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OFFSHORING AND FIRM INNOVATION: THE MODERATING ROLE OF TOP MANAGEMENT TEAM ATTRIBUTES

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This study attempts to increase the understanding of how offshoring influences the introduction of new products and services. Focusing on the offshoring of those business functions that provide direct knowledge inputs for innovation (i.e., production, R&D, and engineering), we propose that offshoring has an inverted U-shaped influence on firm innovativeness. Additionally, we provide an upper echelon contingency perspective by considering the moderating role of two top management team (TMT) attributes (i.e., informational diversity and shared vision). Using a cross-industry sample with lagged data, we find that offshoring has an inverted U-shaped influence on firm innovativeness and that this relationship is steeper in firms with high TMT informational diversity and in firms with low TMT shared vision. Copyright © 2012 John Wiley & Sons, Ltd.

INTRODUCTION

Ample research emphasizes the positive consequences of innovation for firm performance and considers it central to firms' competitive advantage (e.g., Dutta, Narasimhan, and Rajiv, 2005; Hall, 2000; Geroski, Machin, and Van Reenen, 1993). However, introducing new products and services is challenging because it requires substantial new knowledge and financial resources (Sampson, 2007). Highlighted as creating 'new platforms for knowledge creation and innovation,' offshoring has been suggested to provide fertile ground for firms to accumulate knowledge and increase their innovativeness (Kenney, Massini, and Murtha, 2009: 887).

Offshoring refers to the assignment of business functions to locations outside of the firm's national borders in support of domestic rather than foreign business operations (Kenney *et al.*, 2009; Levy, 2005; Lewin, Massini, and Peeters, 2009). Due to recent advances in information technology (IT) and trade liberalization, offshoring is experiencing intensive growth. For instance, the number of offshore service workers grew from less than 35,000 worldwide in 1994 to over 350,000 in India alone in 2003 (Metters and Verma, 2008). This growing trend is expected to continue with estimates that between the years 2000 and 2015, over 3 million white-collar jobs worth more than US$150 billion annually will be moved from the United States to offshore locations (McCarthy *et al.*, 2002). In addition to its overall magnitude, offshoring is also growing in terms of the variety of functions that firms relocate abroad, as firms start to offshore functions rich in product-related knowledge such as research and development (R&D) (Lewin and Peeters, 2006). These developments have led some authors to consider offshoring 'the most important phenomenon transforming the workplace' (Youngdahl and Ramaswamy, 2008: 213).

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Despite offshoring's growing importance, the consequences of relocating business functions to international locations for firms' ability to introduce new products and services are still not well understood as the literature is not only remarkably scarce[1] but it also provides opposing views (Doh, 2005; Kotabe, 1990; Inkpen and Ramaswamy, 2006; Youngdahl, Ramaswamy, and Verma, 2008). While several studies highlight offshoring's potential to stimulate innovativeness (Chung and Yeaple, 2008; Li *et al*., 2008), others have argued that offshoring can actually dampen innovation performance (Chesbrough and Teece, 1996; Markides and Berg, 1988; Teece, 1987). Moreover, the empirical evidence for the offshoring-innovation linkage is largely absent, with most existing studies providing indirect arguments or anecdotal evidence. In light of the increasing practice of relocating business functions to foreign locations, understanding how to avoid the caveats and harness the benefits from offshoring for increasing innovativeness is central for firms' viability and competitive advantage.

This study seeks to explain how and under what conditions offshoring enhances firms' innovative performance. In doing so, this study contributes to offshoring, innovation and upper echelon literatures in several ways. First, we advance the understanding of offshoring as an important antecedent of firm innovation by providing an extensive analysis of how offshoring those business functions that are the primary providers of knowledge (i.e., production, R&D, and engineering) contributes to generating new products and services (e.g., Teece, 1996).[2] These primary functions advance existing knowledge; R&D and engineering deliver new designs, and production provides crucial feedback that contributes to fine-tuning new technologies (Leiblein and Madsen, 2009; Markides and Berg, 1988). Supporting the role of these functions for the introduction of new products and services, Teece (1996) argues that innovation requires the continuous communication and adaptation between production and development. Thus, since these functions represent the direct linkage between offshoring and innovation, their relocation to foreign locations is particularly associated with potential benefits and drawbacks.

We suggest that the extent to which organizations offshore primary functions enables them to unleash unrealized potential for firm innovativeness as they may leverage specialized knowledge sources from foreign locations (Li *et al*., 2008) and utilize wage-differentials (e.g., Chung and Yeaple, 2008; Ethiraj *et al*., 2005; Venkatraman, 2004). Yet, we argue that the relocation of primary functions to foreign countries will exhibit a pattern of diminishing returns, eventually reversing itself at high levels when organizations may become detached from most of their primary operations and, consequently, experience difficulty in recognizing and responding to environmental changes (e.g., Cohen and Levinthal, 1990; Teece, 1987). By focusing on the distinct effects of offshoring primary functions and suggesting an inverted U-shaped relationship, our study advances current insights into the implications of offshoring for firm innovativeness as it extends, integrates, and reconciles the opposing perspectives in extant literatures.

Second, our study contributes to establishing the link between upper echelon and innovation literatures by highlighting and clarifying the role of top management teams (TMTs) in how firms may enhance innovativeness through international sourcing. While previous research has considered, albeit indirectly, the implications of offshoring for the introduction of new products and services, it has done so in isolation of the actors steering the relationship, that is, the senior executives. This oversight is surprising considering the central role that TMTs play in setting strategic goals (Wiersema and Bantel, 1992), influencing international knowledge transfer (Fey and Furu, 2008), and legitimizing new initiatives (Sambharya, 1996).

In order to advance a deeper understanding of the relationship between offshoring and innovation, we provide an upper echelon contingency perspective that analyzes the strategic importance

[1] Most studies on the firm-level consequences of offshoring focus on financial outcomes such as cost savings (e.g., Ellram, Tate, and Billington, 2008; Farrell, 2005) or overall performance (e.g., Bhalla, Sodhi, and Son, 2008).

[2] We thank the editor for suggesting the focus on offshoring primary functions, that is, the primary providers of knowledge for generating new products and services: production, R&D, and engineering. The offshoring of other business functions (e.g., accounting, human resources, information technology, or customer service) may also provide incentives for the development of new products and services. However, since these functions do not contain the knowledge underlying innovation, they are likely to provide only indirect stimuli (e.g., the accumulation of organizational slack). Thus, in this study we focus on the offshoring of primary functions while controlling for the extent of offshoring secondary functions.

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of TMT attributes. Influencing the perception and evaluation of alternatives (Hambrick and Mason, 1984), TMT attributes can alter the effectiveness of firm actions (e.g., Finkelstein and Hambrick, 1996; Vissa and Chacar, 2009). We consider the role of two TMT attributes: informational diversity and shared vision. We focus on these TMT attributes because they have distinct effects on team behavior—while diversity introduces divergence in senior executives' preferences, a shared vision facilitates convergence. These two TMT attributes are relevant for the understanding of the offshoring-innovation relationship as, while diversity enhances the array of ideas regarding the usefulness and potential applications of offshore alternatives (Ang and Inkpen, 2008), a shared vision influences the value perceptions regarding the application of offshore knowledge (von Krogh, Roos, and Slocum, 1994). While offshoring raises a number of opportunities for innovation, we argue that TMT attributes influence the extent to which firms may capitalize on these opportunities. In this sense, our study advances upper echelon literature by emphasizing the importance of the *interplay* between TMT strategic choices and TMT attributes in determining a firm's ability to introduce new products and services, thus, complementing the existing view that TMTs are crucial to organizational outcomes (e.g., Cannella, Park, and Lee, 2008; Simons, Pelled, and Smith, 1999). Specifically, by highlighting TMT attributes as important contingency factors, we answer a call for a better understanding of how senior executives influence the effectiveness of sourcing across national borders (Foss and Pedersen, 2004).

The remainder of this paper is organized as follows. The next section develops the arguments that lead to our hypotheses. Next, we present the methodology and the results. The paper concludes with a discussion of the main ideas, limitations, and opportunities for future research.

HYPOTHESES DEVELOPMENT

Offshoring and firm innovativeness

Innovativeness refers to the introduction of products or services that are new to the firm (Damanpour, 1991; Bell, 2005). Innovativeness originates from a firm's accumulated know-how, which forms the base for developing new ideas; that is, the higher the depth of the knowledge base, the higher the innovativeness (Pennings and Harianto, 1992). In addition to its depth, the breadth of the knowledge base is central for innovativeness as variety diminishes the possibility that firms remain blocked in existing technologies that might become obsolete (Kotabe *et al*., 2007). We propose that offshoring primary functions influences the ability of firms to develop new products and services through its impact on firms' existing knowledge base, yet the direction depends on the extent to which firms engage in offshoring.

Increasing the extent of offshoring from low to intermediate levels allows firms to enhance their innovativeness by leveraging the location-specific advantages and competencies of foreign countries. First of all, studies have shown that firms can capitalize on relatively lower labor costs in order to increase the depth of their knowledge generating activities. For instance, Quinn (2000) argues that offshoring provides access to the latest know-how at lower cost and risk than would be possible in the home country and Chung and Yeaple (2008) propose that the lower cost of international knowledge sourcing can serve as a springboard for firms' knowledge generating activities. By offshoring to locations that provide cost advantages, firms can employ highly specialized personnel who would be too expensive in the home country (Lewin and Peeters, 2006). As a result, they can increase the depth of the knowledge base to levels that would be unattainable with primary functions restricted to their home location. For instance, cost differentials permit General Electric to engage more than 15,000 people in knowledge generating activities in India (Venkatraman, 2004), and firms such as IBM, Sapient, and Accenture leverage the mix of high capabilities and low cost of the Indian software industry (Ethiraj *et al*., 2005).

Second, offshoring primary functions enhances the breadth of the knowledge base by connecting firms with a wide variety of knowledge sources at offshore locations. Utterback (1971) argues that diverse contacts with external entities inspire idea generation and Dewar and Dutton (1986) show that exposure to diverse sources of knowledge enhances innovation adoption. As national environments hold idiosyncratic knowledge and technologies (Cantwell, 1994), offshoring allows firms to tap into new competencies. That is, offshoring provides access to knowledge and technologies that are either not available or less sophisticated

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in the home country than at foreign locations (Chung and Alcacer, 2002). For instance, offshoring enhances learning as it permits firms to enter offshore industry clusters since, according to Powell, Koput, and Smith-Doer (1996), the locus of innovation is the network, not the individual firm.

However, as offshoring of primary functions increases beyond a threshold, its benefits in terms of increased innovativeness are likely to diminish and offshoring can even hinder firms' ability to introduce new products and services. First, at high levels of offshoring firms may become 'hollow corporations,' in the sense that they do not have significant contributions to their product or service value chain, and, as a result, their expertise might stagnate (Miles and Snow, 2002). This is a considerable threat to firms' innovativeness since the ability to recognize the value of new knowledge, assimilate it, and apply it to commercial ends depends on the existence of related knowledge (Cohen and Levinthal, 1990). That is, knowledge transfer from offshore locations requires a certain degree of overlap with the existing knowledge base (Van Wijk, Jansen, and Lyles, 2008; Yang, Mudambi, and Meyer, 2008); thus, excessive reliance on geographically dispersed knowledge sources may inhibit further transfer of offshore knowledge and decrease firms' ability to transform new knowledge into innovations (Teece, 1987).

Second, a high extent of offshoring can dampen firm innovativeness since the geographical disaggregation of functions can make the integration of knowledge more difficult. This is particularly important since innovation requires continuous communication and mutual adjustment between primary functions (Leiblein and Madsen, 2009; Teece, 1996). When a high proportion of primary functions are performed at foreign locations, the knowledge transfer can be burdened by considerable geographical, cultural, and institutional barriers (Lane and Lubatkin, 1998; Markides and Berg, 1988). These complexities increase demands on managerial attention, leading to a dampening of offshoring's benefits (Chesbrough and Teece, 1996; Kotabe, 1990; Rothaermel, Hitt, and Jobe, 2006). In addition, due to the time costs involved in coordinating geographically dispersed operations, high levels of offshoring may impede firms in implementing timely changes to existing product lines (Markides and Berg, 1988). Considering these arguments, we propose an inverted U-shaped relationship between the offshoring of primary functions and firm innovativeness:

> *Hypothesis 1: The extent of offshoring primary functions has an inverted U-shaped relationship with firm innovativeness.*

The moderating role of TMT attributes: informational diversity and shared vision

In order to advance the understanding of the effectiveness of offshoring in influencing innovation, we analyze the contingency role of TMT attributes. Building on the idea that search and decision-making processes jointly influence innovation (Greve, 2003), we propose that while offshoring may provide important opportunities for developing new products and services, the attributes of TMTs influence how firms capitalize on these opportunities.

More specifically, we analyze the moderating role of two TMT attributes: informational diversity and shared vision. Both attributes shape how senior executives perceive the value of the opportunities raised by offshoring and how they interact in implementing various alternatives. TMT informational diversity, or the heterogeneity in senior executives' knowledge bases and perspectives, influences idea generation regarding the usefulness and potential applications of offshore alternatives and TMTs' ability to make competent decisions (Ang and Inkpen, 2008). TMT shared vision, by promoting convergence in cognitive modes regarding the overall strategic direction of the firm (Tvorik and McGivern, 1997), influences how TMTs collectively perceive the value of knowledge generated through offshoring and how they deal with potential conflicts regarding the implementation of competing opportunities. Hence, while diversity creates variation in cognitive models, shared vision ensures that TMTs' decisions converge toward long-term firm goals. Next, we discuss in detail how each of these TMT attributes affects the influence of offshoring on firm innovativeness.

TMT informational diversity, offshoring, and firm innovativeness

TMT informational diversity captures the degree of heterogeneity in knowledge bases and perspectives that TMT members bring to the team

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(Jehn, Northcraft, and Neale, 1999; Pelled, 1996). Informational diversity arises from differences in individual characteristics such as educational background or previous functional roles (Jehn *et al*., 1999). Informational diversity plays an important role in how senior executives perceive the opportunities presented by offshoring and how they interact during their implementation. We propose that the inverted U-shaped relationship between offshoring primary functions and innovation is steeper in firms with high TMT diversity than in those with low TMT diversity.

As varied knowledge structures augment TMTs' capacity to make novel linkages and associations (Cohen and Levinthal, 1990), informational diversity can enhance the ability to recognize the potential of opportunities that arise from relocating primary functions to foreign locations. Informational diversity reduces the risks of strategic inertia by helping TMT members to overcome uniformity pressures (Lant, Milliken, and Batra, 1992; Wiersema and Bantel, 1992). Thus, TMTs with high informational diversity may consider more ways to transform and exploit knowledge from offshore locations than TMTs with low informational diversity (Zahra and George, 2002). In addition, informational diversity can enhance TMTs' information processing capacity (Ancona and Caldwell, 1992). Higher cognitive capacity can improve TMTs' ability to manage internationally dispersed operations as it allows more accurate interpretations of foreign environments in terms of idiosyncratic institutional and cultural conditions (Black, Mendenhall, and Oddou, 1991; Roth, 1995). Furthermore, due to higher decision comprehensiveness (Simons *et al*., 1999), heterogeneous TMTs are also more likely than homogeneous ones to pursue superior alternatives out of the potential opportunities from offshoring for introducing new products and services. As such, TMT informational diversity may enhance the potential opportunities derived from offshoring primary functions for increasing firm innovativeness.

However, TMT informational diversity may also augment the potential detrimental effect of high levels of offshoring on innovativeness, as the heterogeneity of perspectives compounds the difficulty of transferring and integrating knowledge from geographically dispersed operations. Research shows that TMT diversity is a 'double-edged sword.' While the distinct skills, views, and information increase team creativity, they can also lead to more difficult communication and coordination within teams (Milliken and Martins, 1996; Williams and O'Reilly, 1998) and to increased dysfunctional conflict (Jehn *et al*., 1999). These negative effects of diversity are especially likely to hinder the functioning of TMTs when dealing with complex situations such as managing high levels of offshore operations (Carpenter, 2002). The difficulty of reconciling different mental models and competing ideas adds to the hurdles of coordinating the knowledge transfer from high levels of offshore operations as it puts additional pressure on TMTs' cognitive capacity and time resources (Ancona and Caldwell, 1992). In line with this argument, research shows that knowledge integration is more difficult in teams with higher informational diversity as unproductive process conflict may delay decision making (Jehn *et al*., 1999; Milliken and Martins, 1996; Van Der Vegt and Bunderson, 2005). Also, informational diversity may impede knowledge transfer and integration from high levels of offshore operations as the divergence in perspectives increases political activity and lowers the ability to commit to a particular course of action (Jarzabkowski and Searle, 2004). Thus, as the complexity of interactions between members within diverse TMTs may increase the challenges of transferring and integrating knowledge from geographically dispersed operations, TMT diversity may accentuate the negative relationship between high levels of offshoring primary functions and firm innovativeness. These arguments lead to the following hypothesis:

> *Hypothesis 2: TMT informational diversity moderates the inverted U-shaped relationship between the extent of offshoring primary functions and firm innovativeness in such a way that the inverted U-shaped relationship will be steeper in firms with high TMT informational diversity than in firms with low TMT informational diversity.*

TMT shared vision, offshoring, and firm innovativeness

TMT shared vision represents the collective goals among TMT members regarding a common and desired strategic direction of the firm (Jansen *et al*., 2008; Tsai and Ghoshal, 1998). A shared vision affects the relationship between offshoring primary functions and innovativeness as it influences how

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TMT members evaluate opportunities from offshoring and how they oversee knowledge transfer from offshore locations. We propose that a TMT shared vision may flatten the inverted U-shaped relationship between offshoring primary functions and innovation; that is, a TMT shared vision may dampen the positive effects of lower levels of offshoring, yet it may also reduce the potential downside effect of higher levels of offshoring.

A TMT shared vision may lead to a less pronounced positive relationship between lower levels of offshoring and innovativeness because strong consensus on the strategic direction of the firm may narrow the window of opportunities considered by TMTs. As knowledge that falls beyond a firm's search scope is likely overlooked (Cyert and March, 1963), firms with a high TMT shared vision are likely to capitalize on fewer of the offshore knowledge enhancing opportunities than firms with a low TMT shared vision. In addition, TMTs with a high shared vision may value only a restrictive set of offshore knowledge as the lack of disagreement over the strategic direction may predispose them to the problem of groupthink (Janis, 1972; Wong, 2004). Since the shared understanding of the strategic direction provides TMT members with the same criterion for determining the quality of knowledge (Nonaka, 1994; von Krogh *et al*., 1994), TMTs that have a high shared vision may base decisions about the value of new offshore knowledge on unchallenged assumptions (Dooley and Fryxell, 1999). In other words, a TMT shared vision can reduce receptivity to external knowledge and enhance the 'not invented here' syndrome (Katz and Allen, 1982). Thus, a shared vision may restrict TMTs in leveraging the full potential of offshore knowledge as TMTs with high shared vision are likely to value a more limited set of options than TMTs with low shared vision.

However, a shared vision may also alleviate the potential negative effect of higher levels of offshoring primary functions on firm innovativeness. We argue that a TMT shared vision may lessen the hurdles that high levels of offshoring pose for knowledge transfer and integration. Shared cognitions and consensus on strategic goals encourage collaborative and integrative behaviors among TMT members (Oswald, Mossholder, and Harris, 1994; Pearce and Ensley, 2004) and provide a collective understanding of how to resolve contradictory agendas (Sinkula, Baker, and Noordewier, 1997). Thus, by reducing the disagreements among TMT members over resource allocation prevalent at high levels of offshoring, a shared vision provides the organizational support necessary for reducing potential problems associated with the implementation of innovative initiatives originating from offshore locations (Vissa and Chacar, 2009). A shared vision also reduces the cognitive demands that high levels of offshoring make on TMTs as the consensus on the strategic direction helps filter out the short-term opportunities from those opportunities that can aid firms develop distinctive competencies and achieve long-term goals (Lipton, 1996; Vissa and Chacar, 2009). As a result, a shared vision enables TMTs to streamline monitoring (Hamel and Prahalad, 1989) and direct attention to maintaining and enhancing the knowledge that is relevant for the commonly desired strategic direction (Ocasio, 1997). In light of these arguments, we propose the following hypothesis:

Hypothesis 3: TMT shared vision moderates the inverted U-shaped relationship between the extent of offshoring primary functions and firm innovativeness in such a way that the inverted U-shaped relationship will be flatter in firms with high TMT shared vision than in firms with low TMT shared vision.

METHODS

Research setting and data collection

In order to empirically test the proposed relationships, we identified a random sample of 4,000 Dutch firms using a database from a commercial provider. The sample covers a wide range of industries and includes private firms with more than 25 employees. We sent survey participation requests to the executive directors of all firms in the sample. Since the data employed in this study regards details about the overall offshoring strategy, the executive directors were in the best position to provide such general information. To ensure that participants were interested and committed to providing accurate information, we guaranteed confidentiality and offered them a summary of the results.

In order to minimize potential problems of common method bias, we temporally separated the data collection for the independent and dependent variables by collecting data at two different points

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in time. The first round of data collection took place in 2007 and focused on the independent variables. Out of the 4,000 firms contacted, 1,150 executive directors returned completed questionnaires; a response rate of 29 percent. In 2008, approximately one year after the first round of data collection, we sent a second survey to the 1,150 executive directors who completed the first survey to assess their firms' innovativeness, the dependent variable. In this second round of data collection, 276 fully completed questionnaires were returned, representing 24 percent of the original response. The executive directors who responded to both surveys have a mean age of 47.65 years (standard deviation (s.d.) = 8.87) and a mean tenure of 13.78 years (s.d. = 10.44). The firms in the final sample have a mean age of 38.49 (s.d. = 32.20) years, a mean size of 216 (s.d. = 923.76) full-time employees and operate in various industries covering manufacturing (24%), professional services (31%), transportation (9%), construction (17%), food and forestry (8%), and other industries (11%). In order to assess the nonresponse bias, we compared the respondents with nonrespondents for the final sample. Results of t-tests show that the respondents do not differ significantly ($p < 0.05$) from nonrespondents in terms of firm age, firm size, total assets, and prior performance. Further, we examined differences between early and late respondents in terms of demographics and model variables. The finding of no significant differences ($p < 0.05$) indicates that nonresponse bias is not an issue.

Measurement and validation of constructs

The constructs employed in this study are operationalized using existing measures available in the literature.

Firm innovativeness

We measure *firm innovativeness* as the percentage of revenues over the past three years that is attributable to new products and services (e.g., Cassiman and Veugelers, 2006; Laursen and Salter, 2006; Leiponen and Helfat, 2010). This measure of innovativeness (mean = 0.10, s.d. = 0.10) shows the actual level of firm innovativeness as it assesses the end result of the innovation process. We validated the innovativeness measure with a separate four-item measure ($\alpha = 0.86$) adapted from Li and Atuahene-Gima (2002). The four-item measure asked respondents to indicate their agreement with the statements: 'we introduced in the market many products and services that are completely new to us,' 'our firm has launched several new lines of products,' 'our firm places emphasis on product and process innovation,' and 'we often experiment in the market with new products and services.' The high correlation ($r = 0.26$, $p < 0.001$) between the two measures provides evidence of measurement validity.

Extent of offshoring primary functions

To measure the extent of offshoring of various functions, we follow the widely used procedure (e.g., Murray and Kotabe, 1999; Parmigiani and Mitchell, 2009; Poppo and Zenger, 1998; Weigelt, 2009) of asking the respondents to indicate what percentage of each of the following functions was offshored during the past three years: production, R&D, and engineering. The offshoring measure for each function is a continuous variable that ranges between zero percent (the function is fully performed at the domestic location) and 100 percent (the function is fully performed at offshore locations). We focus on aggregate measures and consider the overall impact of offshoring primary functions. We calculate the extent of offshoring primary functions by summing the percentage offshored of the production, R&D, and engineering functions and dividing it by three. The range of values observed for offshoring primary functions in our data is between zero and 70 percent.

TMT attributes

The measure for *TMT informational diversity* ($\alpha = 0.71$) represents the degree of variation in the TMT members' educational background and work experience. We adapted the five-item measure of TMT diversity from Campion, Medsker, and Higgs (1993). The scale asked whether the members of the management team have 'diverse areas of expertise,' 'a very diverse background,' 'varied experiences,' 'skills that are highly complementary,' and 'great variety in training.' *TMT shared vision* ($\alpha = 0.87$) represents the degree of consensus among the TMT members regarding the future strategic direction of the firm and we measured it through a five-item scale adapted from Sinkula *et al.* (1997). We asked TMT members to

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indicate whether there is 'agreement on the firm's vision,' 'commitment to the collective goals of the firm,' 'enthusiasm about the collective ambition of the firm,' 'a common goal within the firm,' and whether 'the divisions within our firm have common objectives.' For both TMT diversity and TMT shared vision, respondents were asked to provide their degree of agreement where 1 = 'strongly disagree' and 7 = 'strongly agree.'

Control variables

In order to account for exogenous influences on firm innovativeness, our study includes relevant control variables: firm size, firm age, TMT size, R&D intensity, extent of offshoring secondary functions, and industry. *Firm size* can either dampen innovativeness as it creates inertia or it can enhance innovativeness as larger firms typically have more resources (c.f. Damanpour, 1992). We control for firm size by including the natural logarithm of the number of employees. We also accounted for *firm age* as older firms tend to be more inert (Hannan and Freeman, 1984), leading to lower levels of innovativeness than younger firms. We measured firm age as the natural logarithm of the number of years since the firm was founded. In line with previous studies (e.g., Siegel and Hambrick, 2005), we control for *TMT size*, which we measured as the natural logarithm of the number of senior executives who are responsible for important decisions about the future of the firm. Further, following existing literature (e.g., Kochhar and David, 1996), this study controls for *R&D intensity*, which we measured by asking the respondents to indicate how much their firms spent, on average, on R&D as a percentage of revenues over the previous three years. We also control for the *extent of offshoring secondary functions* in order to account for demands on managerial attention regarding the coordination of offshore operations. We calculate the extent of offshoring secondary functions by summing the percentage offshored of the accounting, human resources, IT, and customer service functions and then dividing by four. The theoretical range is between zero and 100 percent and the observed range is between zero and 60 percent. Lastly, in order to account for *industry* differences in the level of innovativeness (e.g., Kochhar and David, 1996), we created six dummy variables based on the Standard Industry Classification codes: manufacturing, professional services, transportation, construction, food and forestry (used as the base group), and other industries.

Construct and method validity

We assessed the discriminant and convergent validity of the TMT attributes constructs through exploratory and confirmatory factor analyses. Exploratory factor analysis of all items pertaining to TMT diversity and TMT shared vision clearly produced a two-factor structure with all items loading clearly on their intended factors (all factor loadings were above 0.62 and cross loadings below 0.34) and all factors had eigenvalues greater than one. Furthermore, results of confirmatory factor analysis of all items (restricted to load on the proposed constructs, i.e., on TMT diversity, or TMT shared vision) indicate a good fit with the data (χ^2/df = 1.68 good fit index = 0.97, comparative fit index = 0.98, root mean square error of approximation = 0.05). Also, all item loadings on the proposed indicators were significant ($p < 0.01$). The results of the exploratory and confirmatory factor analyses show evidence in support of the constructs' discriminant and convergent validity.

To test for single respondent bias and to analyze reliability issues, we surveyed additional members of each TMT during each round of data collection in 2007 and 2008. We received completed questionnaires of additional TMT members (from one to three additional members) from 162 firms (or 15% of the 2007 sample) for both TMT diversity and TMT shared vision and from 31 firms (or 11% of the 2008 sample) for innovativeness. The average interrater agreement index (r_{wg}) (James, Demaree, and Wolf, 1993) is 0.88 for innovativeness, 0.86 for TMT diversity and 0.85 for TMT shared vision, indicating adequate agreement among the TMT members (LeBreton, and Senter, 2008). In addition, we calculated the intraclass correlations, ICC(1), which provide a measure of response convergence within TMTs. F-tests of the ICC(1) scores for innovativeness (0.90), TMT informational diversity (0.62), and TMT shared vision (0.85) show that all ICC(1) scores are significantly greater than zero (McGraw and Wong, 1996), indicating accurate agreement.

Regarding common method bias, we employed a procedural method to reduce the potential common method bias and we used statistical techniques to assess its likelihood. First, following Podsakoff

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et al. (2003), we temporally separated the collection of the independent and the dependent variables by one year. The temporal separation of measurement decreases the risk of common method bias because it reduces biases in the respondents' retrieval process, lessens the respondents' ability to use previous answers to fill in recollection gaps, and makes previous answers less salient (Podsakoff *et al*., 2003). Second, we used statistical techniques to determine whether our data is likely to suffer from common method bias. We first performed Harman's one factor test (Podsakoff and Organ, 1986) by including all items of TMT diversity, TMT vision, and the answer for innovativeness in an exploratory factor analysis. The factor analysis clearly showed three factors with eigenvalues greater than one and the first factor accounts for less than 30 percent of the total variance. That is, there is no evidence of unidimensionality in our data. In addition, we followed Podsakoff *et al*.'s (2003: 894) approach to control for an unmeasured latent factor. That is, we performed a confirmatory factor analysis on which we let items load on both their theoretical constructs and on a latent common method variance factor. The fact that all item loadings on the theoretical constructs were still significant even after the inclusion of the latent factor indicates that common method bias is not a serious problem. In short, we incorporated in the study design methods to reduce the potential of common method bias and we used statistical techniques to show that it is not an issue.

ANALYSIS AND RESULTS

Table 1 presents the descriptive statistics for the model variables and Table 2 presents the results for the ordinary least squares (OLS) regressions testing our hypotheses. Inspection of the plots of standardized residuals versus predicted values and the normal probability plot of standardized residuals indicates no serious violations of the major regression assumptions. In order to limit the potential multicolinearity of interaction terms, we mean centered the independent variables before constructing the interaction terms (Aiken and West, 1991). Post-regression tests show that there is no evidence of multicolinearity as all variance inflation factors are below the cut-off value of 10 (Neter, Wasserman, and Kutner, 1990). Model 1 contains the control variables and the subsequent models add the main and moderating effects. We discuss the results of the full model, Model 4.

We find strong support for Hypothesis 1, which described an inverted U-shaped relationship between offshoring of primary functions and firm innovativeness, as the main effect of offshoring is positive and significant ($\beta = 0.50$, $p < 0.001$) and the extent of offshoring squared is negative and significant ($\beta = -0.46$, $p < 0.001$). The empirical results also support a moderating role of TMT informational diversity (Hypothesis 2) as the interaction term between the extent of offshoring squared and TMT diversity is statistically significant ($\beta = -0.31$, $p < 0.01$). In addition, the significance of the interaction term between the extent of offshoring squared and TMT shared vision ($\beta = 0.40$, $p < 0.01$) provides support for the idea that TMT shared vision moderates the relationship between offshoring primary functions and firm innovativeness (Hypothesis 3).

In order to gain more insights about exactly how the TMT attributes moderate the relationship between offshoring and firm innovativeness, we plot the moderating relationships (Aiken and West, 1991). We considered one standard deviation below and above the mean to represent the low and high values of TMT diversity and TMT shared vision. Figure 1 presents the moderating role of TMT informational diversity (Hypothesis 2). The interaction graph indicates that firms with high TMT diversity exhibit an inverted U-shaped relationship between the extent of offshoring and firm innovativeness. Interestingly, firms with low TMT diversity appear to experience a slightly decreasing relationship between the extent of offshoring and innovativeness, indicating that increasing the extent of offshoring may slowly decrease innovativeness. These results corroborate the expectations formulated in Hypothesis 2, which suggested that the inverted U-shaped curve is steeper in firms with high TMT informational diversity than in those with low TMT informational diversity.

Figure 2 depicts how TMT shared vision moderates the nonlinear relationship between the extent of offshoring primary functions and firm innovativeness (Hypothesis 3). In line with our expectations, firms that have a low TMT shared vision experience a steep inverted U-shaped relationship between offshoring and firm innovativeness. Also in line with Hypothesis 3, we find that firms with a high TMT shared vision experience a rather flat

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Table 1. Descriptive statistics and correlations

	Mean	s.d.	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Firm innovativeness	0.10	0.10	0.00	1.00	—													
2. Offshoring primary functions	0.05	0.10	0.00	0.70	0.07	—												
3. TMT diversity	5.27	0.87	2.60	7.00	0.07	0.05	(0.71)											
4. TMT shared vision	5.50	0.83	2.80	7.00	0.11	0.04	0.25	(0.87)										
5. Firm size[a]	4.05	1.06	3.00	8.34	0.04	0.15	−0.05	−0.02	—									
6. Firm age[a]	3.28	0.95	0.69	5.19	−0.13	0.06	−0.07	−0.06	0.23	—								
7. TMT size[a]	1.54	0.54	1.39	4.32	0.02	0.09	0.08	−0.02	0.27	0.08	—							
8. R&D intensity	0.04	0.07	0.00	0.90	0.28	0.07	−0.08	0.09	−0.09	−0.14	−0.02	—						
9. Offshoring secondary functions	0.03	0.06	0.00	0.60	0.06	0.49	0.06	−0.01	0.12	0.03	0.03	0.08	—					
10. Manufacturing	0.24	0.43	0.00	1.00	0.10	0.07	−0.03	0.00	−0.08	0.23	−0.07	−0.02	−0.03	—				
11. Transportation	0.09	0.28	0.00	1.00	−0.01	−0.05	0.04	0.01	−0.10	−0.06	0.03	0.02	0.07	−0.18	—			
12. Construction	0.17	0.38	0.00	1.00	−0.06	−0.08	−0.05	−0.08	0.08	0.07	0.06	−0.12	−0.08	−0.25	−0.16	—		
13. Professional services	0.31	0.46	0.00	1.00	−0.04	−0.03	−0.03	0.12	−0.10	−0.31	−0.05	0.08	0.00	−0.34	−0.22	−0.29	—	
14. Food and forestry	0.07	0.26	0.00	1.00	−0.04	0.13	0.01	0.01	0.12	0.11	0.09	−0.05	0.05	−0.18	−0.12	−0.16	−0.21	—
15. Other industry	0.11	0.31	0.00	1.00	0.05	−0.02	0.09	−0.07	0.14	0.00	−0.02	0.08	0.02	−0.19	−0.12	−0.16	−0.22	−0.12

Notes: N=276. Correlation coefficients above |0.10| are significant at the $p < 0.05$. The Cronbach's alphas of the composite scales are presented in parentheses on the diagonal. [a] Firm size, Firm age, and TMT size are the natural logarithms of the number of years since founding, employees, and members of the TMT, respectively.

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Table 2. Results of the OLS regression analysis for firm innovativeness

	Model 1	Model 2	Model 3	Model 4
Control variables				
Firm size	0.14*	0.15*	0.16**	0.16**
Firm age	−0.18**	−0.18**	−0.19**	−0.18**
TMT size	0.11†	0.09	0.07	0.06
R&D intensity	0.08	0.08	0.05	0.14*
Offshoring secondary functions	0.20***	0.21***	0.22**	0.23**
Manufacturing	0.18†	0.17†	0.16	0.15
Transportation	−0.05	−0.06	−0.05	−0.03
Construction	0.06	0.07	0.08	0.07
Professional services	0.03	0.03	0.06	0.05
Other industry	−0.01	−0.03	−0.02	−0.03
Moderating variables				
TMT diversity		0.17**	0.16**	0.33***
TMT shared vision		0.03	0.02	−0.28**
Main effect				
Offshoring primary functions			0.37**	0.50***
Offshoring primary functions squared (sqr)			−0.36**	−0.46***
Interaction effects				
Offshoring primary functions X TMT diversity				0.42***
Offshoring primary functions X TMT shared vision				−0.56***
Offshoring primary functions sqr X TMT diversity				−0.31**
Offshoring primary functions sqr X TMT shared vision				0.40**
R^2	0.13	0.16	0.20	0.26
ΔR^2	0.13***	0.03**	0.04**	0.06***
Adj. R^2	0.10	0.12	0.15	0.21

Notes: N=276. Standardized coefficients are reported. † $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

(i.e., less positive) relationship between lower levels of offshoring and innovation. Interestingly, we find that a high TMT shared vision not only dampens the detrimental effect of high levels of offshoring on innovation, but may lead to a slightly positive relationship. This means that the effect of TMT shared vision is in the hypothesized direction (i.e., it reduces the negative slope between high levels of offshoring and firm innovativeness), but its magnitude appears somewhat stronger than expected. Thus, these findings are largely in line with the relationships proposed in Hypothesis 3.

Robustness analysis

In order to verify the robustness of our findings regarding the inverted U-shaped relationship between the offshoring of primary functions and innovativeness, we performed several robustness tests. First, we allow more flexibility in the curve by including the cube of offshoring. We find that the cube of offshoring is not statistically significant, which provides evidence that an inverted U-shaped relationship fits data better than other specifications such as diminishing returns to scale or functions that revert to a positive trend (Li, Zhou, and Zajac, 2009). Second, following the procedure advanced by Aiken and West (1991), we conducted a simple slope analysis to test the statistical significance of various parts of the regression curve, especially the negative sections. We consider high and low levels of the moderator terms as one standard deviation above and below the mean and high and low levels of offshoring as one standard deviation above and below the inflection point of the regression curve. Results indicate that for high levels of TMT diversity, the simple slope of the regression curve is positive and significant at low levels of offshoring ($\beta = 1.95$, $t < 0.001$) and negative and significant at high levels of offshoring ($\beta = -0.65$, $t < 0.05$). We also find that for low levels of TMT shared vision, the simple slope of the regression curve is positive and significant at low levels of offshoring ($\beta = 2.08$, $t < 0.001$) and negative and significant at high levels of offshoring ($\beta = -0.56$, $t < 0.05$). These

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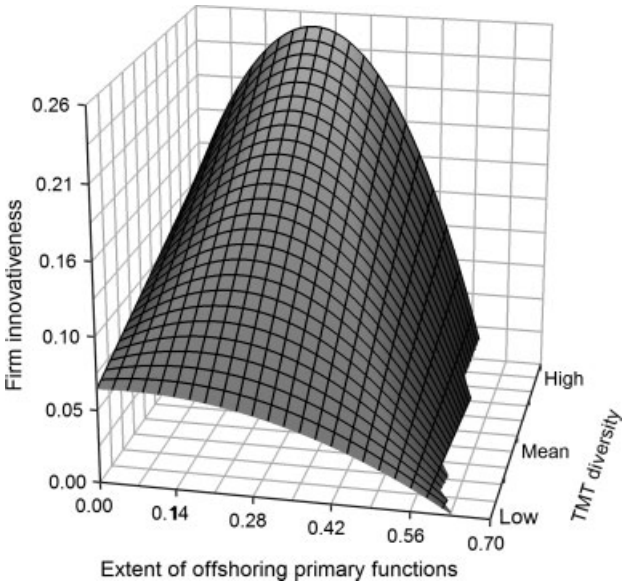

Figure 1. The moderating effect of TMT informational diversity for the relationship between offshoring primary functions and firm innovativeness

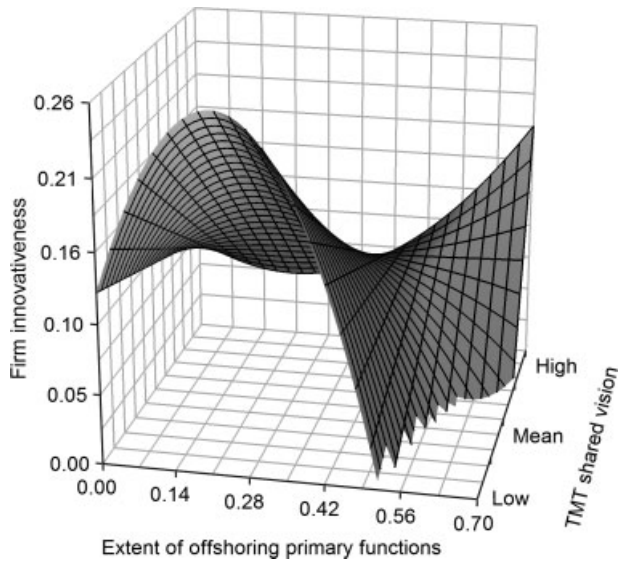

Figure 2. The moderating effect of TMT shared vision for the relationship between offshoring primary functions and firm innovativeness

findings provide additional evidence in support of the inverted U-shaped specification. Also, in line with our hypotheses, for low TMT diversity and high TMT shared vision, the simple slopes are not statistically significant ($p > 0.10$).

Third, following Li *et al*. (2009) we reran the regression analysis using three randomly selected subsamples (90%, 80%, and 70% of the original sample) and we found that the empirical results are the same as when using the full sample. Fourth, we reran the regressions using an alternative operationalization of firm innovativeness, a four-item scale (Li and Atuahene-Gima, 2002) that we described in the Methods section. The results of this alternative regression are similar to the original ones. The findings of all these analyses

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provide additional confidence in the robustness of the inverted U-shaped relationship between the offshoring of primary functions and firm innovativeness.

DISCUSSION AND CONCLUSION

Despite offshoring's increasing prominence in both practice and research, its role in a firm's ability to develop new products and services is not well understood as the few studies on the topic provide contradictory arguments (Doh, 2005; Youngdahl *et al*., 2008). Considering the steady growth of offshoring in recent years, and its expected acceleration in the future, clarifying the relationship between offshoring and innovation is of primary importance for understanding how firms can benefit from relocating business functions to foreign locations. In this context, our study makes several important contributions to both theory and practice.

Theoretical contributions

Building on a large sample of firms operating in a wide range of industries, our study advances innovation literature as it takes a significant step in establishing offshoring as an important antecedent of innovation (e.g., Li *et al*., 2008; Venkatraman, 2004; Teece, 1987). A major finding of this study is that the offshoring of primary functions (i.e., production, R&D, and engineering) can enhance firm innovativeness. The relocation of business operations to foreign locations may mitigate the high demands of innovation as it allows firms to capitalize on location-specific advantages of foreign countries (Cantwell, 1994). For instance, firms may not only leverage cost differentials to increase the magnitude of knowledge generating activities (e.g., Lewin and Peeters, 2006) but also may directly access unique skills and competencies not available at their home location (Chung and Alcacer, 2002). That is, offshoring primary functions can be seen as an important mechanism to access valuable tangible or intangible resources that either augment or complement firms' existing resource stock. Allowing the sourcing of resources from those locations with relative advantages, offshoring provides improved resource management opportunities, thus, aiding firms in developing their combinative capabilities (Sirmon, Hitt, and Ireland, 2007). In this sense, offshoring primary functions enhances a firm's ability to recombine existing and newly acquired knowledge in order to develop new products and services (Teece, Pisano, and Shuen, 1997).

Although our study shows that offshoring has important benefits in terms of enhancing innovation, it also indicates that the relocation of primary functions exhibits decreasing returns to scale and eventually dampens innovative outcomes. When a relatively high proportion of primary functions are performed at foreign locations, firms may experience a decrease in their ability to transfer and assimilate new knowledge due to a lack of overlap with the existing knowledge at the home location (e.g., Van Wijk *et al*., 2008). In this respect, our finding is consistent with the idea that knowledge at international locations is important only in so far as the firm can transfer and assimilate it successfully (Ghoshal, 1987). Also, synthesizing and integrating knowledge may become cumbersome as firms have to deal with geographical, cultural, and institutional differences. The hurdles of coordinating internationally dispersed activities create pressures on managerial attention and communication (Kotabe, 1990) and may slow down the introduction of product changes (Markides and Berg, 1988). Thus, our research indicates that over-offshoring poses the risk of reduced innovative outcomes.

By providing theoretical arguments and finding empirical support for an inverted U-shaped relationship, this study reconciles previous positive (i.e., Li *et al*., 2008) and negative (i.e., Chesbrough and Teece, 1996; Teece, 1987) assertions in extant literature about the influence of offshoring on innovation. Also, by focusing on offshoring primary functions, our study pinpoints the effects of relocating those business functions that provide direct knowledge inputs for a firm's innovation process. In this way, our study uncovers important new insights into how firms can harness the potential of offshoring to stimulate the successful introduction of new products and services. In a broader sense, this study advances the understanding of international sourcing as input for innovation and compliments Chung and Yeaple's (2008) investigation into the reasons of international knowledge sourcing. Also, our findings deepen our understanding of how the sourcing of knowledge from a wide range of sources is beneficial for innovation (Leiponen

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and Helfat, 2010), by emphasizing the benefits and drawbacks of sourcing from *foreign* locations.

In addition to the direct effects, our study proposes a contingency perspective suggesting that TMT attributes alter the effectiveness of offshoring in influencing innovation. Specifically, we find support for the moderating role of both TMT informational diversity and TMT shared vision. These findings make important contributions to the upper echelon literature. While previous studies emphasize the role of TMTs in determining strategic choices (e.g., Bantel and Jackson; 1989; Wiersema and Bantel, 1992), our study complements such assertions by showing that TMT attributes impact the effectiveness of international sourcing strategies. TMT attributes provide important contingencies for strategic actions as they influence perceptions of the surrounding environment (Finkelstein and Hambrick, 1996) and dynamics among senior executives (Vissa and Chacar, 2009). Connecting theory on upper echelon and innovation, our study suggests that innovation depends on the *joint* effect of organizational search processes and managerial decision making (Greve, 2003). That is, where offshoring raises a number of opportunities for enhancing innovation, the extent to which firms introduce new products and services depends significantly on the ability of TMTs to choose viable options and to coordinate knowledge transfer across international borders. Moreover, TMT attributes are important moderating factors as they may influence how senior executives handle challenges inherent in offshoring such as integrating knowledge from geographically distant locations and coordinating operations across cultural and institutional barriers (Roth, 1995). In this sense, we answer a call for a better understanding of how senior executives influence the efficiency of transferring, combining, and deploying knowledge from foreign locations (Foss and Pedersen, 2004).

Regarding the specific effects of TMT attributes, we find that the consequences of offshoring primary functions for the ability of firms to introduce new products and services depend on the level of TMT diversity. The relocation of primary functions to foreign locations enhances innovation the most in those firms that have diverse TMTs. Informational diversity may be an important managerial resource as the multiple perspectives allow TMTs to perceive and value more of the opportunities presented by offshoring (Waller, Huber, and Glick, 1995). With relatively superior cognitive abilities, diverse TMTs may be better able to coordinate internationally dispersed operations in a manner that uses location-specific competencies and captures synergies across locations (Roth, 1995). As such, our findings suggest that enhancing innovation through offshoring benefits from the variety of perspectives available to the TMT as it may allow senior executives to better negotiate and capitalize on cross-border opportunities. However, in line with the argument that diversity can be a double-edged sword (Milliken and Martins, 1996; Williams and O'Reilly, 1998), we find that TMT diversity can also exacerbate the negative effects of offshoring higher levels of primary functions. Differences in mental models may create relational conflicts among senior executives and lead TMTs to incongruent interpretations about what opportunities from offshoring to pursue (Knight *et al*., 1999). For upper echelon theory, the finding that TMT diversity steepens the inverted U-shaped relationship between offshoring and innovation is consistent with prior suggestions that heterogeneity has cognitive benefits in less complex environments but that in more complex situations these benefits are reduced by relational difficulties (Carpenter, 2002).

Our empirical findings also support the idea that a TMT shared vision moderates the relationship between the offshoring of primary functions and firm innovativeness. Our results indicate that firms with a low TMT shared vision can benefit more from lower levels of offshoring in terms of increased innovativeness than firms with a high TMT shared vision. This suggests that offshoring can be an important search mechanism as it allows firms without a clear strategic mission to connect to offshore knowledge sources and engage in multiple experiments (Leiponen and Helfat, 2010). In addition, we find that a high TMT shared vision can have important benefits as it mitigates the detrimental effect of high levels of offshoring primary functions. Our results (see Figure 2) suggest that these benefits may be even more pronounced as firms with a strong TMT shared vision might experience a slightly increasing relationship between high levels of offshoring and innovativeness. That is, a shared vision appears to be an important factor that helps firms surpass the difficulties of cross-border knowledge transfer at high levels of offshoring primary functions in order

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to maintain and even increase expertise. Underscoring the importance of convergence within the TMT regarding a firm's long-term strategic direction, this finding is in line with the idea that TMT consensus is important for strategy implementation (e.g., Floyd and Wooldridge, 1992; Homburg, Krohmer, and Workman, 1999). In this sense, our study advances the understanding of the role of TMT shared vision in how firms leverage external knowledge (Vissa and Chacar, 2009). Overall, by advancing the understanding of the contingency effect of a TMT shared vision on the influence of offshoring on the ability of firms to introduce new products and services, our findings complement existing insights regarding the implications of goal consensus among TMT members for firm performance (Dess, 1987; Priem, 1990).

Managerial implications

The main managerial implication of this study is that it suggests offshoring as a potential means to improve innovative performance. That is, offshoring provides opportunities to leverage wage differentials and competencies at foreign locations. However, our findings suggest that managers should be cautious in offshoring primary functions as "over-offshoring" can be detrimental to innovation. Also, managers contemplating offshoring for other reasons such as cost savings need to consider the possible (negative) side effects on the introduction of new products and services. The moderating role of TMT diversity points out the benefits of a multitude of perspectives on the opportunities arising from offshoring in order to enhance the introduction of new products and services. The finding that firms with low TMT shared vision experience a steep inverted U-shaped relationship suggests that, when used in moderation, offshoring can be a useful means to explore strategic alternatives. Also, our results regarding the moderating role of TMT shared vision emphasize the importance of setting long-term goals for the firm and building commitment to these goals among TMT members prior to engaging in offshoring, especially when firms intend to relocate a large portion of their primary functions.

Limitations and directions for future research

Although our study provides important insights regarding the role of offshoring as an antecedent of firm innovativeness, it can be extended in several ways. A limitation of this study is that we do not address the specific mediating role of knowledge transfer mechanisms. While we argue that offshoring provides access to a wide variety of offshore knowledge sources, we do not discuss the specific mechanisms through which the reverse knowledge transfer takes place. Researchers suggest a multitude of methods for stimulating knowledge transfer such as setting communication channels and personnel interaction (Inkpen, 2008), or implementing financial incentives (Fey and Furu, 2008); however, transferring knowledge is not easily achieved and the effectiveness of transfer mechanisms is highly contextual (e.g., Ambos and Ambos, 2009). Therefore, in order to fully benefit from offshoring in terms of enhancing innovativeness, firms need to set in place appropriate knowledge transfer mechanisms.

In addition, we analyze TMT diversity only in terms of informational diversity. However, recent research has incorporated other types of diversity such as cultural, racial, or gender that also play an important role in influencing TMT actions (e.g., Richard *et al*., 2004). Analyzing other types of diversity alongside informational diversity would provide a more complete understanding of how TMT diversity influences firms' effectiveness in enhancing innovativeness through offshoring. Also, although we temporally separated data collection for the dependent and independent variables, a longitudinal research design would provide additional confidence in the causal link between offshoring and innovativeness. Future studies could contribute by advancing our attempt to open the black box of managerial factors that moderate the offshoring-innovativeness relationship. For instance, future studies could investigate the moderating effect of TMT contingency rewards as Jansen *et al*. (2008) find evidence of their influence on TMTs' ability to reconcile conflicting agendas.

Another opportunity for future research arises from our implicit assumption that firms may choose the level of offshoring in order to satisfy certain innovation targets. However, research shows that, in addition to enhancing innovation, firms offshore for a multitude of reasons. For instance, firms offshore in order to reduce costs, as a response to competitive pressures, or due to a lack of labor availability in the home country (Lewin and Peeters, 2006; Lewin *et al*., 2009).

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However, trying to achieve different goals simultaneously implies certain trade-offs. An especially pertinent trade-off is the one between efficiency and innovation. As these two goals are often conflicting (e.g., Benner and Tushman, 2003), firms may have to find some compromise between them. Thus, in search of (or in response to pressures for) efficiency, firms may have to offshore a large proportion of their business processes at the cost of their innovativeness. Future research could consider the interdependence between offshoring goals in order to determine the degree of these trade-offs and ways in which to reconcile conflicting goals such as those between innovation and efficiency.

In conclusion, this study contributes to extant literature by advancing the understanding of how firms can use offshoring in order to enhance their innovativeness. To this end, we examine not only how increasing the level of offshoring influences innovativeness but also how TMT attributes moderate this relationship.

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