic oligopolistic model based on the differentiated product strategy and integrating quality expectations of the market, outsourcing was found to bring expanded market share for the lower-quality producer that leads to higher possibilities for profit gain. Since the extant literature does not provide much guidance on the marketing performance of outsourcing in the form of a firm's market share, there is a major gap in outsourcing research.

In our study, we seek to fill this gap by focusing on the outsourcing-market share relationship. Building upon the above description, we argue that a range of activities must be performed to satisfy customer demand. Some of these activities should never be outsourced, while others should never be integrated; others may be somewhere in-between. Elsewhere we have used the term *outsourcability* to describe such differences (Kotabe and Mol, 2009) and the *outsourcability* of activities can range from very low to very high. Under the (reasonable) assumption that if firms make mistakes, they do not do this in a random manner, i.e. they are less likely to make mistakes with activities that rank very low or very high on outsourcing than they are to make mistakes with activities that rank somewhere in the middle, what follows is that the outsourcing-performance relationship resembles an inverted-U shape (Mol, 2007), implying that there is an optimal degree of outsourcing for a firm. As a firm deviates further from its optimum, either by insourcing or outsourcing too much, its performance will start to suffer disproportionately. Thus we offer the following hypothesis.

H1: There is a negatively curvilinear relationship between outsourcing and market share.

## **The case for moderation**

In the literature on governance decisions it has long been argued that misalignment (i.e., a wrong governance choice in the circumstances facing the firm) leads to a drop in performance (Masten 1993; Williamson 1985). Williamson (1985) has alternatively referred to misalignment as maladaptation. In other words, making the wrong decision by outsourcing activities that are best kept in-house, or integrating activities that are best outsourced, is a costly mistake (Bruck 1995; Masten 1993). Applied to transaction cost reasoning, the point the TCE literature makes, and has sought to verify empirically, is that where firms outsource activities in the face of high uncertainty and highly specific assets, and especially in their joint presence, their performance will suffer as a consequence (Argyres and Liesbeskind 1999; Jacobides and Winter 2005; Leiblein et al. 2002; Masten 1993; Williamson 1985). This effectively implies that these authors argue that outsourcing will not produce a significant direct effect, but only an indirect effect, through moderation by transaction cost factors (Leiblein et al. 2002). Leiblein et al. (2002) and Poppo and Zenger (1998), among others, have extended this argument to resources and competences.

In this article, we build upon this and similarly argue that poorly aligned outsourcing decisions will lower a firm's marketing performance. In doing so, it is important to bear in mind that we have deliberately set out to examine all of a firm's outsourcing decisions, for reasons outlined above. We are therefore not in a position to examine transaction-specific characteristics - for instance, it is difficult to see how one would measure or even conceptualize the asset specificity of all of the activities combined - and focus instead on firm-level factors. Following earlier literature, we examine the moderating effect of firm resources as a set of internal circumstances specific to the firm. In addition, as marketing and outsourcing strategy are shaped not just by a firm's internal factors, but also by its external environment, we also investigate the extent of competition a firm faces in its industry

environment as an external factor, as detailed below. Here the argument, which partly builds upon insights from economics, goes that intense competition should drive firms to outsource more, and where they do not outsource enough given their level of competition (i.e., there is misalignment), their performance will equally suffer. Following this logic, these two sets of circumstances effectively moderate the relationship between outsourcing and performance, and the next five hypotheses are therefore focused on moderation effects, not direct effects.

### **Firm resources**

Research on the effect of the firm's resource base has argued that the stronger a firm's resources, the less likely it is to outsource (Barney 1999). Building upon that resource-based logic, it has been argued that where firms have a strong resource base but nonetheless decide to outsource activities, this leads to misalignment, thereby undermining these firms' performance (Leiblein et al. 2002). This argument has been specified further by Jacobides and Winter (2005), who suggest that a key comparison is against the resources of a firm's suppliers, not those of its competitors.<sup>1</sup> Below we suggest two firm-specific measures that represent resource strength—export intensity and labor productivity.

*Export intensity.* As documented in the international marketing literature, firms that market their products in foreign markets face a host of challenges not encountered by purely domestic firms (Gao et al. 2010; Cavusgil and Zou 1994; Leonidou et al. 2002; Zou and Cavusgil 2002). For instance, foreign firms may encounter difficulties in building up relationships with customers or in adjusting to local customs or regulations. Therefore, in order to operate effectively, firms that engage in exporting must possess a set of internal resource advantages that help them overcome these challenges. In the international business

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<sup>1</sup> Although we acknowledge this point, our actual measures of resource strength cannot be related to those of a firm's suppliers. But through comparing them with competing firms, we are, *ceteris paribus*, comparing them with suppliers indirectly.

literature, it has been argued that a set of ownership advantages is required to overcome the liability of foreignness faced by firms that enter other markets (Dunning 1993).

The other side of this coin is that through involvement in foreign markets, firms acquire new resources and, over time, learn new capabilities. In other words, the more export intensive firms are, the more they are able to strengthen their resource base. Thus there is a recursive, mutually reinforcing, relationship between a firm's resources and its export intensity. Being export-intensive, a firm develops stronger resources. As argued above, having stronger resources vis-à-vis the outside market should imply that a firm relies on its internal resources and thus outsources less. Where it nonetheless outsources, this could produce misalignment, and hence lower performance. On that basis, we argue that export intensity should act as a negative moderator on the outsourcing–marketing performance relationship.

H2: A firm's export intensity negatively moderates the relationship between outsourcing and market share, such that the firm's optimal amount of outsourcing decreases.

*Labor productivity.* A second, more direct, measure of firm resources is in how productive a firm is compared to its peers. Specifically, we focus on a firm's labor productivity, represented by the output it produces per employee. In a cross-section of firms, having a higher labor productivity is a strong indication that firms have a stronger resource base than their competitors, the external environment being what it is. If a firm is more productive than its competitors, this implies it must possess some set of internal resources that generates this productivity difference.

The firm can exploit those resources by internalizing some activities that its competitor may need to outsource because it lacks the relevant resources. For firms like this, not to outsource is effectively a demonstration of strength. Hence we similarly argue that if a firm has high labor productivity, it is better off by internalizing activities and outsourcing

them leads to misalignment and associated lower performance, as it is effectively a ‘wrong’ decision.<sup>2</sup> So labor productivity equally acts as a negative moderator on the outsourcing-market share relationship.

H3: A firm’s labor productivity negatively moderates the relationship between outsourcing and market share, such that the firm’s optimal amount of outsourcing decreases.

### **Market competition**

Moving from firms’ internal to external circumstances, we specifically focus on the impact that competition has on optimal outsourcing levels. Competition effectively represents the seriousness of challenges facing the firm when it seeks to market its products. There has been a range of studies by economists examining the relationship between competition and outsourcing (Cachon and Harker 2002; Grossman and Helpman 2002; Shy and Stenbacka 2003). Broadly what these studies argue is that where competition is more intense, firms tend to outsource more; competition forces firms to constantly search for cost efficiencies, which may be obtained through outsourcing. But equally, some research also suggests that outsourcing increases levels of competition. The latter effect arises as outsourcing tends to remove the distinctiveness of a firm’s product offerings and therefore reduce its product differentiation capability, because all competing firms rely on a similar set of suppliers for their inputs (Bettis et al. 1992; Porter 1985). So, we argue that circumstances in a firm’s environment, and specifically the levels of competition the firm faces in its competitive environment, matter for a firm’s decisions on the level of outsourcing.

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<sup>2</sup> To avoid any possible confusion, we are not making an argument here about whether or not outsourcing is more likely to involve highly labor-intensive activities. If an activity needed to satisfy customer demand is more labor-intensive, and especially if it involves low-cost labor, this can be an indication that the underlying assets are easy to redeploy elsewhere (i.e., asset specificity is low), and a traditional transaction costs argument could be made. But, as noted above, our focus here is not on one activity but rather on all activities, and obtaining such measures across all activities for a large number of firms seems to be a next to impossible task.

Specifically, we would expect firms to be outsourcing more if they face higher levels of competition. And where a firm outsources more (or less) than is optimal given the level of competition it faces (i.e., it makes the wrong governance decisions), this can again lead to misalignment, and we are therefore examining a moderating effect of competition on the outsourcing-marketing performance relationship. Below we suggest three measures representing the extent of competition—R&D intensity, marketing intensity, and industry concentration.

*R&D intensity.* A first measure of competition in a firm's environment is the level of research and development (R&D) investments across its industry. It has long been argued in industrial organization (Porter 1980; Stigler 1951) that large investments in R&D create sunk costs, which firms in the industry seek to recoup over time. R&D investments simultaneously create barriers to entry, because any firm that wishes to enter the industry needs to make a significant upfront investment in order to catch up technologically. Because of these entry barriers, entry becomes less attractive for outsiders, which means that fewer outsiders will enter, firms can charge higher prices, and the level of competition in the industry decreases. This is best captured in Porter's (1980) well-known five forces model that describes the intensity of competition in a firm's industry.

In terms of the implications this has on the effectiveness of a firm's outsourcing strategy, higher R&D investments in the industry should imply that outsourcing levels decrease because of the associated lower levels of competition.<sup>3</sup> This is why R&D intensity has traditionally been associated with lower levels of outsourcing (Mol 2005). And because of misalignment, operating above (or below) the optimal level of outsourcing is costly in

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<sup>3</sup> At the firm-level, R&D investments could alternatively be seen as a means of accumulating technological resources, and the argument could again be that those resources drive a firm to lower its outsourcing level. The same argument could also be made for investments in marketing and sales, as per hypothesis 5, which create brand-based resources inside a firm. Our data on R&D and marketing and sales, however, operate at the industry-level and we therefore present the argument at this level.

terms of the firm's market share (i.e., when firms in highly R&D-intensive industries outsource much, this has more negative consequences than for firms in less R&D-intensive industries). This implies that R&D intensity acts as a negative moderator on the outsourcing–marketing performance relationship.

H4: The R&D intensity of a firm's industry negatively moderates the relationship between outsourcing and market share, such that the firm's optimal amount of outsourcing decreases.

*Marketing intensity.* As a second indicator of industry competition, we examine the marketing and sales intensity of a firm's industry. Here we believe a very similar logic operates, namely that a significant investment in marketing and sales leads to the creation of entry barriers, because any new entrant will have to overcome a lack of reputation and establish its brand before it can operate effectively in the industry (Aaker 1996; Porter 1980). In consumer goods, a typical example would be cola, where any new competitor needs to overcome (in most markets around the world) the brand strength of Pepsi and Coke before it can establish itself.

Therefore, an industry that is characterized by a high level of investment in marketing and sales activities, with high barriers to entry, will be a more concentrated (i.e., less competitive) one. Therefore we would again expect firms in this industry to be outsourcing less, and where they outsource more, this is a costly deviation from the optimal decision. The implication is that marketing and sales intensity negatively moderates the outsourcing–marketing performance relationship.

H5: The marketing and sales intensity of a firm's industry negatively moderates the relationship between outsourcing and market share, such that the firm's optimal amount of outsourcing decreases.

*Industry concentration.* Our final hypothesis uses a more direct measure of competition, namely the extent to which the total market a firm operates in is divided among many firms.

Markets with a multitude of smaller players are seen as highly competitive, whereas those with a limited number of players, or at least where just a few firms capture the overwhelming share of the total market, are less competitive. Following our earlier logic, the more concentrated (less competitive) an industry is, the less pressure will there be on firms to outsource activities, and vice versa the less concentrated the industry, the more competition there will be, and the more pressure firms will face to outsource in order to seek efficiencies. Good examples at the extreme ends of this logic might be state-run, highly vertically integrated monopolies in the past in the U.K., for instance, in telecoms (BT) or train services (British Rail) on the one hand, and independent sellers operating on Amazon, which outsource most of their activities, on the other hand.

In more concentrated (less competitive) markets, firms should therefore be outsourcing less. If they nonetheless outsource more, this undermines their performance as it is another case of misalignment. The implication is that of a further negative moderating effect of market concentration on the outsourcing-marketing performance relationship.

H6: The extent of concentration of market shares in a firm's industry negatively moderates the relationship between outsourcing and market share, such that the firm's optimal amount of outsourcing decreases.

## **Methods**

The firms in our study are all manufacturing businesses operating in the Netherlands. Statistics Netherlands collects official census data from all Dutch firms and foreign subsidiaries with more than 20 employees on an annual basis. Completion of the data request is a legal requirement. We have data available for the years between 1993 and 1998. The collected data are quantitative in nature and firms stem from a wide cross-section of industries, but are all in manufacturing.<sup>4</sup> In earlier work (Kotabe and Mol 2009; Mol 2007),

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<sup>4</sup> An argument could be made to look at a more specific set of firms, such as those in the assembly industry, as in Kotabe and Mol (2009). We replicated our main results, and they were the same for this subsample.

we have provided more detailed descriptions on the database and on outsourcing in the Netherlands. So suffice it here to say that outsourcing was a key trend during this time period. For purposes of comparison, this earlier work (Kotabe and Mol 2009) also proposed a negatively curvilinear effect, although with a different empirical design and conceptualization, but used return on value added as a dependent variable (the database does not contain information on firms' assets). As argued above, we think that market share is another objective firms strive for, through their marketing strategies, and as such provides an alternative means of testing the overall theory that outsourcing has a negatively curvilinear relationship with firm performance.

In Table 1 we present the 46 industries included in the analysis, which are the industries for which we had the relevant variables available. It is clear to see that although some industries are better represented in the sample than others, no single industry dominates.

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Insert Table 1 here

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## Measures

Below we describe each of the variables in the analysis and how they may be related to the dependent variable.

*Market share.* This is calculated by dividing the firm's sales through its 3-digit level industry overall sales. Given the highly uneven distribution of this variable, with almost all firms clustered near the lower limit of 0%, we then calculate a logarithm. Logged market share is the dependent variable throughout the analysis.

*Outsourcing.* A firm's level of outsourcing was calculated as the ratio of industrial purchasing to total sales. Thus we measure a firm's reliance on external suppliers to produce

its own products, in line with the definition provided by Hitt and Lei (1995) and the measure used by Balakrishnan and Wernerfelt (1986). In our models, we mean-centered this variable to avoid problems of multicollinearity. In order to examine the curvilinear effect of outsourcing on market share, we included the square term of this measure in our models.

*Export intensity.* We calculated the export ratio as exports over sales. Presumably more export-intensive firms achieve a higher market share, since being able to export products is a sign of their attractiveness to customers.

*Labor productivity.* Labor productivity of the firm is calculated by dividing the firm's sales by its number of employees.<sup>5</sup> Presumably, more productive firms capture a larger share of their markets.

*Training and development.* This variable is calculated by dividing all spending on training and development of employees in a firm's 3-digit level industry by total industry sales. Firms with a better trained workforce produce more innovative products, which could influence market share positively.

*R&D intensity.* This variable is calculated by dividing all spending on research and development in a firm's 3-digit level industry by its total industry sales. R&D spending could influence market share positively.

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<sup>5</sup> We acknowledge that this variable is inherently related to our outsourcing variable. When firms outsource activities, this may reduce their number of employees while keeping their sales levels constant. It would therefore be preferable if another measure of productivity was available to us, but that is unfortunately not the case. We checked how strong the correlation between outsourcing and labor productivity was in the sample, through a direct correlation and by calculating variance inflation factors, and established it was not too high. We re-ran our main analysis excluding the labor productivity variable and this did not change the findings. Furthermore, we ran regressions where we tried to predict outsourcing and used labor productivity as an independent variable. Although labor productivity was a positive and highly significant predictor, it did not account for very much variance, and less variance than for instance the industry average level of outsourcing. Given that, we prefer to present the findings obtained here but acknowledge this as a limitation.

*Marketing intensity.* This variable is calculated by dividing all spending on marketing and sales in a firm's 3-digit level industry by its total industry sales. The more a firm spends on marketing and sales, the higher one would expect its market share to be.

*Industry concentration.* The Herfindahl-Hirschman index of concentration for a firm's 3-digit level industry is used, calculated by summing the squares of all individual market shares. If a firm's industry is more concentrated, that firm will likely have a higher market share.

*Capital investments.* This variable is calculated by dividing all spending on capital goods in a firm's 3-digit level industry by total industry sales. Higher capital intensity may be associated with higher market shares.

*Site investments.* This variable is calculated by dividing all spending on physical sites in a firm's 3-digit level industry by total industry sales. Higher investments in facilities may be associated with higher market shares.

*Industry outsourcing.* This variable is the 3-digit level industry average for the outsourcing measure. Perhaps more outsourcing in an industry leads to fragmentation of market shares.

*Dutch multinational.* This dummy variable takes on the value of 1 if the business is part of a Dutch multinational and 0 if it is either part of a foreign multinational or a local stand-alone firm. Dutch multinationals are very competitive in their home market, compared to these other types, and will probably hold higher market shares.

*Year*. This is a set of six dummy variables, for each of the years observed in the data, five of which are entered into the equation.<sup>6</sup> To conserve space these variables are not reported below, but these results and those of other robustness tests are available upon request.

### Econometric methods

Given the availability of a relatively balanced data panel across six years and with a large number of observations, we conduct panel data regression analyses. In view of the nature of the dependent variable, which takes on a large range of values on one hand, but is bounded by a lower and an upper limit as well as heavily censored towards the lower limit on the other hand, tobit analysis is the primary option.<sup>7</sup>

The panel data tobit analysis by definition is a random effects analysis, in the absence of a program for undertaking fixed effects panel data tobit. Because the tobit analysis is based on random effects, it does not automatically pick up unobserved heterogeneity, as a fixed effects analysis would, so it is encouraging to find that the inclusion of time invariant dummies does not change the results. We also checked whether the panel data tobit outperformed a pooled tobit model, which it consistently did.

Stata's `xttobit` function for panel data tobit uses a relatively complicated estimator called the 'adaptive Gauss-Hermite quadrature'. One potential problem that arises with this estimator is that estimations may prove to be inaccurate, especially when groups are large

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<sup>6</sup> We also re-ran the analysis including (time invariant) industry dummies and the findings are consistent. We do not include those dummies in the analyses, however, over concerns around multicollinearity – many of our variables are measured at the industry level.

<sup>7</sup> But, we alternatively apply OLS panel regression models for purposes of robustness. A Hausman test indicated that a fixed effects regression was preferable over random effects. Fixed effects panel models have several desirable properties. They help overcome the problem of omitted variables, since they allow for unobserved individual heterogeneity (by introducing a firm fixed effect, instead of time invariant variables such as industry dummies) that may be correlated with the regressors (Cameron and Trivedi 2005). This is helpful, especially in the absence of appropriate instrumental variables, because omitted variables are a key source of endogeneity problems. Our database does not contain any good instrumental variables, given that market share is correlated with just about every other firm or industry variable. In this fixed effects panel data analysis we are able to overcome heteroskedasticity and autocorrelation, through the use of the cluster estimation command, which produces robust standard errors. Autocorrelation, in particular, is a key problem in the data, given that a firm's market share in one year is highly predictive of its market share during the next year. Our findings on curvilinearity were consistent with those presented below, which provides us with further confidence in the results.

(we have over 3,000 groups, i.e., firms, in the sample) and correlations within groups are large (one would expect a firm's market share to be strongly correlated from one year to the next). We therefore ran a follow-up analysis to assess whether this was the case (quadchk command), and it turned out that there were some problems with our estimation. We took a three-fold approach to resolving those problems. First, we increased the number of estimation points, which improves accuracy. Second, we re-ran the analyses without the offending variables, which were mostly our control variables, and were able to reaffirm the findings. Third, we ran a sub-analysis, using only the largest industry in our sample (222). This reduced the number of groups significantly, and there was no longer an indication of problems in the analysis.<sup>8</sup> Thus, we are relatively confident that our findings do not suffer much from this problem.

## **Findings**

We first present the descriptive statistics and correlations between the independent and dependent variables in Table 2. None of these correlations is worryingly high (although most of them are statistically significant simply because of the large sample size). Note that we only present the correlations for the full set of observations, not for each of the individual years. Note also that common method bias is not a problem in the data, since all variables are measured with hard, objective data.

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Insert Table 2 here

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The results of the tobit panel data analysis in eight models are presented in Table 3. First, we can see that the introduction of additional variables affects the model positively, as measured through the log likelihood. Model 2 shows there is a positive and significant linear

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<sup>8</sup> The analysis on this industry, which only makes up just over 10% of the sample, found support for the same hypotheses we find support for below.

outsourcing effect, which is maintained throughout the analysis. Model 3 shows support for our main prediction (H1) that there is a negatively curvilinear relationship between outsourcing and a firm's market share, as the curvilinear term is negative and highly significant (while the linear term remains positive and significant). This finding is maintained in the other models. This implies that firms in the sample would have been better off by outsourcing more than they actually did at the time in terms of achieving their optimal market shares. We will revisit this issue later. We acknowledge that market share is only one of the multiple objectives firms aim for and that many other factors influence their market share. Models 4 through 8 investigate the moderated effects proposed in H2 - H6. They show support for these hypotheses, although at different significance levels. Support is especially strong for moderation by the export intensity (H2), labor productivity (H3), and R&D intensity (H4) variables, all of which are negative and highly significant. Very weak support is found for moderation by the marketing intensity (H5) and market concentration (H6) variables which are negative and significant at the 10% level.

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Insert Table 3 here

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We then conducted a post hoc analysis to explore how exactly outsourcing levels and the various moderators affect a firm's market share. This helps us better understand the magnitude of the effects we are discussing, or in a more practical sense, to understand how severely a firm's outsourcing decisions affect its market share. We did this by predicting the firm's market share with all other variables at their means, and then varying outsourcing levels between two standard deviations below and above the mean, respectively. We first conducted the analysis by including only the outsourcing and outsourcing squared terms, and then including the different moderating effects one at a time. The results are contained in Table 4.

The results demonstrate that the impact of making the ‘wrong’ outsourcing decision is significant, as firms’ predicted market shares sink substantially both at the bottom and the top end of outsourcing levels, and the predicted sales levels/market shares drop by over 20% in some extreme cases. Making the wrong outsourcing decisions by a relatively small margin, however, does not make such a big difference to market share outcomes, in line with our proposed theory. The results also demonstrate that the average firm could outsource more than it did (slightly more than half a standard deviation above its current level), since the optimal level of outsourcing lies above the mean. Including most of the interactions does not radically alter this finding. But, if we take into account the interaction with labor productivity (as per H3), the picture changes markedly. We find that market shares drop much faster when firms outsource too much, and that for the average firm in the sample, the optimal outsourcing strategy is actually to outsource less than it did. We acknowledge this is only a limited exploration, and the average firm does not exist in real life, but it provides some intuition into how, in this sample, outsourcing levels affect the predicted market shares, and how the moderator variables change those predictions.

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Insert Table 4 here

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In a previous study, some of the authors have conducted extensive qualitative research on outsourcing, supply chain relationships, and modular production processes in the automotive industry of Brazil (Kotabe, Parente, and Murray, 2007). Our qualitative data were collected in Brazil, in a different research setting and on a specific industry (i.e., the automotive industry). Although the Brazilian data is not directly designed for a triangulation with our empirical findings from the Netherlands, we believe that it can provide some interesting illustrations of the optimal level of outsourcing of a firm. In turn, the insights from

our qualitative data from Brazil in comparison to our quantitative data from the Netherlands should serve as a potential indication of the generalizability of our findings to other contexts.

Our qualitative data were collected through secondary sources, observations during company visits, and most importantly in-depth semi-structured interviews with senior executives, manufacturing supervisors, supply-chain managers, and purchasing managers of four major automakers operating in Brazil and their on-site suppliers.<sup>9</sup> Of the 34 executives interviewed, 19 were at the operational level as either plant managers or manufacturing supervisors from Ford (Sao Bernardo do Campo, São Paulo), DaimlerChrysler (Sao Bernardo do Campo, São Paulo), General Motors (Gravatá, Rio Grande do Sul), and Volkswagen (Resende, Rio de Janeiro). Ten of the respondents worked for six suppliers (i.e., Dana Corporation, Eaton Corporation, Johnson Controls, Lear Corporation, Valeo SA, and Visteon Automotive Systems) operating inside these automakers as system suppliers. In addition, we interviewed one professor at the University of São Paulo who was an expert in the automotive industry. Four of those we interviewed were executives at Anfavea and Sindipeças.<sup>10</sup> A total of four automakers (i.e., Volkswagen, Ford, DaimlerChrysler, and General Motors) were included in the sample, and multiple individuals from each automaker and suppliers were interviewed. The automakers interviewed were from different countries, including one Brazilian, two European, and two American. Therefore, our sample reflects a diverse set of companies within the automotive industry regarding the influences these business units may receive from their parent companies and the effect of their outsourcing strategies on market performance.

We followed a pre-designed interview protocol for our interviews. First, we provided interviewees with a brief description of our research project along with definitions of the key constructs. The personal interviews lasted for an average of 60 minutes and were recorded,

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<sup>9</sup> See Kotabe, Parente, Murray (2007) for a detailed explanation on the qualitative data collection.

<sup>10</sup> The Brazilian association of automakers and the Brazilian association of auto suppliers.

unless requested otherwise. All interviews were followed by a tour of the production facilities. The interviews were conducted between October 21st and November 4th of 2001 in the states of São Paulo, Rio de Janeiro, Rio Grande do Sul, and Ceará in Brazil. Our qualitative data, in conjunction with our literature review and secondary data sources, is well suited to provide a rich array of ideas and insights regarding the level of outsourcing and its outcomes in a different context, by offering additional support for our theory and empirical findings.

Our empirical results support our main hypothesis that there is a negative curvilinear relationship between outsourcing and market share, implying that as firms deviate further from their optimal degree of outsourcing, by either insourcing or outsourcing too much, their performance will suffer disproportionately. As stated by one top executive from Ford, *“we need to constantly monitor our relationship with our module suppliers, ...it is complicated to figure out what is too much or too little when it comes to restructure a traditional manufacturing plant to implement a modular production approach [that involves high degree of outsourcing activities].”* It seems that pushing to higher levels of outsourcing activities may have also negative outcomes. *“[T]hese higher levels of outsourcing [resulting from implementing modular production] are taking up most of our managers’ time....[it] requires extremely high levels of supervision to keep our suppliers performing at higher levels for all the activities we have suppliers performing for us....there are many unanticipated costs we are dealing with ...”*

Yet, another plant manager, although emphasizing the importance of outsourcing as a way to save costs, suggested that it is very important to know the optimal level of outsourcing. *“Here at VW we developed a modular consortium [using outsourcing]...that requires us to know what activities to outsource and what not to outsource.”* In general, our respondents recognized the benefits of outsourcing, but were also concerned about its

potential downside and their ability to decide on the optimal level of outsourcing. As another respondent stated, *“when implementing modularity in production, which requires higher levels of outsourcing, we need to be cautious with all the potential downsides in order to stay competitive.”*

We found in our interviews that although outsourcing strategies have been implemented in the automobile industry, there seems to be evidence of diminishing returns to outsourcing. In general, the managers interviewed in Brazil suggested that their firm’s competitive advantage seems to be linked to decisions regarding how well the firm arranges its methods of production and supply chain. As one respondent said, *“...it is hard to completely evaluate all costs involved [with outsourcing] and the potential for product quality problems, delivery schedule problems, and large price adjustments on the supply side.”* Therefore, there seems to be an optimal level of outsourcing activities beyond which diminishing returns set in. As stated by another respondent, *“[W]e have a daily meeting with all our suppliers, so that we predict and identify any potential problems,... and make quick [fine tuning] adjustment to the extent we depend on our suppliers.... In modular production plants, the key is to find the optimal level of dependency [in outsourcing] that we can afford.”*

Our fieldwork indicated that auto suppliers in Brazil are currently providing more and more complete systems through outsourcing, and are also taking up more of the engineering design and development. According to Mr. Tinoco, plant manager at the GM plant in Gravatai, *“our strategy focuses on leveraging our capabilities with the suppliers’ capabilities through outsourcing....in our case many suppliers ...have been involved in the project since the design phase [and] are working together from the project conception.”* But while outsourcing seems to be necessary and has some positive implications, the risk of overexposure through a lack of balance between insourcing and outsourcing is also clear according to another executive, *“[i]t is important that we leverage our capabilities [with*

*those of suppliers] through the codesign of components and systems, ... but we must find the balance between how much to transfer to the supplier side and how much to keep in-house ... any miscalculations can lead to problems and compromise our competitiveness.”*

Moreover, our findings are in line with a recent study by Argyres and Bigelow (2010). An anecdotal evidence of outsourcing problems faced by Boeing serves to offer additional support for our empirical findings (The Outsource Blog 2010; Edmunds Daily 2010). Boeing outsourced more than 70% of the production of its 787 Dreamliner, with the intent to reduce production costs. Because of high levels of interaction between modules and components outsourced to different suppliers, Boeing underestimated the increased redesign costs and delays that resulted from outsourcing. By not being able to put the product in the market on time, Boeing lost market share as well as customer confidence.

Using an RBV logic, our quantitative findings support the notion that the greater the firm resource base, the lower the optimal level of outsourcing will be, as indicated by the two moderators in our model: export intensity and labour productivity. In general, there is some indication in our qualitative data that those automakers marketing their products in foreign markets face a host of challenges not encountered by purely domestic firms. They may encounter difficulties in building up relationships with customers or in adjusting to local customs or regulations, thereby undermining the effectiveness of outsourcing. In addition, in our field research, we examined the outsourcing of labor-intensive activities as part of the modularization strategies of automakers in Brazil. Our qualitative data indicate that it is difficult to replicate the same level of productivity and efficiency with suppliers mainly because in emerging countries there is a lack of regulation on how these labor-intensive activities are to be provided. We also observed that some firms with high labor productivity tended to internalize activities because outsourcing them might lead to a misalignment and

eventually to poor performance. When suppliers are less productive relative to the outsourcing firm, the benefits of outsourcing seems to disappear.

We also hypothesized from an industry perspective, R&D investments create sunk costs and raise barriers to entry, thus decreasing the level of competition in the industry. Our empirical findings support the idea that the optimal outsourcing levels will decrease with higher R&D investments in the industry because of the associated lower levels of competition. Accordingly, one respondent stated,

*“... We have completely redesigned our factories and innovated in the ways we negotiate with our suppliers .... today, suppliers perform most of the activities we used to perform before and bring the modules right into the production line...but when a problem occurs it takes time to figure out the source of the problem and it may reflect on our overall outcome not only in product quality but also in customer satisfaction....we are afraid we may have gone too far in transferring the responsibilities to suppliers but we are not sure how to move back...we just have to find ways to make it work ....”*

Moreover, entry barriers can be higher due to investments in marketing and sales that create reputation and establish brand name. Therefore, industries characterized by a high level of investment in marketing and sales activities tend to be less competitive. Although our empirical results on this variable are only marginally significant, our qualitative data appear to offer further support, as stated by one of our interviewees,

*“...this highly competitive market is forcing us to focus on reducing costs and we look for the most efficient suppliers out there, but on the flip side we may be stretching ourselves too thin and may be overlooking the hidden costs of this modularization [strategy] in the long run .... but as of today we do not see any other alternative if we are to stay competitive ... we must invest in creating awareness and brand loyalty by our customers and find the most efficient suppliers at the same time.”*

## **Discussion and implications**

Overall these findings suggest support for the hypothesized negatively curvilinear relationship between outsourcing and market share, as well as for the negative moderating effects of firm resources and market competition. This is in line with conceptual arguments

and empirical evidence put forward in recent years (Grimpe and Kaiser 2010; Kotabe and Mol 2004, 2009; Kotabe et al. 2008b; Mol 2007; Rothaermel et al. 2006), but also extends the extant literature in important ways. First, this research is the first to demonstrate this relationship for marketing performance in the form of a firm's market share. This matters, because decision-makers should consider how outsourcing decisions affect a firm's market share. Our empirical evidence suggests that firms may benefit from outsourcing, but only to some extent. On the basis of anecdotal evidence, it seems that over the past decade customer responses to outsourcing decisions have gotten more negative, and this might be translating in a reluctance to purchase products of firms that are seen to be outsourcing excessively.

Second, our research operates at the level of all of a firm's activities, in essence its vertical structure, which is also different from some existing research. As has been argued before (Mol 2007), empirical evidence that a particular activity has a negatively curvilinear effect on performance is essentially luck of the draw: finding a negative curvilinear effect is a function of investigating a set of activities with a wide spread in terms of their suitability for outsourcing, what has been referred to as outsourceability (Kotabe and Mol 2009; Mol 2007). Where there is a wide spread, a curvilinear effect will emerge. But for a set that only contains activities with high outsourceability, a positive linear effect will emerge, as more outsourcing seems to improve performance 'endlessly'; and vice versa if the set only contains activities with low outsourceability, a negative linear effect will emerge. This article therefore presents a more generalized argument than some existing research.

Third, we examined two sets of moderating factors. While there is earlier work in management that tested how failing to properly account for the strength of firm resources produces misalignment, and hence lower performance (e.g., Leiblein et al. 2002), the effect of industry-level competition seems to thus far only have been investigated by economists. We were able to show that failing to account for competition, by outsourcing a lot when

competition is low or instead very little when competition is rife, can also produce misalignment and associated lower performance. In marketing and management this represents a novel argument and new empirical evidence.

Fourth, we believe our article builds upon strong empirical data and methods. We were not only able to examine a very large number of firms across a wide range of industries, but also benefitted from having six years of data available. This enabled us to undertake a panel data analysis, which alleviates some of the concerns about endogeneity typically present when studying variables such as outsourcing and market share. We avoided the typical concerns about common method bias by presenting hard data. And we presented a good mix of firm- and industry-level data. Moreover, we presented some qualitative evidence that allowed us to supplement the findings from the panel data analysis, and provided further insights into the mechanisms that explain our findings.

Fifth, and perhaps most importantly, our research lends evidence to the viewpoint we presented in the introduction that marketing scholars ought to be concerned with logistics and supply chain management issues, or governance decisions as some would frame it, because they have a strong bearing on customer choices. Our work suggests that firms that do not properly balance their outsourcing levels will suffer in terms of their market shares, regardless of whatever other efforts they may undertake in marketing their products. The rationale for this is that if a firm clearly outsources too little, it does not obtain the cost levels its customers are seeking. Similarly, if a firm outsources far too much, it suffers from a lack of control over productive activities and will struggle to convince customers that its products are actually distinct from those of its competitors. Hence we would like to suggest that marketing researchers must continuously consider sourcing decisions, as much as strategic management scholars should be considering the demand side of a firm.

There are, however, some limitations to the empirical work and findings in this article as well. As noted earlier, support for hypotheses 5 and 6 was very weak, although both hypotheses produced the expected negative sign. We argued for hypothesis 5 by suggesting heavy investments in marketing and sales create barriers to entry, which undermine competition. But an alternative point of view, and one probably embraced by some marketing scholars, is that heavy marketing and sales expenditures actually are a sign of intense competition. Unlike R&D investments, which involve high up-front fixed investments and long-term accumulation of knowledge, and hence act as a barrier to entry, marketing and sales expenditures are largely of a variable nature. In terms of hypothesis 6, it may be that measures of industry competition at an even more detailed level than those available to us (e.g., at the 4-digit or 5-digit product-level) would produce stronger support, if this is where real competition takes place. Another limitation is that this article restricts itself to market share as a dependent variable. Future research should examine other indicators of marketing performance, such as brand strength or other measures of firm reputation, consumer loyalty, or sales growth (the latter was briefly discussed in a cursory manner).

### ***Practical implications***

The implications of this study for marketing practitioners are three-fold. First, we clearly demonstrate that there is a cost attached to making the wrong outsourcing decisions. Particularly if firms outsource far too much or too little, this will have a strong detrimental effect on their market share. Thus a degree of balance is required between performing activities internally and externally. Second, we also point to important moderating effects that should be considered. Marketers and other decision-makers in a firm that is export-intensive and highly productive should shy away from outsourcing too much, and this is also true if the firm operates in an R&D intensive industry, where outsourcing significantly undermines market shares. Third, marketers should have some level of direct involvement in outsourcing

decisions. Firms that decide on their outsourcing levels without properly considering the consequences of those decisions for their market-oriented activities are likely to come to misguided conclusions; therefore, some level of integration of information between the different functions of the firm is essential.

One practical implication our work explicitly does not offer, is that firms should outsource more in order to increase their market share. Although, on average, this was true for firms in our specific sample at the time of measurement, our theory suggests that the optimal amount of outsourcing is highly context dependent, both temporally and spatially, and in addition varies from one firm to the next. Perhaps firms in the sample have now, on average, gone beyond their optimal degree of outsourcing and are suffering performance losses as a consequence (see Mol and Kotabe 2011, for an example and further discussion). And of course few firms, if any, are ‘average’ and therefore an individual firm needs to consider its own idiosyncrasies.

## **Conclusions**

In this article, we posed the question: How does outsourcing affect the marketing performance of firms? We argued that outsourcing has a positive effect on marketing performance, in the form of a firm’s market share, but only up to a point, after which the effect becomes negative. We further posited that the outsourcing–market share relationship is moderated negatively by both internal (i.e., the strength of a firm’s resources) and external circumstances (i.e., the intensity of competition a firm faces in its industry). The empirical evidence presented, from quantitative and qualitative research in two countries (the Netherlands and Brazil) broadly supports these arguments. This research adds to the existing literature both conceptually and empirically. First, this study extends the notion of a negatively curvilinear relationship between outsourcing and performance to the area of marketing performance, specifically a firm’s market share. Second, we argue and

demonstrate that marketing scholars should continue to have an interest in outsourcing and supply chain management issues as they matter to outcomes in which they are interested. Third, we develop new conceptual lines of thinking by arguing for, and empirically demonstrating, the moderating effect of a firm's resource strength on its outsourcing–marketing performance relationship, and to some extent doing the same for the competition a firm faces in its industry.

For marketing managers the key implication of our research is that they should be wary about the effects of either far too much or too little outsourcing, as it will have a detrimental impact on the firm's market share, and ultimately its chances of survival in the marketplace. Finally, because outsourcing is increasingly important for the future success of firms, we believe the research agenda of marketing scholars should incorporate more studies like this one, and more broadly that marketing research ought to consider how the management of the firm's supply chain influences its own customers' satisfaction.

## References

- Aaker, D. (1996). *Building strong brands*. New York: The Free Press.
- Adner, R., & Zemsky, P. (2006). A demand-based perspective on sustainable competitive advantage. *Strategic Management Journal*, 27, 215-239.
- Afuah, A. (2001). Dynamic boundaries of the firm: are firms better off being vertically integrated in the face of a technological change? *Academy of Management Journal*, 44, 1211-1228.
- American Marketing Association (2007). Definition of marketing. October, <http://www.marketingpower.com/AboutAMA/Pages/DefinitionofMarketing.aspx>.
- Argyres, N., & Bigelow, L. (2010). Innovation, modularity, and vertical deintegration: evidence from the early U.S. auto industry. *Organization Science*, 21, 842 - 853.
- Argyres, N. S., & Liebeskind, J. P. (1999). Contractual commitments, bargaining power, and governance inseparability: incorporating history into transaction cost theory. *Academy of Management Review*, 24, 49-63.
- Bae, S. H., Yoo, C. S., & Sarkis, J. (2010). Outsourcing with quality competition: insights from a three-stage game-theoretic model. *International Journal of Production Research*, 48, 327-342.
- Barney J.B. (1999). How a firm's capabilities affect boundary decisions. *Sloan Management Review*, 40, 137-145.
- Bartels, R. (1974). The identity crisis in marketing. *Journal of Marketing*, 38, October, 73-76.
- Bettis R., Bradley S., & Hamel G. (1992) Outsourcing and industrial decline. *Academy of Management Executive*, 6, 7-16.
- Bruck, F. (1995). Make versus buy: The wrong decisions cost. *The McKinsey Quarterly*, 1, 28-47.
- Brusoni, S., Prencipe, A., & Pavitt, K. (2001). Knowledge specialization, organization coupling, and the boundaries of the firm: why do firms know more than they make? *Administrative Science Quarterly*, 46, 597-621.
- Buzzell, R. D., & Gale, R. T. (1987). *The PIMS principles*, New York: Macmillan.
- Cachon, G. P., & Harker, P. T. (2002). Competition and outsourcing with scale economies. *Management Science*, 48, 1314-1333.
- Cameron, A. C., & Trivedi, P. K. (2005) *Microeconometrics: methods and applications*. New York: Cambridge University Press.
- Cavusgil, S. T., & Zou, S. (1994). Marketing strategy-performance relationship: An investigation of the empirical link in export market ventures. *Journal of Marketing*, 58, 1-21.

- Cocheo, S. (1995). Main street meets the 21<sup>st</sup> century. *ABA Banking Journal*, 87, 44-48.
- Duddy, E. A., & Revzan, D. A. (1953). *Marketing: an Institutional Approach*, New York: McGraw Hill.
- Dunning J. H. (1993). *Multinational enterprises and the global economy*. Wokingham: Addison-Wesley.
- Edmund Daily (2010). <http://blog.edmunds.com/strategies/2010>. By Carrol Lachnit on August 4<sup>th</sup>, 2010.
- Fortune* (1991). Apple's Japanese ally. November 4, 151-52.
- Fortune* (2006). The global outsourcing 100. April 3, S2-S17.
- Gao, G. Y., Murray, J. Y., Kotabe, M., & Lu, J. (2010). A 'strategy tripod' perspective on export behaviors: evidence from firms based in an emerging economy. *Journal of International Business Studies*, 41, 377-396.
- Glover, H. D., & Williams, A. (1995). Fighting back. *The Internal Auditor*, 52, 71-73.
- Gottfredson, M., Puryear, R., & Phillips, S. (2005). Strategic sourcing—from periphery to the core. *Harvard Business Review*, February, 132-139.
- Grimpe, C., & Kaiser U. (2010). Balancing internal and external knowledge acquisition: the gains and pains from R&D Outsourcing. *Journal of Management Studies*, 47, 1483-1509.
- Grossman, G. M., & Helpman, E. (2002). Integration versus outsourcing in industry equilibrium. *Quarterly Journal of Economics*, 117, 85-120.
- Harrigan, K. R. (1984). Formulating vertical integration strategies. *Academy of Management Review*, 9, 638-652.
- Hendry, J. (1995). Culture, community and networks: the hidden cost of outsourcing. *European Management Journal*, 13, 218-229.
- Hult, G. T. M., Ketchen Jr., D. J., & Arrfelt, M. (2007). Strategic supply chain management: improving performance through a culture of competitiveness and knowledge Development. *Strategic Management Journal*, 28, 1035-1052.
- Jacobides, M. G., & Billinger, S. (2006). Designing the boundaries of the firm: from 'make, buy, or ally' to the dynamic benefits of vertical architecture. *Organization Science*, 17, 249-261.
- Jacobides, M. G., & Winter S. G. (2005). The co-evolution of capabilities and transaction costs: explaining the institutional structure of production. *Strategic Management Journal*, 26, 395-413.
- Kotabe M. (1998). Efficiency vs. effectiveness orientation of global sourcing strategy: a comparison of U.S. and Japanese multinational companies. *Academy of Management Executive*, 12, 107-119.

- Kotabe, M., & Mol, M. J. (2004). A new perspective on outsourcing and the performance of the firm. In: M. Trick (ed.), *Global Corporate Evolution: Looking Inward or Looking Outward* (pp. 331-340). International Management Series: Volume 4. Pittsburgh: Carnegie Mellon University Press.
- Kotabe, M., & Mol, M. J. (2009). Outsourcing and financial performance: A negative curvilinear relationship. *Journal of Purchasing and Supply Management*, 15, 205-213.
- Kotabe, M., Mol, M. J., & Ketkar, S. (2008a). An evolutionary stage theory of outsourcing and competence destruction: a triad comparison of the consumer electronics industry. *Management International Review*, 48, 65-93.
- Kotabe, M., Mol, M. J., & Murray, J. Y. (2008b). Outsourcing, performance, and the role of e-commerce: a dynamic perspective. *Industrial Marketing Management*, 37, 37-45.
- Kotler, P., & Levy, S. J. (1973), Buying is marketing too. *Journal of Marketing*, 37, January, 54-59.
- Lacity, M. C., Khan, S., Yan, A., & Willcocks, L. (2010). A review of the IT outsourcing empirical literature and future research directions. *Journal of Information Technology*, 25, 395-433.
- Leachman, C., Pegels, C. C., & Shin, S. K. (2005). Manufacturing performance: evaluation and determinants. *International Journal of Operations & Production Management*, 25, 851- 874.
- Leiblein, M. J., Reuer, J. J., & Dalsace, F. (2002). Do make or buy decisions matter? The influence of organizational governance on technological performance. *Strategic Management Journal*, 23, 817-833.
- Leonidou, L. C., Katsikeas, C. S., & Samiee, S. (2002). Marketing strategy determinants of export performance: a meta-analysis. *Journal of Business Research*, 55, 51– 67.
- Levy, D. L. (2005). Offshoring in the new global political economy. *Journal of Management Studies*, 42, 687–93.
- Masten, S. E. (1993). Transaction costs, mistakes, and performance: assessing the importance of governance. *Managerial and Decision Economics*, 14, 119-129.
- McEvily, B., & Marcus, A. (2005). Embedded ties and the acquisition of competitive capabilities. *Strategic Management Journal*, 26, 1033-1055.
- Mol, M. J. (2005). Does being R&D intensive still discourage outsourcing? Evidence from Dutch manufacturing. *Research Policy*, 34, 571–582.
- Mol, M. J. (2007). *Outsourcing: design, process, and performance*. Cambridge, U.K.: Cambridge University Press.
- Mol, M. J., & Kotabe, M. (2011). Overcoming inertia: Drivers of the outsourcing process. *Long Range Planning*, 44, 160-178.

- Murray, J. Y., Kotabe, M., & Zhou, J. N. (2005). Strategic alliance-based sourcing and market performance: Evidence from foreign firms operating in China. *Journal of International Business Studies*, 36, 187-208.
- Murray, J. Y., Kotabe, M., & Westjohn, S. (2009). Global sourcing strategy and performance of knowledge-intensive business services: A two-stage strategic fit model. *Journal of International Marketing*, 17, 90-105.
- Nikkei.com (2006). Sony's technological leadership In Jeopardy. October 7.
- Porter M. E. (1980). *Competitive strategy*. New York: Free Press.
- Porter M. E. (1985). *Competitive advantage*. New York: Free Press.
- Poppo L., & Zenger, T. (1998). Testing alternative theories of the firm: Transaction cost, knowledge-based, and measurement explanations for make-or-buy decisions in information services. *Strategic Management Journal*, 19, 853-877.
- Powell, W. W., Koput, K. W., & Smith-Doerr, L. (1996). Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology. *Administrative Science Quarterly*, 41, 116-145.
- Rao, R. K. S., & Bharadwaj, N. (2008). Marketing initiatives, expected cash flows, and shareholders' wealth. *Journal of Marketing*, 72, 16-26.
- Reitzig, M., & Wagner, S. (2010). The hidden cost of outsourcing: Evidence from patent data. *Strategic Management Journal*, 31, 1183-1201.
- Rodan, S., & Galunic, C. (2004). More than network structure: How knowledge heterogeneity influences managerial performance and innovativeness. *Strategic Management Journal*, 25, 541-562.
- Rothaermel, F. T., Hitt, M. A., & Jobe, L. A. (2006). Balancing vertical integration and strategic outsourcing: Effects on product portfolio, product success, and firm performance. *Strategic Management Journal*, 27, 1033-1056.
- Rust, R. T., Ambler, T., Carpenter, G. S., Kumar, V., & Srivastava, R. K. (2004). Measuring marketing productivity: Current knowledge and future directions. *Journal of Marketing*, 68, 76-89.
- Shy, O., & Stenbacka, R. (2003). Strategic outsourcing. *Journal of Economic Behavior and Organization*, 50, 203-224.
- Srinivasan, S., & Hanssens, D. M. (2009). Marketing and firm value: Metrics, methods, findings, and future directions. *Journal of Marketing Research*, 46, 293-312.
- Stigler G. J. (1951). The division of labor is limited by the extent of the market. *Journal of Political Economy*, 59, 185-193.
- Suter, M. P., & Michael, N. (1999). Banking's top performance—Part 2: The community banks. *ABA Banking Journal*, 91, 44-49.

Szymanski, D. M., Bharadwaj, S. G., & Varadarajan, P. R. (1993). An analysis of the market-share profitability relationship. *Journal of Marketing*, 57, 1-18.

The Outsource Blog (2010). [Http://www.theoutsourceblog.com/2010](http://www.theoutsourceblog.com/2010). By Manmohan on August 5.

Weigelt, C. (2009). The impact of outsourcing new technologies on integrative capabilities and performance. *Strategic Management Journal*, 30, 595-616.

Williamson O. E. (1985). *The Economic Institutions of Capitalism*. New York: Free Press.

Zou, S. & Cavusgil, S. T. (2002), The GMS: A broad conceptualization of global marketing strategy and its effect on firm performance. *Journal of Marketing*, 66 (October), 40-56.

**Table 1** Industries represented in the analysis and numbers of observations in each of these industries (on average each business is observed 5.7 times).

indu151	Production, processing and preserving of meat and meat products	830	indu261	Manufacture of glass and glass products	128
indu152	Processing and preserving of fish and fish products	159	indu264	Manufacture of bricks, tiles and construction products, in baked clay	146
indu153	Processing and preserving of fruit and vegetables	246	indu267	Cutting, shaping and finishing of ornamental and building stone	47
indu156	Manufacture of grain mill products, starches and starch products	53	indu281	Manufacture of structural metal products	2171
indu157	Manufacture of prepared animal feeds	347	indu284	Forging, pressing, stamping and roll forming of metal; powder metallurgy	393
indu173	Finishing of textiles	112	indu285	Treatment and coating of metals; general mechanical engineering	847
indu174	Manufacture of made-up textile articles, except apparel	251	indu286	Manufacture of cutlery, tools and general hardware	338
indu175	Manufacture of other textiles	259	indu287	Manufacture of other fabricated metal products	629
indu193	Manufacture of footwear	106	indu291	Machinery for production and use of mechanical power, except aircraft, vehicle and cycle engines	565
indu202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards	41	indu292	Manufacture of other general purpose machinery	1673
indu203	Manufacture of builders carpentry and joinery	540	indu293	Manufacture of agricultural and forestry machinery	365
indu204	Manufacture of wooden containers	147	indu294	Manufacture of machine-tools	139
indu205	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	71	indu297	Manufacture of domestic appliances n.e.c.	124
indu221	Publishing	601	indu300	Manufacture of office machinery and computers	81
indu222	Printing and service activities related to printing	2205	indu311	Manufacture of electric motors, generators and transformers	170
indu223	Reproduction of recorded media	54	indu313	Manufacture of insulated wire and cable	66
indu232	Manufacture of refined petroleum products	94	indu332	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment	288
indu241	Manufacture of basic chemicals	499	indu342	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	415
indu244	Manufacture of pharmaceuticals, medicinal chemicals and botanical products	167	indu343	Manufacture of parts and accessories for motor vehicles and their engines	104
indu245	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations	168	indu351	Building and repairing of ships and boats	524
indu246	Manufacture of other chemical products	235	indu354	Manufacture of motorcycles and bicycles	98
indu251	Manufacture of rubber products	125	indu361	Manufacture of furniture	1355
indu252	Manufacture of plastic products	1421	indu362	Manufacture of jewellery and related articles	54

**Table 2** Descriptive statistics (non-centered versions of variables) and correlations. N = 19,451

Variable	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12
1 Logged market share	-0.97	1.36	1											
2 Outsourcing	47.42	18.11	0.28	1										
3 Export intensity	26.16	32.43	0.37	0.17	1									
4 Training and development	0.54	0.22	-0.06	-0.33	-0.12	1								
5 R&D intensity	0	0.52	0.12	0.03	0.27	0.17	1							
6 Marketing intensity	0.01	1.47	0.17	0.02	0.09	0.26	0.25	1						
7 Labor productivity	324.1	484.7	0.25	0.34	0.16	-0.23	0.04	0.03	1					
8 Industry concentration	3.60	4.62	0.47	0.02	0.23	-0.03	0.33	0.11	0.14	1				
9 Capital investment	2.99	2.05	-0.08	-0.27	-0.01	0.08	-0.01	-0.07	0.01	0.01	1			
10 Site investment	0.89	0.52	0.01	-0.13	-0.06	0.25	0.03	0.04	-0.09	-0.07	0.31	1		
11 Industry outsourcing	47.69	9.83	0.11	0.53	0.14	-0.62	0.01	0.04	0.24	0.03	-0.51	-0.24	1	
12 Dutch multinational	0.23	0.42	0.27	0.17	0.07	-0.07	0.03	0.07	0.13	0.04	-0.02	-0.01	0.14	1

**Table 3** Random effects tobit panel data regression predicting logged market share (N = 19,451; 5.8 observations per group). Reporting unstandardized beta; standard error; p-value; significance (\*\*\*=0.1%; \*\*=1%; \*=5%; †=10%)

Model	1	2	3	4	5	6	7	8
Export intensity	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
	10.22(***)	9.69(***)	9.59(***)	9.84(***)	9.77(***)	9.93(***)	9.63(***)	9.43(***)
Training and development	0.16(0.02)	0.16(0.02)	0.16(0.02)	0.16(0.02)	0.16(0.02)	0.16(0.02)	0.18(0.02)	0.16(0.02)
	6.80(***)	6.99(***)	7.11(***)	6.94(***)	7.26(***)	7.06(***)	7.79(***)	6.96(***)
R&D intensity	0.07(0.01)	0.07(0.01)	0.07(0.01)	0.07(0.01)	0.06(0.01)	0.07(0.01)	0.06(0.01)	0.07(0.01)
	9.95(***)	9.69(***)	10.13(***)	10.03(***)	9.43(***)	10.11(***)	9.38(***)	9.60(***)
Marketing intensity	0.1(0)	0.1(0)	0.1(0)	0.1(0)	0.1(0)	0.1(0)	0.1(0)	0.1(0)
	29.83(***)	29.90(***)	29.80(***)	30.34(***)	33.16(***)	30.11(***)	30.17(***)	29.97(***)
Labor productivity	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
	35.02(***)	34.31(***)	34.66(***)	34.68(***)	41.95(***)	34.67(***)	34.70(***)	34.73(***)
Industry concentration	0.01(0)	0.01(0)	0.01(0)	0.01(0)	0.01(0)	0.01(0)	0.01(0)	0.01(0)
	4.91(***)	4.95(***)	5.03(***)	5.06(***)	3.88(***)	5.12(***)	4.45(***)	5.03(***)
Capital investments	0(0)	0(0)	-0.01(0)	0(0)	0(0)	0(0)	0(0)	0(0)
	-1.81(†)	-1.54	-2.48(*)	-1.88(†)	-1.86(†)	-2.11(*)	-2.11(*)	-1.76(†)
Site investments	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
	-0.89	-0.93	-0.80	-1.03	-0.99	-0.95	-0.97	-0.97
Industry outsourcing	0.01(0)	0.01(0)	0.01(0)	0.01(0)	0.01(0)	0.01(0)	0.01(0)	0.01(0)
	8.97(***)	6.30(***)	7.97(***)	7.33(***)	7.19(***)	6.83(***)	6.78(***)	7.09(***)
Dutch multinational	0.75(0.05)	0.74(0.04)	0.75(0.04)	0.77(0.04)	0.85(0.04)	0.77(0.05)	0.81(0.04)	0.9(0.04)
	15.15(***)	17.26(***)	17.09(***)	19.60(***)	23.27(***)	16.86(***)	22.72(***)	23.67(***)
Outsourcing		0(0)	0.01(0)	0.01(0)	0.01(0)	0.01(0)	0.01(0)	0.01(0)
		10.75(***)	15.37(***)	14.92(***)	12.21(***)	15.40(***)	15.51(***)	15.34(***)
Outsourcing squared			0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
			-12.69(***)	-12.25(***)	-9.80(***)	-12.73(***)	-12.91(***)	-12.72(***)
Outsourcing x export intensity				0(0)				
				-2.82(**)				

Outsourcing x labor productivity					0(0)			
					-25.53(***)			
Outsourcing x R&D intensity						0(0)		
						-3.45(***)		
Outsourcing x marketing intensity							0(0)	
							-1.93(†)	
Outsourcing x market concentration								0(0)
								-1.88(†)
Constant	-1.69(0.06)	-1.55(0.06)	-1.38(0.06)	-1.39(0.06)	-1.38(0.06)	-1.33(0.06)	-1.32(0.06)	-1.38(0.06)
	-28.55(***)	-25.79(***)	-21.81(***)	-22.11(***)	-22.82(***)	-21.04(***)	-21.75(***)	-21.99(***)
Rho	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Log likelihood	-5931.8	-5879.8	-5813.6	-5794.1	-5487.8	-5787.3	-5803.9	-5809.5

**Table 4** Predicted market share of firms (in %) for different levels of outsourcing between -2 and +2 standard deviations, with all other variables at the means.

	-2	-1.5	-1	-0.5	Means	0.5	1	1.5	2
Outsourcing only	0.300	0.327	0.351	0.369	0.382	0.388	0.388	0.381	0.368
With export intensity interaction	0.305	0.331	0.353	0.371	0.382	0.387	0.386	0.378	0.364
With labor productivity interaction	0.342	0.359	0.372	0.380	0.382	0.378	0.369	0.355	0.335
With R&D intensity interaction	0.304	0.330	0.353	0.371	0.382	0.387	0.386	0.378	0.364
With marketing intensity interaction	0.304	0.330	0.353	0.371	0.382	0.387	0.386	0.378	0.363
With industry concentration interaction	0.304	0.330	0.353	0.371	0.382	0.387	0.385	0.377	0.363